VAX LISP/VMS
Installation Guide

Order Number: AA-Y922C-TE

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

Operating System and Version: VAX/VMS Version 4.2
MicroVMS Version 4.2

Software Version: VAX LISP/VMS Version 2.0

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PREFACE

Manual Objectives

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

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 SYS$SYSTEM:SYSGEN

Convention	Meaning
Lowercase characters	In examples, 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 information

- 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. Both 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 where practicable.

1.2 CONTENTS OF THE DISTRIBUTION KIT

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

1.2.1 Documentation

The six 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 User's Guide*

1.2.2 Components of the VAX LISP/VMS Software

The distribution volume contains the files for the VAX LISP product. When you conclude the installation procedure, these files are installed in your system in the following way:

- The system manager's directory (SYS$MANAGER) will contain the files LISPSTART.COM and LISPSITE.COM.

- The system help directory (SYS$HELP) will contain the release notes in the file LISPnnn.RELEASE_NOTES where nnn is the VAX LISP version number. For example, LISP020.RELEASE_NOTES is the release notes for VAX LISP, Version 2.0.

- The product directory (SYS$SYSROOT:[VAXLISP] by default) will contain:

LISP.EXE	LISP executable image
LISPSUS.SUS	Full development environment for VAX LISP
LISPDOC.TLB	LISP on-line documentation library
LISPIVP.COM	Installation Verification Procedure

- The EXAMPLES subdirectory of the product directory will contain example LISP source files.

1.3 VAX/VMS SYSTEM MANAGEMENT

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

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

- *Guide to VAX/VMS Software Installation*

- *VAX/VMS Utilities Reference Volume*

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.

If you have an AI VAXstation, see Section 3.3 for recommended system paramters and authorization quotas.

Prerequisites:

- Access to the system manager's account

- A valid VAX/VMS operating system configuration with VAX/VMS V4.2 or later

- A directory for the VAX LISP files

- Adequate:

    - System disk blocks

    - Global pages (GBLPAGES) and sections (GBLSECTIONS)

    - Known file list (KFILSTCNT)

    - Virtual pages (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 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 Reference Manual*, Vol 4C, The System Generation Utility, Appendix A.

1.4.1 Product Directory

By default, the installation procedure creates the directory SYS$SYSROOT:[VAXLISP] and copies the product files into it. To put the VAX LISP product elsewhere, enter the name of that directory at the appropriate point in the installation procedure. The procedure then creates the directory for you. Note that the installation procedure also creates additional subdirectories under the directory you specify.

1.4.2 System Disk Blocks

The installation of VAX LISP/VMS requires approximately 12,300 free blocks on the system disk. After the installation, approximately 12,000 blocks are occupied on the disk containing the product directory.

1.4.3 Global Pages (GBLPAGES) and Sections (GBLSECTIONS)

You need approximately 310 global pages and 2 global sections to install the VAX LISP/VMS image LISP.EXE and to make it shareable. You need an additional 4200 global pages and 1 additional global section to install the suspended system LISPSUS.SUS as a shareable section (with the LISP/INSTALL command described in Section 3.2.2).

You might need to adjust the values of the system generation (SYSGEN) parameters GBLPAGES and GBLSECTIONS before installing LISP.EXE and LISPSUS.SUS.

To determine the current value of GBLSECTIONS and GBLPAGES enter the commands:

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

Next, you must determine how many global pages and global sections are 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 adequate global sections and global pages available, you must modify the GBLSECTIONS and/or GBLPAGES parameters.

To modify these values edit the file SYS$SYSTEM:MODPARAMS.DAT (Section 3.3.1) to include the lines:

```
ADD_GBLPAGES=3
ADD_GBLSECTIONS=310
```

or if you plan to install LISPSUS.SUS:

```
ADD_GBLPAGES=4
ADD_GBLSECTIONS=4510
```

1.4.4 Known File List (KFILSTCNT)

If VAX LISP is installed on a user disk, you may also need to increase the value of the KFILSTCNT parameter.

To determine the current value of KFILSTCNT, enter the commands:

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

To modify the KFILSTCNT value, edit the file SYS$SYSTEM:MODPARAMS.DAT (Section 3.3.1) to include the line:

```
ADD_KFILSTCNT=1
```

1.4.5 Virtual Pages (VIRTUALPAGECNT)

The default VAX LISP product requires approximately eight megabytes of
address space. 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 use the LISP/MEMORY command to
increase the size of the LISP system's dynamic memory (see the *VAX
LISP User's Guide* for a description of the LISP/MEMORY command).

NOTE

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

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

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

To modify these values edit the file SYS$SYSTEM:MODPARAMS.DAT (Section
3.3.1) to include the line:

```
VIRTUALPAGECNT=20000
```

1.4.6 User Authorization Quotas

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

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

NOTE

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

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 use the LISP/MEMORY command to increase the size of the LISP system's dynamic memory. See the *VAX LISP User's Guide* for a description of the LISP/MEMORY command.

  You can use the following format to change the 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 is highly dependent on the nature of the program. However, DIGITAL recommends that each LISP user doing development work has a minimum working set quota of 1500 pages of physical memory. You can 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)**

  You may want to adjust your WSEXTENT quota. Increasing this quota increase the amount of physical memory the system allows your process when the system has an excess of free pages. You can use the following format to change this quota:

      UAF> MODIFY user-name /WSEXTENT=value

  Example:

      UAF> MODIFY JONES /WSEXTENT=10000

1.4.7 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 be asking for increases in their disk quotas. You can change these quotas with the DISKQUOTA utility. To enter that utility, type the command:

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

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

Use the VMSINSTAL procedure to install and verify the VAX LISP product on the VAX/VMS or MicroVMS operating system. 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 that has the same privileges as the system manager's account can perform the installation procedure.

The VMSINSTAL procedure is automated, self-explanatory, and takes approximately 15 minutes to complete. The procedure requires you to mount the software distribution volume when prompted and to respond to questions asked during the installation. Most of the questions can be answered with a YES or a 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.

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.

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3. If you have a previous version of VAX LISP 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 the following
    command:

        $ @SYS$UPDATE:VMSINSTAL LISP device

    In the preceding command, device is the name of the device on
    which you must mount the VAX LISP distribution volume;
    examples of device names are MTA0 and DUA1. When you specify
    a device name, type a colon (:) after the name. For example:

        $ @SYS$UPDATE:VMSINSTAL LISP MTA0:

    After you type in the preceding information, the following
    messages, along with the current date and time, are displayed
    on your output device:

    VAX/VMS Software Product Installation Procedure

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

    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 have typed YES (or pressed the RETURN key), the
    installation starts.

2.2 SAVING PREVIOUS VERSIONS OF VAX LISP

Users of VAX LISP can create suspended systems containing LISP
programs and data. These suspended systems are sensitive to the
version of VAX LISP used to create them. Thus, suspended systems do
not usually run with later versions of VAX LISP.

To avoid the problem of having a suspended system that is incompatible
with a new version of VAX LISP, you can save the previous version of
VAX LISP. Consequently, during the installation procedure, you are
asked if you want to save the previous version of the VAX LISP system.

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 2.0 would be saved in the subdirectory V020.

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

2.3 VERIFYING THE INSTALLATION

During the installation, the VMSINSTAL procedure asks if you have properly configured your system (according to the prerequisites that are listed in Section 1.4). If you have properly configured your system, type YES in response to the preceding question. The IVP then creates, compiles, and executes a small LISP program. A message is printed when the program is completed, and the VMSINSTAL procedure automatically ends.

If you reply NO to the preceding installation question, the installation is concluded without running the Installation Verification Procedure (IVP).

You can install VAX LISP without properly configuring your system, but VAX LISP will not run until you have properly configured your system. You may only want to install VAX LISP 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

2.4 TWO SAMPLE INSTALLATION PROCEDURES

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

2.4.1 Sample New Installation

This example illustrates a new installation when you do not have Version 1.2 of VAX LISP/VMS.

```
$ @SYS$UPDATE:VMSINSTAL LISP MSA0:


        VAX/VMS Software Product Installation Procedure V4.4


It is 28-APR-1986 at 10:24.
Enter a question mark (?) at any time for help.

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

The following products will be processed:

  LISP V2.0


        Beginning installation of LISP V2.0 at 10:24

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

* In which directory is VAX LISP to be installed [SYS$SYSROOT:[VAXLISP]]:
  SYS$COMMON:[VAXLISP]
* Is directory SYS$COMMON:[VAXLISP] correct [YES]? YES
%VMSINSTAL-I-SYSDISK, This product creates system disk directory
  SYS$COMMON:[VAXLISP].
* Is your system configured as described in the Installation Guide
  [YES]? YES

%VMSINSTAL-I-SYSDISK, This product creates system disk directory
  SYS$COMMON:[VAXLISP.EXAMPLES].
%LISP-I-RELNOTES, The release notes are in SYS$HELP:LISP020.RELEASE_NOTES.
%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...
Executing VAX LISP startup procedure...

        VAX LISP Installation Verification Procedure (IVP)

Starting compilation of file VMI$ROOT:[SYSUPD.LISP020]LISPIVP.LSP;1
```

```
FIBONACCI compiled.
PRINT-FIBONACCI-TABLE compiled.

Finished compilation of file VMI$ROOT:[SYSUPD.LISP020]LISPIVP.LSP;1
0 Errors, 0 Warnings


Welcome to VAX LISP, version V2.0


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 V2.0 IVP Completed Successfully

         Installation of LISP V2.0 completed at 10:29


            VMSINSTAL procedure done at 10:29
```

2.4.2 Sample Update Installation

This example illustrates a new installation when you have Version 1.2
of VAX LISP/VMS.

```
$ @SYS$UPDATE:VMSINSTAL LISP MSA0:
```

VAX/VMS Software Product Installation Procedure V4.4

It is 28-APR-1986 at 08:34.
Enter a question mark (?) at any time for help.

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

The following products will be processed:

  LISP V2.0

          Beginning installation of LISP V2.0 at 08:34

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

* Do you want to purge files replaced by this installation [YES]? YES
* Do you want to save the previous version of VAX LISP (8037 blocks)
  [NO]? NO
* Is your system configured as described in the Installation Guide
  [YES]? YES

%LISP-I-RELNOTES, The release notes are in SYS$HELP:LISP020.RELEASE_NOTES.
%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.LISP020]LISPIVP.LSP;1

FIBONACCI compiled.
PRINT-FIBONACCI-TABLE compiled.

Finished compilation of file VMI$ROOT:[SYSUPD.LISP020]LISPIVP.LSP;1
0 Errors, 0 Warnings

Welcome to VAX LISP, version V2.0

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 V2.0 IVP Completed Successfully

Installation of LISP V2.0 completed at 08:38

VMSINSTAL procedure done at 08:38

CHAPTER 3

COMPLETING THE INSTALLATION

To complete a new installation of VAX LISP/VMS, you must modify the site-specific system startup file, SYS$MANAGER:SYSTARTUP.COM.

You should also:

- Modify the default site-specific startup file for VAX LISP, SYS$MANAGER:LISPSITE.COM.

- Read Section 3.3 on recommended system parameters and authorization quotas if you are installing VAX LISP on an AI VAXstation.

3.1 MODIFYING THE SYSTEM STARTUP FILE

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

    $ @SYS$MANAGER:LISPSTART

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

3.2 MODIFYING THE VAX LISP STARTUP FILE

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

Included in this file are 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.

If your VAX LISP system has only one user or if you do not have enough global pages 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 separate copies (one for each user).

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.

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

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.

  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 not optional.

- 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 multiple lines, you can create a text file containing the lines. Then, refer to the text file with the logical name. Suppose, for example, that the file SYS$MANAGER:LISPSITE.TXT contained the following text:

          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 (@) before 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 to be 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 you have more than one user of the VAX LISP system, you may want to
install it shareable. The following explanation shows how to install
or delete shareable sections and the amount of global pages you need
to install them.

You need approximately 310 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.

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

    $ INSTALL := SYSSYSTEM:INSTALL
    $ INSTALL LISP$SYSTEM:LISP.EXE /OPEN/HEADER_RESIDENT/SHARED

Most of the LISP code and data reside in the suspended system
LISPSUS.SUS. You can create a global section so that the read-only
portion of that suspended system is shared among all users. To do so,
you need:

● SYSGBL and the PRMGBL privileges

● Approximately 4200 additional global pages

● The following line in the file LISPSITE.COM:

    $ LISP/INSTALL=LISP$SYSTEM:LISPSUS.SUS

You can delete the global section created by the preceding command, if you have the SYSGBL and the PRMGBL privileges and if you use the following DCL command:

    $ LISP/REMOVE=LISP$SYSTEM:LISPSUS.SUS

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 := SYSSYSTEM:INSTALL), must be local (:=), not global (:==).

3.2.3 The Default LISPSITE.COM File

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 := $SYS$SYSTEM:INSTALL /COMMAND_MODE
$!        INSTALL CREATE LISP$SYSTEM:LISP/OPEN/HEADER_RESIDENT/SHARED
$!        LISP/INSTALL=LISP$SYSTEM:LISPSUS.SUS
$         SET ON
$         EXIT
```

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 AI
VAXstation. The values of these AUTOGEN parameters are recommended
for optimal performance of VAX LISP on an AI VAXstation (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_HILIMT number or a system
                         !    deadlock will occur
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              ! Maximium 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
```

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

Therefore you should review the requirements of other products and use these values as recommended values for VAX LISP.

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 Reference Manual*, Vol 4C, The System Generation Utility, Appendix A.

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. See Chapter 1
of this manual on how to use the Authorize Utility. See the *VAX/VMS*
Reference Manual, Vol 4 for further information on the quotas.

APPENDIX A

PROBLEM DETERMINATION AND REPORTING

If an error occurs while you are using VAX LISP 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 respectively obtain with the SOFTWARE-TYPE and SOFTWARE-VERSION functions.

- The version number of VAX LISP/VMS which is included in the greeting message when you start up 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 the file.