Installation Guide for PC and Macintosh
Version 5.0
How to Contact The MathWorks:

508-647-7000 Phone
508-647-7001 Fax
The MathWorks, Inc.
24 Prime Park Way
Natick, MA 01760-1500

http://www.mathworks.com Web
ftp.mathworks.com Anonymous FTP server
comp.soft-sys.matlab Newsgroup

support@mathworks.com Technical support
suggest@mathworks.com Product enhancement suggestions
bugs@mathworks.com Bug reports
doc@mathworks.com Documentation error reports
subscribe@mathworks.com Subscribing user registration
service@mathworks.com Order status, license renewals, passcodes
info@mathworks.com Sales, pricing, and general information

Installation Guide for PC and Macintosh (December 1996)
© COPYRIGHT 1984 - 1996 by The MathWorks, Inc. All Rights Reserved.
The software described in this document is furnished under a license agreement. The software may be used or copied only
under the terms of the license agreement. No part of this manual may be photocopied or reproduced in any form without
prior written consent from The MathWorks, Inc.
U.S. GOVERNMENT: If Licensee is acquiring the software on behalf of any unit or agency of the U. S. Government, the
following shall apply:
(a) for units of the Department of Defense
REstricted RIGHTS LEGEND: Use, duplication, or disclosure by the Government is subject to restrictions as set forth
(b) for any other unit or agency:
NOTICE - Notwithstanding any other lease or license agreement that may pertain to, or accompany the delivery of, the
computer software and accompanying documentation, the rights of the Government regarding its use, reproduction and
disclosure are as set forth in Clause 52.227-19(c)(2) of the FAR.
Contractor/manufacturer is The MathWorks Inc., 24 Prime Park Way, Natick, MA 01760-1500.
MATLAB, SIMULINK, Handle Graphics, and Real-Time Workshop are registered trademarks of The MathWorks, Inc.
Other product or brand names are trademarks or registered trademarks of their respective holders.
Printing History: December 1996 First printing for MATLAB 5
1 Installing MATLAB

1.1 System Recommendations
   - PC: 1-2
   - Macintosh: 1-3

1.2 PC Stand-alone Installation
   - Before You Begin: 1-4
   - Installation Procedure: 1-4

1.3 PC Network Installation
   - Before You Begin: 1-10
   - Installation Procedure: 1-11
   - License Manager: 1-15

1.4 Macintosh Installation
   - Before You Begin: 1-18
   - Installation Procedure: 1-18

1.5 Transferring a Toolbox: 1-23

2 Directory Structures

2.1 Windows Directory Structure
   - MATLAB\BIN: 2-2
   - MATLAB\TOOLBOX\LOCAL: 2-2
   - MATLAB\TOOLBOX\MATLAB: 2-3
   - MATLAB\EXTERN: 2-4
   - MATLAB\GHOSTSCRIPT: 2-4
Macintosh Directory Structure .................................................. 2-5
MATLAB:Toolbox:matlab ....................................................... 2-6
MATLAB:Toolbox:local ......................................................... 2-7
MATLAB:Extern ................................................................. 2-7
Installing MATLAB

1-2   System Recommendations
1-2   PC
1-3   Macintosh

1-4   PC Stand-alone Installation
1-4   Before You Begin
1-4   Installation Procedure

1-10  PC Network Installation
1-10  Before You Begin
1-11  Installation Procedure
1-15  License Manager

1-18  Macintosh Installation
1-18  Before You Begin
1-18  Installation Procedure

1-23  Transferring a Toolbox
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.
1 Installing MATLAB

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.

If you have MS Word, we recommend you install the MATLAB Notebook. Would you like to install it?

Yes No

Indicate where Microsoft Word template files reside on your system.
1 Installing MATLAB

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

and where your compiler is located.
8 You have now successfully installed MATLAB!
Before You Begin
For network installations, MATLAB uses a license manager called FLEXlm (a product of GLOBE trotter 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 `winipcfg` 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.

   [Image: Screenshot of the Customer Information window showing the input fields for Name, Company, and Personal License Password.]

   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 Start Up directory.

To remove FLEXlm, type `install remove`.
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 GLOBE trotter 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:
1 Installing MATLAB

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 CC816700619E5C168C`

  `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.

<table>
<thead>
<tr>
<th>Feature</th>
<th>MATLAB</th>
<th>MLM 5 01-jan-1997 4 0123456789ABCDEF1234</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increment</td>
<td>MATLAB</td>
<td>MLM 5 01-jan-1997 1 0123456789ABCDEF1234</td>
</tr>
</tbody>
</table>

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.

![Password Entry](image)

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.

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.
1 Installing MATLAB

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.
Installing MATLAB
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
\DEMONS      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
\IOFUN       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
### Directory Structures

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

**MATLAB\EXTERN**

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

**MATLAB\GHOSTSCRIPT**

- **\BIN** - The GhostScript binary
- **\FONTS** - GhostScript versions of PostScript fonts
- **\PS_FILES** - 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.

- **Toolbox**
  - 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
- **DEMO**  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
- **IOFUN**  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
Macintosh Directory Structure

MATLAB: Toolbox: local

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

docopt.m Hypertext documentation options
license.m License number
matlabrc.m MATLAB's system-wide startup file
printopt.m User-configurable print options
siteid.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
2 Directory Structures
C
comment lines 1-16
configuration, minimum 1-3

D
daemon line 1-16
directory structure 2-2

F
feature line 1-16
flexlm 1-15
  automatic start 1-13
  manual start 1-13
  overview 1-10

G
GhostScript 2-2

H
hardware 1-2

I
increment line 1-17
ipconfig 1-10

L
license command 1-23
license file 1-10, 1-11, 1-12, 1-15
license manager 1-15
license number 1-4, 1-10, 1-18, 1-23
license password 1-4, 1-5, 1-18, 1-19, 1-23
license.dat 1-10, 1-15

M
memory 1-2
mex-files 1-8

N
Notebook 1-7, 1-21
NT service 1-11, 1-13
number, license 1-4, 1-10, 1-18

P
password, license 1-4, 1-5, 1-18, 1-19, 1-23
printer 1-2

S
server line 1-16
service, NT 1-11, 1-13
site ID 1-4, 1-10, 1-18
subdirectories 2-6
system recommendations 1-2
system requirements 1-2

T
toolbox, transfer 1-23

W
winipcfg 1-10