
AGL Reference Update

Graphics & Animation: 3D Drawing



2008-04-22



Apple Inc.
© 2008 Apple Inc.
All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without prior written permission of Apple Inc., with the following exceptions: Any person is hereby authorized to store documentation on a single computer for personal use only and to print copies of documentation for personal use provided that the documentation contains Apple's copyright notice.

The Apple logo is a trademark of Apple Inc.

Use of the "keyboard" Apple logo (Option-Shift-K) for commercial purposes without the prior written consent of Apple may constitute trademark infringement and unfair competition in violation of federal and state laws.

No licenses, express or implied, are granted with respect to any of the technology described in this document. Apple retains all intellectual property rights associated with the technology described in this document. This document is intended to assist application developers to develop applications only for Apple-labeled computers.

Every effort has been made to ensure that the information in this document is accurate. Apple is not responsible for typographical errors.

Apple Inc.
1 Infinite Loop
Cupertino, CA 95014
408-996-1010

Apple, the Apple logo, Logic, Mac, Mac OS, and Objective-C are trademarks of Apple Inc., registered in the United States and other countries.

DEC is a trademark of Digital Equipment Corporation.

Intel and Intel Core are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

OpenGL is a registered trademark of Silicon Graphics, Inc.

Simultaneously published in the United States and Canada.

Even though Apple has reviewed this document, APPLE MAKES NO WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT, ITS QUALITY, ACCURACY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. AS A RESULT, THIS DOCUMENT IS PROVIDED "AS IS," AND YOU, THE READER, ARE ASSUMING THE ENTIRE RISK AS TO ITS QUALITY AND ACCURACY.

IN NO EVENT WILL APPLE BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECT OR INACCURACY IN THIS DOCUMENT, even if advised of the possibility of such damages.

THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, ORAL OR WRITTEN, EXPRESS OR IMPLIED. No Apple dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Contents

Introduction to AGL Reference Update 5

Organization of This Document 5
See Also 5

10.6 Symbol Changes 7

C Symbols 7
gliContext.h 7

10.5 Symbol Changes 9

C Symbols 9
agl.h 9
aglMacro.h 10
aglRenderers.h 13
gl.h 13

10.4 Symbol Changes 15

C Symbols 15
agl.h 15
aglMacro.h 16
gl.h 19

10.3 Symbol Changes 27

C Symbols 27
agl.h 27
aglMacro.h 29
aglRenderers.h 32
gl.h 33

10.2 Symbol Changes 53

C Symbols 53
agl.h 53
aglMacro.h 54
aglRenderers.h 63
gl.h 64

10.1 Symbol Changes 67

C Symbols 67

agl.h 67

aglMacro.h 67

gl.h 70

glm.h 73

glu.h 75

Document Revision History 77

Introduction to AGL Reference Update

This document summarizes the symbols that have been added to the AGL framework. The full reference documentation notes in what version a symbol was introduced, but sometimes it's useful to see only the new symbols for a given release.

If you are not familiar with this framework you should refer to the complete framework reference documentation.

Organization of This Document

Symbols are grouped by class or protocol for Objective-C and by header file for C. For each symbol there is a link to complete documentation, if available, and a brief description, if available.

See Also

For reference documentation on this framework, see *AGL Reference*.

10.6 Symbol Changes

This article lists the symbols added to `AGL.framework` in Mac OS X v10.6.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

gliContext.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GLIShared

10.5 Symbol Changes

This article lists the symbols added to `AGL.framework` in Mac OS X v10.5.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

agl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>aglCreatePixelFormat</code>	Creates a pixel format with the provided attributes.
<code>aglDisplaysOfPixelFormat</code>	Returns the graphics devices supported by a pixel format object.
<code>aglGetHViewRef</code>	Retrieves the HView object associated with an AGL context.
<code>aglGetWindowRef</code>	Retrieves the window associated with an AGL context.
<code>aglQueryRendererInfoForCGDirectDisplayIDs</code>	Creates and returns a renderer information object that contains properties and values for all renderers driving the specified displays.
<code>aglSetHViewRef</code>	Sets an AGL context to the specified HView object.
<code>aglSetWindowRef</code>	Sets an AGL context to the specified window.

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>AGL_ALLOW_OFFLINE_RENDERERS</code>
--

AGL_DISPLAY_MASK	
AGL_INVALID_FUNCTION	
AGL_VERSION_3_0	
DEPRECATED_FOR_MAC_OS_X_VERSION_10_5_AND_LATER	

aglMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glActiveVaryingEXT	
glBeginTransformFeedbackEXT	
glBindBufferBaseEXT	
glBindBufferOffsetEXT	
glBindBufferRangeEXT	
glBindFragDataLocationEXT	
glBindFramebufferEXT	
glBindRenderbufferEXT	
glBlendEquationSeparate	
glBlitFramebufferEXT	
glBufferParameteriAPPLE	
glCheckFramebufferStatusEXT	
glDeleteFramebuffersEXT	
glDeleteRenderbuffersEXT	
glEndTransformFeedbackEXT	
glFlushMappedBufferRangeAPPLE	
glFramebufferRenderbufferEXT	
glFramebufferTexture1DEXT	
glFramebufferTexture2DEXT	

10.5 Symbol Changes

glFramebufferTexture3DEXT	
glFramebufferTextureEXT	
glFramebufferTextureFaceEXT	
glFramebufferTextureLayerEXT	
glGenerateMipmapEXT	
glGenFramebuffersEXT	
glGenRenderbuffersEXT	
glGetActiveVaryingEXT	
glGetBooleanIndexedvEXT	
glGetFragDataLocationEXT	
glGetFramebufferAttachmentParameterivEXT	
glGetIntegerIndexedvEXT	
glGetObjectParameterivAPPLE	
glGetRenderbufferParameterivEXT	
glGetTransformFeedbackVaryingEXT	
glGetUniformBufferOffsetEXT	
glGetUniformBufferSizeEXT	
glGetUniformuivEXT	
glGetVaryingLocationEXT	
glGetVertexAttribIivEXT	
glGetVertexAttribIuivEXT	
glIsFramebufferEXT	
glIsRenderbufferEXT	
glObjectPurgeableAPPLE	
glObjectUnpurgeableAPPLE	
glProgramEnvParameters4fvEXT	
glProgramLocalParameters4fvEXT	
glProgramParameteriEXT	

10.5 Symbol Changes

glRenderbufferStorageEXT	
glRenderbufferStorageMultisampleEXT	
glTransformFeedbackVaryingsEXT	
glUniform1uiEXT	
glUniform1uivEXT	
glUniform2uiEXT	
glUniform2uivEXT	
glUniform3uiEXT	
glUniform3uivEXT	
glUniform4uiEXT	
glUniform4uivEXT	
glUniformBufferEXT	
glUniformMatrix2x3fv	
glUniformMatrix2x4fv	
glUniformMatrix3x2fv	
glUniformMatrix3x4fv	
glUniformMatrix4x2fv	
glUniformMatrix4x3fv	
glVertexAttribI1iEXT	
glVertexAttribI1ivEXT	
glVertexAttribI1uiEXT	
glVertexAttribI1uivEXT	
glVertexAttribI2iEXT	
glVertexAttribI2ivEXT	
glVertexAttribI2uiEXT	
glVertexAttribI2uivEXT	
glVertexAttribI3iEXT	
glVertexAttribI3ivEXT	

glVertexAttribI3uiEXT	
glVertexAttribI3uivEXT	
glVertexAttribI4bvEXT	
glVertexAttribI4iEXT	
glVertexAttribI4ivEXT	
glVertexAttribI4svEXT	
glVertexAttribI4ubvEXT	
glVertexAttribI4uiEXT	
glVertexAttribI4uivEXT	
glVertexAttribI4usvEXT	
glVertexAttribIPointerEXT	

aglRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

AGL_RENDERER_ATI_RADEON_X1000_ID	An ATI Radeon 9700 display device.
AGL_RENDERER_INTEL_900_ID	An Intel GMA 900 display device.

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glUniformMatrix2x3fv	
glUniformMatrix2x4fv	
glUniformMatrix3x2fv	
glUniformMatrix3x4fv	

<code>glUniformMatrix4x2fv</code>	
<code>glUniformMatrix4x3fv</code>	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>glUniformMatrix2x3fvProcPtr</code>	
<code>glUniformMatrix2x4fvProcPtr</code>	
<code>glUniformMatrix3x2fvProcPtr</code>	
<code>glUniformMatrix3x4fvProcPtr</code>	
<code>glUniformMatrix4x2fvProcPtr</code>	
<code>glUniformMatrix4x3fvProcPtr</code>	

10.4 Symbol Changes

This article lists the symbols added to `AGL.framework` in Mac OS X v10.4.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

agl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>aglGetCGLContext</code>	Gets the CGL rendering context associated with an AGL rendering context.
<code>aglGetCGLPixelFormat</code>	Gets the CGL pixel format object associated with an AGL pixel format.

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>AGL_ENABLE_SURFACE_BACKING_SIZE</code>	Enable or disable the surface backing-size override.
<code>AGL_SURFACE_BACKING_SIZE</code>	The associated value specifies the width and height of surface backing size.
<code>AGL_SURFACE_VOLATILE</code>	Flags the surface as a candidate for deletion.
<code>AVAILABLE_MAC_OS_X_VERSION_10_4_AND_LATER</code>	

aglMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

AGL_MACRO_CONTEXT_RENDERER	
AGL_MACRO_DECLARE_CONTEXT	
AGL_MACRO_DECLARE_RENDERER	
AGL_MACRO_DECLARE_VARIABLES	
AGL_MACRO_RENDERER	
glAttachShader	
glBindAttribLocation	
glCompileShader	
glCreateProgram	
glCreateShader	
glDeleteProgram	
glDeleteShader	
glDetachShader	
glDisableVertexAttribArray	
glDrawBuffers	
glDrawBuffersARB	
glEnableVertexAttribArray	
glGetActiveAttrib	
glGetActiveUniform	
glGetAttachedShaders	
glGetAttribLocation	
glGetProgramInfoLog	
glGetProgramiv	
glGetShaderInfoLog	

10.4 Symbol Changes

<code>glGetShaderiv</code>	
<code>glGetShaderSource</code>	
<code>glGetUniformfv</code>	
<code>glGetUniformiv</code>	
<code>glGetUniformLocation</code>	
<code>glGetVertexAttribdv</code>	
<code>glGetVertexAttribfv</code>	
<code>glGetVertexAttribiv</code>	
<code>glGetVertexAttribPointerv</code>	
<code>glIsProgram</code>	
<code>glIsShader</code>	
<code>glLinkProgram</code>	
<code>glMultiDrawElementArrayAPPLE</code>	
<code>glMultiDrawRangeElementArrayAPPLE</code>	
<code>glPointParameteri</code>	
<code>glPointParameteriv</code>	
<code>glShaderSource</code>	
<code>glStencilFuncSeparate</code>	
<code>glStencilMaskSeparate</code>	
<code>glStencilOpSeparate</code>	
<code>glUniform1f</code>	
<code>glUniform1fv</code>	
<code>glUniform1i</code>	
<code>glUniform1iv</code>	
<code>glUniform2f</code>	
<code>glUniform2fv</code>	
<code>glUniform2i</code>	
<code>glUniform2iv</code>	

10.4 Symbol Changes

glUniform3f	
glUniform3fv	
glUniform3i	
glUniform3iv	
glUniform4f	
glUniform4fv	
glUniform4i	
glUniform4iv	
glUniformMatrix2fv	
glUniformMatrix3fv	
glUniformMatrix4fv	
glUseProgram	
glValidateProgram	
glVertexAttrib1d	
glVertexAttrib1dv	
glVertexAttrib1f	
glVertexAttrib1fv	
glVertexAttrib1s	
glVertexAttrib1sv	
glVertexAttrib2d	
glVertexAttrib2dv	
glVertexAttrib2f	
glVertexAttrib2fv	
glVertexAttrib2s	
glVertexAttrib2sv	
glVertexAttrib3d	
glVertexAttrib3dv	
glVertexAttrib3f	

glVertexAttrib3fv	
glVertexAttrib3s	
glVertexAttrib3sv	
glVertexAttrib4bv	
glVertexAttrib4d	
glVertexAttrib4dv	
glVertexAttrib4f	
glVertexAttrib4fv	
glVertexAttrib4iv	
glVertexAttrib4Nbv	
glVertexAttrib4Niv	
glVertexAttrib4Nsv	
glVertexAttrib4Nub	
glVertexAttrib4Nubv	
glVertexAttrib4Nuiv	
glVertexAttrib4Nusv	
glVertexAttrib4s	
glVertexAttrib4sv	
glVertexAttrib4ubv	
glVertexAttrib4uiv	
glVertexAttrib4usv	
glVertexAttribPointer	

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glAttachShader	
----------------	--

10.4 Symbol Changes

<code>glBindAttribLocation</code>	
<code>glBlendEquationSeparate</code>	
<code>glCompileShader</code>	
<code>glCreateProgram</code>	
<code>glCreateShader</code>	
<code>glDeleteProgram</code>	
<code>glDeleteShader</code>	
<code>glDetachShader</code>	
<code>glDisableVertexAttribArray</code>	
<code>glDrawBuffers</code>	
<code>glEnableVertexAttribArray</code>	
<code>glGetActiveAttrib</code>	
<code>glGetActiveUniform</code>	
<code>glGetAttachedShaders</code>	
<code>glGetAttribLocation</code>	
<code>glGetProgramInfoLog</code>	
<code>glGetProgramiv</code>	
<code>glGetShaderInfoLog</code>	
<code>glGetShaderiv</code>	
<code>glGetShaderSource</code>	
<code>glGetUniformfv</code>	
<code>glGetUniformiv</code>	
<code>glGetUniformLocation</code>	
<code>glGetVertexAttribdv</code>	
<code>glGetVertexAttribfv</code>	
<code>glGetVertexAttribiv</code>	
<code>glGetVertexAttribPointerv</code>	
<code>glIsProgram</code>	

10.4 Symbol Changes

<code>glIsShader</code>	
<code>glLinkProgram</code>	
<code>glPointParameteri</code>	
<code>glPointParameteriv</code>	
<code>glShaderSource</code>	
<code>glStencilFuncSeparate</code>	
<code>glStencilMaskSeparate</code>	
<code>glStencilOpSeparate</code>	
<code>glUniform1f</code>	
<code>glUniform1fv</code>	
<code>glUniform1i</code>	
<code>glUniform1iv</code>	
<code>glUniform2f</code>	
<code>glUniform2fv</code>	
<code>glUniform2i</code>	
<code>glUniform2iv</code>	
<code>glUniform3f</code>	
<code>glUniform3fv</code>	
<code>glUniform3i</code>	
<code>glUniform3iv</code>	
<code>glUniform4f</code>	
<code>glUniform4fv</code>	
<code>glUniform4i</code>	
<code>glUniform4iv</code>	
<code>glUniformMatrix2fv</code>	
<code>glUniformMatrix3fv</code>	
<code>glUniformMatrix4fv</code>	
<code>glUseProgram</code>	

10.4 Symbol Changes

glValidateProgram	
glVertexAttrib1d	
glVertexAttrib1dv	
glVertexAttrib1f	
glVertexAttrib1fv	
glVertexAttrib1s	
glVertexAttrib1sv	
glVertexAttrib2d	
glVertexAttrib2dv	
glVertexAttrib2f	
glVertexAttrib2fv	
glVertexAttrib2s	
glVertexAttrib2sv	
glVertexAttrib3d	
glVertexAttrib3dv	
glVertexAttrib3f	
glVertexAttrib3fv	
glVertexAttrib3s	
glVertexAttrib3sv	
glVertexAttrib4bv	
glVertexAttrib4d	
glVertexAttrib4dv	
glVertexAttrib4f	
glVertexAttrib4fv	
glVertexAttrib4iv	
glVertexAttrib4Nbv	
glVertexAttrib4Niv	
glVertexAttrib4Nsv	

<code>glVertexAttrib4Nub</code>	
<code>glVertexAttrib4Nubv</code>	
<code>glVertexAttrib4Nuiv</code>	
<code>glVertexAttrib4Nusv</code>	
<code>glVertexAttrib4s</code>	
<code>glVertexAttrib4sv</code>	
<code>glVertexAttrib4ubv</code>	
<code>glVertexAttrib4uiv</code>	
<code>glVertexAttrib4usv</code>	
<code>glVertexAttribPointer</code>	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>glAttachShaderProcPtr</code>	
<code>glBindAttribLocationProcPtr</code>	
<code>glBlendEquationSeparateProcPtr</code>	
<code>GLchar</code>	
<code>glCompileShaderProcPtr</code>	
<code>glCreateProgramProcPtr</code>	
<code>glCreateShaderProcPtr</code>	
<code>glDeleteProgramProcPtr</code>	
<code>glDeleteShaderProcPtr</code>	
<code>glDetachShaderProcPtr</code>	
<code>glDisableVertexAttribArrayProcPtr</code>	
<code>glDrawBuffersProcPtr</code>	
<code>glEnableVertexAttribArrayProcPtr</code>	
<code>glGetActiveAttribProcPtr</code>	
<code>glGetActiveUniformProcPtr</code>	

10.4 Symbol Changes

glGetAttachedShadersProcPtr	
glGetAttribLocationProcPtr	
glGetProgramInfoLogProcPtr	
glGetProgramivProcPtr	
glGetShaderInfoLogProcPtr	
glGetShaderivProcPtr	
glGetShaderSourceProcPtr	
glGetUniformfvProcPtr	
glGetUniformivProcPtr	
glGetUniformLocationProcPtr	
glGetVertexAttribdvProcPtr	
glGetVertexAttribfvProcPtr	
glGetVertexAttribivProcPtr	
glGetVertexAttribPointervProcPtr	
glIsProgramProcPtr	
glIsShaderProcPtr	
glLinkProgramProcPtr	
glPointParameteriProcPtr	
glPointParameterivProcPtr	
glShaderSourceProcPtr	
glStencilFuncSeparateProcPtr	
glStencilMaskSeparateProcPtr	
glStencilOpSeparateProcPtr	
glUniform1fProcPtr	
glUniform1fvProcPtr	
glUniform1iProcPtr	
glUniform1ivProcPtr	
glUniform2fProcPtr	

10.4 Symbol Changes

glUniform2fvProcPtr	
glUniform2iProcPtr	
glUniform2ivProcPtr	
glUniform3fProcPtr	
glUniform3fvProcPtr	
glUniform3iProcPtr	
glUniform3ivProcPtr	
glUniform4fProcPtr	
glUniform4fvProcPtr	
glUniform4iProcPtr	
glUniform4ivProcPtr	
glUniformMatrix2fvProcPtr	
glUniformMatrix3fvProcPtr	
glUniformMatrix4fvProcPtr	
glUseProgramProcPtr	
glValidateProgramProcPtr	
glVertexAttrib1dProcPtr	
glVertexAttrib1dvProcPtr	
glVertexAttrib1fProcPtr	
glVertexAttrib1fvProcPtr	
glVertexAttrib1sProcPtr	
glVertexAttrib1svProcPtr	
glVertexAttrib2dProcPtr	
glVertexAttrib2dvProcPtr	
glVertexAttrib2fProcPtr	
glVertexAttrib2fvProcPtr	
glVertexAttrib2sProcPtr	
glVertexAttrib2svProcPtr	

10.4 Symbol Changes

<code>glVertexAttrib3dProcPtr</code>	
<code>glVertexAttrib3dvProcPtr</code>	
<code>glVertexAttrib3fProcPtr</code>	
<code>glVertexAttrib3fvProcPtr</code>	
<code>glVertexAttrib3sProcPtr</code>	
<code>glVertexAttrib3svProcPtr</code>	
<code>glVertexAttrib4bvProcPtr</code>	
<code>glVertexAttrib4dProcPtr</code>	
<code>glVertexAttrib4dvProcPtr</code>	
<code>glVertexAttrib4fProcPtr</code>	
<code>glVertexAttrib4fvProcPtr</code>	
<code>glVertexAttrib4ivProcPtr</code>	
<code>glVertexAttrib4NbvProcPtr</code>	
<code>glVertexAttrib4NivProcPtr</code>	
<code>glVertexAttrib4NsvProcPtr</code>	
<code>glVertexAttrib4NubProcPtr</code>	
<code>glVertexAttrib4NubvProcPtr</code>	
<code>glVertexAttrib4NuivProcPtr</code>	
<code>glVertexAttrib4NusvProcPtr</code>	
<code>glVertexAttrib4sProcPtr</code>	
<code>glVertexAttrib4svProcPtr</code>	
<code>glVertexAttrib4ubvProcPtr</code>	
<code>glVertexAttrib4uivProcPtr</code>	
<code>glVertexAttrib4usvProcPtr</code>	
<code>glVertexAttribPointerProcPtr</code>	

10.3 Symbol Changes

This article lists the symbols added to `AGL.framework` in Mac OS X v10.3.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

agl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>aglCreatePBuffer</code>	Creates a pixel buffer of the specified size, compatible with the specified texture target.
<code>aglDescribePBuffer</code>	Retrieves information that describes the specified pixel buffer object.
<code>aglDestroyPBuffer</code>	Releases the resources associated with a pixel buffer object.
<code>aglGetPBuffer</code>	Retrieves a pixel buffer and its parameters for a specified rendering context.
<code>aglSetPBuffer</code>	Attaches a pixel buffer object to a rendering context.
<code>aglTexImagePBuffer</code>	Binds the contents of a pixel buffer to a data source for a texture object.

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>AGL_BAD_CONNECTION</code>	Unable to connect to the window server.
---------------------------------	---

AGL_COLOR_FLOAT	This constant is a Boolean attribute. If it is present in the attributes array, color buffers store floating-point pixels. Do not supply a value with this constant because its presence in the array implies true.
AGL_MULTISAMPLE	This constant is a Boolean attribute. If it is present in the attributes array, specifies a hint to the driver to prefer multisampling. Do not supply a value with this constant because its presence in the array implies true.
AGL_PBUFFER	This constant is a Boolean attribute. If it is present in the attributes array, specifies that the renderer can render to a pixel buffer. You can pass this constant to the function <code>aglDescribeRenderer</code> .
AGL_REMOTE_PBUFFER	This constant is a Boolean attribute. If it is present in the attributes array, specifies that the renderer can render offline to a pixel buffer.
AGL_RENDERER_COUNT	The associated value is the number of renderers.
AGL_RGBAFLOAT128_BIT	Specifies a format that has 128 bits per pixel with an ARGB channel layout, IEEE floating point values.
AGL_RGBAFLOAT256_BIT	Specifies a format that has 256 bits per pixel with an ARGB channel layout, IEEE double values.
AGL_RGBAFLOAT64_BIT	Specifies a format that has 64 bits per pixel with an ARGB channel layout, half-floating point values. (A half-float is a 16-bit floating-point value.)
AGL_RGBFLOAT128_BIT	Specifies a format that has 128 bits per pixel with an RGB channel layout, IEEE floating point values.
AGL_RGBFLOAT256_BIT	Specifies a format that has 256 bits per pixel with an RGB channel layout, IEEE double values.
AGL_RGBFLOAT64_BIT	Specifies a format that has 64 bits per pixel with an RGB channel layout, half-floating point values. (A half-float is a 16-bit floating-point value.)
AGL_SAMPLE_ALPHA	This constant is a Boolean attribute. If it is present in the attributes array, request alpha filtering when multisampling. Do not supply a value with this constant because its presence in the array implies true.
AGL_SUPERSAMPLE	This constant is a Boolean attribute. If it is present in the attributes array, specifies a hint to the driver to prefer supersampling. Do not supply a value with this constant because its presence in the array implies true.

AGLPbuffer	Represents a pointer to an opaque pixel buffer object.
AVAILABLE_MAC_OS_X_VERSION_10_2_AND_LATER	
AVAILABLE_MAC_OS_X_VERSION_10_3_AND_LATER	

aglMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glAttachObjectARB	
glBeginQuery	
glBeginQueryARB	
glBindAttribLocationARB	
glBindBuffer	
glBindBufferARB	
glBlendEquationSeparateEXT	
glBufferData	
glBufferDataARB	
glBufferSubData	
glBufferSubDataARB	
glCompileShaderARB	
glCreateProgramObjectARB	
glCreateShaderObjectARB	
glDeleteBuffers	
glDeleteBuffersARB	
glDeleteObjectARB	
glDeleteQueries	
glDeleteQueriesARB	

10.3 Symbol Changes

glDepthBoundsEXT	
glDetachObjectARB	
glDisableVertexAttribAPPLE	
glEnableVertexAttribAPPLE	
glEndQuery	
glEndQueryARB	
glFinishRenderAPPLE	
glFlushRenderAPPLE	
glGenBuffers	
glGenBuffersARB	
glGenQueries	
glGenQueriesARB	
glGetActiveAttribARB	
glGetActiveUniformARB	
glGetAttachedObjectsARB	
glGetAttribLocationARB	
glGetBufferParameteriv	
glGetBufferParameterivARB	
glGetBufferPointerv	
glGetBufferPointervARB	
glGetBufferSubData	
glGetBufferSubDataARB	
glGetHandleARB	
glGetInfoLogARB	
glGetObjectParameterfvARB	
glGetObjectParameterivARB	
glGetQueryiv	
glGetQueryivARB	

10.3 Symbol Changes

glGetQueryObjectiv	
glGetQueryObjectivARB	
glGetQueryObjectuiv	
glGetQueryObjectuivARB	
glGetShaderSourceARB	
glGetUniformfvARB	
glGetUniformivARB	
glGetUniformLocationARB	
glIsBuffer	
glIsBufferARB	
glIsQuery	
glIsQueryARB	
glIsVertexAttribEnabledAPPLE	
glLinkProgramARB	
glMapBuffer	
glMapBufferARB	
glMapVertexAttrib1dAPPLE	
glMapVertexAttrib1fAPPLE	
glMapVertexAttrib2dAPPLE	
glMapVertexAttrib2fAPPLE	
glShaderSourceARB	
glStencilFuncSeparateATI	
glStencilOpSeparateATI	
glSwapAPPLE	
glUniform1fARB	
glUniform1fvARB	
glUniform1iARB	
glUniform1ivARB	

<code>glUniform2fARB</code>	
<code>glUniform2fvARB</code>	
<code>glUniform2iARB</code>	
<code>glUniform2ivARB</code>	
<code>glUniform3fARB</code>	
<code>glUniform3fvARB</code>	
<code>glUniform3iARB</code>	
<code>glUniform3ivARB</code>	
<code>glUniform4fARB</code>	
<code>glUniform4fvARB</code>	
<code>glUniform4iARB</code>	
<code>glUniform4ivARB</code>	
<code>glUniformMatrix2fvARB</code>	
<code>glUniformMatrix3fvARB</code>	
<code>glUniformMatrix4fvARB</code>	
<code>glUnmapBuffer</code>	
<code>glUnmapBufferARB</code>	
<code>glUseProgramObjectARB</code>	
<code>glValidateProgramARB</code>	

aglRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>AGL_RENDERER_ATI_RADEON_9700_ID</code>	An ATI Radeon 9700 display device.
<code>AGL_RENDERER_GENERIC_FLOAT_ID</code>	A floating-point software renderer that is optimized for vector-based processors, is programmable, and supports shading.

AGL_RENDERER_NVIDIA_GEFORCE_FX_ID	An NVIDIA GeForce FX, GeForce 6, or GeForce 7 display device.
AGL_RENDERER_VT_BLADE_XP2_ID	A Village Tronic display device.

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glBeginQuery	
glBindBuffer	
glBufferData	
glBufferSubData	
glDeleteBuffers	
glDeleteQueries	
glEndQuery	
glGenBuffers	
glGenQueries	
glGetBufferParameteriv	
glGetBufferPointerv	
glGetBufferSubData	
glGetQueryiv	
glGetQueryObjectiv	
glGetQueryObjectuiv	
glIsBuffer	
glIsQuery	
glMapBuffer	
glUnmapBuffer	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glAccumProcPtr	
glActiveTextureProcPtr	
glAlphaFuncProcPtr	
glAreTexturesResidentProcPtr	
glArrayElementProcPtr	
glBeginProcPtr	
glBeginQueryProcPtr	
glBindBufferProcPtr	
glBindTextureProcPtr	
glBitmapProcPtr	
glBlendColorProcPtr	
glBlendEquationProcPtr	
glBlendFuncProcPtr	
glBlendFuncSeparateProcPtr	
glBufferDataProcPtr	
glBufferSubDataProcPtr	
glCallListProcPtr	
glCallListsProcPtr	
glClearAccumProcPtr	
glClearColorProcPtr	
glClearDepthProcPtr	
glClearIndexProcPtr	
glClearProcPtr	
glClearStencilProcPtr	
glClientActiveTextureProcPtr	
glClipPlaneProcPtr	

10.3 Symbol Changes

<code>glColor3bProcPtr</code>	
<code>glColor3bvProcPtr</code>	
<code>glColor3dProcPtr</code>	
<code>glColor3dvProcPtr</code>	
<code>glColor3fProcPtr</code>	
<code>glColor3fvProcPtr</code>	
<code>glColor3iProcPtr</code>	
<code>glColor3ivProcPtr</code>	
<code>glColor3sProcPtr</code>	
<code>glColor3svProcPtr</code>	
<code>glColor3ubProcPtr</code>	
<code>glColor3ubvProcPtr</code>	
<code>glColor3uiProcPtr</code>	
<code>glColor3uivProcPtr</code>	
<code>glColor3usProcPtr</code>	
<code>glColor3usvProcPtr</code>	
<code>glColor4bProcPtr</code>	
<code>glColor4bvProcPtr</code>	
<code>glColor4dProcPtr</code>	
<code>glColor4dvProcPtr</code>	
<code>glColor4fProcPtr</code>	
<code>glColor4fvProcPtr</code>	
<code>glColor4iProcPtr</code>	
<code>glColor4ivProcPtr</code>	
<code>glColor4sProcPtr</code>	
<code>glColor4svProcPtr</code>	
<code>glColor4ubProcPtr</code>	
<code>glColor4ubvProcPtr</code>	

10.3 Symbol Changes

glColor4uiProcPtr	
glColor4uivProcPtr	
glColor4usProcPtr	
glColor4usvProcPtr	
glColorMaskProcPtr	
glColorMaterialProcPtr	
glColorPointerProcPtr	
glColorSubTableProcPtr	
glColorTableParameterfvProcPtr	
glColorTableParameterivProcPtr	
glColorTableProcPtr	
glCompressedTexImage1DProcPtr	
glCompressedTexImage2DProcPtr	
glCompressedTexImage3DProcPtr	
glCompressedTexSubImage1DProcPtr	
glCompressedTexSubImage2DProcPtr	
glCompressedTexSubImage3DProcPtr	
glConvolutionFilter1DProcPtr	
glConvolutionFilter2DProcPtr	
glConvolutionParameterfProcPtr	
glConvolutionParameterfvProcPtr	
glConvolutionParameteriProcPtr	
glConvolutionParameterivProcPtr	
glCopyColorSubTableProcPtr	
glCopyColorTableProcPtr	
glCopyConvolutionFilter1DProcPtr	
glCopyConvolutionFilter2DProcPtr	
glCopyPixelsProcPtr	

10.3 Symbol Changes

glCopyTexImage1DProcPtr	
glCopyTexImage2DProcPtr	
glCopyTexSubImage1DProcPtr	
glCopyTexSubImage2DProcPtr	
glCopyTexSubImage3DProcPtr	
glCullFaceProcPtr	
glDeleteBuffersProcPtr	
glDeleteListsProcPtr	
glDeleteQueriesProcPtr	
glDeleteTexturesProcPtr	
glDepthFuncProcPtr	
glDepthMaskProcPtr	
glDepthRangeProcPtr	
glDisableClientStateProcPtr	
glDisableProcPtr	
glDrawArraysProcPtr	
glDrawBufferProcPtr	
glDrawElementsProcPtr	
glDrawPixelsProcPtr	
glDrawRangeElementsProcPtr	
glEdgeFlagPointerProcPtr	
glEdgeFlagProcPtr	
glEdgeFlagvProcPtr	
glEnableClientStateProcPtr	
glEnableProcPtr	
glEndListProcPtr	
glEndProcPtr	
glEndQueryProcPtr	

10.3 Symbol Changes

glEvalCoord1dProcPtr	
glEvalCoord1dvProcPtr	
glEvalCoord1fProcPtr	
glEvalCoord1fvProcPtr	
glEvalCoord2dProcPtr	
glEvalCoord2dvProcPtr	
glEvalCoord2fProcPtr	
glEvalCoord2fvProcPtr	
glEvalMesh1ProcPtr	
glEvalMesh2ProcPtr	
glEvalPoint1ProcPtr	
glEvalPoint2ProcPtr	
glFeedbackBufferProcPtr	
glFinishProcPtr	
glFlushProcPtr	
glFogCoorddProcPtr	
glFogCoorddvProcPtr	
glFogCoordfProcPtr	
glFogCoordfvProcPtr	
glFogCoordPointerProcPtr	
glFogfProcPtr	
glFogfvProcPtr	
glFogiProcPtr	
glFogivProcPtr	
glFrontFaceProcPtr	
glFrustumProcPtr	
glGenBuffersProcPtr	
glGenListsProcPtr	

10.3 Symbol Changes

glGenQueriesProcPtr	
glGenTexturesProcPtr	
glGetBooleanvProcPtr	
glGetBufferParameterivProcPtr	
glGetBufferPointervProcPtr	
glGetBufferSubDataProcPtr	
glGetClipPlaneProcPtr	
glGetColorTableParameterfvProcPtr	
glGetColorTableParameterivProcPtr	
glGetColorTableProcPtr	
glGetCompressedTexImageProcPtr	
glGetConvolutionFilterProcPtr	
glGetConvolutionParameterfvProcPtr	
glGetConvolutionParameterivProcPtr	
glGetDoublevProcPtr	
glGetErrorProcPtr	
glGetFloatvProcPtr	
glGetHistogramParameterfvProcPtr	
glGetHistogramParameterivProcPtr	
glGetHistogramProcPtr	
glGetIntegervProcPtr	
glGetLightfvProcPtr	
glGetLightivProcPtr	
glGetMapdvProcPtr	
glGetMapfvProcPtr	
glGetMapivProcPtr	
glGetMaterialfvProcPtr	
glGetMaterialivProcPtr	

10.3 Symbol Changes

glGetMinmaxParameterfvProcPtr	
glGetMinmaxParameterivProcPtr	
glGetMinmaxProcPtr	
glGetPixelMapfvProcPtr	
glGetPixelMapuivProcPtr	
glGetPixelMapusvProcPtr	
glGetPointervProcPtr	
glGetPolygonStippleProcPtr	
glGetQueryivProcPtr	
glGetQueryObjectivProcPtr	
glGetQueryObjectuivProcPtr	
glGetSeparableFilterProcPtr	
glGetStringProcPtr	
glGetTexEnvfvProcPtr	
glGetTexEnvivProcPtr	
glGetTexGendvProcPtr	
glGetTexGenfvProcPtr	
glGetTexGenivProcPtr	
glGetTexImageProcPtr	
glGetTexLevelParameterfvProcPtr	
glGetTexLevelParameterivProcPtr	
glGetTexParameterfvProcPtr	
glGetTexParameterivProcPtr	
glHintProcPtr	
glHistogramProcPtr	
glIndexdProcPtr	
glIndexdvProcPtr	
glIndexfProcPtr	

10.3 Symbol Changes

<code>glIndexfvProcPtr</code>	
<code>glIndexiProcPtr</code>	
<code>glIndexivProcPtr</code>	
<code>glIndexMaskProcPtr</code>	
<code>glIndexPointerProcPtr</code>	
<code>glIndexsProcPtr</code>	
<code>glIndexsvProcPtr</code>	
<code>glIndexubProcPtr</code>	
<code>glIndexubvProcPtr</code>	
<code>glInitNamesProcPtr</code>	
<code>glInterleavedArraysProcPtr</code>	
<code>GLintptr</code>	
<code>glIsBufferProcPtr</code>	
<code>glIsEnabledProcPtr</code>	
<code>glIsListProcPtr</code>	
<code>glIsQueryProcPtr</code>	
<code>glIsTextureProcPtr</code>	
<code>glLightfProcPtr</code>	
<code>glLightfvProcPtr</code>	
<code>glLightiProcPtr</code>	
<code>glLightivProcPtr</code>	
<code>glLightModelfProcPtr</code>	
<code>glLightModelfvProcPtr</code>	
<code>glLightModeliProcPtr</code>	
<code>glLightModelivProcPtr</code>	
<code>glLineStippleProcPtr</code>	
<code>glLineWidthProcPtr</code>	
<code>glListBaseProcPtr</code>	

10.3 Symbol Changes

glLoadIdentityProcPtr	
glLoadMatrixdProcPtr	
glLoadMatrixfProcPtr	
glLoadNameProcPtr	
glLoadTransposeMatrixdProcPtr	
glLoadTransposeMatrixfProcPtr	
glLogicOpProcPtr	
glMap1dProcPtr	
glMap1fProcPtr	
glMap2dProcPtr	
glMap2fProcPtr	
glMapBufferProcPtr	
glMapGrid1dProcPtr	
glMapGrid1fProcPtr	
glMapGrid2dProcPtr	
glMapGrid2fProcPtr	
glMaterialfProcPtr	
glMaterialfvProcPtr	
glMaterialiProcPtr	
glMaterialivProcPtr	
glMatrixModeProcPtr	
glMinmaxProcPtr	
glMultiDrawArraysProcPtr	
glMultiDrawElementsProcPtr	
glMultiTexCoord1dProcPtr	
glMultiTexCoord1dvProcPtr	
glMultiTexCoord1fProcPtr	
glMultiTexCoord1fvProcPtr	

10.3 Symbol Changes

glMultiTexCoord1iProcPtr	
glMultiTexCoord1ivProcPtr	
glMultiTexCoord1sProcPtr	
glMultiTexCoord1svProcPtr	
glMultiTexCoord2dProcPtr	
glMultiTexCoord2dvProcPtr	
glMultiTexCoord2fProcPtr	
glMultiTexCoord2fvProcPtr	
glMultiTexCoord2iProcPtr	
glMultiTexCoord2ivProcPtr	
glMultiTexCoord2sProcPtr	
glMultiTexCoord2svProcPtr	
glMultiTexCoord3dProcPtr	
glMultiTexCoord3dvProcPtr	
glMultiTexCoord3fProcPtr	
glMultiTexCoord3fvProcPtr	
glMultiTexCoord3iProcPtr	
glMultiTexCoord3ivProcPtr	
glMultiTexCoord3sProcPtr	
glMultiTexCoord3svProcPtr	
glMultiTexCoord4dProcPtr	
glMultiTexCoord4dvProcPtr	
glMultiTexCoord4fProcPtr	
glMultiTexCoord4fvProcPtr	
glMultiTexCoord4iProcPtr	
glMultiTexCoord4ivProcPtr	
glMultiTexCoord4sProcPtr	
glMultiTexCoord4svProcPtr	

10.3 Symbol Changes

<code>glMultMatrixdProcPtr</code>	
<code>glMultMatrixfProcPtr</code>	
<code>glMultTransposeMatrixdProcPtr</code>	
<code>glMultTransposeMatrixfProcPtr</code>	
<code>glNewListProcPtr</code>	
<code>glNormal3bProcPtr</code>	
<code>glNormal3bvProcPtr</code>	
<code>glNormal3dProcPtr</code>	
<code>glNormal3dvProcPtr</code>	
<code>glNormal3fProcPtr</code>	
<code>glNormal3fvProcPtr</code>	
<code>glNormal3iProcPtr</code>	
<code>glNormal3ivProcPtr</code>	
<code>glNormal3sProcPtr</code>	
<code>glNormal3svProcPtr</code>	
<code>glNormalPointerProcPtr</code>	
<code>glOrthoProcPtr</code>	
<code>glPassThroughProcPtr</code>	
<code>glPixelMapfvProcPtr</code>	
<code>glPixelMapuivProcPtr</code>	
<code>glPixelMapusvProcPtr</code>	
<code>glPixelStorefProcPtr</code>	
<code>glPixelStoreiProcPtr</code>	
<code>glPixelTransferfProcPtr</code>	
<code>glPixelTransferiProcPtr</code>	
<code>glPixelZoomProcPtr</code>	
<code>glPointParameterfProcPtr</code>	
<code>glPointParameterfvProcPtr</code>	

10.3 Symbol Changes

glPointSizeProcPtr	
glPolygonModeProcPtr	
glPolygonOffsetProcPtr	
glPolygonStippleProcPtr	
glPopAttribProcPtr	
glPopClientAttribProcPtr	
glPopMatrixProcPtr	
glPopNameProcPtr	
glPrioritizeTexturesProcPtr	
glPushAttribProcPtr	
glPushClientAttribProcPtr	
glPushMatrixProcPtr	
glPushNameProcPtr	
glRasterPos2dProcPtr	
glRasterPos2dvProcPtr	
glRasterPos2fProcPtr	
glRasterPos2fvProcPtr	
glRasterPos2iProcPtr	
glRasterPos2ivProcPtr	
glRasterPos2sProcPtr	
glRasterPos2svProcPtr	
glRasterPos3dProcPtr	
glRasterPos3dvProcPtr	
glRasterPos3fProcPtr	
glRasterPos3fvProcPtr	
glRasterPos3iProcPtr	
glRasterPos3ivProcPtr	
glRasterPos3sProcPtr	

10.3 Symbol Changes

<code>glRasterPos3svProcPtr</code>	
<code>glRasterPos4dProcPtr</code>	
<code>glRasterPos4dvProcPtr</code>	
<code>glRasterPos4fProcPtr</code>	
<code>glRasterPos4fvProcPtr</code>	
<code>glRasterPos4iProcPtr</code>	
<code>glRasterPos4ivProcPtr</code>	
<code>glRasterPos4sProcPtr</code>	
<code>glRasterPos4svProcPtr</code>	
<code>glReadBufferProcPtr</code>	
<code>glReadPixelsProcPtr</code>	
<code>glRectdProcPtr</code>	
<code>glRectdvProcPtr</code>	
<code>glRectfProcPtr</code>	
<code>glRectfvProcPtr</code>	
<code>glRectiProcPtr</code>	
<code>glRectivProcPtr</code>	
<code>glRectsProcPtr</code>	
<code>glRectsvProcPtr</code>	
<code>glRenderModeProcPtr</code>	
<code>glResetHistogramProcPtr</code>	
<code>glResetMinmaxProcPtr</code>	
<code>glRotatedProcPtr</code>	
<code>glRotatefProcPtr</code>	
<code>glSampleCoverageProcPtr</code>	
<code>glSamplePassProcPtr</code>	
<code>glScaledProcPtr</code>	
<code>glScalefProcPtr</code>	

10.3 Symbol Changes

glScissorProcPtr	
glSecondaryColor3bProcPtr	
glSecondaryColor3bvProcPtr	
glSecondaryColor3dProcPtr	
glSecondaryColor3dvProcPtr	
glSecondaryColor3fProcPtr	
glSecondaryColor3fvProcPtr	
glSecondaryColor3iProcPtr	
glSecondaryColor3ivProcPtr	
glSecondaryColor3sProcPtr	
glSecondaryColor3svProcPtr	
glSecondaryColor3ubProcPtr	
glSecondaryColor3ubvProcPtr	
glSecondaryColor3uiProcPtr	
glSecondaryColor3uivProcPtr	
glSecondaryColor3usProcPtr	
glSecondaryColor3usvProcPtr	
glSecondaryColorPointerProcPtr	
glSelectBufferProcPtr	
glSeparableFilter2DProcPtr	
glShadeModelProcPtr	
GLsizeiPtr	
glStencilFuncProcPtr	
glStencilMaskProcPtr	
glStencilOpProcPtr	
glTexCoord1dProcPtr	
glTexCoord1dvProcPtr	
glTexCoord1fProcPtr	

10.3 Symbol Changes

glTexCoord1fvProcPtr	
glTexCoord1iProcPtr	
glTexCoord1ivProcPtr	
glTexCoord1sProcPtr	
glTexCoord1svProcPtr	
glTexCoord2dProcPtr	
glTexCoord2dvProcPtr	
glTexCoord2fProcPtr	
glTexCoord2fvProcPtr	
glTexCoord2iProcPtr	
glTexCoord2ivProcPtr	
glTexCoord2sProcPtr	
glTexCoord2svProcPtr	
glTexCoord3dProcPtr	
glTexCoord3dvProcPtr	
glTexCoord3fProcPtr	
glTexCoord3fvProcPtr	
glTexCoord3iProcPtr	
glTexCoord3ivProcPtr	
glTexCoord3sProcPtr	
glTexCoord3svProcPtr	
glTexCoord4dProcPtr	
glTexCoord4dvProcPtr	
glTexCoord4fProcPtr	
glTexCoord4fvProcPtr	
glTexCoord4iProcPtr	
glTexCoord4ivProcPtr	
glTexCoord4sProcPtr	

10.3 Symbol Changes

glTexCoord4svProcPtr	
glTexCoordPointerProcPtr	
glTexEnvfProcPtr	
glTexEnvfvProcPtr	
glTexEnviProcPtr	
glTexEnvivProcPtr	
glTexGendProcPtr	
glTexGendvProcPtr	
glTexGenfProcPtr	
glTexGenfvProcPtr	
glTexGeniProcPtr	
glTexGenivProcPtr	
glTexImage1DProcPtr	
glTexImage2DProcPtr	
glTexImage3DProcPtr	
glTexParameterfProcPtr	
glTexParameterfvProcPtr	
glTexParameteriProcPtr	
glTexParameterivProcPtr	
glTexSubImage1DProcPtr	
glTexSubImage2DProcPtr	
glTexSubImage3DProcPtr	
glTranslatedProcPtr	
glTranslatefProcPtr	
glUnmapBufferProcPtr	
glVertex2dProcPtr	
glVertex2dvProcPtr	
glVertex2fProcPtr	

10.3 Symbol Changes

glVertex2fvProcPtr	
glVertex2iProcPtr	
glVertex2ivProcPtr	
glVertex2sProcPtr	
glVertex2svProcPtr	
glVertex3dProcPtr	
glVertex3dvProcPtr	
glVertex3fProcPtr	
glVertex3fvProcPtr	
glVertex3iProcPtr	
glVertex3ivProcPtr	
glVertex3sProcPtr	
glVertex3svProcPtr	
glVertex4dProcPtr	
glVertex4dvProcPtr	
glVertex4fProcPtr	
glVertex4fvProcPtr	
glVertex4iProcPtr	
glVertex4ivProcPtr	
glVertex4sProcPtr	
glVertex4svProcPtr	
glVertexPointerProcPtr	
glViewportProcPtr	
glWindowPos2dProcPtr	
glWindowPos2dvProcPtr	
glWindowPos2fProcPtr	
glWindowPos2fvProcPtr	
glWindowPos2iProcPtr	

10.3 Symbol Changes

<code>glWindowPos2ivProcPtr</code>	
<code>glWindowPos2sProcPtr</code>	
<code>glWindowPos2svProcPtr</code>	
<code>glWindowPos3dProcPtr</code>	
<code>glWindowPos3dvProcPtr</code>	
<code>glWindowPos3fProcPtr</code>	
<code>glWindowPos3fvProcPtr</code>	
<code>glWindowPos3iProcPtr</code>	
<code>glWindowPos3ivProcPtr</code>	
<code>glWindowPos3sProcPtr</code>	
<code>glWindowPos3svProcPtr</code>	

10.2 Symbol Changes

This article lists the symbols added to `AGL.framework` in Mac OS X v10.2.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

agl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>aglSurfaceTexture</code>	Allows texturing from a drawable object that has an attached rendering context, using the surface contents as the source data for the texture.
--------------------------------	--

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>AGL_AUX_DEPTH_STENCIL</code>	The associated value is the independent depth and/or the stencil buffers for the auxiliary buffer.
<code>AGL_CLIP_REGION</code>	Enables or sets the drawable clipping region. The associated value is a <code>rgnHandle</code> data type that defines the clipping region.
<code>AGL_CONTEXT_DISPLAY_ID</code>	The associated value is a list of the display IDs of all displays touched by the rendering context, up to a maximum of 32 displays.
<code>AGL_CONTEXT_SURFACE_ID</code>	The associated value is the ID of the drawable surface for the rendering context. You can't set this value because the system sets it. However, you can retrieve the value using the function <code>aglGetInteger</code> .
<code>AGL_FS_CAPTURE_SINGLE</code>	Enables the capture of a single display for full-screen rendering. This option is disabled by default.
<code>AGL_SAMPLE_BUFFERS_ARB</code>	The associated value is the number of multisample buffers.

AGL_SAMPLES_ARB	The associated value is the number of samples per multisample buffer.
AGL_SURFACE_OPACITY	The associated value specifies the opacity of the OpenGL surface. A value of 1 means the surface is opaque (the default); 0 means completely transparent.
AGL_SURFACE_ORDER	The associated value is the position of the OpenGL surface relative to the window. A value of 1 means that the position is above the window; a value of -1 specifies a position that is below the window.
AGL_SWAP_LIMIT	Enable or disable the swap asynchronous limit.

aglMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

AGL_MACRO_CONTEXT	
glActiveStencilFaceEXT	
glBindProgramARB	
glBindVertexArrayAPPLE	
glBlendColor	
glBlendEquation	
glBlendEquationSeparateATI	
glBlendFuncSeparate	
glBlendFuncSeparateEXT	
glColorSubTable	
glColorSubTableEXT	
glColorTable	
glColorTableEXT	
glColorTableParameterfv	
glColorTableParameteriv	
glCombinerInputNV	
glCombinerOutputNV	

10.2 Symbol Changes

glCombinerParameterfNV	
glCombinerParameterfvNV	
glCombinerParameteriNV	
glCombinerParameterivNV	
glCombinerStageParameterfvNV	
glConvolutionFilter1D	
glConvolutionFilter2D	
glConvolutionParameterf	
glConvolutionParameterfv	
glConvolutionParameteri	
glConvolutionParameteriv	
glCopyColorSubTable	
glCopyColorTable	
glCopyConvolutionFilter1D	
glCopyConvolutionFilter2D	
glCopyTexSubImage3D	
glDeleteFencesAPPLE	
glDeleteProgramsARB	
glDeleteVertexArraysAPPLE	
glDisableVertexAttribARB	
glDisableVertexAttribArrayARB	
glDrawElementArrayAPPLE	
glDrawRangeElementArrayAPPLE	
glDrawRangeElementsEXT	
glElementPointerAPPLE	
glEnableVertexAttribARB	
glEnableVertexAttribArrayARB	
glFinalCombinerInputNV	

10.2 Symbol Changes

glFinishFenceAPPLE	
glFinishObjectAPPLE	
glFlushVertexArrayRangeAPPLE	
glFogCoordd	
glFogCoorddEXT	
glFogCoorddv	
glFogCoorddvEXT	
glFogCoordf	
glFogCoordfEXT	
glFogCoordfv	
glFogCoordfvEXT	
glFogCoordPointer	
glFogCoordPointerEXT	
glGenFencesAPPLE	
glGenProgramsARB	
glGenVertexArraysAPPLE	
glGetColorTable	
glGetColorTableEXT	
glGetColorTableParameterfv	
glGetColorTableParameterfvEXT	
glGetColorTableParameteriv	
glGetColorTableParameterivEXT	
glGetCombinerInputParameterfvNV	
glGetCombinerInputParameterivNV	
glGetCombinerOutputParameterfvNV	
glGetCombinerOutputParameterivNV	
glGetCombinerStageParameterfvNV	
glGetConvolutionFilter	

10.2 Symbol Changes

glGetConvolutionParameterfv	
glGetConvolutionParameteriv	
glGetFinalCombinerInputParameterfvNV	
glGetHistogram	
glGetHistogramParameterfv	
glGetHistogramParameteriv	
glGetMinmax	
glGetMinmaxParameterfv	
glGetMinmaxParameteriv	
glGetProgramEnvParameterdvARB	
glGetProgramEnvParameterfvARB	
glGetProgramivARB	
glGetProgramLocalParameterdvARB	
glGetProgramLocalParameterfvARB	
glGetProgramStringARB	
glGetSeparableFilter	
glGetTexParameterPointervAPPLE	
glGetVertexAttribdvARB	
glGetVertexAttribfvARB	
glGetVertexAttribivARB	
glGetVertexAttribPointervARB	
glHistogram	
glIsFenceAPPLE	
glIsProgramARB	
glIsVertexArrayAPPLE	
glIsVertexAttribEnabledARB	
glMapVertexAttrib1dARB	
glMapVertexAttrib1fARB	

10.2 Symbol Changes

<code>glMapVertexAttrib2dARB</code>	
<code>glMapVertexAttrib2fARB</code>	
<code>glMinmax</code>	
<code>glMultiDrawArrays</code>	
<code>glMultiDrawArraysEXT</code>	
<code>glMultiDrawElements</code>	
<code>glMultiDrawElementsEXT</code>	
<code>glPNTrianglesfATI</code>	
<code>glPNTrianglesfATIX</code>	
<code>glPNTrianglesiATI</code>	
<code>glPNTrianglesiATIX</code>	
<code>glPointParameterf</code>	
<code>glPointParameterfARB</code>	
<code>glPointParameterfv</code>	
<code>glPointParameterfvARB</code>	
<code>glPointParameteriNV</code>	
<code>glPointParameterivNV</code>	
<code>glProgramEnvParameter4dARB</code>	
<code>glProgramEnvParameter4dvARB</code>	
<code>glProgramEnvParameter4fARB</code>	
<code>glProgramEnvParameter4fvARB</code>	
<code>glProgramLocalParameter4dARB</code>	
<code>glProgramLocalParameter4dvARB</code>	
<code>glProgramLocalParameter4fARB</code>	
<code>glProgramLocalParameter4fvARB</code>	
<code>glProgramStringARB</code>	
<code>glResetHistogram</code>	
<code>glResetMinmax</code>	

10.2 Symbol Changes

<code>glSecondaryColor3b</code>	
<code>glSecondaryColor3bEXT</code>	
<code>glSecondaryColor3bv</code>	
<code>glSecondaryColor3bvEXT</code>	
<code>glSecondaryColor3d</code>	
<code>glSecondaryColor3dEXT</code>	
<code>glSecondaryColor3dv</code>	
<code>glSecondaryColor3dvEXT</code>	
<code>glSecondaryColor3f</code>	
<code>glSecondaryColor3fEXT</code>	
<code>glSecondaryColor3fv</code>	
<code>glSecondaryColor3fvEXT</code>	
<code>glSecondaryColor3i</code>	
<code>glSecondaryColor3iEXT</code>	
<code>glSecondaryColor3iv</code>	
<code>glSecondaryColor3ivEXT</code>	
<code>glSecondaryColor3s</code>	
<code>glSecondaryColor3sEXT</code>	
<code>glSecondaryColor3sv</code>	
<code>glSecondaryColor3svEXT</code>	
<code>glSecondaryColor3ub</code>	
<code>glSecondaryColor3ubEXT</code>	
<code>glSecondaryColor3ubv</code>	
<code>glSecondaryColor3ubvEXT</code>	
<code>glSecondaryColor3ui</code>	
<code>glSecondaryColor3uiEXT</code>	
<code>glSecondaryColor3uiv</code>	
<code>glSecondaryColor3uivEXT</code>	

10.2 Symbol Changes

glSecondaryColor3us	
glSecondaryColor3usEXT	
glSecondaryColor3usv	
glSecondaryColor3usvEXT	
glSecondaryColorPointer	
glSecondaryColorPointerEXT	
glSeparableFilter2D	
glSetFenceAPPLE	
glTestFenceAPPLE	
glTestObjectAPPLE	
glTexImage3D	
glTexSubImage3D	
glTextureRangeAPPLE	
glVertexArrayParameteriAPPLE	
glVertexArrayRangeAPPLE	
glVertexAttribARB	
glVertexAttribdvARB	
glVertexAttribfARB	
glVertexAttribfvARB	
glVertexAttribsARB	
glVertexAttribsvARB	
glVertexAttrib2dARB	
glVertexAttrib2dvARB	
glVertexAttrib2fARB	
glVertexAttrib2fvARB	
glVertexAttrib2sARB	
glVertexAttrib2svARB	
glVertexAttrib3dARB	

10.2 Symbol Changes

glVertexAttrib3dvARB	
glVertexAttrib3fARB	
glVertexAttrib3fvARB	
glVertexAttrib3sARB	
glVertexAttrib3svARB	
glVertexAttrib4bvARB	
glVertexAttrib4dARB	
glVertexAttrib4dvARB	
glVertexAttrib4fARB	
glVertexAttrib4fvARB	
glVertexAttrib4ivARB	
glVertexAttrib4NbvARB	
glVertexAttrib4NivARB	
glVertexAttrib4NsvARB	
glVertexAttrib4NubARB	
glVertexAttrib4NubvARB	
glVertexAttrib4NuivARB	
glVertexAttrib4NusvARB	
glVertexAttrib4sARB	
glVertexAttrib4svARB	
glVertexAttrib4ubvARB	
glVertexAttrib4uivARB	
glVertexAttrib4usvARB	
glVertexAttribPointerARB	
glVertexBlendARB	
glWeightbvARB	
glWeightdvARB	
glWeightfvARB	

10.2 Symbol Changes

<code>glWeightivARB</code>	
<code>glWeightPointerARB</code>	
<code>glWeightsvARB</code>	
<code>glWeightubvARB</code>	
<code>glWeightuivARB</code>	
<code>glWeightusvARB</code>	
<code>glWindowPos2d</code>	
<code>glWindowPos2dARB</code>	
<code>glWindowPos2dv</code>	
<code>glWindowPos2dvARB</code>	
<code>glWindowPos2f</code>	
<code>glWindowPos2fARB</code>	
<code>glWindowPos2fv</code>	
<code>glWindowPos2fvARB</code>	
<code>glWindowPos2i</code>	
<code>glWindowPos2iARB</code>	
<code>glWindowPos2iv</code>	
<code>glWindowPos2ivARB</code>	
<code>glWindowPos2s</code>	
<code>glWindowPos2sARB</code>	
<code>glWindowPos2sv</code>	
<code>glWindowPos2svARB</code>	
<code>glWindowPos3d</code>	
<code>glWindowPos3dARB</code>	
<code>glWindowPos3dv</code>	
<code>glWindowPos3dvARB</code>	
<code>glWindowPos3f</code>	
<code>glWindowPos3fARB</code>	

glWindowPos3fv	
glWindowPos3fvARB	
glWindowPos3i	
glWindowPos3iARB	
glWindowPos3iv	
glWindowPos3ivARB	
glWindowPos3s	
glWindowPos3sARB	
glWindowPos3sv	
glWindowPos3svARB	

aglRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

AGL_RENDERER_APPLE_SW_ID	The Apple software renderer.
AGL_RENDERER_ATI_RADEON_8500_ID	An ATI Radeon 8500 display device.
AGL_RENDERER_ATI_RADEON_ID	An ATI Radeon display device.
AGL_RENDERER_ATI_RAGE_128_ID	An ATI Rage 128 display device.
AGL_RENDERER_ATI_RAGE_PRO_ID	An ATI Rage Pro display device.
AGL_RENDERER_MESA_3DFX_ID	A Mesa 3DFX display device.
AGL_RENDERER_NVIDIA_GEFORCE_2MX_ID	An NVIDIA GeForce 2MX display device or an NVIDIA GeForce 4MX.
AGL_RENDERER_NVIDIA_GEFORCE_3_ID	An NVIDIA GeForce 3 display device or an NVIDIA GeForce 4 Ti.

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glBlendFuncSeparate	
glFogCoordd	
glFogCoorddv	
glFogCoordf	
glFogCoordfv	
glFogCoordPointer	
glMultiDrawArrays	
glMultiDrawElements	
glPointParameterf	
glPointParameterfv	
glSecondaryColor3b	
glSecondaryColor3bv	
glSecondaryColor3d	
glSecondaryColor3dv	
glSecondaryColor3f	
glSecondaryColor3fv	
glSecondaryColor3i	
glSecondaryColor3iv	
glSecondaryColor3s	
glSecondaryColor3sv	
glSecondaryColor3ub	
glSecondaryColor3ubv	
glSecondaryColor3ui	
glSecondaryColor3uiv	

10.2 Symbol Changes

<code>glSecondaryColor3us</code>	
<code>glSecondaryColor3usv</code>	
<code>glSecondaryColorPointer</code>	
<code>glWindowPos2d</code>	
<code>glWindowPos2dv</code>	
<code>glWindowPos2f</code>	
<code>glWindowPos2fv</code>	
<code>glWindowPos2i</code>	
<code>glWindowPos2iv</code>	
<code>glWindowPos2s</code>	
<code>glWindowPos2sv</code>	
<code>glWindowPos3d</code>	
<code>glWindowPos3dv</code>	
<code>glWindowPos3f</code>	
<code>glWindowPos3fv</code>	
<code>glWindowPos3i</code>	
<code>glWindowPos3iv</code>	
<code>glWindowPos3s</code>	
<code>glWindowPos3sv</code>	

10.1 Symbol Changes

This article lists the symbols added to `AGL.framework` in Mac OS X v10.1.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

agl.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>AGL_ORDER_CONTEXT_TO_FRONT</code>	Specifies to order the current rendering context in front of all the other contexts.
---	--

aglMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

<code>glActiveTexture</code>	
<code>glClientActiveTexture</code>	
<code>glCompressedTexImage1D</code>	
<code>glCompressedTexImage1DARB</code>	
<code>glCompressedTexImage2D</code>	
<code>glCompressedTexImage2DARB</code>	
<code>glCompressedTexImage3D</code>	
<code>glCompressedTexImage3DARB</code>	

10.1 Symbol Changes

glCompressedTexSubImage1D	
glCompressedTexSubImage1DARB	
glCompressedTexSubImage2D	
glCompressedTexSubImage2DARB	
glCompressedTexSubImage3D	
glCompressedTexSubImage3DARB	
glDrawRangeElements	
glGetCompressedTexImage	
glGetCompressedTexImageARB	
glLoadTransposeMatrixd	
glLoadTransposeMatrixdARB	
glLoadTransposeMatrixf	
glLoadTransposeMatrixfARB	
glMultiTexCoord1d	
glMultiTexCoord1dv	
glMultiTexCoord1f	
glMultiTexCoord1fv	
glMultiTexCoord1i	
glMultiTexCoord1iv	
glMultiTexCoord1s	
glMultiTexCoord1sv	
glMultiTexCoord2d	
glMultiTexCoord2dv	
glMultiTexCoord2f	
glMultiTexCoord2fv	
glMultiTexCoord2i	
glMultiTexCoord2iv	
glMultiTexCoord2s	

10.1 Symbol Changes

<code>glMultiTexCoord2sv</code>	
<code>glMultiTexCoord3d</code>	
<code>glMultiTexCoord3dv</code>	
<code>glMultiTexCoord3f</code>	
<code>glMultiTexCoord3fv</code>	
<code>glMultiTexCoord3i</code>	
<code>glMultiTexCoord3iv</code>	
<code>glMultiTexCoord3s</code>	
<code>glMultiTexCoord3sv</code>	
<code>glMultiTexCoord4d</code>	
<code>glMultiTexCoord4dv</code>	
<code>glMultiTexCoord4f</code>	
<code>glMultiTexCoord4fv</code>	
<code>glMultiTexCoord4i</code>	
<code>glMultiTexCoord4iv</code>	
<code>glMultiTexCoord4s</code>	
<code>glMultiTexCoord4sv</code>	
<code>glMultTransposeMatrixd</code>	
<code>glMultTransposeMatrixdARB</code>	
<code>glMultTransposeMatrixf</code>	
<code>glMultTransposeMatrixfARB</code>	
<code>glSampleCoverage</code>	
<code>glSampleCoverageARB</code>	
<code>glSamplePass</code>	
<code>glSamplePassARB</code>	

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glActiveTexture	
glBlendColor	
glBlendEquation	
glClientActiveTexture	
glColorSubTable	
glColorTable	
glColorTableParameterfv	
glColorTableParameteriv	
glCompressedTexImage1D	
glCompressedTexImage2D	
glCompressedTexImage3D	
glCompressedTexSubImage1D	
glCompressedTexSubImage2D	
glCompressedTexSubImage3D	
glConvolutionFilter1D	
glConvolutionFilter2D	
glConvolutionParameterf	
glConvolutionParameterfv	
glConvolutionParameteri	
glConvolutionParameteriv	
glCopyColorSubTable	
glCopyColorTable	
glCopyConvolutionFilter1D	
glCopyConvolutionFilter2D	

10.1 Symbol Changes

glCopyTexSubImage3D	
glDrawRangeElements	
glGetColorTable	
glGetColorTableParameterfv	
glGetColorTableParameteriv	
glGetCompressedTexImage	
glGetConvolutionFilter	
glGetConvolutionParameterfv	
glGetConvolutionParameteriv	
glGetHistogram	
glGetHistogramParameterfv	
glGetHistogramParameteriv	
glGetMinmax	
glGetMinmaxParameterfv	
glGetMinmaxParameteriv	
glGetSeparableFilter	
glHistogram	
glLoadTransposeMatrixd	
glLoadTransposeMatrixf	
glMinmax	
glMultiTexCoord1d	
glMultiTexCoord1dv	
glMultiTexCoord1f	
glMultiTexCoord1fv	
glMultiTexCoord1i	
glMultiTexCoord1iv	
glMultiTexCoord1s	
glMultiTexCoord1sv	

10.1 Symbol Changes

<code>glMultiTexCoord2d</code>	
<code>glMultiTexCoord2dv</code>	
<code>glMultiTexCoord2f</code>	
<code>glMultiTexCoord2fv</code>	
<code>glMultiTexCoord2i</code>	
<code>glMultiTexCoord2iv</code>	
<code>glMultiTexCoord2s</code>	
<code>glMultiTexCoord2sv</code>	
<code>glMultiTexCoord3d</code>	
<code>glMultiTexCoord3dv</code>	
<code>glMultiTexCoord3f</code>	
<code>glMultiTexCoord3fv</code>	
<code>glMultiTexCoord3i</code>	
<code>glMultiTexCoord3iv</code>	
<code>glMultiTexCoord3s</code>	
<code>glMultiTexCoord3sv</code>	
<code>glMultiTexCoord4d</code>	
<code>glMultiTexCoord4dv</code>	
<code>glMultiTexCoord4f</code>	
<code>glMultiTexCoord4fv</code>	
<code>glMultiTexCoord4i</code>	
<code>glMultiTexCoord4iv</code>	
<code>glMultiTexCoord4s</code>	
<code>glMultiTexCoord4sv</code>	
<code>glMultTransposeMatrixd</code>	
<code>glMultTransposeMatrixf</code>	
<code>glResetHistogram</code>	
<code>glResetMinmax</code>	

glSampleCoverage	
glSamplePass	
glSeparableFilter2D	
glTexImage3D	
glTexSubImage3D	

glm.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glmCalloc	
glmCopy	
glmDCBAlloc	
glmDCBFree	
glmFree	
glmGetError	
glmGetInteger	
glmMalloc	
glmPageFreeAll	
glmRealloc	
glmSetDouble	
glmSetFunc	
glmSetInteger	
glmSetMode	
glmSetUByte	
glmSetUInt	
glmSetUShort	
glmVecAlloc	

10.1 Symbol Changes

glmVecFree	
glmZero	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GLM_APPLICATION_HEAP_MODE	
GLM_COPY_FUNC_PTR	
GLM_CURRENT_MEMORY	
GLM_INVALID_ENUM	
GLM_INVALID_OPERATION	
GLM_INVALID_VALUE	
GLM_MAXIMUM_MEMORY	
GLM_MULTIPROCESSOR_MODE	
GLM_NO_ERROR	
GLM_NUMBER_PAGES	
GLM_OUT_OF_MEMORY	
GLM_OVERRIDE_MODE	
GLM_PAGE_ALLOCATION_FUNC_PTR	
GLM_PAGE_FREE_FUNC_PTR	
GLM_PAGE_SIZE	
GLM_SET_DOUBLE_FUNC_PTR	
GLM_SET_UBYTE_FUNC_PTR	
GLM_SET_UINT_FUNC_PTR	
GLM_SET_USHORT_FUNC_PTR	
GLM_SYSTEM_HEAP_MODE	
GLM_VERSION_2_0	
GLM_ZERO_FUNC_PTR	
GLMCopyFunc	

GLMPageAllocFunc	
GLMPageFreeFunc	
GLMSetDoubleFunc	
GLMSetUByteFunc	
GLMSetUIntFunc	
GLMSetUShortFunc	
GLMZeroFunc	

glu.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

gluBuild1DMipmapLevels	
gluBuild2DMipmapLevels	
gluBuild3DMipmapLevels	
gluBuild3DMipmaps	
gluCheckExtension	
gluNurbsCallbackData	
gluUnProject4	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GLUnurbs	
GLUquadric	
GLUtesselator	

Document Revision History

This table describes the changes to *AGL Reference Update*.

Date	Notes
2008-04-22	Updated with the symbols added to the AGL framework in Mac OS X v10.6.
2007-07-18	Updated with the symbols added to the AGL framework in Mac OS X v10.5.
2005-06-04	Updated for Mac OS X v10.4.
2005-04-29	New document that summarizes the symbols added to the AGL framework in Mac OS X v10.4.

