

# **Aerospace Toolbox Release Notes**

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*Aerospace Toolbox Release Notes*

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## Summary by Version

This table provides quick access to what's new in each version. For clarification, see "Using Release Notes" on page 1.

<b>Version (Release)</b>	<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
<b>Latest Version V2.3 (R2009a)</b>	Yes Details	No	Bug Reports Includes fixes	Printable Release Notes: PDF  Current product documentation
V2.2 (R2008b)	Yes Details	No	Bug Reports Includes fixes	No
V2.1 (R2008a)	Yes Details	No	Bug Reports Includes fixes	No
V2.0 (R2007b)	Yes Details	Yes Summary	Bug Reports Includes fixes	No
V1.1 (R2007a)	Yes Details	No	Bug Reports Includes fixes	No
New Product V1.0 (R2006b)	Yes Details	Not applicable	Bug Reports	No

### Using Release Notes

Use release notes when upgrading to a newer version to learn about:

- New features
- Changes
- Potential impact on your existing files and practices

Review the release notes for other MathWorks™ products required for this product (for example, MATLAB® or Simulink®) for enhancements, bugs, and compatibility considerations that also might impact you.

If you are upgrading from a software version other than the most recent one, review the release notes for all interim versions, not just for the version you are installing. For example, when upgrading from V1.0 to V1.2, review the release notes for V1.1 and V1.2.

## **What's in the Release Notes**

### **New Features and Changes**

- New functionality
- Changes to existing functionality

### **Version Compatibility Considerations**

When a new feature or change introduces a reported incompatibility between versions, the **Compatibility Considerations** subsection explains the impact.

Compatibility issues reported after the product is released appear under Bug Reports at The MathWorks™ Web site. Bug fixes can sometimes result in incompatibilities, so you should also review the fixed bugs in Bug Reports for any compatibility impact.

### **Fixed Bugs and Known Problems**

The MathWorks offers a user-searchable Bug Reports database so you can view Bug Reports. The development team updates this database at release time and as more information becomes available. This includes provisions for any known workarounds or file replacements. Information is available for bugs existing in or fixed in Release 14SP2 or later. Information is not available for all bugs in earlier releases.

Access Bug Reports using your MathWorks Account.

## Version 2.3 (R2009a) Aerospace Toolbox

This table summarizes what's new in Version 2.3 (R2009a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	Printable Release Notes: PDF  Current product documentation

- “Support to Read File Type 21 for 2007 Version of DATCOM” on page 3
- “Using FlightGear Version 1.9.0 with Aerospace Toolbox” on page 3

### Support to Read File Type 21 for 2007 Version of DATCOM

The `datcomimport` function has been enhanced to read file type 21 for 2007 DATCOM files. In previous releases, the Aerospace Toolbox read only file type 6.

### Using FlightGear Version 1.9.0 with Aerospace Toolbox

Aerospace Toolbox Version 2.3 does not support FlightGear Version 1.9.0. You can use this procedure.

- 1 In the MATLAB Command Window, create a FlightGear animation object.

```
h = Aero.FlightGearAnimation;
```

- 2 Set the FlightGear animation object property `FlightGearVersion` to 1.0.

```
h.FlightGearVersion = '1.0';
```

- 3 Set the FlightGear animation object property `FlightGearBaseDirectory` to the location of FlightGear Version 1.9.0.

```
h.FlightGearBaseDirectory = 'C:\Program Files\FlightGear190'
```

**4** Generate the run script.

```
GenerateRunScript(h)
```

**5** Open the custom FlightGear run script with a text editor and change the input parameter '--airport-id=' to '--airport='.

**6** Save and close this file.

For more information on working with FlightGear, see “Using Aero.FlightGearAnimation Object” in the *Aerospace Toolbox User’s Guide*.



## Version 2.2 (R2008b) Aerospace Toolbox

This table summarizes what's new in Version 2.2 (R2008b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	Printable Release Notes: PDF  Current product documentation

New features and changes introduced in this version are

- “Support for 2007 Version of DATCOM File” on page 5
- “FlightGear Version 1.0 with Aerospace Toolbox” on page 5
- “FlightGear Animation Object play Method Now Supports Custom Timers” on page 6

### Support for 2007 Version of DATCOM File

The `datcomimport` function has been enhanced to support the 2007 DATCOM file in addition to the 1976 and 1999 DATCOM files.

### FlightGear Version 1.0 with Aerospace Toolbox

Aerospace Toolbox Version 2.2 now supports FlightGear Version 1.0. To access this version of FlightGear, you can use this procedure.

- 1 In the MATLAB Command Window, create a FlightGear animation object.

```
h = Aero.FlightGearAnimation;
```

- 2 Set the FlightGear animation object property `FlightGearVersion` to 1.0.

```
h.FlightGearVersion = '1.0';
```

- 3 Set the FlightGear animation object property FlightGearBaseDirectory to the location of FlightGear Version 1.0.

```
h.FlightGearBaseDirectory = 'C:\Program Files\FlightGear10'
```

For more information on working with FlightGear, see “Using Aero.FlightGearAnimation Object” in the *Aerospace Toolbox User’s Guide*.

## **FlightGear Animation Object play Method Now Supports Custom Timers**

The FlightGear animation object play method now supports custom timers.

In previous releases, you needed to create your own play method if your FlightGear animation object was used with custom timers. This is no longer necessary.

## Version 2.1 (R2008a) Aerospace Toolbox

This table summarizes what's new in Version 2.1 (R2008a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	No

- “Support for 1999 Version of DATCOM File” on page 7
- “Using FlightGear Version 1.0 with Aerospace Toolbox” on page 7

### Support for 1999 Version of DATCOM File

The `datcomimport` function has been enhanced to support the 1999 DATCOM file in addition to the 1976 DATCOM file.

### Using FlightGear Version 1.0 with Aerospace Toolbox

Aerospace Toolbox Version 2.1 does not support FlightGear Version 1.0. You can use this procedure.

- 1 In the MATLAB Command Window, create a FlightGear animation object.

```
h = Aero.FlightGearAnimation;
```

- 2 Set the FlightGear animation object property `FlightGearVersion` to 0.9.10.

```
h.FlightGearVersion = '0.9.10';
```

- 3 Set the FlightGear animation object property `FlightGearBaseDirectory` to the location of FlightGear Version 1.0.

```
h.FlightGearBaseDirectory = 'C:\Program Files\FlightGear10'
```

For more information on working with FlightGear, see “Using Aero.FlightGearAnimation Object” in the *Aerospace Toolbox User's Guide*.

## Version 2.0 (R2007b) Aerospace Toolbox

This table summarizes what's new in Version 2.0 (R2007b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes—Details labeled as <b>Compatibility Considerations</b> , below. See also Summary.	Bug Reports	Printable Release Notes: PDF  Current product documentation

New features and changes introduced in this version are

- “Virtual Reality Toolbox Animation Object” on page 8
- “Support for the COSPAR International Reference Atmosphere 1986 Model” on page 9
- “Support for 2001 United States Naval Research Laboratory Mass Spectrometer and Incoherent Scatter Radar Exosphere” on page 9
- “Support for the EGM96 Geopotential Model” on page 9
- “quat2angle Function Replaces quat2euler” on page 9
- “angle2quat Function Replaces euler2quat” on page 9

### Virtual Reality Toolbox Animation Object

This release introduces the following new objects and their associated methods to visualize flight data using the Virtual Reality Toolbox™ product:

- Aero.VirtualRealityAnimation
- Aero.Node
- Aero.Viewpoint

## **Support for the COSPAR International Reference Atmosphere 1986 Model**

The `atmoscira` function implements the COSPAR International Reference Atmosphere (CIRA) 1986 environmental model.

## **Support for 2001 United States Naval Research Laboratory Mass Spectrometer and Incoherent Scatter Radar Exosphere**

The `atmosnrlmsise00` function implements the 2001 United States Naval Research Laboratory Mass Spectrometer and Incoherent Scatter Radar Exosphere (NRLMSISE) environmental model.

## **Support for the EGM96 Geopotential Model**

The `geoidegm96` function implements the 1996 Earth Geopotential Model (EGM96).

## **quat2angle Function Replaces quat2euler**

The `quat2angle` function converts spatial representation from any of 12 standard sequences of rotation angles to quaternions.

### **Compatibility Considerations**

The `quat2euler` function is deprecated. Applications that contain this function continue to be supported, but an error message will be displayed. Use the `quat2angle` function instead.

## **angle2quat Function Replaces euler2quat**

The `angle2quat` function converts spatial representation from quaternions to any of 12 standard sequences of rotation angles.

### **Compatibility Considerations**

The `euler2quat` function is deprecated. Applications that contain this function continue to be supported, but an error message will be displayed. Use the `angle2quat` function instead.

## Version 1.1 (R2007a) Aerospace Toolbox

This table summarizes what's new in Version 1.1 (R2007a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Not applicable	Bug Reports	Printable Release Notes: PDF  Current product documentation

New features and changes introduced in this version are

- “New Aerospace Toolbox Objects” on page 10
- “New Aerospace Toolbox Demo” on page 10

### New Aerospace Toolbox Objects

This release introduces the following new objects and their associated methods to create a six-degrees-of-freedom animation of multiple bodies that have custom geometries:

- Aero.Animation
- Aero.Body
- Aero.Camera
- Aero.Geometry

### New Aerospace Toolbox Demo

The Aerospace Toolbox product has a new demo, Overlying Simulated and Actual Flight Data, which illustrates the use of the Aero objects.

## Version 1.0 (R2006b) Aerospace Toolbox

This table summarizes what's new in Version 1.0 (R2006b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Not applicable	Bug Reports	Printable Release Notes: PDF  Current product documentation

New features introduced in this version are described here.

### Introduction of Aerospace Toolbox Product

This product extends the MATLAB technical computing environment by providing reference standards, environment models, and aerodynamic coefficient importing for performing advanced aerospace analysis to develop and evaluate your designs. An interface to the FlightGear flight simulator enables you to visualize flight data in a three-dimensional environment and reconstruct behavioral anomalies in flight-test results. To ensure design consistency, the Aerospace Toolbox software provides utilities for unit conversions, coordinate transformations, and quaternion math, as well as standards-based environmental models for the atmosphere, gravity, and magnetic fields. You can import aerodynamic coefficients directly from the U.S. Air Force Digital Data Compendium (DATCOM) to carry out preliminary control design and vehicle performance analysis.

The toolbox provides you with the following main features:

- Provides standards-based environmental models for atmosphere, gravity, and magnetic fields.
- Converts units and transforms coordinate systems and spatial representations.
- Implements predefined utilities for aerospace parameter calculations, time calculations, and quaternion math.

- Imports aerodynamic coefficients directly from the U.S. Air Force Digital Data Compendium (DATCOM).
- Interfaces to the FlightGear flight simulator, enabling visualization of vehicle dynamics in a three-dimensional environment.

The Aerospace Toolbox software has the following limitation:

- The FlightGear animation object can not be compiled with the MATLAB® Compiler™ software to create a standalone application.



## Aerospace Toolbox Compatibility Summary

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
<b>Latest Version V2.3 (R2009a)</b>	Not applicable
V2.2 (R2008b)	Not applicable
V2.1 (R2008a)	Not applicable
V2.0 (R2007b)	See the <b>Compatibility Considerations</b> subheading for this new feature or change: <ul style="list-style-type: none"> <li>• “quat2angle Function Replaces quat2euler” on page 9</li> <li>• “angle2quat Function Replaces euler2quat” on page 9</li> </ul>
V1.1 (R2007a)	Not applicable
V1.0 (R2006b)	Not applicable