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Release Notes for Release 14
with Service Pack 3



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Release Notes for Release 14 with Service Pack 3

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Revision History

September 2005 First printing New for Release 14SP3

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)

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<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.

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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 `savesas`:

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`

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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 `savesas`:

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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 3

Introduction

Release 14 with Service Pack 3 (R14SP3) includes many new features. However, the major focus of R14SP3 is on improving the quality of the MathWorks products.

Where to Find Information About This Release

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

- This document, Release Notes for Release 14 with Service Pack 3 (described below)
- Product-specific release notes (“Quick Access to Product-Specific Release Notes” on page 44 includes links to product-specific release notes)

Note To view important fixed and open bugs in R14SP3, use the Bug Reports interface on the MathWorks Web site. If you are not already logged in to Access, you will be prompted to log in or to create an Access Login account.

To view bug fixes introduced prior to R14SP2, refer to the product-specific release notes.

Overview of the Release Notes for Release 14 with Service Pack 3

These general release notes give you a quick overview of the products that have been updated for R14SP3. Major sections are

- “Summary of Product Updates” on page 4
- “Summary of R14SP3 New Features” on page 11
- “Upgrading from a Previous Release” on page 27
- “Supported Platforms” on page 30
- “Accessibility Notes” on page 33
- “Installation Notes” on page 39
- “Quick Access to Product-Specific Release Notes” on page 44

Highlights of Changes Since R14SP2

These general release notes highlight changes in products since R14SP2. This includes changes to products that updated for R14SP3 and products that have had a Web release since R14SP2.

Printing the Release Notes for R14SP3

If you are reading these general release notes for R14SP3 online and would like to print them, you can link to a PDF version.

Summary of Product Updates

The release summary table in this section summarizes the kinds of updates made to each product for R14SP3.

Explanation of Table Columns

The release summary table that follows has four columns, described below.

Product

MATLAB® and Simulink® are listed first in the table. The rest of the MathWorks products are listed in alphabetical order.

An asterisk (*) after a product name indicates the product has had a Web release since R14SP2.

Product name links take you to the individual release notes for specific products.

Note The product-specific release notes are available in the installed online documentation for each product and in the documentation on the MathWorks Web site.

New Features

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

Major Bug Fixes

A “Yes” in the “Major Bug Fixes” column indicates R14SP3 includes major bug fixes for the product.

Note To view important fixed and open bugs in R14SP3, use the Bug Reports interface on the MathWorks Web site. If you are not already logged in to Access, you will be prompted to log in or to create an Access Login account.

To view bug fixes introduced prior to R14SP2, refer to the product-specific release notes.

Compatibility Issues

A “Yes” in the “Compatibility Issues” column indicates that there are upgrade issues associated with upgrading from R14SP2 to R14SP3. For more information, see “Upgrading from a Previous Release” on page 27. The details of the upgrade issues for a product are included in the product-specific release notes.

Release Summary

Product (Links to Release Notes)	New Features	Major Bug Fixes	Compatibility Issues
MATLAB®	Yes	Yes	Yes
Simulink®*	Yes	Yes	Yes
Aerospace Blockset*	Yes	Yes	No
Bioinformatics Toolbox*	Yes	Yes	No
CDMA Reference Blockset	No	No	No
Communications Blockset	Yes	Yes	No
Communications Toolbox	Yes	Yes	No
Control System Toolbox	No	Yes	No
Curve Fitting Toolbox	No	Yes	No
Data Acquisition Toolbox	No	Yes	No
Database Toolbox	Yes	Yes	Yes
Datafeed Toolbox	Yes	No	No
Distributed Computing Toolbox	No	Yes	Yes
Embedded Target for Infineon C166® Microcontrollers	No	Yes	No
Embedded Target for Motorola® HC12	No	Yes	No
Embedded Target for Motorola® MPC555	No	Yes	Yes

Product (Links to Release Notes)	New Features	Major Bug Fixes	Compatibility Issues
Embedded Target for OSEK/VDX®	No	Yes	No
Embedded Target for TI C2000™ DSP	Yes	Yes	No
Embedded Target for TI C6000™ DSP	Yes	Yes	Yes
Excel Link	Yes	Yes	No
Filter Design HDL Coder	Yes	Yes	No
Filter Design Toolbox	Yes	Yes	Yes
Financial Derivatives Toolbox	Yes	Yes	No
Financial Time Series Toolbox	Yes	No	No
Financial Toolbox	Yes	Yes	No
Fixed-Income Toolbox	No	Yes	No
Fixed-Point Toolbox	Yes	Yes	No
Fuzzy Logic Toolbox (no release notes)	No	No	No
GARCH Toolbox	Yes	No	Yes
Gauges Blockset	No	Yes	No
Genetic Algorithm and Direct Search Toolbox	Yes	Yes	No
Image Acquisition Toolbox	Yes	Yes	Yes

Product (Links to Release Notes)	New Features	Major Bug Fixes	Compatibility Issues
Image Processing Toolbox	Yes	Yes	Yes
Instrument Control Toolbox	No	Yes	No
Link for Code Composer Studio™ Development Tools	No	Yes	Yes
Link for ModelSim®	Yes	Yes	No
Mapping Toolbox	Yes	Yes	No
MATLAB® Builder for COM	No	Yes	No
MATLAB® Builder for Excel	No	Yes	No
MATLAB® Compiler	Yes	Yes	No
MATLAB® Distributed Computing Engine	No	Yes	No
MATLAB® Report Generator*	Yes	Yes	No
MATLAB® Web Server	No	No	No
Model Predictive Control Toolbox	No	No	No
Model-Based Calibration Toolbox	No	No	No
Neural Network Toolbox	No	Yes	No
OPC Toolbox*	Yes	Yes	No
Optimization Toolbox	Yes	Yes	No

Product (Links to Release Notes)	New Features	Major Bug Fixes	Compatibility Issues
Partial Differential Equation Toolbox (no release notes)	No	No	No
Real-Time Windows Target	No	Yes	No
Real-Time Workshop®*	Yes	Yes	Yes
Real-Time Workshop® Embedded Coder®*	Yes	Yes	Yes
RF Blockset	Yes	Yes	Yes
RF Toolbox	Yes	No	No
Robust Control Toolbox	No	Yes	No
Signal Processing Blockset	Yes	Yes	No
Signal Processing Toolbox	Yes	Yes	No
SimDriveline*	Yes	Yes	No
SimMechanics	Yes	Yes	Yes
SimPowerSystems*	Yes	Yes	No
Simulink® Accelerator*	No	Yes	No
Simulink® Control Design	Yes	Yes	No
Simulink® Fixed Point	No	No	No
Simulink® Parameter Estimation	No	Yes	No

Product (Links to Release Notes)	New Features	Major Bug Fixes	Compatibility Issues
Simulink® Report Generator*	Yes	Yes	No
Simulink® Response Optimization	Yes	Yes	No
Simulink® Verification and Validation*	Yes	Yes	Yes
Spline Toolbox	Yes	Yes	Yes
Stateflow® and Stateflow® Coder*	Yes	Yes	No
Statistics Toolbox	Yes	Yes	No
Symbolic Math Toolbox	No	Yes	No
System Identification Toolbox	No	Yes	No
Video and Image Processing Blockset	Yes	Yes	Yes
Virtual Reality Toolbox*	Yes	Yes	No
Wavelet Toolbox	No	No	No
xPC Target	Yes	Yes	Yes
xPC TargetBox®	No	No	No

Summary of R14SP3 New Features

This section summarizes the major new features and enhancements introduced in R14SP3.

MATLAB and Simulink are described first. The rest of the MathWorks products are described in alphabetical order.

The products summarized below are

- “MATLAB” on page 13
- “Simulink” on page 15
- “Aerospace Blockset” on page 15
- “Bioinformatics Toolbox” on page 16
- “Communications Blockset” on page 16
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- “Stateflow and Stateflow Coder” on page 24
- “Statistics Toolbox” on page 25
- “Video and Image Processing Blockset” on page 25
- “Virtual Reality Toolbox” on page 25
- “xPC Target” on page 26

You can also see a summary of all new functions and models introduced in R14SP3 on the documentation page of the MathWorks Web site.

MATLAB

Desktop Tools and Development Environment

- On the Macintosh platform, figure windows are now dockable.
- Preferences for this release are stored in a new directory, R14SP3, which is useful if you run multiple versions of MATLAB.
- New font preference for antialiasing provides a smoother appearance to desktop fonts.
- New tab completion preference allows you to press **Tab** to further narrow the list of possible completions. This behavior is similar to tab completion behavior in releases prior to R14.
- Within a product, demos are depicted on the summary page with a thumbnail image and an icon representing the type (M-file, M-GUI, model, and video). You can run M-file demos in the Command Window, as well as from the Editor/Debugger.
- The Editor/Debugger offers a split screen display (horizontal and vertical), allowing you to view two parts of the same document at once.
- There is a new Editor/Debugger preference allowing you to highlight the current line.
- The Editor/Debugger allows you to comment (and uncomment) selected lines in Java and C/C++ files.
- The Find Files tool has been enhanced, allowing you to search all file types except those specified.
- Directory Reports allow you to rerun an existing report or run the same report on a new current directory.
- A new option for the `mlint` function, `'-notok'`, allows you to disable any ignored (`%#ok`) lines in an M-file.
- If you include your own toolboxes in the **Start** button or Help browser by using `info.xml` files, there is now a schema file and a validator.

Mathematics

- The new `hypot` function returns the square root of the sum of squares.
- The new `mode` function returns the most frequent values in a sample.
- The `rand` function supports an algorithm called Mersenne twister.
- You can impose nonnegativity constraints on computed ODE solutions.
- The `accumarray` function allows more flexibility for input/output classes and functions to be called.
- The `svd` function, when used with the new `econ` switch, returns an “economy size” decomposition.

Programming

- Three new functions enable you to apply a given function to all elements of a structure field, all fields of a structure, or all cells of a cell array.
- With the new `typecast` function, you can convert the data type of an array without changing the underlying data.
- Use the new `swapbytes` function to reverse the byte ordering of an array.
- The `lasterror` function returns information about the stack. You can also use this information as input to the `rethrow` function.
- The `who` and `whos` functions display information separately for any nested functions you have in an M-file.
- The `isfield` function supports cell array input.
- The MATLAB date and time functions support milliseconds.
- In time values, the `Seconds` field now truncates instead of rounding.
- Performance of the JIT/Accelerator on the Mac is improved.
- You can read EXIF (Exchangeable Image File Format) data.
- A new book, called “Data Analysis,” has been added to the MATLAB documentation set.

Graphics

- Plot tools are now available on Mac platforms.

MATLAB External Interfaces

- MATLAB now supports the `-l` and `-L` options to the `mex` command on Windows.

Simulink

- Function-call models
- Variable-step solvers support for referenced models
- Support for converting atomic subsystems to model references
- New Variable Transport Delay and Variable Time Delay blocks
- Additional reset trigger for Discrete-Time Integrator block
- Use of a variable-step solver with Rate Transition blocks
- Enhanced inport latching
- Support for custom signal viewers and generators
- Ability to view logged signal data
- Use of signal objects to assign signal properties
- Bus utility functions
- Ability to view logged signal data
- Ability to import time-series data
- New Annotation Properties dialog box
- Annotation API
- Additional diagnostics

Aerospace Blockset

- 51 new blocks
- Interface to third-party FlightGear Flight Simulator, an open source flight simulator software package

Bioinformatics Toolbox

- Multiple Sequence Alignment — new functions for aligning a set of nucleotide or amino acid sequences; updated functions for reading and displaying sets of sequences
- Sequence Analysis — new graphical interface for sequence analysis that uses many of the alignment, statistics, and utility functions
- Phylogenetic Analysis — new `phytree` object with methods to manipulate and display phylogenetic tree information

Communications Blockset

- Enhanced analog modulation library
- Many blocks updated to generate embeddable C-code, with Real-Time Workshop and Real-Time Workshop Embedded Coder
- Many blocks updated to work within triggered subsystems
- Many blocks updated with additional C data type support
- Two parameters in the Error Rate Calculation block updated to be tunable
- New demo of timing recovery using fixed-rate resampling

Communications Toolbox

- New function `bchnumerr`
- `bchgenpoly`, `bchenc`, and `bchdec` functions enhanced to increase speed

Database Toolbox

- New `fastinsert` function is about three times faster than the `insert` function.
- Visual Query Builder supports JDBC connections on Windows.

Datafeed Toolbox

- The Bloomberg `fetch` command has these added capabilities:
 - Currency conversion
 - Security type identifier support
 - Real-Time flag for `pricevol`, `showtrades`, and `stockticker` commands

Embedded Target for TI C2000 DSP

- New free-running scheduler (no interrupts)
- Added internal memory map support for C2407
- New C24x and C28x SCI blocks
- New C24x and C28x SPI blocks
- New Ramp Control block
- New Ramp Generator block
- Enhanced ADC blocks — simultaneous sampling for c28x and oversampling for c28x and c24x
- Added support for nonblocking transmit to CAN blocks
- Enhanced PWM blocks — ability to set waveform control logic, deadband period value, PWM period and duty cycle units
- Simulation stop time in generated code now honored via Stop block

Embedded Target for TI C6000 DSP

- Support for model reference
- Ability to use multiple DM642 Video ADC blocks in a model (enabling picture-in-picture display)
- Support for the revised DM642 EVM that uses a different video codec

Excel Link

- Displays full desktop

Filter Design HDL Coder

- Support for generation of script files for third-party Electronic Design Automation (EDA) tools, enabling you to compile and simulate generated HDL code and/or synthesize generated HDL code
- Significantly improved speed of generation of large test bench files for multirate filters

Filter Design Toolbox

- New approach for designing filters
- `fdesign` objects now use a default design method when available
- `limitcycle` method restored to the toolbox
- `normalizefreq` method added to the toolbox
- The `butter` and `ellip` half-band design methods added for IIR `fdesign` objects
- New `measure` method for filters
- Added `multistage` filter design method
- New `fireqint` filter design method added
- New way to get help for filter designs

Financial Derivatives Toolbox

- Support for recombining trinomial trees
- Hull-White and Black-Karasinski interest rate models added

Financial Time Series Toolbox

- New `merge` function

Financial Toolbox

- Statistical computation routines that compute values when there are missing data elements within a larger data set

Fixed-Point Toolbox

- Fixed-Point Toolbox function support added to Embedded MATLAB
- Double, single, and Boolean data type support added to the `fi` object
- Helper functions for accessing logged information added
- New “Fixed-Point Doubles Override, Min/Max Logging, and Scaling” demo
- `RoundMode` property value `round` now called `nearest`

GARCH Toolbox

- Support for a user-specified noise process as input to the simulation

Genetic Algorithm and Direct Search Toolbox

- Both the genetic algorithm and the pattern search algorithm accept nonlinear constraints.
- Direct Search now implements two algorithms — generalized pattern search (GPS) and mesh adaptive search (MADS).
- New options available in the genetic algorithm
- New options available in the pattern search algorithm
- New demos

Image Acquisition Toolbox

- Support for Meteor-II/Camera Link framegrabber
- Significant improvements to the Video Input block for use with Simulink
- Improved performance of the Video Preview window (the version built with Handle Graphics® components)
- Introduction of the Image Acquisition Toolbox Adaptor Kit

Image Processing Toolbox

- Support for reading data in two new medical file formats: Analyze 7.5 and Interfile
- New distance tool included in the Image Tool and available as a modular interactive tool that you can use in GUIs of your own creation
- New functions to create draggable and, in some cases, resizable points, lines, and rectangles
- New utility functions for use with the profile-based color conversion functions

Link for ModelSim

- Support for MATLAB component functions lets you simulate the behavior of VHDL entities in the MATLAB environment. MATLAB component functions typically provide some functionality (such as a filter) that is not yet implemented in the VHDL code.

Mapping Toolbox

- Geodetic-geocentric coordinate conversion functions
- Additional user control over shapefile content
- Enhanced shapefile read/write efficiency
- Improved rendering of polygons with inner rings
- Map viewer now georeferences saved images
- Tiger/line file support upgraded

MATLAB Compiler

- Support for Mac OS X

MATLAB Report Generator

- Support for modifying the content of headers and footers in PDF reports

OPC Toolbox

- An additional library of blocks for communicating with OPC servers from Simulink was added in Version 2.0 of the OPC Toolbox, which was released in Web-downloadable form after R14SP2. There are no additional new features introduced in R14SP3.

Optimization Toolbox

- Notify parameter added to display option for five functions — `fmincon`, `fminunc`, `fminimax`, `fgoalattain`, and `fseminf`

Real-Time Workshop

- New `rtw_precompile_libs` function
- Support for Subsystem Latch enhancements
- Support for Variable Transport Delay enhancements
- C++ Target Language support for Real-Time Windows Target and External Mode

Real-Time Workshop Embedded Coder

- Data type replacement

RF Blockset

- New RLCG Transmission Line block
- Transmission Line block now supports frequency-dependent parameters
- Output Port block now supports budget plots
- Improved nonlinear modeling for Pin/Pout data
- Improved error messages
- Improved demos

RF Toolbox

- New RLCG transmission line object
- New Command Window help for functions that act on circuit objects
- Transmission Line object now supports frequency-dependent properties
- Improved Touchstone data file support
- Improved demos

Signal Processing Blockset

- New Numerically Controlled Oscillator (NCO) block
- Ability to specify a filter for the Digital Filter block by entering a `dfilt` object on the block mask
- Ability to launch FVTool from the Digital Filter block mask to view the filter response
- Fixed-point support added to the Matrix Multiply block
- Simulink virtual bus support added to key blocks
- New Audio Sample Rate Conversion demo

Signal Processing Toolbox

- New discrete-time filter objects delay structure (`dfilt.delay`)
- New WinTool/WVTool normalize-magnitude option
- Improved default *y*-axis ranges of FDATool and FVTool analyses
- FVTool passband zoom added

SimDriveline

- Efficiency Demo Library and Model
- Changes to the Driveline Environment, Controllable Friction Clutch, Differential, and Tire blocks
- New demo
- Enhanced documentation: expanded “Advanced Methods” chapter

SimMechanics

- Shared Environment block
- State vector commands
- CAD-XML model import GUI
- Changes to Body Spring & Damper block
- New demos
- Enhanced documentation: new Stewart platform case studies added

SimPowerSystems

- Two new blocks in the Machines library
- Enhancements to the Asynchronous Machine block and the Permanent Magnet Synchronous Machine block
- Branch Type parameter implemented for the RLC Branch blocks
- Ability to specify average values for the blocks in the Electric Drives library

Simulink Control Design

- Support for linearization and computation of operating points for models that reference other models using the Model block
- Support in the Control and Estimation Tools Manager for copying and editing of operating points
- Support for initializing a Simulink model for simulation using operating points from within the Control and Estimation Tools Manager

Simulink Report Generator

- Support for modifying the content of headers and footers in PDF reports

Simulink Response Optimization

- Added ability to search for response optimization solutions that lie further inside the constraint region, rather than stopping at the first feasible solution, which typically lies at the edge of the region (the default behavior)
- Added ability to use **Shift** key to easily and precisely align constraint segments horizontally or vertically

Simulink Verification and Validation

- New API supports customizing behavior of Model Advisor for checking and reporting how well your Simulink models are optimized for simulation and code generation. The API provides constructs for defining custom checks and tasks and for writing custom callback functions.
- Support for new location types: multiple ways to identify a location based on the type of document
- Support for PDF requirement documents
- Support for custom requirement document types
- Selection-based linking lets you create links to the currently selected text in Word, active cell in Excel, or last selected object in DOORS without using the Requirements dialog box.
- Navigation from requirements documents to Simulink objects using ActiveX and persistent identifiers
- The new System Requirements block lets you view the requirements for a subsystem or model directly on the block diagram for convenience, printing, and easy navigation.
- DOORS links without a surrogate.
- DOORS synchronization changes
- Menu additions to improve usability and simplify the workflow

Spline Toolbox

- You can construct a rational spline as the rBform of an arc for which you can specify the center, radius, and extent.

Stateflow and Stateflow Coder

- New interface that gives Stateflow charts access to global variables in Simulink models
- Support for using embedded MATLAB action language in truth tables
- New truth table function block is now available (in the Simulink library); supports calling a truth table function directly from Simulink models
- Ability to specify the execution order of parallel states explicitly in Stateflow charts

Statistics Toolbox

- New univariate probability distributions — generalized extreme value and generalized Pareto
- New Hypothesis Tests for chi-square goodness of fit, variance testing, the Ansari Bradley test, and tests of randomness
- New partial correlation functionality
- New and enhanced functionality for prediction and prediction intervals
- New functionality for survival analysis
- Enhanced plotting usability for `ksdensity` and `ecdf`
- New and updated demos

Video and Image Processing Blockset

- New features added to the following blocks: 2-D FIR Filter, Blob Analysis, Color Space Conversion, Draw Shapes, and Edge Detection
- Improvements made to the following I/O blocks: From Multimedia File, Read AVI File, Read Binary File, and Write Binary File
- Enhancements made to MPlay GUI — it can now stop, start, and step through a simulation
- Autothreshold block support for fixed-point data types
- Five new demos — bacteria cell segmentation, color-based segmentation and tracking, people tracking, visual effects, and an MPlay tutorial

Virtual Reality Toolbox

- These new features were added in Version 4.2 of the Virtual Reality Toolbox, released in Web-downloadable form after R14SP2. There are no additional new features introduced in R14SP3.
 - Support for the MATLAB Compiler
 - Support for frame captures in addition to animation recording
 - New toolbar camera icon support for frame captures of the current virtual scene
 - Frame capture preferences added to the toolbox preferences dialog

- `vrsetpref` and `vrgetpref` include more properties to support frame capturing
- Parameters added to the Space Mouse block, allowing for coordinate limit specifications for the mouse

xPC Target

- Fixed-point support — xPC Target now fully supports Simulink fixed-point data. This enables you to monitor and log signals of fixed-point data types and tune parameters of fixed-point data types.
- Support for drivers for the MIL-STD-1553 military avionics databus protocol

Upgrading from a Previous Release

These topics summarize the potential compatibility issues in upgrading from R14SP2 to R14SP3:

- “Compatibility Issues in This Release” on page 27
- “Compatibility Considerations for New Functions and Models” on page 29

Compatibility Issues in This Release

Upgrading to R14SP3 is not expected to result in any significant compatibility problems for most users.

To see if any known compatibility issues exist for your product, refer to the “Release Summary” on page 6. If the table shows that there are compatibility issues for any of your products, follow the link to see the details in the product’s release notes. If you are upgrading from a release prior to R14SP2, refer to the “Upgrading from an Earlier Release” section(s) in the product-specific release notes associated with the earlier releases.

The compatibility issues likely to be noticed by the broadest cross section of users are summarized in the following table:

Product and Area	Issue	Potential Impact	Recommended Actions
MATLAB Desktop Tools and Development Environment	New name for preferences directory	If you run R14SP3 with previous R14 releases, changes to files in the preferences directory are not shared.	See “New R14SP3 Preferences Directory” in the MATLAB release notes.
MATLAB Mathematics	New mode function	Under certain circumstances, errors or unexpected results occur if you have functions or variables named mode.	See “Possible Conflict with New Function Names” in the MATLAB release notes.

Product and Area	Issue	Potential Impact	Recommended Actions (Continued)
MATLAB Programming	Warning on function name conflicts with built-in functions	When you modify the MATLAB search path to a directory containing a file with the same name as a built-in function, MATLAB issues a warning. Modifying the search path includes adding a directory to the path or changing the MATLAB current directory.	Consider renaming your functions to avoid conflicts. For more information, see “Warning of Potential Naming Conflict” in the MATLAB release notes.
MATLAB External Interfaces	New extension on Windows, MEXW32	There might be search path conflicts. In addition, MEX-files generated by R14SP3 cannot be used with previous versions of MATLAB.	See “New File Extension for MEX-Files on Windows” in the MATLAB release notes.
Real-Time Workshop	rtwgen function not intended for direct use	If you have used rtwgen, upgrading Real-Time Workshop might cause code that uses the function to fail.	For existing code, replace instances of rtwgen with slbuild. For new code, use slbuild. For more information, see “Use slbuild Instead of rtwgen” in the Real-Time Workshop release notes.

Compatibility Considerations for New Functions and Models

The introduction of new functions and models could cause a conflict between any of your own M-files, models, and variables having the same names.

Example

If you created a function named `mode` in a previous release, it might conflict with the new MATLAB `mode` function (introduced in R14SP3). Another conflict that might arise is when you load a MAT-file that contains a variable named `mode`.

Recommendations

- In the By Product List of new functions and models (on the documentation page of the MathWorks Web site), scan the products you have installed for function, model, and variable names you already use, and note potential conflicts.
- Because you could experience conflicts with names from products you do not use, scan the Alphabetical List of new functions and models for all products (on the documentation page of the MathWorks Web site), and note any other potential conflicts. For example, you might have a name conflict if you share files with users who have different products installed.
- To identify and address name conflicts, consult these topics:
 - Possible Conflict with New Function Names (in “New Features” section of the MATLAB release notes)
 - Avoid Using Function Names for Variables (in the “Programming” section of the MATLAB documentation)

Supported Platforms

Note For the most up-to-date and detailed information about supported platforms and system requirements, see “Release 14SP3 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 R14SP3:

- Windows XP (Service Pack 1 or 2)
- Windows 2000 (Service Pack 3 or 4), 2003 Server
- Linux x86 2.4.x, glibc (glibc6) 2.2.5
- Linux x86 2.4.x, glibc (glibc6) 2.3.2
- Linux x86 2.6.x, glibc (glibc6) 2.3.2
- Sun Solaris 2.8, 2.9, and 2.10
- HP-UX 11.0 and 11.i
- Panther — Mac OS X 10.3.8
- Panther — Mac OS X 10.3.9 (requires an Apple Java patch. You can find more information on this in Solution 1-161VXT).
- Tiger — Mac OS X 10.4

Note The Windows NT platform is *not* supported for R14SP3.

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

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

256 Color Displays No Longer Supported

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

- For Windows platforms, use a 16-, 24-, or 32-bit OpenGL graphics adapter.
- For UNIX and Macintosh platforms, use a 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.

R14SP3 supports

- Linux x86_64 2.4.x, glibc (glibc6) 2.3.2
- Linux x86_64 2.6.x, glibc (glibc6) 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 of 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 $2 \cdot 10^9$). 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 function is not supported.
- CDF writing is not supported, but you can read CDF files.

Products Not Available on x86_64

These products are not available on x86_64 platforms.

- Data Acquisition Toolbox
- Datafeed Toolbox
- Image Acquisition Toolbox
- OPC Toolbox

These products also are not available on x86_64 platforms. These products are waiting for 64-bit vendor support.

- Extended Symbolic Math
- Instrument Control Toolbox
- Symbolic Math Toolbox

Accessibility Notes

MathWorks products include a number of modifications to make them more accessible to all users.

For installation instructions relating to accessibility support, see “Installation Notes for Accessibility Support” on page 41.

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
- Excel Link
- MATLAB® Compiler
- Optimization Toolbox
- Signal Processing Toolbox
- Statistics Toolbox

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 35
- 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, 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 35
- “Troubleshooting” on page 35
- “Documentation” on page 37

If you are using a screen reader, such as JAWS, see also “Installation Notes for Accessibility Support” on page 41.

Assistive Technologies

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

Tested Assistive Technologies

For R14SP3, 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.

Accessing the Documentation

To access the documentation with a screen reader, go to the R14SP3 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 documentation for the following five products has been modified 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
- Signal Processing Toolbox
- Statistics 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 R14SP3 on a Windows, UNIX, or Macintosh system, follow the instructions in the R14SP3 installation guide for that platform.

R14SP3 also includes product modifications to make our products more accessible to all users, including visually impaired and blind users.

“Accessibility Notes” on page 33 describes these modifications. “Installation Notes for Accessibility Support” on page 41 discusses some installation issues involved in setting up your environment to work with assistive technologies.

New License Time-Out Feature

MATLAB installations that have a concurrent license can now use the FLEXlm time-out option to return idle license keys. With time-outs, the license manager automatically frees license keys that sit idle for a specified period of time, returning them to the pool of available license keys. The time-out option is only available for concurrent licenses.

For example, if you start MATLAB, use several toolboxes, and then go home without exiting MATLAB, the license manager will return the license keys that you checked out after the time-out period expires (4 hours). When you return, you will find MATLAB still open on your computer and will see the following message in the Command Window:

```
Your MATLAB session has timed out. All license keys have been returned.
```

To resume your MATLAB session, just use MATLAB. If a license key is available, MATLAB checks it out automatically. Likewise, as you use toolboxes and other products, MATLAB will check out license keys for these products as well.

If a license key is not available, MATLAB will periodically attempt to check out a license, issuing warning messages. After 10 warnings, if a license key is still not available, MATLAB saves the workspace and exits.

Note If you return to a timed-out Simulink session, you cannot run or modify a currently open model. These menu options are disabled. Until a Simulink license key becomes available, you can only save the model.

For information about enabling time-outs, see the Installation Guide for your platform.

Installation Folder with Spaces

R14SP2 introduced the following two changes to the MathWorks Installer on Windows systems:

- The Installer 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 have had issues working in this environment; however, note that some of these products may now be working with R14SP3.

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:\matlab71\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.

MATLAB and Simulink are listed first in the table. The rest of the MathWorks products are listed in alphabetical order.

Note Products followed by an asterisk (*) have been updated since R14SP2. Refer to release notes for products that do *not* have an asterisk only if you are upgrading from a release prior to R14SP2.

- MATLAB®*
- Simulink®*
- Aerospace Blockset*
- Bioinformatics Toolbox*
- CDMA Reference Blockset
- Communications Blockset*
- Communications Toolbox*
- Control System Toolbox*
- Curve Fitting Toolbox*
- Data Acquisition Toolbox*
- Database Toolbox*
- Datafeed Toolbox*
- Distributed Computing Toolbox*
- 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*](#)
- [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*](#)
- [Gauges Blockset*](#)
- [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*](#)
- [MATLAB® Builder for COM*](#)
- [MATLAB® Builder for Excel*](#)
- [MATLAB® Compiler*](#)
- [MATLAB® Distributed Computing Engine*](#)
- [MATLAB® Report Generator*](#)
- [MATLAB® Web Server](#)
- [Model-Based Calibration Toolbox](#)
- [Model Predictive Control Toolbox](#)
- [Neural Network Toolbox*](#)
- [OPC Toolbox*](#)
- [Optimization Toolbox*](#)
- [Partial Differential Equation Toolbox \(no release notes\)](#)
- [Real-Time Windows Target*](#)

- Real-Time Workshop®*
- Real-Time Workshop® Embedded Coder*
- RF Blockset*
- RF Toolbox*
- Robust Control Toolbox*
- Signal Processing Blockset*
- Signal Processing Toolbox*
- SimDriveline*
- SimMechanics*
- SimPowerSystems*
- Simulink® Accelerator*
- Simulink® Control Design*
- Simulink® Fixed Point
- Simulink® Parameter Estimation*
- Simulink® Report Generator*
- Simulink® Response Optimization*
- Simulink® Verification and Validation*
- Spline Toolbox*
- Statistics Toolbox*
- Stateflow® and Stateflow® Coder*
- Symbolic Math Toolbox*
- System Identification Toolbox*
- Video and Image Processing Blockset*
- Virtual Reality Toolbox*
- Wavelet Toolbox
- xPC Target*
- xPC TargetBox®