MATLAB on Windows x64 Beta Release Notes

The MATLAB Windows x64 Beta Release Notes describe the beta version of MATLAB that introduces support for the Windows XP Professional x64 Edition. The following topics are discussed in these Release Notes:

Overview (p. 1-4)	New features and enhancements introduced in this release
Installation Notes (p. 1-6)	Provides important information about installing this beta
Products Available for the Windows x64 Beta (p. 1-9)	MathWorks products that are available on the Windows x64 platform, and those that are not available
Known Issues (p. 1-12)	Significant problems that still exist in the MATLAB code or documentation.
Printable Release Notes	PDF version of these Release Notes

NOTE: You must download and install the Beta 2 release of the Visual C++ 2005 runtime libraries before installing this beta release of MATLAB. For more information, see “Installation Notes”.

1

MATLAB on Windows x64 Beta Release Notes

"Overview" on page 1-4	Provides an overview of Windows x64 platform support
"Installation Notes" on page 1-6	Provides important information about installing this beta
"Products Available for the Windows x64 Beta" on page 1-9	Lists the MathWorks products that are available and are not available on the Windows x64 platform
"Known Issues" on page 1-12	Describes known issues and limitations of this release

NOTE: You must download and install the Beta 2 release of the Visual C++ 2005 runtime libraries before installing this beta release of MATLAB. For more information, see "Installation Notes".

Overview

This is the Beta version of MATLAB for Windows XP Professional x64 Edition. The MATLAB for Windows x64 Edition is a true 64-bit application that breaks through the 2 GB virtual address space limitations of the 32-bit Windows version. If you are interested in handling large data sets and high-performance computing, we encourage you to test this Beta version.

This section covers the following topics:

- "Performance Expectations" on page 1-4
- "Matrix Size Limitations" on page 1-4
- "Providing Beta Feedback" on page 1-5

Note You must download and install the Beta 2 release of the Visual C++ 2005 runtime libraries before installing this beta release of MATLAB. For more information, see "Installation Notes" on page 1-6.

For a list of the products available for this beta release, see "Products Available for the Windows x64 Beta" on page 1-9. For a list of known issues with the beta release, see "Known Issues" on page 1-12.

Performance Expectations

The MATLAB for Windows x64 Edition is a native 64-bit build. Note that this Beta version is not an optimized release. It uses reference BLAS rather than tuned BLAS like MKL or ACML. Expect reasonably good performance that will get better in a future release.

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, MATLAB for Windows x64 Edition lifts some of those limitations, 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. We hope to relax this limit further in a future release.

Providing Beta Feedback

Your feedback on the Beta will help us determine when our support for this platform will be ready for release. To send us your Beta feedback, go to The MathWorks Web site and click **Support**. Click **Contact Us**, select **Request Technical Support**, and use the form to provide your feedback. To gather as much information as possible, a member of our development team may contact you.

Installation Notes

When installing this beta release, note the following:

- You must download and install the Beta 2 Release of the Visual C++ 2005 runtime libraries before installing the MATLAB for Windows x64 Edition beta. See "Obtaining the Visual C++ Runtime Libraries" for more information.
- You must install this Beta release in its own installation directory, separate from any existing MATLAB installations you might have on your system.

See "System Requirements" on page 1-7 for information about the systems you can run this beta on.

Obtaining the Visual C++ Runtime Libraries

The Beta Release of MATLAB for Windows XP x64 was built using the Beta 2 Release of Visual C++ 2005 (which is part of Visual Studio 2005). Because this development environment is still in Beta itself, we are unable to ship the requisite runtime libraries along with MATLAB. If you get the following error message when you try to launch MATLAB, it means you are missing the Visual C++ Runtime Libraries:

```
The system cannot execute the specified program.
```

To obtain these libraries, you must download them directly from Microsoft following this procedure.

1 Go to the following Web site:

```
http://www.microsoft.com/downloads/details.aspx?FamilyID=25ae0cd6-
783b-4968-a841-38a2743307d9&DisplayLang=en
```

2 Click the link labeled **vcredist_x64.exe** to download the x64 libraries.

Note You need to have Administrator privileges to install these libraries as they are placed in the Windows `WinSxS` directory.

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3 Choose **Run** when prompted with the **File Download** dialog box. The download typically takes a minute or two.

4 When the download is complete, click **Run** to run the library installer.

5 Click **Yes** to initiate the actual installation.

6 Read the licensing terms and click **Yes**.

7 Specify the directory in which you want to install the extracted files and then click **OK**.

Note In this dialog box, you specify the location of the license terms. The actual libraries are installed into the Windows `WinSxS` directory.

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8 Click **OK** to dismiss the dialog box indicating that the libraries were installed successfully.

System Requirements

The following are system requirements for this Beta version of MATLAB for the Windows x64 Edition.

Operating System	Processor	RAM and Swap Space
Windows XP Professional x64 Edition	AMD64 (Opteron or Athlon64)	1GB minimum recommended
	Intel EM64T (newer Pentium 4 or Xeon)	Note: MATLAB is capable of using all the RAM you have as well as any size swap file you create.

Note This beta release does not support dongles and, therefore, is not available to customers in countries where dongles are required.

Supported Compilers

For compiling MEX files and accelerating Simulink code, you can use the following compilers.

C/C++	Fortran
Microsoft Visual Studio Beta 2 (Visual C++ 8.0)	Intel Visual Fortran Compiler 9.0 for Windows, Professional Edition. **Note**: Recommended because it handles `NaN`s correctly if you specify the `/Qprec` flag.
Microsoft Platform SDK (April 2005)	Intel Fortran Compiler 8.1 **Note**: Does not handle `NaN`s correctly.

Note Both Fortran compilers require the Microsoft Platform SDK.

For building Real-Time Workshop code (GRT Target), you can use Microsoft Visual Studio Beta 2 (Visual C++ 8.0). Note that this usage requires the Microsoft Platform SDK.

Products Available for the Windows x64 Beta

The following products are available in this beta of the MATLAB for Windows XP Professional x64 Edition. For a list of products that are not available in this beta, see “Products That Are Not Available in this Beta” on page 1-11.

- Bioinformatics Toolbox
- CDMA Reference Blockset
- Communications Blockset
- Communications Toolbox
- Control System Toolbox
- Curve Fitting Toolbox
- Database Toolbox
- Datafeed Toolbox
- 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
- GARCH Toolbox
- Genetic Algorithm and Direct Search Toolbox
- Image Processing Toolbox
- Mapping Toolbox
- MATLAB®
- MATLAB® Report Generator
- Model Predictive Control Toolbox
- Neural Network Toolbox
- Optimization Toolbox

- Partial Differential Equation Toolbox
- 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®
- Simulink® Accelerator
- Simulink® Control Design
- Simulink® Fixed Point
- Simulink® Parameter Estimation
- Simulink® Report Generator
- Simulink® Response Optimization
- Simulink® Verification and Validation
- Spline Toolbox
- Stateflow®
- Stateflow® Coder
- Statistics Toolbox
- System Identification Toolbox
- Wavelet Toolbox

Products That Are Not Available in this Beta

- Aerospace Blockset
- Data Acquisition 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
- Extended Symbolic Math Toolbox
- Gauges Blockset
- 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® Distributed Computing Engine
- MATLAB® Web Server
- Model-Based Calibration Toolbox
- OPC Toolbox
- Real-Time Windows Target
- Symbolic Math Toolbox
- Video and Image Processing Blockset
- Virtual Reality Toolbox
- xPC Target
- xPC Target Embedded Option
- xPC TargetBox®

Known Issues

The following are known issues with this Beta version of the MATLAB for Windows XP Professional x64 Edition.

- You can only run one instance of this beta version of MATLAB on a system.
- ActiveX controls built on win32 platforms do not work with this Beta release; however, the beta release does work with 64-bit compliant controls.
- The following functions in the Mapping Toolbox are not available for this Beta release:
  - `geotiffinfo`
  - `geotiffread`
  - `projfwd`
  - `projinv`

MATLAB Software Acknowledgments

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

Please note that this version of MATLAB relies on pre-release, time-sensitive, unsupported software that may not operate correctly.

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).

CopyrightC 2003 Carnegie Mellon University All Rights Reserved
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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Unsymmetric MultiFrontal PACKage (UMFPACK) for solving unsymmetric sparse linear systems.

UMFPACK Version 4.0, April 11, 2002. Copyright © 2002 by Timothy A. Davis, University of Florida, `davis@cise.ufl.edu`. All Rights Reserved.

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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