

MATLAB[®]

The Language of Technical Computing

Computation

Visualization

Programming

Installation Guide for PC and Macintosh

Version 5.0

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Installation Guide for PC and Macintosh (December 1996)

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System Recommendations

PC

- IBM or 100% compatible system with an Intel 486 processor plus 487 math coprocessor (except 486DX, which includes an internal coprocessor), Pentium, or Pentium Pro processor
- Microsoft Windows 95 or Windows NT
- CD-ROM drive
- 8 bit graphics adaptor and display (for 256 simultaneous colors)
- Sufficient hard disk space to install and run the selected products. The hard disk requirement varies according to the size of your partition and whether the optional online Help files are installed. The installer will inform you of the hard disk requirement for your particular partition. For example:
 - Partition with a cluster size of 0 requires 25 MB for MATLAB[®] only and 50 MB total for MATLAB and the Help files.
 - Partition with a cluster size of 64K requires 115 MB for MATLAB only and 250 MB total for MATLAB and the Help files.
- Memory:
 - **Microsoft Windows 95:** 8 MB minimum; 16 MB recommended.
 - **Microsoft Windows NT 3.51 or 4.0:** 12 MB minimum; 16 MB recommended

The following items are recommended:

- Additional memory
- Microsoft Windows-supported graphics accelerator card
- Microsoft Windows-supported printer
- Microsoft Windows-supported sound card

Optional software not supplied by The MathWorks:

- Microsoft Word 7.0 or later (if you intend to use the MATLAB Notebook)
- Microsoft, Borland, or Watcom C compiler (for building MEX-files)
- Netscape Navigator 2.0 or later or Microsoft Internet Explorer version 3.0 (to run the MATLAB Help Desk)

Macintosh

MATLAB for the Macintosh runs on:

- Any Power Macintosh
- Any Macintosh equipped with a 68020 or 68030 microprocessor and a 68881 or 68882 math coprocessor
- Any Macintosh equipped with a 68040 microprocessor (math coprocessor is built in).

MATLAB will not run on a Macintosh with a 68LC040 microprocessor.

MATLAB requires the following minimum configuration:

- 26 MB of free space on your hard drive. An additional 60 MB is required for the optional online Help system.
- 16 MB memory partition
- CD-ROM drive
- Color QuickDraw
- System 7.1 or later; System 7.5 or later is preferred.

Note Suggested total system memory assumes a reasonably large System Folder. Your memory requirements may vary depending upon the exact size of your System Folder.

PC Stand-alone Installation

Before You Begin

Before you begin installing MATLAB, you must have a valid Personal License Password provided by The MathWorks. This password is a 25-digit number tied to your License Number. It determines which products you are permitted to install and use. If you do not have your Personal License Password, contact The MathWorks immediately to request one:

- Via e-mail at service@mathworks.com
- Via telephone at 508-647-7000; ask for Customer Service.
- Via fax at 508-647-7001
- Via Web (<http://www.mathworks.com>. Choose **Express passcodes**.)

Please have ready, or include in your e-mail or fax, these items:

- 1 Your License Number (Site ID).

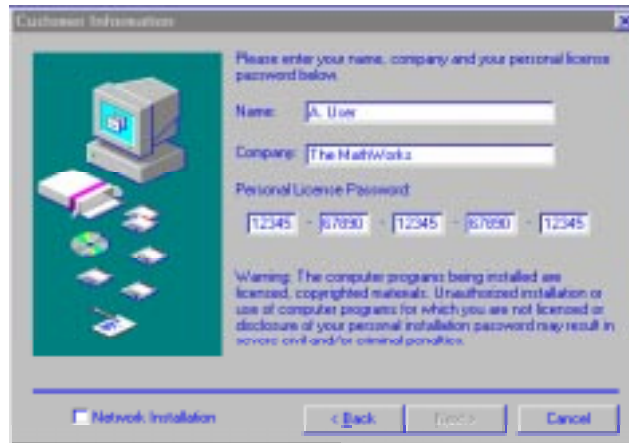
If you have not previously installed MATLAB at your site, you can find your License Number (Site ID) on the upper right-hand corner of the packing slip. If you have a previous version of MATLAB running at your site, you can obtain your License Number by entering the `license` command at the MATLAB command prompt.

- 2 Your e-mail address (if you have one).

Installation Procedure

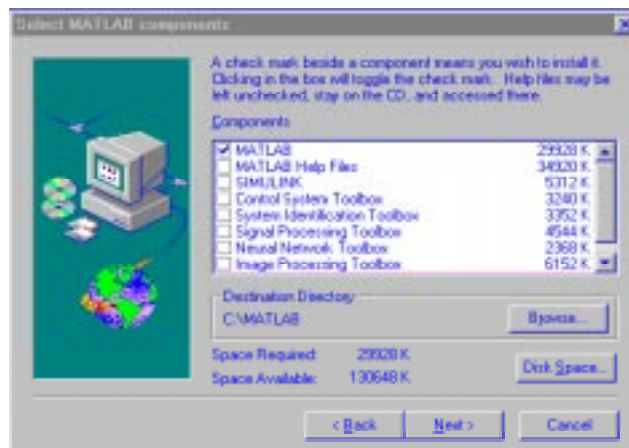
- 1 Place the CD-ROM distribution disk into the CD-ROM drive. On Windows 95, the Setup program begins to run automatically if MATLAB was not previously installed. Otherwise, double-click the `setup.exe` icon to begin the installation procedure.
- 2 Accept or reject the software licensing agreement displayed. If you accept the terms of the agreement, you may proceed with the installation.

- 3 On the **Customer Information** screen, enter your name, your company name, and the 25-digit Personal License Password previously provided.



The **Next** button becomes enabled when you enter the correct Personal License Password.

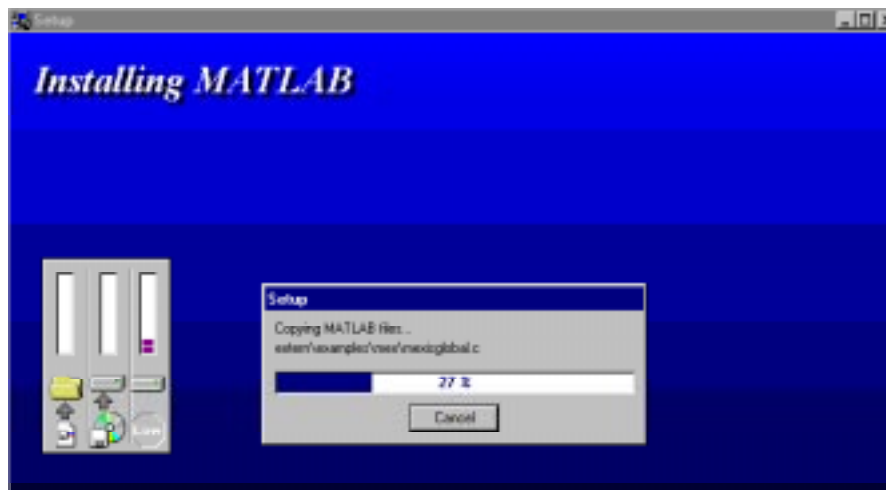
- 4 Click in the box beside a component name to indicate which products you want to install. Click on a check mark to deselect any component you do not want to install at this time. You can add any deselected component to your installation at a later time.



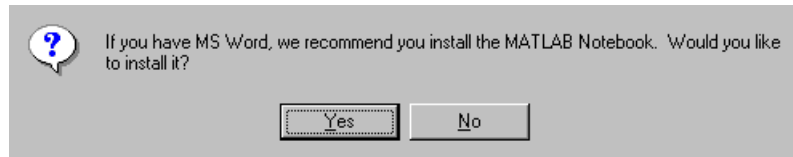
This screen assumes C: \MATLAB is the destination directory for installation of MATLAB and any selected toolboxes. Press **Browse** if you want to install into a different directory.

MATLAB 4 Users: To prevent warning messages, do not install MATLAB 5 over MATLAB 4. Choose a new destination directory.

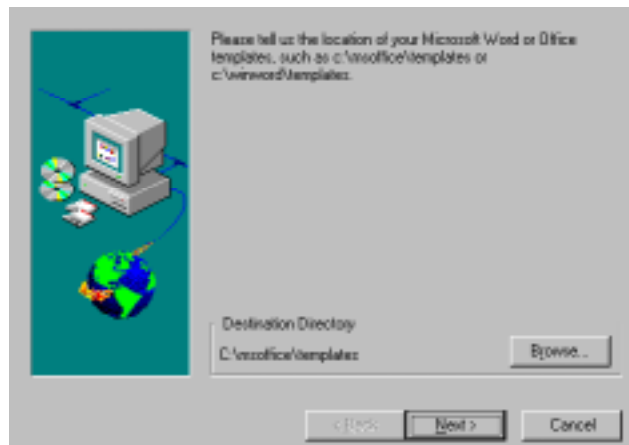
5 Press **Next**. You will be informed of the progress of the installation.



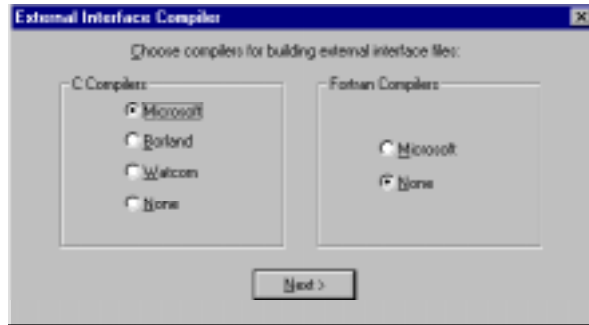
- 6 You have the option to install the MATLAB Notebook if Microsoft Word is available on your system. Skip this step if you do not want to install the MATLAB Notebook.



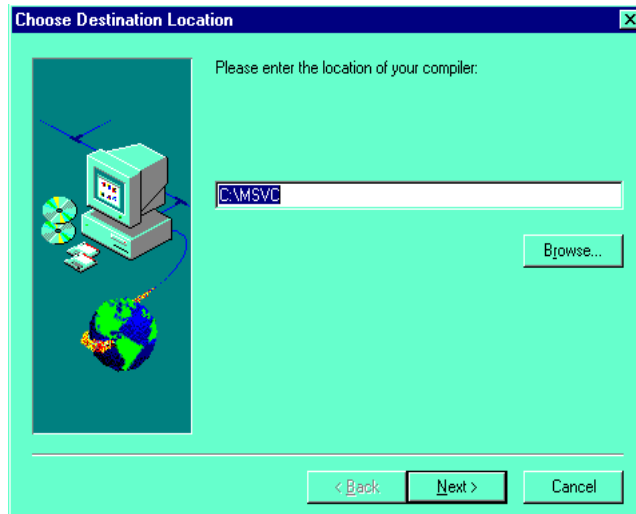
Indicate where Microsoft Word template files reside on your system.



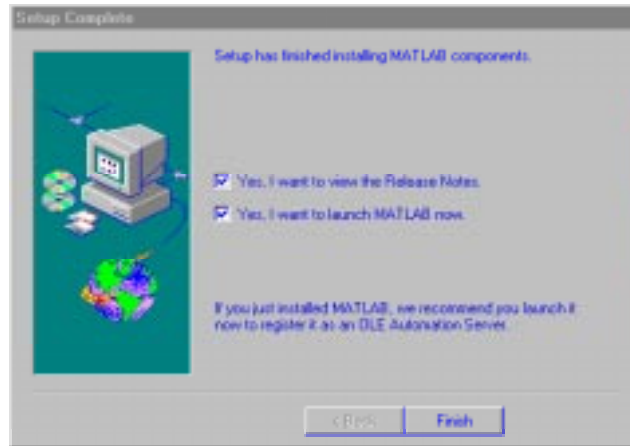
7 Indicate your choice of compiler(s) for building MEX-files,



and where your compiler is located.



8 You have now successfully installed MATLAB!



PC Network Installation

Before You Begin

For network installations, MATLAB uses a license manager called FLEXlm (a product of GLOBETrotter Software, Inc.) to manage software access. Before you begin installing MATLAB, you must obtain a valid License File from The MathWorks. The License File is a file named `license.dat` on your disk. During installation you will be asked to indicate the location of your License File.

Obtaining a License File

The License File is usually supplied by fax or e-mail. The MathWorks prefers to send a License File by e-mail because that saves you from entering the file by hand.

To obtain your License File, contact The MathWorks by any of these methods:

- Via e-mail at `service@mathworks.com`
- Via telephone at 508-647-7000; ask for Customer Service.
- Via fax at 508-647-7001
- Via Web (<http://www.mathworks.com>. Choose **Express passcodes.**)

Please have ready, or include in your e-mail or fax, the following three items:

1 Your License Number (Site ID).

If you have not previously installed MATLAB at your site, you can find your License Number (Site ID) on the upper right-hand corner of the packing slip. If you have a previous version of MATLAB running at your site, you can obtain your License Number by entering the `license` command at the MATLAB command prompt.

2 The internet address (IP Address) for the server on which you will run the MATLAB license manager. To obtain your internet address on systems running Windows NT, enter the command `ipconfig` at a DOS prompt. On systems running Windows 95, enter the command `wi n i p c f g` at a DOS prompt.

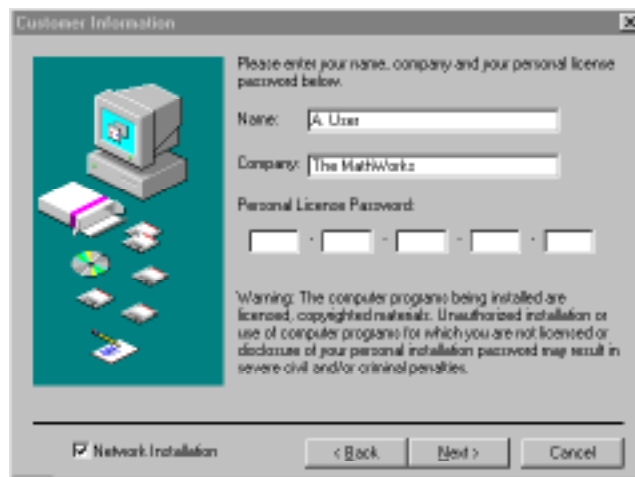
3 Your e-mail address (if you have one).

When you have obtained your License File, proceed to Step 1 of the installation procedure.

Installation Procedure

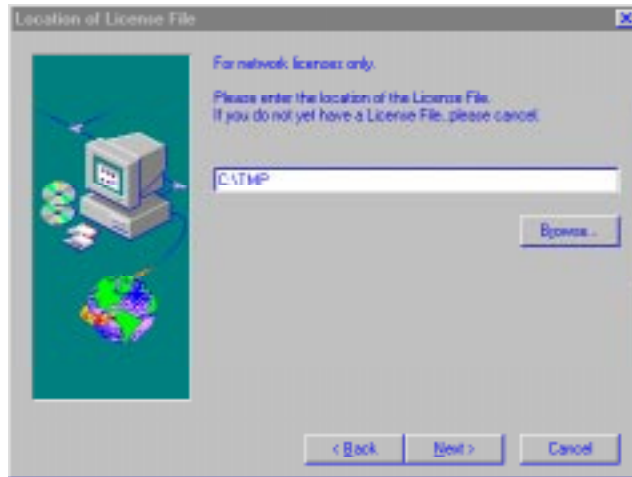
Windows NT Users: Step 7 of this procedure requires that you have administrator privileges to install the license manager as an NT service.

- 1 Place the CD-ROM distribution disk into the CD-ROM drive. On Windows 95, the Setup program begins to run automatically if MATLAB was not previously installed. Otherwise, double-click the setup.exe icon to begin the installation procedure.
- 2 Accept or reject the software licensing agreement displayed. If you accept the terms of the agreement, you may proceed with the installation.
- 3 On the **Customer Information** screen, enter your name and your company name. Then click the **Network** check box.

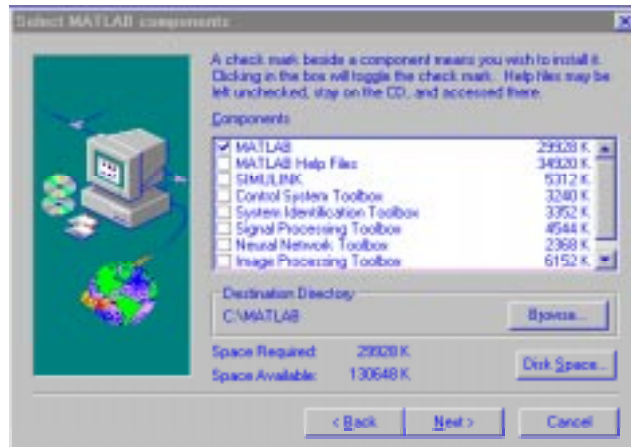


Press **Next** to continue with the installation.

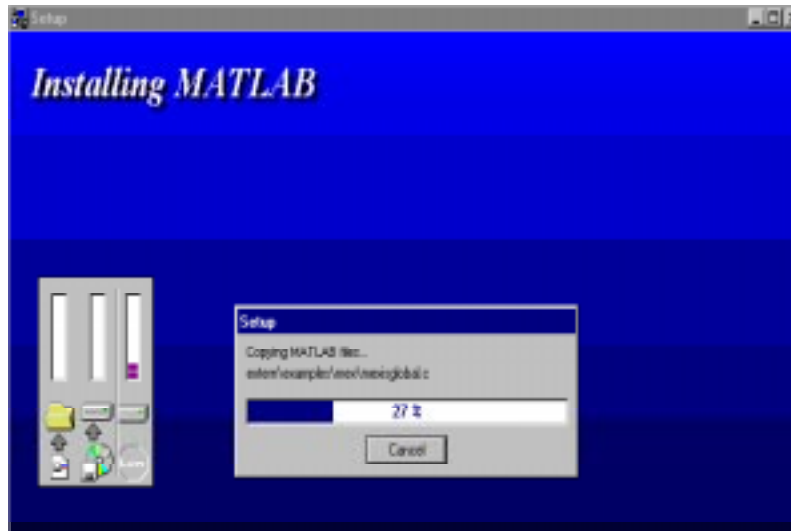
4 Provide the location of your License File.



5 Click in the box beside a component name to indicate which products you want to install. Click on a check mark to deselect any component you do not want to install at this time. You can add any deselected component to your installation at a later time.



- 6 Press **Next**. You will be informed of the progress of the installation.

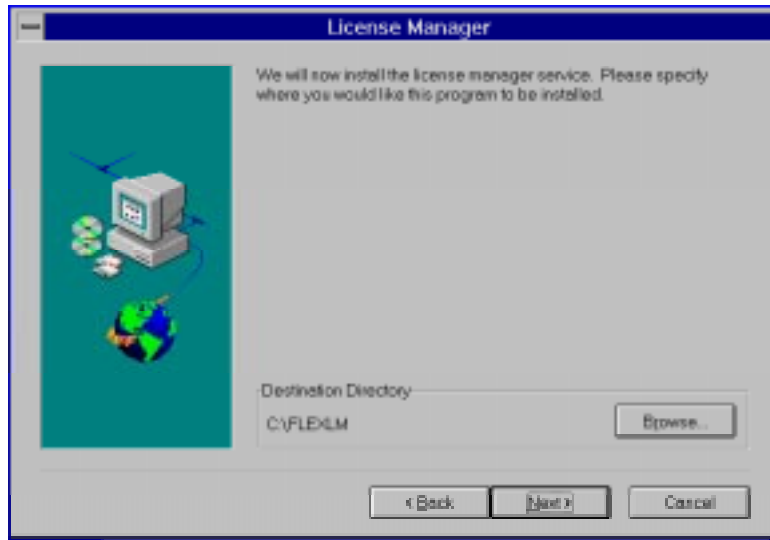


- 7 Install the license manager. Click on the **Next** button to accept the default destination directory (C: \Flexlm).

If you have administrator privileges for Windows NT, the license manager is installed as an NT service so that FLEXlm starts automatically every time your system is booted. To start FLEXlm manually, use the Services icon from the Control Panel. The FLEXlm service log file is `lmgrd.log` in your NT system directory.

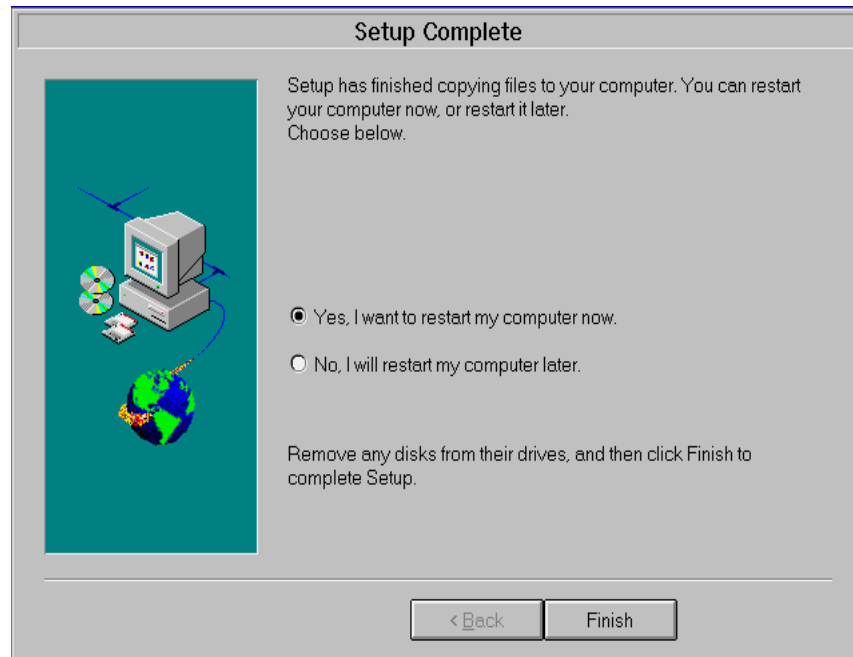
Under Windows 95, the license manager is installed as an application. Windows 95 users must start FLEXlm manually by double-clicking the `lmgrd.exe` icon in the directory where you have installed the license man-

ager. Alternatively, to start FLEXlm automatically when your system is booted, move the `lmgrd.exe` file to your StartUp directory.



To remove FLEXlm, type `install remove`.

- 8 You have now successfully installed MATLAB! You need to restart your computer to use MATLAB.**



License Manager

To manage software access on a PC network, MATLAB uses a license manager called FLEXlm, a product of GLOBETrotter Software, Inc. Once you have obtained a License File from The MathWorks and installed it on your system, the license manager should function without additional effort on your part. This section provides minimal information about FLEXlm and the License File. You may want to refer to this section if you are upgrading your license or run into any difficulties. More comprehensive information is available online at <http://www.globetrotter.com>.

License File

The ASCII License File `license.dat` contains configuration information, including the number of license keys and the `hostid` of the licensed CPU:

```
# MATLAB license passcode file for use with FLEXlm 5.0a
# LicenseNo: 12345          HostID: INTERNET=144.212.21.32
SERVER 144.212.21.32      INTERNET=144.212.21.32 1705
DAEMON MLM C:\matlab\bin\mlm.exe
FEATURE  MATLAB          MLM 5 01-apr-1997  6 3C819780CF72C7A
FEATURE  SIMULINK        MLM 5 01-apr-1997  6 2C7147104C56DE5
FEATURE  Control_Toolbox MLM 5 01-apr-1997  6 CC816700619E5C1
FEATURE  Identification_Toolbox MLM 5 01-apr-1997  6 2CA1A7DOB6AFBD4
```

The file includes:

- Two comment lines (beginning with the character #) indicating license version, license number, and Host ID information:

```
# MATLAB license passcode file for use with FLEXlm 5.0a
# LicenseNo: 12345          HostID: INTERNET=144.212.21.32
```

- A SERVER line and a DAEMON line, providing information necessary for the license manager to function:

```
SERVER 144.212.21.32      INTERNET=144.212.21.32 1705
DAEMON MLM C:\matlab\bin\mlm.exe
```

- A series of FEATURE lines that itemize the products you are licensed to use, for example, MATLAB, SIMULINK®, and any toolboxes you have purchased:

```
FEATURE  MATLAB          MLM 5 01-apr-1997  6 3C819780CF72C7A09C
FEATURE  SIMULINK        MLM 5 01-apr-1997  6 2C7147104C56DE5608
FEATURE  Control_Toolbox  MLM 5 01-apr-1997  6 CC816700619E5C16BI
```

FEATURE lines also indicate the maximum number of users allowed to use the product at any one time.

If you create your License File by hand using a text editor, be careful that the FEATURE lines in your License File exactly match the information provided to you by The MathWorks.

Note: The FEATURE lines in a License File must not contain any line breaks.

Adding Additional Features

If you want to add users, acquire additional toolboxes, or move the license server to a different computer, The MathWorks can give you new information by fax, e-mail, or telephone. If, for example, you purchase an additional toolbox, The MathWorks will send you a new FEATURE line to add to your License File. Open the file with your text editor and insert the line into the list of FEATURE lines, making certain once more that the line does not contain any line breaks.

If you want to increment a feature, for example, add additional users or run additional copies of the same feature, The MathWorks will send you one or more INCREMENT lines, which you should add to the License File with a text editor. Place the INCREMENT line immediately after the FEATURE line for the licensed product.

```
FEATURE  MATLAB      MLM 5 01-j an- 1997 4 0123456789ABCDEF1234
INCREMENT MATLAB      MLM 5 01-j an- 1997 1 0123456789ABCDEF1234
```

The INCREMENT line above adds one additional user to the existing MATLAB license.

Macintosh Installation

Before You Begin

Before you begin installing MATLAB, you must have a valid Personal License Password provided by The MathWorks. This password is a 25-digit number tied to your License Number. It determines which products you are permitted to install and use. If you do not have your Personal License Password, contact The MathWorks immediately to request one:

- Via e-mail at service@mathworks.com
- Via telephone at 508-647-7000; ask for Customer Service.
- Via fax at 508-647-7001
- Via Web (<http://www.mathworks.com>. Choose **Express passcodes**.)

Please have ready, or include in your e-mail or fax, these items:

- 1 Your License Number (Site ID).

If you have not previously installed MATLAB at your site, you can find your License Number (Site ID) on the upper right-hand corner of the packing slip. If you have a previous version of MATLAB running at your site, you can obtain your License Number by entering the `license` command at the MATLAB command prompt.

- 2 Your e-mail address (if you have one).

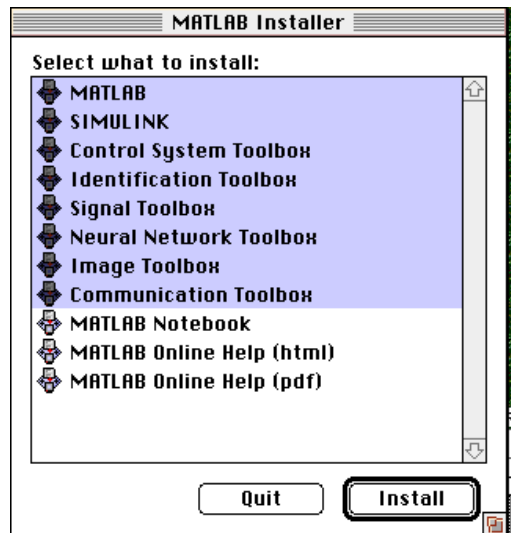
Installation Procedure

- 1 Place the CD-ROM distribution disk into the CD-ROM drive. Double-click the Install MATLAB icon.
- 2 Accept or reject the software licensing agreement displayed. If you accept the terms of the agreement, you may proceed with the installation.

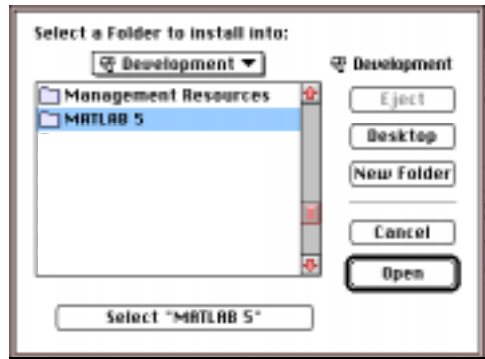
- 3 Enter the 25-digit Personal License Password previously obtained from The MathWorks. Do not insert any additional characters such as hyphens into the password.



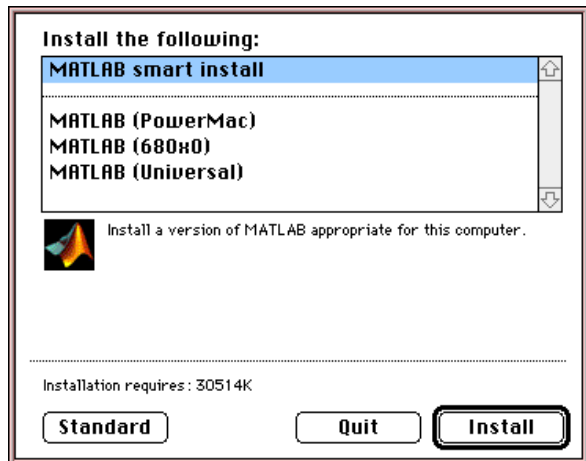
- 4 The products you are licensed to install appear highlighted on the **MATLAB Installer** screen. Deselect (command-click) any products you do not want to install at this time. You can add any deselected component to your installation at a later date.



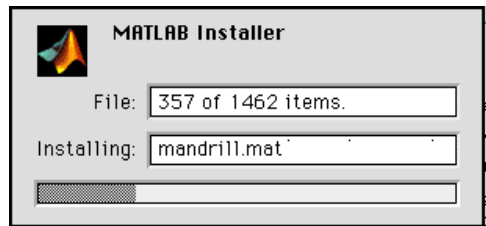
5 Indicate the folder where you want to install MATLAB



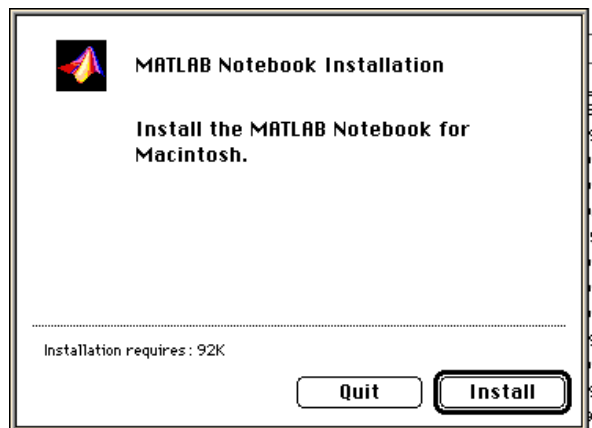
and the version of MATLAB to install.



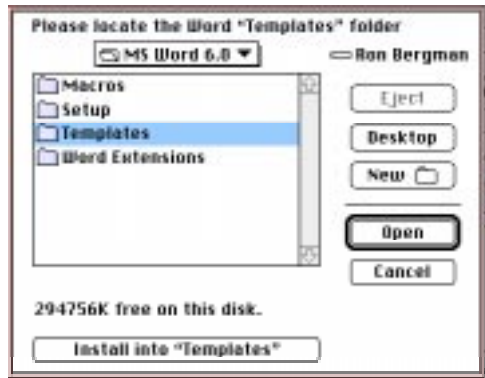
You will be informed of the progress of the installation.



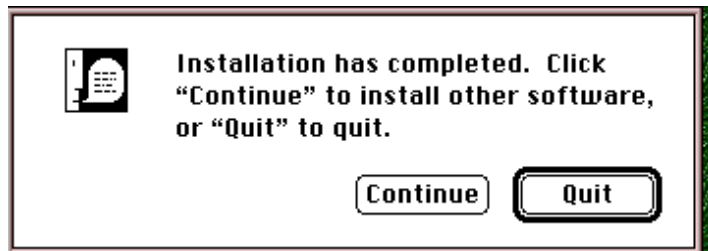
- 6 If, in Step 4, you selected the MATLAB Notebook as an installation option, click the **Install** button to proceed with the installation. You must have Microsoft Word for the Macintosh installed on your computer to use the MATLAB Notebook.



- 7 Indicate the location of the Microsoft Word Templates folder.



- 8 You have successfully installed MATLAB for the Macintosh!



Transferring a Toolbox

If you want to transfer a toolbox from one license to run on a different license, you will require the assistance of The MathWorks before you can effect the transfer.

Because your 25-digit Personal License Password uniquely configures the system you are running on, you will require new License Passwords for both the current system and the system you are moving to. To obtain your new passwords, contact The MathWorks by any of these methods:

- Via e-mail at service@mathworks.com
- Via telephone at 508-647-7000; ask for Customer Service.
- Via fax at 508-647-7001

Please have ready, or include in your e-mail or fax, the following items:

- 1 The name of the toolbox you want to transfer.
- 2 The License Number of the system the toolbox is currently running on and the License Number of the system you are transferring the toolbox to.

You can find your License Number on the e-mail or fax containing your Personal License Password. You can also obtain your license number by entering the `license` command at the MATLAB command prompt.

- 3 Your e-mail address (if you have one)

When you have obtained your new Personal License Passwords, proceed to reinstall the toolbox following the instructions in this book appropriate for your machine type.

Directory Structures

2-2 Windows Directory Structure

2-2 MATLAB\BIN

2-2 MATLAB\TOOLBOX\LOCAL

2-3 MATLAB\TOOLBOX\MATLAB

2-4 MATLAB\EXTERN

2-4 MATLAB\GHOSTSCRIPT

2-5 Macintosh Directory Structure

2-6 MATLAB:Toolbox:matlab

2-7 MATLAB:Toolbox:local

2-7 MATLAB:Extern

Windows Directory Structure

MATLAB is distributed in compressed format on CD-ROM. The installation procedure moves the files to your hard disk, decompresses them, and installs them in the Windows environment. After installation, your MATLAB directory will possess the following files and subdirectories containing the various components of the MATLAB system (and other toolbox directories, if you have purchased and installed these options):

\BIN	The MATLAB binary and associated files
\TOOLBOX	The MATLAB toolboxes
\EXTERN	Tools for building external interfaces to MATLAB
\GHOSTSCRIPT	The GhostScript PostScript translation utility
\HELP	Optionally installed Help system
RELNOTES.TXT	Release Notes file

The subdirectories and their contents are listed below.

MATLAB\BIN

MATLAB.EXE	The MATLAB binary
*.DLL, *.EXE, *.BAT	Miscellaneous files

MATLAB\TOOLBOX\LOCAL

Local environment M-files.

MATLAB\TOOLBOX\MATLAB

\BITFUN	Bit manipulation functions
\CELLFUN	Cell array and structure functions
\COLOR	Color controls and lighting model functions
\DATAFUN	Data analysis and Fourier transform functions
\DDE	DDE toolbox
\DEMOS	Demonstrations and samples
\ELFUN	Elementary math functions
\ELMAT	Elementary matrices and matrix manipulation
\FUNFUN	Function functions – nonlinear numerical methods
\GENERAL	General purpose commands
\GRAPHICS	General purpose graphics commands
\GUIDE	Guide functions
\I OFUN	Low-level file I/O functions
\LANG	Language constructs and debugging
\MATFUN	Matrix functions – numerical linear algebra
\NDFUN	N-D array functions
\OOPFUN	Object-oriented programming functions and methods
\OPS	Operators and special characters
\PLOTXY	Two-dimensional graphics
\PLOTXYZ	Three-dimensional graphics
\POLYFUN	Polynomial and interpolation functions
\SOUNDS	Sound functions
\SPARFUN	Sparse matrix functions
\SPECFUN	Specialized math functions
\SPECMAT	Specialized matrices

<code>\STRFUN</code>	Character string functions
<code>\TIMEFUN</code>	Time, date, and calendar functions
<code>\UITOOLS</code>	User interface utilities

MATLAB\EXTERN

<code>\EXAMPLES</code>	C and Fortran examples of using the Application Program Interface
<code>\INCLUDE</code>	Header files for the External Interface Library
<code>\SRC</code>	C source files for inclusion in MEX building

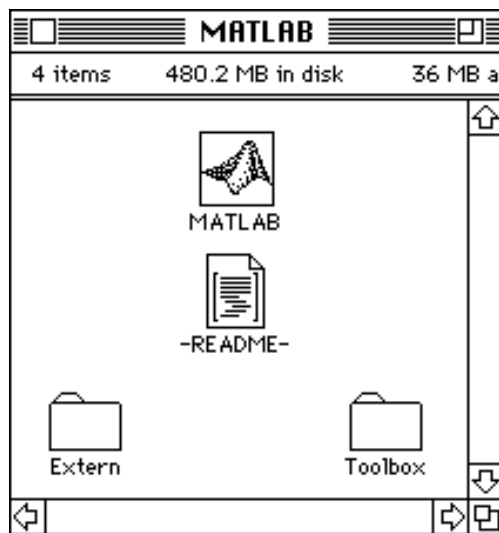
MATLAB\GHOSTSCRIPT

<code>\BIN</code>	The GhostScript binary
<code>\FONTS</code>	GhostScript versions of PostScript fonts
<code>\PS_FILES</code>	PostScript initialization and configuration files

Macintosh Directory Structure

MATLAB is distributed in compressed format on CD-ROM. The installation procedure moves the files to your hard disk, decompresses them, and installs them in the Macintosh environment.

In this manual, MATLAB folder refers to the folder that contains the MATLAB program and associated folders. The exact name of the folder may vary depending upon which version of MATLAB you have installed.



The main MATLAB system includes::

MATLAB	The MATLAB application.
Tool box	A folder containing the MATLAB Toolbox M-files and any additional toolboxes you install.
Extern	A folder containing the files needed to build and run C and Fortran functions from MATLAB and stand-alone applications using the Application Program Interface.
-README-	A file containing the latest release notes.

The subdirectories and their contents are listed below.

MATLAB:Toolbox:matlab

BITFUN	Bit manipulation functions
CELLFUN	Cell array and structure functions
COLOR	Color controls and lighting model functions
DATAFUN	Data analysis and Fourier transform functions
DEMOS	Demonstrations and samples
ELFUN	Elementary math functions
ELMAT	Elementary matrices and matrix manipulation
FUNFUN	Function functions – nonlinear numerical methods
GENERAL	General purpose commands
GRAPHICS	General purpose graphics commands
GUIDE	Guide functions
I OFUN	Low-level file I/O functions
LANG	Language constructs and debugging
MATFUN	Matrix functions – numerical linear algebra
NDFUN	N-D array functions
OOPFUN	Object-oriented programming functions and methods
OPS	Operators and special characters
PLOTXY	Two-dimensional graphics
PLOTXYZ	Three-dimensional graphics
POLYFUN	Polynomial and interpolation functions
SOUNDS	Sound functions
SPARFUN	Sparse matrix functions
SPECFUN	Specialized math functions
SPECMAT	Specialized matrices

STRFUN	Character string functions
TIMEFUN	Time, date, and calendar functions
UITOOLS	User interface utilities

MATLAB:Toolbox:local

docopt.m	Hypertext documentation options
license.m	License number
matlabrc.m	MATLAB's system-wide startup file
printopt.m	User-configurable print options
sited.m	User site identification
userpath.m	User environment path

MATLAB:Extern

Includes	Header files for the Application Program Interface
Libraries	Object libraries for the Application Program Interface
Examples	C and Fortran examples of using the Application Program Interface
Scripts	MPW scripts used with the Application Program Interface

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