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Release Notes for Release 14 with Service Pack 2

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Release Notes for Release 14 with Service Pack 2

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MATLAB Software Acknowledgments

MATLAB and/or its associated products include software developed by the following third parties.

ARnoldi PACKage (ARPACK)

Rich Lehoucq, Kristi Maschhoff, Danny Sorensen, and Chao Yang
`http://www.caam.rice.edu/software/ARPACK`

Assertion blocks were developed in cooperation with

Helmut Keller, Andreas Rau, and Joachim Boensch, members of the Control System Design (CSD) group at DaimlerChrysler Germany.

Automatically Tuned Linear Algebra Software (ATLAS)

R. Clint Whaley and Jack Dongarra
`http://www.netlib.org/atlas`

The Image Acquisition Toolbox DCAM adaptor uses the Carnegie Mellon University driver to communicate with cameras compatible with the IIDC 1394-based Digital Camera Specification (DCAM).

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The Robotics Institute - Carnegie Mellon University
`http://www-2.cs.cmu.edu/~iwan/1394/`

FDLIBM C math library for machines that support IEEE 754 floating point

Developed at SunSoft, a Sun Microsystems, Inc. business, by Kwok C. Ng and others. FDLIBM is freely redistributable and is available through NetLib. For information about FDLIBM, see `http://www.netlib.org`.

`fft` and related MATLAB functions are based on the FFTW library.

Developed by Matteo Frigo and Steven G. Johnson
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`http://www.fftw.org`

FreeType2 Project library is included with Simulink.

FreeType was created by David Turner, Robert Wilhelm, and Werner Lemberg http://freetype.org

A few MathWorks products contain the `graphviz` code from AT&T. ("AT&T Software") proprietary to AT&T Corp. ("AT&T").

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HDF capability in the functions `imread`, `imwrite`, `imfinfo`, and `hdf` and HDF 5 capability in the functions `hdf5info` and `hdf5read` are based on code of which portions were developed at

> The National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign.

J2PrinterWorks `.class` files are a product of Wildcrest Associates.

JPEG capability in the functions `imread`, `imwrite`, `imfinfo`, `print`, and `saveas`:

> This software is based in part on the work of the Independent JPEG Group.

Linear Algebra PACKage (LAPACK)

> `http://www.netlib.org/lapack` (for general information about LAPACK)
> For details, see the *LAPACK User's Guide*.
> E. Anderson, Z. Bai, C. Bischof, L. S. Blackford, J. Demmel, J. Dongarra, J. Du Croz, A. Greenbaum, S. Hammarling, A. McKenney, and D. Sorensen
> For a printed version of the *LAPACK User's Guide*, go to `http://www.siam.org`.
> For an online version of the *LAPACK User's Guide,* go to `http://www.netlib.org/lapack/lug/lapack_lug.html`.

openVRML, developed by The OpenVRML project (www.openvrml.org), is used in the Virtual Reality Toolbox. openVRML is redistributed herein under The GNU Lesser General Public License (LGPL), Version 2.1.

Qhull based computational geometry capability in MATLAB

> Qhull copyright (c) 1993-2003 The National Science and Technology Research Center for Computation and Visualization of Geometric Structures, The Geometry Center, University of Minnesota
> e-mail: qhull@qhull.org
> For complete copyright information, issue the MATLAB command `help qhull`.

Sparse matrix minimum degree permutation functions `colamd` and `symamd`

> Copyright © 1998-2000 by the University of Florida. All rights reserved.
> Authors of the code are Stefan I. Larimore and Timothy A. Davis (`davis@cise.ufl.edu`), University of Florida. The algorithm was developed in collaboration with John Gilbert, Xerox PARC, and Esmond Ng, Oak Ridge National Laboratory.
> This work was supported by the National Science Foundation, under grants DMS-9504974 and DMS-9803599.
> For complete copyright information, issue the MATLAB command `edit colamd` or `edit symamd`.

The SLICOT library of numerical algorithms for computations in systems and control theory is used in the Control System Toolbox. The SLICOT library is developed by the NICONET group (`www.win.tue.nl/niconet/NIC2/slicot.html`).

> More detailed information on SLICOT can be found in:
>
> Benner, P., Mehrmann, V., Sima, V., Van Huffel, S., and A. Varga: "SLICOT - A Subroutine Library in Systems and Control Theory", June 1997, NICONET Report 97-3.
>
> SLICOT is freely available through WWW: (http://www.win.tue.nl/wgs/) or anonymous ftp: (`ftp://wgs.esat.kuleuven.ac.be/pub/WGS/SLICOT/`).

The MATLAB implementation of TeX is compiled from Donald Knuth's original TeX parser (Version: 3.14159) located on the TeX Archive Network: `www.ctan.org`. The LaTeX distribution was also obtained from `www.ctan.org`.

TIFF capability in the functions `imread`, `imwrite`, `imfinfo`, `print`, and `saveas`:

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See `http://www.cise.ufl.edu/research/sparse/umfpack` for general information about UMFPACK. For details, the *UMFPACK Version 4.0 User Guide* is available at `http://www.cise.ufl.edu/research/sparse/umfpack/v4.0/UserGuide.pdf`.

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Release Notes for Release 14 with Service Pack 2

Release Notes for Release 14 with Service Pack 2

Introduction

Release 14 with Service Pack 2 (R14SP2) includes several new features and two new products. The major focus of R14SP2 is on improving the quality and performance of the MathWorks products.

Where to Find Information About This Release

The following documents describe what's new in this release:

- Release Notes for Release 14 with Service Pack 2 (described below)
- Product-specific release notes ("Quick Access to Product-Specific Release Notes" on page 38 includes links to product-specific release notes)
- "R14SP2 Late-Breaking News," for important information that was not available when the documentation set was finalized

Release Notes for Release 14 with Service Pack 2

These general release notes give you a quick overview of which products have been updated for R14SP2.

These general release notes include the following sections:

Highlights of Changes Since R14SP1

These general release notes highlight changes in products since R14SP1. This includes products that updated for R14SP2 and products that have had a Web release since R14SP1.

Printing the Release Notes for Release 14 with Service Pack 2

If you are reading the general release notes for Release 14SP2 online and would like to print them, you can link to a PDF version.

Summary of Product Updates

This section summarizes the kinds of updates made to each product for R14SP2. The products are organized into the following groups:

Products are listed in the following sections only if they have significant updates for R14SP2. However, the release notes for products not listed in the following tables may discuss upgrade issues or other important information. See "Quick Access to Product-Specific Release Notes" on page 38 for links to all the product-specific release notes.

Also, two new products were introduced between R14SP1 and R14SP2. Those products are described in "New Products" on page 24.

Note If you are reading the online version of these release notes, the links in the tables below take you to the individual release notes for specific products. The product-specific release notes are available in the online documentation for each product and on the MathWorks Web site.

MATLAB Products

An asterisk (*) after a product name indicates the product has had a Web release since R14SP1.

The links in the “New Features” column bring you to a summary of major new features, in the section called “MATLAB Products” on page 10. For details about a product’s new features, see that product’s release notes.

The links in the “Major Bug Fixes” column bring you to a page describing the bug fixes for a product. For many products, the link accesses the MathWorks Web site.

Product (Links to Release Notes)	New Features	Major Bug Fixes
MATLAB®	Summary	Details
MATLAB® Builder for COM*		Fixes for 1.1.4 and 1.1.3
MATLAB® Builder for Excel*		Fixes for 1.2.3
MATLAB® Compiler*	Summary	Details

Toolboxes

An asterisk (*) after a product name indicates the product has had a Web release since R14SP1.

The links in the "New Features" column bring you to a summary of major new features, in the section called "Toolboxes" on page 13. For details about a product's new features, see that product's release notes.

The links in the "Major Bug Fixes" column bring you to a page describing the bug fixes for a product. For many products, the link accesses the MathWorks Web site.

Product (Links to Release Notes)	New Features	Major Bug Fixes
Bioinformatics Toolbox*	Summary	Details
Communications Toolbox	Summary	Details
Control System Toolbox	Summary	Details
Curve Fitting Toolbox		Details
Data Acquisition Toolbox	Summary	Details
Database Toolbox		Details
Distributed Computing Toolbox*		Details
Filter Design HDL Coder	Summary	Details
Filter Design Toolbox	Summary	Details
Fixed-Point Toolbox	Summary	Details
Image Acquisition Toolbox	Summary	Details
Image Processing Toolbox		Details
Instrument Control Toolbox*	Summary	Details
Link for Code Composer Studio™ Development Tools*	Summary	Details

Product (Links to Release Notes)	New Features	Major Bug Fixes
Link for ModelSim®*	Summary	Details
Mapping Toolbox	Summary	Details
OPC Toolbox	Summary	
Optimization Toolbox		Details
RF Toolbox	Summary	
Robust Control Toolbox	Summary	
Signal Processing Toolbox	Summary	Details
Statistics Toolbox	Summary	Details
Symbolic Math Toolbox		Details
Virtual Reality Toolbox*	Summary	Details

Simulink Products

An asterisk (*) after a product name indicates the product has had a Web release since R14SP1.

The links in the "New Features" column bring you to a summary of major new features, in the section called "Simulink Products" on page 19. For details about a product's new features, see that product's release notes.

The links in the "Major Bug Fixes" column bring you to a page describing the bug fixes for a product. For many products, the link accesses the MathWorks Web site.

Product (Links to Release Notes)	New Features	Major Bug Fixes
Simulink®	Summary	Details
Embedded Target for Infineon® C166 Microcontrollers	Summary	Details
Embedded Target for Motorola® MPC555	Summary	Details
Embedded Target for TI C2000™ DSP*	Summary	
Embedded Target for TI C6000™ DSP*		Details
Real-Time Windows Target	Summary	
Real-Time Workshop®	Summary	Details
Real-Time Workshop® Embedded Coder	Summary	Details
SimDriveline		Details
SimMechanics		Details
SimPowerSystems		Details
Simulink® Accelerator		Details

Product (Links to Release Notes)	New Features	Major Bug Fixes
Simulink® Control Design	Summary	Details
Simulink® Parameter Estimation		Details
Simulink® Response Optimization	Summary	
Simulink® Verification and Validation		Details
Stateflow® and Stateflow® Coder	Summary	Details
xPC Target*	Summary	Details

Blocksets

An asterisk (*) after a product name indicates the product has had a Web release since R14SP1.

The links in the “New Features” column bring you to a summary of major new features, in the section called “Blocksets” on page 22. For details about a product’s new features, see that product’s release notes.

The links in the “Major Bug Fixes” column bring you to a page describing the bug fixes for a product. For many products, the link accesses the MathWorks Web site).

Product (Links to Release Notes)	New Features	Major Bug Fixes
Communications Blockset	Summary	Details
Gauges Blockset		Details
RF Blockset	Summary	
Signal Processing Blockset	Summary	Details
Video and Image Processing Blockset	Summary	Details

Summary of R14SP2 New Features

This section summarizes the major new features and enhancements introduced in R14SP1. The products are organized into the following groups:

MATLAB Products

This section highlights new features and enhancements in the following products:

MATLAB

- New features to support working with time series data. For R14SP2, these features are at a Beta level. If you are interested in being a Beta tester for these features, see "Beta Test the Time Series Features" on page 11.
- New syntax and features for creating and working with classes in MATLAB. For R14SP2, these features are at a Beta level. If you are interested in being a Beta tester for these features, see "Beta Test the MATLAB Class System" on page 11.
- New preferences that allow you to show or hide confirmation dialog boxes. This includes an optional dialog box that appears when you quit MATLAB, asking you to confirm or cancel quitting.
- Changes to preferences for the Current Directory browser that allow you to display additional information, including size for files and folders
- Enhanced **Go To** dialog box in the Editor/Debugger that allows you to go to a line number or a function
- Access to the Help browser from the MATLAB stand-alone Editor
- Improved source control feature for registering files in a project with MATLAB

- Memory mapping maps a portion of a file, or an entire file, on disk to a range of addresses within an application's address space. The application can then access files on disk in the same way it accesses dynamic memory. Advantages of memory mapping are
  - File reads and writes are faster than using `fread` and `fwrite`.
  - You can access file data using standard MATLAB indexing operations.
  - You can share data between applications by having each application map sections of the same file.
- The `textscan` function can read from strings, as well as from files.
- You can write a function and pass a handle to this function to `xlsread`. When `xlsread` executes, it reads from the spreadsheet, executes your function on the data read from the spreadsheet, and returns the final results to you.
- You can display MATLAB output using two new formats: short eng and long eng

Beta Test the Time Series Features. MATLAB 7.0.4 includes a Beta version of several features for working with time series data that allow you to

- Use a graphical interface to manage tasks and data associated with analyzing time series data
- View and manipulate time series data graphically using five different plot types, statistical annotations, and data filtering tools
- Conduct analysis of time series data at the command line using the new time series object and its associated methods

Participation in this Beta program is open only to customers who are current on their maintenance for MATLAB. Trial passcodes will not be made available for this Beta test.

If you are interested in being a Beta tester for these features, register on the MathWorks Web site, at `http://www.mathworks.com/products/beta/r14sp2/signup_newfeatures.html`.

Beta Test the MATLAB Class System. MATLAB 7.0.4 includes a Beta version of new syntax and features for working with classes in MATLAB, which simplify and expand object-oriented programming capabilities in MATLAB.

Participation in this Beta program is open only to customers who are current on their maintenance for MATLAB. Trial passcodes will not be made available for this Beta test.

If you are interested in being a Beta tester for these features, register on the MathWorks Web site, at `http://www.mathworks.com/products/beta/r14sp2/signup_newfeatures.html`.

MATLAB Compiler

- MATLAB Compiler 4.2 lets you create redistributable, stand-alone applications or software components on the following platforms:
  - Windows
  - Linux
  - Solaris
  - HP-UX
  - Linux x86-64

Toolboxes

This section highlights new features and enhancements in the following products:

Bioinformatics Toolbox

- Mass spectrometry data analysis — New functions for preprocessing and classificating raw mass spectrometry data from SELDI-TOF and MALDI-TOF spectrometers
- Graph visualization — New functions for viewing relationships between data, using interactive maps
- Statistical learning — New functions for classifying data and identifying features in the data

Communications Toolbox

- New channel visualization tool allows you to plot various channel characteristics
- Increased the signal processing speed of the Rayleigh Fading channel by up to a factor of two
- New functions, `bin2gray` and `gray2bin`, to convert between Gray decoded and encoded integers
- Gray symbol ordering added to the `pskmod`, `pammod`, `dpskmmod`, `qammod`, `fskmod`, `pskdemod`, `pamdemod`, `dpskdemod`, `qamdemod`, and `fskdemod` functions
- Theoretical BER results for a Rician channel added to the BERTool

Control System Toolbox

- The Control System Toolbox now provides a command-line API for customizing plots. You can modify labels, units, etc., for any response plot. For example, if you have a large batch job, you can set default *x*-axis units for all your plots without resorting to using the Plot Editor GUI for each individual plot.
- When editing Bode and Nichols plots, you can now
  - Manually set the lower limit of the magnitude
  - Adjust the phase offsets by multiples of 360 degrees to facilitate comparing multiple responses
- SISO Design Constraints
  - You can create single linear piecewise constraints for root locus and Bode plots
  - For Nichols plots, you can create gain/phase regions
- The `balreal` function has been split into two new functions: `hvsd` and `balred`. This gives you greater flexibility in rebalancing LTI systems.

Data Acquisition Toolbox

- Three new functions for querying the status of device objects: `islogging`, `isrunning`, and `issending`
- Three new properties for National Instruments cards: `HwDigitalTriggerSoruce`, `ExternalSampleClockSource`, and `ExternalScanClockSource`, which allow you to select PFI or RTSI channels as trigger or clock sources
- The `peekdata` function now accepts a third parameter specifying data format, allowing native data format.
- The Property Inspector replaces the Data Acquisition Property Editor (`daqpropedit`) graphical user interface.

Filter Design HDL Coder

- Code generation support for the following multirate and discrete filter types:
  - Direct-Form FIR Polyphase Interpolator
  - Direct-Form FIR Polyphase Decimator
  - FIR Hold Interpolator
  - FIR Linear Interpolator
  - Discrete-Time Scalar
- Code generation for cascades that include interpolators

Filter Design Toolbox

- Updated fixed-point FIR filter objects to match the multirate filter objects more closely. Now they use the same properties and methods. The improved filters are:
  - `dfilt.dfasymfir`
  - `dfilt.dffir`
  - `dfilt.dffirt`
  - `dfilt.dfsymfir`
- Added fixed-point filtering support to two multirate interpolators
  - `mfilt.holdinterp`
  - `mfilt.linearinterp`
- Context-sensitive help for the quantization, frequency transformation, and multirate filter design panels in Filter Design and Analysis Tool (FDATool)

Fixed-Point Toolbox

- Over 90 new plotting and matrix manipulation functions
- Overflow and underflow logging

Image Acquisition Toolbox

- User-customizable preview window
- Support for DCAM Format 7
- The `imaqhwinfo` function provides native data type information

Instrument Control Toolbox

- Advantech GPIB added to supported GPIB interfaces

Link for Code Composer Studio Development Tools

Version 1.4.1 (R14SP2) incorporates functionality introduced in 1.4, which was released via the Web after R14SP1. Link for Code Composer Studio Development Tools now supports Version 3.0 (as well as 2.2) of the Code Composer Studio Development IDE, unless specified otherwise.

Link for ModelSim

- Improved support for specification of cosimulation timing relationship between Simulink and ModelSim
- Improved relative timing mode scales Simulink time to ModelSim-defined tick units
- New absolute timing mode scales Simulink time to ModelSim time in absolute time units

Mapping Toolbox

- Shapefile export, ETOPO2 import, and improved readers for the ETOPO5 and GSHHS data sets
- Restructured world and U.S. “atlas data,” including removal of world geopolitical boundaries
- Major changes to `worldmap` and `usamap` functions and updates to examples throughout of the toolbox

- Links to URLs for Internet map data sources are located in a technical note on the MathWorks Web site rather than in the Mapping Toolbox documentation, to help keep the links more current

OPC Toolbox

- The property `QualityID` added to the `daitem` object, along with the new functions `opcqparts` and `opcqstr` that enable you to work with this new property
- A limit status added to Quality strings to indicate any limitations on the data value

RF Toolbox

- New objects added for storing RF data such as network parameters, noise figure, power, IP3, and spot noise
- Three new circuit objects: `rfckt.delay` for delay lines, `rfckt.hybridg` for hybrid G connected networks, and `rfckt.passive` for RF passive networks
- New `write` method allows saving of RF network data into files for all `rfckt` objects
- New `read` and `restore` methods, which read and restore data for `rfckt.datafile`, `rfckt.amplifier`, and `rfckt.mixer`
- New `stabilitymu` and `stabilityk` functions, which calculate the stability factors μ and k
- New `h2g` and `g2h` functions , which convert between hybrid G and hybrid H parameters
- Support for creating the objects `rfckt.amplifier` and `rfckt.mixer` from a MATLAB variable
- Frequency-dependent NF and IP3 data types added to the AMP format
- The `analyze` method adds three optional inputs for the load, source, and reference impedances

Robust Control Toolbox

The Robust Control Toolbox introduced two new functions in Version 3.01.

- `actual2normalized` — Calculate the normalized distance between a nominal value and a given value for an uncertain atom
- `normalized2actual` — Convert the value for an atom in normalized coordinates to the corresponding actual value

Signal Processing Toolbox

- FDATool
  - New "Tip of the Day" dialog — displays tips on tool startup
  - Spectral Rejection masks — draws lines on spectra
  - Support for complex filters in generated C-Header files
- FVTool
  - New Analysis Parameters option — Normalize magnitude to zero dB
  - New Analysis Parameters option — Auto scale
- New `spectrogram` function — replaces `specgram`
- New `gaussfir` function — replaces `firgauss`
- Filter Wizard no longer requires Signal Processing Blockset

Statistics Toolbox

- The `cophenet` function returns a second output that is the vector of cophenetic distances.

Virtual Reality Toolbox

- Inclusion of Orbisnap, which is a free, optional, multiplatform stand-alone VRML viewer that does not require you to have either MATLAB or the Virtual Reality Toolbox
- The Virtual Reality Toolbox viewer now allows you to interactively set the `vrfigure` maximum texture size through the **Rendering** menu.

Simulink Products

This section highlights new features and enhancements in the following products:

Simulink

- Enhancements to the Signal & Scope Manager

Embedded Target for Infineon C166 Microcontrollers

- Switch Target Configuration block
- Fast External Interrupt block
- Digital Input/Output blocks

Embedded Target for Motorola MPC555

- Support for latest toolchains
- Switch Target Configuration block

Embedded Target for TI 2000 DSP

- C24x and C28x CAP blocks capture unit blocks

Real-Time Windows Target

- Support for bidirectional counters for National Instruments 60XX and 67XX boards

Real-Time Workshop

- Support for generating C++ code
- Model Advisor enhancements that include new checks and grouping of checks
- Rate Transition block enhancements, including automatic insertions for asynchronous tasks
- Data Store Read block optimization that eliminates a temporary variable in generated code
- Beta support for the Open Watcom 1.3 compiler

Real-Time Workshop Embedded Coder

- Support for generating C++ code

Simulink Control Design

- Three different discretization methods for linearization of multirate and hybrid models
- State space, transfer function, and zero-pole gain representations of linearized models viewable from within the Control and Estimation Tools Manager without exporting to the workspace
- Support for truncated block names or full block names within the LTI Viewer and in the state space matrices of a linearized model, to improve readability

Simulink Response Optimization

- Enhanced graphical representation of signal constraints for easier manipulation
- Support for a nonzero start time for response optimization
- Support for saving response optimization projects to the model workspace, as well as to MAT files and the MATLAB workspace
- Support for viewing the number of simulations performed at each step of a response optimization

Stateflow and Stateflow Coder

- User-specified transition execution order in Stateflow charts
- Stateflow and Embedded MATLAB support for Simulink data type aliases

xPC Target

Version 2.7.2 (R14SP2) adds these new features:

- xPC Target Explorer support for inlined parameters and the monitoring of test-pointed Stateflow states
- New driver block: National Instruments PXI-6052E

These features were introduced in Version 2.7.1, which was made available via a Web download after R14SP1:

- xPC Target Explorer support for
  - Scopes of type file
  - Access to target PC file systems
  - Ability to export and import target PC environments
  - Designation of a default target PC
  - Support for viewing PCI device information
- Introduction of concept of a default target PC
- Monitoring of test-pointed Stateflow states
- xPC Target COM API support for a new object, xPCFileSystem, and associated methods
- New driver blocks
- New demos

Blocksets

This section highlights new features and enhancements in the following products:

Communications Blockset

- New channel visualization option added to the Multipath Rayleigh Fading Channel block, which allows for use of the new channel visualization tool
- Increased signal processing speed, by a factor of 2 to 10, for the Multipath Rayleigh Fading Channel block
- 26 blocks updated to generate embeddable RTW C code
- Native C data type support for the same 26 S-functions noted above
- Six demos updated to include this new support
- Many blocks updated to work in a triggered subsystem
- New `gardner_intdelay` demo illustrates Gardner symbol timing recovery for a symbol frequency offset

RF Blockset

- New Series RLC and Shunt RLC blocks
- Support for the Real-Time Workshop generic real-time (GRT) target
- Improved nonlinear behavior for physical mixers and amplifiers

Signal Processing Blockset

- Broader support for the logging of simulation minimums and maximums and fixed-point autoscaling
- Fixed-point support for the DCT and IDCT blocks
- New Audio File Source and Sink blocks
- Multirate support for CIC Filter blocks

Video and Image Processing Blockset

- Ten new blocks for tasks such as blob analysis, drawing shapes and markers, finding local maxima, image data type conversion, binary file I/O, and viewing video from the MATLAB workspace, a file, or a Simulink signal
- Three new demos - two for detection and tracking and one that illustrates the functionality of the Draw Shapes block

New Products

The following two new products have been added to the MathWorks product family since R14SP2:

- Distributed Computing Toolbox
- MATLAB Distributed Computing Engine

Distributed Computing Toolbox and MATLAB Distributed Computing Engine

The Distributed Computing Toolbox works with the MATLAB Distributed Computing Engine to enable you to execute coarse-grained MATLAB algorithms and Simulink models in a cluster of computers. You can prototype and develop applications in the MATLAB environment, and then you can use the Distributed Computing Toolbox to divide them into independent tasks. The MATLAB Distributed Computing Engine (available separately) evaluates these tasks on remote MATLAB sessions.

Both of these products were initially introduced in Web download form after R14SP1. Version 1.0.1 (R14SP2) adds some bug fixes.

Supported Platforms

Note For the most up-to-date and detailed information about supported platforms and system requirements, see "Release 14SP2 System Requirements" on the MathWorks Web site: `http://www.mathworks.com/support/sysreq/current_release/all.html`.

32-Bit Platforms

The following 32-bit platforms are supported for R14SP2:

- Windows XP (Service Pack 1 or 2)
- Windows 2000 (Service Pack 3 or 4), 2003 Server
- Windows NT 4.0 (Service Pack 5 or 6a)
- Linux x86 2.4.x, glibc 2.3.2
- Linux x86 2.4.x, glibc 2.2.5
- Linux x86 2.6.x, glibc 2.3.2
- Sun Solaris 2.8 and 2.9
- HPUX 11.0 and 11.i
- Mac OS X 10.3.2, 10.3.4, 10.3.5, 10.3.6, and 10.3.7

Sun Solaris Run-time Libraries

MATLAB dynamically links against the Solaris C++ Run-time Library, which must reside on the same machine.

To determine whether this library is already installed, type the following line in a UNIX shell.

```
ls -l /usr/lib/libCstd.so.*
```

If you get a `No match` response, then you need to install it from your Solaris system CD.

256 Color Displays No Longer Supported

For all supported platforms, MATLAB requires a 16-bit or higher graphics adapter:

- For Windows platforms, use 16-, 24-, or 32-bit OpenGL graphics adapter.
- For UNIX and Macintosh platforms, use 16-bit graphics or higher adaptor and display (24 bit recommended).

64-Bit Platforms

MATLAB is now available on AMD 64-bit Opteron, Athlon64, and Intel EM64T microprocessors running Linux.

R14SP2 supports

- Linux x86_64 2.4.x, glibc 2.3.2
- Linux x86_64 2.6.x, glibc 2.3.2

Matrix Size Limitations

Historically, MATLAB matrices have been limited in size to those that would fit in a 32-bit address space. At this stage for 64-bit Linux support, some of those limitations have been lifted, but some remain. Specifically, the data type used to index into an mxArray is still a 32-bit signed integer. This limits the number of elements in any one array to `INT_MAX-1`, or 2147483646 (approximately 2*10^9). With this limit, you can create matrices up to 16 GB (for doubles). You can create as many of these as your machine has memory to support.

Known Issues

- HDF4 and HDF5 functions are not supported.
- CDF writing is not supported, but you can read CDF files.

Products Not Available on x86_64

- Data Acquisition Toolbox
- Datafeed Toolbox
- Gauges Blockset
- Embedded Target for Infineon® C166 Microcontrollers

- Embedded Target for Motorola® HC12
- Embedded Target for Motorola® MPC555
- Embedded Target for OSEK/VDX
- Embedded Target for TI C2000™ DSP
- Embedded Target for TI C6000™ DSP
- Excel Link
- Extended Symbolic Math*
- Image Acquisition Toolbox
- Instrument Control Toolbox*
- Link for Code Composer Studio™
- Link for ModelSim®
- MATLAB® Builder for COM
- MATLAB® Builder for Excel
- MATLAB® Compiler
- MATLAB® Report Generator
- MATLAB® Web Server
- Model-Based Calibration Toolbox
- OPC Toolbox
- Real-Time Windows Target
- Symbolic Math Toolbox*
- xPC Target
- xPC Target Embedded Option
- xPC TargetBox® Legend

*Waiting for 64-bit vendor support

Accessibility Notes

R14SP2 includes a number of modifications to make our products more accessible to all users.

For installation instructions relating to accessibility support, see “Installation Notes for Accessibility Support” on page 34.

Products Updated

The MathWorks has made general modifications to make its products more accessible. Particular emphasis has been placed on the accessibility of the following products/features:

- The product installation process
- MATLAB
- Simulink
- Control System Toolbox
- Curve Fitting Toolbox
- Optimization Toolbox
- Signal Processing Toolbox
- Statistics Toolbox
- Excel Link
- MATLAB Compiler

Summary of Accessibility Support

Accessibility support for blind and visually impaired users includes:

- Support for screen readers and screen magnifiers, as described in “Assistive Technologies” on page 30
- Command-line alternatives for most graphical user interface (GUI) options
- Keyboard access to GUI components
- A clear indication of the current cursor focus
- Information available to assistive technologies about user interface elements, including the identity, operation, and state of the element

- Nonreliance on color coding as the sole means of conveying information about working with a GUI
- Noninterference with user-selected contrast and color selections and other individual display attributes, as well as noninterference for other operating system-level accessibility features
- Consistent meaning for bit-mapped images used in GUIs
- HTML documentation that is accessible to screen readers

The MathWorks believes that its products do not rely on auditory cues as the sole means of conveying information about working with a GUI. However, if you do encounter any issues in this regard, please report them to the MathWorks Technical Support group.

```
http://www.mathworks.com/support/
```

Keyboard access to the user interface includes support for "sticky keys," which allow you to press key combinations (such as **Ctrl + C**) sequentially rather than simultaneously.

With the exception of scopes and real-time data acquisition, the MathWorks software does not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.

Accessibility Support Details

These notes about product accessibility cover the following topics:

- "Assistive Technologies" on page 30
- "Troubleshooting" on page 30
- "Documentation" on page 32

If you are using a screen reader, such as JAWS, see also "Installation Notes for Accessibility Support" on page 34.

Assistive Technologies

Note For R14SP2, to take advantage of accessibility support features, you must use MathWorks products on a Microsoft Windows platform.

Tested Assistive Technologies

For R14SP2, The MathWorks has tested the following assistive technologies:

- JAWS 4.5 and 5.0 (recommended) for Windows (screen reader) from Freedom Scientific
- Built-in accessibility aids from Microsoft, including the Magnifier and "sticky keys"

Use of Other Assistive Technologies

Although The MathWorks has not tested other assistive technologies, such as other screen readers or ZoomText Xtra (screen magnifier) from Ai Squared, The MathWorks believes that most of the accessibility support built into its products should work with most assistive technologies that are generally similar to the ones tested.

If you use other assistive technologies than the ones tested, The MathWorks is very interested in hearing from you about your experiences.

Troubleshooting

This section identifies work-arounds for some possible issues you may encounter related to accessibility support in MathWorks products.

JAWS Does Not Detect When the MATLAB Installation Has Started

When you select `setup.exe`, the Windows copying dialog comes up and you are informed. After the files have been copied, the installation splash screen comes up, and then the installer starts up. However, JAWS does not inform you that the installer has begun: the installer either starts up below other windows or applications or it is minimized. Since the installer is not an active item, nothing is read.

Therefore, check the Windows applications bar for the installer. Once you go to the installer, you can use JAWS to perform the installation.

JAWS Stops Speaking

When there are lot of desktop components open, JAWS with MATLAB sometimes just stops speaking.

If this happens, close most of the desktop components, exit MATLAB, and restart.

Command Output Not Read

In the MATLAB Command Window, JAWS does not automatically read the results of commands.

To read command output, first select **File** --> **Preferences** --> **Command Window**, select the option **Use arrow keys for navigation instead of command history recall**, and click **OK**. Then, in the Command Window, press the arrow keys to move to the command output and use JAWS keystrokes to read the output.

With this preference set, you cannot use arrow keys to recall previous commands. Instead use the following key bindings:

- Windows key bindings:
  - Previous history: **CTRL-up arrow**
  - Next history: **CTRL-down arrow**
- Emacs key bindings:
  - Previous history: **CTRL-p**
  - Next history: **CTRL-n**

To return to using the up and down arrow keys to recall previous commands, clear the preference.

Some GUI Menus Are Treated As Check Boxes

For some GUIs (for example, the figure window), menus are treated by JAWS as though they are check boxes, whether or not they actually are.

You can choose a menu item for such GUIs by using accelerator keys (e.g., **Ctrl+N** to select **New Figure**), if one is associated with a menu item. You can also use mnemonics for menu navigation (e.g., **Alt+E**).

Note that check boxes that you encounter by tabbing through the elements of a GUI are handled properly.

Text Ignored in Some GUIs

For some dialog boxes, JAWS reads the dialog box title and any buttons, but ignores any text in the dialog box.

Also, in parts of some GUIs, such as some text-entry fields, JAWS ignores the label of the field. However, JAWS will read any text in the text box.

Documentation

Documentation is available in HTML format for all MathWorks products that are included in R14SP2.

Accessing the Documentation

To access the documentation with a screen reader, go to the R14SP2 documentation area on the MathWorks Web site at

```
http://www.mathworks.com/access/helpdesk/help/helpdesk.html
```

Navigating the Documentation

Note that the first page that comes up is a listing of the products. To get the documentation for a specific product, click the link for that product.

The table of contents is in a separate frame. You can use a document's table of contents to navigate through the sections of that document.

Because you will be using a general Web browser, you will not be able to use the search feature included in the MATLAB Help browser. You will have access to an index, although the index will be for the specific document you are using; the cross-product index of the MATLAB Help browser is not available when you are using a general Web browser.

Products

The documentation for all products is in HTML and can be read with a screen reader. However, for most products, most equations and most graphics are not accessible.

The following product documentation has been modified (as described below) to enhance its accessibility for people using a screen reader such as JAWS:

- MATLAB (many sections, but not the function reference pages (however, M-file help is accessible))
- Excel Link
- Optimization Toolbox
- Statistics Toolbox
- Signal Processing Toolbox

Documentation Modifications

Modifications to the documentation include the following:

- Describing illustrations in text (either directly or via links)
- Providing text to describe the content of tables (as necessary)
- Restructuring information in tables to be easily understood when a screen reader is used
- Providing text links in addition to any image mapped links

Equations

Equations that are integrated in paragraphs are generally explained in words. However, most complex equations that are represented as graphics are not currently explained with alternative text.

Installation Notes

To install R14SP2 on a Windows, UNIX, or Macintosh system, follow the instructions in the R14SP2 installation guide for that platform.

R14SP2 also includes product modifications to make our products more accessible to all users, including visually impaired and blind users. “Accessibility Notes” on page 28 describes these modifications. “Installation Notes for Accessibility Support” below discusses some installation issues involved in setting up your environment to work with assistive technologies.

Installation Folder with Spaces

In R14SP2, the following two changes have been made to the MathWorks Installer on Windows systems:

- The Installer now allows a folder name with spaces in the installation path.
- The Installer honors the Windows default installation folder, which on most machines is `Program Files`.

These changes were made in response to many customer requests and the desire to conform to a widely established industry practice for the PC platform.

Note MathWorks products are used and integrated into many software environments. If you use MathWorks products in conjunction with other third party applications (compilers, other numerical analysis packages, etc.) you might want to continue installing into a folder that does not have spaces in the path until you have tested that those applications work with MathWorks products. See the R14SP2 Late-Breaking News for a list of applications that are known to have issues working in this environment.

Installation Notes for Accessibility Support

Note If you are not using a screen reader such as JAWS, you can skip this section.

This section describes the installation process for setting up your MATLAB environment to work effectively with JAWS.

Use the regular MATLAB installation script to install the products for which you are licensed. The installation script has been modified to improve its accessibility for all users.

Note Java Access Bridge 1.1 is installed automatically when you install MATLAB.

After you complete the product installation, there are some additional steps you need to perform to ensure JAWS works effectively with MathWorks products.

Setting Up JAWS

Make sure that JAWS is installed on your machine. If it is, there is probably a shortcut to it on the Windows desktop.

Setting up JAWS involves these tasks:

1. Add the Access Bridge to your Windows path (for networked installations only).
2. Create the `accessibility.properties` file.

These tasks are described in more detail below.

(For Networked Installations Only) Add Access Bridge to Your Path. If you are running MATLAB in a networked installation environment (that is, if the MATLAB Installer was not run on your machine), you need to take the following steps to add Access Bridge to your Windows path.

Note This procedure assumes your Windows **Start** button is set to Classic mode. To set Classic mode, from the **Start** button, select **Settings**. Next select **Task Bar and Start Button**, and then select the **Start Button** tab and make sure `Classic Start Menu` option is enabled.

---

1. From the **Start** button, select **Settings**, next select **Control Panel**, and then **System**.
2. In the **System Properties** dialog box, select the **Advanced** tab.
3. Click **Environment Variables**.
4. Under the **System variables**, select the `Path` option.
5. Click the **Edit** button.
6. To the start of the `Path` environment variable, add the directory that contains `matlab.exe`; for example:

   ```
   C:\matlabr14\bin\win32;
   ```

   Be sure to include that semicolon between the end of this directory name and the text that was already there.

7 Click **OK** three times.

8 If JAWS is already running, exit and restart.

Note JAWS must be started with these path changes in effect to work properly with MATLAB.

Create the accessibility.properties File.

1 Create a text file that contains the following line:

```
assistive_technologies=com.sun.java.accessibility.AccessBridge
```

2 Use the filename `accessibility.properties`.

3 Move the `accessibility.properties` file into

```
$(matlabroot)\sys\java\jre\win32\jre1.5.0\lib\
```

JAWS Pronunciation Dictionary. As a convenience, the MathWorks provides a pronunciation dictionary for JAWS. This dictionary is in a file called `MATLAB.jdf`.

During the installation, the file is copied to your system under the MATLAB root directory at `sys\Jaws\matlab.jdf`.

To make use of the dictionary, you must copy it to the `\SETTINGS\ENU` folder located beneath the JAWS root installation directory.

You need to restart JAWS and MATLAB for the settings to take effect.

Testing

After you have installed JAWS and set up your environment as described above, you should test whether JAWS is working properly:

1 Start JAWS.

2 Start MATLAB.

JAWS should start talking to you as you select menu items and work with the MATLAB user interface in other ways.

Quick Access to Product-Specific Release Notes

This section provides online links to the product-specific release notes for each MathWorks product. If a product is *not* listed below, it has not changed significantly since Release 11.

Note Product names followed by an asterisk (*) are updated since R14SP1. Refer to release notes for products that do *not* have an asterisk only if you are upgrading from a release prior to R14SP1.

Products are organized into the following categories:

MATLAB Products

- MATLAB*
- Excel Link
- MATLAB Builder for COM*
- MATLAB Builder for Excel*
- MATLAB Compiler*
- MATLAB Distributed Computing Engine*
- MATLAB Report Generator
- MATLAB Web Server

Toolboxes

- Bioinformatics Toolbox*
- Communications Toolbox*
- Control System Toolbox*
- Curve Fitting Toolbox*

- Data Acquisition Toolbox*
- Database Toolbox*
- Datafeed Toolbox
- Distributed Computing Toolbox*
- Filter Design HDL Coder*
- Filter Design Toolbox*
- Financial Derivatives Toolbox
- Financial Time Series Toolbox
- Financial Toolbox
- Fixed-Income Toolbox
- Fixed-Point Toolbox*
- Fuzzy Logic Toolbox (no release notes)
- GARCH Toolbox
- Genetic Algorithm and Direct Search Toolbox
- Image Acquisition Toolbox*
- Image Processing Toolbox*
- Instrument Control Toolbox*
- Link for Code Composer Studio Development Tools*
- Link for ModelSim*
- Mapping Toolbox*
- Model-Based Calibration Toolbox
- Model Predictive Control Toolbox
- Neural Network Toolbox
- OPC Toolbox*
- Optimization Toolbox*
- Partial Differential Equation Toolbox (no release notes)
- RF Toolbox*
- Robust Control Toolbox*
- Signal Processing Toolbox*
- Spline Toolbox
- Statistics Toolbox*

- Symbolic Math Toolbox*
- System Identification Toolbox
- Virtual Reality Toolbox*
- Wavelet Toolbox

Simulink Products

- Simulink*
- Embedded Target for Infineon C166 Microcontrollers*
- Embedded Target for Motorola HC12
- Embedded Target for Motorola MPC555*
- Embedded Target for OSEK/VDX
- Embedded Target for TI C2000 DSP*
- Embedded Target for TI C6000 DSP*
- Real-Time Windows Target*
- Real-Time Workshop*
- Real-Time Workshop Embedded Coder*
- SimDriveline*
- SimMechanics*
- SimPowerSystems*
- Simulink Accelerator*
- Simulink Control Design*
- Simulink Fixed Point
- Simulink Parameter Estimation*
- Simulink Report Generator
- Simulink Response Optimization*
- Simulink Verification and Validation*
- Stateflow and Stateflow Coder*
- xPC Target*
- xPC TargetBox

Blocksets

- Aerospace Blockset
- CDMA Reference Blockset
- Communications Blockset*
- Gauges Blockset*
- RF Blockset*
- Signal Processing Blockset*
- Video and Image Processing Blockset*