

VAX LISP/VMS Installation Guide

Order No. AA-Y922D-TE

July 1987

This document contains instructions for installing VAX LISP/VMS on the VMS operating system.

Revision/Update Information: This is a revised manual.

Operating System and Version: VAX/VMS Version 4.4

Software Version: VAX LISP/VMS Version 2.2

First Printing, June 1984
Revised, December 1984
Revised, May 1986
Revised, July 1987

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PREFACE

Manual Objectives

This manual explains how to install, verify, and manage VAX LISP/VMS.

Intended Audience

If you are responsible for installing and maintaining the VAX LISP software product, you should read this manual. To perform the installation, you must have access to a privileged system manager's account and be familiar with VAX/VMS installation procedures for layered products.

Structure of This Manual

The manual is divided into three chapters and one appendix:

- Chapter 1, Preparing for the Installation, describes the prerequisites for installing and verifying VAX LISP.
- Chapter 2, Installation and Verification, explains the procedure for installing and verifying VAX LISP.
- Chapter 3, Completing the Installation, gives information needed to complete the installation.
- The Appendix, Problem Determination and Reporting, shows how to report a defect in the product.

Conventions

Convention	Meaning
UPPERCASE characters	In examples, indicate that you should type the word or letter exactly as shown. For example:

```
$ RUN SYSSYSTEM:SYSGEN
```

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Convention	Meaning
<i>lowercase italics</i>	In examples, italics indicate that you are to substitute a word or value of your choice. For example: UAF> MODIFY user-name /PGFLQUOTA=value
Red print	In examples, indicates user input. For example: INSTALL> /LIST/GLOBAL/SUMMARY
Black print	In examples, indicates output lines or prompting characters that the system displays. For example: SYSGEN> SHOW GBLSECTIONS

CHAPTER 1

PREPARING FOR THE INSTALLATION

Before you install the VAX LISP/VMS language, you should be familiar with:

- VAX LISP naming conventions
- Contents of the distribution Kit
- VAX/VMS system management
- VAX LISP/VMS installation prerequisites

1.1 VAX LISP NAMING CONVENTIONS

VAX LISP is implemented on both the VMS and the ULTRIX-32 operating systems. VAX LISP as implemented on the VMS operating system is formally named VAX LISP/VMS. VAX LISP as implemented on the ULTRIX operating system is formally named VAX LISP/ULTRIX. VAX LISP/VMS and VAX LISP/ULTRIX are the same language, but with some specific operating system differences. For the differences, see the VAX LISP/VMS Release Notes described in Section 1.2.2.

This manual describes VAX LISP/VMS but refers to VAX LISP/VMS as VAX LISP whenever possible.

1.2 CONTENTS OF THE DISTRIBUTION KIT

The VAX LISP/VMS distribution kit contains seven manuals and one distribution volume.

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1.2.1 Documentation

The seven manuals in the distribution kit are:

- *COMMON LISP: The Language* by Guy Steele
- *VAX LISP/VMS Editor Programming Guide*
- *VAX LISP/VMS Graphics Programming Guide*
- *VAX LISP/VMS Installation Guide* (this manual)
- *VAX LISP/VMS System Access Programming Guide*
- *VAX LISP/VMS System-Building Guide*
- *VAX LISP/VMS User's Guide*

1.2.2 Software

The distribution volume contains the files for the VAX LISP product in four savesets:

LISPnnn.A	Installation procedure and release notes
LISPnnn.B	LISP executable image, on-line documentation, and Installation Verification Procedure
LISPnnn.C	Examples of LISP source code
LISPnnn.D	System-Building utility libraries

where *nnn* is the VAX LISP version number. When you finish the installation procedure, these files are installed in your system in the following way:

- The system manager's directory (SYSS\$MANAGER) will contain the files LISPSTART.COM and LISPSITE.COM.
- The system help directory (SYSS\$HELP) will contain the release notes in the file LISPnnn.RELEASE_NOTES where *nnn* is the VAX LISP version number. For example, file LISP020.RELEASE_NOTES contains the release notes for VAX LISP, Version 2.0.
- The product directory (SYSS\$SYSROOT:[VAXLISP] by default) will contain:

LISP.EXE	LISP executable image
LISPDOC.TLB	LISP on-line documentation library
LISPIVP.COM	Installation Verification Procedure (IVP)

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- The EXAMPLES subdirectory of the product directory will contain sample LISP source files.
- The LIBRARY subdirectory of the product directory will contain the System-Building utility files.

1.3 VAX/VMS SYSTEM MANAGEMENT

For information on system installation, utilities, operation, and management not covered by the VAX LISP/VMS documentation, see the appropriate VMS documentation. If you are installing VAX LISP on the VMS operating system, the following documents may be useful:

- *Guide to VAX/VMS System Management and Daily Operations*
- *Guide to VAX/VMS Software Installation*
- *VAX/VMS Utilities*

For a complete list of VAX/VMS documents, see the *VAX/VMS Master Index*.

If you are installing VAX LISP on the MicroVMS operating system, see the *MicroVMS User's Manual*.

1.4 VAX LISP/VMS INSTALLATION PREREQUISITES

Before you begin the installation procedure, make sure you have the necessary software, documentation, and prerequisites. The prerequisites listed below are the **minimum** amounts needed to install VAX LISP. The installation procedure will fail if any of these parameters are below the required value.

If you have an AI VAXstation, you may want more than the minimum number for your virtual page count and user authorization quotas. The recommended values may be set before or after the installation. See Section 3.3 for **recommended** system parameters and authorization quotas on a typical AI VAXstation.

Prerequisites:

- Access to the system manager's account.
- A valid VAX/VMS operating system configuration with VAX/VMS V4.4 or later.
- Adequate amounts or values for:

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- System disk blocks
- Global pages (GBLPAGES) and sections (GBLSECTIONS)
- Virtual page count (VIRTUALPAGECNT)
- User authorization quotas
- User disk block quota

The following sections explain all but the first two prerequisites.

NOTE

If you modify any of the SYSGEN parameters in SYS\$SYSTEM:MODPARAMS.DAT (Section 3.3.1), you must run the AUTOGEN utility to re-compute your system parameters. To do so, enter the following command:

```
§ @SYS$UPDATE:AUTOGEN SAVPARAMS REBOOT
```

Since these parameters are not dynamic, your system will then need to be rebooted. AUTOGEN will perform an automatic shutdown and reboot when it has finished.

For details on using the AUTOGEN utility, see Chapter 11 of the *Guide to VAX/VMS System Management and Daily Operations*. For detailed descriptions of the SYSGEN parameters, see the *VAX/VMS Utilities*.

1.4.1 System Disk Blocks

The installation of VAX LISP/VMS requires approximately 60,000 free blocks on the system disk. After the installation, approximately 30,000 blocks on the disk containing the product directory are occupied. Saveset B occupies approximately 11,500 blocks; saveset C, approximately 5,000; and saveset D, approximately 13,500.

1.4.2 Global Pages (GBLPAGES) and Sections (GBLSECTIONS)

You need approximately 5060 global pages and 4 global sections to install the VAX LISP/VMS image LISP.EXE and to make it shareable. You may need to adjust the values of the system generation (SYSGEN) parameters GBLPAGES and GBLSECTIONS before installing LISP.EXE.

To determine the current value of GBLSECTIONS and GBLPAGES, enter the following SYSGEN utility commands:

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```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> SHOW GBLSECTIONS
SYSGEN> SHOW GBLPAGES
```

Note the values that are displayed.

Next, you must determine how many global pages and global sections are actually in use on your system. To do so, type CTRL/Z to leave the SYSGEN utility, and enter the commands:

```
$ INSTALL := $SYS$SYSTEM:INSTALL /COMMAND_MODE
$ INSTALL
INSTALL> LIST/GLOBAL/SUMMARY
```

These commands display "Global Sections Used" and "Global Pages Used." Take these values and subtract them from the values you previously obtained from the SYSGEN utility. If you do not have enough global sections and global pages, you must modify the GBLSECTIONS and/or GBLPAGES parameters.

To modify these values, edit SYS\$SYSTEM:MODPARAMS.DAT to include the lines:

```
ADD_GBLPAGES=5060
ADD_GBLSECTIONS=4
```

NOTE

Using the ADD_ prefix with these parameters increases them by the amount you supply in each subsequent GENPARAMS phase of AUTOGEN. After many executions of AUTOGEN, parameters can become undesirably large. You can avoid this problem by commenting out the ADD_ lines in MODPARAMS.DAT after the first execution of the GENPARAMS phase of AUTOGEN.

1.4.3 Virtual Page Count (VIRTUALPAGECNT)

The default VAX LISP product requires approximately eight megabytes of address space. In addition, the value of the SYSGEN parameter VIRTUALPAGECNT must be approximately 16,000 virtual pages for VAX LISP to execute. This value must be larger if you want to increase the size of the LISP system's dynamic memory with the LISP/MEMORY command. (See the *VAX LISP User's Guide* for a description of the LISP/MEMORY command.)

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NOTE

If you increase the virtual page count, you may also need to increase the size of your paging file. You can display statistics about your paging file use with the DCL command SHOW MEMORY/FILES.

To determine the current value of VIRTUALPAGECNT, enter the SYSGEN utility commands:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> SHOW VIRTUALPAGECNT
```

To modify these values, edit SYS\$SYSTEM:MODPARAMS.DAT to include a line in the following format:

```
VIRTUALPAGECNT=value
```

1.4.4 User Authorization Quotas

The system manager's account and accounts for VAX LISP users must have adequate user authorization quotas for paging files and working sets. These quotas (PGFLQUOTA, WSQUOTA, and WSEXTENT) are set with the AUTHORIZE utility. To invoke the AUTHORIZE utility, specify the following commands:

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

NOTE

When the system manager changes a user authorization quota (including the system manager's own quota) with the AUTHORIZE utility, the quota is not changed until the user logs out of the system and then logs back in.

Once you have invoked the AUTHORIZE utility, you can set each of the quotas with the commands below. To leave the AUTHORIZE utility, type EXIT or CTRL/Z.

- **Paging file quota (PGFLQUOTA)**

A VAX LISP user requires a minimum paging file quota of 10,500 pages. However, this quota must be larger if users want to increase the size of the LISP system's dynamic memory with the

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LISP/MEMORY command. See the VAX *LISP User's Guide* for a description of the LISP/MEMORY command.

Use the following format to change a user's paging file quota:

```
UAF> MODIFY user-name /PGFLQUOTA=value
```

Example:

```
UAF> MODIFY JONES /PGFLQUOTA=20000
```

- **Working set quota (WSQUOTA)**

The amount of physical memory required to execute a LISP program depends on the nature of the program. DIGITAL recommends that each LISP user doing development work have a minimum working set quota of 1500 pages of physical memory. Use the following format to change this quota:

```
UAF> MODIFY user-name /WSQUOTA=value
```

Example:

```
UAF> MODIFY JONES /WSQUOTA=1500
```

- **Working set extent quota (WSEXTENT)**

The WSEXTENT quota allocates the amount of physical memory given to a process when the system has an excess of free pages. Use the following format to change this quota:

```
UAF> MODIFY user-name /WSEXTENT=value
```

Example:

```
UAF> MODIFY JONES /WSEXTENT=10000
```

1.4.5 User Disk Block Quota

VAX LISP provides a facility that enables users to suspend LISP operation and continue it later (see the VAX *LISP User's Guide* for an explanation of suspended systems). Since a suspended LISP system requires a large amount of disk space, users may need increased disk quotas. You can change these quotas with the DISKQUOTA utility. To enter that utility, type the command:

```
$ RUN SYS$SYSTEM:DISKQUOTA  
DISKQ>
```

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To leave the DISKQUOTA utility, type EXIT or CTRL/Z. When you are in the DISKQUOTA utility, use the following format to change a user disk quota:

```
DISKQ> MODIFY uic [/PERMQUOTA=quota]  
                [/OVERDRAFT=quota-plus]
```

Example:

```
DISKQ> MODIFY [300,211] /PERMQUOTA=20000
```

CHAPTER 2

INSTALLATION AND VERIFICATION

This chapter explains how to use the VMSINSTAL procedure to install VAX LISP/VMS and to verify the installation. For a detailed description of the VMSINSTAL procedure, see the *Guide to VAX/VMS Software Installation*.

Any system user who has access to the system manager's account or to an account with the same privileges as the system manager's account can perform the installation procedure.

The VMSINSTAL procedure is automated and self-explanatory, and takes approximately 15 minutes (25 on a MicroVAX). The procedure prompts you to mount the software distribution volume and to respond to questions during the installation. Most of the questions can be answered with YES or NO. The default response is enclosed in square brackets []. To choose the default response, just press the RETURN key. Or, enter your response and press the RETURN key. If you need help with a question, type a question mark (?) and press the RETURN key.

It's a good idea to back up your system disk before installing any layered product.

2.1 STARTING THE VMSINSTAL PROCEDURE

To start the VMSINSTAL procedure:

1. Make sure the installation prerequisites listed in Section 1.4 have been met. The *Guide to VAX/VMS Software Installation* describes all the VMSINSTAL prerequisites.
2. Log into the system manager's account.

Installations are usually done from the console terminal, but can be done from any terminal.

INSTALLATION AND VERIFICATION

3. If a previous version of VAX LISP is installed, make sure you have edited your LISPSITE.COM procedure as described in Section 3.2.2. Pay particular attention to the notes in that section.
4. Invoke the VMSINSTAL procedure by using a command of the form:

```
$ @SYS$UPDATE:VMSINSTAL LISP device
```

where device is the name of the device on which you must mount the VAX LISP distribution volume, such as MFA0 or MUA0. When you specify a device name, type a colon (:) after the name. For example:

```
$ @SYS$UPDATE:VMSINSTAL LISP MFA0:
```

After you invoke VMSINSTAL, the following messages are displayed on your output device:

```
VAX/VMS Software Product Installation Procedure
It is dd-mmm-yyyy at hh:mm
Enter a question mark (?) at any time for help.
```

You may receive warning messages from VMSINSTAL if, for example, your DECnet network is still up and running. Check the *Guide to VAX/VMS Software Installation* for VMSINSTAL error messages and recommended actions. Once all VMSINSTAL prerequisites are met, the procedure displays:

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

5. Respond to the backup question. If you are satisfied with the backup of your system disk, type YES (or press the RETURN key). If you are not satisfied, type NO and provide for a backup (see the *Guide to VAX/VMS Software Installation*). If you type NO, the procedure ends. When you are ready, start again.

If you type YES (or press the RETURN key), the installation starts.

2.2 INSTALLING VAX LISP/VMS

The installation consists of the following five steps:

1. Purge files.

INSTALLATION AND VERIFICATION

The installation procedure first reads the tape and displays the product(s) it contains:

The following products will be processed:

LISP V2.2

Beginning installation of LISP V2.2 at *hh:mm*
%VMSINSTAL-I-RESTORE, Restoring product saveset A...
%VMSINSTAL-I-REMOVED, The products release notes have
been successfully moved to SYS\$HELP.

Next it asks whether you want to purge any files replaced during the course of the installation:

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

Just press the RETURN key if you want to purge the old files, or enter NO if you want to keep them. (See also step 4, below, on saving the previous version.)

The installation procedure now displays a help message explaining the contents of the savesets and your options for installing them.

2. Select a saveset.

The procedure now asks whether you want to install the next saveset on the tape, and displays the size of the saveset. On saveset B, for example, it asks:

Do you wish to install the VAX LISP product files
(11500 blocks) [YES]?

Press the RETURN key if you do want to install the saveset. Enter NO if you do not.

You can install all three savesets now, or you can install only the product files (the LISP executable image, on-line documentation library, and Installation Verification Procedure). Saveset B contains everything needed to run VAX LISP. You can install additional savesets at any time by running VMSINSTAL again and selecting different savesets.

3. Specify location.

You must now tell VMSINSTAL the desired location of the saveset you selected in step 2. Continuing with saveset B as the example:

In which directory are the VAX LISP product files to be
installed [SYS\$SYSROOT:[VAXLISP]]?

INSTALLATION AND VERIFICATION

Press the RETURN key if you are satisfied with the default directory, or enter a different location. If the directory you specify does not already exist, the procedure asks:

Directory SYS\$SYSROOT:[VAXLISP] does not exist. Should it be created [YES]?

4. Save previous version. (optional)

This step is not executed unless a previous version of VAX LISP is already installed in the default directory.

VAX LISP users can create "suspended systems" that contain LISP programs and data. A suspended system depends on the version of VAX LISP used to create it. Since the installation procedure overwrites any previous version of VAX LISP in the default directory, installing the new version makes user-created suspended systems unuseable. You may want to save your previous version of VAX LISP so that users can resume their suspended systems.

To save the previous version of VAX LISP, you can allow the procedure to move it to another directory before you install the new version in SYS\$SYSROOT[VAXLISP].

Do you want to save the previous version of VAX LISP
(nnn blocks) [NO] ?

If you do not want to save your previous version, enter NO or press RETURN and skip the rest of this step. If you do want to save it, enter YES. The procedure now asks for a new location for VAX LISP:

In which directory should the previous version be saved
[VMI\$ROOT:[VAXLISP.V021]]?

Enter your own directory or just press RETURN to use the default. (The default directory automatically includes the correct version number.) Again, if the directory does not exist, the procedure asks for confirmation:

Directory VMI\$ROOT:[VAXLISP.V021] does not exist.
Should it be created [YES]?

See Chapter 3 of this manual for directions on using the old version of VAX LISP after you have moved it out of SYS\$SYSROOT:[VAXLISP].

Steps 2 and 3 repeat for each of the other savesets on the tape.

INSTALLATION AND VERIFICATION

5. Verifying the installation.

If you have selected saveset B, the last prompt asks whether you want to run the Installation Verification Procedure (IVP) after the installation is complete:

Do you want to run the IVP after the installation [YES]?

Press RETURN or enter YES only if you have properly configured your system according to the prerequisites in Section 1.4. See the next section for more information on the IVP.

Once you have answered all its questions, the installation procedure copies the files. For example:

```
%VMSINSTAL-I-SYSDISK, This product creates system disk directory
SYS$SYSROOT:[VAXLISP].
%VMSINSTAL-I-RESTORE, Restoring product saveset B...
%LISP-I-SITESTART, A skeleton site-specific startup procedure,
LISPSITE.COM,
-LISP-I-SITESTART, has been provided in SYS$MANAGER.
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
directories.
```

You may receive additional messages, depending on how many subsets you are installing and on your system configuration (for example, a VAX cluster or an AI VAXstation).

2.3 VERIFYING THE INSTALLATION

The IVP creates, compiles, and executes a small LISP program. Because VAX LISP will not run until you have properly configured your system, you cannot run the IVP if you have not already configured your system.

During installation, the VMSINSTAL procedure asks if you want to run the IVP. If you have properly configured your system, type YES. The IVP runs, prints a message when the program has been completed, and the VMSINSTAL procedure automatically ends. If you type NO, VMSINSTAL ends without running the IVP.

You may want only to install VAX LISP now and to configure your system later. Then, when you have properly configured your system, you can run the IVP by entering the following DCL command:

```
@LISP$SYSTEM:LISPIVP
```

INSTALLATION AND VERIFICATION

2.4 TWO SAMPLE INSTALLATION PROCEDURES

Two sample installation procedures follow. The first is a new installation, and the second is an update installation.

2.4.1 Sample New Installation

This example illustrates the first installation of VAX LISP/VMS on a VAX. Since no previous version is present, the installation procedure does not ask whether you want to save it.

```
$ @SYS$UPDATE:VMSINSTAL LISP MFA0:
```

VAX/VMS Software Product Installation Procedure

It is 10-APR-1987 at 16:10

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

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

The following products will be processed:

LISP V2.2

Beginning installation of LISP V2.2 at 16:10

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

%VMSINSTAL-I-REMOVED, The products release notes have been
successfully moved to SYS\$HELP.

* Do you want to purge files replaced by this installation [YES]?
<RET>

The LISP installation kit contains the VAX LISP product files, some example files, and some special library files for building customized LISP systems. It is possible to install just VAX LISP, and nothing else. It is also possible to install just the examples, or just the library files, or any combination of these.

Enter YES to this question if you wish to install VAX LISP at this time. Enter NO to this question if you only wish to install the examples and/or library files at this time.

* Do you wish to install the VAX LISP product files (11500 blocks) [YES]? <RET>

* In which directory are the VAX LISP product files to be installed [SYS\$SYSROOT:[VAXLISP]]: <RET>

INSTALLATION AND VERIFICATION

```
* Directory SYS$SYSROOT:[VAXLISP] does not exist. Should it be
  created [YES]? <RET>
* Do you wish to install the VAX LISP examples (5000 blocks)
  [NO]? YES
* In which directory are the VAX LISP examples to be installed
  [SYS$SYSROOT:[VAXLISP.EXAMPLES]]: <RET>
* Directory SYS$SYSROOT:[VAXLISP.EXAMPLES] does not exist.
  Should it be created [YES]? <RET>
* Do you wish to install the VAX LISP system-building library
  files (13500 blocks) [NO]? YES
* In which directory are the VAX LISP system-building library
  files to be installed [SYS$SYSROOT:[VAXLISP.LIBRARY]]: <RET>
* Directory SYS$SYSROOT:[VAXLISP.LIBRARY] does not exist. Should
  it be created [YES]? <RET>
* Do you want to run the IVP after the installation [YES]? <RET>
%VMSINSTAL-I-SYSDISK, This product creates system disk directory
  VMI$ROOT:[VAXLISP].
%VMSINSTAL-I-RESTORE, Restoring product saveset B...
%LISP-I-SITESTART, A skeleton site-specific startup procedure,
  LISPSITE.COM,
-LISP-I-SITESTART, has been provided in SYS$MANAGER.
%VMSINSTAL-I-SYSDISK, This product creates system disk directory
  VMI$ROOT:[VAXLISP.EXAMPLES].
%VMSINSTAL-I-RESTORE, Restoring product saveset C...
%VMSINSTAL-I-SYSDISK, This product creates system disk directory
  VMI$ROOT:[VAXLISP.LIBRARY].
%VMSINSTAL-I-RESTORE, Restoring product saveset D...
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
  directories...
Executing VAX LISP startup procedure...
```

VAX LISP Installation Verification Procedure (IVP)

```
Starting compilation of file
  VMI$ROOT:[SYSUPD.LISP022]LISPIVP.LSP;1

FIBONACCI compiled.
PRINT-FIBONACCI compiled.

Finished compilation of file
  VMI$ROOT:[SYSUPD.LISP022]LISPIVP.LSP;1
0 Errors, 0 Warnings

Welcome to VAX LISP, version V2.2
```

INSTALLATION AND VERIFICATION

A table of the first 20 Fibonacci numbers:

n	Fibonacci(n)
0	0
1	1
2	1
3	2
4	3
5	5
6	8
7	13
8	21
9	34
10	55
11	89
12	144
13	233
14	377
15	610
16	987
17	1,597
18	2,584
19	4,181

VAX LISP V2.2 IVP Completed Successfully

Installation of LISP V2.2 completed at 16:22

VMSINSTAL procedure done at 16:22

\$

2.4.2 Sample Update Installation

This example illustrates an update installation on a MicroVAX with Version 2.1 of VAX LISP/VMS already present. Version 2.1 will be saved to the directory VMI\$ROOT[VAXLISP.V021]. Only the VAX LISP product files will be installed.

\$ @SYS\$UPDATE:VMSINSTAL LISP MUA0:

VAX/VMS Software Product Installation Procedure

It is 10-APR-1987 at 16:30

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

INSTALLATION AND VERIFICATION

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

The following products will be processed:

LISP V2.2

Beginning installation of LISP V2.2 at 16:31

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

%VMSINSTAL-I-REMOVED, The products release notes have been
successfully moved to SYS\$HELP.

* Do you want to purge files replaced by this installation [YES]?
<RET>

The LISP installation kit contains the VAX LISP product files,
some example files, and some special library files for building
customized LISP systems. It is possible to install just VAX
LISP, and nothing else. It is also possible to install just the
examples, or just the library files, or any combination of these.

Enter YES to this question if you wish to install VAX LISP at
this time. Enter NO to this question if you only wish to install
the examples and/or library files at this time.

* Do you wish to install the VAX LISP product files (11500
blocks) [YES]? <RET>

* In which directory are the VAX LISP product files to be
installed [SYS\$SYSROOT:[VAXLISP]]: <RET>

* Do you want to save the previous version of VAX LISP (9151
blocks) [NO]? YES

* In which directory should the previous version be saved
[VMI\$ROOT:[VAXLISP.V021]]: <RET>

* Directory VMI\$ROOT:[VAXLISP.V021] does not exist. Should it be
created [YES]? <RET>

* Do you wish to install the VAX LISP examples (5000 blocks)
[NO]? <RET>

* Do you wish to install the VAX LISP system-building library
files (13500 blocks) [NO]? <RET>

* Do you want to run the IVP after the installation [YES]? <RET>

%VMSINSTAL-I-SYSDISK, This product creates system disk directory
VMI\$ROOT:[VAXLISP.V021].

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

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

Executing VAX LISP startup procedure...

VAX LISP Installation Verification Procedure (IVP)

Starting compilation of file

VMI\$ROOT:[SYSUPD.LISP022]LISP IVP.LSP;1

INSTALLATION AND VERIFICATION

FIBONACCI compiled.
PRINT-FIBONACCI compiled.

Finished compilation of file
VMI\$ROOT:[SYSUPD.LISP022]LISP IVP.LSP;1
0 Errors, 0 Warnings

Welcome to VAX LISP, version V2.2

A table of the first 20 Fibonacci numbers:

n	Fibonacci(n)
--	-----
0	0
1	1
2	1
3	2
4	3
5	5
6	8
7	13
8	21
9	34
10	55
11	89
12	144
13	233
14	377
15	610
16	987
17	1,597
18	2,584
19	4,181

VAX LISP V2.2 IVP Completed Successfully

Installation of LISP V2.2 completed at 16:55

VMSINSTAL procedure done at 16:55

\$

CHAPTER 3

COMPLETING THE INSTALLATION

To complete a new installation of VAX LISP/VMS, you must modify the site-specific system startup file, `SYSS$MANAGER:SYSTARTUP.COM`. You should also modify the default site-specific startup file for VAX LISP, `SYSS$MANAGER:LISPSITE.COM`. If you are installing VAX LISP on an AI VAXstation, read Section 3.3 on recommended system parameters and authorization quotas. Section 3.4 explains how to use a previous version of VAX LISP that has been moved out of the main directory.

3.1 MODIFYING THE SYSTEM STARTUP FILE

After the installation procedure is concluded, add the following line to your site-specific system startup file, `SYSS$MANAGER:SYSTARTUP.COM`:

```
$ @SYSS$MANAGER:LISPSTART
```

This command line invokes the VAX LISP system startup procedure every time you boot your system. The startup procedure defines the system logical name `LISP$SYSTEM` to mean the VAX LISP product directory and defines the logical name `LISP$EXAMPLES` to mean the examples directory.

3.2 MODIFYING THE VAX LISP STARTUP FILE

When you boot your VAX/VMS system, the file `SYSS$MANAGER:SYSTARTUP.COM` invokes the LISP command file `LISPSTART.COM`, which in turn invokes the file `SYSS$MANAGER:LISPSITE.COM`. This last command file is a default site-specific startup procedure for VAX LISP.

This file includes default LISP system logical names and default commands for installing shareable sections. You should modify the logical name definitions to make them appropriate for your site.

COMPLETING THE INSTALLATION

If your VAX LISP system has only one user or if enough global pages are not available, you may not want to install LISP shareable. The benefit of installing shareable sections is that multiple users running VAX LISP use only one copy of the LISP system rather than a separate copy for each user, thereby saving valuable system resources.

This skeleton LISPSITE.COM file will be installed in SYS\$MANAGER, provided such a file is not already there:

```

$!      VAX LISP site-specific startup procedure.
$!      This procedure is invoked by the lispstart procedure.
$!      Remove comments and alter this file to suit your site.
$
$      DEFINE/SYSTEM/EXECUTIVE LISP$TIME_ZONE 0
$      DEFINE/SYSTEM/EXECUTIVE LISP$DAYLIGHT_SAVING_TIME_P NO
$!     DEFINE/SYSTEM/EXECUTIVE LISP$SHORT_SITE_NAME "?"
$!     DEFINE/SYSTEM/EXECUTIVE LISP$LONG_SITE_NAME "?"
$!     DEFINE/SYSTEM/EXECUTIVE LISP$MACHINE_INSTANCE "?"
$
$      SET NOON
$!     INSTALL := $SYSS$SYSTEM:INSTALL /COMMAND_MODE
$!     INSTALL CREATE LISP$SYSTEM:LISP/OPEN/HEADER_RESIDENT/SHARED
$      SET ON
$      EXIT

```

You can add to this file any other site-specific commands for starting VAX LISP.

To install your system shareable, delete the comment character (!) from the beginning of each command between SET NOON and SET ON in the default LISPSITE.COM file.

3.2.1 Defining the LISP System Logical Names

The following list describes the LISP system logical names and shows how to define them.

- LISP\$TIME_ZONE

Define LISP\$TIME_ZONE to indicate your local time zone relative to Greenwich Mean Time (GMT). The value can be an integer or a floating-point number in the range 0 (inclusive) to 24 (exclusive). Floating-point numbers are used when an area is not in a full hour time zone, and are specified by the format "hour.fraction". To determine your local time zone, consult an atlas.

COMPLETING THE INSTALLATION

Examples:

```
$ DEFINE/SYSTEM/EXECUTIVE LISP$TIME_ZONE 4.5 ! Newfoundland
$ DEFINE/SYSTEM/EXECUTIVE LISP$TIME_ZONE 5 ! Boston
$ DEFINE/SYSTEM/EXECUTIVE LISP$TIME_ZONE 8 ! San Francisco
$ DEFINE/SYSTEM/EXECUTIVE LISP$TIME_ZONE 12.75 ! Chatham Island
$ DEFINE/SYSTEM/EXECUTIVE LISP$TIME_ZONE 23 ! Munich
```

NOTE

This logical name is required.

- LISP\$DAYLIGHT_SAVING_TIME_P

Define LISP\$DAYLIGHT_SAVING_TIME_P to specify whether you are on daylight saving time. The values T, TRUE, YES, and 1 mean yes; any other values mean no. You should update this logical name each time daylight saving time changes.

In the following example, the NO after the logical name means it is not daylight saving time.

```
Example: $ DEFINE/SYSTEM/EXECUTIVE -
          LISP$DAYLIGHT_SAVING_TIME_P NO
```

- LISP\$SHORT_SITE_NAME

Define LISP\$SHORT_SITE_NAME to specify a short string that describes your site. This string is returned by the LISP SHORT-SITE-NAME function. An example is "Widget Group."

```
Example: $ DEFINE/SYSTEM/EXECUTIVE -
          LISP$SHORT_SITE_NAME "Widget Group"
```

- LISP\$LONG_SITE_NAME

Define LISP\$LONG_SITE_NAME to specify a long string that describes your site. This string is returned by the LISP LONG-SITE-NAME function. An example is "Super Widget Development Group, Widget Corp."

```
Example: $ DEFINE/SYSTEM/EXECUTIVE LISP$LONG_SITE_NAME -
          "Super Widget Development Group, Widget Corp."
```

If you would like the long site name to occupy several lines, you can create a text file for it. Then, refer to the text file with the logical name. Suppose, for example, that the file SYS\$MANAGER:LISPSITE.TXT contained the following text:

COMPLETING THE INSTALLATION

Super Widget Development Group
Intelligent Widget Corporation
One First Street
Any Town, Massachusetts 01001

You can define LISP\$LONG_SITE_NAME by placing an at sign (@) in front of the name of the text file you created.

Example: \$ DEFINE/SYSTEM/EXECUTIVE LISP\$LONG_SITE_NAME -
"@SYS\$MANAGER:LISPSITE.TXT"

- LISP\$MACHINE_INSTANCE

Define LISP\$MACHINE_INSTANCE as a string that identifies the specific computer on which VAX LISP is running. This string is returned by the LISP MACHINE-INSTANCE function. An example is "Super Widget VAX-11/785."

Example: \$ DEFINE/SYSTEM/EXECUTIVE LISP\$MACHINE_INSTANCE -
"Super Widget VAX-11/785"

If this logical name is not defined and you are running DECnet, your computer's node name is used as the machine instance.

In the preceding list of system logical names, the two logical names LISP\$TIME_ZONE and LISP\$DAYLIGHT_SAVING_TIME_P are used by the LISP function GET-DECODED-TIME, which is described in *COMMON LISP: The Language*. The functions SHORT-SITE-NAME, LONG-SITE-NAME, and MACHINE-INSTANCE are described in the *VAX LISP User's Guide*.

3.2.2 Installing the Shareable Sections

If more than one user is on your VAX LISP system, you may want to install it as a shareable system. The following explanation describes how to install and delete shareable sections and the amount of global pages you need to install them.

You need approximately 5060 global pages to install the VAX LISP/VMS image LISP.EXE. You can install this image as you do any other image. If you install it, users of the VAX LISP/VMS system share the read-only section of the image, reducing physical memory requirements and making image activation faster.

Install LISP.EXE by putting the following two lines in the file LISPSITE.COM:

```
$ INSTALL := $$SYS$SYSTEM:INSTALL /COMMAND_MODE  
$ INSTALL LISP$SYSTEM:LISP/OPEN/HEADER_RESIDENT/SHARED
```

COMPLETING THE INSTALLATION

NOTE

You must surround any installation commands in LISPSITE.COM with the SET NOON (do not check for errors) and SET ON (check for errors) commands.

Symbol definitions, as in the preceding example (INSTALL := \$SYS\$SYSTEM:INSTALL), must be local (:=), not global (:=).

3.3 TUNING THE AI VAXSTATION

You can tune your AI VAXstation in two ways:

- By adjusting parameter values in your system parameters file
- By adjusting authorization quotas in your user accounts

3.3.1 Recommended System Parameters

The following sample MODPARAMS.DAT file is for a typical monochrome AI VAXstation. The values of these AUTOGEN parameters are recommended for optimal performance of VAX LISP on an AI VAXstation with 9 megabytes of memory.

Sample SYS\$SYSTEM:MODPARAMS.DAT File

```
! Site specific AUTOGEN data file. In a VAXcluster where a
! common system disk is being used, this file should reside
! in SYS$SPECIFIC:[SYSEXE], not a common system directory.
!
! Add modifications that you wish to make to AUTOGEN's hardware
! configuration data, system parameter calculations, and page,
! swap, and dump file sizes to the bottom of this file.
!
CHANNELCNT=2048      ! Number of allowed channels
CTLPAGES=500        ! Used with workstation windows
SPTREQ=2000         ! Required number of system page table
                   ! entries
MPW_HILIMIT=2500    ! Modified page-list size at which writing
                   ! to free-list page occurs
MPW_WAITLIMIT=2500 ! Wait-limit number of pages on the
                   ! modified page list; this number must
                   ! be greater than or equal to the
                   ! MPW_HILIMIT number or a system
                   ! deadlock will occur
```

COMPLETING THE INSTALLATION

```
MPW_LOLIMIT=500      ! Writing of the modified page list stops
                     ! when it is less than or equal to the
                     ! MPW_LOLIMIT number
NPAGEDYN=330000     ! Size of the non-paged dynamic pool in
                     ! pages
PAGFILCNT=1         ! 1 page file; the maximum number of
                     ! page files that can be installed
PAGEFILE=30000      ! Size of a page file in pages
PAGEDYN=4000000     ! Size of the paged dynamic pool in pages
PHYSICALPAGES=18432 ! 9 megabytes of physical memory
SWPFILCNT=1         ! 1 swap file; the maximum number of
                     ! swapping that can be installed
SWAPFILE=8000       ! Size of a swap file in pages
WSMAX=12000         ! Maximum working set size
WSINC=350           ! Amount by which the working set of a
                     ! process is increased by AWSA
                     ! (Automatic Working Set Adjustment)
WSDEC=0             ! Amount by which the working set of a
                     ! process is decreased by AWSA
VIRTUALPAGECNT=30000 ! Maximum amount of virtual pages
                     ! a process can map
```

The following three values are recommended for a VAXstation II/GPX:

```
CTLPAGES=850        ! Used with workstation windows
SPTREQ=2300         ! Required number of system page table
                     ! entries
NPAGEDYN=450000    ! Size of the non-paged dynamic pool in
                     ! pages
```

NOTE

These values are only recommended for a 9-megabyte system and should not be used on systems with less than 9 megabytes of memory. Using these values on systems with less than 9 megabytes could prevent your workstation from booting.

The values are valid only for a system that can be characterized as a single-use system running primarily VAX LISP. Although running only VAX LISP is not a requirement, these values tune the system to run VAX LISP efficiently and may have an adverse effect on systems that heavily use other products concurrently with VAX LISP.

Therefore, you should review the requirements of other products and evaluate these recommended values in that context.

COMPLETING THE INSTALLATION

To adjust your system's parameter values:

1. Add the preceding values to the file SYS\$SYSTEM:MODPARAMS.DAT
2. Reconfigure your system, using the AUTOGEN utility by executing the command:

```
@SYS$UPDATE:AUTOGEN SAVPARAMS REBOOT
```

For details on using the AUTOGEN Utility, see Chapter 11 of the Guide to VAX/VMS System Management and Daily Operations. For detailed descriptions of the SYSGEN parameters, see the VAX/VMS Utilities, Volume 4C.

Since these parameters are not dynamic, your system will need to be rebooted. AUTOGEN will perform an automatic shutdown and reboot when it has finished.

3.3.2 Recommended Authorization Quotas

The following are recommended authorization quotas for VAX LISP accounts on an AI VAXstation:

WSDEFAULT:	1024	! Default working set size
WSQUOTA:	8000	! Limit for the amount of physical ! memory a user process may lock ! into its working set
WSEXTENT:	18000	! Absolute limit on physical ! memory the system allows the ! process
PGFLQUOTA:	30000	! Maximum number of pages a user's ! process can use in the system ! paging file

To adjust these quotas, invoke the Authorize Utility as shown in Section 1.4.5 of this manual. See the VAX/VMS Utilities, Volume 4 for further information on the quotas.

3.4 USING PREVIOUS VERSIONS OF VAX LISP

The files comprising a saved version of VAX LISP are put in a subdirectory under the main VAX LISP directory (referred to by the logical name LISP\$SYSTEM). The subdirectory name uses the VAX LISP version number in the format Vvvu, with vv representing the 2-digit version and u representing the 1-digit update. For example, Version 2.2 would be saved in the subdirectory V022.

COMPLETING THE INSTALLATION

To run a saved version of VAX LISP, you must define the logical name LISP\$SYSTEM to refer to the subdirectory containing the files of that saved version. Then use the standard LISP command to invoke the old version of the LISP system.

APPENDIX A

PROBLEM DETERMINATION AND REPORTING

If an error occurs while you are using VAX LISP/VMS and you believe that the error is a result of a defect in the product, you should report the error to DIGITAL, using a Software Performance Report (SPR) form. In particular, an error message preceded by "Internal error:" is caused by the failure of an internal consistency check and should be reported.

Along with the SPR form, you should include:

- The operating system name and version, which you can obtain with the SOFTWARE-TYPE and SOFTWARE-VERSION functions.
- The version number of VAX LISP/VMS which is part of the greeting message when you start VAX LISP.
- A complete description of the problem.
- A listing (reduced to the shortest form possible) of the LISP program that caused the error. Include initialization files or macro definitions that are pertinent.
- If possible, use the DRIBBLE function (see *COMMON LISP: The Language*) to place the error output in a file and include a listing of the file.

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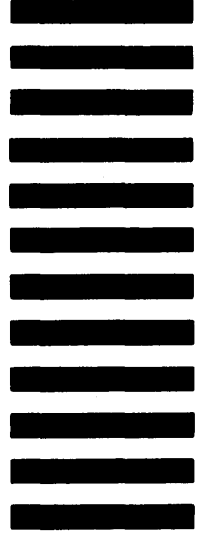


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