Installing DEC GKS–3D for VMS

Order Number: AA–LM44B–TE

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This document contains instructions for installing DEC GKS–3D on the VMS operating system. It also explains how to read the online release notes before or after installing this product.

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Preface

This document describes how to install DEC GKS–3D on the VMS operating system. It is intended for system managers. This document applies to Version 1.1 of DEC GKS–3D.

Keep this document with your distribution kit. You will need it to install maintenance updates or to reinstall DEC GKS–3D for any other reason.

At the back of this document are two Reader's Comments forms. If you have any comments about this document, please fill out one form and mail it. Your comments will be considered for the next revision of the installation guide.

The installation procedure is described step-by-step and is, for the most part, self-explanatory. The system prompts you to answer questions and to change volumes, and waits for you to tell it to continue.

Associated Documents

For more information about installing DEC GKS–3D on a VMS system, see your processor-specific installation/operations guide.

For specific questions on your operating system, refer to the documentation set for that operating system.

Conventions Used in This Document

Defaults appear in brackets ([ ]) throughout the installation procedure. Red ink indicates user input. The RETURN key is symbolized as ⌐ RET¬. CTRL/x indicates that you must press the key labeled CTRL while you simultaneously press another key, for example CTRL/C.

Chapter 1

Preparing to Install DEC GKS–3D

This chapter describes the preparations and requirements necessary for installing DEC GKS–3D.

Your bill of materials (BOM) and indented bills report (BIL) specify the number and contents of your media. Be sure to verify the contents of your kit with this information. If your kit is damaged or if you find that parts of it are missing, contact your Digital representative.

DEC GKS–3D provides online release notes. Digital strongly recommends that you read the release notes before proceeding with the installation.

1.1 Required Operating System Components

DEC GKS–3D runs on the VMS operating system, Version 5.3 or higher. DEC GKS–3D requires the following VMS classes for full functionality of the product:

- VMS required saveset
- Utilities, if the DEC GKS–3D for VMS online HELP is to be installed
- Network support, where full DECwindows network functionality is required
- Programming support, with the DEC GKS–3D development kit for GKS–3D application development

1.2 Prerequisite Software

To install DEC GKS–3D on a VAXstation, you must have one of the following products installed:

- VAXstation Windowing Software Version 4.0 or higher
- VMS Version 5.3 or higher with its related DECwindows version

1.3 VMS License Management Facility

The VMS License Management Facility (LMF) is available with Version 5.3 of the VMS operating system. If you are installing DEC GKS–3D on a VMS Version 5.3 or higher system, you must register your software license.

The license registration information you need is contained in the Product Authorization Key (PAK) that is shipped with DEC GKS–3D. The PAK is a paper certificate that contains information about the license you have to run a particular piece of software.

It is best to register your DEC GKS–3D license before you perform the installation. During the installation, you are asked if you have registered the DEC GKS–3D license and loaded the appropriate authorization key. If you have not already done so, you can complete the installation; however, you will not be able to run either the DEC GKS–3D software or its Installation Verification Procedure (IVP). Once you perform the license registration and have loaded an authorization key, you will be able to run the IVP and use DEC GKS–3D.

To register a license under a VMS Version 5.3 system, first log in to the system manager's account, SYSTEM. You then have a choice of two ways to perform the registration:

- Invoke the SYS$UPDATE:VMSLICENSE.COM procedure. When it prompts you for information, respond with data from your Product Authorization Key (PAK).
- Issue the LICENSE REGISTER DCL command with the appropriate qualifiers that correspond to information on the PAK.

For complete information on using LMF, see the manual on the License Management Utility in the VMS documentation set.

1.4 Installation Procedure Requirements

This section describes various requirements for installing DEC GKS–3D. Before you begin, you should perform a system disk (or disks) backup. The installation procedure takes approximately 5 to 30 minutes, depending on your type of media and your system configuration.

The following sections describe the privileges and resources you must have to install DEC GKS–3D.

1.4.1 Privileges

To install DEC GKS–3D, you must be logged in to an account that has SETPRV or at least the following privileges:

- CMKRNL
- WORLD
- SYSPRV

Note that VMSINSTAL turns off BYPASS privilege at the start of the installation.

1.4.2 Disk Space

Installing DEC GKS–3D requires a certain amount of free storage disk space during the installation. Once DEC GKS–3D is installed, less storage space is required. Table 1–1 summarizes the storage requirements for DEC GKS–3D.

Table 1–1: Disk Space Requirements

Kit	Blocks During Installation	Blocks After Installation
DECGKS3D	12,000	11,000
DECGKS3DRT	8,000	7,000

To determine the number of free disk blocks on the current system disk, enter the following command at the DCL prompt:

```
$ SHOW DEVICE SYS$SYSDEVICE RET
```

1.4.3 System Parameters

Table 1–2 lists the minimum required system parameter values for the installation. Depending on the kinds of programs and applications running at your site, you might need higher values for some settings.

Table 1–2: Required System Parameter Values

System Parameter	Value
GBLSECTIONS[1]	n + 25

[1]The n variable refers to the system parameter values that are currently in use. To install DEC GKS–3D, you must raise those values by the number indicated. (See Section 1.4.3.1.)

The following sections show you how to check system parameter values, calculate values for the GBLPAGES and GBLSECTIONS system parameters, and change parameter values with the VMS AUTOGEN command procedure.

1.4.3.1 Calculating the Values for GBLPAGES and GBLSECTIONS

To install and run DEC GKS–3D, you must set the correct values for the GBLPAGES and GBLSECTIONS system parameters.

The values for GBLSECTIONS in Table 1–2 indicate that you must have at least 25 sections available on your system for the installation to process successfully. To calculate how many global sections your system has, perform the following steps:

1. Run the VMS Install Utility (INSTALL) using the following DCL command:

```
$ INSTALL RET
INSTALL> LIST/GLOBAL/SUMMARY RET
```

   The INSTALL utility displays a summary of global pages and global sections used by your system, as well as the current number of unused global pages. For example:

```
                Summary of Local Memory Global Sections

   258 Global Sections Used,  22580/3420 Global Pages Used/Unused
```

2. Note the amount shown for ‘‘Global Sections Used’’ (258 in the example), then exit.

```
INSTALL>  EXIT RET
```

3. Run the SYSGEN utility and use the SHOW command to determine the number of global sections that have been allocated:

```
$  RUN SYS$SYSTEM:SYSGEN RET
SYSGEN>  USE CURRENT RET
SYSGEN>  SHOW GBLSECTIONS RET

Parameter Name    Current   Default   Minimum   Maximum Unit  Dynamic
--------------    -------   -------   -------   ------- ----  -------
GBLSECTIONS           512       250        20      4095 Sections
```

4. Subtract the amount shown in the summary (258 in the example) from the amount allocated (512 in the example). If the difference is less than the number required in Table 1–2, you need to increase the value of the GBLSECTIONS parameter. Exit from SYSGEN.

```
SYSGEN>  EXIT RET
```

Section 1.4.3.2 describes the procedures for increasing this value as well as those of other system parameters. Refer to the VMS documentation on system management and operations for more information.

1.4.3.2 Changing System Parameter Values with AUTOGEN

You use the AUTOGEN command procedure to change system parameters. AUTOGEN automatically adjusts values for parameters that are associated with the ones you reset manually. To change system parameters with AUTOGEN, you must edit the following file:

```
$  EDIT SYS$SYSTEM:MODPARAMS.DAT RET
```

After you change the values of the appropriate parameters, run the AUTOGEN procedure to recalculate your system parameters. Enter the following command at the DCL prompt:

```
$  @SYS$UPDATE:AUTOGEN GETDATA REBOOT RET
```

AUTOGEN performs an automatic system shutdown and reboots when it has finished. Rebooting your system makes the new parameter values active. Also on VMS systems Version 5.3, you may wish to add the [NO]FEEDBACK parameter to the AUTOGEN command line. For more information about using AUTOGEN, see the instructions on modifying system parameters in the VMS documentation on system management and operations.

1.4.4 Process Account Quotas

The account you use to install DEC GKS–3D must have sufficient quotas to enable you to perform the installation. Table 1–3 summarizes the process quotas required to perform the installation.

Table 1–3: Process Account Quotas for the Installing Account

Account Quota	Value
ASTLM	24
BIOLM	18
BYTLM	18,000
DIOLM	18
ENQLM	30
FILLM	20

User account quotas are stored in the file SYSUAF.DAT. You use the VMS Authorize Utility to verify and change user account quotas. First set your directory to SYS$SYSTEM and then run AUTHORIZE:

```
$  SET DEFAULT SYS$SYSTEM RET
$  RUN AUTHORIZE RET
UAF>
```

At the AUTHORIZE prompt (UAF>), use the SHOW command with an account name to check a particular account. For example:

```
UAF>  SHOW SMITH RET
```

To change a quota, use the MODIFY command at the UAF> prompt. MODIFY has the following format:

```
MODIFY account-name /quota-name=nnnn
```

The following example changes the FILLM quota for the SMITH account and then exits from the Authorize Utility:

```
UAF>  MODIFY SMITH /FILLM=50 RET
UAF>  EXIT RET
```

After you exit from the utility, the VMS system displays messages indicating whether or not changes were made. Once the changes have been made, you must log out and log in again for the new quotas to take effect.

For more information on modifying account quotas, see the description of the AUTHORIZE utility in the VMS documentation on system management and operations.

1.4.5 VMSINSTAL Requirements

When you invoke VMSINSTAL, it checks the following:

- Whether you have set your default device and directory to SYS$UPDATE
- Whether you are logged in to a privileged account
- Whether you have adequate quotas for installation
- Whether DECnet is up and running
- Whether any users are logged in to the system

If VMSINSTAL detects any problems during the installation, it notifies you of the problem and asks if you want to continue the installation. In some instances, you can enter YES to continue. To stop the installation process and correct the situation, enter NO or press RETURN. Then correct the problem and restart the installation.

1.4.6 Backing Up Your System Disk

At the beginning of the installation, VMSINSTAL asks if you have backed up your system disk. Digital recommends that you do a system disk backup before installing any software on top of the operating system.

Use the backup procedures that have been established at your site. For details on performing a system disk backup, see the section on the Backup Utility in the VMS documentation set.

1.4.7 DEC GKS–3D Requirements

DEC GKS–3D makes the following checks during the installation:

- Disk check
- Global pages check
- Global sections check
- Help library check

1.4.8 License Management Utility Requirements

You will need to register and load your license for DEC GKS–3D before you start the installation to run the Installation Verification Procedure (IVP). Refer to the VMS documentation on the License Management Utility for information about registering your license.

Chapter 2

Installing DEC GKS–3D

This chapter describes how to install DEC GKS–3D. Section 2.2 contains a step-by-step description of the installation procedure.

2.1 General Information

This section includes information about accessing release notes, determining files and logical names added to your system, running the Installation Verification Procedure (IVP), and aborting the installation. Refer to Appendix B for a list of files and logical names that are added to your system during installation.

2.1.1 Accessing the Online Release Notes

DEC GKS–3D provides online release notes. If you specify OPTIONS N when you invoke VMSINSTAL, the installation procedure asks you if you want to display or print the release notes. The release notes question comes near the beginning of the installation. You should review the release notes in case they contain any information about changes in the installation procedures.

After DEC GKS–3D has been installed, the release notes are located in the following files for development and run-time only kits respectively:

```
SYS$HELP:DECGKS3D011.RELEASE_NOTES
```

```
SYS$HELP:DECGKS3DRT011.RELEASE_NOTES
```

Online help also directs you to the release notes file. After the installation, you can enter the following command to review the Help facility:

```
$ HELP GKS3D RELEASE_NOTES RET
```

2.1.2 Running the Installation Verification Procedure (IVP)

The Installation Verification Procedure (IVP) for DEC GKS–3D verifies the installation. During the installation, you are asked if you want to run the IVP as part of the installation. If you respond YES, VMSINSTAL runs the IVP. It is recommended that you run the IVP to be sure that DEC GKS–3D is installed correctly.

After DEC GKS–3D is installed, you can run the IVP independently to verify that the software is available on your system. You might also want to run the IVP after a system failure to be sure that users can access DEC GKS–3D.

If the IVP fails for any reason, the following messages are displayed:

```
The DECGKS3D V1.1 Installation Verification Procedure failed.

%VMSINSTAL-E-IVPFAIL, The IVP for DEC GKS-3D V1.1 has failed.
```

Running the IVP is described further in Section 2.2.4.

2.1.3 Aborting the Installation

To abort the installation procedure at any time, press CTRL/Y. When you press CTRL/Y, the installation procedure deletes all files it has created up to that point and exits. You can then start the installation again.

2.2 The Installation Procedure

The DEC GKS–3D installation process consists of a series of questions and informational messages, as described in the following sections.

Before you begin the DEC GKS–3D installation, define the destination for the output of the Installation Verification Procedure (IVP) with the following command, and replace *node* with your node name:

```
$ DEFINE DECW$DISPLAY node::0.0 RET
```

2.2.1 Invoking VMSINSTAL

To start the installation, invoke the VMSINSTAL command procedure from a privileged account, such as the SYSTEM account. Next, invoke VMSINSTAL. You use the following syntax to invoke VMSINSTAL:

@SYS$UPDATE:VMSINSTAL product-name device-name: [OPTIONS N] RET

product-name
The installation name for the component. For DEC GKS–3D, use the following installation names:

- DECGKS3D (for development kit)
- DECGKS3DRT (for run-time only kit)

device-name
The name of the device on which you plan to mount the media. For example, MUA0: is the device name for a tape drive. It is not necessary to use the console drive for this installation. However, if you do use the console drive, you should replace any media you removed once the installation is completed.

OPTIONS N
An optional parameter that indicates you want to be prompted to display or print the release notes. If you do not include the OPTIONS N parameter, VMSINSTAL does not prompt you to display or print the release notes. You are strongly recommended to read the release notes before proceeding with this installation.

VMSINSTAL has several other options. For more information, see the VMS documentation on software installation.

The following example displays the development kit and the run-time only kit commands to invoke VMSINSTAL to install DEC GKS–3D from tape drive MUA0:. It also shows the system response. This example uses the OPTIONS N parameter for printing or displaying release notes.

```
$  @SYS$UPDATE:VMSINSTAL DECGKS3D MUA0: OPTIONS N RET

$  @SYS$UPDATE:VMSINSTAL DECGKS3DRT MUA0: OPTIONS N RET

      VAX/VMS Software Product Installation Procedure V5.3-2

It is 20-AUG-1990 at 14:53.
Enter a question mark (?) at any time for help.
```

If you do not supply either the product name or the device name, VMSINSTAL prompts you for this information later during the installation procedure. VMSINSTAL does not prompt you for any options, so be sure to include OPTIONS N on the VMSINSTAL command line to access the release notes before installation.

2.2.2 Installation Questions

This section describes the questions that appear during the installation. See Appendix A for a sample installation procedure.

Each question in the installation is marked with an asterisk (*) at the beginning of the line. Some questions show the default response in brackets, for example [YES]. If you want to give the default response, press the RETURN key.

1. DECnet status

   VMSINSTAL notifies you if DECnet is running and displays a list of all active processes. It then asks if you want to continue the installation. You should install DEC GKS–3D on a standalone system or cluster with DECnet shut down. NO is the default response to the question.

```
%VMSINSTAL-W-DECNET, Your DECnet network is up and running.
   .
   .
   .
* Do you want to continue anyway [NO]?
```

2. System backup

   VMSINSTAL asks if you are satisfied with your system backup. You should always back up your system disk before performing an installation. If you are satisfied with the backup of your system disk, press RETURN. Otherwise, enter NO to discontinue the installation. After you back up your system disk, you can restart the installation.

```
* Are you satisfied with the backup of your system disk [YES]?
```

3. Mounting the media

   You should now mount the first distribution volume on the device you specified when you invoked VMSINSTAL. The device name appears in the line preceding the question. VMSINSTAL then asks you if you are ready to continue with the installation.

If you respond YES to indicate that you are ready, VMSINSTAL displays a message that the media containing DEC GKS–3D has been mounted on the specified device and that the installation has begun. For example:

```
Please mount the first volume of the set on MUA0.
* Are you ready?  YES RET
%MOUNT-I-MOUNTED, DECGKS3D MOUNTED ON MUA0 (NODE 1)

 The following products will be processed:
 DECGKS3D V1.1

    Beginning installation of DECGKS3D V1.1 at 14:58

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

If you entered the wrong device name when you invoked VMSINSTAL and need to restart the installation, enter NO in response to the ''Are you ready?'' question. To abort the installation for other reasons, press CTRL/Y.

4. Additional media volumes

   If your installation kit contains more than one volume, VMSINSTAL prompts you to mount the additional volumes and then asks you to indicate that you are ready for the installation to proceed.

```
%BACKUP-I-READYREAD, mount volume 2 on MUA0 for reading

Enter "YES" when ready: YES RET
```

5. Release notes

   If you specified OPTIONS N when you invoked VMSINSTAL, you are now given four options for reviewing the release notes.

```
Additional Release Notes Options:

    1. Display release notes
    2. Print release notes
    3. Both 1 and 2
    4. None of the above

* Select option [2]:
```

   If you select option 1, VMSINSTAL displays the release notes immediately on the console terminal. You can terminate the display at any time by pressing CTRL/C.

   If you select option 2, VMSINSTAL prompts you for the name of the print queue that you want to use:

```
* Queue name [SYS$PRINT]: RET
```

   You can enter a queue name or press RETURN to send the file to the default output print device.

If you select option 3, VMSINSTAL displays the release notes immediately on the console terminal and then prompts you for a queue name for the printed version.

6. Continuing the installation

   The installation procedure now asks if you want to continue the installation. To continue, enter YES. Otherwise, press RETURN. In either case, the release notes are copied to a file in the SYS$HELP directory. For example:

```
* Do you want to continue the installation [NO]?: YES RET
%VMSINSTAL-I-RELMOVED, The product's release notes have been
    successfully moved to SYS$HELP.
```

   The release notes for development and run-time kits are located respectively in the following files:

```
SYS$HELP:DECGKS3D011.RELEASE_NOTES

SYS$HELP:DECGKS3DRT011.RELEASE_NOTES
```

NOTE

> The name of the release notes file installed by VMSINSTAL consists of the current product name and version number. Do not delete release notes for previous versions of DEC GKS–3D.

7. Choosing to purge files

   You have the option of purging files from previous versions of DEC GKS–3D that are superseded by this installation. Purging is recommended; however, if you need to keep files from the previous version, enter NO in response to the question.

```
* Do you want to purge files replaced by this installation [YES]?
```

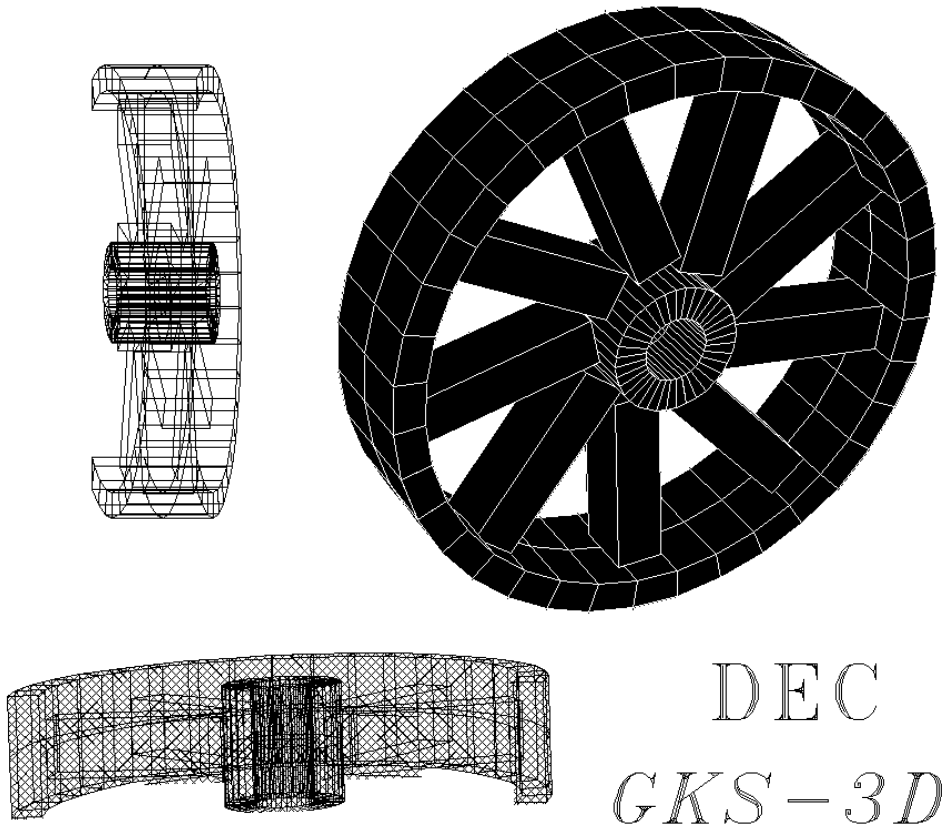
8. Choosing to run the Installation Verification Procedure (IVP)

   The installation procedure now asks if you want to run the Installation Verification Procedure. The IVP for DEC GKS–3D checks to be sure that the installation is successful. It is recommended that you run the IVP.

```
* Do you wish to perform the Installation Verification Procedure [YES]?
```

   The IVP displays the picture shown in Figure 2–1

Figure 2–1: Sample IVP Display



9. License Registration

   The installation procedure asks if you have registered and loaded your authorization key for DEC GKS–3D, and prints out information specific to the particular license, for example:

```
Product: GKS3D
Producer: DEC
Version: 1.1
Release Date: 15-OCT-1990
```

   For the run-time kit:

```
Product: GKS3D-RT
Producer: DEC
Version: 1.1
Release Date: 15-OCT-1990
```

   The installation also inquires:

```
* Does this product have an authorization key registered and loaded?
```

   If you have not registered and loaded your authorization key, you must answer "NO" to this question. A successful installation of DEC GKS–3D depends upon an authorization key being registered and loaded. Please be certain that this has been completed before proceeding with the installation.

2.2.3 Informational Messages

At this point, the installation procedure displays a number of informational messages that report on the progress of the installation. There are no further questions. If the installation procedure has been successful up to this point, VMSINSTAL moves the new or modified files to their target directories, updates help files, and updates DCL tables, if necessary. If you asked for files to be purged, that work is done now. The following messages are displayed:

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
directories...
```

2.2.4 Running the Installation Verification Procedure (IVP)

If you chose to run the IVP, VMSINSTAL runs it now. When the IVP runs successfully, you see the following display:

```
Beginning the DEC GKS-3D Installation Verification Procedure (IVP).
The IVP will take 1 to 5 minutes depending on your CPU.

Since you are running on a VAXstation the Installation
Verification Procedure will be run with DEC GKS-3D device type 211
(DECW). Output will be done to the node indicated by the logical
name DECW$DISPLAY.

The DECGKS3D V1.1 Installation Verification Procedure (IVP) completed
successfully. If the results of the Installation Verification
Procedure (IVP) look like the illustration provided with the
DEC GKS-3D Installation Guide, then installation has been successful.
```

2.2.5 Completing the Installation Procedure

The following messages indicate that the entire installation procedure is complete:

```
Installation of DECGKS3D V1.1 completed at 18:02

VMSINSTAL procedure done at 18:02
```

You can now log out of the privileged account:

```
$ LOGOUT RET
SYSTEM     logged out at 20-AUG-1990 18:05.
```

Note that VMSINSTAL deletes or changes entries in the process symbol tables during the installation. Therefore, if you are going to continue using the system manager's account and you want to restore these symbols, you should log out and log in again.

2.3 Error Recovery

If errors occur during the installation itself or when the IVP is running, VMSINSTAL displays failure messages. If the installation fails, the following message is displayed:

```
%VMSINSTAL-E-INSFAIL, The installation of DECGKS3D V1.1 has failed.
```

If the IVP fails, the following messages are displayed:

```
The DECGKS3D V1.1 Installation Verification Procedure failed.

%VMSINSTAL-E-IVPFAIL, The IVP for DEC GKS-3D V1.1 has failed.
```

Errors can occur during the installation if any of the following conditions exist:

- The operating system version is incorrect.
- A prerequisite software version is incorrect.
- Quotas necessary for successful installation are insufficient.
- System parameter values for successful installation are insufficient.
- The VMS help library is currently in use.
- The product is not properly licensed.
- The metafile input handler is not installed.
- The default output handler, defined by the logicals GKS3D$WSTYPE and GKS3D$CONID, is not installed.

The following errors may occur during execution of the IVP.

- IVP failure.

  ```
  DECGKS3D-F-IVP, GKS-3D installation verification procedure failed
  ```

- Workstation handler not installed.

  ```
  GKS3D-E-ERROR_23, specified workstation type does not exist in
   routine OPEN WORKSTATION
  ```

  First, ensure that the metafile input handler is installed. Then ensure that the definition of GKS3D$WSTYPE is a valid workstation type, including bit masks, and that GKS3D$CONID corresponds to a physical device that is supported and functional.

- The connection ID and workstation type are not compatible.

  ```
  GKS3D-E-ERROR_26, specified workstation cannot be opened
   in routine OPEN WORKSTATION
  ```

  Ensure that the definitions of GKS3D$CONID and GKS3D$WSTYPE make valid pairs, and that GKS3D$CONID corresponds to a physical device that is supported and installed.

- There are not enough unused color entries available for GKS–3D in DECwindows.

  ```
  DECGKS3D-E-ERROR_NEG_2, requested color map could not be created
   in routine OPEN WORKSTATION
  ```

  Set the bit *n* in the workstation bit mask %x0nmm00Da. For example, for workstation type 211, specify %x010000D3.

For descriptions of the error messages generated by these conditions, see the VMS documentation on system messages, recovery procedures, and VMS software installation. If you are notified that any of these conditions exist, you should take the appropriate action as described in the message. (You might need to change a system parameter or increase an authorized quota value.) For information on installation requirements, see Chapter 1.

Chapter 3

After Installing DEC GKS–3D

After installing DEC GKS–3D, you must perform the following tasks:

- Edit the system startup files.
- Reboot the system.
- Set user account quotas.
- Modify system parameter settings.

This chapter also explains how to run the Installation Verification Procedure (IVP) after the software has been installed.

3.1 Editing the System Files

You must edit the system startup file to provide for automatic startup of DEC GKS–3D when your system is rebooted.

Add the command line that starts DEC GKS–3D to the system startup file, SYS$MANAGER:SYSTARTUP_V5.COM. You must position this new command line *after* the line that invokes the network startup command procedure. The following example shows the network startup command line followed by the startup command line for DEC GKS–3D:

```
$ @SYS$STARTUP:STARTNET
      .
      .
      .
$ @SYS$STARTUP:GKS3D$STARTUP
```

3.2 Cluster Considerations

If you want to run DEC GKS–3D on multiple nodes of a VAXcluster, first check to see that you have the appropriate software license. Then, follow these steps after installing DEC GKS–3D:

1. Run the following command on each node of the cluster that has the software license:

   ```
   $  @SYS$STARTUP:GKS3D$STARTUP  RET
   ```

2. Prepare the system-specific roots on other nodes by issuing the following commands on each node:

   ```
   $  CREATE/DIRECTORY SYS$SPECIFIC:[SYSHLP.EXAMPLES.GKS3D]  RET
   $  CREATE/DIRECTORY SYS$SPECIFIC:[SYSTEST.GKS3D]  RET
   ```

3. Verify the installation by running the IVP on each node. Information about running the IVP is given in Section 3.3.2.

   ```
   $  RUN GKS3D$TEST:GKS3D$IVP  RET
   ```

4. Determine if the INSTALL utility was used to install GKS3D$RTLIB.EXE.

   a. Log in to a node on the cluster.

   b. Run INSTALL and enter the following command at the INSTALL> prompt:

      ```
      INSTALL>  LIST SYS$LIBRARY:GKS3D$RTLIB.EXE  RET
      ```

      The INSTALL utility displays how the GKS3D$RTLIB was installed. For example:

      ```
      DISK$SYSTEM01:<SYS0.SYSCOMMON.SYSLIB>.EXE
          GKS3D$RTLIB;1    Open     Share         Lnkbl
      ```

      If an error occurs with this command, GKS–3D was not properly installed.

   c. Repeat steps a and b for each node of the cluster.

3.3 User Account Requirements

To use DEC GKS–3D, user accounts on your system must have certain privileges and quotas. The next two sections contain information on these requirements.

3.3.1 Privileges

To use DEC GKS–3D, each account must have at least the TMPMBX and NETMBX privileges. Use the VMS Authorize Utility to determine whether users have the privileges they require.

3.3.2 Running the Installation Verification Procedure After Installation

The DEC GKS–3D IVP reads a three-dimensional image from a metafile workstation (GKS3D$TEST:GKS3D$IVP.DAT). The metafile is large and execution tests the DEC GKS–3D installation thoroughly.

The image is output to the default OUTPUT or OUTIN workstation, which is defined by the workstation identifier and connection identifier (the logicals GKS3D$WSTYPE and GKS3D$CONID respectively). The default workstation types are as follows:

- VAX: Sixel
- Workstation running DECwindows: DECwindows
- Workstation running VAXstation Workstation Software (VWS): VWS

To redirect the IVP output to another workstation, redefine the logicals.

Run the IVP using the following command:

```
$  RUN GKS3D$TEST:GKS3D$IVP  RET
```

For example, if you want to run the DECwindows IVP on a remote node, ensure that you have the access rights on the server for remote use and that the GKS–3D DECwindows handler is installed. Then enter the following commands, and substitute your node name for node REMOTE:

```
$  DEFINE GKS3D$WSTYPE 211  RET
$  DEFINE GKS3D$CONID  REMOTE::0.0  RET
$  RUN GKS3D$TEST:GKS3D$IVP  RET
```

Output is on a remote server.

3.4 Determining and Reporting Problems

If an error occurs while DEC GKS–3D is being used and you believe that the error is caused by a problem with DEC GKS–3D, take one of the following actions:

- If you have a basic or DECsupport Software Agreement, you should call your Customer Support Center. (With these services, you receive

telephone support that provides high-level advisory and remedial assistance.)

- If you have a Self-Maintenance Software Agreement, you can submit a Software Performance Report (SPR).
- If you purchased DEC GKS–3D within the past 90 days and you think the problem is caused by a software error, you can submit a Software Performance Report (SPR).

If you find an error in the DEC GKS–3D documentation, you should fill out and submit the Reader's Comments form at the back of the document in which the error was found. Include the section and page number where the error was found.

Appendix A

Sample Installation

This appendix contains two sample installations of DEC GKS–3D. These samples were run on a system that had no previous version of DEC GKS–3D installed.

The sample installations assume that DECnet has been shut down, that no users are logged on to your system, and that OPTIONS N is specified to print the release notes. The Installation Verification Procedure (IVP) runs at the end of the installation.

A.1 Full Development Kit Installation

This section contains a sample installation for the DEC GKS–3D full development kit.

Before you begin the DEC GKS–3D installation, define the destination for the output of the Installation Verification Procedure (IVP) with the following command, and replace *node* with your node name:

```
$  DEFINE DECW$DISPLAY node::0.0 RET
```

The sample installation follows:

```
$ @SYS$UPDATE:VMSINSTAL DECGKS3D MUA0: OPTIONS N RET

       VAX/VMS Software Product Installation Procedure V5.3-2

It is 20-AUG-1990 at 14:53.

Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]? yes RET

The following products will be processed:

  DECGKS3D V1.1

       Beginning installation of DECGKS3D V1.1 at 14:58
```

```
%VMSINSTAL-I-RESTORE, Restoring product save set A ...

    Release notes included with this kit are always copied to SYS$HELP.

    Additional Release Notes Options:

 1.  Display release notes
 2.  Print release notes
 3.  Both 1 and 2
 4.  None of the above

* Select option [2]: 1 RET

* Do you want to continue the installation [NO]? YES RET

%VMSINSTAL-I-RELMOVED, The product's release notes have been successfully moved
 to SYS$HELP.
%VMSINSTAL-I-RESTORE, Restoring product save set B ...
* Do you want to purge files replaced by this installation [YES]? yes RET

       PostScript is a registered trademark of Adobe Systems, Inc.
       LaserWriter is a registered trademark of Apple Computer, Inc.
       Tektronix is a registered trademark of Tektronix, Inc.

       This kit contains an Installation Verification Procedure (IVP)
       to verify the correct installation of the DEC GKS-3D product.
       It can be run prior to the conclusion of this procedure by answering
       "YES" to the IVP prompt or invoked after the installation as
       follows :

        RUN SYS$SYSROOT:[SYSTEST.GKS3D]GKS3D$IVP
       or
        RUN GKS3D$TEST:GKS3D$IVP

* Do you wish to perform the Installation Verification Procedure [YES]? yes RET

        Product:      GKS3D
        Producer:     DEC
        Version:      1.1
        Release Date: 15-OCT-1990

* Does this product have an authorization key registered and loaded? YES RET

       STARTING to perform all the installation work. No additional
       user actions are necessary from this point. The remaining part
       of the installation will take ( 5 - 30 minutes ) depending on
       your CPU.

       The DEC GKS-3D run-time library has been processed successfully.

       The installation procedure is continuing...


       The DEC GKS-3D VAXstation marker fonts have been processed successfully.

       The installation procedure is continuing...


       The DEC GKS-3D language bindings have been processed successfully.

       The installation procedure is continuing...


       The DEC GKS-3D Fonts have been processed successfully.

       The installation procedure is continuing...
```

```
        The DEC GKS-3D Language files have been processed successfully.

        The installation procedure is continuing...

    %VMSINSTAL-I-SYSDIR, This product creates system directory
    [SYSHLP.EXAMPLES.GKS3D].

    If you intend to execute this layered product on other nodes in your
    VAXcluster, and you have the appropriate software license, you must
    prepare the system-specific roots on the other nodes by issuing the
    following command on each node (using a suitably privileged account):

        $ CREATE/DIRECTORY SYS$SPECIFIC:[SYSHLP.EXAMPLES.GKS3D]

        This kit contains example programs to demonstrate how to interface
        with the DEC GKS-3D product. The example programs are located in:

         SYS$SYSROOT:[SYSHLP.EXAMPLES.GKS3D]
        or
         GKS3D$EXAMPLES:

     %VMSINSTAL-I-SYSDIR, This product creates system directory [SYSTEST.GKS3D].

     If you intend to execute this layered product on other nodes in your
     VAXcluster, and you have the appropriate software license, you must
     prepare the system-specific roots on the other nodes by issuing the
     following command on each node (using a suitably privileged account):

        $ CREATE/DIRECTORY SYS$SPECIFIC:[SYSTEST.GKS3D]

        DEC GKS-3D has built successfully.
        Continuing installation...

  System Manager:

        Upon completion of this installation, please be sure to
        edit the system startup files as described in the DEC GKS-3D
        Installation Guide.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

        Beginning the DEC GKS-3D Installation Verification Procedure (IVP).
        The IVP will take 1 to 5 minutes depending on your CPU.

        Since you are running on a VAXstation the Installation
        Verification Procedure will be run with DEC GKS-3D device type 211
        (DECW). Output will be done to the node indicated by the logical
        name DECW$DISPLAY.

        The DECGKS3D V1.1 Installation Verification Procedure (IVP) completed
        successfully. If the results of the Installation Verification
        Procedure (IVP) look like the illustration provided with the
        DEC GKS-3D Installation Guide, then installation has been successful.

        Installation of DECGKS3D V1.1 completed at 18:02

        VMSINSTAL procedure done at 18:02
```

A.2 Run-Time Kit Installation

This section contains a sample installation for the DEC GKS–3D run-time only kit.

Before you begin the DEC GKS–3D installation, define the destination for the output of the Installation Verification Procedure (IVP) with the following command, and replace *node* with your node name:

```
$  DEFINE DECW$DISPLAY node::0.0 RET
```

The sample installation follows:

```
$ @SYS$UPDATE:VMSINSTAL DECGKS3DRT MUA0: OPTIONS N RET

       VAX/VMS Software Product Installation Procedure V5.3-2

It is 20-AUG-1990 at 14:53.

Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]? yes RET

The following products will be processed:

  DECGKS3DRT V1.1

       Beginning installation of DECGKS3DRT V1.1 at 14:58

%VMSINSTAL-I-RESTORE, Restoring product save set A ...

    Release notes included with this kit are always copied to SYS$HELP.

    Additional Release Notes Options:

 1.  Display release notes
 2.  Print release notes
 3.  Both 1 and 2
 4.  None of the above

* Select option [2]: 1 RET

* Do you want to continue the installation [NO]? YES RET

%VMSINSTAL-I-RELMOVED, The product's release notes have been successfully moved
 to SYS$HELP.
%VMSINSTAL-I-RESTORE, Restoring product save set B ...
* Do you want to purge files replaced by this installation [YES]? yes RET

       PostScript is a registered trademark of Adobe Systems, Inc.
       LaserWriter is a registered trademark of Apple Computer, Inc.
       Tektronix is a registered trademark of Tektronix, Inc.

       This kit contains an Installation Verification Procedure (IVP)
       to verify the correct installation of the DEC GKS-3D product.
       It can be run prior to the conclusion of this procedure by answering
       "YES" to the IVP prompt or invoked after the installation as
       follows :
```

```
        RUN SYS$SYSROOT:[SYSTEST.GKS3D]GKS3D$IVP
       or
        RUN GKS3D$TEST:GKS3D$IVP

* Do you wish to perform the Installation Verification Procedure [YES]? yes RET

        Product:      GKS3D-RT
        Producer:     DEC
        Version:      1.1
        Release Date: 15-OCT-1990

* Does this product have an authorization key registered and loaded? YES RET

       STARTING to perform all the installation work. No additional
       user actions are necessary from this point. The remaining part
       of the installation will take ( 5 - 30 minutes ) depending on
       your CPU.

       The DEC GKS-3D run-time library has been processed successfully.

       The installation procedure is continuing...


       The DEC GKS-3D VAXstation marker fonts have been processed successfully.

       The installation procedure is continuing...


       The DEC GKS-3D Fonts have been processed successfully.

       The installation procedure is continuing...

%VMSINSTAL-I-SYSDIR, This product creates system directory [SYSTEST.GKS3D].

    If you intend to execute this layered product on other nodes in your
    VAXcluster, and you have the appropriate software license, you must
    prepare the system-specific roots on the other nodes by issuing the
    following command on each node (using a suitably privileged account):

       $ CREATE/DIRECTORY SYS$SPECIFIC:[SYSTEST.GKS3D]

       DEC GKS-3D has built successfully.
       Continuing installation...

  System Manager:

       Upon completion of this installation, please be sure to
       edit the system startup files as described in the DEC GKS-3D
       Installation Guide.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

       Beginning the DEC GKS-3D Installation Verification Procedure (IVP).
       The IVP will take 1 to 5 minutes depending on your CPU.

       Since you are running on a VAXstation the Installation
       Verification Procedure will be run with DEC GKS-3D device type 211
       (DECW). Output will be done to the node indicated by the logical
       name DECW$DISPLAY.

       The DECGKS3DRT V1.1 Installation Verification Procedure (IVP) completed
       successfully. If the results of the Installation Verification
       Procedure (IVP) look like the illustration provided with the
       DEC GKS-3D Installation Guide, then installation has been successful.

       Installation of DECGKS3DRT V1.1 completed at 18:02
```

```
VMSINSTAL procedure done at 18:02
```

Appendix B

Files and Logical Names Installed on Your System

The DEC GKS–3D installation procedure installs a number of files on your system and defines some logical names. Sections B.1 and B.2 list the installed files. Section B.3 lists the logical names that are added to the system logical name table.

B.1 DEC GKS–3D Development Kit Files for VMS

The following list contains the directories and file names of all files installed for the development kit:

Directory SYS$COMMON:[SYS$STARTUP]

GKS3D$STARTUP.COM

Directory SYS$COMMON:[SYSFONT]

GKS3D$MARKERS.VWS$FONT
GKS3D$MARKERS.VWS$VAFONT

Directory SYS$COMMON:[SYSHLP]

DECGKS3D011.RELEASE_NOTES

Directory SYS$COMMON:[SYSHLP.EXAMPLES.GKS3D]

GKS3D$EXAMPLES_BUILD.COM
GKS3D$IMM_MODE_XFORM.C
GKS3D$IMM_MODE_XFORM.EXE
GKS3D$SEGMENT_XFORM.C
GKS3D$SEGMENT_XFORM.EXE
GKS3D$SIMPLE_CUBE.DAT
GKS3D$SIMPLE_GARAGE.DAT
GKS3D$SIMPLE_PYRAMID.DAT

Directory SYS$COMMON:[SYSLIB]

```
GKS3D$CBND.H
GKS3D$CBND.OLB
GKS3D$DEFS.ADA
GKS3D$DEFS.BAS
GKS3D$DEFS.FOR
GKS3D$DEFS.H
GKS3D$DEFS.PAS
GKS3D$DEFS.PLI
GKS3D$DEFS.R32
GKS3D$ERRORS.ADA
GKS3D$ERRORS.BAS
GKS3D$ERRORS.FOR
GKS3D$ERRORS.H
GKS3D$ERRORS.PAS
GKS3D$ERRORS.PLI
GKS3D$ERRORS.R32
GKS3D$FORBND.FOR
GKS3D$FORBND.OLB
GKS3D$GKSBND.OLB
GKS3D$GKSRTLIB.EXE
GKS3D$MI_WS_HANDLER.EXE
GKS3D$MO_WS_HANDLER.EXE
GKS3D$RTLIB.EXE
GKS3D$WISS_WS_HANDLER.EXE
GKS3D$WSM_WS_HANDLER.EXE
```

Directory SYS$COMMON:[SYSLIB]

```
VAXGFX$CGMO_DEV_HANDLER.EXE
VAXGFX$COLSIX_DEV_HANDLER.EXE
VAXGFX$DDIF_COLOR_TABLE.DAT
VAXGFX$DDIF_DEV_HANDLER.EXE
VAXGFX$DECW_DEV_HANDLER.EXE
VAXGFX$FONT_NEG01.FNT
VAXGFX$FONT_NEG02.FNT
VAXGFX$FONT_NEG03.FNT
VAXGFX$FONT_NEG04.FNT
VAXGFX$FONT_NEG05.FNT
VAXGFX$FONT_NEG06.FNT
VAXGFX$FONT_NEG07.FNT
VAXGFX$FONT_NEG08.FNT
VAXGFX$FONT_NEG09.FNT
VAXGFX$FONT_NEG10.FNT
VAXGFX$FONT_NEG11.FNT
VAXGFX$FONT_NEG12.FNT
VAXGFX$FONT_NEG13.FNT
VAXGFX$FONT_NEG14.FNT
VAXGFX$FONT_NEG15.FNT
VAXGFX$FONT_NEG16.FNT
VAXGFX$FONT_NEG17.FNT
VAXGFX$FONT_NEG18.FNT
VAXGFX$FONT_NEG19.FNT
VAXGFX$FONT_NEG20.FNT
VAXGFX$FONT_NEG21.FNT
VAXGFX$FONT_NEG22.FNT
VAXGFX$FONT_NEG23.FNT
VAXGFX$FONT_NEG24.FNT
VAXGFX$HPGL_DEV_HANDLER.EXE
```

```
VAXGFX$PS_DEV_HANDLER.EXE
VAXGFX$REGIS_DEV_HANDLER.EXE
VAXGFX$RTL.EXE
VAXGFX$SIXEL_DEV_HANDLER.EXE
VAXGFX$TEK41_DEV_HANDLER.EXE
VAXGFX$TEK_DEV_HANDLER.EXE
VAXGFX$UIS_DEV_HANDLER.EXE
```

Directory SYS$COMMON:[SYSMSG]

```
GKS3D$MSGS.EXE
```

Directory SYS$COMMON:[SYSTEST.GKS3D]

```
GKS3D$IVP.DAT
GKS3D$IVP.EXE
```

B.2 DEC GKS–3D Run-Time Kit Files for VMS

The following list contains the directories and file names of all files installed for the run-time kit:

Directory SYS$COMMON:[SYS$STARTUP]

```
GKS3D$STARTUP.COM
```

Directory SYS$COMMON:[SYSFONT]

```
GKS3D$MARKERS.VWS$FONT
GKS3D$MARKERS.VWS$VAFONT
```

Directory SYS$COMMON:[SYSHLP]

```
DECGKS3DRT011.RELEASE_NOTES
```

Directory SYS$COMMON:[SYSHLP.EXAMPLES.GKS3D]

```
GKS3D$IMM_MODE_XFORM.EXE
GKS3D$SEGMENT_XFORM.EXE
GKS3D$SIMPLE_CUBE.DAT
GKS3D$SIMPLE_GARAGE.DAT
GKS3D$SIMPLE_PYRAMID.DAT
```

Directory SYS$COMMON:[SYSLIB]

```
GKS3D$GKSRTLIB.EXE
GKS3D$MI_WS_HANDLER.EXE
GKS3D$MO_WS_HANDLER.EXE
GKS3D$RTLIB.EXE
GKS3D$WISS_WS_HANDLER.EXE
GKS3D$WSM_WS_HANDLER.EXE
```

Directory SYS$COMMON:[SYSLIB]

```
VAXGFX$CGMO_DEV_HANDLER.EXE
VAXGFX$COLSIX_DEV_HANDLER.EXE
VAXGFX$DDIF_COLOR_TABLE.DAT
VAXGFX$DDIF_DEV_HANDLER.EXE
VAXGFX$DECW_DEV_HANDLER.EXE
VAXGFX$FONT_NEG01.FNT
VAXGFX$FONT_NEG02.FNT
VAXGFX$FONT_NEG03.FNT
VAXGFX$FONT_NEG04.FNT
VAXGFX$FONT_NEG05.FNT
VAXGFX$FONT_NEG06.FNT
VAXGFX$FONT_NEG07.FNT
VAXGFX$FONT_NEG08.FNT
VAXGFX$FONT_NEG09.FNT
VAXGFX$FONT_NEG10.FNT
VAXGFX$FONT_NEG11.FNT
VAXGFX$FONT_NEG12.FNT
VAXGFX$FONT_NEG13.FNT
VAXGFX$FONT_NEG14.FNT
VAXGFX$FONT_NEG15.FNT
VAXGFX$FONT_NEG16.FNT
VAXGFX$FONT_NEG17.FNT
VAXGFX$FONT_NEG18.FNT
VAXGFX$FONT_NEG19.FNT
VAXGFX$FONT_NEG20.FNT
VAXGFX$FONT_NEG21.FNT
VAXGFX$FONT_NEG22.FNT
VAXGFX$FONT_NEG23.FNT
VAXGFX$FONT_NEG24.FNT
VAXGFX$HPGL_DEV_HANDLER.EXE
VAXGFX$PS_DEV_HANDLER.EXE
VAXGFX$REGIS_DEV_HANDLER.EXE
VAXGFX$RTL.EXE
VAXGFX$SIXEL_DEV_HANDLER.EXE
VAXGFX$TEK41_DEV_HANDLER.EXE
VAXGFX$TEK_DEV_HANDLER.EXE
VAXGFX$UIS_DEV_HANDLER.EXE
```

Directory SYS$COMMON:[SYSMSG]

```
GKS3D$MSGS.EXE
```

Directory SYS$COMMON:[SYSTEST.GKS3D]

```
GKS3D$IVP.DAT
GKS3D$IVP.EXE
```

B.3 Logical Names

The following logical names are entered into the system logical name tables when DEC GKS–3D is installed. These names are stored in the product's startup file. They are automatically entered into the system logical name table whenever the system reboots or whenever the software is invoked.

```
(LNM$PROCESS_TABLE)

(LNM$JOB_80326230)

(LNM$GROUP_000200)

(LNM$SYSTEM_TABLE)

  "GKS3D$ASF" = "INDIVIDUAL"
  "GKS3D$CONID" = "0::0"
  "GKS3D$ERROR" = "ON"
  "GKS3D$EXAMPLES" = "SYS$COMMON:[SYSHLP.EXAMPLES.GKS3D]"
  "GKS3D$LIST_TYPES" = "2"
        = "3"
        = "5"
        = "210"
        = "211"
        = "212"
        = "213"
        = "41"
        = "10"
        = "11"
        = "12"
        = "13"
        = "14"
        = "15"
        = "16"
        = "17"
        = "70"
        = "72"
        = "80"
        = "82"
        = "83"
        = "84"
        = "85"
        = "86"
        = "87"
        = "88"
        = "31"
        = "32"
        = "33"
        = "34"
        = "35"
        = "38"
        = "39"
        = "91"
        = "92"
        = "93"
        = "51"
```

```
        = "52"
        = "53"
        = "54"
        = "55"
        = "56"
        = "61"
        = "62"
        = "65"
        = "66"
        = "250"
        = "7"
  "GKS3D$NDC_CLIP" = "ON"
  "GKS3D$STROKE_FONT1" = "SYS$COMMON:VAXGFX$FONT_NEG01.FNT"
  "GKS3D$STROKE_FONT_LIST" = "1"
        = "NEG_1"
        = "NEG_2"
        = "NEG_3"
        = "NEG_4"
        = "NEG_5"
        = "NEG_6"
        = "NEG_7"
        = "NEG_8"
        = "NEG_9"
        = "NEG_10"
        = "NEG_11"
        = "NEG_12"
        = "NEG_13"
        = "NEG_14"
        = "NEG_15"
        = "NEG_16"
        = "NEG_17"
        = "NEG_18"
        = "NEG_19"
        = "NEG_20"
        = "NEG_21"
        = "NEG_22"
        = "NEG_23"
        = "NEG_24"
  "GKS3D$TEST" = "SYS$COMMON:[SYSTEST.GKS3D]"
  "GKS3D$WSTYPE" = "211"

(DECW$LOGICAL_NAMES)
```

```
(GKS3D$TABLE)
  "GKS3D$DEVICE_10" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_11" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_12" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_13" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_14" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_15" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_16" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_17" = "VAXGFX$REGIS_DEV_HANDLER"
  "GKS3D$DEVICE_210" = "VAXGFX$DECW_DEV_HANDLER"
  "GKS3D$DEVICE_211" = "VAXGFX$DECW_DEV_HANDLER"
  "GKS3D$DEVICE_212" = "VAXGFX$DECW_DEV_HANDLER"
  "GKS3D$DEVICE_213" = "VAXGFX$DECW_DEV_HANDLER"
  "GKS3D$DEVICE_250" = "VAXGFX$DDIF_DEV_HANDLER"
  "GKS3D$DEVICE_31" = "VAXGFX$SIXEL_DEV_HANDLER"
  "GKS3D$DEVICE_32" = "VAXGFX$SIXEL_DEV_HANDLER"
  "GKS3D$DEVICE_33" = "VAXGFX$SIXEL_DEV_HANDLER"
  "GKS3D$DEVICE_34" = "VAXGFX$SIXEL_DEV_HANDLER"
  "GKS3D$DEVICE_35" = "VAXGFX$SIXEL_DEV_HANDLER"
  "GKS3D$DEVICE_38" = "VAXGFX$SIXEL_DEV_HANDLER"
  "GKS3D$DEVICE_39" = "VAXGFX$LASER_DEV_HANDLER"
  "GKS3D$DEVICE_41" = "VAXGFX$UIS_DEV_HANDLER"
  "GKS3D$DEVICE_51" = "VAXGFX$HPGL_DEV_HANDLER"
  "GKS3D$DEVICE_52" = "VAXGFX$HPGL_DEV_HANDLER"
  "GKS3D$DEVICE_53" = "VAXGFX$HPGL_DEV_HANDLER"
  "GKS3D$DEVICE_54" = "VAXGFX$HPGL_DEV_HANDLER"
  "GKS3D$DEVICE_55" = "VAXGFX$HPGL_DEV_HANDLER"
  "GKS3D$DEVICE_56" = "VAXGFX$HPGL_DEV_HANDLER"
  "GKS3D$DEVICE_61" = "VAXGFX$PS_DEV_HANDLER"
  "GKS3D$DEVICE_62" = "VAXGFX$PS_DEV_HANDLER"
  "GKS3D$DEVICE_65" = "VAXGFX$PS_DEV_HANDLER"
  "GKS3D$DEVICE_66" = "VAXGFX$PS_DEV_HANDLER"
  "GKS3D$DEVICE_7"  = "VAXGFX$CGMO_DEV_HANDLER"
  "GKS3D$DEVICE_70" = "VAXGFX$TEK_DEV_HANDLER"
  "GKS3D$DEVICE_72" = "VAXGFX$TEK_DEV_HANDLER"
  "GKS3D$DEVICE_80" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_82" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_83" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_84" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_85" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_86" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_87" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_88" = "VAXGFX$TEK41_DEV_HANDLER"
  "GKS3D$DEVICE_91" = "VAXGFX$COLSIX_DEV_HANDLER"
  "GKS3D$DEVICE_92" = "VAXGFX$COLSIX_DEV_HANDLER"
  "GKS3D$DEVICE_93" = "VAXGFX$COLSIX_DEV_HANDLER"
  "GKS3D$DEVICE_TAB_10" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_11" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_12" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_13" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_14" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_15" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_16" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_17" = "VAXGFX$$REGIS_DFT"
  "GKS3D$DEVICE_TAB_210" = "VAXGFX$$DECW_DFT"
  "GKS3D$DEVICE_TAB_211" = "VAXGFX$$DECW_DFT"
  "GKS3D$DEVICE_TAB_212" = "VAXGFX$$DECW_DFT"
  "GKS3D$DEVICE_TAB_213" = "VAXGFX$$DECW_DFT"
  "GKS3D$DEVICE_TAB_250" = "VAXGFX$$DDIF_DFT"
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```
"GKS3D$DEVICE_TAB_31" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_32" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_33" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_34" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_35" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_38" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_39" = "VAXGFX$$SIXEL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_41" = "VAXGFX$$UIS_DFT"
"GKS3D$DEVICE_TAB_51" = "VAXGFX$$HPGL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_52" = "VAXGFX$$HPGL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_53" = "VAXGFX$$HPGL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_54" = "VAXGFX$$HPGL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_55" = "VAXGFX$$HPGL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_56" = "VAXGFX$$HPGL_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_61" = "VAXGFX$$PS_DFT"
"GKS3D$DEVICE_TAB_62" = "VAXGFX$$PS_DFT"
"GKS3D$DEVICE_TAB_65" = "VAXGFX$$PS_DFT"
"GKS3D$DEVICE_TAB_66" = "VAXGFX$$PS_DFT"
"GKS3D$DEVICE_TAB_7"  = "VAXGFX$$CGMO_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_70" = "VAXGFX$$TEK_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_72" = "VAXGFX$$TEK_DFT"
"GKS3D$DEVICE_TAB_80" = "VAXGFX$$TEK4107_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_82" = "VAXGFX$$TEK4107_DFT"
"GKS3D$DEVICE_TAB_83" = "VAXGFX$$TEK4207_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_84" = "VAXGFX$$TEK4207_DFT"
"GKS3D$DEVICE_TAB_85" = "VAXGFX$$TEK4128_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_86" = "VAXGFX$$TEK4128_DFT"
"GKS3D$DEVICE_TAB_87" = "VAXGFX$$TEK4129_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_88" = "VAXGFX$$TEK4129_DFT"
"GKS3D$DEVICE_TAB_91" = "VAXGFX$$COLSIX_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_92" = "VAXGFX$$COLSIX_OUTPUT_DFT"
"GKS3D$DEVICE_TAB_93" = "VAXGFX$$COLSIX_OUTPUT_DFT"
"GKS3D$FUNCTION_TAB_10" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_11" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_12" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_13" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_14" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_15" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_16" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_17" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_2" = "GKS3D$$MO_WFT"
"GKS3D$FUNCTION_TAB_210" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_211" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_212" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_213" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_250" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_3" = "GKS3D$$MI_WFT"
"GKS3D$FUNCTION_TAB_31" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_32" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_33" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_34" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_35" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_38" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_39" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_41" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_5" = "GKS3D$$WISS_WFT"
"GKS3D$FUNCTION_TAB_51" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_52" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_53" = "GKS3D$$WSM_WFT"
```

```
"GKS3D$FUNCTION_TAB_54" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_55" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_56" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_61" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_62" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_65" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_66" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_7"  = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_70" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_72" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_80" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_82" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_83" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_84" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_85" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_86" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_87" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_88" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_91" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_92" = "GKS3D$$WSM_WFT"
"GKS3D$FUNCTION_TAB_93" = "GKS3D$$WSM_WFT"
"GKS3D$STROKE_FONT_NEG1" = "SYS$COMMON:VAXGFX$FONT_NEG01.FNT"
"GKS3D$STROKE_FONT_NEG10" = "SYS$COMMON:VAXGFX$FONT_NEG10.FNT"
"GKS3D$STROKE_FONT_NEG11" = "SYS$COMMON:VAXGFX$FONT_NEG11.FNT"
"GKS3D$STROKE_FONT_NEG12" = "SYS$COMMON:VAXGFX$FONT_NEG12.FNT"
"GKS3D$STROKE_FONT_NEG13" = "SYS$COMMON:VAXGFX$FONT_NEG13.FNT"
"GKS3D$STROKE_FONT_NEG14" = "SYS$COMMON:VAXGFX$FONT_NEG14.FNT"
"GKS3D$STROKE_FONT_NEG15" = "SYS$COMMON:VAXGFX$FONT_NEG15.FNT"
"GKS3D$STROKE_FONT_NEG16" = "SYS$COMMON:VAXGFX$FONT_NEG16.FNT"
"GKS3D$STROKE_FONT_NEG17" = "SYS$COMMON:VAXGFX$FONT_NEG17.FNT"
"GKS3D$STROKE_FONT_NEG18" = "SYS$COMMON:VAXGFX$FONT_NEG18.FNT"
"GKS3D$STROKE_FONT_NEG19" = "SYS$COMMON:VAXGFX$FONT_NEG19.FNT"
"GKS3D$STROKE_FONT_NEG2" = "SYS$COMMON:VAXGFX$FONT_NEG02.FNT"
"GKS3D$STROKE_FONT_NEG20" = "SYS$COMMON:VAXGFX$FONT_NEG20.FNT"
"GKS3D$STROKE_FONT_NEG21" = "SYS$COMMON:VAXGFX$FONT_NEG21.FNT"
"GKS3D$STROKE_FONT_NEG22" = "SYS$COMMON:VAXGFX$FONT_NEG22.FNT"
"GKS3D$STROKE_FONT_NEG23" = "SYS$COMMON:VAXGFX$FONT_NEG23.FNT"
"GKS3D$STROKE_FONT_NEG24" = "SYS$COMMON:VAXGFX$FONT_NEG24.FNT"
"GKS3D$STROKE_FONT_NEG3" = "SYS$COMMON:VAXGFX$FONT_NEG03.FNT"
"GKS3D$STROKE_FONT_NEG4" = "SYS$COMMON:VAXGFX$FONT_NEG04.FNT"
"GKS3D$STROKE_FONT_NEG5" = "SYS$COMMON:VAXGFX$FONT_NEG05.FNT"
"GKS3D$STROKE_FONT_NEG6" = "SYS$COMMON:VAXGFX$FONT_NEG06.FNT"
"GKS3D$STROKE_FONT_NEG7" = "SYS$COMMON:VAXGFX$FONT_NEG07.FNT"
"GKS3D$STROKE_FONT_NEG8" = "SYS$COMMON:VAXGFX$FONT_NEG08.FNT"
"GKS3D$STROKE_FONT_NEG9" = "SYS$COMMON:VAXGFX$FONT_NEG09.FNT"
"GKS3D$WORKSTATION_10" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_11" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_12" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_13" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_14" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_15" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_16" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_17" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_2" = "GKS3D$MO_WS_HANDLER"
"GKS3D$WORKSTATION_210" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_211" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_212" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_213" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_250" = "GKS3D$WSM_WS_HANDLER"
```

```
"GKS3D$WORKSTATION_3" = "GKS3D$MI_WS_HANDLER"
"GKS3D$WORKSTATION_31" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_32" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_33" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_34" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_35" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_38" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_39" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_41" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_5" = "GKS3D$WISS_WS_HANDLER"
"GKS3D$WORKSTATION_51" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_52" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_53" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_54" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_55" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_56" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_61" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_62" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_65" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_66" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_7"  = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_70" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_72" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_80" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_82" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_83" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_84" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_85" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_86" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_87" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_88" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_91" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_92" = "GKS3D$WSM_WS_HANDLER"
"GKS3D$WORKSTATION_93" = "GKS3D$WSM_WS_HANDLER"
```