Adobe® After Effects® 6.5

Using Help

About Help

Adobe Systems Incorporated provides complete documentation in an Adobe PDF-based help system. This help system includes information on all tools, commands, and features of an application. It is designed for easy on-screen navigation and can also be printed and used as a desktop reference. Additionally, it supports third-party screen-reader applications that run in a Windows environment.

Navigating in Help

Help opens in an Adobe Acrobat window with the Bookmarks pane open. (If the Bookmarks pane is not open, click the Bookmarks tab at the left edge of the window.) At the top and bottom of each page is a navigation bar containing links to this page (Using Help), the table of contents (Contents), and the index (Index).

To move through pages sequentially, you can click the Next Page ▶ and the Previous Page ◀ arrows; click the navigation arrows at the bottom of the page; or click Back to return to the last page you viewed.

You can navigate Help topics by using bookmarks, the table of contents, the index, or the Search (Acrobat 6) or Find (Acrobat 5) command.

To find a topic using bookmarks:

1 In the Bookmarks pane, click the plus sign (+) (Windows) or the right-facing arrow (Mac OS) next to a bookmark topic to view its subtopics.

2 Click the bookmark to go to that topic.

To find a topic using the table of contents:

1 Click Contents in the navigation bar.

2 On the Contents page, click a topic to go to that topic.

3 To view a list of subtopics, click the plus sign (+) (Windows) or the right-facing arrow (Mac OS) next to the topic name in the Bookmarks pane.

To find a topic using the index:

1 Do one of the following:

- Click Index in the navigation bar, and then click a letter at the top of the page.
- In the Bookmarks pane, expand the Index bookmark to view the letter subtopics; then click a letter.

2 Locate the entry you want to view, and click the page number to go to that topic.

3 To view other entries for the same topic, click Back to return to the same place in the index, and then click another page number.

To find a topic using the Search command (Acrobat 6):

1 Choose Edit > Search.

2 Type a word or phrase in the text box and click Search. Acrobat searches the document and displays every occurrence of the word or phrase in the Results area of the Search PDF pane.

To find a topic using the Find command (Acrobat 5):

1 Choose Edit > Find.

2 Type a word or phrase in the text box and click Find. Acrobat searches the document, starting from the current page, and displays the first occurrence.

3 To find the next occurrence, choose Edit > Find Again.

Printing Help

Although Help is optimized for on-screen viewing, you can print selected pages or the entire file.

To print Help:

Choose File > Print, or click the Print icon in the Acrobat toolbar.

Overview

The *Adobe After Effects 6.5 Render Automation & Scripting Guide* demonstrates how to take procedural control of your After Effects projects via scripting. This feature set is available only in Adobe After Effects 6.5 Professional Edition.

With the use of system-level scripting, you can streamline your render pipeline and avoid a lot of repetitive pointing and clicking. If you have used expressions or other JavaScript-like techniques for animating, or worked with system scripting in AppleScript or Visual Basic, you will recognize the power of application scripting in After Effects. With some practice, and with sufficient experience using the JavaScript language, you can take control of your graphics pipeline.

If you know nothing about scripting

After Effects 6.5 is a visual tool with a graphical user interface; you are used to interacting with it via interface elements such as menus, palettes and icons. For the most part, this is the most accessible way to work. Scripting is designed for situations in which this methodology involves tedious repetition or painstaking searching and sorting that could be automated. It is also useful for leveraging the power of networked rendering in situations where Watch Folder is less powerful (and less convenient to set up).

Scripting is designed to help users of After Effects get past these types of obstacles, and it is available even to users who have no inclination to learn the JavaScript language. If you are this type of user, you can still harness the power of scripting via third party solutions such as Rush Render Queue, a graphical user interface to set up distributed renders from any computer on the network without having to set up on individual machines.

You can also leverage the contributions of scripting users who share scripts with other users. Larger studios may have such users in-house, while other users can visit forums such as those found at www.adobe-forums.com.

After Effects objects

You may not think of After Effects as a collection of hierarchical objects, but when you make use of render queue items, compositions, and projects, that is how they appear in scripting. Just as the expressions features in After Effects give you access to virtually any property of any layer inside any composition of your project (each of which we refer to as an object), scripting gives you access to the hierarchy of objects within After Effects and allows you to make changes to these objects.

After Effects scripting is based on ECMAScript (or more specifically, the 3rd Edition of the ECMA-262 Standard). Further documentation on this standard can be found at www.ecma-international.org.

Expressions and motion math

Because scripting can access individual layer properties, and because it utilizes JavaScript, one might assume that expressions and scripting are one and the same. However, they are two entirely distinct entities. Expressions have no ability to access information from scripts (such as variables and functions), although a script can be written to create or edit an expression.

The similarity between expressions and scripting is, however, apparent in that they are both drawn from the same language, ECMA standard JavaScript. Thus, knowing how to utilize one is helpful in understanding the other.

Motion math is no longer included in After Effects; its functionality has been superseded by scripting and expressions. All mathematical and logical operators common to ECMAScript are available in scripting.

For example, with expressions it is possible to simulate the physics of a a bouncing ball by applying mathematical rules to a "ball" layer. But using scripting, you can create a whole user interface that allows a bouncing ball and shadow layer to be animated using criteria entered by the user.

About this guide

This guide is for users who manage a graphics pipeline (which may include other scriptable applications as well) and who want to write scripts to add custom capabilities to After Effects.

This functionality is also offered via third-party network rendering management solutions. These products feature software designed to help manage this process, so it is possible to take advantage of this functionality without having to perform manual editing of scripts.

Although this guide is intended to provide an understanding of the extensions that have been added to the ECMAScript/JavaScript language for scripting of After Effects projects, to take full advantage of what is possible with scripting you will also need an understanding of writing scripts at the system level (for integration with AppleScript on the Mac and DOS shell scripts on Windows systems) and a background in how to work with JavaScript.

Much of what scripting can accomplish replicates what can be done via the After Effects user interface, so a thorough knowledge of the application itself is also essential to understanding how to use this functionality.

Note that JavaScript objects normally referred to as "properties" are consistently called "attributes" in this guide, to avoid confusion with After Effects' own definition of a Property (an animatable value of an effect or transform within an individual layer).

Activating full scripting features

For security reasons, the scripting features that operate outside the After Effects application (such as adding and deleting files and folders on volumes, or accessing the network) are disabled by default.

To enable these features, choose Preferences > General, and select Allow Scripts to Write Files and Access Network.

By selecting this box, you enable the following:

- Writing files
- Creating folders
- Setting the current folder
- Creating a socket
- Opening a socket
- Listening to a socket

The JavaScript Debugger is disabled by default so that casual users do not encounter it. When editing or writing scripts, the JavaScript Debugger can help you diagnose script problems more quickly.

To activate the JavaScript Debugger on the local machine when a script error is encountered, choose Preferences > General, and select Enable JavaScript Debugger.

Note that the JavaScript Debugger operates only when executing a script, not with expressions, even though expressions also make use of JavaScript.

For detailed information on the JavaScript Debugger, see “JavaScript Debugging” on page 15.

Accessing and writing scripts

To create and edit scripts for After Effects, use an external text-editing application that creates files with Unicode UTF-8 text encoding. Beware of applications such as Microsoft Word that by default add header information to files (these create line 0 errors in scripts, causing them to fail). A script can reside anywhere, although to appear in the Scripts menu it must be saved in the Scripts folder within the After Effects application folder. For details on writing and editing scripts, see “Writing Scripts” on page 6.

There is no built-in method for recording a series of actions in After Effects into a script, as you can with Photoshop actions. Scripts are created outside After Effects and then executed within it, or externally via a command-line or third-party render management software.

Uses of After Effects scripting

One primary use for scripting in After Effects 6.5 is render automation. Anyone charged with managing a complex rendering pipeline will be interested in this. Render automation can be accomplished either by hand-coding scripts or via a third-party network rendering solution that supports automated management of network rendering pipelines.

There are other uses for scripting; it can be a shortcut around tedious tasks that would otherwise involve repetitious pointing and clicking.

See “Examples” on page 179 for examples of what scripts can do.

Writing Scripts

When you use Adobe After Effects, you create projects, compositions, and Render Queue items along with all of the elements that they contain: footage, images, solids, layers, masks, effects, and properties. Each of these items, in scripting terms, is an object.

The heart of a scriptable application is the object model. In After Effects, the object model is composed of projects, items, compositions, layers, and Render Queue items. Each object has its own special attributes, and every object in an After Effects project has its own identity (although not all are accessible to scripting).

You should be familiar with the After Effects object model in order to create scripts. For more resources for learning scripting, see "More resources to learn scripting" on page 8.

Editing scripts

After Effects 6.5 does not include a script editor. You can use any text editor to create, edit, and save scripts, but it is recommended that you choose an application that does not automatically add header information when saving files and that saves with Unicode (UTF-8) encoding.

Windows applications that are useful for editing scripts include EM Editor or the built-in Notepad (be sure to set Encoding within save options to UTF-8).

Mac OS applications that are useful for editing scripts include BBEdit or the built-in OS X Textedit (be sure to set the Save type in Preferences to Unicode [UTF-8]).

The .jsx format

After Effects scripts must include the .jsx file extension in order to be properly recognized by the application. This extension is a variation on the standard ".js" extension used with normal JavaScript files; any UTF-8 encoded text file with this extension will be recognized.

The Scripts menu and Scripts folder

After Effects scripts reside in the Scripts folder, within the same folder as your After Effects 6.5 application file. Only scripts contained in this Scripts folder are automatically listed in the Scripts menu, although a script file can reside anywhere.

To run a script that does not appear in the Scripts menu, choose File > Run Script > Choose File, and choose the script in the Open dialog box. Alternatively, you can send After Effects a script from a command line (on Windows) or from AppleScript (on Mac OS).

To appear in the Open dialog box, your script must include the proper .jsx file extension.

Shutdown and Startup folders

Within the Scripts folder are two folders called Startup and Shutdown. After Effects runs scripts in these folders automatically on starting and quitting, respectively.

In the Startup folder you can place scripts that you wish to execute at startup of the application. They are executed after the application is initialized and all plug-ins are loaded.

Scripting shares a global environment, so any script executed at startup can define variables and functions that are available to all scripts. In all cases, variables and functions, once defined by running a script that contains them, persist in succeeding scripts during a given After Effects session. Once the application is quit, all such globally defined variables and functions are cleared.

Please note that this persistence of global settings also means that if you are not careful about giving variables in scripts unique names, you can inadvertently reassign global variables intended to persist throughout a session.

Properties can also be embedded in existing objects such as the Application object (see "Application object" on page 26) to extend the application for other scripts.

The Shutdown folder scripts are executed as the application quits. This occurs after the project is closed but before any other application shutdown occurs.

Sending a script to After Effects from the system

If you are familiar with how to run a script from the command line in Windows or via AppleScript, you can send a script directly to the open After Effects application, which then runs automatically.

How to include After Effects scripting in a command line (Windows)

Following are examples of DOS shell scripts that will send an After Effects script to the application without using the After Effects user interface to execute the script.

In the first example, you would copy and paste your After Effects script directly into the command line script and then run it, as follows (your script text would appear in quotation marks following the afterfx.exe -s command):

```
afterfx.exe –s "alert ("You just sent an alert to After Effects")"
```

Alternatively, you could specify the location of the .jsx file to be executed, as follows:

```
afterfx.exe –r c:\myDocuments\Scripts\yourAEScriptHere.jsx
```

How to include After Effects scripting in an AppleScript (Mac OS)

Following are three examples of AppleScripts that will send an existing .jsx file containing an After Effects script to the application without using the After Effects user interface to execute the script.

In the first example, you copy your After Effects script directly into the AppleScript and then run it, as follows (your script text would appear in quotation marks following the DoScript command):

```
tell application "Adobe After Effects 6.5"
  DoScript "alert (\"You just sent an alert to After Effects\")"
end tell
```

Alternatively, you could display a dialog box asking for the location of the .jsx file to be executed, as follows:

```
set thefile to choose file
tell application "Adobe After Effects 6.5"
  DoScript thefile
end tell
```

Finally, this script is perhaps most useful when you are working directly on editing a .jsx script and want to send it to After Effects for testing or to run. To use it effectively you must enter the application that contains the open .jsx file (in this example it is TextEdit); if you do not know the proper name of the application, type in your best guess to replace "TextEdit" and AppleScript prompts you to locate it.

Simply highlight the script text that you want to run, and then activate this AppleScript:

```
(*
This script sends the current selection to After Effects as a script.
*)

tell application "TextEdit"

  set the_script to selection as text

end tell

tell application "Adobe After Effects 6.5"
  activate
  DoScript the_script
end tell
```

For more information on using AppleScript, check out Matt Neuberg's *AppleScript: the Definitive Guide* (O'Reilly & Associates) or Sal Soghoian's *AppleScript 1-2-3* (Peachpit Press).

Testing and troubleshooting

Any After Effects script that contains an error preventing it from being completed generates an error message from the application. This error message includes information about the nature of the error and the line of the script on which it occurred.

Additionally, After Effects includes a JavaScript debugger. For more information on activating and using the debugger, see "JavaScript Debugging" on page 15.

More resources to learn scripting

Many resources exist for learning more about scripting that uses the ECMA standard.

The After Effects scripting engine supports the 3rd Edition of the ECMA-262 Standard, including its notational and lexical conventions, types, objects, expressions and statements.

For a complete listing of the keywords and operators included with ECMAScript, please refer to Ecma-262.pdf, available at www.ecma-international.org/publications/standards/ECMA-262.HTM.

Books that deal with JavaScript 1.2 are also useful for understanding how scripting works in After Effects. One book that is something of a standard for JavaScript users is *JavaScript, The Definitive Guide* (O'Reilly) by David Flanagan. Another very readable source is *JavaScript: A Beginner's Guide* (Osborne) by John Pollock. Both of these texts contain information that pertains only to extensions of JavaScript for Internet browsers; however, they also contain thorough descriptions of scripting fundamentals.

There are also books for using AppleScript and creating Windows command line scripts, each of which can be used to send scripts to After Effects.

Keywords and statement syntax

Although it is not possible to provide an exhaustive resource describing usage of JavaScript, the following tables provide an overview of keywords, statements, operators, precedence and associativity.

The following table lists and describes all keywords and statements recognized by the After Effects scripting engine.

Table 1 Keywords and Statement Syntax

Keyword/Statement	Description
break	Standard JavaScript; exit the currently executing loop.
continue	Standard JavaScript; cease execution of the current loop iteration.
case	label used in a switch statement
default	label used in a switch statement when a case label is not found
do - while	Standard JavaScript construct. Similar to the while loop, except loop condition evaluation occurs at the end of the loop.
false	Literal representing boolean false.
for	Standard JavaScript loop construct.
for - in	Standard JavaScript construct. Provides a way to easily loop through the properties of an object.
function	Used to define a function.
if/if - else	Standard JavaScript conditional constructs.
new	Standard JavaScript constructor statement.
null	Assigned to a variable, array element, or object property to indicate that it does not contain a legal value.
return	Standard JavaScript way of returning a value from a function or exiting a function.
switch	Standard JavaScript way of evaluating an expression and attempting to match the expression's value to a case label.
this	Standard JavaScript method of indicating the current object.
true	Literal representing boolean true.
undefined	Indicates that the variable, array element, or object property has not yet been assigned a value.
var	Standard JavaScript syntax used to declare a local variable.
while	Standard JavaScript construct. Similar to the do - while loop, except loop condition evaluation occurs at the beginning of the loop.
with	Standard JavaScript construct used to specify an object to use in ensuing statements.

Operators

The following tables list and describe all operators recognized by the After Effects scripting engine and show the precedence and associativity for all operators.

Table 2 Description of Operators

Operators	Description
new	Allocate object.

Operators	Description
delete	Deallocate object.
typeof	Returns data type.
void	Returns undefined value.
.	Structure member.
[]	Array element.
()	Function call.
++	Pre- or post-increment.
--	Pre- or post-decrement.
-	Unary negation or subtraction.
~	Bitwise NOT.
!	Logical NOT.
*	Multiply.
/	Divide.
%	Modulo division.
+	Add.
<<	Bitwise left shift.
>>	Bitwise right shift.
>>>	Unsigned bitwise right shift.
<	Less than.
<=	Less than or equal.
>	Greater than.
>=	Greater than or equal.
==	Equal.
!=	Not equal.
&	Bitwise AND.
^	Bitwise XOR.
|	Bitwise OR.
&&	Logical AND.
||	Logical OR.
?:	Conditional (ternary).
=	Assignment.
+=	Assignment with add operation.
-=	Assignment with subtract operation.
*=	Assignment with multiply operation.

Operators	Description
/=	Assignment with divide operation.
%=	Assignment with modulo operation.
<<=	Assignment with bitwise left shift operation.
>>=	Assignment with bitwise right shift operation.
>>>=	Assignment with bitwise right shift unsigned operation.
&=	Assignment with bitwise AND operation.
^=	Assignment with bitwise XOR operation.
|=	Assignment with bitwise OR operation.
,	Multiple evaluation.

Table 3 Operator Precedence

Operators (Listed from highest precedence —top row—to lowest)	Associativity
[], (), .	left to right
new, delete, -(unary negation), ~, !, typeof, void,++, --	right to left
*, /, %	left to right
+, -(subtraction)	left to right
<<, >>, >>>	left to right
<, <=, >, >=	left to right
==, !=	left to right
&	left to right
^	left to right
|	left to right
&&	left to right
||	left to right
?:	right to left
=, /=, %=, <<=, >>=, >>>=, &=, ^=, |=, +=, -=, *=	right to left
,	left to right

Render automation with aerender

One primary use for scripting in After Effects 6.5 is render automation. Anyone charged with managing a complex rendering pipeline will be interested in this. Render automation can be accomplished either by hand-coding scripts or via a third-party network rendering solution that supports automated management of network rendering pipelines.

Note: *There are other uses for scripting; it can be a shortcut around tedious tasks that would otherwise involve repetitious pointing and clicking. See "Examples" on page 179 for examples of what scripts can do.*

Usage

The command-line application aerender renders After Effects compositions. The render may be performed either by an already running instance of After Effects or by a newly invoked instance. By default, aerender will invoke a new instance of After Effects, even if one is already running. To change this, see the "-reuse" flag in the following “Arguments” below.

Arguments

From the command line aerender takes a series of optional arguments that are added following the executable command (i.e. aerender.exe). Some are single flags, like "-reuse". Some come in flag-argument pairs, like "-project project_path". And one comes in a triplet, -mem_usage image_cache_percent max_mem_percent.

With 0 arguments, or with any argument equaling "-help", aerender prints a usage message with the information contained in this section.

Argument	Usage
-help	print usage message
-reuse	Use this flag if you want to try and reuse an already running instance of After Effects to perform the render. By default, aerender launches a new instance of After Effects, even if one is already running. But, if After Effects is already running, and the -reuse flag is provided, aerender asks the already running instance of After Effects to perform the render. Whenever aerender launches a new instance of After Effects, it tells After Effects to quit when rendering is completed; otherwise, it doesn't quit After Effects. Also, the preferences are written to file upon quitting when the -reuse flag is specified; otherwise it isn't written.
-project project_path	where project_path is a file path or URI specifying a project file to open. If none is provided, aerender will work with the currently open project. If no project is open and no project is provided, an error will result.
-comp comp_name	where comp_name specifies a comp to be rendered. If the comp is in the render queue already, and in a queueable state, then (only) the first queueable instance of that comp on the render-queue is rendered. If the comp is in the project but not in the render queue, then it is added to the render queue and rendered. If no -comp argument is provided, aerender renders the entire render queue as is. In this case (no -comp), the only other arguments used are -project, -log, -v, -mem_usage, and -close; the -RStemplate, -OMtemplate, -output, -s, -e, and arguments are ignored.

Argument	Usage
-RStemplate render_settings_template	where render_settings_template is the name of a template to apply to the render queue item. If the template does not exist, it is an error. Default is to use the render template already defined for the item.
-OMtemplate output_module_template	where output_module_template is the name of a template to apply to the output module. If the template does not exist, it is an error. Default is to use the template already defined for the output module.
-output output_path	where output_path is a file path or URI specifying the destination render file. Default is the path already in the project file.
-log logfile_path	where logfile_path is a file path or URI specifying the location of the log file. Default is stdout.
-s start_frame	where start_frame is the first frame to render. Default is the start frame in the file.
-e end_frame	where end_frame is the last frame to render. Note, this is "inclusive;" the final frame is rendered. Default is the end frame in the file.
-i increment	where increment is the number of frames to advance before rendering a new frame. A value of 1 (the default) results in a normal rendering of all frames. Higher increments will repeat the same (frame increment-1) times and then render a new one, starting the cycle again. Higher values result in faster renders but choppier motion. Default is 1.
-mem_usage image_cache_percent max_mem_percent	where image_cache_percent specifies the maximum percent of memory used to cache already rendered images/footage, and max_mem_percent specifies the total percent of memory that can be used by After Effects.
-v verbose_flag	where verbose_flag specifies the type of messages reported. Possible values are ERRORS (prints only fatal and problem errors) or ERRORS_AND_PROGRESS (prints progress of rendering as well). Default value is ERRORS_AND_PROGRESS.
-close close_flag	where close_flag specifies whether or not toclose the project when done rendering, and whether or not to save changes. If close_flag is DO_NOT_SAVE_CHANGES, the project is closed without saving changes. If close_flag is SAVE_CHANGES, project is closed and changes are saved. If close_flag is DO_NOT_CLOSE the project is left open; but the project is left open only if using an already-running instance of After Effects, since new invocations of After Effects must always close and quit when done. Default value is DO_NOT_SAVE_CHANGES.

Argument	Usage
-sound sound_flag	where sound_flag specifies whether or not to play a sound when rendering is complete. Possible values are ON or OFF. Default value is OFF.
-version	Displays the version number of aerender to the console. Does not render.

Examples

To render just Comp 1 to a specified file, enter:

```
aerender -project c:\projects\proj1.aep -comp "Comp 1" -output c:\output\proj1\proj1.avi
```

To render everything in the render queue as is in the project file, enter:

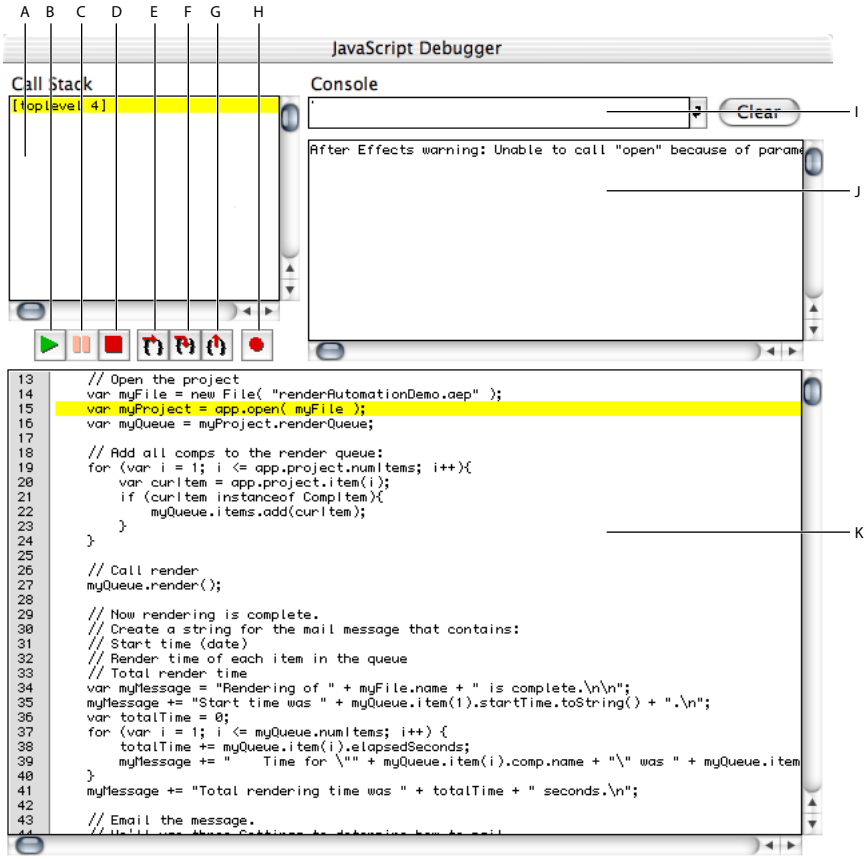
```
aerender -project c:\projects\proj1.aep
```

To render frames 1-10 using multi-machine render, enter:

```
aerender -project c:\projects\proj1.aep -comp "Comp 1" -s 1 -e 10
-RStemplate "Multi-Machine Settings"
-OMtemplate "Multi-Machine Sequence"
-output c:\output\proj1\frames[####].psd
```

JavaScript Debugging

This section describes the JavaScript Debugger, which appears when the Enable JavaScript Debugger preference is selected in General Preferences (it is deselected by default) and there is an error when executing a script.



JavaScript Debugger window
A. *Stack trace view* ***B.*** *Resume* ***C.*** *Pause* ***D.*** *Stop* ***E.*** *Step over* ***F.*** *Step into*
G. *Step out* ***H.*** *Breakpoints display* ***I.*** *Command line* ***J.*** *Debug output view*
K. *JavaScript source view*

The current stack trace appears in the upper-left pane of the JavaScript Debugger window. This Stack Trace view displays the calling hierarchy at the time of the breakpoint. Double-clicking a line in this view changes the current scope, enabling you to inspect and modify scope-specific data.

All debugging output appears in the upper-right pane of the JavaScript Debugger window. Specifically, output from the *print* method of the *$* object appears in this Debug Output view.

The currently executing JavaScript source appears in the lower pane of the JavaScript Debugger window. Double-clicking a line in this JavaScript Source view sets or clears an unconditional breakpoint on that line. That is, if a breakpoint is in effect for that line, double-clicking it clears the breakpoint, and vice-versa. The line number display on the left part displays a red dot for all lines with a breakpoint.

If Enable JavaScript Debugger is deselected in General Preferences, you see an error message but not the JavaScript Debugger itself. This is the typical setup used in situations in which professional roles are divided between those writing and administering scripts (technical directors, system administrators, and so on) and those using them (the artist or animators). If you are writing and debugging your own scripts, you will want to enable the JavaScript Debugger.

Controlling code execution in the JavaScript Debugger

This section describes the buttons that control the execution of code when the JavaScript Debugger window is active. Most of these buttons also provide a keyboard shortcut.

Resume
Ctrl+R (Windows)
Command+R (Mac OS)

Resume execution of the script with the JavaScript Debugger window open. When the script terminates, the application closes the JavaScript Debugger window automatically. Closing the window manually also causes script execution to resume. This button is enabled when script execution is paused or stopped.

Pause
Ctrl+P (Windows)
Command+P (Mac OS)

Halt the currently executing script temporarily and reactivate the JavaScript Debugger. This button is enabled when a script is running.
, wrapping on this line . . . -cj>>

Stop
Ctrl+K (Windows)
Command+K (Mac OS)

Stop execution of the script and generate a runtime error. This button is enabled when a script is running.

Step Over
Ctrl+S (Windows)
Command+S (Mac OS)

Halt after executing a single JavaScript statement in the script; if the statement calls a JavaScript function, execute the function in its entirety before stopping.

Step Into
Ctrl+T (Windows)
Command+T (Mac OS)

Halt after executing a single JavaScript statement in the script or after executing a single statement in any JavaScript function that the script calls.

Step Out
Ctrl+U (Windows)
Command+U (Mac OS)

When the JavaScript Debugger is paused within the body of a JavaScript function, resume script execution until the function returns. When the JavaScript Debugger is paused outside the body of a function, resume script execution until the script terminates.

Script Breakpoints Display

Display the Script Breakpoints window.

Using the JavaScript command line entry field

You can use the JavaScript Debugger's command line entry field to enter and execute JavaScript code interactively within a specified stack scope. Commands entered in this field execute with a time-out of one second. If a command takes longer than one second to execute, the script terminates and generates a time-out error.

Command line entry field

Enter in this field a JavaScript statement to execute within the stack scope of the line highlighted in the Stack Trace view. When you've finished entering the JavaScript expression, you can execute it by clicking the Command Line Entry button or pressing the Enter key. Click the button next to the field, or press Enter to execute the JavaScript code in the command line entry field. The application executes the contents of the command line entry field within the stack scope of the line highlighted in the Stack Trace view.

The command line entry field accepts any JavaScript code, making it very convenient to use for inspecting or changing the contents of variables.

Note: *To list the contents of an object as if it were JavaScript source code, enter the object.toSource() command.*

Setting breakpoints

You can set breakpoints in the JavaScript Debugger itself, by calling methods of the $ object, or by defining them in your JavaScript code.

Setting breakpoints in the JavaScript Debugger

When the JavaScript Debugger window is active, you can double-click a line in the JavaScript Source view to set or clear a breakpoint at that line. Alternatively, you can click the Script Breakpoints Display button to display the Script Breakpoints window and set or clear breakpoints in this window as described in "Script Breakpoints window" on page 18.

Setting breakpoints in JavaScript code

Adding the debugger statement to a script sets an unconditional breakpoint. For example, the following code causes the script to halt and display the JavaScript Debugger as soon as it enters the setupBox function.

```
function setupBox(box) {
  // break unconditionally at the next line
  debugger;
```

```
  box.width  = 48;
  box.height = 48;
  box.url    = "none";
}
```

To execute a breakpoint in runtime code, call the $.bp() method, as shown in the following example:

```
function setupBox(box) {
  box.width  = (box.width == undefined) ? $.bp() : 48;
  box.height = (box.height == undefined) ? $.bp() : 48;
  box.url    = (box.url == undefined) ? $.bp() : "none";
}
```

This example breaks into the JavaScript Debugger if any of the width, height, or url attributes of the custom element are undefined. Of course, you wouldn't put bp method calls into production code—it's more appropriate for shipping code to set default values for undefined properties, as the previous example does.

Script Breakpoints window

Display of the Script Breakpoints window is controlled by the Script Breakpoints button in the JavaScript Debugger. This window displays all defined breakpoints. This window does not display temporary breakpoints or breakpoints defined by the debugger statement in JavaScript code.

The Script Breakpoints window provides the following controls:

- The Line field contains the line number of the breakpoint.
- The Condition field may contain a JavaScript expression to evaluate when the breakpoint is reached. If the expression evaluates to false, the breakpoint is not executed.
- Breakpoints set in this window persist across multiple executions of a script. When the application quits or a script is reloaded, it removes all breakpoints.

To set a breakpoint in the Script Breakpoints window:

1 Click New to create a new breakpoint, or click the breakpoint that you wish to edit.

2 Enter a line number in the Line Number field, or change the existing line number.

3 Optionally, enter a condition such as (i>5) in the Condition field. This can be any valid JavaScript expression. If the result of evaluating the expression is true, the breakpoint activates.

The $ object

The $ object (Debugger Object) provides properties and methods you can use to debug your JavaScript code. For example, you can call its methods to set or clear breakpoints programmatically, or to change the language flavor of the script currently executing. It also provides properties that hold information about the version of the host platform's operating system.

Note: *The $ object is not a standard JavaScript object.*

Properties

Name	Type	Description
error	Error	Retrieve the last runtime error. Reading this property returns an Error object containing information about the last runtime error.

version	String	Returns the version number of the JavaScript engine as a three-part number like e.g. "3.1.11". Read only.
os	String	Outputs the current operating system version. Read only.

Debug output method

```
write (text, ...);
writeln (text, ...);
```

Write the given string to the Debug Output window. The writeln method appends a New Line character to its arguments.

Parameters

text	String	All parameters are concatenated to a single string.

Returns

None.

Clear breakpoint method

```
clearbp (scriptletName, line);
```

Clear a breakpoint. The breakpoint is defined by the name of the scriptlet or function and the line number. If the scriptlet name is the empty string or is missing, the name of the currently executing scriptlet is used. If the line number is zero or not supplied, the current line number is used. Thus, the call $.clearbp() without parameters clears a breakpoint at the current position.

The special string "NEXTCALL" as the scriptlet name causes the engine to clear a breakpoint at the next function call.

Parameters

scriptletName	String	The name of the scriptlet where the breakpoint is to be cleared.
line	Number	The line number where the breakpoint is to be cleared.

Returns

None.

Execute breakpoint method

```
bp([condition]);
```

Execute a breakpoint at the current position. Optionally, a condition may be supplied. The condition is a JavaScript expression string that is evaluated before the breakpoint is executed. The breakpoint is executed only if the expression returns true. If no condition is given, the use of the debugger statement is recommended instead as it is a more widely supported JavaScript standard statement.

Parameters

condition	String	An optional JavaScript expression string that is evaluated before the breakpoint is executed.The expression needs to evaluate to the equivalent of true in order to activate the breakpoint.

Returns

None.

Garbage collection method

gc ()

Initiate a garbage collection. Garbage collection is the process by which the JavaScript interpreter cleans up memory it is no longer using. This is done automatically. Occasionally when you're debugging a script, it may be useful to call this process.

Returns

None.

Reference

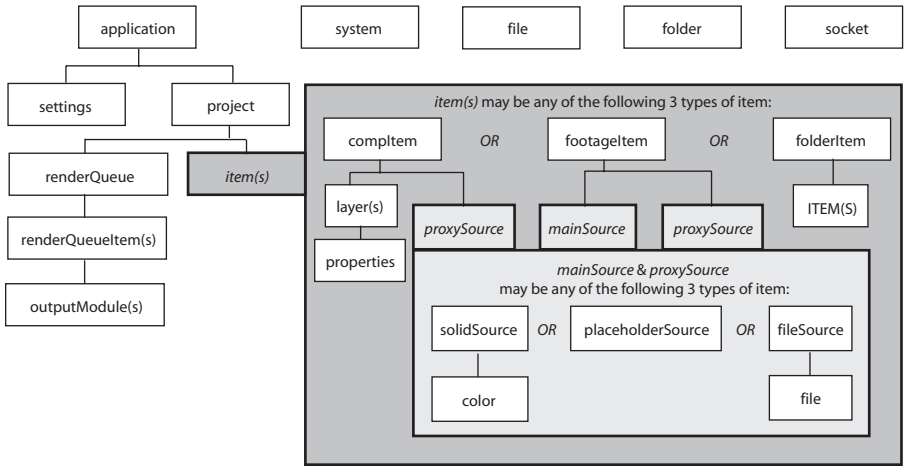
This chapter lists and describes syntax (keywords, statements, operators,classes, objects, methods, attributes, and global functions) particular to the After Effects scripting engine.

The After Effects Scripting engine supports the 3rd Edition of the ECMA-262 Standard, including its notational and lexical conventions, types, objects, expressions and statements. For a complete listing of the keywords and operators included with ECMAScript, please refer to Ecma-262.pdf, available at www.ecma-international.org/publications/standards/ECMA-262.HTM

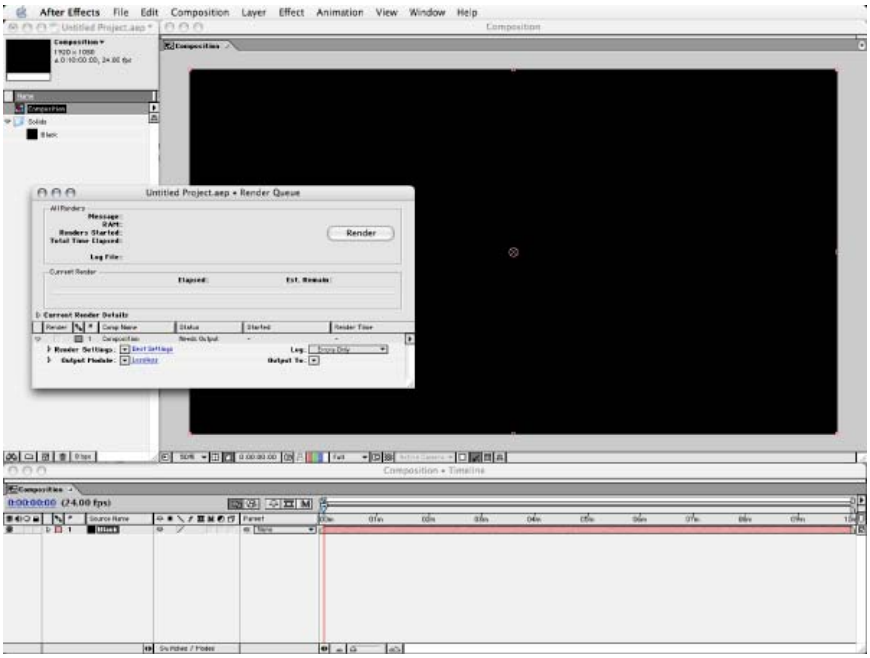
For an overview of the most common keywords and statements available from ECMA-262, see "Keywords and statement syntax" on page 9.

Objects, methods, attributes, and globals

As you look through this reference section, which is organized alphabetically according to object groupings, you can refer to the following diagrams for an overview of where the various objects fall within the hierarchy, and their correspondence to the user interface.



Hierarchy diagram of the main After Effects scripting objects



The hierarchy of objects in scripting corresponds to the hierarchy in the user interface. The Application contains a Project window that contains a Composition with a Layer. The source for the Layer can be a footage file, placeholder, or solid, and it is also listed in the Project window. The Layer in turn contains settings known as Properties, and these can hold individual keyframes. The Render Queue contains Render Queue Items as well as Render Settings and Output Modules. All of these rules are directly analogous to scripting.

Attributes and properties

Note that in ECMAScript and JavaScript, a named piece of data of a certain type is commonly referred to as a property. However, After Effects already has a separate definition of a "property": It is a specific editable value within a layer. Therefore in this section the synonymous term "attribute" refers to these same pieces of data.

Global functions

This section describes globally available functions that are specific to After Effects. Any JavaScript object or function can call the functions in this section.

Functions

Function	Reference	Description
alert()	see "alert() global function" on page 23	displays an alert dialog displaying a specified text string
prompt()	see "prompt() global function" on page 25	opens a dialog box with a text field into which the user can enter a text string
write()	see "write() global function" on page 26	writes output to the Info palette, with no line break added
writeLn()	see "writeLn() global function" on page 26	writes output to the info palette, adding a line break at the end
clearOutput()	see "clearOutput() global function" on page 23	clears the Info palette
confirm()	see "confirm() global function" on page 24	prompts the user with a modal dialog and yes/no buttons which clear the dialog and return a boolean
fileGetDialog()	see "fileGetDialog() global function" on page 24	presents the platform's standard Open dialog box
filePutDialog()	see "filePutDialog() global function" on page 24	presents the platform's standard Save dialog box
folderGetDialog()	see "folderGetDialog() global function" on page 25	displays a dialog in which the user can select a folder

alert() global function

alert(*text*)

Description

The Alert global function opens an alert dialog that can contain a text alert. The user then has the option of clicking OK to close the window.

Parameters

text	text string that is displayed in the dialog, which can display up to 240 characters

Example

```
alert ( "CoSA Lives!");
```

clearOutput() global function

clearOutput()

Description

The clearOutput global function clears the output in the info palette.

Parameters

None.

confirm() global function

confirm(*text*)

Description

The Confirm global function prompts the user with a modal dialog and yes/no buttons that clear the dialog. These return a boolean; true if yes, false if no.

Parameters

text	text string; Mac OS user interface can display 256 characters, Windows, 30 characters

Returns

Boolean.

Example

```
var shouldAdd = confirm("Add to Render Queue?");
if (shouldAdd == "true"){
  proj.renderQueue.items.add(myCompItem);
}
```

fileGetDialog() global function

fileGetDialog(*prompt,typeList*)

Description

The fileGetDialog global function presents the Open dialog box that is standard for the platform on which After Effects is running.

The typeList is a semicolon-separated list of four-character Mac OS file types followed by Windows file extensions. For example, a value of "EggP aep" for this argument specifies that the Open dialog box is to display After Effects project items only; other file types will be grayed out.

Parameters

prompt	message that displays on the title bar of the dialog; truncated if too long
typeList	a platform-specific value indicating a list of file types to display

Returns

File object, or null if the user cancels the dialog.

filePutDialog() global function

filePutDialog(*prompt,default,type*)

Description

The filePutDialog global function presents the Save dialog box that is standard for the platform on which After Effects is running.

Parameters

prompt	message that appears on the title bar of the dialog; truncated if too long
default	default file name to display in the file-saving dialog; this value must observe the file-naming conventions of the platform on which After Effects is running
type	specified file type

Returns

File object, or null if the user cancels the dialog.

folderGetDialog() global function

folderGetDialog(*prompt*)

Description

The folderGetDialog global function displays a dialog in which the user can select a folder.

Parameters

prompt	message that appears on the title bar of the dialog; truncated if too long

Returns

Folder object, or null if the user cancels the dialog.

prompt() global function

prompt(*prompt, default*)

Description

The prompt global function opens a dialog box with a text field into which the user can enter a text string. The text string is returned as a value, or is null if the dialog is cancelled.

Parameters

prompt	text string that appears in the prompt dialog
default	text string that appears by default in the text field

Returns

String, or null if dialog is cancelled. Read-only.

Example

```
// presuming a project loaded with at least one comp is open:
var myCompItem = app.project.item(1);
var newName = prompt( "What would you like to name the comp?");
// rename it

if (newName) { //if the user cancels, newName is null
  myCompItem.name = newName; // newName now holds a string
}
```

write() global function

write(*text*)

Description

The write global function writes output to the Info palette, with no line break added.

Parameters

text	text string; truncated if too long for the info palette

Example

```
write("This text appears in Info palette.");
```

See also

"writeLn() global function" on page 26

writeLn() global function

writeLn(*text*)

Description

The write global function writes output to the info palette and adds a line break at the end.

Parameters

text	text string

Example

```
writeLn("This line of text appears in the console window with a line break at the end.");
```

See also

"TextDocument." on page 178

Application object

app.

Description

The application (app) global object enables access to data and functionality within the After Effects application. Attributes of the Application object provide access to specific objects within After Effects. Methods of the Application object can create documents, open existing documents, control Watch Folder mode, purge memory, and quit the After Effects application. When the After Effects application quits, it closes the open project, prompting the user to save or discard changes as necessary, and creates a project file as necessary.

Attributes

Attribute	Reference	Description
project	see "Application project attribute" on page 34 and "Project object" on page 121	instance of the current After Effects Project and all of its associated methods & attributes
language	see "Application language attribute" on page 32	identifies the language in which the application is running
version	see "Application version attribute" on page 36	identifies the version number of the After Effects application
serialNumber	see "Application serialNumber Attribute" on page 35	identifies the serial number of the After Effects installation
registeredName	see"Application registeredName attribute" on page 35	identifies the name to which the After Effects installation is registered
registeredCompany	see "Application registeredCompany attribute" on page 35	identifies the company to which the After Effects installation is registered
buildName	see "Application buildName attribute" on page 29	identifies the name of this build of the application
buildNumber	see "Application buildNumber attribute" on page 29	identifies the number of this build of the application
isProfessionalVersion	see "Application isProfessionalVersion attribute" on page 31	identifies if the After Effects version is the Professional Version
isWatchFolder	see "Application isWatchFolder attribute" on page 31	boolean that returns true when the local application is running in Watch Folder mode
isRenderEngine	see "Application isRenderEngine attribute" on page 31	identifies whether the local After Effects application is installed as a render engine
settings	see "Application settings attribute" on page 36 and "Settings object" on page 170	calls settings within After Effects that can be set via scripting
onError	see "Application onError attribute" on page 33	a callback that is called when an error occurs in the application
exitCode	see "Application exitCode attribute" on page 31	Used only when executing script externally (i.e., from a command line or AppleScript). Set to zero, indicates no error occurred; set to a positive number, indicates an error occurred while running the script.
exitAfterLaunchAndEval	see "Application exitAfterLaunchAndEval attribute" on page 30	specifies whether the application remains open after running a script from the command line on Windows

Methods

Method	Reference	Description
newProject()	see "Application newProject() method" on page 32	opens a new project in After Effects
open()	see "Application open() method" on page 33	opens a project or an Open Project dialog

Method	Reference	Description
quit()	see "Application quit() method" on page 34	quits the application
watchFolder()	see "Application watchFolder() method" on page 37	starts watch-folder mode; does not return until watch-folder mode is turned off
pauseWatchFolder()	see "Application pauseWatchFolder() method" on page 34	pauses a current watch-folder process
endWatchFolder()	see "Application endWatchFolder() method" on page 30	ends a current watch-folder process
purge()	see "Application purge() method" on page 34	purges a targeted type of cached information (replicates Purge options in the Edit menu)
beginUndoGroup()	see "Application beginUndoGroup() method" on page 28	groups the actions that follow it into a single undoable step
endUndoGroup()	see "Application endUndoGroup() method" on page 29	ends an undo group; needed only when one script contains more than one undo group
beginSuppressDialogs()	see "Application beginSuppressDialogs() method" on page 28	begins suppression of dialogs in the user interface
endSuppressDialogs()	see "Application endSuppressDialogs() method" on page 29	ends suppression of dialogs in the user interface
setMemoryUsageLimits()	see "Application setMemoryUsageLimits() method" on page 36	sets memory usage limits as in the Cache preferences tab
setSavePreferencesOnQuit()	see "Application setSavePreferencesOnQuit() method" on page 36	sets whether Preferences are saved when the application is quit

Application beginSuppressDialogs() method

app.beginSuppressDialogs()

Description

This method begins suppression of dialogs in the user interface.

Parameters

None.

Returns

None.

Application beginUndoGroup() method

app.beginUndoGroup(*undoString*)

Description

An undo group allows a script to logically group all of its actions as a single undoable action (for use with the Edit Undo/Redo menu items). Should be used in conjunction with the application.endUndoGroup() method.

Please note that beginUndoGroup() and endUndoGroup() pairs can be nested. Groups within groups become part of the larger group, and will undo correctly. In such cases, the names of inner groups are ignored.

Parameters

undoString	(mandatory) the text that will appear for the Undo command in the Edit menu (i.e.,"Undo undoString")

See also

"Application endUndoGroup() method" on page 29

Application buildName attribute

app.buildName

Description

The buildName attribute identfies the name of the build of After Effects being run. This attribute is used primarily by Adobe for testing and troubleshooting purposes.

Type

String; read-only.

Application buildNumber attribute

app.buildNumber

Description

The buildNumber attribute identfies the number of the build of After Effects being run. This attribute is used primarily by Adobe for testing and troubleshooting purposes.

Type

Integer; read-only.

Application endSuppressDialogs() method

app.endSuppressDialogs(*alert*)

Description

This method ends the suppression of dialogs in the user interface. It should be called only if beginSuppress-Dialogs() has previously been called.

If the input argument 'alert' is true, and any errors occurred between the calls to beginSuppressDialogs() and endSuppressDialogs(), then a dialog will be presented to the user displaying that error message.

Parameters

alert	boolean; specifies whether errors that have occurred following beginSuppressDialogs() should be dis-played

See also

"Application beginSuppressDialogs() method" on page 28

Application endUndoGroup() method

app.endUndoGroup()

Description

This ends the undo group begun with the app.beginUndoGroup() method. You can use this method to place an end to an undo group in the middle of a script, should you wish to use more than one undo group for a single script.

If you are using only a single undo group for a given script, you do not need to use this method; in its absence at the end of a script, the system will close the undo group automatically.

Calling this method without having set a beginUndoGroup() method yields an error.

Parameters

None.

Returns

None.

See also

"Application beginUndoGroup() method" on page 28

Application endWatchFolder() method

app.endWatchFolder()

Description

The endWatchFolder() method ends watch folder mode.

Parameters

None

See also

"Application version attribute" on page 36

"Application pauseWatchFolder() method" on page 34

Application exitAfterLaunchAndEval attribute

app.exitAfterLaunchAndEval

Description

This attribute is used only when executing a script from a command line on Windows. When the application is launched from the command line, the `-r` or `-s` command line flag will cause the application to run a script (from a file and from a string, respectively).

If this attribute is set to true, After Effects will exit after the script is run; if it is false, the application will remain open.

Note that this attribute only has an effect when After Effects is run, and it has no effect on Mac OS.

Type

Boolean; read/write.

Application exitCode attribute

app.exitCode

Description

The exitCode attribute is used only when executing a script from outside After Effects (i.e., from a command line or AppleScript).

On Mac OS and Windows, the exitCode is set to 0 (EXIT_SUCCESS) at the beginning of each script evaluation. In the event of an error while the script is running, it will be set to a positive integer.

Type

Integer; read/write.

Example

```
app.exitCode = 2; //on quit, if value is 2, no error has occurred
```

Application isProfessionalVersion attribute

app.isProfessionalVersion

Description

The isProfessionalVersion attribute is a boolean used to determine if the locally installed After Effects application is the Standard or Professional version.

Type

Boolean; read-only.

Example

```
var PB = app.isProductionBundle;
alert("It is " + PB + " that you are running the Production Bundle.");
```

Application isRenderEngine attribute

app.isRenderEngine

Description

The isRenderEngine attribute is a boolean used to determine if an installation of After Effects is a Render Engine only installation.

Type

Boolean; read-only.

Application isWatchFolder attribute

app.isWatchFolder

Description

The isWatchFolder attribute is a boolean used to determine if the Watch Folder dialog is currently displayed (and the application is currently watching a folder for rendering). This returns true when the Watch Folder dialog is open.

Type

Boolean; read-only.

Application language attribute

app.language

Description

The language attribute indicates in which language After Effects is running. The codes for the language attribute are as follows:

- Language.ENGLISH
- Language.FRENCH
- Language.GERMAN
- Language.JAPANESE

Type

Language enumerated type (listed above).

Example

```
var lang = app.language;
if (lang == Language.JAPANESE){
  alert("After Effects is running in Japanese.")};
else if (lang == Language.ENGLISH){
  alert("After Effects is running in English.")};
else if (lang == Language.FRENCH){
  alert("After Effects is running in French.")};
else{
  alert("After Effects is running in German.")
};
```

Application newProject() method

app.newProject()

Description

The newProject method opens a new project in After Effects, replicating the File > New > New Project menu command. If a project is already open and has been edited, the user will be prompted to save.

Use app.project.close(CloseOptions.DO_NOT_SAVE_CHANGES) to close an open project before opening a new one.

Parameters

None.

Returns

Project object; null if the user cancels a Save dialog in response to having an open project that has been edited since the last save.

Example

```
app.project.close(CloseOptions.DO_NOT_SAVE_CHANGES);
app.newProject();
```

See also

"Project close() method" on page 123

Application onError attribute

app.onError

Description

The onError attribute takes a function to perform an action when an error occurs. By creating a function and assigning it to onError, you can respond to the error systematically, e.g., close and restart the application, noting the error in a log file if it occurred during rendering.

Type

Function that takes a string, or null if no function is assigned.

Example

```
function err(errString) (
  alert(errString);
)
app.onError = err
```

Application open() method

app.open()
app.open(*file*)

Description

The open() method opens a project. If the file parameter is null (i.e., if no argument is used) the user will be presented with a dialog to select and open a file.

Parameters

file	*(Optional)* File object being opened

Returns

Project object (the file specified as a parameter), or null if the user cancels the Open dialog.

Example

```
var my_file = new File("../my_folder/my_test.aep");
if (my_file.exist){
  new_project = app.open(my_file);
if (new_project){
    alert(new_project.file.name);
  }
}
```

Application pauseWatchFolder() method

app.pauseWatchFolder(*pause*)

Description

The pauseWatchFolder() method pauses searching the target folder for render items.

Parameters

pause	boolean (paused - true or false)

See also

"Application version attribute" on page 36

"Application endWatchFolder() method" on page 30

Application project attribute

app.project

Description

This attribute is the project that is currently loaded.

For more information about what is contained in the Project object, see "Project object" on page 121.

Type

Project; read-only.

Application purge() method

app.purge(target)

Description

The purge method replicates the functionality and target options of the Purge options within the Edit menu. The target parameter contains the area of memory to be purged; the options for target are listed as enumerated variables below.

Parameters

target	the type of elements to purge from memory; use one of Enumerated Types below

Enumerated Types

PurgeTarget.ALL_CACHES	purges all data that After Effects has cached to physical memory
PurgeTarget.UNDO_CACHES	purges all data saved in the undo cache
PurgeTarget.SNAPSHOT_CACHES	purges all data cached as comp/layer snapshots
PurgeTarget.IMAGE_CACHES	purges all saved image data

Application quit() method

app.quit()

Description

The quit method quits the application.

Parameters

None.

Returns

None.

Application registeredCompany attribute

app.registeredCompany

Description

Text string; name (if any) that the user of the application entered as the registered company at the time of installation.

Type

Text string; read-only.

Example

```
var company = app.registeredCompany;
alert("Your company name is " + company + ".");
```

Application registeredName attribute

app.registeredName

Description

The registeredName attribute contains the text string that the user of the application entered for the registered name at the time of installation.

Type

Text string; read-only.

Example

```
var userName = app.registeredName;
confirm("Are you " + userName + "?");
```

Application serialNumber Attribute

app.serialNumber

Description

The serialNumber attribute contains an alphanumeric string that is the serial number of the installed version of After Effects.

Type

String; read-only.

Example

```
var serial = app.serialNumber;
alert("This copy is serial number " + serial);
```

Application setMemoryUsageLimits() method

app.setMemoryUsageLimits(*imageCachePercentage, maximumMemoryPercentage*)

Description

This method sets memory usage limits as in the Cache preferences tab.

Parameters

imageCachePercentage	floating-point value; percentage of memory assigned to image cache
maximumMemoryPercentage	floating-point value; maximum usable percentage of memory

Returns

None.

Application setSavePreferencesOnQuit() method

app.setSavePreferencesOnQuit(*doSave*)

Description

This method sets the toggle that determines whether preferences are saved when the application is closed (quit).

Parameters

doSave	boolean; if true, preferences are set to save on quit

Returns

None.

Application settings attribute

app.settings

Description

This attribute holds the currently loaded settings.

For more information about what is contained in the Settings object, see “Settings object” on page 170.

Type

Settings; read-only.

Application version attribute

app.version

Description

The version attribute returns an alphanumerical string indicating which version of After Effects is running.

Type

String; read-only.

Example

```
var ver = app.version;
alert("This machine is running version " + ver + " of After Effects.");
```

Application watchFolder() method

app.watchFolder(*folder_object_to_watch*)

Description

The watchFolder() method starts a watch folder (network rendering) process pointed at a specified folder.

Parameters

folder_object_to_watch	the Folder object to be watched

Example

```
var theFolder = new Folder("c:\\tool");
app.watchFolder(theFolder);
```

See also

"Application endWatchFolder() method" on page 30

"Application pauseWatchFolder() method" on page 34

AVItem object

app.project.item(*index*)

Description

The AVitem object provides access to attributes and methods of audio/visual files imported into After Effects.

AVItem is the base class for both CompItem and FootageItem, so AVItem attributes and methods are also available when working in CompItem and FootageItem.

Attributes

Attribute	Reference	Description
name	see "AVItem name attribute" on page 41	name of the object as shown in the Project window
width	see "AVItem width attribute" on page 44	integer [1 ..30,000] describing the width, in pixels of the item
height	see "AVItem height attribute" on page 41	integer [1 .. 30,000] describing the height, in pixels of the item

Attribute	Reference	Description
pixelAspect	see "AVItem pixelAspect attribute" on page 41	pixel aspect ratio; floating-point value [0.01 ..100]
frameRate	see "AVItem frameRate attribute" on page 40	frame rate of the AVItem [1..99]
frameDuration	see "AVItem frameDuration attribute" on page 39	frame rate for the AVItem [1/99 .. 1]
duration	see "AVItem duration attribute" on page 39	duration of the AVItem, in seconds [0 .. 10,800]
useProxy	see "AVItem useProxy attribute" on page 44	boolean describing whether a proxySource should be used for this item
proxySource	see "AVItem proxySource attribute" on page 42	FootageItem used as proxy of the AVItem; read-only
time	see "AVItem time attribute" on page 44	current time of the AVItem in seconds
usedIn	see "AVItem usedIn attribute" on page 44	array containing all the CompItems that use this AVItem
hasVideo	see "AVItem hasVideo attribute" on page 40	true if the AVItem has an audio component
hasAudio	see "AVItem hasAudio attribute" on page 40	true if the AVItem has a video component
footageMissing	see "AVItem footageMissing attribute" on page 39	true if the AVItem cannot be found or if it is a placeholder

Attributes from Item object (See "Item object" on page 97)

Attribute	Reference	Description
name	see "Item name attribute" on page 98	name of the object as shown in the Project window
comment	see "Item comment attribute" on page 98	string that holds a comment
id	see "Item id attribute" on page 98	unique integer ID for this item
parentFolder	see "Item parentFolder attribute" on page 98	parent folder of this item
selected	see "Item selected attribute" on page 99	true if this item is currently selected
typeName	see "Item typeName attribute" on page 99	string corresponding to the type of item

Methods

Method	Reference	Description
setProxy()	see "AVItem setProxy() method" on page 42	sets a proxy for the AVItem
setProxyWithSequence()	see "AVItem setProxyWithSequence() method" on page 43	sets a sequence as a proxy for the AVItem

Method	Reference	Description
setProxyWithSolid()	see "AVItem setProxyWithSolid() method" on page 43	sets a solid as a proxy (feature available only via scripting)
setProxyWithPlaceholder()	see "AVItem setProxyWithPlaceholder() method" on page 42	sets a placeholder as a proxy
setProxyToNone()	see "AVItem setProxyToNone() method" on page 42	removes the proxy

Method from Item object (See"Item object" on page 97)

Method	Reference	Description
remove()	see "Item remove() method" on page 99	deletes the item from the project

AVItem duration attribute

app.project.item(index).duration

Description

The duration attribute returns the duration, in seconds, of the item. This attribute is read-only unless it is a CompItem.

Permissible range of values is [0..10,800]. In a FootageItem, duration is linked to the duration of the mainSource; in a CompItem, it is linked to the duration of the composition. This value may be written only in a CompItem. It is an error to change this value if the item is a FootageItem.

Note: *Still footage items have a duration of 0.*

Type

Floating-point value; seconds. Read/write when item is a CompItem; otherwise, read-only.

AVItem footageMissing attribute

app.project.item(index).footageMissing

Description

The footageMissing attribute is true if the AVItem cannot be found or if it is a placeholder.

Type

Boolean; read-only.

AVItem frameDuration attribute

app.project.item(index).frameDuration

Description

The frameDuration attribute returns the length, in seconds, of a frame for this AVItem.

Permitted range is [1/99 .. 1]. This is the reciprocal of frameRate. When you set the frameDuration, you are really storing the reciprocal as a new frameRate.

When you read the value back, you are retrieving the reciprocal of the frameRate. Hence, if you set and then get the value to be a frameDuration that does not evenly divide into 1.0 (for example, 0.3), the value you get back will be close, but not exactly equal; due to numerical limitations, (1 / (1 / 0.3)) != 0.3, but rather something close to 0.3.

If the AVItem is a FootageItem, then this attribute is readOnly.

In the case of a FootageItem, you must write to the conformFrameRate of the mainSource in order to change the frameRate, and hence the frameDuration.

Type

Floating-point value; seconds. Read/write or read-only if AVItem is a FootageItem.

AVItem frameRate attribute

app.project.item(index).frameRate

Description

The frameRate attribute returns frame rate of the AVItem.

Permitted range is [1..99]. If the AVItem is a CompItem, then this corresponds to the frameRate of the comp.

If the AVItem is a FootageItem, then this corresponds to the displayFrameRate of the mainSource, and is readOnly.

In the case of a FootageItem, you must write to the conformFrameRate of the mainSource in order to change the frame rate.

Type

Floating-point value; frames per second. Read/write or read-only if AVItem is a FootageItem.

AVItem hasAudio attribute

app.project.item(index).hasAudio

Description

The hasAudio attribute is true if the AVItem has an audio component.

In the case of a CompItem, the value reflects the value for the comp. In the case of a FootageItem, the value reflects the value for the mainSource.

Type

Boolean; read-only.

AVItem hasVideo attribute

app.project.item(index).hasVideo

Description

The hasVideo attribute is true if the AVItem has a video component.

In the case of a CompItem, the value reflects the value for the comp. In the case of a FootageItem, the value reflects the value for the mainSource.

Type

Boolean; read-only.

AVItem height attribute

app.project.item(index).height

Description

The height attribute is the height, in pixels, of the item.

Permitted range is [1 ..30,000]. In a FootageItem, height is linked to the height of the mainSource; in a CompItem, it is linked to the height of a composition. It is legal to change the height of a CompItem or a FootageItem whose mainSource is a SolidSource. It is an error to change the height if the item is a FootageItem whose mainSource is not a SolidSource.

Type

Integer; read-only unless a CompItem.

AVItem name attribute

app.project.item(index).name

Description

The name attribute is the name of the object as shown in the Project window.

In a FootageItem, the name is linked to the mainSource.

It is an error to attempt to change the name if the mainSource is a FileSource; in that case, the name is tied to the name of the file(s) and may not be changed.

Type

String; read/write.

AVItem pixelAspect attribute

app.project.item(index).pixelAspect

Description

The pixelAspect attribute determines the pixel aspect ratio of a given item.

Permitted range is [0.01 .. 100]. In a FootageItem, pixelAspect is linked to the pixelAspect of the mainSource; in a CompItem, it is linked to the pixelAspect of a composition.

Certain pixelAspect values are specially known to After Effects, and will be stored/retrieved with perfect accuracy. These are the set { 1, 0.9, 1.2, 1.07, 1.42, 2, 0.95, 1.9 }. Other values may experience slight rounding errors when you set them and get them. Thus, the value you retrieve after setting may be slightly different from the value you supplied.

Type

Floating-point value; read-only unless a CompItem.

AVItem proxySource attribute

app.project.item(index).proxySource

Description

The proxySource attribute is the FootageSource being used as a proxy.

The attribute is read-only, but it can be changed by calling any of the AVItem methods that change the proxy source: setProxy(), setProxyWithSequence(), setProxyWithSolid(), and setProxyWithPlaceholder().

Type

FootageSource; read-only.

AVItem setProxy() method

app.project.item(index).setProxy(File file)

Description

The setProxy method sets a file as the proxy of an AVItem.

It loads the given file into a FileSource and establishes this as the new proxySource. It does not preserve the interpretation parameters, instead using the user preference.

This is different than what happens with a FootageItem's main source, but both are the same behavior as the user interface. If the file has an unlabeled alpha channel, and the user preference says to ask the user what to do via a dialog, scripting will guess the alpha interpretation instead of asking the user. After changing the proxySource, this method will set the value of useProxy to true.

Parameters

File	file to be used as a proxy

Returns

None.

AVItem setProxyToNone() method

app.project.item(index).setProxyToNone()

Description

The setProxyToNone method removes the proxy from this AVItem. Following this, the value of proxySource is null.

Returns

None.

AVItem setProxyWithPlaceholder() method

app.project.item(index).setProxyWithPlaceholder(*name, width, height, frameRate, duration*)

Description

The setProxyWithPlaceholder method creates a PlaceholderSource with specifications according to the input arguments and establishes this as the new proxySource.

Note that there is no direct way to set a placeholder as a proxy in the user interface; this behavior occurs when a proxy has been set and then moved or deleted.

This method does not preserve the interpretation parameters. After changing the proxySource, the value of useProxy is set to true.

Parameters

name	text string
width, height	pixel dimensions of solid[4..30,000]
frameRate	frames per second [1..99]
duration	length in seconds [0..10,800] (up to 3 hours)

Returns

None.

AVItem setProxyWithSequence() method

app.project.item(index).setProxyWithSequence(*file, forceAlphabetical*)

Description

The setProxy method loads the given sequence into a FileSource and establishes this as the new proxySource.

It loads the given sequence into a FileSource and establishes this as the new proxySource. It does not preserve the interpretation parameters, instead using the user preference.

If the file has an unlabeled alpha channel, and the user preference says to ask the user what to do via a dialog, scripting will guess the alpha interpretation instead of asking the user.

Parameters

File	file to be used as a proxy.
forceAlphabetical	boolean determining whether to use the "force alphabetical order" option

Returns

None.

AVItem setProxyWithSolid() method

app.project.item(index).setProxyWithSolid(*color, name, width, height, pixelAspect*)

Description

The setProxyWithSolid method creates a SolidSource with specifications according to the input arguments and establishes this SolidSource as the new proxySource.

Note that there is no way, using the user interface, to set a solid as a proxy; this feature is available only via scripting.

This method does not preserve the interpretation parameters. After changing the proxySource, the value of useProxy is set to true.

Parameters

color	array of 3 floats in the range [0..1] (red, green, and blue values)
width, height	pixel dimension of solid[1..30,000]
pixelAspect	pixel aspect of solid [0.01 .. 100]

Returns

None.

AVItem time attribute

app.project.item(index).time

Description

The time attribute is the current time of the item when it is being previewed directly from the Project window.

It is an error to set this on a FootageItem whose mainSource is a still (i.e., if mainSource.isStill is true).

Type

Floating-point value; read/write.

AVItem usedIn attribute

app.project.item(index).usedIn

Description

The usedIn attribute is an array containing all the CompItems that use this AVItem.

Note: *The returned value will not automatically update in response to changes that occur after you retrieve it. So if you retrieve usedIn and then add this item into another comp, you need to retrieve usedIn again in order to get an array that includes the new comp.*

Type

Array of CompItem; read-only.

AVItem useProxy attribute

app.project.item(index).useProxy

Description

The useProxy attribute determines whether a proxy should be used for the item.

Type

Boolean; read/write.

AVItem width attribute

app.project.item(index).width

Description

The width attribute specifies the width, in pixels, of the item. Permitted range is [1 ..30,000].

In a FootageItem, width is linked to the mainSource's width; in a CompItem, it is linked to the comp's width. It is legal to change the width of a CompItem or a FootageItem whose mainSource is a SolidSource. It is an error to change the width if the item is a FootageItem whose mainSource is not a SolidSource.

Type

Integer; read-only unless a CompItem.

AVLayer object

app.project.layer(*index*)

Description

The AVLayer object provides an interface to those layers that contain AVItems (Comp layers, footage layers, solid layers, text layers, and sound layers).

Since AVLayer is a subclass of Layer, all methods and attributes of Layer, in addition to those listed below, are available when working with AVLayer.

Attributes

Attribute	Reference	Description
source	see "AVLayer source attribute" on page 51	source item for this layer
isNameFromSource	see "AVLayer isNameFromSource attribute" on page 50	true if the layer has no expressly set name, but contains a named source
height	see "AVLayer height attribute" on page 50	height of the layer in pixels
width	see "AVLayer width attribute" on page 52	width of the layer in pixels
audioEnabled	see "AVLayer audioEnabled attribute" on page 47	true if the layer's audio is enabled
motionBlur	see "AVLayer motionBlur attribute" on page 51	true if layer's motionBlur is enabled
effectsActive	see "AVLayer effectsActive attribute" on page 49	true if the layer's effects are active
adjustmentLayer	see "AVLayer adjustmentLayer attribute" on page 46	true if this is an adjustment layer
guideLayer	see "AVLayer guideLayer attribute" on page 50	specifies whether this AVLayer is a guide layer
threeDLayer	see "AVLayer threeDLayer attribute" on page 52	true if this is a 3D layer
canSetCollapseTransformation	see "AVLayer canSetCollapseTransformation attribute" on page 48	true if it is legal to change the value of collapseTransformation on this layer
collapseTransformation	see "AVLayer collapseTransformation attribute" on page 49	true if collapse transformation is on

Attribute	Reference	Description
frameBlending	see "AVLayer frameBlending attribute" on page 49	true if frame blending is enabled
canSetTimeRemapEnabled	see "AVLayer canSetTimeRemapEnabled attribute" on page 49	true if it is legal to change the value of timeRemap
timeRemapEnabled	see "AVLayer timeRemapEnabled attribute" on page 52	true if time remapping is enabled on this layer
hasAudio	see "AVLayer hasAudio attribute" on page 50	true if the layer contains an audio component
audioActive	see "AVLayer audioActive attribute" on page 47	true if the layer's audio is active at the current time
blendingMode	see "AVLayer blendingMode attribute" on page 47	blending mode of the layer
preserveTransparency	see "AVLayer preserveTransparency attribute" on page 51	true if preserve transparency is enabled
trackMatteType	see "AVLayer trackMatteType attribute" on page 52	if layer has a track matte, specifies the way it will be applied
isTrackMatte	see "AVLayer isTrackMatte attribute" on page 51	true if this layer is being used as a matte track for the layer below it
hasTrackMatte	see "AVLayer hasTrackMatte attribute" on page 50	true if the layer above is being used as a track matte on this layer
quality	see "AVLayer quality attribute" on page 51	layer quality setting
guideLayer	see "AVLayer guideLayer attribute" on page 50	true if the layer is a guide layer

Method

Method	Reference	Description
audioActiveAtTime()	see "AVLayer audioActiveAtTime() method" on page 47	given a time, returns whether this layer's audio is active at that time

Example

If the first item in the project is a CompItem, and the first layer of that CompItem is an AVLayer, the following would set the layer quality, startTime, and inPoint.

```
var firstLayer = app.project.item(1).layer(1);
firstLayer.quality = LayerQuality.BEST;
firstLayer.startTime = 1;
firstLayer.inPoint = 2;
```

AVLayer adjustmentLayer attribute

app.project.item(index).adjustmentLayer

Description

The adjustmentLayer attribute returns a value of true if the layer is an adjustment layer.

Type

Boolean; read/write.

AVLayer audioActive attribute

app.project.item(index).audioActive

Description

The audioActive attribute returns a value of true if the layer's audio is active at the current time.

To be true, audioEnabled must be true, no other layer with audio may be soloing unless this layer is soloed too, and the time must be in between the inPoint and outPoint of this layer.

Type

Boolean; read-only.

AVLayer audioActiveAtTime() method

app.project.item(index).audioActiveAtTime(*time*)

Description

Given a time, the `audioActiveAtTime` method returns whether this layer's audio will be active at that time.

To be true the layer's audioEnabled attribute must be true, no other layer containing audio may be soloing unless this layer is soloed too, and the given time must be between this layer's inPoint and outPoint.

Parameters

time	time, in seconds (floating-point value)

Returns

Boolean.

AVLayer audioEnabled attribute

app.project.item(index).audioEnabled

Description

The audioEnabled attribute is true if the layer's audio is enabled. This attribute corresponds to the speaker button in the user interface.

Type

Boolean; read/write.

AVLayer blendingMode attribute

app.project.item(index).blendingMode.

Description

The blendingMode is the blending mode of the layer.

Type

Enumerated type (read/write); one of the following:

BlendingMode.ADD

BlendingMode.ALPHA_ADD

BlendingMode.CLASSIC_COLOR_BURN

BlendingMode.CLASSIC_COLOR_DODGE

BlendingMode.CLASSIC_DIFFERENCE

BlendingMode.COLOR

BlendingMode.COLOR_BURN

BlendingMode.COLOR_DODGE

BlendingMode.DANCING_DISSOLVE

BlendingMode.DARKEN

BlendingMode.DIFFERENCE

BlendingMode.DISSOLVE

BlendingMode.EXCLUSION

BlendingMode.HARD_LIGHT

BlendingMode.HARD_MIX

BlendingMode.HUE

BlendingMode.LIGHTEN

BlendingMode.LINEAR_BURN

BlendingMode.LINEAR_DODGE

BlendingMode.LINEAR_LIGHT

BlendingMode.LUMINESCENT_PREMUL

BlendingMode.LUMINOSITY

BlendingMode.MULTIPLY

BlendingMode.NORMAL

BlendingMode.OVERLAY

BlendingMode.PIN_LIGHT

BlendingMode.SATURATION

BlendingMode.SCREEN

BlendingMode.SILHOUETE_ALPHA

BlendingMode.SILHOUETTE_LUMA

BlendingMode.SOFT_LIGHT

BlendingMode.STENCIL_ALPHA

BlendingMode.STENCIL_LUMA

BlendingMode.VIVID_LIGHT

AVLayer canSetCollapseTransformation attribute

app.project.item(index).canSetCollapseTransformation

Description

The canSetCollapseTransformation attribute returns a value of true if it is legal to change the value of the collapseTransformation attribute on this layer.

Type

Boolean; read-only.

AVLayer canSetTimeRemapEnabled attribute

app.project.item(index).canSetTimeRemapEnabled

Description

The canSetTimeRemapEnabled attribute returns a value of true if it is legal to change the value of the timeRemapEnabled attribute on this layer.

Type

Boolean; read-only.

AVLayer collapseTransformation attribute

app.project.item(index).collapseTransformation

Description

The collapseTransformation attribute returns a value of true if collapse transformation is on for this layer.

Type

Boolean; read/write.

AVLayer effectsActive attribute

app.project.item(index).effectsActive

Description

The effectsActive attribute returns a value of true if the layer's effects are active.

Type

Boolean; read/write.

AVLayer frameBlending attribute

app.project.item(index).frameBlending

Description

The frameBlending attribute returns a value of true if frame blending is enabled.

Type

Boolean; read/write.

AVLayer guideLayer attribute

app.project.item(index).guideLayer

Description

This attribute returns a value of true if the layer is a guide layer.

Type

Boolean; read-only.

AVLayer hasAudio attribute

app.project.item(index).hasAudio

Description

The hasAudio attribute holds a value of true if the layer contains an audio component, regardless of whether it is audioEnabled or soloed.

Type

Boolean; read-only.

AVLayer hasTrackMatte attribute

app.project.item(index).hasTrackMatte

Description

The hasTrackMatte attribute returns a value of true if the layer in front of this layer is being used as a track matte on this layer. If true, then this layer's trackMatteType controls how the matte is applied.

Type

Boolean; read-only.

AVLayer height attribute

app.project.item(index).height

Description

The height attribute is the height of the layer, in pixels.

Type

Floating-point value; read-only.

AVLayer isNameFromSource attribute

app.project.item(index).isNameFromSource

Description

The isNameFromSource attribute returns a value of true if the layer has no expressly set name, but the layer contains a named source. In this case, layer.name will be the same as layer.source.name. It returns false if the layer has an expressly set name, or if neither the layer nor the layer's source has a name.

Type

Boolean; read-only.

AVLayer isTrackMatte attribute

app.project.item(index).isTrackMatte

Description

The isTrackMatte attribute returns a value of true if this layer is being used as a matte track for the layer behind it.

Type

Boolean; read-only.

AVLayer motionBlur attribute

app.project.item(index).motionBlur

Description

The motionBlur attribute returns a value of true if the layer's motionBlur is enabled.

Type

Boolean; read/write.

AVLayer preserveTransparency attribute

app.project.item(index).preserveTransparency

Description

The preserveTransparency attribute returns a value of true if preserve transparency is enabled for the layer.

Type

Boolean; read/write.

AVLayer quality attribute

app.project.item(index).quality.

Description

The quality is the layer quality specifying how this layer is to be displayed.

Type

Enumerated type (read/write); one of the following:

LayerQuality.BEST
LayerQuality.DRAFT
LayerQuality.WIREFRAME

AVLayer source attribute

app.project.item(index).source

Description

The source attribute is the source AVItem for this layer.

The value of the source will be null in a Text layer.

Type

AVItem; read-only.

AVLayer threeDLayer attribute

app.project.item(index).threeDLayer

Description

The threeDLayer attribute is true if this is a 3D layer.

Type

Boolean; read/write.

AVLayer timeRemapEnabled attribute

app.project.item(index).timeRemapEnabled

Description

The timeRemapEnabled attribute is true if time remapping is enabled on this layer.

Type

Boolean; read/write.

AVLayer trackMatteType attribute

app.project.item(index).trackMatteType

Description

If this layer has a track matte, the trackMatteType specifies the way the track matte will be applied.

Type

Enumerated type (read/write); one of the following:

TrackMatteType.ALPHA
TrackMatteType.ALPHA_INVERTED
TrackMatteType.LUMA
TrackMatteType.LUMA_INVERTED
TrackMatteType.NO_TRACK_MATTE

AVLayer width attribute

app.project.item(index).width

Description

The width attribute is the width of the layer, in pixels.

Type

Floating-point value; read-only.

Collection object

Description

A Collection object acts like an array that provides access to its elements by index. Like an array, a collection associates a set of objects or values as a logical group and provides random access to them. However, most collection objects are read-only. You do not assign objects to them yourself—their contents update automatically as objects are created or deleted.

The index numbering of a collection starts with 1, not 0.

Objects

Object	Reference	Description
ItemCollection	see "ItemCollection" on page 99	a collection of all of the items (imported files, folders, solids, etc.) found in the Project window
LayerCollection	see "LayerCollection" on page 110	contains all of the layers in a composition
OMCollection	see "OMCollection" on page 119	contains all of the OutputModule items in the project
RQItemCollection	see "RQItemCollection" on page 164	contains all of the RenderQueue items in the project

Attributes

length	the number of objects in the collection (applies to all collections)

Methods

[]	retrieves an object or objects in the collection via its index number

CompItem object

app.project.item(*index*)

Description

The CompItem object provides access to attributes and methods of Compositions. These are accessed via their index number.

Attributes

Attribute	Reference	Description
frameDuration	see "CompItem frameDuration attribute" on page 58	The duration of a single frame in seconds. This is the inverse of the framerate.

Attribute	Reference	Description
workAreaStart	see "CompItem workAreaStart attribute" on page 61	the work area start time (in seconds)
workAreaDuration	see "CompItem workAreaDuration attribute" on page 61	the work area duration (in seconds)
numLayers	see "CompItem numLayers attribute" on page 59	number of layers in the CompItem
hideShyLayers	see "CompItem hideShyLayers attribute" on page 58	corresponds to the value of the Hide All Shy Layers button in the Composition window
motionBlur	see "CompItem motionBlur attribute" on page 59	if true, motion blur is enabled for this comp
draft3d	see "CompItem draft3d attribute" on page 57	sets the 3d display mode to Draft quality
frameBlending	see "CompItem frameBlending attribute" on page 57	if true, time filtering is enabled for this comp
preserveNestedFrameRate	see "CompItem preserveNestedFrameRate attribute" on page 59	boolean determining whether the frame rate of nested compositions should be preserved
preserveNestedResolution	see "CompItem preserveNestedResolution attribute" on page 60	boolean determining whether the resolution of nested compositions should be preserved
bgColor	see "CompItem bgColor attribute" on page 56	background color of the composition
activeCamera	see "CompItem activeCamera attribute" on page 56	current active Camera Layer
displayStartTime	see "CompItem displayStartTime attribute" on page 57	changes the display of the start time in the Timeline window
resolutionFactor	see "CompItem resolutionFactor attribute" on page 60	integer array determining the factor by which the *x* and *y* resolution of the Composition window is downsampled
shutterAngle	see "CompItem shutterAngle attribute" on page 61	integer value (0 - 720) determining the camera shutter angle
shutterPhase	see "CompItem shutterPhase attribute" on page 61	integer value (0 - 360) determining the camera shutter phase
layers	see "LayerCollection" on page 110	LayerCollection containing the layers of the compItem
selectedLayers	see "CompItem selectedLayers attribute" on page 60	array containing all selected Layers
selectedProperties	see "CompItem selectedProperties attribute" on page 60	array containing all selected Properties

Attributes inherited from Item object and AVItem object (see "Item object" on page 97 and "AVItem object" on page 37)

Attribute	Reference	Description
name	see "Item name attribute" on page 98	name of the object as shown in the Project window
comment	see "Item comment attribute" on page 98	string that holds a comment

Attribute	Reference	Description
id	see "Item id attribute" on page 98	unique integer ID for this item
parentFolder	see "Item parentFolder attribute" on page 98	parent folder of this item
selected	see "Item selected attribute" on page 99	true if this item is currently selected
typeName	see "Item typeName attribute" on page 99	string corresponding to the type of item
width	see "AVItem width attribute" on page 44	integer [1 ..30,000] describing the width, in pixels, of the item
height	see "AVItem height attribute" on page 41	integer [1 .. 30,000] describing the height, in pixels, of the item
pixelAspect	see "AVItem pixelAspect attribute" on page 41	pixel aspect ratio; floating-point value [0.01 ..100]
frameRate	see "AVItem frameRate attribute" on page 40	frame rate of the AVItem [1..99].
frameDuration	see "AVItem frameDuration attribute" on page 39	frame rate for the AVItem [1/99 .. 1].
duration	see "AVItem duration attribute" on page 39	duration of the AVItem, in seconds [0 .. 10,800]
useProxy	see "AVItem useProxy attribute" on page 44	boolean describing whether a proxySource should be used for this item
proxySource	see "AVItem proxySource attribute" on page 42	FootageItem used as proxy of the AVItem; read-only
time	see "AVItem time attribute" on page 44	current time of the AVItem in seconds
usedIn	see "AVItem usedIn attribute" on page 44	array containing all the CompItems that use this AVItem
hasVideo	see "AVItem hasVideo attribute" on page 40	true if the AVItem has an audio component
hasAudio	see "AVItem hasAudio attribute" on page 40	true if the AVItem has a video component
footageMissing	see "AVItem footageMissing attribute" on page 39	true if the AVItem cannot be found or if it is a placeholder

Methods

Method	Reference	Description
duplicate()	see "CompItem duplicate() method" on page 57	creates and returns a duplicate of this comp item
layer()	see "CompItem layer() method" on page 58	returns the layer using index, relative index or name

Methods inherited from Item object and AVItem object (see "Item object" on page 97 and "AVItem object" on page 37)

Method	Reference	Description
remove()	see "Item remove() method" on page 99	deletes the item from the project
setProxy()	see "AVItem setProxy() method" on page 42	sets a proxy for the AVItem
setProxyWithSequence()	see "AVItem setProxyWithSequence() method" on page 43	sets a sequence as a proxy for the AVItem
setProxyWithSolid()	see "AVItem setProxyWithSolid() method" on page 43	sets a solid as a proxy (feature available only via scripting)
setProxyWithPlaceholder()	see "AVItem setProxyWithPlaceholder() method" on page 42	sets a placeholder as a proxy
setProxyToNone()	see "AVItem setProxyToNone() method" on page 42	removes the proxy

Example

Given that the first item in the project is a CompItem, the following code would result in two alerts. The first would display the number of layers in the CompItem, and the second would display the name of the last Layer in the CompItem.

```
var firstComp = app.project.item(1);
alert( "number of layers is " + firstComp.numLayers );
alert( "name of last layer is " + firstComp.layer(firstComp.numLayers).name );
```

CompItem activeCamera attribute

app.project.item(index).activeCamera

Description

The active camera is the front-most camera layer that is enabled. The value is null if the comp contains no enabled camera layers.

Type

Layer; read-only.

CompItem bgColor attribute

app.project.item(index).bgColor

Description

The bgColor attribute specifies the background color of the comp. The value should be an array containing three floats in the range [0..1] for red, green, and blue.

Type

Array of three floating-point values from 0 to 1: [R, G, B); read/write.

CompItem displayStartTime attribute

app.project.item(index).displayStartTime

Description

The displayStartTime attribute corresponds the time, in seconds, set as the begining of the composition. This is the equivalent of the Start Timecode or Start Frame setting in the Composition Settings window, expressed in seconds.

The permissible range is [0...86339] (86339 is 1 second less than 25 hours).

Type

Floating-point value; time, in seconds. Read/write.

CompItem draft3d attribute

app.project.item(index).draft3d

Description

The draft3d attribute determines whether Draft 3D mode is enabled for the Composition window. This corresponds to the value of the draft3d button in the Composition window.

Type

Boolean; if true, enables Draft 3D. Read/write.

CompItem duplicate() method

app.project.item(index).duplicate()

Description

The duplicate() method creates and returns a duplicate of this comp item. The duplicate will contain the same layers as the original.

Parameters

None.

Returns

CompItem.

CompItem frameBlending attribute

app.project.item(index).frameBlending

Description

The frameBlending attribute determines whether frame blending is enabled for this Composition. Corresponds to the value of the frame blending button in the Composition window.

Type

Boolean; if true, frame blending is enabled; read/write.

CompItem frameDuration attribute

app.project.item(index).frameDuration

Description

The frameDuration attribute returns the duration of a frame, in seconds. This is the inverse of the framerate (or frames per second). This attribute is read-only.

Type

Floating-point value; read-only.

CompItem hideShyLayers attribute

app.project.item(index).hideShyLayers

Description

The hideShyLayers attribute determines whether shy layers should be visible in the Timeline window. It corresponds to the value of the Hide All Shy Layers button in the Composition window.

If false, then only layers with "shy" set to false will be shown. If true, then all layers will be shown regardless of the value of their "shy" attributes.

Type

Boolean; if true, shy layers are visible. Read/write.

CompItem layer() method

app.project.item(index).layer(*index*)
app.project.item(index).layer(*otherLayer, relIndex*)
app.project.item(index).layer(*name*)

Description

The layer() method returns a specified layer object.

Using the syntax `layer(int index)` this method returns the layer with the given index. The given index must be in the range [1,numLayers], where numLayers is the number of layers in the Composition.

Using the syntax `layer(Layer otherLayer, int relIndex)` this method returns the layer whose index is that of the given otherlayer added to the given relindex. Relindex must be in the range [(1-otherlayer.index), (numlayers-otherlayer.index)].

Using the syntax `layer(String name)` this method returns the layer within the CompItem whose name matches the given name.

Parameters

Note that there are three separate types of usage possible with layer, with unique syntax for each:

index	index number of the specified layer; an integer

or

otherLayer	index number of the layer to which an offset will be applied
relIndex	relative position of the layer; the difference between the two index numbers expressed as an integer

or

name	name of the specified number; a text string

Returns

Layer object.

CompItem layers attribute

app.project.item(index).layers

Description

The layers attribute contains the LayerCollection for this composition.

Type

LayerCollection. Read-only.

CompItem motionBlur attribute

app.project.item(index).motionBlur

Description

The motionBlur attribute determines whether motion blur is enabled for the Composition. Corresponds to the value of the motion blur button in the Composition window.

Type

Boolean; if true, motion blur is enabled. Read/write.

CompItem numLayers attribute

app.project.item(index).numLayers

Description

The numLayers attribute is the number of layers in the CompItem. This always equals length of the LayerCollection.

Type

Integer. Read-only.

CompItem preserveNestedFrameRate attribute

app.project.item(index).preserveNestedFrameRate

Description

The preserveNestedFrameRate attribute determines whether the frame rate of nested compositions is preserved in the current composition. This corresponds to the value of the Preserve Frame Rate When Nested or in Render Queue option in the Advanced tab of the Composition Settings dialog box.

Type

Boolean; if true, nested frame rate is preserved. Read/write.

CompItem preserveNestedResolution attribute

app.project.item(index).preserveNestedResolution

Description

The preserveNestedResolution attribute determines whether the resolution of nested compositions is preserved in the current composition. This corresponds to the value of the Preserve Resolution When Nested option in the Advanced tab of the Composition Settings dialog box.

Type

Boolean; if true, nested frame rate is preserved. Read/write.

CompItem resolutionFactor attribute

app.project.item(index).resolutionFactor

Description

The resolutionFactor attribute specifies the sampling resolution of the comp when rendering.

Each of the two values in the array specifies how many pixels to skip when sampling in one of the two directions. The first number controls horizontal sampling; the second controls vertical sampling. Each of the two integers must lie in the range [1..99]. Full resolution is [1,1], half resolution is [2,2], and quarter resolution is [4,4]. The default is [1,1].

Type

Array of two integers, describing the *x* and *y* downsample resolution factor; read/write.

CompItem selectedLayers attribute

app.project.item(index).selectedLayers

Description

This attribute yields an array containing all of the selected Layers in this CompItem.

Type

Array of Layer objects; read-only.

CompItem selectedProperties attribute

app.project.item(index).selectedProperties

Description

This attribute yields an array containing all of the selected Property and PropertyGroup objects in this CompItem.

Type

Array of Property and PropertyGroup objects; read-only.

CompItem shutterAngle attribute

app.project.item(index).shutterAngle

Description

The shutterAngle attribute determines the shutter angle setting for the composition. This setting corresponds to the Shutter Angle setting found under the Advanced tab of the Composition Settings dialog box. Acceptable integer settings are within the range of 0 - 720.

Type

Integer value (0 - 720 range only). Read/write.

CompItem shutterPhase attribute

app.project.item(index).shutterPhase

Description

The shutterPhase attribute determines the shutter phase setting for the composition. This setting is the equivalent of the Shutter Phase setting found under the Advanced tab of the Composition Settings dialog box. Acceptable integer settings are within the range of 0 - 360.

Type

Integer value (-360 - 360 range only). Read/write.

CompItem workAreaDuration attribute

app.project.item(index).workAreaDuration

Description

The workAreaDuration attribute determines the duration, in seconds, of the work area. This value is the difference of the start point time of the Composition work area and the end point.

Type

Floating-point value; time, in seconds. Read/write.

CompItem workAreaStart attribute

app.project.item(index).workAreaStart

Description

The workAreaStart attribute determines the time, in seconds, where the Composition work area begins.

Type

Floating-point value; time, in seconds. Read/write.

File Class

The File Class contains methods and attributes common to File objects. A File object corresponds to a disk file.

Also included in this class are all attributes and methods within the FileSystem class, as those apply to Files as well as Folders.

Note that the difference between the File Class and File object is that the class attributes and methods require no specific instance of a File, whereas class methods and attributes do.

Class attributes inherited from FileSource object (see "FileSource object" on page 71)

Class attribute	Reference	Description
fs	see "FileSystem fs class attribute" on page 74	name of the file system; read-only

Methods

Method	Reference	Description
File() new File()	see "File() Class method" on page 62	constructs a new File object
openDialog()	see "File openDialog() Class method" on page 67	opens the built-in operating-system dialog to select an existing file to open
saveDialog()	see "File saveDialog() Class method" on page 69	opens the built-in operating-system dialog to select a file name to save a file into

Class methods inherited from FileSource object (see "FileSource object" on page 71)

Class method	Reference	Description
decode()	see "FileSystem decode() class method" on page 73	decodes the input string from UTF-8
encode()	see "FileSystem encode() class method" on page 73	encodes the input string in UTF-8

File() Class method

File(*path*)
new File(*path*)

Description

This function constructs a new File object. If the given path name refers to an already existing folder, a Folder object is returned instead.

The CRLF sequence is preset to the system default, and the encoding is preset to the default system encoding.

Parameters

Path, expressed as a string. If missing, a temporary name is generated.

Returns

File (or Folder if path refers to an existing folder).

File object

File("path")

Description

The File object contains methods and attributes common to File objects. A Folder object corresponds to a folder.

Also included in this object are all attributes and methods within the FileSystem object, as those apply to Files as well as Folders.

Attributes

Attribute	Reference	Description
creator	see "File creator attribute" on page 65	Macintosh file creator as a four-character string
encoding	see "File encoding attribute" on page 65	gets or sets the encoding for subsequent read/write operations
eof	see "File eof attribute" on page 66	has the value true if a read attempt caused the current position to be behind the end of the file
hidden	see "File hidden attribute" on page 66	set to true if the file is invisible
length	see "File length attribute" on page 66	size of the file in bytes
lineFeed	see "File lineFeed attribute" on page 66	way line feed characters are written
readonly	see "File readonly attribute" on page 69	when set, prevents the file from being altered or deleted
type	see "File type attribute" on page 70	Macintosh file type as a four-character string

Attributes inherited from FileSystem object (see "FileSystem object" on page 74)

Attribute	Reference	Description
absoluteURI	see "FileSystem absoluteURI attribute" on page 75	full path name for the object in URI notation
alias	see "FileSystem alias attribute" on page 76	returns true if the object refers to a file system alias
created	see "FileSystem created attribute" on page 76	creation date of the object
error	see "FileSystem error attribute" on page 76	contains a message describing the last file system error

Attribute	Reference	Description
exists	see "FileSystem exists attribute" on page 76	returns true if the path name of this object refers to an actually existing file or folder
fsName	see "FileSystem fsName attribute" on page 77	file-system specific name of the object as a full path name
modified	see "FileSystem modified attribute" on page 77	date of the object's last modification
name	see "FileSystem name attribute" on page 77	name of the object without the path specification
parent	see "FileSystem parent attribute" on page 78	folder object containing this object
path	see "FileSystem path attribute" on page 78	path portion of the absolute URI
relativeURI	see "FileSystem relativeURI attribute" on page 78	path name for the object in URI notation, relative to the current folder

Methods

Method	Reference	Description
close()	see "File close() method" on page 65	closes the open file
copy()	see "File copy() method" on page 65	copies the file to the given location
open()	see "File open() method" on page 67	opens the file for subsequent read/write operations
read()	see "File read() method" on page 68	reads the contents of the file from the current position on
readch()	see "File readch() method" on page 68	reads one single text character
readln()	see "File readln() method" on page 69	reads one line of text
seek()	see "File seek() method" on page 70	seeks to a certain position in the file
tell()	see "File tell() method" on page 70	returns the current position in the file as an offset in bytes
write()	see "File write() method" on page 71	writes the given string to the file
writeln()	see "File writeln() method" on page 71	writes the given string to the file and append a line feed sequence

Methods inherited from FileSystem object (see "FileSystem object" on page 74)

Method	Reference	Description
getRelativeURI()	see "FileSystem getRelativeURI() method" on page 77	calculates and returns the relative URI, given a base path, in URI notation
remove()	see "FileSystem remove() method" on page 78	deletes the file or folder that this object represents
rename()	see "FileSystem rename() method" on page 79	renames the object to the new name
resolve()	see "FileSystem resolve() method" on page 79	attempts to resolve the file system alias that this object points to

File close() method

File(path).close()

Description

The close() method closes the open file. The return value is true if the file was closed, false on I/O errors.

Parameters

None.

Returns

Boolean.

File copy() method

File(path).copy(*target*)

Description

The close() method copies the file to the given location.

You can supply a URI path name as well as another File object. If there is a file at the target location, it is overwritten.

The method returns true if the copy was successful, false otherwise. The method resolves any aliases to find the source file.

Parameters

target	File object or String specifying the target location

Returns

Boolean.

File creator attribute

File(path).creator

Description

The creator attribute is the Macintosh file creator as a four-character string. On Windows, the return value is always "????".

Type

String; read-only.

File encoding attribute

File(path).encoding

Description

The encoding attribute gets or sets the encoding for subsequent read/write operations.

The encoding is one of several predefined constants that follow the common Internet encoding names. Valid names are UCS-2, X-SJIS, ISO-8851-9, ASCII or the like.

A special encoder, BINARY, is used to read binary files. This encoder stores each byte of the file as one Unicode character regardless of any encoding. When writing, the lower byte of each Unicode character is treated as a single byte to write. See "Encoding Names" on page 228 for a list of encodings. If an unrecognized encoding is used, the encoding reverts to the system default encoding.

Type

String; read/write.

File eof attribute

File(path).eof

Description

The File eof attribute has the value true if a read attempt caused the current position to be past the end of the file.

If the file is not open, the value is true.

Type

Boolean; read-only.

File hidden attribute

File(path).hidden

Description

The File hidden attribute has the value true if the file is invisible. Assigning a Boolean value sets or clears this attribute.

Type

Boolean; read/write.

File length attribute

File(path).length

Description

The File length attribute is size of the file in bytes. When setting the file size, the file must not be open.

Type

Number; read-only.

File lineFeed attribute

File(path).lineFeed

Description

The File lineFeed attribute determines the way line feed characters are written. This can be one of the three values: macintosh, unix or windows (actually, only the first character is interpreted).

Type

String (one of: macintosh, unix, windows); read/write.

File open() method

File(path).open(*mode, type, creator*)

Description

The File open() method opens the file for subsequent read/write operations. The type and creator arguments are optional and Macintosh specific; they specify the file type and creator as two four-character strings. They are used if the file is newly created. On other platforms, they are ignored.

When open() is used to open a file for read access, the method attempts to detect the encoding of the open file. It reads a few bytes at the current location and tries to detect the Byte Order Mark character 0xFFFE. If found, the current position is advanced behind the detected character and the encoding property is set to one of the strings UCS-2BE, UCS-2LE, UCS4-BE, UCS-4LE or UTF-8. If the marker character cannot be found, it checks for zero bytes at the current location and makes an assumption about one of the above formats (except for UTF-8). If everything fails, the encoding property is set to the system encoding. The method resolves any aliases to find the file.

You should be careful if you try to open a file more than once. The operating system usually permits you to do so, but if you start writing to the file using two different File objects, you may destroy your data.

The return value is true if the file has been opened successfully, false otherwise.

Parameters

mode	one of r, w or e: r (read) Opens for reading. If the file does not exist or cannot be found, the call fails. w (write) Opens an empty file for writing. If the file exists, its contents are destroyed. e (edit) Opens an existing file for reading and writing.
type	The Macintosh file type; a four-byte character string; ignored on non-Macintosh operating systems.
creator	The Macintosh file creator; a four-byte character string; ignored on non-Macintosh operating systems.

Returns

Boolean.

File openDialog() Class method

File.openDialog(*prompt, select*)

Description

The File.openDialog class method presents the Open dialog box that is standard for the platform on which After Effects is running. This method overlaps somewhat with the easier to use fileGetDialog() global function.

Parameters

prompt	An optional prompt (expressed as a string) that is displayed as part of the dialog if the dialog permits the display of an additional message.
select	This argument allows the pre-selection of the files that the dialog displays. Unfortunately, this argument is different on Mac OS and on Windows.
select (Win)	Windows selection string is actually a list of file types with explanative text. This list appears in the bottom of the dialog box as a drop-down list box so the user can select which types of files to display. The elements of this list are separated by commas. Each element starts with the descriptive text, followed by a colon and the file search masks for this text. Again, each search mask is separated by a semicolon. A Selection list that allowed the selection of all text files (*.TXT and *.DOC) or all files would look like this: Text Files:*.TXT;*.DOC,All files:* A single asterisk character is a placeholder for all files.
select (Mac OS)	On Mac OS, the optional second argument is a callback function. This function takes one argument, which is a File object. When the dialog is set up, it calls this callback function for each file that is about to be displayed. If the function returns anything else than true, the file is not displayed. This is true only for the openDialog() method; the saveDialog() method ignores this callback method.

Returns

File object, or null if the user cancels the dialog.

See also

"FileSource object" on page 71.

File read() method

File(path).read(*chars*)

Description

The File read() method reads the contents of the file from the current position on. Returns a string that contains up to the number of characters that were supposed to be read.

Parameters

chars	The number of characters to read, expressed as an integer. If the number of characters to read is not supplied, the entire file is read in one big chunk, starting at the current position. If the file is encoded, multiple bytes may be read to create single Unicode characters.

Returns

String.

File readch() method

File(path).readch()

Description

The File readch() method reads one single text character. Line feeds are recognized as CR, LF, CRLF or LFCR pairs. If the file is encoded, multiple bytes may be read to create single Unicode characters.

Parameters

None.

Returns

String.

File readln() method

File(path).readln()

Description

The File readch() method reads one line of text. Line feeds are recognized as CR, LF, CRLF or LFCR pairs. If the file is encoded, multiple bytes may be read to create single Unicode characters.

Parameters

None.

Returns

String.

File readonly attribute

File(path).readonly

Description

The File readonly attribute, when set, prevents the file from being altered or deleted.

Type

Boolean; read/write.

File saveDialog() Class method

File.saveDialog(*prompt, select*)

Description

The File.saveDialog class method presents the Save dialog box that is standard for the platform on which After Effects is running. This method overlaps somewhat with the easier-to-use filePutDialog() global function.

Parameters

prompt	An optional prompt (expressed as a string) that is displayed as part of the dialog if the dialog permits the display of an additional message.
select	This argument allows the pre-selection of the files that the dialog displays. Unfortunately, this argument is different on Mac OS and on Windows.
select (Win)	Windows selection string is actually a list of file types with explanative text. This list is displayed in the bottom of the dialog as a drop-down list box so the user can select which types of files to display. The elements of this list are separated by commas. Each element starts with the descriptive text, followed by a colon and the file search masks for this text. Again, each search mask is separated by a semicolon. A Selection list that allowed the selection of all text files (*.TXT and *.DOC) or all files would look like this: Text Files:*.TXT;*.DOC,All files:* A single asterisk character is a placeholder for all files.

select (Mac OS)	On Mac OS, the optional second argument is a callback function. This function takes one argument, which is a File object. When the dialog is set up, it calls this callback function for each file that is about to be displayed. If the function returns anything else than true, the file is not displayed. This is true only for the openDialog() method; the saveDialog() method ignores this callback method.

Returns

File object, or null if the user cancels the dialog.

See also

"filePutDialog() global function" on page 24

File seek() method

File(path).seek(*pos, mode*)

Description

The File seek() method seeks to a certain position in the file. This method does not permit seeking to positions less than 0 or greater than the current file size.

Parameters

pos	the new current position inside the file as an offset in bytes (an integer), dependent on the seek mode
mode	the seek mode (0 = seek to absolute position, 1 = seek relative to the current position, 2 = seek backwards from the end of the file)

Returns

Boolean; true if the position was changed.

File tell() method

File(path).tell()

Description

The File tell() method returns the current position in the file as an offset in bytes.

Parameters

None.

Returns

Integer.

File type attribute

File(path).type

Description

The File type attribute holds the Macintosh file type as a four-character string.

On Mac OS, the file type is returned. On Windows, "appl" is returned for .EXE files, "shlb" for .DLLs and "TEXT" for any other file. If the file does not exist, the file type is "????".

Type

Boolean; read-only.

File write() method

File(path).write(*text, ...*)

Description

The File write() method writes a given string to the file. The parameters of this function are concatenated to a single string. Returns true on success.

For encoded files, writing a single Unicode character may result in multiple bytes being written. Take care not to write to a file that is open in another application or object. This may cause loss of data, since a second write issued from another File object may overwrite existing data.

Parameters

text	A string or set of strings. All arguments are concatenated to form the string to be written.

Returns

Boolean.

File writeln() method

File(path).writeln(*text, ...*)

Description

The File writeln() method writes a given string to the file. The parameters of this function are concatenated to a single string, and a Line Feed sequence is appended. Returns true on success.

If the file is encoded, multiple bytes may be read to create single Unicode characters.

Parameters

text	A string or set of strings. All arguments are concatenated to form the string to be written.

Returns

Boolean.

FileSource object

app.project.item(index).mainSource
app.project.item(index).proxySource

Description

The FileSource describes footage that comes from a file. FileSource is a subclass of FootageSource and so it inherits all attributes and methods of FootageSource.

Attributes

Attribute	Reference	Description
file	see "FileSource file attribute" on page 72	specifies the file that defines this FileSource

Methods

Method	Reference	Description
reload()	see "FileSource reload() method" on page 72	reloads the asset from the file

FileSource file attribute

app.project.file

Description

The FileSource file attribute specifies the file that defines this FileSource. The attribute is readOnly.

Note that there are other ways to change the file. If this FootageSource is a proxySource of an AVItem, you can call setProxy() or setProxyWithSequence() to change files. If this FootageSource is a mainSource of a FootageItem, you can call replace() or replaceWithSequence() to change files.

Type

File; read-only.

FileSource reload() method

app.project.mainSource.reload()

Description

The FileSource reload() method reloads the asset from the file. This method can be called only on a mainSource, not a proxySource.

Parameters

None.

Returns

None.

FileSystem Class

File.
Folder.

Description

The FileSystem class contains methods and attributes common to both File and Folder objects. A File object corresponds to a disk file, while a Folder object matches a folder.

This attribute and methods differ from those found under the FileSystemObject in that they can be applied without referring to a particular instance of a file or folder.

Class attributes

Class attribute	Reference	Description
fs	see "FileSystem fs class attribute" on page 74	name of the files system; read-only

Class methods

Class method	Reference	Description
decode()	see "FileSystem decode() class method" on page 73	decodes the input string from UTF-8
encode()	see "FileSystem encode() class method" on page 73	encodes the input string in UTF-8

FileSystem decode() class method

File.decode(*string*)
Folder.decode(*string*)

Description

The decode() class method of File or Folder decodes escaped characters and then interprets them as UTF-8.

Parameters

string	string to be decoded

Returns

String.

See also

"FileSystem encode() class method" on page 73

FileSystem encode() class method

File.encode(*string*)
Folder.encode(*string*)

Description

The encode() class method of File or Folder converts the input string to UTF-8 and then encodes it such that all characters are usable in a URI (or URL).

Parameters

string	string to be encoded

Returns

String.

See also

"FileSystem alias attribute" on page 76

FileSystem fs class attribute

File.fs
Folder.fs

Description

The fs class attribute of File or Folder holds the name of the file system (operating system). Possible values are "Windows" or "Macintosh".

Type

String; read-only.

Example

```
write("The local file system is " + File.fs);
```

FileSystem object

File("path").
Folder("path").

Description

The FileSystem object contains methods and attributes common to both File and Folder objects. A File object corresponds to a disk file, while a Folder object matches a folder. "FileSystem" is a name used to refer to both Folders and Files.

These attributes and methods differ from those found under the FileSystem Class in that they cannot be applied without referring to a particular instance of a file or folder, expressed as a path to that file or folder.

You can use absolute path names and relative path names. Absolute path names start with one or two slash characters. These path names describe the full path from a root folder down to a file or folder. Relative path names start from a known location, the current folder. A relative path name starts either with a folder name or with one of the special names "." and "..". The name "." refers to the current folder, and the name ".." refers to the parent folder. The slash character is used to separate path elements. Special characters are encoded in UTF-8 notation.

The FileSystem objects support a common convention. A volume name may be the first part of an absolute path. The objects know where to look for the volume names on Mac OS and Windows and they translate the volume names accordingly.

A path name can also start with the tilde "~" character. This character stands for the user's home directory (on Mac OS). On Windows, a directory with the environment variable HOME or, failing that, the desktop is used as a home directory.

The following table illustrates how the root element of a full path name is used on different file systems. In these examples, the current drive is C: on Windows and "Macintosh HD" on Mac OS.

URI	Windows name	Mac OS name
/d/dir/name.ext	D:\dir\name.ext	Macintosh HD:d:dir:name.ext

/Macintosh HD/dir/name.ext	C:\Macintosh HD\dir\name.ext	Macintosh HD:dir:name.ext

Thus if you have to use a script with URI notation on both Mac OS and Windows, try to use relative path names, or try to originate your path names from the home directory. If that is not possible, it is recommended that you work with Mac OS X aliases and UNC names on Windows, and store files on a machine that is remote to the Windows machine on which the script is running.

Attributes

Attribute	Reference	Description
absoluteURI	see "FileSystem absoluteURI attribute" on page 75	full path name for the object in URI notation
alias	see "FileSystem alias attribute" on page 76	returns true if the object refers to a file system alias
created	see "FileSystem created attribute" on page 76	creation date of the object
error	see "FileSystem error attribute" on page 76	contains a message describing the last file system error
exists	see "FileSystem exists attribute" on page 76	returns true if the path name of this object refers to an actually existing file or folder
fsName	see "FileSystem fsName attribute" on page 77	file-system specific name of the object as a full path name
modified	see "FileSystem modified attribute" on page 77	date of the object's last modification
name	see "FileSystem name attribute" on page 77	name of the object without the path specification
parent	see "FileSystem parent attribute" on page 78	folder object containing this object
path	see "FileSystem path attribute" on page 78	path portion of the absolute URI
relativeURI	see "FileSystem relativeURI attribute" on page 78	path name for the object in URI notation, relative to the current folder

Methods

Method	Reference	Description
getRelativeURI()	see "FileSystem getRelativeURI() method" on page 77	calculate and return the relative URI, given a base path, in URI notation
remove()	see "FileSystem remove() method" on page 78	delete the file or folder that this object represents
rename()	see "FileSystem rename() method" on page 79	rename the object to the new name
resolve()	see "FileSystem resolve() method" on page 79	attempt to resolve the file system alias that this object points to

FileSystem absoluteURI attribute

File(path).absoluteURI

Folder(path).absoluteURI

Description

The absoluteURI attribute of File or Folder is the full path name for the object in URI notation.

Type

String; read-only.

FileSystem alias attribute

File(path).alias
Folder(path).alias

Description

The alias attribute of File or Folder returns true if the object refers to a file system alias.

Type

Boolean; read-only.

FileSystem created attribute

File(path).created
Folder(path).created

Description

The created attribute of File or Folder is the creation date of the object. If the object does not refer to a folder or file on the disk, the value is null.

Type

Date, or null if the object does not refer to a file or folder on disk; read-only.

FileSystem error attribute

File(path).error
Folder(path).error

Description

The error attribute of File or Folder contains a message describing the last file system error. Setting this value clears any error message and resets the error bit for opened files.

Type

Boolean; read/write (writing resets the error bit).

FileSystem exists attribute

File(path).exists
Folder(path).exists

Description

The exists attribute of File or Folder returns true if the path name of this object refers to an already existing file or folder.

Type

Boolean; read-only.

FileSystem fsName attribute

File(path).fsName
Folder(path).fsName

Description

The fsName attribute of File or Folder is the file-system specific name of that object as a full path name.

Type

String; read-only.

FileSystem getRelativeURI() method

File(path).getRelativeURI(*string*)
Folder(path).getRelativeURI(*string*)

Description

The getRelativeURI() method of File or Folder calculates and returns the relative URI, given a base path, in URI notation. If the base path is omitted, the path of the current folder is assumed.

Parameters

string	base path, in URI notation

Returns

String.

FileSystem modified attribute

File(path).modified
Folder(path).modified

Description

The modified attribute of File or Folder is the date of the object's last modification. If the object does not refer to a folder or file on disk, the value is null.

Type

Date, or null if no valid FileSystem object is referenced; read-only.

FileSystem name attribute

File(path).name
Folder(path).name

Description

The name attribute of File or Folder is the name of the object without the path specification.

Type

String; read-only.

FileSystem parent attribute

File(path).parent
Folder(path).parent

Description

The parent attribute of File or Folder is the folder object containing this object. If this object already is the root folder of a volume, the property value is null.

Type

Folder, or null if the object has no parent; read-only.

FileSystem path attribute

File(path).path
Folder(path).path

Description

The path attribute of File or Folder is the path portion of the absolute URI. If the name does not have a path, this property contains the empty string.

Type

String, empty if name has no path; read-only.

FileSystem relativeURI attribute

File(path).relativeURI
Folder(path).relativeURI

Description

The relativeURI attribute of File or Folder is the path name for the object in URI notation, relative to the current folder.

Type

String; read-only.

FileSystem remove() method

File(path).remove()
Folder(path).remove()

Description

The remove() method of File or Folder deletes the file or folder that this object represents. Folders must be empty before they can be deleted. The return value is true if the file or folder has been deleted.

IMPORTANT: *The remove() method deletes the referenced file or folder immediately. It does not move the referenced file or folder to the system trash. The effects of the remove method cannot be undone. It is recommended that you prompt the user for permission to delete a file or folder before deleting it. The method does not resolve aliases; it rather deletes the file alias itself.*

Parameters

None.

Returns

Boolean.

FileSystem rename() method

File(path).rename(*string*)
Folder(path).rename(*string*)

Description

The rename() method of File or Folder renames the object to a new name. The new name must not have a path. This method returns true if the object was renamed. The method does not resolve aliases, but rather renames the alias file.

Parameters

string	the new name for the object

Returns

Boolean.

FileSystem resolve() method

File(path).resolve()
Folder(path).resolve()

Description

The resolve() method of File or Folder attempts to resolve the file system alias that this object points to. If successful, a new File or Folder object is returned that points to the resolved file system element. If the object is not an alias, or if the alias could not be resolved, the return value is null.

Parameters

None.

Returns

FileSystem object (File or Folder) or null if no alias.

Folder class

Folder.

Description

The Folder class contains methods and attributes common to Folder objects. A Folder object corresponds to a folder.

Also included in this class are all attributes and methods within the FileSystem class, as those apply to Folders as well as Files.

Note that the difference between the Folder Class and Folder object is that the class attributes and methods require no specific instance of a Folder, whereas class methods and attributes do.

Attributes

Attribute	Reference	Description
current	see "Folder current Class attribute" on page 81	current folder is returned as a Folder object
startup	see "Folder startup Class attribute" on page 81	folder containing the executable image of the running application
system	see "Folder system Class attribute" on page 82	folder containing the operating system files
temp	see "Folder temp Class attribute" on page 82	default folder for temporary files
trash	see "Folder trash Class attribute" on page 82	folder containing deleted items

Class attributes from FileSystem object (see "FileSystem object" on page 74)

Class attribute	Reference	Description
fs	see "FileSystem fs class attribute" on page 74	name of the files system; read-only

Methods

Method	Reference	Description
Folder() new Folder()	see "Folder create() method" on page 84	constructs a new Folder object
selectDialog()	see "Folder selectDialog() Class method" on page 81	opens a dialog box that permits you to select a folder using the OS specific folder select dialog

Class methods from FileSystem object (see "FileSystem object" on page 74)

Class method	Reference	Description
decode()	see "FileSystem decode() class method" on page 73	decodes the input string from UTF-8
encode()	see "FileSystem encode() class method" on page 73	encodes the input string in UTF-8

Folder() Class method

Folder(*path*)
new Folder(*path*)

Description

This function constructs a new Folder object. If the given path name refers to an already existing disk file, a File object is returned instead.

The folder that the path name refers to does not need to exist. If the argument is omitted, a temporary name is generated.

Parameters

path	path for the folder created, expressed as a string

Returns

Folder (or File if path refers to an existing file).

Folder current Class attribute

Folder.current

Description

The current attribute of Folder is the current folder. It is returned as a Folder object. Assigning either a Folder object or a string containing the new path name sets the current folder.

Type

Folder; read/write.

Folder selectDialog() Class method

Folder.selectDialog(*prompt, preset*)

Description

The Folder SelectDialog() method opens a dialog box that permits you to select a folder using the platform-specific selection dialog box. Both arguments are optional.

Parameters

prompt	String	displays a prompt text if the dialog allows the display of such a message; optional
preset	Folder	a folder that is pre-selected when the dialog opens

Returns

Folder object pointing to the selected folder, or null if the user cancels the dialog.

Folder startup Class attribute

Folder.startup

Description

The startup attribute of Folder is the folder containing the executable image of the running application.

Type

Folder; read-only.

Folder system Class attribute

Folder.system

Description

The system attribute of Folder is the folder containing the operating system files.

Type

Folder; read-only.

Folder temp Class attribute

Folder.temp

Description

The temp attribute of Folder is the default folder for temporary files.

Type

Folder; read-only.

Folder trash Class attribute

Folder.trash

Description

The trash attribute of Folder is the folder containing deleted items.

Type

Folder; read-only.

Folder object

Folder("path").

Description

The Folder object contains methods and attributes common to Folder objects. A Folder object corresponds to a folder.

Also included in this object are all attributes and methods within the FileSystem object, as those apply to Folders as well as Files.

Attributes inherited from the FileSystem object (see "FileSystem object" on page 74)

Attribute	Reference	Description
absoluteURI	see "FileSystem absoluteURI attribute" on page 75	full path name for the object in URI notation
alias	see "FileSystem alias attribute" on page 76	returns true if the object refers to a file system alias
created	see "FileSystem created attribute" on page 76	creation date of the object
error	see "FileSystem error attribute" on page 76	contains a message describing the last file system error
exists	see "FileSystem exists attribute" on page 76	returns true if the path name of this object refers to an actually existing file or folder
fsName	see "FileSystem fsName attribute" on page 77	file-system specific name of the object as a full path name
modified	see "FileSystem modified attribute" on page 77	date of the object's last modification
name	see "FileSystem name attribute" on page 77	name of the object without the path specification
parent	see "FileSystem parent attribute" on page 78	folder object containing this object
path	see "FileSystem path attribute" on page 78	path portion of the absolute URI
relativeURI	see "FileSystem relativeURI attribute" on page 78	path name for the object in URI notation, relative to the current folder

Methods

Method	Reference	Description
create()	see "Folder create() method" on page 84	attempts to create a folder at the location the path name points to
getFiles()	see "Folder getFiles() method" on page 84	gets a list of File and Folder objects contained in the folder object

Methods inherited from FileSystem object (see "FileSystem object" on page 74)

Method	Reference	Description
getRelativeURI()	see "FileSystem getRelativeURI() method" on page 77	calculates and returns the relative URI, given a base path, in URI notation
remove()	see "FileSystem remove() method" on page 78	deletes the file or folder that this object represents
rename()	see "FileSystem rename() method" on page 79	renames the object to the new name
resolve()	see "FileSystem resolve() method" on page 79	attempts to resolve the file system alias that this object points to

Folder create() method

Folder(path).create()

Description

The create() method attempts to create a folder at the location the path name points to.

Parameters

None.

Returns

Boolean; true if the folder was created.

Folder getFiles() method

Folder.getFiles(*mask*)

Description

The Folder getFiles() method returns a list of File and Folder objects contained in the folder object. The mask parameter is the search mask for the file names, expressed as a string. It may contain question marks and asterisks and is preset to * to find all files.

Alternatively, a function may be supplied. This function is called with a File or Folder object for every file or folder in the directory search. If the function returns true, the object is added to the array.

On Windows, all aliases end with the extension ".lnk". This extension is stripped from the file name when found to preserve compatibility with other operating systems. You can, however, search for all aliases by supplying the search mask "*.lnk". This is *not* recommended, however, because it is not portable.

Parameters

mask	String	search mask for the files names (see above)

Returns

Array of File & Folder objects or null if the folder does not exist.

FolderItem object

app.project.FolderItem

Description

The FolderItem object corresponds to any folder in your Project window. It can contain various types of items (footage, compositions, solids) as well as other folders.

Attributes

Attribute	Reference	Description
items	see "FolderItem items attribute" on page 85	ItemCollection that represents the contents of this FolderItem

Attribute	Reference	Description
numItems	see "FolderItem numItems attribute" on page 86	number of items contained in the FolderItem

Methods

Method	Reference	Description
item()	see "FolderItem item() method" on page 85	returns an Item

Example

Given that the second item in the project is a FolderItem, the following code puts up one alert for each top-level item in the folder. The alerts display the name of each top-level item.

```
var secondItem = app.project.item(2);
if ( !(secondItem instanceof FolderItem) ) {
  alert( "problem: second item is not a folder");
} else {
  for (i = 1; i <= secondItem.numItems; i++ ) {
    alert( "item number " + i + " within the folder is named "
      + secondItem.item(i).name);
  }
}
```

FolderItem item() method

app.project.folderItem.item(*index*)

Description

The FolderItem item() method returns the top-level item in this FolderItem with the given index. Note that "top-level" here means top-level within the folder, not necessarily within the project.

Parameters

index	Integer	index number of the FolderItem

Returns

Item.

FolderItem items attribute

app.project.folderItem.items

Description

The items attribute is the ItemCollection that represents the contents of this FolderItem.

Unlike the ItemCollection that is owned by the Project object, a FolderItem's ItemCollection contains only the top-level Items in the FolderItem.

Note that "top-level" indicates top-level within the folder, not necessarily within the project. Only in the case of the rootFolder are the top-level items in the FolderItem also top-level items in the Project.

Type

ItemCollection; read only.

FolderItem numItems attribute

*app.project.folderItem.*numItems

Description

The numItems attribute is the number of items contained in the FolderItem.

This number is the number of top-level Items within the folder. In other words, if this FolderItem contains another FolderItem, then the contained FolderItem counts as one item, even if there are further sub-items inside the contained folder.

Type

Integer; read only.

FootageItem object

*app.project.*item(*index*)
*app.project.*items[*index*]

Description

The FootageItem object represents a footage item imported into the project, which appears in the Project window.

Attributes

Attribute	Reference	Description
file	see "FootageItem file attribute" on page 87	footage source file
mainSource	see "FootageItem mainSource attribute" on page 87	contains all settings related to the footage item

Methods

Method	Reference	Description
replace()	see "FootageItem replace() method" on page 87	replaces a footage file with another footage file
replaceWithPlaceholder()	see "FootageItem replaceWithPlaceholder() method" on page 87	replaces a footage file with a placeholder object
replaceWithSequence()	see "FootageItem replaceWithSequence() method" on page 88	replaces a footage file with an image sequence
replaceWithSolid()	see "FootageItem replaceWithSolid() method" on page 88	replaces a footage file with a solid

FootageItem file attribute

app.project.item(index).file

Description

The file attribute is the File object of the footage's source file.

If the FootageItem's mainSource is a FileSource, this is the same thing as mainSource.file Otherwise it is NULL.

Type

File object (or null if mainSoure is not a FileSource); read only.

FootageItem mainSource attribute

app.project.item(index).mainSource.

Description

The footage item mainSource attribute contains all of the settings related to that footage item, including those that are normally accessed via the Interpret Footage dialog box. See also FootageSource (and its three types: SolidSource, FileSource, and PlaceholderSource).

The attribute is read-only, but it can be changed by calling any of the FootageItem methods that change the footage source: replace(), replaceWithSequence(), replaceWithSolid(), and replaceWithPlaceholder().

Type

FootageSource. Read-only.

FootageItem replace() method

app.project.item(index).replace(*file*)

Description

The FootageItem replace() method replaces the FootageItem with the file given as a parameter.

In After Effects 6.5, in addition to loading the given file, this method does the following:

• Sets the mainSource to a new value reflecting the contents of the new file.

• Sets the name, width, height, frameDuration, and duration attributes, defined in the base AVItem class, based on the contents of the file.

• Preserves interpretation parameters from the previous mainSource.

• Guesses the alpha if replace() is called with a file that has an unlabeled alpha channeI.

Parameters

file	File object

FootageItem replaceWithPlaceholder() method

app.project.item(index).replaceWithPlaceholder(*name, width, height, frameRate, duration*)

Description

The FootageItem replaceWithSequence() method replaces the FootageItem with the image sequence given as a parameter.

In After Effects 6.5, in addition to loading the given file, this method does the following:

• Sets the mainSource to a new value reflecting the contents of the new file.

• Sets the name, width, height, frameDuration, and duration attributes, defined in the base AVItem class, based on the contents of the file.

• Preserves interpretation parameters from the previous mainSource.

• Guesses the alpha if replace() is called with a file that has an unlabeled alpha channeI.

Parameters

name	string	name of the placeholder
width	integer	width of the placeholder [4..30,000]
height	integer	height of the placeholder [4..30,000]
frameRate	Floating-point value	frame rate of the Placeholder [1..99]
duration	Floating-point value	duration of the Placeholder [0..10,800]

FootageItem replaceWithSequence() method

app.project.item(index).replaceWithSequence(*file, forceAlphabetical*)

Description

The FootageItem replaceWithSequence() method replaces the FootageItem with the image sequence given as a parameter.

In After Effects 6.5, in addition to loading the given file, this method does the following:

• Sets the mainSource to a new value reflecting the contents of the new file.

• Sets the name, width, height, frameDuration, and duration attributes, defined in the base AVItem class, based on the contents of the file.

• Preserves interpretation parameters from the previous mainSource.

• Guesses the alpha if replace() is called with a file that has an unlabeled alpha channel.

Parameters

file	File object	replacement file
forceAlphabetical	boolean	value of true is equivalent to activating the Force Alphabetical Order option in the File > Replace > Footage > File dialog box.

FootageItem replaceWithSolid() method

app.project.item(index).replaceWithSolid(*color, name, width, height, pixelAspect*)

Description

The FootageItem replaceWithSequence() method replaces the FootageItem with the image sequence given as a parameter.

In After Effects 6.5, in addition to loading the given file, this method does the following:

• Sets the mainSource to a new value reflecting the contents of the new file.

• Sets the name, width, height, frameDuration, and duration attributes, defined in the base AVItem class, based on the contents of the file.

• Preserves interpretation parameters from the previous mainSource.

• Guesses the alpha if replace() is called with a file that has an unlabeled alpha channeI.

Parameters

color	Floating-point array	color of the solid (an array of four floating-point values from 0 to 1: [R, G, B, A])
name	string	name of the solid
width	integer	width of the solid [4..30,000]
height	integer	height of the solid [4..30,000]
pixelAspect	Floating-point value	pixel aspect ratio of the Solid [0.01..100]

FootageSource object

app.project.item(index).mainSource.
app.project.item(index).proxySource.

Description

The FootageSource object holds information describing the source of some footage. It is used to hold the mainSource of a FootageItem, or the proxySource of an AVItem. AVItem is the base class of FootageItem and CompItem; thus proxySource appears in both these types of Item.

Attributes

Attribute	Reference	Description
hasAlpha	see "FootageSource hasAlpha attribute" on page 92	specifies if a footage clip or proxy includes an alpha channel
alphaMode	see "FootageSource alphaMode attribute" on page 90	specifies the mode of an alpha channel
premulColor	see "FootageSource premulColor attribute" on page 94	specifies the color to be premultiplied
invertAlpha	see "FootageSource invertAlpha attribute" on page 93	specifies if an alpha channel in a footage clip or proxy should be inverted
isStill	see "FootageSource isStill attribute" on page 93	specifies if footage is a still image
fieldSeparationType	see "FootageSource fieldSeparationType attribute" on page 91	specifies the field separation type

Attribute	Reference	Description
highQualityFieldSeparation	see "FootageSource highQualityFieldSeparation attribute" on page 92	specifies how the fields are to be separated in a non-still footage.
removePulldown	see "FootageSource removePulldown attribute" on page 94	specifies the Pulldown Type for the footage
loop	see "FootageSource loop attribute" on page 93	specifies how many times an image sequence is set to loop
nativeFrameRate	see "FootageSource nativeFrameRate attribute" on page 93	the native frame rate of the footage
displayFrameRate	see "FootageSource displayFrameRate attribute" on page 91	the effective frame rate as displayed and rendered in compositions by After Effects
conformFrameRate	see "FootageSource conformFrameRate attribute" on page 90	specifies the rate to which footage should conform

Methods

Method	Reference	Description
guessAlphaMode()	see "FootageSource guessAlphaMode() method" on page 91	guesses the alphaMode setting
guessPulldown()	see "FootageSource guessPulldown() method" on page 92	guesses the pulldownType setting

FootageSource alphaMode attribute

*app.project.item(index).mainSource.*alphaMode
*app.project.item(index).proxySource.*alphaMode

Description

The alphaMode attribute of footageSource defines how the alpha information in the footage is to be interpreted. If hasAlpha is false, this attribute has no relevant meaning.

Type

AlphaMode; one of the following (read/write):

AlphaMode.IGNORE
AlphaMode.STRAIGHT
AlphaMode.PREMULTIPLIED

FootageSource conformFrameRate attribute

*app.project.item(index).mainSource.*conformFrameRate
*app.project.item(index).proxySource.*conformFrameRate

Description

The conformFrameRate attribute of FootageSource determines a frame rate to use instead of the nativeFrameRate. If set to 0, the nativeFrameRate will be used instead. Permissible range is [0 .. 99.0].

It is an error to set this value if FootageSource.isStill is true. It is an error to set this value to 0 if removePulldown is not set to PulldownPhase.OFF. If this is 0 when you set removePulldown to a value other than PulldownPhase.OFF, then this will be set to be equal to nativeFrameRate by default.

Type

Floating-point value; read/write.

FootageSource displayFrameRate attribute

*app.project.item(index).mainSource.*displayFrameRate
*app.project.item(index).proxySource.*displayFrameRate

Description

The displayFrameRate attribute of FootageSource corresponds to the effective frame rate as displayed and rendered in compositions by After Effects.

If removePulldown is PulldownPhase.OFF, then this will be the conformFrameRate (if non-zero) or the nativeFrameRate (if conformFrameRate is 0). If removePulldown is not PulldownPhase.OFF, then this will be (0.8 * conformFrameRate), the effective frame rate after removing 1 of every 5 frames.

Type

Floating-point value; read-only.

FootageSource fieldSeparationType attribute

*app.project.item(index).mainSource.*fieldSeparationType
*app.project.item(index).proxySource.*fieldSeparationType

Description

The fieldSeparationType attribute of FootageSource specifies how the fields are to be separated in a non-still footage.

It is an error to attempt to write to this attribute if isStill is true. It is an error to set this value to FieldSeparationType.OFF if removePulldown is not PulldownPhase.OFF. You must instead change removePulldown to PulldownPhase.OFF, and then set the fieldSeparationType to FieldSeparationType.OFF.

Enumerated Types

FieldSeparationType (read/write); one of:

NONE
UPPER_FIELD_FIRST
LOWER_FIELD_FIRST

FootageSource guessAlphaMode() method

*app.project.item(index).mainSource.*guessAlphaMode()
*app.project.item(index).proxySource.*guessAlphaMode()

Description

The guessAlphaMode() method sets alphaMode, premulColor, and invertAlpha to the best guesses for this footage source. If hasAlpha is false, no change will occur.

Parameters

None.

Returns

None.

FootageSource guessPulldown() method

app.project.item(index).mainSource.guessPulldown(*method*)
app.project.item(index).proxySource.guessPulldown(*method*)

Description

The guessPulldown() method sets the fieldSeparationType and removePulldown to the best guesses for this footage source. If isStill is true, no change will occur.

Parameters

Pulldown-Method	used as an input argument to the guessPulldown()method of a FootageSource; use one of Enumerated Types below

Enumerated Types

PULLDOWN_3_2	uses 3:2 pulldown method
ADVANCE_24P	uses Advance 24p method

Returns

None.

FootageSource hasAlpha attribute

app.project.item(index).mainSource.hasAlpha
app.project.item(index).proxySource.hasAlpha

Description

The hasAlpha attribute of FootageSource is true if the footage has an alpha component.

If true, then the attributes alphaMode, invertAlpha, and premulColor will have relevance. If false, then those three fields have no relevant meaning for the footage.

Type

Boolean; true if alpha exists. Read-only.

FootageSource highQualityFieldSeparation attribute

app.project.item(index).mainSource.highQualityFieldSeparation
app.project.item(index).proxySource.highQualityFieldSeparation

Description

The highQualityFieldSeparation attribute of FootageSource specifies whether After Effects will use special algorithms to determine how to perform field separation.

It is an error to attempt to write to this attribute if isStill is true. It is an error to attempt to write to this attribute if fieldSeparationType is FieldSeparationType.OFF.

Type

Boolean; true if high quality is activated. Read/write.

FootageSource invertAlpha attribute

*app.project.item(index).mainSource.*invertAlpha
*app.project.item(index).proxySource.*invertAlpha

Description

The invertAlpha attribute of footageSource determines if an alpha channel in a footage clip or proxy should be inverted.

This attribute is valid only if an alpha is present. If hasAlpha is false, or if alphaMode is AlphaMode.IGNORE, then this attribute has no relevant meaning.

Type

Boolean; true if alpha is inverted. Read/write.

FootageSource isStill attribute

*app.project.item(index).mainSource.*isStill
*app.project.item(index).proxySource.*isStill

Description

The isStill attribute of footageSource specifies whether the footage is still or has a time-based component.

Examples of still footage are JPEG files, solids, and placeholders with duration of 0. Examples of non-still footage are movie files, sound files, sequences, and placeholders of non-zero duration.

Type

Boolean; true if a still frame. Read-only.

FootageSource loop attribute

*app.project.item(index).mainSource.*loop
*app.project.item(index).proxySource.*loop

Description

The loop attribute of footageSource specifies the number of times that the footage is to be played consecutively when used in a comp.

Legal range for values is [1 .. 9999] with a default value of 1. It is an error to attempt to write this attribute if isStill is true.

Type

Integer; number of times the sequence will loop. Read/write.

FootageSource nativeFrameRate attribute

*app.project.item(index).mainSource.*nativeFrameRate
*app.project.item(index).proxySource.*nativeFrameRate

Description

The nativeFrameRate attribute of footageSource corresponds to the native frame rate of the footage.

Type

Floating-point value. Read/write.

FootageSource premulColor attribute

*app.project.item(index).mainSource.*premulColor
*app.project.item(index).proxySource.*premulColor

Description

The premulColor attribute of footageSource determines the color to be premultiplied. This attribute is valid only if the alphaType is set to PREMULTIPLIED.

Type

Color (an array of four floating-point values from 0 to 1: [R, G, B, A]); read/write.

FootageSource removePulldown attribute

*app.project.item(index).mainSource.*removePulldown
*app.project.item(index).proxySource.*removePulldown

Description

The removePulldown attribute of Footage File Info specifies how the pulldowns are to be removed when field separation is used.

It is an error to attempt to write to this attribute if isStill is true. It is an error to attempt to set this to a value other than PulldownPhase.OFF in the case where fieldSeparationType is FieldSeparationType.OFF. The field-SeparationType must be changed first.

Enumerated Type

PulldownPhase (read/write); one of:

RemovePulldown.OFF
RemovePulldown.WSSWW
RemovePulldown.SSWWW
RemovePulldown.SWWWS
RemovePulldown.WWWSS
RemovePulldown.WWSSW
RemovePulldown.WSSWW_24P_ADVANCE
RemovePulldown.SSWWW_24P_ADVANCE
RemovePulldown.SWWWS_24P_ADVANCE
RemovePulldown.WWWSS_24P_ADVANCE
RemovePulldown.WWSSW_24P_ADVANCE

ImportOptions object

new ImportOptions();
new ImportOptions(*File*);

Description

The ImportOptions object provides the ability to create, change, and access options for the importFile() method. You can create ImportOptions using one of two constructors, one of which takes arguments, the other which does not.

Constructors

If importFile() is set without arguments, it has a "file" that does not exist unless it is set in another statement:

```
new ImportOptions().file = new File("myfile.psd");
```

Otherwise importFile can be set with a single argument, which is a File object:

```
var my_io = new ImportOptions( new File( "myfile.psd" ) );
```

Attributes

Attributes	Reference	Description
importAs	see "ImportOptions importAs attribute" on page 96	contains the ImportAsType
sequence	see "ImportOptions sequence attribute" on page 96	boolean to determine whether a sequence or an individual file is imported
forceAlphabetical	see "ImportOptions forceAlphabetical attribute" on page 96	boolean to determine whether the Force Alphabetical Order option is set
file	see "ImportOptions file attribute" on page 96	the file to import

Methods

Method	Reference	Description
canImportAs()	see "ImportOptions canImportAs() method" on page 95	sets the ImportAsType, allowing the input to be restricted to a particular type

ImportOptions canImportAs() method

importOptions.canImportAs(*ImportAsType*)

Description

The canImportAs() method is used to determine whether a given file can be imported as a given ImportAsType, passed in as an argument.

Parameters

ImportAsType; one of:

```
ImportAsType.COMP
ImportAsType.FOOTAGE
ImportAsType.COMP_CROPPED_LAYERS
ImportAsType.PROJECT
```

Returns

Boolean.

Example

```
var io = new ImportOptions( File("c:\\foo.psd"));
io.canImportAs( ImportAsType.COMP )
```

ImportOptions file attribute

importOptions.file

Description

The file attribute specifies the file to be imported. This is used to get or change the file that is set in the constructor.

Type

File; read/write.

ImportOptions forceAlphabetical attribute

importOptions.forceAlphabetical

Description

The forceAlphabetical attribute is a boolean. A value of true is equivalent to activating the Force Alphabetical Order option in the File > Import > File dialog box.

Type

Boolean; read/write.

ImportOptions importAs attribute

importOptions.importAs

Description

The importAs attribute holds the importAsType for the file to be imported. You can set it by setting a file of the type you want to import as an argument.

Enumerated Type

ImportAsType; read/write. One of:

```
ImportAsType.COMP_CROPPED_LAYERS
ImportAsType.FOOTAGE
ImportAsType.COMP
ImportAsType.PROJECT
```

ImportOptions sequence attribute

importOptions.sequence

Description

The sequence attribute is a boolean; it determines whether a sequence or an individual file is imported.

Type

Boolean; read/write.

Item object

app.project.item(index)
app.project.items[index]

Description

The Item object represents an item that can appear in the Project window. FootageItem, CompItem, and FolderItem are all types of Item.

Note that numbering of the index for item starts at 1, not 0.

Attributes

Attributes	Reference	Description
name	see "Item name attribute" on page 98	name of the object as shown in the Project window
comment	see "Item comment attribute" on page 98	string that holds a comment
id	see "Item id attribute" on page 98	unique integer ID for this item
parentFolder	see "Item parentFolder attribute" on page 98	parent folder of this item
selected	see "Item selected attribute" on page 99	true if this item is currently selected
typeName	see "Item typeName attribute" on page 99	string corresponding to the type of item

Methods

Method	Reference	Description
remove()	see "Item remove() method" on page 99	deletes the item from the project

Example

The following example will get the second item from the project and check that the typeName of that item is "Folder". Then it will remove from that folder any top-level item that is a Solid, but only if it is not currently selected. The example will also check to make sure that, for each item in the folder, the parentFolder is properly set to be the correct folder.

```
var myFolder = app.project.item(2);
if (myFolder.typeName != "Folder" ) {
  alert("error: second item is not a folder");
}
else {
  var numInFolder = myFolder.numItems;
  // Always run loops backwards when deleting things:
  for(i = numInFolder; i >= 1; i--) {
    var curItem = myFolder.item(i);
    if ( curItem.parentFolder != myFolder) {
```

```
      alert("errorwithin AE: the parentFolder is not set correctly");
    }
    else {
      if ( !curItem.selected && curItem.typeName == "Footage") {
        // Aha! an unselected solid.
        curItem.remove();
      }
    }
  }
}
```

Item comment attribute

app.project.item(index).comment

Description

The item comment attribute is a string that holds a comment, up to 15,999 bytes in length after any encoding conversion. The comment is for the user's purpose only; it has no effect on the Item's appearance or behavior.

Type

String; read/write.

Item id attribute

app.project.item(index).id

Description

The item ID attribute is a unique and persistent identification number used to identify an item between sessions. The value of the ID will not change even after the project is saved to file and read in at a later time.

An ID is thus effectively permanent except when importing a project into another project, in which case new IDs are assigned to the newly imported items.

Type

Integer; read-only.

Item name attribute

app.project.item(index).name

Description

The item name attribute is the name of the item as displayed in the Project window.

Type

String; read/write.

Item parentFolder attribute

app.project.item(index).parentFolder

Description

The Parent Folder attribute yields the Folder Item that contains the selected item. If this Item is at the top level of the project, then the parentFolder will be the project's root folder, (app.project.rootFolder).

Type

FolderItem; read-only.

Item remove() method

app.project.item(index).remove()

Description

The Item remove() method removes (deletes) this item from the project window. If the item is a FolderItem, all the items contained in the folder will also be removed.

Parameters

None.

Returns

None.

Item selected attribute

app.project.item(index).selected

Description

The selected attribute defines whether an item is selected or not. Multiple Items can be selected simultaneously at any given time.

The selected attribute is true if this Item is currently selected. Setting this attribute to true will select the item.

Type

Boolean; read/write.

Item typeName attribute

app.project.item(index).typeName

Description

The typeName attribute is a string representing a user-readable name of the type. Examples are Folder, Footage and Composition.

Type

String; read-only.

ItemCollection

app.project.items

Description

The ItemCollection object represents a collection of Items. The ItemCollection belonging to a Project object represents all the Items in the project. The ItemCollection belonging to a FolderItem object represents all the Items in that folder.

Attributes

length	the number of objects in the collection (applies to all collections)

Methods

[]	retrieves an object or objects in the collection via its index number
addComp()	creates a new CompItem and adds it to the ItemCollection

ItemCollection addComp() method

app.project.ItemCollection.addComp(*name, width, height, pixelAspect, duration, frameRate*)

Description

The itemCollection addcomp() method creates a new CompItem and adds it to the ItemCollection.

If the ItemCollection belongs to the project or the root folder, then the new comp's parentFolder will be the root folder. Otherwise, the new comp's parentFolder will be the FolderItem that owns the ItemCollection.

Parameters

name	string	name of the new CompItem
width	integer	width of the new CompItem [4.. 30,000]
height	integer	height of the new CompItem [4.. 30,000]
pixelAspect	floating-point value	pixel aspect ratio of the Solid [0.01..100]
duration	floating-point value	duration of the new CompItem [0 .. 10800]
frameRate	floating-point value	frame rate of the new CompItem [1 .. 99]

Returns

CompItem.

KeyframeEase object

The KeyframeEase object specifies the KeyframeEase setting of a keyframe, which is determined by its speed and influence settings.

Attributes

Attribute	Reference	Description
speed	see "KeyframeEase speed attribute" on page 101	corresponds to the speed setting for a key-frame

Attribute	Reference	Description
influence	see "KeyframeEase influence attribute" on page 101	corresponds to the influence setting for a key-frame in range [0.1..100.0]

Method

Method	Reference	Description
keyframeEase()	see "KeyframeEase keyframeEase() method" on page 101	returns a KeyframeEase

KeyframeEase keyframeEase() method

myKey.keyframeEase(*speed, influence*)

Description

This constructor creates a KeyframeEase value. Both paramters are required. Note that for non-spatial 2D and 3D properties you must set an easeIn and and easeOut for each dimension (see example below). Note also that there are two types of ease: temporal and spatial.

Parameters

speed	Floating-point value; the keyframe speed
influence	Floating-point value in range [0.1..100.0]; the keyframe influence

Returns

None.

Example

```
var easeIn = new KeyframeEase(0.5, 50);
var easeOut = new KeyfreameEase(0.75, 85);
myPositionProperty.setTemporalEaseAtKey(2, [easeIn], [easeOut]);
```

KeyframeEase influence attribute

myKey,KeyframeEase.influence

Description

This attribute specifies the influence value of the keyframe. The valid range is 0.1 to 100.0.

Type

Floating-point value; read/write.

KeyframeEase speed attribute

myKey,KeyframeEase.speed

Description

This attribute specifies the speed value of the keyframe.

Type

Floating-point value; read/write.

Layer object

app.project.item(index).layer*(index)*

Description

The Layer object provides access to a layer within Compositions. It can be accessed either by index number or by a name string.

Those layers that are AV layers (Comp layers, footage layers, etc.) will be represented as AVLayer objects. AVLayer is a subclass of Layer and contains additional methods and attributes. (See "AVLayer object" on page 45 for more information.)

The Layer object is derived from PropertyGroup. All attributes of the PropertyBase and PropertyGroup objects are available on Layers, as well.

Attributes

Attribute	Reference	Description
index	see "Layer index attribute" on page 105	index of the layer, in the range [1,numLayers]
name	see "Layer name attribute" on page 107	name of the layer
parent	see "Layer parent attribute" on page 107	parent of this layer
time	see "Layer time attribute" on page 109	current time of the layer
startTime	see "Layer startTime attribute" on page 109	startTime of the layer, expressed in comp time
stretch	see "Layer stretch attribute" on page 109	time stretch, expressed as a percentage
inPoint	see "Layer inPoint attribute" on page 105	inPoint of the layer, expressed in comp time
outPoint	see "Layer outPoint attribute" on page 107	outPoint of the layer, expressed in comp time
enabled	see "Layer enabled attribute" on page 104	true if the layer is enabled
solo	see "Layer solo attribute" on page 109	true if the layer is soloed
shy	see "Layer shy attribute" on page 108	true if the layer is shy
locked	see "Layer locked attribute" on page 105	true if the layer is locked
hasVideo	see "Layer hasVideo attribute" on page 105	true if the layer contains a video component
active	see "Layer active attribute" on page 103	true if the layer is active at the current time
nullLayer	see "Layer nullLayer attribute" on page 107	true if this is a null layer
selectedProperties	see "Layer selectedProperties attribute" on page 108	array containing all selected Property and PropertyGroup objects in Layer

Methods

Method	Reference	Description
remove()	see "Layer remove() method" on page 108	deletes the layer from the composition
moveToBeginning()	see "Layer moveToBeginning() method" on page 106	moves the layer to the top of the composition (the first layer)
moveToEnd()	see "Layer moveToEnd() method" on page 106	moves the layer to the bottom of the composition (the last layer)
moveAfter()	see "Layer moveAfter() method" on page 105	moves the layer below another, specified layer
moveBefore()	see "Layer moveBefore() method" on page 106	moves the layer above another, specified layer
duplicate()	see "Layer duplicate() method" on page 104	duplicates the layer
copyToComp()	see "Layer copyToComp() method" on page 104	copies the layer to the top and beginning of another composition
activeAtTime()	see "Layer activeAtTime() method" on page 103	given a time, returns whether this layer will be active at that time
setParentWithJump()	see "Layer setParentWithJump() method" on page 108	establishes newParent as the parent of this layer

Example

If the first item in the project is a CompItem, the following example would disable the first layer in that composition (i.e., turn the eyeball icon off) and rename it to "Lord High Imperial Layer."

```
var firstLayer = app.project.item(1).layer(1);
firstLayer.enabled = false;
firstLayer.name = "Lord High Imperial Layer";
```

Layer active attribute

app.project.item(index).layer(index).active

Description

The Layer active attribute is true if the layer's video is active at the current time.

To be true, the layer must be enabled; no other layer may be soloing unless this layer is soloed too, and the time must be in between the inPoint and outPoint of this layer.

Note that an audio layer will not have active as true; there is a separate audioActive attribute in the AVLayer object.

Type

Boolean; read-only.

Layer activeAtTime() method

app.project.item(index).layer(index).activeAtTime(*time*)

Description

The layer activeAtTime method returns whether this layer will be active at a given time. To be true, the layer's enabled attribute must be true, no other layer may be soloing unless this layer is soloed too, and the given time must be between this layer's inPoint and outPoint.

Parameters

time	floating-point value	time (in seconds) to evaluate

Returns

Boolean.

Layer copyToComp() method

app.project.item(index).layer(index).copyToComp(*intoComp*)

Description

The layer copyToComp() method copies the layer into the comp specified by intoComp. The original layer will remain unchanged.

Parameters

comp	target composition where the layer will be moved

Returns

None.

Layer duplicate() method

app.project.item(index).layer(index).duplicate()

Description

The layer duplicate method duplicates the layer. This has the same effect as selecting a layer in the user interface and choosing Edit > Duplicate, except the selection in the user interface does not change when you call this method.

Parameters

None.

Returns

Layer.

Layer enabled attribute

app.project.item(index).layer(index).enabled

Description

The Layer enabled attribute is true if the layer is enabled, false otherwise. This corresponds to the toggle control in the Layer window.

Type

Boolean; read/write.

Layer hasVideo attribute

app.project.item(index).layer(index).hasVideo

Description

The Layer hasVideo attribute is true if the layer is enabled, false otherwise. This corresponds to the toggle control in the Layer window.

Type

Boolean; read-only.

Layer index attribute

app.project.item(index).layer(index).index

Description

The Layer index attribute is the index of the layer, in the range [1,numLayers].

Type

Integer; read-only.

Layer inPoint attribute

app.project.item(index).layer(index).inPoint

Description

The Layer inPoint attribute is the in-point of the layer, expressed in comp time. Values may be in the range [-10800, 10800].

Type

Floating-point value; read/write.

Layer locked attribute

app.project.item(index).layer(index).locked

Description

The Layer locked attribute is true if the layer is locked, false otherwise. This correponds to the lock toggle in the Layer window.

Type

Boolean; read/write.

Layer moveAfter() method

app.project.item(index).layer(index).moveAfter(*layer*)

Description

The Layer moveAfter method moves the layer below another, specified layer

Parameters

layer	target layer that this layer will follow

Returns

None.

Layer moveBefore() method

app.project.item(index).layer(index).moveBefore(*layer*)

Description

The Layer moveAfter method moves the layer above another, specified layer.

Parameters

layer	target layer that this layer will precede

Returns

None.

Layer moveToBeginning() method

app.project.item(index).layer(index).moveToBeginning()

Description

The Layer moveToBeginning method moves the layer to the top of the layer stack (the first layer).

Parameters

None.

Returns

None.

Layer moveToEnd() method

app.project.item(index).layer(index).moveToEnd()

Description

The Layer moveToEndmethod moves the layer to the bottom of the layer stack (the last layer).

Parameters

None.

Returns

None.

Layer name attribute

app.project.item(index).layer(index).name

Description

The Layer name attribute is the name of the layer. This can be unique from the Source name (which cannot be changed in the Layer window), although by default they are identical until edited.

Type

String; read/write.

Layer nullLayer attribute

app.project.item(index).layer(index).nullLayer

Description

The Layer nullLayer attribute is true if the layer was created as a null object, false otherwise.

Type

Boolean; read/write.

Layer outPoint attribute

app.project.item(index).layer(index).outPoint

Description

The Layer outPoint attribute is the out-point of the layer, expressed in comp time (seconds). Values may be in the range [-10800, 10800].

Type

Floating-point value; read/write.

Layer parent attribute

app.project.item(index).layer(index).parent

Description

The Layer parent attribute is the parent of this layer. The value may be null and may be set to null.

Note that, as in the regular application, if you set the parent, there will be no apparent jump in the layer's transform. This is because offset values will be calculated to counterbalance any transforms above it in the hierarchy. For example, if the new parent has a rotation of 30 degrees, then the child layer would be given a rotation of -30 degrees.

If you want to set the parent while keeping the child layer's transform values from changing, use the “Layer setParentWithJump() method” on page 108.

Type

Layer; read/write.

Layer remove() method

app.project.item(index).layer(index).remove()

Description

This method deletes the specified layer from the composition.

Parameters

None.

Layer selectedProperties attribute

app.project.item(index).layer(index).selectedProperties

Description

This attribute yields an array containing all of the selected Property and PropertyGroup objects in the layer.

Type

Array of PropertyBase; read-only.

Layer setParentWithJump() method

app.project.item(index).layer(index).setParentWithJump(newParent)

Description

The Layer setParentWithJump() method establishes newParent as the parent of this layer.

This method does not change the transform values of the child layer, and as a result, there may be an apparent jump in the rotation, translation, or scale of the child layer.

If you do not want the child layer to jump, set the parent attribute directly (as in "childLayer.parent = newParent;"). When you set the parent attribute directly, an offset will be calculated and set in the child layer's transform fields, which will prevent the jump from occurring.

Parameters

newParent	replacement parent layer

Returns

None.

Layer shy attribute

app.project.item(index).layer(index).shy

Description

The Layer shy attribute is true if the layer is shy, and therefore will be hidden in the Layer window if the composition's hide all shy layers is toggled on.

Type

Boolean; read/write.

Layer solo attribute

app.project.item(index).layer(index).solo

Description

The Layer solo attribute is true if a layer is soloed, false otherwise.

Type

Boolean; read/write.

Layer startTime attribute

app.project.item(index).layer(index).startTime

Description

The Layer startTime attribute is the startTime of the layer, expressed in comp time. Permitted values are in the range [-10800, 10800] seconds, corresponding to +/- 3 hours.

Type

Floating-point value; read/write.

Layer stretch attribute

app.project.item(index).layer(index).stretch

Description

The Layer stretch attribute is the layer's time stretch, expressed as a percentage. A value of 100 means no stretch.

Range can be [-9900, 9900]. Values between [-1, 1] will be clipped to minimum acceptable values. Those between [0, 1] will be clipped to 1, and those between [-1, 0] (not including 0) will be set to -1.

Type

Floating-point value; read/write.

Layer time attribute

app.project.item(index).layer(index).time

Description

The Layer time attribute is the current time of the layer, expressed in comp time (seconds).

Type

Floating-point value; read-only.

Returns

None.

LayerCollection

app.project.item(index).lcoll

Description

The Layer Collection represents a collection of layers. Each CompItem object contains one LayerCollection. The LayerCollection attributes and methods provide access to and the ability to add new layers.

Attributes

length	the number of objects in the collection (applies to all collections)

Methods

Method	Reference	Description
[]	(no cross-reference)	retrieves an object or objects in the collection via its index number
add()	see "LayerCollection add() method" on page 110	creates a new AVLayer containing the given AVItem and adds it to the CompItem
addNull()	see "LayerCollection addNull() method" on page 112	layer returned is a newly created layer in the Comp that owns the LayerCollection
addSolid()	see "LayerCollection addSolid() method" on page 112	creates a new FootageItem that has a Solid-Source according to the specified parameters, and adds it to the project
addText()	see "LayerCollection addText() method" on page 113	creates a new Text layer with the specified source text
addCamera()	see "LayerCollection addCamera() method" on page 111	creates a new Camera layer with the specified name and center point
addLight()	see "LayerCollection addLight() method" on page 111	creates a new Light layer with the specified name and center point
byName()	see "LayerCollection byName() method" on page 113	returns the first layer found with the given name
precompose()	see "LayerCollection precompose() method" on page 113	collects the layers referred to by the indices given in layerIndices, and puts them into a new CompItem with the given name

Example

Given that the first item in the project is a CompItem and the second item in the project is an AVItem, the following code shows how to display the number of layers in the CompItem's layer collection, add a new layer based on an AVItem in the project, and then display the new number of layers in the layer collection.

```
var firstComp = app.project.item(1);
var layerCollection = firstComp.layers;
alert( "number of layers before is " + layerCollection.length);
var anAVItem = app.project.item(2);
layerCollection.add(anAVItem);
alert( "number of layers after is " + layerCollection.length);
```

LayerCollection add() method

app.project.item(index).lcoll.add(*item, duration*)

Description

The LayerCollection add() method creates a new AVLayer containing the given AVItem, and adds the new AVLayer to the containing CompItem.

This method generates an exception if the item cannot be added as a layer to this CompItem.

The duration parameter, if provided, will affect the method only if the given AVItem contains a piece of still footage; it has no effect on movies, sequences or audio. If duration is provided, then the duration of the newly created layer will be the passed value. If duration is not provided, then the duration will be determined by the user preferences.

Note that by default, user preferences proscribe that the duration be set equal to that of the CompItem into which the layer is being added. The preference can be changed to a specific duration. Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import, and specify options under Still Footage.

Parameters

item	AVItem to be added
duration	optional floating-point value specifying the length of a still layer

Returns

AVLayer.

LayerCollection addCamera() method

app.project.item(index).lcoll.addCamera(*name, centerPoint*)

Description

This method creates a new camera layer within the LayerCollection.

Parameters

name	string; name of the new layer
centerPoint	floating-point array; center of the new camera

Returns

Camera layer.

LayerCollection addLight() method

app.project.item(index).lcoll.addLight(*name, centerPoint*)

Description

This method creates a new light layer within the LayerCollection.

Parameters

name	string; name of the new layer
centerPoint	floating-point array containing 2 values; center of the new light

Returns

Light layer.

LayerCollection addNull() method

app.project.item(index).lcoll.addNull(*duration*)

Description

The LayerCollection addNull() method returns a newly created layer in the Comp that owns the LayerCollection. The method has the same effect as choosing Layer > New > Null Object.

If duration is provided, then the duration of the newly created layer will be the passed value. If duration is not provided, then the duration will be determined by user preferences.

Note that by default, user preferences specify that the duration be set equal to that of the CompItem into which the layer is being added. The preference can be changed to a specific duration in the Preferences dialog box. Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import, and specify options under Still Footage.

Parameters

duration	optional floating-point value specifying the duration of the new layer

Returns

AVLayer.

LayerCollection addSolid() method

app.project.item(index).lcoll.addSolid(*color, name, width, height, pixelAspect, duration*)

Description

The layerCollection addSolid() method creates a new FootageItem whose mainSource is a SolidSource according to the specified parameters, and adds it to the project. This method also creates a new AVLayer that has that new FootageItem as its source, and adds that layer to the containing CompItem.

Note that by default, user preferences proscribe that the duration be set equal to that of the CompItem into which the layer is being added. The preference can be changed to a specific durationin the Preferences dialog box. Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import, and specify options under Still Footage.

Parameters

color	Establishes the color of the new FootageItem (a solid) contained in the layer. The color argument must be an array of 3 floats lying in the range [0..1].
name	Establishes the name of the new layer and the new FootageItem.
width	Specifies the width, in pixels, of the new layer and the new FootageItem. Permitted values are in the range [1 .. 30,000].
height	Specifies the height, in pixels, of the new layer and the new FootageItem. Permitted values are in the range [1 .. 30,000].
pixelAspect	Specifies the pixel aspect ratio for the new FootageItem.
duration	Optional floating-point value specifying the length of a still layer.

Returns

AVLayer.

LayerCollection addText() method

app.project.item(index).lcoll.addText(*sourceText*)

Description

This method creates a new text layer within the LayerCollection.

Parameters

sourceText	string; optional, serves as the source text of the new layer

Returns

Text layer.

LayerCollection byName() method

app.project.item(index).lcoll.byName(*name*)

Description

The LayerCollection byName() method returns the first layer found with the given name. This method returns null if no layer with the given name is found.

Parameters

name	string - the name of the layer being sought

Returns

Layer; null if name is not found.

LayerCollection precompose() method

app.project.item(index).lcoll.precompose(*layerIndicies, name, moveAllAttributes*)

Description

The LayerCollection precompose() method collects the layers referred to by the given indices (first parameter) and puts them into a new CompItem that has the given name (second parameter). The given layers are removed from the LayerCollection. The new CompItem is added into the LayerCollection and is also returned by the precompose() method.

Parameters

layerIndices	indices of layers to be collected
name	establishes the name of the new compItem
moveAllAttributes	Optional boolean, defaults to true; may be set to false only if there is only 1 index in the layerIndices array. Setting this to true corresponds to selecting the Move All Attributes into the New Composition option in the Pre-Compose dialog box. Setting it to false corresponds to selecting the Leave All Attributes In option in the Pre-Compose dialog box.

Returns

CompItem.

MarkerValue object

app.project.item(index).layer(index).MarkerValue

Description

The MarkerValue object holds the representation of a layer marker. It contains four string attributes: comment, chapter, url, and frameTarget.

For more on the usage of markers see "Using markers" in After Effects Help.

Methods

Method	Reference	Description
MarkerValue()	see "MarkerValue method" on page 115	Returns a MarkerValue. Sets the comment and, optionally, the chapter, url and frameTarget attributes.

Attributes

Attribute	Reference	Description
comment	see "MarkerValue Comment attribute" on page 116	string comment included with the marker
chapter	see "MarkerValue Chapter attribute" on page 115	string Chapter Link reference point included with the marker
url	see "MarkerValue URL attribute" on page 116	string Uniform Resource Locator included with the marker
frameTarget	see "MarkerValue FrameTarget attribute" on page 116	string target (specifying a Web site frame) included with the marker

Examples

To set a marker that says "Fade Up" at the 2 second mark:

```
var myMarker = new Marker("Fade Up");
myLayer.property("Marker").setValueAtTime(2, myMarker);
```

To get a comment value from a particular marker:

```
var commentOfFirstMarker = app.project.item(1).layer(1).property("Marker").keyValue(0).comment;

var commentOfMarkerAtTime4  = app.project.item(1).layer(1).property("Marker").value-
AtTime(4.0,TRUE) .comment

var markerProperty = app.project.item(1).layer(1).property("Marker");
var markerValueAtTimeClosestToTime4 = markerProperty
.keyValue(markerProperty.nearestKeyIndex(4.0));
var commentOfMarkerClosestToTime4 = markerValueAtTimeClosestToTime4.comment;
```

MarkerValue method

app.project.item(index).layer(index).MarkerValue(*comment*)
app.project.item(index).layer(index).MarkerValue(*comment, chapter*)
app.project.item(index).layer(index).MarkerValue(*comment, chapter, url*)
app.project.item(index).layer(index).MarkerValue(*comment, chapter, url, frameTarget*)

Description

The markerValue method sets between one and four specific attributes of the marker and returns a Marker-Value.

Parameters

comment	string	see "MarkerValue Comment attribute" on page 116
chapter	string	see "MarkerValue Chapter attribute" on page 115
url	string	see "MarkerValue URL attribute" on page 116
frameTarget	string	see "MarkerValue FrameTarget attribute" on page 116

Returns

MarkerValue (a marker keyframe containing the above four string values).

MarkerValue Chapter attribute

app.project.item(index).layer(index).MarkerValue.chapter

Description

The MarkerValue chapter attribute is a text chapter link attached to a given layer marker. Chapter links initiate a jump to a chapter in a QuickTime movie or in other formats that support chapter marks (for more on markers see "Using markers" in After Effects Help).

Type

String; read/write.

MarkerValue Comment attribute

app.project.item(index).layer(index).MarkerValue.comment

Description

The MarkerValue comment attribute is a text comment attached to a given layer marker. This comment appears in the Timeline window next to the layer marker (for more on markers see "Using markers" in After Effects Help).

Type

String; read/write.

MarkerValue FrameTarget attribute

app.project.item(index).layer(index).MarkerValue.frameTarget

Description

The MarkerValue frameTarget attribute is a text frame marker attached to a given layer marker. Used with a URL, this can target a specific frame within a Web site (for more on markers see "Using markers" in After Effects Help).

Type

String; read/write.

MarkerValue URL attribute

app.project.item(index).layer(index).MarkerValue.url

Description

The MarkerValue URL attribute is a text Uniform Resource Locator attached to a given layer marker. This URL is an automatic link to a site (for more on markers see "Using markers" in After Effects Help).

Type

String; read/write.

MaskPropertyGroup object

app.project.item(index).layer(index).mask

Description

The MaskPropertyGroup object is derived from PropertyGroup and inherits all the attributes and methods of PropertyBase and PropertyGroup, along with its own attributes and methods as follows.

Attributes

Attribute	Reference	Description
maskMode	see "MaskPropertyGroup maskMode attribute" on page 117	specifies the MaskMode for this mask
inverted	see "MaskPropertyGroup inverted attribute" on page 117	specifies whether the mask is inverted
rotoBezier	see "MaskPropertyGroup rotoBezier attribute" on page 118	specifies whether the shape of the mask is Rotobezier
maskMotionBlur	see "MaskPropertyGroup maskMotion-Blur attribute" on page 118	specifies how motion blur is applied to this mask
locked	see "MaskPropertyGroup locked attribute" on page 117	true if the mask is locked
color	see "MaskPropertyGroup color attribute" on page 117	color used to draw the mask outline in the user interface

MaskPropertyGroup color attribute

app.project.item(index).layer(index).mask(index).color

Description

This attribute is the color used to draw the mask outline as it appears in the user interface (Composition window, Layer window, and Timeline window).

Type

Array of three floating-point values from 0 to 1: [R, G, B); read/write.

MaskPropertyGroup inverted attribute

app.project.item(index).layer(index).mask(index).inverted

Description

This attribute is a boolean specifying whether the mask is inverted.

Type

Boolean; read/write.

MaskPropertyGroup locked attribute

app.project.item(index).layer(index).mask(index).locked

Description

This attribute is a boolean specifying whether the mask is locked and cannot be edited in the user interface.

Type

Boolean; read/write.

MaskPropertyGroup maskMode attribute

app.project.item(index).layer(index).mask(index).maskMode

Description

This attribute is an enumerated type specifying the MaskMode for this mask.

Enumerated Types

MaskMode.NONE	None
MaskMode.ADD	Add
MaskMode.SUBTRACT	Subtract
MaskMode.INTERSECT	Intersect
MaskMode.LIGHTEN	Lighten
MaskMode.DARKEN	Darken
MaskMode.DIFFERENCE	Difference

MaskPropertyGroup maskMotionBlur attribute

app.project.item(index).layer(index).mask(index).maskMotionBlur

Description

This attribute is an enumerated type specifying how motion blur is applied to this mask.

Enumerated Type

MaskMotionBlur.SAME_AS_LAYER	Same as Layer
MaskMotionBlur.ON	On
MaskMotionBlur.OFF	Off

MaskPropertyGroup rotoBezier attribute

app.project.item(index).layer(index).mask(index).rotoBezier

Description

This attribute is a boolean specifying whether the mask is in RotoBezier mode.

Type

Boolean; read/write.

OutputModule object

app.project.renderQueue.item(index).outputModule(*index*)

Description

The outputModule object of renderQueueItem generates a single file or sequence via a render, and contains attributes and methods relating to that file to be rendered. It returns an Output Module with the given index number. The indexed items are numbered beginning with 1.

Attributes

Attribute	Reference	Description
file	see "OutputModule file attribute" on page 120	path and name of the file to be rendered
postRenderAction	see "OutputModule postRenderAction attribute" on page 120	one of the postRenderAction types
name	see "OutputModule name attribute" on page 120	name of the Output Module as presented to the user
templates	see "OutputModule templates attribute" on page 121	array of all Output Module templates

Methods

Method	Reference	Description
remove()	see "OutputModule remove() method" on page 120	removes the Output Module
saveAsTemplate()	see "OutputModule saveAsTemplate() method" on page 121	saves a new Output ModuleTemplate with the given name
applyTemplate()	see "OutputModule applyTemplate() method" on page 119	applies a pre-set Output Module Template

OMCollection

app.project.renderQueue.items.outputModules

Description

The OMCollection contains all of the Output Modules in the project.

Attributes

length	number of objects in the collection (applies to all collections)

Methods

[]	retrieves an object or objects in the collection via its index number
add()	adds an Output Module with a specified template

See also

"Collection object" on page 53

OutputModule applyTemplate() method

app.project.renderQueue.item(index).outputModules[i].applyTemplate(*templateName*)

Description

Applies an existing Output Module template, identified by name.

Parameters

templateName	name of the template to be applied

Returns

None.

OutputModule file attribute

*app.project.renderQueue.item(index).outputModules[i].*file

Description

The file attribute is the File object to which the output module is set to render.

Type

File object; read-write.

OutputModule name attribute

*app.project.renderQueue.item(index).outputModules[i].*name

Description

The name attribute is the output module name as it is presented to the user, expressed as a string.

Type

String; read-only.

OutputModule postRenderAction attribute

*app.project.renderQueue.item(index).outputModules[i].*postRenderAction

Description

The postRenderAction attribute returns the Post Render Action (listed below).

Type

PostRenderAction (read/write); one of the following:

postRenderAction.NONE
postRenderAction.IMPORT
postRenderAction.IMPORT_AND_REPLACE_USAGE
postRenderAction.SET_PROXY

OutputModule remove() method

*app.project.renderQueue.item(index).outputModules[i].*remove()

Description

Deletes an Output Module.

Parameters

None.

Returns

None.

OutputModule saveAsTemplate() method

app.project.renderQueue.item(index).outputModules[i].saveAsTemplate(*name*)

Description

Saves an Output Module with the name given as a parameter.

Parameters

name	name of the new template

Returns

None.

OutputModule templates attribute

app.project.renderQueue.item(index).outputModules[i].templates

Description

The templates attribute is an array of strings; these are the names of the templates in the local installation of After Effects.

Type

Array; read-only.

PlaceholderSource object

app.project.item(index).mainSource
app.project.item(index).proxySource

Description

The PlaceholderSource object holds information describing the footage source of a placeholder. It is a subclass of FootageSource and so it inherits all attributes and methods of the FootageSource object. (See "Footage-Source object" on page 89.)

There are no attributes or methods in PlaceholderSource other than those inherited from the FootageSource object.

Project object

app.project

Description

The project object enables access to data and functionality within a particularAfter Effects project.

Attributes of the Project object provide access to specific objects within an After Effects project, such as imported files and footage, comps, as well as project settings such as the timecode base.

Methods of the Project object can import footage, can create solids, compositions and folders, and can save changes.

Attributes

Attribute	Reference	Description
file	see "Project file attribute" on page 124	file object of the currently open project
rootFolder	see "Project rootFolder attribute" on page 127	folderItem containing all the contents of the project; the equivalent of the Project window
items	see "Project items attribute" on page 126	itemCollection representing all items in the project
activeItem	see "Project activeItem attribute" on page 123	currently active item, or null if none is active or multiple items are active
bitsPerChannel	see "Project bitsPerChannel attribute" on page 123	color depth of the current project
transparencyGridThumbnails	see "Project transparencyGridThumbnails attribute" on page 130	determines if thumbnail views should use the transparency checkerboard pattern
timecodeDisplayType	see "Project timecodeDisplayType attribute" on page 129	method with which timecode is set to display
timecodeBaseType	see "Project timecodeBaseType attribute" on page 128	timecode base as set in the File > Project Settings dialog box
timecodeNTSCDropFrame	see "Project timecodeNTSCDropFrame attribute" on page 129	equivalent to Drop Frame or Non-Drop Frame in the File > Project Settings dialog box
timecodeFilmType	see "Project timecodeFilmType attribute" on page 129	method with which timecode is set to display
numItems	see"Project numItems attribute" on page 126	total number of items contained in the project
selection	see "Project selection attribute" on page 128	array of the items selected in the Project window
renderQueue	see "Project renderQueue attribute" on page 127	the project's render queue

Methods

Method	Reference	Description
item()	see "Project item() method" on page 125	returns an item
consolidateFootage()	see"Project consolidateFootage() method" on page 124	replicates the functionality of File > Consolidate All Footage
removeUnusedFootage()	see "Project removeUnusedFootage() method" on page 127	replicates the functionality of File > Remove Unused Footage

Method	Reference	Description
reduceProject()	see "Project reduceProject() method" on page 126	replicates the functionality of File > Reduce Project
close()	see"Project close() method" on page 123	closes the project with normal save options
save()	see "Project save() method" on page 127	saves the project (or displays a Save dialog box if project has never been saved)
saveWithDialog()	see "Project saveWithDialog() method" on page 128	displays a Save dialog box; returns true if file was saved
importPlaceholder()	see "Project importPlaceholder() method" on page 125	replicates the functionality of File > Import > Placeholder.
importFile()	see "Project importFile() method" on page 124	replicates the functionality of File > Import > File.
importFileWithDialog()	see "Project importFileWithDialog() method" on page 125	displays an Import dialog box; returns an array of all imported items
showWindow()	see "Project showWindow() method" on page 128	if true, shows the project window

Project activeItem attribute

app.project.activeItem

Description

The project attribute activeItem returns the item that is currently active and is to be acted upon, or a null if no item is currently selected or if multiple items are selected.

Type

The item that is currently active; read-only.

Project bitsPerChannel attribute

app.project.bitsPerChannel

Description

The bitsPerChannel attribute is an integer describing the color depth of the current project (either 8 or 16 bits).

Type

Integer (8 or 16 only); read/write.

Project close() method

app.project.close(*CloseOptions*)

Description

Closes the project with the option of saving changes automatically, prompting the user to save changes or closing without saving changes.

Parameters

CloseOptions	action to be performed on close (see Enumerated Types, below)

Enumerated Types

CloseOptions.DO_NOT_SAVE_CHANGES	close without saving
CloseOptions.PROMPT_TO_SAVE_CHANGES	send a prompt asking whether to save changes before close
CloseOptions.SAVE_CHANGES	save automatically on close option

Returns

Boolean. False only in one case: the file has not been previously saved; the user is presented with a Save dialog box, and cancels the save.

Project consolidateFootage() method

app.project.consolidateFootage()

Description

Replicates the functionality of the Consolidate All Footage command.

Parameters

None.

Returns

Integer; the total number of footage items removed.

Project file attribute

app.project.file

Description

The file attribute is a File object representing the project that is currently open.

Type

File Object or null if project has not been saved; read-only.

Project importFile() method

app.project.importFile(*ImportOptions*)

Description

Replicates the functionality of the Import File dialog box.

Parameters

ImportOptions	options as set in the ImportOptions object

Returns

FootageItem

Example

```
app.project.importFile( ImportOptions( File( "sample.psd" ) ) )
```

See also

"ImportOptions object" on page 94

Project importPlaceholder() method

app.project.importPlaceholder(*name, width, height, framerate, duration*)

Description

Replicates the functionality of File > Import > Placeholder; adds a placeholder footage item of a specified name, width, height, framerate, and duration to the project.

Parameters

name	name of the placeholder
width	width in pixels of the placeholder footage
height	height in pixels of the placeholder footage
framerate	frame rate of the placeholder footage
duration	duration of the placeholder footage, in seconds

Returns

FootageItem.

Project importFileWithDialog() method

app.project.importFileWithDialog()

Description

Replicates the functionality of File > Import > File and produces an Import dialog box for the user. Unlike importFile(), importWithDialog() does not take arguments.

Returns

Array of Items created during import; or null if the user cancels the dialog.

Project item() method

app.project.item(*index*)

Description

This method returns an item with the given index number.

Parameters

index	integer; the index of the item

Returns

Item.

Project items attribute

app.project.items

Description

This attribute represents all of the items in the project.

Type

ItemCollection; read-only.

Project numItems attribute

app.project.numItems

Description

The numItems attribute represents the total number of items contained in the project, including folders and all types of footage.

Type

Integer; read-only.

Example

```
n = app.project.numItems;
alert("There are " + n + " items in this project.")
```

Project reduceProject() method

app.project.reduceProject(*array_of_items*)

Description

Replicates the functionality of File > Reduce Project.

Parameters

array_of_items	items to which the project is to be reduced

Returns

Integer; the total number of items removed.

Example

```
var theItems = new Array();
theItems[theItems.length] = app.project.item(1);
theItems[theItems.length] = app.project.item(3);
```

```
app.project.reduceProject(theItems);
```

Project removeUnusedFootage() method

app.project.removeUnusedFootage()

Description

Replicates the functionality of File > Remove Unused Footage.

Parameters

None.

Returns

Integer; the total number of footage items removed.

Project renderQueue attribute

app.project.renderQueue

Description

This attribute represents the render queue of the project.

Type

RenderQueue; read-only.

Project rootFolder attribute

app.project.rootFolder

Description

The rootFolder attribute is the root folder containing the root contents of the project; this is a conceptual folder that contains all items in the Project window, but not items contained inside other folders in the Project window.

Type

FolderItem; read-only.

Project save() method

app.project.save()
app.project.save(*File*)

Description

Saves the project (or prompts the user if the file has never previously been saved). Passing in a File object is equivalent to the Save As command and allows you to save a project to a new file.

Parameters

File	File object to save

Returns

None.

Project saveWithDialog() method

app.project.saveWithDialog()

Description

This method presents the Save dialog box to a user. The user can either name a file with a location and save it, or click Cancel and exit the dialog.

This method returns a boolean that is true if the file was saved, and false if not.

Parameters

None.

Returns

Boolean; true if file was saved.

Project selection attribute

app.project.selection

Description

The selection attribute contains an array of the items selected in the Project window.

Type

Array; read-only.

Project showWindow() method

app.project.showWindow(*doShow*)

Description

This method shows or hides the Project window, depending on how its argument is set.

Parameters

doShow	boolean; if true, shows the Project window, if false, hides the Project window

Returns

None.

Project timecodeBaseType attribute

app.project.timecodeBaseType

Description

The timecodeBaseType attribute reveals the Timecode Base as set in the Project Settings dialog box.

Enumerated Type

One of the following (read/write):

TimecodeBaseType.FPS24
TimecodeBaseType.FPS25
TimecodeBaseType.FPS30
TimecodeBaseType.FPS48
TimecodeBaseType.FPS50
TimecodeBaseType.FPS60
TimecodeBaseType.FPS100

Project timecodeDisplayType attribute

app.project.timecodeDisplayType

Description

The timecodeDisplayType attribute describes the method with which timecode is set to display. The enumerated values are found in a menu in the Project Settings dialog box.

Enumerated Type

One of the following (read/write):

TimecodeDisplayType.TIMECODE
TimecodeDisplayType.FRAMES
TimecodeDisplayType.FEET_AND_FRAMES

Project timecodeFilmType attribute

app.project.timecodeFilmType

Description

The timecodeFilmType attribute describes the film type that has been selected for the Feet + Frames option in the Project Settings dialog box.

Enumerated Type

One of the following (read/write):

TimecodeFilmType.MM16
TimecodeFilmType.MM35

Project timecodeNTSCDropFrame attribute

app.project.timecodeNTSCDropFrame

Description

The timecodeNTSCDropFrame attribute describes how timecode for 29.97 fps footage is displayed. This corresponds to the Drop Frame or Non-Drop Frame pulldown options under "NTSC" in the Project Settings dialog box.

Type

Boolean (read/write); true if NTSC Drop Frame is set as the current project display style.

Project transparencyGridThumbnails attribute

app.project.transparencyGrid

Description

The transparencyGridThumbnails attribute determines if thumbnail views should use the transparency checkerboard pattern (yes or no).

Type

Boolean (read/write).

Property object

app.project.item(index).layer(index).property

Description

The Property object contains value, keyframe, and/or expression information about a particular property of the layer. Examples of a Property are position, zoom, and mask feather.

Note that in standard JavaScript descriptions a "property" and an "attribute" are synonymous. Because After Effects contained this separate use of the term "property" before any scripting support was added, this documentation refers only to "attributes" when speaking about accessible values within scripting. "Property" meanwhile remains the term for values attached to layers, effects and masks both within this document and throughout After Effects.

Attributes

Attribute	Reference	Description
propertyValueType	see "Property propertyValueType attribute" on page 142	type of value stored in this property
value	see "Property value attribute" on page 149	value of the property at the current time
hasMin	see "Property hasMin attribute" on page 135	true if there is a minimum permitted value
hasMax	see "Property hasMax attribute" on page 135	true if there is a maximum permitted value
minValue	see "Property minValue attribute" on page 142	minimum permitted value
maxValue	see "Property maxValue attribute" on page 141	maximum permitted value
isSpatial	see "Property isSpatial attribute" on page 136	true if property defines a spatial value
canVaryOverTime	see "Property canVaryOverTime attribute" on page 134	true if the property can be keyframed
isTimeVarying	see "Property isTimeVarying attribute" on page 136	true if the property has keyframes or an expression enabled that vary its values
numKeys	see "Property numKeys attribute" on page 142	number of keyframes on this property

Attribute	Reference	Description
unitsText	see "Property unitsText attribute" on page 149	text description of the units in which the value is expressed
expression	see "Property expression attribute" on page 134	the expression string for this property
expressionEnabled	see "Property expressionEnabled attribute" on page 135	if true, the expression is used to generate values for the property
expressionError	see "Property expressionError attribute" on page 135	contains error if the last expression evaluated with an error
KeyframeInterpolationType	see "Property KeyframeInterpolationType attribute" on page 136	type of interpolation used at a keyframe
selectedKeys	see "Property selectedKeys attribute" on page 144	array containing the indices of all selected keyframes of the Property

Methods

Method	Reference	Description
valueAtTime()	see "Property valueAtTime() method" on page 149	returns value of the property evaluated at given time
setValue()	see "Property setValue() method" on page 147	sets the static value of the property
setValueAtTime()	see "Property setValueAtTime() method" on page 148	creates a keyframe at the given time (if none exists) for the property
setValuesAtTimes()	see "Property setValuesAtTimes() method" on page 148	creates a keyframe that is an array at the given time (if none exists) for the property
setValueAtKey()	see "Property setValueAtKey() method" on page 148	finds the keyframe with the given index and sets the value of the property at that keyframe
nearestKeyIndex()	see "Property nearestKeyIndex() method" on page 142	returns the index of the keyframe nearest to the given time
keyTime()	see "Property keyTime() method" on page 141	returns the time at which the condition given by the arguments occurs
keyValue()	see "Property keyValue() method" on page 141	returns the value of the property at the time at which the condition given by the arguments occurs
addKey()	see "Property addKey() method" on page 134	adds a new keyframe at the given time
removeKey()	see "Property removeKey() method" on page 143	removes the keyframe with the given index
isInterolationTypeValid()	see "Property isInterpolationTypeValid() method" on page 136	true if this property can be interpolated
setInterpolationTypeAtKey()	see "Property setInterpolationTypeAtKey() method" on page 144	sets the interpolation type for the key
keyInInterpolationType()	see "Property keyInInterpolationType() method" on page 137	returns the 'in' interpolationType for the given key
keyOutInterpolationType()	see "Property keyOutInterpolationType() method" on page 138	returns the 'out' interpolationType for the given key

Method	Reference	Description
setSpatialTangentsAtKey()	see "Property setSpatialTangentsAtKey() method" on page 146	sets the in and out tangent vectors for the given key
keyInSpatialTangent()	see "Property keyInSpatialTangent() method" on page 137	returns the 'in' spatial tangent for the given key
keyOutSpatialTangent()	see "Property keyOutSpatialTangent() method" on page 138	returns the 'out' spatial tangent for the given key
setTemporalEaseAtKey()	see "Property setTemporalEaseAtKey() method" on page 147	sets the in and out temporal ease for the given key
keyInTemporalEase()	see "Property keyInTemporalEase() method" on page 137	returns the 'in' temporal ease for the given key
keyOutTemporalEase()	see "Property keyOutTemporalEase() method" on page 138	returns the 'out' temporal ease for the given key
setTemporalContinuousAtKey()	see "Property setTemporalContinuousAtKey() method" on page 146	specifies whether the keyframe has temporal continuity
keyTemporalContinuous()	see "Property keyTemporalContinuous() method" on page 140	returns whether the keyframe has temporal continuity
setTemporalAutoBezierAtKey()	see "Property setTemporalAutoBezierAtKey() method" on page 146	specifies whether the keyframe has temporal auto bezier
keyTemporalAutoBezier()	see "Property keyTemporalAutoBezier() method" on page 140	returns whether the keyframe has auto bezier
setSpatialContinuousAtKey()	see "Property setSpatialContinuousAtKey() method" on page 145	specifies whether the keyframe has spatial continuity
keySpatialContinuous()	see "Property keySpatialContinuous() method" on page 140	returns whether the keyframe has spatial continuity
setSpatialAutoBezierAtKey	see "Property setSpatialAutoBezierAtKey() method" on page 145	specifies whether the keyframe has spatial auto bezier
keySpatialAutoBezier()	see "Property keySpatialAutoBezier() method" on page 139	returns whether the keyframe has spatial auto bezier
setRovingAtKey()	see "Property setRovingAtKey() method" on page 144	specifies whether the keyframe is roving
keyRoving()	see "Property keyRoving() method" on page 139	returns whether the keyframe is roving
setSelectedAtKey()	see "Property setSelectedAtKey() method" on page 145	sets whether the keyframe is selected
keySelected()	see "Property keySelected() method" on page 139	returns whether the keyframe is selected

Examples

1 Getting and setting the value of an opacity

opacity has propertyValueType of OneD, and is stored as a float.

```
var myProperty = myLayer.opacity;
myProperty.setValue(0.5);
// This new variable myOpacity will be a float value.
var myOpacity = myProperty.value;
```

2 Getting and setting the value of a position

position has propertyValueType of ThreeD_SPATIAL and is stored as an array of three floats.

```
var myProperty = myLayer.position;
myProperty.setValue([10,30,0]);
// This new variable myPosition be an array of 3 floats:
var myPosition = myProperty.value;
```

3 Changing the value of a mask shape to be open instead of closed

```
var myMask = mylayer.mask(1);
var myProperty = myMask.maskShape;
myShape = myProperty.value;
myShape.closed = false;
myProperty.setValue(myShape);
```

4 Getting the value of a color at a particular time

A color is stored as an array of four floats (r,g,b,opacity). The following code sets the value of the red component of a light's color at time 4 to be half of that at time 2:

```
var myProperty = myLight.color;
var colorValue = myProperty.valueAtTime(2,true);
colorValue[0] = 0.5 * colorValue[0];
myProperty.setValueAtTime(4,colorValue);
```

5 How to check that a scale calculated by an expression at time 3.5 is the expected value of [10,50]

```
var myProperty = myLayer.scale;
// false value of preExpression means evaluate the expression
var scaleValue = myProperty.valueAtTime(3.5,false);
if (scaleValue[0] == 10 && scaleValue[1] == 50) {
  alert("hurray");
else {
  alert("oops");
}
```

6 Keyframing a rotation from 0 to 90 and back again

The animation is 10 seconds, and the middle keyframe is at the 5 second mark. Rotation properties are stored as a OneD value.

```
myProperty = myLayer.rotation;
myProperty.setValueAtTime(0, 0);
myProperty.setValueAtTime(5, 90);
myProperty.setValueAtTime(10, 0);
```

7 Changing the keyframe values for the first three keyframes of some source text

```
myProperty = myTextLayer.sourceText;
if (myProperty.numKeys < 3) {
  alert("error, I thought there were 3 keyframes");
}
myProperty.setValueAtKey(1, new TextDocument("key number 1");
myProperty.setValueAtKey(2, new TextDocument("key number 2");
```

```
myProperty.setValueAtKey(3, new TextDocument("key number 3");
```

8 Setting values using the convenience syntax for position, scale, color, or source text

```
// These two are equivalent. The second fills in a default of 0.
myLayer.position.setValue([ 20, 30, 0]);
myLayer.position.setValue([ 20, 30 ]);
// These two are equivalent. The second fills in a default of 100.
myLayer.scale.setValue([ 50, 50, 100]);
myLayer.scale.setValue([ 50, 50 ]);
// These two are equivalent. The second fills in a default of 1.0
myLight.color.setValue([ .8, .3, .1, 1.0]);
myLight.color.setValue([ .8, .3, .1]);
// These two are equivalent. The second creates a TextDocument
myTextLayer.sourceText.setValue(new TextDocument("foo"));
myTextLayer.sourceText.setValue("foo");
```

Property addKey() method

app.project.item(index).layer(index).property(name).addKey(*time*)

Description

The property addKey method adds a new keyframe at the given time and returns the index of the new keyframe.

Parameters

time	floating-point value; the time at which the keyframe is added

Returns

Integer; the index of the new keyframe.

Property canVaryOverTime attribute

app.project.item(index).layer(index).property(name).canVaryOverTime

Description

The Property canVaryOverTime attribute is true if this property can vary over time, in other words, if keyframe values or expressions can be written to this property.

Type

Boolean; read-only.

Property expression attribute

app.project.item(index).layer(index).property(name).expression

Description

The Property expression attribute is the expression for this property, expressed as a string. This attribute forces an evalution of the given expression string. The value always changes to the given expression string even if the string is not a valid expression.

If the given string is a valid expression, expressionEnabled becomes true. If the given string is not a valid expression, an error is generated, and expressionEnabled is set to false. If you set a property's expression to the empty string, expressionEnabled will be set to false.

Type

String; read/write.

Property expressionEnabled attribute

app.project.item(index).layer(index).property(name).expressionEnabled

Description

The Property expressionEnabled attribute, if true, uses the expression to generate the value for the property. If the attribute is false, then the expression is not used; keyframe information or the static value of the property is used. This attribute can be set to true only if the expression contains a valid expression string.

Type

Boolean; read/write.

Property expressionError attribute

app.project.item(index).layer(index).property(name).expressionError

Description

The Property expressionError attribute contains the error if the last expression string given to the expression attribute evaluated with an error.

If no expression string has been given to the expression, or if the last expression string given to expression evaluated without error, it contains the empty string ("").

Type

String; read-only.

Property hasMax attribute

app.project.item(index).layer(index).property(name).hasMax

Description

The Property hasMax attribute is true if there is a maximum permitted value for this property.

Type

Boolean; read-only.

Property hasMin attribute

app.project.item(index).layer(index).property(name).hasMin

Description

The Property hasMin is true if there is a minimum permitted value for this property.

Type

Boolean; read-only.

Property isInterpolationTypeValid() method

app.project.item(index).layer(index).property(name).isInterpolationTypeValid(*theType*)

Description

This method returns true if this Property can be interpolated using the theType.

Parameters

theType	KeyframeInterpolationType

Returns

Boolean.

Property isSpatial attribute

app.project.item(index).layer(index).property(name).isSpatial

Description

The Property isSpatial attribute is true if the property defines a spatial value. Examples are position and effect point controls.

Type

Boolean; read-only.

Property isTimeVarying attribute

app.project.item(index).layer(index).property(name).isTimeVarying

Description

The Property isTimeVarying attribute is true if the property is time varying. A property is time varying if it has keyframes or an enabled expression. If isTimeVarying is true, then canVaryOverTime must also be true.

Type

Boolean; read-only.

Property KeyframeInterpolationType attribute

app.project.item(index).layer(index).property(name).setInterpolationTypeAtKey
(1,KeyframeInterpolationType.LINEAR,KeyframeInterpolationType.BEZIER)

Description

This enumerated type specifies the type of interpolation used at a keyframe.

Enumerated Types

Possible values are:

KeyframeInterpolationType.LINEAR	specifies a linear keyframe
KeyframeInterpolationType.BEZIER	specifies a bezier keyframe.
KeyframeInterpolationType.HOLD	specifies a hold keyframe

Property keyInInterpolationType() method

app.project.item(index).layer(index).property(name).keyInInterpolationType(*keyIndex*)

Description

This method returns the 'in' interpolationType for the given key.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

KeyframeInterpolationType.

Property keyInSpatialTangent() method

app.project.item(index).layer(index).property(name).keyInSpatialTangent(*keyIndex*)

Description

This method returns the 'in' spatial tangent for the given key.

If the PropertyValueType is TwoD_SPATIAL, the return value contains 2 floating-point values. If the PropertyValueType is ThreeD_SPATIAL, the return value contains 3 floating-point values.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Array of floating-point values.

Property keyInTemporalEase() method

app.project.item(index).layer(index).property(name).keyInTemporalEase(*keyIndex*)

Description

This method returns the 'in' temporal ease for the given key.

The return value is an array of KeyframeEase objects. The dimension of the array depends on the dimension of the property's keyframeValueType. For ThreeD, the dimension of the array is 3. For TwoD, it is 2. For all other keyframeValueTypes, it is 1.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

KeyframeEase expressed as an array.

Property keyOutInterpolationType() method

app.project.item(index).layer(index).property(name).keyOutInterpolationType(*keyIndex*)

Description

This method returns the 'out' interpolationType for the given key.

Parameters

keyIndex	Integer; the keyframe to be evaluated

Returns

KeyframeInterpolationType.

Property keyOutSpatialTangent() method

app.project.item(index).layer(index).property(name).keyOutSpatialTangent(*keyIndex*)

Description

This method returns the 'out' spatial tangent for the given key.

If the PropertyValueType is TwoD_SPATIAL, the return value contains 2 floating-point values. If the PropertyValueType is ThreeD_SPATIAL, the return value contains 3 floating-point values.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being set

Returns

Array of floating-point values.

Property keyOutTemporalEase() method

app.project.item(index).layer(index).property(name).keyOutTemporalEase(*keyIndex*)

Description

This method returns the 'out' temporal ease for the given key.

The return value is an array of KeyframeEase objects. The dimension of the array depends on the dimension of the property's keyframeValueType. For ThreeD, the dimension of the array is 3. For TwoD, it is 2. For all other keyframeValueTypes, it is 1.

Parameters

keyIndex	Integer; the keyframe being set

Returns

KeyframeEase expressed as an array.

Property keyRoving() method

app.project.item(index).layer(index).property(name).keyRoving(*keyIndex*)

Description

This method returns whether the keyframe is roving.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Boolean.

Property keySelected() method

app.project.item(index).layer(index).property(name).keyRoving(*keyIndex*)

Description

This method returns whether the keyframe is selected.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Boolean.

Property keySpatialAutoBezier() method

app.project.item(index).layer(index).property(name).keySpatialAutoBezier(*keyIndex*)

Description

This method returns whether the keyframe has spatial auto-bezier interpolation.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Note that spatial auto-bezier has an effect at this keyframe only if keySpatialContinuous(keyIndex) is true.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Boolean.

Property keySpatialContinuous() method

app.project.item(index).layer(index).property(name).keySpatialContinuous(*keyIndex*)

Description

This method returns whether the keyframe has spatial continuity.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Boolean.

Property keyTemporalAutoBezier() method

app.project.item(index).layer(index).property(name).keyTemporalAutoBezier(*keyIndex*)

Description

This method returns whether the keyframe has auto-bezier interpolation.

Note that temporal auto-bezier has an effect at this keyframe only if the KeyframeInterpolationType is BEZIER for both keyInInterpolation(keyIndex) and keyOutInterpolation(keyIndex).

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Boolean.

Property keyTemporalContinuous() method

app.project.item(index).layer(index).property(name).keyTemporalContinuous(*keyIndex*)

Description

This method returns whether the keyframe has temporal continuity.

Note that temporal continuity has an effect at this keyframe only if the KeyframeInterpolationType is BEZIER for both keyInInterpolation(keyIndex) and keyOutInterpolation(keyIndex).

Parameters

keyIndex	Integer; the keyframe being evaluated

Returns

Boolean.

Property keyTime() method

app.project.item(index).layer(index).property(name).keyTime(*keyIndex*)
app.project.item(index).layer(index).property(name).keyTime(*markerComment*)

Description

The property keyTime method finds the keyframe or marker specified in the arguments and returns the time at which it occurs.

If no keyframe or marker can be found that matches the argument, this method generates an exception, and an error is displayed.

Parameters

keyIndex	integer; the keyframe index number, (in range 0..numKeys)
markerComment	string; the comment attached to a marker (see "MarkerValue Comment attribute" on page 116)

Returns

Floating-point value; the time at which the keyframe or marker occurs.

Property keyValue() method

app.project.item(index).layer(index).property(name).keyValue(*keyIndex*)
app.project.item(index).layer(index).property(name).keyValue(*markerComment*)

Description

The property keyValue method finds the keyframe or marker specified in the arguments and returns the time at which it occurs.

If no keyframe or marker can be found that matches the argument, this method generates an exception, and an error is displayed.

Parameters

keyIndex	integer; the keyframe index number, (in range 0..numKeys)
markerComment	string; the comment attached to a marker (see "MarkerValue Comment attribute" on page 116)

Returns

Floating-point value; the time at which the keyframe or marker occurs.

Property maxValue attribute

app.project.item(index).layer(index).property(name).maxValue

Description

The Property maxValue attribute contains the maximum permitted value of the property. If the hasMax attribute is false, an exception occurs, and an error is generated.

Type

Floating-point value; read-only.

Property minValue attribute

app.project.item(index).layer(index).property*(name)*.minValue

Description

The Property maxValue attribute contains the minimum permitted value of the property. If the hasMax attribute is false, an exception occurs, and an error is generated.

Type

Floating-point value; read-only.

Property nearestKeyIndex() method

app.project.item(index).layer(index).property(name).nearestKeyIndex(*time*)

Description

The property nearestKeyIndex method returns the index of the keyframe nearest to the given time.

Parameters

time	floating-point value; the time at which to search for the nearest key

Returns

Integer; the index of the nearest keyframe.

Property numKeys attribute

app.project.item(index).layer(index).property(name).numKeys

Description

The Property numKeys attribute contains the number of keyframes in this property. If this attribute's value is 0, then the property is not being keyframed.

Type

Integer; read-only.

Property propertyValueType attribute

app.project.item(index).layer(index).property(name).propertyValueType

Description

The Property numKeys attribute contains the type of value stored in this property.

The enumerated type associated with this attribute has one value for each type of data that can be stored in and/or retrieved from a property. All property objects store data that falls into one of these categories.

Each type of data is stored and retrieved in a different kind of structure. For example, a 3D spatial property (like a layer's position) is stored as an array of three floating point values. When setting a value for position, you'd pass in such an array, as in:

```
mylayer.property("position").setValue([10,20,0]);
```

For another example, a shape property (such as a layer's mask shape) is stored as a Shape object. When setting a value for a shape, pass in a shape object, as in:

```
var myShape = new Shape();
myShape.vertices = [[0,0],[0,100],[100,100],[100,0]];
var myMask = mylayer.property("ADBE Mask Parade").property(1);
myMask.property("ADBE Mask Shape").setValue(myShape);
```

Enumerated Types

PropertyValueType.NO_VALUE	stores no data
PropertyValueType.ThreeD_SPATIAL	array of three floating point positional values, e.g., Anchor Pont [10, 20.2, 0]
PropertyValueType.ThreeD	array of three floating point quantitative values, e.g., Scale [100, 20.2, 0]
PropertyValueType.TwoD_SPATIAL	array of 2 floating point positional values, e.g., Anchor Pont [5.1, 10]
PropertyValueType.TwoD	array of 2 floating point quantitative values, e.g., Scale [5.1, 100]
PropertyValueType.OneD	a floating point value
PropertyValueType.COLOR	array of 4 floating point values in the range 0..1, e.g., [.8, .3, .1, 1.0]
PropertyValueType.CUSTOM_VALUE	unimplemented type; you cannot get and set values for properties with this type
PropertyValueType.MARKER	MarkerValue object (see "MarkerValue object" on page 114)
PropertyValueType.LAYER_INDEX	integer; a value of 0 means none (no layer)
PropertyValueType.MASK_INDEX	integer; a value of 0 means none (no mask)
PropertyValueType.SHAPE	shape object
PropertyValueType.TEXT_DOCUMENT	TextDocument object (see "TextDocument object" on page 177)

Property removeKey() method

app.project.item(index).layer(index).property(name).removeKey(*keyIndex*)

Description

The property removeKey method removes a keyframe with the given keyIndex. If no keyframe with that keyIndex exists, this method generates an exception and an error is displayed.

Parameters

keyIndex	integer; the index of the keyframe being removed

Returns

None.

Property selectedKeys attribute

app.project.item(index).layer(index).property(name).selectedKeys

Description

The Property selectedKeys attribute yields an array of indices of all the selected keyframes in this Property. If no keys are selected, or if the property has no keyframes, an empty array is returned.

Type

Array of integers; read-only.

Property setInterpolationTypeAtKey() method

app.project.item(index).layer(index).property(name).setInterpolationTypeAtKey(*inType, outType*)

Description

This method sets the in and out interpolation types for the given key.

If an outType is not provided, then outType will be set equal to the inType.

Parameters

inType	KeyframeInterpolationType; the incoming interpolation type
outType	KeyframeInterpolationType (optional); the outgoing interpolation type

Returns

None.

Property setRovingAtKey() method

app.project.item(index).layer(index).property(name).setRovingAtKey(*keyIndex, newVal*)

Description

This method specifies whether the keyframe is roving.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Note: *The first and last key in any property never will rove. Setting to true will be ignored and the value will remain false.*

Parameters

keyIndex	Integer; the keyframe being set
newVal	Boolean; if set to true, keyframe is set to be roving

Returns

None.

Property setSelectedAtKey() method

app.project.item(index).layer(index).property(name).setSelectedAtKey(*keyIndex, onOff*)

Description

This method specifies whether the keyframe is selected.

Parameters

keyIndex	Integer; the keyframe being specified
onOff	the new setting to use; if true, keyframe is selected, if false, deselected

Returns

None.

Property setSpatialAutoBezierAtKey() method

app.project.item(index).layer(index).property(name).setSpatialAutoBezierAtKey(keyIndex, newVal)

Description

This method specifies whether the keyframe has spatial continuity.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being set
newVal	Boolean; if set to true, keyframe is set to be auto-bezier

Returns

None.

Property setSpatialContinuousAtKey() method

app.project.item(index).layer(index).property(name).setSpatialContinuousAtKey(*keyIndex, newVal*)

Description

This method specifies whether the keyframe has spatial continuity.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being set
newVal	Boolean; if set to true, keyframe is set to be continuous

Returns

None.

Property setSpatialTangentsAtKey() method

app.project.item(index).layer(index).property(name).setSpatialTangentsAtKey(*keyIndex, inTangent, outTangent*)

Description

This method sets the in and out tangent vectors for the given key.

If no outTangent argument is provided, outTangent will be set equal to inTangent. If the PropertyValueType is TwoD_SPATIAL, the inputs should be arrays containing 2 floating-point values. If the PropertyValueType is ThreeD_SPATIAL, the inputs should be arrays containing 3 floating-point values.

If the PropertyValueType is neither TwoD_SPATIAL nor ThreeD_SPATIAL, an exception is generated.

Parameters

keyIndex	Integer; the keyframe being set
inTangent	Floating-point value; the in tangent vector for this keyframe
outTangent	Floating-point value (optional); the out tangent vector for this keyframe

Returns

None.

Property setTemporalAutoBezierAtKey() method

app.project.item(index).layer(index).property(name).setTemporalAutoBezierAtKey(*keyIndex, newVal*)

Description

This method specifies whether the keyframe has temporal auto-bezier interpolation.

Note that spatial auto bezier has an effect at this keyframe only if keySpatialContinuous(keyIndex) is true.

Parameters

keyIndex	Integer; the keyframe being set
newVal	Boolean; if set to true, keyframe is set to be continuous

Returns

None.

Property setTemporalContinuousAtKey() method

app.project.item(index).layer(index).property(name).setTemporalContinuousAtKey(*keyIndex, newVal*)

Description

This method specifies whether the keyframe has temporal continuity.

Note that temporal continuity has an effect at this keyframe only if the KeyframeInterpolationType is BEZIER for both keyInInterpolation(keyIndex) and keyOutInterpolation(keyIndex).

Parameters

keyIndex	Integer; the keyframe being set
newVal	Boolean; if set to true, keyframe is set to be continuous

Returns

None.

Property setTemporalEaseAtKey() method

app.project.item(index).layer(index).property(name).setTemporalEaseAtKey(*keyIndex, inTemporalEase, outTemporalEase*)

Description

This method sets the in and out temporal ease for the given key.

If outTemporalEase is not provided, then outTemporalEase will be set equal to the inTemporalEase.

InTemporalEase and outTemporalEase are arrays of KeyframeEase objects. The dimension of the array depends on the dimension of the property's keyframeValueType. For ThreeD, the dimension of the array is 3. For TwoD, it is 2. For all other keyframeValueTypes, including TwoD_SPATIAL and ThreeD_SPATIAL types, it is 1.

Parameters

keyIndex	Integer; the keyframe being set
inTemporalEase	KeyframeEase; the incoming temporal ease setting
outTemporalEase	KeyframeEase; the outgoing temporal ease setting

Returns

None.

Property setValue() method

app.project.item(index).layer(index).property(name).setValue(*newValue*)

Description

The property setValue method sets the static value of the property.

If the property has keyframes, this method cannot be used; see “Property setValueAtTime() method” on page 148 or “Property setValueAtKey() method” on page 148 instead. If used with a property that has keyframes, this method generates an exception and an error is displayed.

The type of value to use as an argument depends on the propertyValueType.

Parameters

newValue	propertyValueType; a value appropriate for the type of property being set

Returns

None.

Property setValueAtKey() method

app.project.item(index).layer(index).property(name).setValueAtKey(*keyIndex, newValue*)

Description

The property setValueAtKey method finds the keyframe with the given keyIndex and sets the value at that keyframe.

If the property has no keyframes, or no keyframe with the given keyIndex, this method generates an exception and an error is displayed.

The type of value to use as an argument depends on the propertyValueType.

Parameters

keyIndex	integer; the index of the keyframe to receive a value
newValue	propertyValueType; a value appropriate for the type of property being set

Returns

None.

Property setValueAtTime() method

app.project.item(index).layer(index).property(name).setValueAtTime(*time, newValue*)

Description

The property setValueAtTime method creates a keyframe at the given time (if none exists) and sets the value at that keyframe.

If no keyframes yet exist, this method creates and sets the first keyframe at the given time. If no keyframe exists at the given time, this method creates one. If a keyframe does exist at the given time, this method sets its value.

The type of value to use as an argument depends on the propertyValueType.

Parameters

time	floating point value; the time at which to set a keyframe
newValue	propertyValueType; a value appropriate for the type of property being set

Returns

None.

Property setValuesAtTimes() method

app.project.item(index).layer(index).property(name).setValuesAtTimes(*[times], [newValues]*)

Description

The property setValuesAtTimes method creates keyframes at a given series of times (for those times where no keyframes exist) and sets values of those keyframes.

If no keyframes yet exist, this method creates a set of keyframes and sets the first keyframe at the given time. If no keyframe exists at the given time, this method creates one. If a keyframe does exist at the given time, this method sets its value.

Times and values are expressed as arrays. The type of value to use as arguments depends on the propertyValueType.

Parameters

[times]	floating point value; an array of times at which to set keyframes
[newValues]	propertyValueType; an array of values appropriate for the type of property being set

Returns

None.

Property unitsText attribute

app.project.item(index).layer(index).property(name).unitsText

Description

The Property unitsText attribute is a text description of the units in which the value is expressed.

Type

String; read-only.

Property value attribute

app.project.item(index).layer(index).property(name).value

Description

The Property value attribute contains the value of the property at the current time. If expressionEnabled is true, value returns the evaluated expression value; if there are keyframes, value returns the keyframed value at the current time; in all other cases, value returns the static value for the property.

The type of value returned depends on the propertyValueType of the stream.

Type

Dependent on stream being evaluated; read-only.

Examples

See “Getting and setting the value of an opacity” on page 132, “Getting and setting the value of a position” on page 133, and “Changing the value of a mask shape to be open instead of closed” on page 133 under Property Object Examples.

Property valueAtTime() method

app.project.item(index).layer(index).property(name).valueAtTime(*time, preExpression*)

Description

The property valueAtTime method returns the value of the property as evaluated at the given time. Time is in seconds with the beginning of the composition represented as zero.

The preExpression option is relevant only if the property has an expression applied; otherwise it is ignored. It controls whether any expression is used to calculate the value.

Note that the type of value returned is not made explicit; it will be of a different type, depending on the property evaluated.

Parameters

time	floating point value; the time at which to set a keyframe
preExpression	boolean; determines whether to evaluate the property before or after applying any active expression

Returns

Value (type depends on the propertyValueType).

PropertyBase object

*app.project.item(index).layer(index).*propertyBase

Description

PropertyBase is the base class for both PropertyGroup and Property, so PropertyBase attributes and methods are also available to PropertyGroup and Property. Because PropertyGroup is the base class for Layer, its attributes and methods are available for Layers as well.

Attributes

Attribute	Reference	Description
name	see "PropertyBase name attribute" on page 154	name of the property
matchName	see "PropertyBase matchName attribute" on page 153	special name for the property used to build unique naming paths
propertyIndex	see "PropertyBase propertyIndex attribute" on page 155	index of a PropertyBase within its ParentGroup
propertyDepth	see "PropertyBase propertyDepth attribute" on page 154	indicates number of levels of parent PropertyGroups between the PropertyBase and the layer
propertyType	see "PropertyBase propertyType attribute" on page 155	returns the PropertyType describing this PropertyBase
parentProperty	see "PropertyBase parentProperty attribute" on page 154	returns the PropertyGroup that is the parent of this PropertyBase
isModified	see "PropertyBase isModified attribute" on page 153	returns true if the PropertyBase has been changed since its creation
canSetEnabled	see "PropertyBase canSetEnabled attribute" on page 151	true if the user interface displays an eyeball icon for this property
enabled	see "PropertyBase enabled attribute" on page 152	corresponds to the setting of the eyeball icon, if there is one

Attribute	Reference	Description
active	see "PropertyBase active attribute" on page 151	determines if PropertyBase is active
elided	see "PropertyBase elided attribute" on page 152	returns whether this property is elided (not displayed) in the user interface
isEffect	see "PropertyBase isEffect attribute" on page 153	true if this property is an effect PropertyGroup
isMask	see "PropertyBase isMask attribute" on page 153	true if this property is a mask PropertyGroup
selected	see "PropertyBase selected attribute" on page 156	determines whether this PropertyBase is selected

Methods

Method	Reference	Description
propertyGroup()	see "PropertyBase propertyGroup() method" on page 155	returns the parent PropertyGroup
remove()	see "PropertyBase remove() method" on page 156	removes the PropertyBase from the project
moveTo()	see "PropertyBase moveTo() method" on page 154	moves the PropertyBase to the specified newIndex within its PropertyGroup
duplicate()	see "PropertyBase duplicate() method" on page 152	duplicates the PropertyBase and returns the duplicate

PropertyBase active attribute

app.project.item(index).layer(index).property(name).active

Description

This attribute specifies whether the property is active. For a layer, this corresponds to the setting of the eyeball icon. For an effect and all properties, it is the equivalent to the "enabled" attribute.

This attribute can be written only if canSetEnabled is true.

Type

Boolean; read/write (read-only if canSetEnabled is false).

PropertyBase canSetEnabled attribute

app.project.item(index).layer(index).property(name).canSetEnabled

Description

This attribute specifies whether you can write as well as read the enabled attribute. As a rule of thumb, this attribute is set to true if the user interface displays an eyeball icon for this property (thus it is true for all layers).

Type

Boolean; read-only.

PropertyBase duplicate() method

app.project.item(index).layer(index).property(name).duplicate()

Description

The PropertyBase duplicate method duplicates the PropertyBase and returns the duplicate.

This method is valid only for children of indexed groups; if not, an exception is generated and an error is displayed.

Parameters

None.

Returns

PropertyBase; the duplicate.

PropertyBase elided attribute

app.project.item(index).layer(index).property(name).elided

Description

This attribute specifies whether this property is elided in the user interface. If elided, then this property is just a group used to organize other properties. The property is not displayed in the user interface and its child properties are not indented in the Timeline window.

Type

Boolean; read-only.

Example

Given a text layer with two animators and no properties twirled down, you would see:

- Text
- Path Options
- More Options
- Animator 1
- Animator 2

However, Animator 1 and Animator 2 are actually contained in a PropertyBase called "Text Animators", which is not displayed in the user interface, and so these two properties are not indented in the Timeline window.

PropertyBase enabled attribute

app.project.item(index).layer(index).property(name).enabled

Description

This attribute specifies whether this property is enabled. It corresponds to the setting of the eyeball icon, if there is one.

If there is no eyeball icon, this attribute will default to true; you can write this attribute only if canSetEnabled is true.

If you try to write this attribute and canSetEnabled is false, an exception will be generated.

Type

Boolean; read/write (read-only if canSetEnabled is false).

PropertyBase isEffect attribute

app.project.item(index).layer(index).property(name).isEffect

Description

This attribute specifies whether this property is an effect PropertyGroup (in which case it is set to true).

Type

Boolean; read-only.

PropertyBase isMask attribute

app.project.item(index).layer(index).property(name).isMask

Description

This attribute specifies whether this property is a mask PropertyGroup (in which case it is set to true).

Type

Boolean; read-only.

PropertyBase isModified attribute

app.project.item(index).layer(index).property(name).isModified

Description

The PropertyBase isModified attribute returns true if the PropertyBase has been changed since its creation.

Type

Boolean; read-only.

PropertyBase matchName attribute

app.project.item(index).layer(index).property(name).matchName

Description

The PropertyBase matchName attribute is a special name for the property used to build unique naming paths. This name helps to identify that the property is part of a unique classification.

Every property has a unique matchName identifier. MatchNames are meant to be stable from version to version regardless of its "name" in the user interface or any changes to the application. You can't see matchNames directly through the user interface. But you can refer to them through scripting and sample them via this attribute.

Note: *Unlike names, matchNames do not change based on the language of the After Effects user interface (English/French/German/Japanese).*

Children of INDEXED_GROUP PropertyGroups (see “PropertyBase propertyType attribute” on page 155) do not always have a “name,” defaulting instead to an empty string, but in all cases, they have a matchName.

Type

String; read-only.

PropertyBase moveTo() method

app.project.item(index).layer(index).property(name).moveTo(*newIndex*)

Description

The PropertyBase moveTo method moves the PropertyBase to the specified newIndex within its PropertyGroup.

This method is valid only for children of indexed groups; if not, or if newIndex is not valid, an exception is generated and an error is displayed.

Parameters

newIndex	integer; the index within the same PropertyGroup to which the PropertyBase is to be moved.

Returns

None.

PropertyBase name attribute

app.project.item(index).layer(index).property(name).name

Description

The PropertyBase name attribute is the name of the property.

It is an error to attempt to set the name if the property is not a child property of an INDEXED_GROUP.

Type

String; read/write.

PropertyBase parentProperty attribute

app.project.item(index).layer(index).property(name).parentProperty

Description

The PropertyBase parentProperty returns the PropertyGroup that is the parent of this PropertyBase, or null if this PropertyBase is a layer.

Type

PropertyGroup; read-only.

PropertyBase propertyDepth attribute

app.project.item(index).layer(index).property(name).propertyDepth

Description

The PropertyBase propertyDepth is 0 for a layer. Add 1 (one) for each level of parent PropertyGroup above this PropertyBase until the layer has been reached.

Type

String; read-only.

PropertyBase propertyGroup() method

app.project.item(index).layer(index).property(name).propertyGroup()
app.project.item(index).layer(index).property*(name)*.propertyGroup(*countUp*)

Description

The PropertyBase propertyGroup method returns the parent PropertyGroup, found by moving up the hierarchy the number of levels proscribed by countUp.

The countUp is optional and defaults to 1 if not provided. Range of countUp must be within [1 ...property-Depth]. Returns NULL if countUp takes you as far up as the parent of the layer containing this propertyBase.

Parameters

countUp	integer (optional); defaults to 1; the number of levels to ascend within the range 1..property-Depth.

Returns

PropertyGroup. Null if countUp reaches the layer parent.

PropertyBase propertyIndex attribute

app.project.item(index).layer(index).property(name).propertyIndex

Description

The PropertyBase propertyIndex is the index of a PropertyBase within its ParentGroup.

Note that some properties, such as Layers or "position," will not have a propertyIndex. Others, such as individual effects or masks, will have an index within their parent PropertyGroup.

Type

Integer; read-only.

PropertyBase propertyType attribute

app.project.item(index).layer(index).property(name).propertyType

Description

The PropertyBase propertyType returns the PropertyType describing this PropertyBase.

Enumerated Types

PropertyType is an enumerated type returned by propertyType (read-only). It specifies a particular type of PropertyBase, as follows:

PROPERTY	specifies a single property such as position or zoom
INDEXED_GROUP	specifies a PropertyGroup whose members have an editable name and an index, e.g., the "Masks" property of a layer, which refers to a variable number of individual masks by index number.
NAMED_GROUP	specifies a PropertyGroup whose members have an uneditable name and an index, e.g., a layer

PropertyBase remove() method

app.project.item(index).layer(index).property(name).remove()

Description

The PropertyBase remove method removes the PropertyBase from its parent group. If the PropertyBase is a PropertyGroup, it removes the child properties as well.

This method is valid only for children of indexed groups; if not, an exception is generated and an error is displayed.

This method may be called on a text animation property (any animator that has been set to a text layer).

Parameters

None.

Returns

None.

PropertyBase selected attribute

app.project.item(index).layer(index).property(name).selected

Description

This attribute specifies whether this PropertyBase is selected. Setting selected to true selects the property; setting it to false deselects.

The value of this attribute can be read for any Property, PropertyGroup or Layer. The value can be written on a PropertyGroup only if it is an effect or mask; attempting to set this attribute for any other kind of PropertyGroup will generate an exception.

Note that sampling this attribute can slow down system performance if it is used repeatedly to sample a large number of properties. To read the full set of selected Properties for a Comp or Layer, use the selectedProperties attribute of Comp or Layer.

Type

Boolean; read/write.

PropertyGroup object

app.project.item(index).layer(index).propertyGroup

Description

The PropertyGroup object represents a group of PropertyBase objects, (i.e., Property objects and/or PropertyGroup objects). PropertyGroups may be nested to provide a chain all the way from the Layer at the top down to a single Property (such as the mask feather of the third mask).

Attributes

Attribute	Reference	Description
numProperties	see "PropertyGroup numProperties attribute" on page 158	number of indexed properties in the group

Methods

Method	Reference	Description
property()	see "PropertyGroup property() method" on page 158	returns the child PropertyGroup or Property with the given propertyIndex or name
canAddProperty()	see "PropertyGroup canAddProperty() method" on page 158	true if a property with the given name can be added to the PropertyGroup
addProperty()	see "PropertyGroup addProperty() method" on page 157	adds a property with the given name to the PropertyGroup

PropertyGroup addProperty() method

app.project.item(index).layer(index).propertyGroup(index).addProperty(*name*)

Description

This method adds a property with the given name to this group.

Properties may only be added to a PropertyGroup whose propertyType is PropertyType.INDEXED_GROUP. The only exception to this rule is a text animator property, which is contained in a NAMED_GROUP.

This method generates an exception if a property cannot be created with the given name, so it is always a good idea to call PropertyGroup canAdd Property() method first to check. (See "PropertyGroup canAddProperty() method" on page 158.)

The following names are supported:

- Any matchName for a property that can be added normally using the user interface. For example, ADBE Mask Atom, ADBE Paint Atom, ADBE Text Position, ADBE Text Anchor Point.
- When adding to an ADBE Mask Parade: ADBE Mask Atom, Mask.
- When adding to an ADBE Effects Parade, any effect by matchName, such as ADBE Bulge, ADBE Glo2, APC Vegas.
- Any effect by display name, such as Bulge, Glow, Vegas.
- For text animators and selectors, Text Animator maps to ADBE Text Animator, Range Selector maps to ADBE Text Selector, Wiggly Selector maps to ADBE Text Wiggly Selector, and Expression Selector maps to ADBE Text Expressible Selector.

Parameters

name	string; the name to be added to the PropertyGroup

Returns

PropertyBase.

PropertyGroup canAddProperty() method

*app.project.item(index).layer(index).propertyGroup(index).*canAddProperty(*name*)

Description

This method returns true if a property with the given name can be added to this PropertyGroup.

Parameters

name	string; the name to be added to the PropertyGroup

Returns

Boolean.

Example

The maskGroup can *only* add masks. The only legal input arguments are as follows:

- mask
- ADBE Mask Atom

Any other argument is illegal. Therefore:

- maskGroup.canAddProperty("mask") returns true
- maskGroup.canAddProperty("ADBE Mask Atom") returns true

Any other input for maskGroup argument is false. For example, maskGroup.canAddProperty("blend") returns false

PropertyGroup numProperties attribute

*app.project.item(index).layer(index).propertyGroup(index).*numProperties

Description

This attribute represents the number of indexed properties in this group.

Note: *For Layers only, this can appear misleading, as it returns a value of 3. These correspond to the mask, effect, and motion tracker groups inside the Layer. However, Layers also have a host of other properties available only by name; see the "PropertyGroup property() method" on page 158.*

Type

Integer; read-only.

PropertyGroup property() method

*app.project.item(index).layer(index).propertyGroup(index).*property(*index*)
*app.project.item(index).layer(index).propertyGroup(index).*property(*name*)

Description

This method finds and returns the child PropertyBase, using either its propertyIndex or its name.

If using a string to provide the name argument, you may use any of the following:

- Any name used in expressions "parenthesis style" syntax, meaning the display name or the compact English name
- Any match name
- Any expressions intercap sytax

See below for examples of these various types of names. Essentially, the method replicates syntax available with expressions. In other words, the following are all allowed and are virtually interchangeable (where "mylayer" is an already identified layer):

- `mylayer.position`
- `mylayer("position")`
- `mylayer.property("position")`

as well as the following, which are also interchangeable with one another:

- `mylayer(1)`
- `mylayer.property(1)`
- Note that some properties of a Layer, such as position and zoom, can be accessed only by name. When using the name argument to find a property that is multiple levels down, you will need to make more than one call of this method; for example,

```
myLayer.property("ADBE Masks").property(1)
```

will search two levels down, and return the first mask in the mask group.

If no Property or PropertyGroup can be found with the given name, this method returns a value of null.

Properties that can be accessed using this method with the name argument include:

Properties that can be accessed by name from any Layer	• "ADBE Mask Parade", or "Masks" • "ADBE Effect Parade", or "Effects" • "ADBE MTrackers", or "Motion Trackers"
Properties that can be accessed by name from an AVLayer	• "Anchor Point" or "anchorPoint" • "Position" or "position" • "Scale" or "scale" • "Rotation" or "rotation" • "Z Rotation" or "zRotation" or "Rotation Z" or "rotationZ" • "Opacity" or "opacity" • "Marker" or "marker"
Properties that can be accessed by name from a camera layer	• "Zoom" or "zoom" • "Depth of Field" or "depthOfField" • "Focus Distance" or "focusDistance" • "Aperture" or "aperture" • "Blur Level" or "blurLevel"

Properties that can be accessed by name from a light layer	• "Intensity" or "intensity" • "Color" or "color" • "Cone Angle" or "coneAngle" • "Cone Feather" or "coneFeather" • "Shadow Darkness" or "shadowDarkness" • "Shadow Diffusion" or "shadowDiffusion" • "Casts Shadows" or "castsShadows"
Properties that can be accessed by name from a 3D layer	• "Accepts Shadows" or "acceptsShadows" • "Accepts Lights" or "acceptsLights" • "Ambient" or "ambient" • "Diffuse" or "diffuse" • "Specular" or "specular" • "Shininess" or "shininess" • "Casts Shadows" or "castsShadows" • "Light Transmission" or "lightTransmission" • "Metal" or "metal"
Properties that can be accessed by name from a camera, light or 3D layer	• "X Rotation" or "xRotation" or "Rotation X" or "rotationX" • "Y Rotation" or "yRotation" or "Rotation Y" or "rotationY" • "Orientation" or "orientation"
Properties can be accessed by name from a text layer	• "Source Text" or "sourceText" or "Text" or "text"
Properties that can be accessed from an AVLayer with a non-still source	• "Time Remap" or "timeRemapEnabled"
Properties that can be accessed from an AVLayer with an audio	• "Audio Levels" or "audioLevels"
Properties that can be accessed by name from a PropertyGroup "ADBE Mask Parade"	• "ADBE Mask Atom"
Properties that can be accessed by name from a PropertyGroup "ADBE Mask Atom"	• "ADBE Mask Shape", or "maskShape" • "ADBE Mask Feather", or "maskFeather" • "ADBE Mask Opacity", or "maskOpacity" • "ADBE Mask Offset", or "maskOffset"

Parameters

index	integer; the propertyIndex of the target PropertyBase, in the range [1..numProperties]
name	string; the name of the target PropertyBase, which is a child of the current one.

Returns

PropertyBase; or NULL if no property with the given string name can be found.

Examples

1 If a layer (e.g., myLayer) has a Box Blur effect, you can retrieve the effect in any of the following ways:

```
myLayer.property("Effects").property("Box Blur");
myLayer.property("Effects").property("boxBlur");
```

```
myLayer.property("Effects").property("ADBE Box Blur");
```

2 If a layer (e.g., myLayer) has a mask named "Mask 1" you can retrieve it as follows:

```
myLayer.property("Masks").property("Mask 1");
```

3 To get a Bulge Center value from a Bulge effect, you could use any of the following:

```
myLayer.property("Effects").property("Bulge").property("Bulge Center");
myLayer.property("Effects").property("Bulge").property("bulgeCenter");
```

RenderQueue object

app.project.renderQueue

Description

The RenderQueue object enables access to data and functionality within the Render Queue area of a particular After Effects project. This object is pivotal to render automation.

Attributes of the RenderQueue object provide access to items in the Render Queue and their render status.

Methods of the RenderQueue object can start, pause, and stop the render process.

The RenderQueueItem object provides access to the specific settings for an item to be rendered.

Attributes

Attribute	Reference	Description
rendering	see "RenderQueue rendering attribute" on page 163	determines whether a render is in progress
numItems	see "RenderQueue numItems attribute" on page 162	total number of items in the Render Queue
items	see "ItemCollection" on page 99	collected items in the Render Queue

Methods

Method	Reference	Description
showWindow()	see "RenderQueue showWindow() method" on page 163	boolean to show/hide the Render Queue window
render()	see "RenderQueue render() method" on page 162	starts the render; does not return until render is complete
pauseRendering()	see "RenderQueue pauseRendering() method" on page 162	pauses the render
stopRendering()	see "RenderQueue stopRendering() method" on page 163	stops the render
item()	see "RenderQueue Item() method" on page 161	returns a RenderQueueItem

RenderQueue Item() method

app.project.renderQueue.item(*index*)

Description

This method returns a render queue item with the given index number.

Parameters

index	integer; the index of the item

Returns

RenderQueueItem.

RenderQueue items attribute

app.project.renderQueue.items

Description

The items attribute of renderQueue provides a collection of all items in the Render Queue as a collection.

Type

RQItemCollection; read-only.

See also

"RQItemCollection" on page 164

RenderQueue numItems attribute

app.project.renderQueue.numItems

Description

The numItems attribute indicates the total number of render queue items in the Render Queue.

Type

Integer; read-only.

RenderQueue pauseRendering() method

app.project.renderQueue.pauseRendering(*pause*)

Description

Pauses the Render Queue; equivalent to use of the Pause button in the Render Queue window during a render.

Parameters

pause	boolean; set to true, it pauses the render, set to false, it continues a paused render

Returns

None.

RenderQueue render() method

app.project.renderQueue.render()

Description

Starts the Render Queue; equivalent to use of the Render button in the Render Queue window. Does not return until render is complete.

Set the app.onError if you wish to be notified of errors during the rendering process.

Set the RenderQueueItem.onStatusChanged attribute of a particular RenderQueueItem to get updates while the render is progressing.

Parameters

None.

Returns

None.

See also

"Application open() method" on page 33

"RenderQueueItem onStatusChanged attribute" on page 167

RenderQueue rendering attribute

app.project.renderQueue.rendering

Description

The rendering attribute indicates whether rendering is in progress. This is a read-only attribute; use the render() and stopRendering() methods to control it. If the render is paused, this is set to true.

Type

Boolean; read-only.

RenderQueue showWindow() method

app.project.renderQueue.showWindow(*doShow*)

Description

The showWindow method of RenderQueue is a boolean; if true, it makes the Render Queue window visible, if false, it hides the window.

Parameters

doShow	boolean; if true, shows the Render Queue window; if false, conceals it

Returns

None.

RenderQueue stopRendering() method

app.project.renderQueue.stopRendering()

Description

Stops the Render Queue; equivalent to use of the Stop button in the Render Queue window during a render. Useful to call in the event of an onStatusChanged callback.

Parameters

None.

Returns

None.

See also

"RenderQueueItem onStatusChanged attribute" on page 167.

RQItemCollection

app.project.renderQueue.items

Description

The RQItemCollection contains all of the Render Queue items. This is the equivalent of all of the items found in the Render Queue window of a given project.

Attributes

length	number of objects in the collection (applies to all collections)

Methods

[]	retrieves an object or objects in the collection via its index number
add()	adds a RenderQueueItem for a specified composition

See also

"Collection object" on page 53

RenderQueueItem object

app.project.renderQueue.item(index)

Description

The RenderQueueItem object is an individual item in the Render Queue.

Attributes

Attribute	Reference	Description
numOutputModules	see "RenderQueueItem numOutput-Modules attribute" on page 166	total number of Output Modules assigned to a given Render Queue item
render	see "RenderQueueItem render attribute" on page 168	boolean that shows true if this item will render when the queue is started

Attribute	Reference	Description
startTime	see "RenderQueueItem startTime attribute" on page 169	Date object representing time program began rendering the item
elapsedSeconds	see "RenderQueueItem elapsedSeconds attribute" on page 166	time elapsed in the current render, in seconds
timeSpanStart	see "RenderQueueItem timeSpanStart attribute" on page 170	start time, in seconds, in the comp to be rendered
timeSpanDuration	see "RenderQueueItem timeSpanDuration attribute" on page 169	duration of the comp to be rendered, in seconds
skipFrames	see "RenderQueueItem skipFrames attribute" on page 168	number of frames to skip when rendering
comp	see "RenderQueueItem comp attribute" on page 166	composition being rendered by this RQ item
outputModules	see "RenderQueueItem outputModules attribute" on page 167	collection of the Output Modules
templates	see "RenderQueueItem templates attribute" on page 169	array of the Render Settings templates
status	see "RenderQueueItem status attribute" on page 169	current status of a Render Queue item
onStatusChanged	see "RenderQueueItem onStatusChanged attribute" on page 167	condition in which the status of an item changes (e.g., from RENDERING to DONE status)
logType	see "RenderQueueItem logType attribute" on page 166	returns one of the log types

Methods

Method	Reference	Description
outputModule()	see "RenderQueueItem outputModule() method" on page 167	returns an Output Module for the item
remove()	see "RenderQueueItem remove() method" on page 167	deletes the item from the Render Queue
saveAsTemplate()	see "RenderQueueItem saveAsTemplate() method" on page 168	saves a new Render Settings Template with the given name
applyTemplate()	see "RenderQueueItem applyTemplate() method" on page 165	applies a pre-set Render Settings Template

RenderQueueItem applyTemplate() method

app.project.renderQueue.item.applyTemplate(*templateName*)

Description

The applyTemplate method of renderQueueItem applies a Render Settings template to the item.

Parameters

templateName	name of the template to apply

Returns

None.

RenderQueueItem comp attribute

app.project.renderQueue.item(index).comp

Description

The comp attribute returns the CompItem object that will be rendered by this Render Queue item. This is a read-only attribute; to change the Composition, the Render Queue item must be deleted and re-created.

Type

CompItem; read-only.

RenderQueueItem elapsedSeconds attribute

app.project.renderQueue.item(index).elapsedSeconds

Description

The elapsedSeconds attribute shows the number of seconds spent rendering the item.

Type

Integer, or null if item has not been rendered; read-only.

RenderQueueItem logType attribute

app.project.renderQueue.item(index).outputModule.logType

Description

The logType attribute returns one of the log types (listed below).

Enumerated Type

LogType (read/write); one of the following:

LogType.ERRORS_ONLY
LogType.ERRORS_AND_SETTINGS
LogType.ERRORS_AND_PER_FRAME_INFO

RenderQueueItem numOutputModules attribute

app.project.renderQueue.item(index).numOutputModules

Description

The numOutputModules attribute represents the total number of Output Modules assigned to a given Render Queue item.

Type

Integer; read-only.

RenderQueueItem onStatusChanged attribute

app.project.renderQueue.item(index).onStatusChanged

Description

The onStatusChanged attribute is invoked whenever the value of the RenderQueueItem.status attribute is changed.

Note that changes cannot be made to render queue items (or to the application) while a render is in progress (including when paused). This mirrors the regular application functionality.

Type

Function.

Example

```
function myStatusChanged() {
  alert(app.project.renderQueue.item(1).status)
}

app.project.renderQueue.item(1).onStatusChanged = myStatusChanged();
app.project.renderQueue.item(1).render = false; //shows dialog
```

RenderQueueItem outputModules attribute

app.project.renderQueue.item(index).outputModules

Description

The outputModules attribute returns the collection of Output Modules for the item.

Type

OMCollection; read-only.

RenderQueueItem outputModule() method

app.project.renderQueue.item(index).outputModule(*index*)

Description

This method returns an output module with the given index.

Parameters

index	integer; the index of the output module

Returns

OutputModule.

RenderQueueItem remove() method

app.project.renderQueue.item(index).remove()

Description

The remove method of renderQueueItem deletes the referenced item from the Render Queue.

Parameters

None.

Returns

None.

RenderQueueItem render attribute

app.project.renderQueue.item(index).render

Description

The render attribute determines whether an item will render when the Render Queue is started.

Type

Boolean; read/write.

RenderQueueItem saveAsTemplate() method

app.project.renderQueue.item(index).saveAsTemplate(*name*)

Description

The saveAsTemplate method of RenderQueueItem saves the item's current render settings as a new template with the name passed as a parameter.

Parameters

name	name of the new template

Returns

None.

RenderQueueItem skipFrames attribute

app.project.renderQueue.item(index).skipFrames

Description

The skipFrames attribute specifies the number of frames to skip when rendering. It is used to do quicker rendering tests than a full render. The total length of time remains unchanged.

A value of 0 specifies no skipped frames and results in regular rendering of all frames. A value of 1 specifies that every other frame is to be skipped. This is equivalent to "rendering on twos." Higher values will skip a larger number of frames. For example, if skip has a value of 1, for sequence output you'd get half the number of frames and for movie output each frame would be double the duration.

The permissible range of values for skipFrames is [0..99].

Type

Integer. Read/write.

RenderQueueItem startTime attribute

app.project.renderQueue.item(index).startTime

Description

The startTime attribute returns a Date object showing the day and time that the item started rendering.

Type

Date; null if the item has not started rendering. Read-only.

RenderQueueItem status attribute

app.project.renderQueue.item(index).status

Description

The status attribute represents the current render status of the item.

Enumerated Type

RQItemStatus - one of the following attributes:

RQItemStatus.WILL_CONTINUE	render has been paused
RQItemStatus.NEEDS_OUTPUT	item lacks a valid output path
RQItemStatus.UNQUEUED	render item is listed in the Render Queue window but is not ready to render
RQItemStatus.QUEUED	composition is ready to render
RQItemStatus.RENDERING	composition is rendering
RQItemStatus.USER_STOPPED	rendering process was stopped by the user
RQItemStatus.ERR_STOPPED	rendering process was stopped due to an error
RQItemStatus.DONE	rendering process for the item is complete

RenderQueueItem templates attribute

app.project.renderQueue.item(index).templates

Description

The templates attribute returns an array of the names of Render Settings templates available for the item. It is a read-only attribute.

Type

Array; read-only.

RenderQueueItem timeSpanDuration attribute

app.project.renderQueue.item(index).timeSpanDuration

Description

The timeSpanDuration attribute determines the duration, in seconds, of the comp to be rendered. This achieves the same effect as setting a custom end time in the Render Settings dialog box, although the duration is determined by subtracting the start time from the end time.

Type

Floating-point value; read/write.

RenderQueueItem timeSpanStart attribute

*app.project.renderQueue.item(index).*timeSpanStart

Description

The timeSpanStart attribute determines the time in the comp, in seconds, at which rendering will begin. This is the equivalent of setting a custom start time in the Render Settings dialog box.

Type

Floating-point value; read/write.

Settings object

Description

The Settings object provides an easy way to manage settings for scripts. The settings are persistent between application launches, saved in the After Effects Preferences file.

Methods

Method	Reference	Description
saveSetting()	see "Settings saveSetting() method" on page 171	can save a default value for a preferences item
getSetting()	see "Settings getSetting() method" on page 170	retrieves a setting found in the Prefs file
haveSetting()	see "Settings haveSetting() method" on page 171	used to determine whether a given section name and key name have a setting assigned

Settings getSetting() method

app.settings.getSetting(*sectionName,keyName*)

Description

The getSetting method retrieves a setting found in the Prefs file.

Parameters

sectionName	text string that holds the name of a section of settings; in the prefs file these are the names enclosed in brackets and quotation marks
keyName	text string that describes an individual setting name; these are listed in quotation marks below the sectionName

Returns

String representing the value of the setting.

Example

```
var n = app.settings.getSetting("Eraser - Paint Settings", "Aligned Clone");
alert("The setting is " + n);
```

See also

"Settings haveSetting() method" on page 171

"Settings saveSetting() method" on page 171

Settings haveSetting() method

app.settings.haveSetting(*sectionName*,*keyName*)

Description

The haveSetting method is used to determine whether a given section name and key name have a setting assigned.

Returns

Boolean.

See also

"Settings getSetting() method" on page 170

"Settings saveSetting() method" on page 171

Settings saveSetting() method

app.settings.saveSetting(*sectionName*,*keyName*,*value*)

Description

The saveSetting method can save a default value for a scripting preferences item.

Parameters

sectionName	text string that holds the name of a section of settings; in the prefs file these are the names enclosed in brackets and quotations
keyName	text string that describes an individual setting name; these are listed in quotations below the sectionName
value	value assigned to the setting

See also

"Settings getSetting() method" on page 170

"Settings haveSetting() method" on page 171

Shape object

app.project.item(index).layer(index).property(1).property(index).property("maskShape").value

Description

The Shape object holds information describing the outline shape of a Mask.

Attributes

Attribute	Reference	Description
closed	see "Shape closed attribute" on page 173	specifies whether the shape is a closed curve
vertices	see "Shape vertices attribute" on page 174	array of floating-point pairs specifying the anchor points of the shape
inTangents	see "Shape inTangents attribute" on page 173	array of floating-point pairs specifying the tangent vectors coming into the shape vertices
outTangents	see "Shape outTangents attribute" on page 173	array of floating-point pairs specifying the tangent vectors coming out of the shape vertices

Methods

Method	Reference	Description
shape()	see "Shape Shape() method" on page 174	constructor to create a new Shape

Examples

1 Creating a square mask

A square is a closed shape with 4 points. The inTangents and outTangents for connected straightline segments are always 0, the default. Since the default values are the desired values, you do not need to set them here.

```
var myShape = new Shape();
myShape.vertices = [ [0,0], [0,1], [1,1], [1,0] ];
myShape.closed = true;
```

2 Creating a "U" shaped mask

A "U" is an open shape with the same 4 points used in Example 1:

```
var myShape = new Shape();
myShape.vertices = [ [0,0], [0,1], [1,1], [1,0] ];
myShape.closed = false;
```

3 Creating an oval

An oval is a closed shape with 4 points and inTangents and outTangents:

```
var myShape = new Shape();
myShape.vertices = [[300,50],[200,150],[300,250],[400,150]];
myShape.inTangents = [[55.23,0],[0,-55.23],[-55.23,0],[0,55.23]];
myShape.outTangents = [[-55.23,0],[0,55.23],[55.23,0],[0,-55.23]];
myShape.closed = true;
```

Shape closed attribute

app.project.item(index).layer(index).property(1).property(index).property("maskShape").value.closed

Description

This attribute specifies whether the shape is a closed curve. If true, the first and last vertices will be connected to form a closed curve. If false, the closing segment will not be drawn.

Type

Boolean; read/write.

Shape inTangents attribute

app.project.item(index).layer(index).property(1).property(index).property("maskShape").value.inTangents

Description

This attribute describes an array of float pairs specifying the tangent vectors (direction handles) associated with the vertices of the shape.

Each float pair specifies one inTangent. There is one inTangent and one outTangent associated with each vertex in the vertices array. However, when creating a shape to set as a keyframe value, you may leave inTangent and/or outTangent null, or you may leave entries unfilled; they will be automatically padded with zeroes. This will result in straight line segments in the non-RotoBezier case; in the RotoBezier case the zeros will be ignored and the inTangents/outTangents will be automatically calculated.

Each vertex on the shape has two direction handles. The inTangent is the direction handle associated with the line segment 'coming into' the vertex from the preceding vertex in the shape.

The inTangents are *x,y* coordinates specified relative to the associated vertex. For example, an inTangent of [-1,-1] is located above and to the left of the vertex and has a 45 degree slope, regardless of the actual location of the vertex. The longer a handle is, the greater an influence it has, so an incoming shape segment will hug the tangent vector closer for an inTangent of [-2,-2] than it will for an inTangent of [-1,-1], even though both of these come toward the vertex from the same direction.

If a shape is not closed, the inTangent for the first vertex and the outTangent for the final vertex will be ignored. These two vectors would otherwise specify the dirction handles of the final connecting segment out of the final vertex and back into the first vertex.

Note that if a shape is used in a mask with Rotobeziers, then the tangent values will be ignored on write (i.e., ignored when you set the new shape), because RotoBezier masks calculate their tangents automatically. This means that, for RotoBezier masks, you can construct a shape by setting only the vertices attribute and setting inTangents and outTangents both to null. If you set the shape without tangents, then follow this by getting the shape once again; the new shape's tangent values will be filled with the automatically-calculated tangent values.

Type

Array of floating-point pairs; read/write.

Shape outTangents attribute

app.project.item(index).layer(index).property(1).property(index).property("maskShape").value.outTangents

Description

This attribute describes an array of float pairs specifying the tangent vectors (direction handles) associated with the vertices of the shape.

Each float pair specifies one inTangent. There is one inTangent and one outTangent associated with each vertex in the vertices array. However, when creating a shape to set as a keyframe value, you may leave inTangent and/or outTangent null, or you may leave entries unfilled; they will be automatically padded with zeroes. This will result in straight line segments in the non-RotoBezier case; in the RotoBezier case the zeros will be ignored and the inTangents/outTangents will be automatically calculated.

Each vertex on the shape has two direction handles. The outTangent is the direction handle associated with the line segment 'going out of' the vertex toward the next vertex in the shape.

The outsTangent are *x,y* coordinates specified relative to the associated vertex. For example, an inTangent of [-1,-1] is located above and to the left of the vertex, and has a 45 degree slope, regardless of the actual location of the vertex. The longer a handle is, the greater an influence it has, so an incoming shape segment will hug the tangent vector closer for an inTangent of [-2,-2] than it will for an inTangent of [-1,-1], even though both of these come toward the vertex from the same direction.

If a shape is not closed, the inTangent for the first vertex and the outTangent for the final vertex will be ignored. These two vectors would otherwise specify the dirction handles of the final connecting segment out of the final vertex and back into the first vertex.

Note that if a shape is used in a mask with Rotobeziers, then the tangent values will be ignored on write (i.e., ignored when you set the new shape), because RotoBezier masks calculate their tangents automatically. This means that, for RotoBezier masks, you can construct a shape by setting only the vertices attribute and setting inTangents and outTangents both to null. If you set the shape without tangents, then follow this by getting the shape once again, the new shape's tangent values will be filled with the automatically-calculated tangent values.

Type

Array of floating-point pairs; read/write.

Shape Shape() method

New Shape()

Description

This method is the constructor to create a new shape. After constructing a shape with this method, set the various attributes individually to fill the shape with desired values.

Parameters

None.

Returns

Shape.

Shape vertices attribute

Description

This attribute describes an array of float pairs specifying the anchor points of the shape. Each float pair is an array of two floats.

Type

Array of floating-point pairs; read/write.

SolidSource object

app.project.item(index).mainSource
app.project.item(index).proxySource

Description

The SolidSource object holds information describing a solid color footage source. It is a subclass of FootageSource and so it inherits all attributes and methods of the "FootageSource object" on page 89.

Attributes

color	see "SolidSource color attribute" on page 175	specifies the color of the solid

SolidSource color attribute

app.project.item(index).solidSource.color

Description

The color attribute of SolidSource specifies the color of the solid. The value is an array of three floats for red, green, and blue, where those floats are in the range [0..1].

Type

Array of three floating-point values from 0 to 1: [R, G, B]); read/write.

System object

system

Description

The System object provides access to attributes found on the user's system, such as the user name or the name and version of the operating system.

Attributes

Attribute	Reference	Description
userName	see "System userName attribute" on page 176	user name logged in to the current session of the operating system
machineName	see "System machineName attribute" on page 176	name of the host machine
osName	see "System osName attribute" on page 176	name of the operating system currently running
osVersion	see "System osVersion attribute" on page 176	version of the operating system currently running

System machineName attribute

system.machineName

Description

The machineName attribute specifies the name of the machine on which the program is running, and is expressed as a text string.

Type

String; read-only.

Example

```
alert ( "Your machine is called " + system.machineName + ".");
```

System osName attribute

system.osName

Description

The osName attribute specifies the name of the operating system on which the program is running, and is expressed as a text string.

Type

String; read-only.

Example

```
alert ( "Your OS is " + system.osname + ".");
```

System osVersion attribute

system.osVersion

Description

The osVersion attribute specifies the version of the current local operating system, and is expressed as a text string.

Type

String; read-only.

Example

```
alert ( "Your OS is " + system.osname + " running version " + system.osversion);
```

System userName attribute

system.userName

Description

The userName attribute specifies the name of the user logged on to the system, and is expressed as a text string.

Type

String; read-only.

Example

```
confirm( "You are: " + system.userName + " running on " + system.machineName + ".");
```

TextDocument object

Description

The TextDocument object holds a string an attribute named "text." It is used to store values for a text layer's Source Text property.

Attributes

Attribute	Reference	Description
text	see "TextDocument text attribute" on page 177	text string stored in the TextDocument

Methods

Method	Reference	Description
TextDocument()	see "TextDocument TextDocument() method" on page 178	constructor to create a TextDocument

Examples

1 Set a value of some source text and then display an alert showing the new value:

```
var myTextDocument = new TextDocument("Happy Cake");
myTextLayer.property("Source Text").setValue(myTextDocument);
alert(myTextLayer.property("Source Text").getValue());
```

2 Set keyframe values for text that will show different words over time:

```
var textProp = myTextLayer.property("Source Text");
textProp.setValueAtTime(0, new TextDocument("Happy"));
textProp.setValueAtTime(.33, new TextDocument("cake"));
textProp.setValueAtTime(.66, new TextDocument("is"));
textProp.setValueAtTime(1, new TextDocument("yummy!"));
```

TextDocument text attribute

TextDocument.text

Description

The actual text string stored in this TextDocument.

Type

String; read/write.

TextDocument TextDocument() method

New TextDocumnent(docText)

Description

This method is the constructor for a new TextDocument.

Parameters

docText	string; text contents of the TextDocument

Returns

TextDocument.

Examples

Following are sample scripts included on your CD with an overview of what they do and a step-by-step breakdown of how they work. This set of examples is by no means exhaustive, but it does demonstrate some of scripting's more complex features in action. It also shows some typical programming constructions from JavaScript that apply to scripting.

For examples specific to the use of the user interface, see "Creating User Interface Elements" on page 197. For more examples from Adobe, as well as from other After Effects users, visit Adobe Studio Exchange at http://share.studio.adobe.com, and choose Scripting under the Adobe After Effects section.

Apply effect

This example is a rather simple one; it first requires that the user select an AVLayer and, if that condition is met, sets a 10-pixel Fast Blur to the selected layer (or layers), with Repeat Edge Pixels set to true.

The comments that appear on lines beginning with double forward slashes (//) describe what is occurring in each section of the script. The script does the following, in order:

- checks that at least one selected layer can have effects applied to it
- adds Fast Blur to any selected layer that can
- sets Blurriness to 10 and turns on Repeat Edge Pixels
- returns a boolean stating whether the effect was added
- starts an undo group so that if the effect is being applied to more than one layer, the entire script operation can be undone in one step rather than several
- sets an error with instructions to the user should the script fail to apply an effect to any layer

```
{
// This function applies the effect to one single layer
//
function applyFastBlurToLayer(the_layer)
{
var addedIt = false;

// Can only add an effect if there's an effects group in the layer.
// Some layers don't have one, like camera and light layers.
if (the_layer("Effects") != null) {
// Always best to check if it's safe before adding:
if (the_layer("Effects").canAddProperty("Fast Blur")) {
// add a new Fast Blur effect to the effects group of the layer
the_layer("Effects").addProperty("Fast Blur");

// set the parameter values
the_layer("Effects")("Fast Blur").blurriness.setValue(10);
the_layer("Effects")("Fast Blur").repeatEdgePixels.setValue(true);

addedIt = true;
}
```

```
}
// Return a boolean saying whether we added the effect
return addedIt;
}

// Start an undo group.  By using this with an endUndoGroup(), you
// allow users to undo the whole script with one undo operation.
app.beginUndoGroup("Apply Fast Blur to Selections");

// If we don't find any selected layers, we'll put up an alert at the end.
var numLayersChanged = 0;

// Get the active comp
var activeItem = app.project.activeItem;
if (activeItem != null && (activeItem instanceof CompItem)){

var activeComp = activeItem;

// try to apply to every selected layer
var selectedLayers = activeComp.selectedLayers;
for (var i = 0; i < selectedLayers.length; i++) {

var curLayer = selectedLayers[i];

// The method returns true if it adds the effect, false otherwise.
if (applyFastBlurToLayer(curLayer) == true) {
numLayersChanged++;
}
}
}
// Print a message if no layers were affected
if (numLayersChanged == 0) {
alert("Please select an AV layer or layers and run script again");
}

app.endUndoGroup();
}
```

Replace text

This script performs an action much too specific to be useful as it is, but it shows the basics for a very useful general operation, which is the automatic editing of text layers. Quite simply, the script looks for selected text layers that contain the text string “blue” and changes this string to read “monday”--note that “blue” could appear anywhere in the selected layer, even as part of another word, and still be changed. For example, “bluejean” will read “mondayjean” after the effect is applied.

The comments that appear on lines beginning with double forward slashes (//) describe what is occurring in each section of the script. The script does the following, in order:

- sets a function that replaces all instances of “blue” with “monday”
- sets a function that applies the first function to a single layer, looking for all Source Text keyframes where “blue” might appear, evaluating each time whether any text was changed (and returning a boolean stating whether it was changed)
- sets a single undo group for all changes made by the script
- pops up a warning if no layers were changed, instructing the user how to properly apply the script

```
{
// This script replaces text in all the selected text layers.
//
// It finds all instances of the word "blue" and changes them to "monday"
//

// This function takes theString and replaces firstWord with secondWord.
// It repeats, so it will replace all instances of firstWord in theString.
// Returns the changed string.
function replaceTextInString(theString, firstWord, secondWord)
{
var newString = theString;
while(newString.indexOf(firstWord) != -1) {
newString = newString.replace(firstWord,secondWord);
}
return newString;
}

// This function applies the change to one single layer
//
function replaceTextInLayer(theLayer, firstWord, secondWord)
{
var changedSomething = false;

// Get the sourceText property, if there is one.
var sourceText = theLayer.sourceText;
if (sourceText != null) {
if (sourceText.numKeys == 0) {
// textValue is a TextDocument. Retrieve the string inside
var oldString = sourceText.value.text;
if (oldString.indexOf(firstWord) != -1) {
var newString = replaceTextInString(oldString, firstWord, secondWord);
if (oldString != newString) {
sourceText.setValue(newString);
changedSomething = true;
}
}
} else {
// Do it for each keyframe:
for (var keyIndex = 1; keyIndex <= sourceText.numKeys; keyIndex++) {
// textValue is a TextDocument. Retrieve the string inside
var oldString = sourceText.keyValue(keyIndex).text;
```

```
if (oldString.indexOf(firstWord) != -1) {
var newString = replaceTextInString(oldString, firstWord, secondWord);
if (oldString != newString) {
sourceText.setValueAtKey(keyIndex,newString);
changedSomething = true;
}
}
}
}
}
// Return a boolean saying whether we replaced any text
return changedSomething;
}

// Start an undo group.  By using this with an endUndoGroup(), you
// allow users to undo the whole script with one undo operation.
app.beginUndoGroup("Apply Text Change to Selections");

// If we don't make any changes, we'll put up an alert at the end.
var numLayersChanged = 0;

// Get the active comp
var activeItem = app.project.activeItem;
if (activeItem != null && (activeItem instanceof CompItem)){

var activeComp = activeItem;

// try to apply to every selected layer
var selectedLayers = activeComp.selectedLayers;
for (var i = 0; i < selectedLayers.length; i++) {

var curLayer = selectedLayers[i];

// The method returns true if it changes any text, false otherwise.
if (replaceTextInLayer(curLayer, "blue", "monday") == true) {
numLayersChanged++;
}
}
}
// Print a message if no layers were affected
if (numLayersChanged == 0) {
// Note: if you put quotes in the interior of the string,
// they must be preceded by a backslash, as in \"blue\" below.
alert("Please select a text layer or layers containing the word \"blue\" and run script again");
}

app.endUndoGroup();
}
```

Save and increment

Although much of the functionality of this script has been superseded by the incremental save feature that is new to After Effects 6.5, it is still included here because it makes effective use of conditionals, functions, and the File and FileSystem objects.

This script automatically saves a new copy of the open After Effects project and increments a three-digit number in its name to distinguish it from preceding versions of the project. This script is saved as save_and_increment.jsx on your install CD.

The first step is to determine whether the currently open project has ever been saved. This is accomplished with an opening if/else statement. The first condition, "!app.project.file" is saying that if the project has not been saved, an alert telling the user to save the project is popped up, and the script ends.

```
if (!app.project.file) {
  alert ("This project must be saved before running this script.");
```

Next, if the project has been saved at least once before, we set some variables to point to the name of the file and to the numbering and file extension that we plan to add to it. The lastIndexOf() JavaScript searches a string backwards (from end to start) and in this case looks for the dot that separates the name from the extension.

```
} else {
  var currFile = app.project.file;
  var currFileName = currFile.name;
  var extPos = currFileName.lastIndexOf(".");
  var ext = "";
```

Now we set the currFileName variable to the current name, before the dot.

```
  if (extPos != -1) {
    ext = currFileName.substring(extPos, currFileName.length);
    currFileName = currFileName.substring(0, extPos);
  }
```

Next we set a variable that will increment versions starting with 0, and we check to see if there is an underscore character four characters from the end of currFileName. If there is, we assume that the incrementer has run before, as its job is to assign a 3-digit suffix after an underscore incremented one higher than the last suffix. In that case we set incrementer to the current numerical string and extract the name without this numerical extension.

```
  var incrementer = 0;
  if (currFileName.charAt(currFileName.length -4) == "_") {
    incrementer = currFileName.substring(currFileName.length - 3, currFileName.length);
    currFileName = currFileName.substring(0, currFileName.length -4);
  }
```

Now we add an incrementer loop and test for whether numbering has extended to two or three digits (e.g., if the numbering has reached "_010" or above, or "_100" or above), assigning a zero for each if not.

```
  incrementer++;
  var istring = incrementer + "";
  if (incrementer < 10) {
    istring = "0" + istring;
  }
```

```
  if (incrementer < 100) {
    istring = "0" + istring;
  }
```

Finally we create a new file using our updated name and extension, display an alert letting the user know the new file name being saved, and save the project with the new file name.

```
  var newFile = File(currFile.path + "/" + currFileName + "_" + istring + ext);
  alert(newFile.fsName);
  app.project.save(newFile);
}
```

Render named items

This script allows you to find compositions in the open project with a particular text string in their names and send all such compositions to the Render Queue.

To start, we check to see if a default string for rendering has already been set in the user preferences. If so, we set this as a user prompt, handy if you're always looking for the same string (for example, "FINAL" or "CURRENT"). If not, we set a new sectionName and keyName for the preferences file along with a placeholder value for the string that will be entered by the user.

```
var sectionName = "AE Example Scripts";
var keyName = "Render comps with this string";
var searchString = "";

if (app.settings.haveSetting(sectionName, keyName)) {
  searchString = app.settings.getSetting(sectionName, keyName);
}
```

Now we display a prompt to the user asking for what text string we should use.

```
searchString = prompt("What string to render?", searchString);
```

We next go through the project looking for the text entered by the user, and seeing if the item that contains that text is a composition, sending all compositions with that text string in their names to the Render Queue. If the user cancels, the text is undefined. Otherwise, we save the new setting in preferences, convert it to all lowercase letters for consistency's sake (keeping in mind that the search will not be case sensitive).

```
if (searchString) {

  app.settings.saveSetting(sectionName, keyName, searchString);
  searchString = searchString.toLowerCase();
  for (i = 1; i <= app.project.numItems; ++i) {
    var curItem = app.project.item(i);
    if (curItem instanceof CompItem) {
      if (curItem.name.toLowerCase().indexOf(searchString) != -1) {
        app.project.renderQueue.items.add(curItem);
      }
    }
  }
```

Finally, we make the Render Queue window visible and bring it to the front, ready for the user to assign save locations for the new render queue items.

```
  app.project.renderQueue.showWindow(true);
}
```

New render locations

This script allows the user to select queued items in the Render Queue and assign a new render destination for them.

First, we prompt the user for a new folder to use as a render destination.

```
var newLocation = folderGetDialog("Select a render destination...");
```

Next, we make certain that the user entered a new location (and didn't cancel the dialog). Then we create a loop for each selected render queue item. If this item is queued, we take the current render location, give it a new name and location, and then display an alert stating the new file path.

```
if (newLocation) { //boolean to see if the user cancelled
  for (i = 1; i <= app.project.renderQueue.numItems; ++i) {
    var curItem = app.project.renderQueue.item(i);
    if (curItem.status == RQItemStatus.QUEUED) {
      for (j = 1; j <= curItem.numOutputModules; ++j) {
        var curOM = curItem.outputModule(j);
        var oldLocation = curOM.file;
        curOM.file = new File(newLocation.toString() + "/" + oldLocation.name);
        alert(curOM.file.fsName);
      }
    }
  }
}
```

Smart import

This script allows the user to import the full, nested contents of a folder just by selecting it. It attempts to detect whether each item is a still, moving footage, or an image sequence. The user still has to make other choices via dialogs, such as which layer of a multi-layer image (e.g., a .psd file) to import.

First, we prompt the user for a folder whose contents are to be imported, and ascertain that the user chooses a folder rather than cancelling the dialog. We then call a function that appears below to import all of the files, one by one.

```
var targetFolder = folderGetDialog("Import Items from Folder...");
//returns a folder or null
if (targetFolder) {
  function processFile (theFile) {
    var importOptions = new ImportOptions (theFile);
    //create a variable containing ImportOptions
    importSafeWithError (importOptions);
  }
```

Now we add a function to test whether a given file is part of a sequence. This uses Regular Expressions, which are a special type of JavaScript designed to reduce the number of steps required to evaluate a string. The first one tests for the presence of sequential numbers anywhere in the file name, followed by another making certain that the sequential files aren't of a type that can't be imported as a sequence (moving image files).

We then check adjacent files to see if a sequence exists, stopping after we've evaluated ten files to save processing time.

```
function testForSequence (files){
  var searcher = new RegExp ("[0-9]+");
  var movieFileSearcher = new RegExp ("(mov|avi|mpg)$", "i");
  var parseResults = new Array;

  for (x = 0; (x < files.length) & x < 10; x++) {
  //test that we have a sequence, stop parsing after 10 files
    var movieFileResult = movieFileSearcher.exec(files[x].name);
    if (! movieFileResult) {
        var currentResult = searcher.exec(files[x].name);
```

If no match is found using the Regular Expression looking for a number string, we get null and assume there is no image sequence. Otherwise, we want an array consisting of the matched string and its location within the file name.

```
        if (currentResult) {
        //we have a match - the string contains numbers
        //the match of those numbers is stored in the array[1]
        //take that number and save it into parseResults
        parseResults[parseResults.length] = currentResult[0];
      }
      else {
        parseResults[parseResults.length] = null;
      }
    }
    else {
      parseResults[parseResults.length] = null;
    }
  }
```

Now if all of the files just evaluated indicated that they are part of a numbered sequence, we assume that we have a sequence and return the first file of that sequence. Otherwise, we end this function.

```
  var result = null;
  for (i = 0; i < parseResults.length; ++i) {
    if (parseResults[i]) {
      if (! result) {
        result = files[i];
      }
    } else {
      //case in which a file name did not contain a number
      result = null;
      break;
    }
```

```
  }
  return result;
}
```

Next we add a function to pop up error dialogs if there is a problem with any file we are attempting to import.

```
function importSafeWithError (importOptions) {
  try {
    app.project.importFile (importOptions);
  } catch (error) {
    alert(error.toString() + importOptions.file.fsName);
  }
}
```

Next comes a function to actually import any image sequence that we discover using testForSequence(), above. Note that there is an option for forcing alphabetical order in sequences, which is commented out in the script as written. If you want to force alphabetical order, un-comment the line "importOptions.forceAlphabetical = true" by removing the two slashes at the beginning of that line.

```
function processFolder(theFolder) {
  var files = theFolder.getFiles();
  //Get an array of files in the target folder
  //test whether theFolder contains a sequence
  var sequenceStartFile = testForSequence(files);
  //if it does contain a sequence, import the sequence
  if (sequenceStartFile) {
    var importOptions = new ImportOptions (sequenceStartFile);
    //create a variable containing ImportOptions
    importOptions.sequence = true;
    //importOptions.forceAlphabetical = true;
    //un-comment this if you want to force alpha order by default
    importSafeWithError (importOptions);
  }

  //otherwise, import the files and recurse

  for (index in files) {
  //Go through the array, set each element to singleFile, run this:
    if (files[index] instanceof File) {
      if (! sequenceStartFile) {
  //if file is already part of a sequence, don't import it individually
        processFile (files[index]);
        //calls the processFile function above
      }
    }
    if (files[index] instanceof Folder) {
      processFolder (files[index]); // recursion
    }
  }
}

processFolder(targetFolder);
```

```
}
```

Render and email

This script renders all queued items in an open project and sends an email report to indicate when the render has completed. It makes use of two other scripts that follow, email_methods.jsx (to send the email properly) and email_setup.jsx (which establishes the sender, recipient, and email server).

We start by establishing conditions under which the script will run. An open project with at least one item queued is required.

```
{
  var safeToRunScript = true;

  safeToRunScript = app.project != null;
  if (! app.project) {
    alert ("A project must be open to run this script.");
  }
  if (safeToRunScript) {
  debugger;
    //check the render queue and make certain at least one item is queued
    safeToRunScript = false;
    for (i = 1; i <= app.project.renderQueue.numItems; ++i) {
      if (app.project.renderQueue.item(i).status ==
      RQItemStatus.QUEUED) {
        safeToRunScript = true;
        break;
      }
    }
    if (! safeToRunScript) {
      alert ("You do not have any items set to render.");
    }
  }
```

Now we check whether we have email settings already saved in the Preferences. If so, we don't need to prompt the user. If not, we run the email_setup.jsx script, which prompts the user as to the mail gateway, sender and recipient addresses. If there are saved settings that you need to change, you can always run email_setup.jsx to make new settings that overwrite the existing ones.

```
  if (safeToRunScript) {

    var settings = app.settings;
    if ( !settings.haveSetting("Email Settings", "Mail Server") ||
       !settings.haveSetting("Email Settings", "Reply-to Address") ||
       !settings.haveSetting("Email Settings", "Render Report
        Recipient")){

      // We don't have the settings yet, so run email_setup.jsx
      // to prompt for them
      var email_setupfile = new File("email_setup.jsx");
      email_setupfile.open("r");
```

```
    eval( email_setupfile.read() );
    email_setupfile.close();
  }

  var myQueue = app.project.renderQueue //creates a shortcut for RQ
```

Now we're ready to render. Once rendering is complete, the script creates a text string for the email message that contains the start time of the render, the render time of each item in the queue, and the total render time.

```
  myQueue.render();

  var projectName = "Unsaved Project";
  if (app.project.file) {
    projectName = app.project.file.name;
  }
  var myMessage = "Rendering of " + projectName + " is complete.\n\n";
```

Now email the message, using the three settings from the email_methods.jsx script that has been automatically run to prompt the user for the server, above.

```
  if ( !settings.haveSetting("Email Settings", "Mail Server") ||
     !settings.haveSetting("Email Settings", "Reply-to Address") ||
     !settings.haveSetting("Email Settings", "Render Report
      Recipient")){
    alert("Can't send an email, I don't have all the settings I need.
    Aborting.");
  } else {
    // Load code from a file with handy emailing methods:
    var emailCodeFile = new File("email_methods.jsx");
    emailCodeFile.open("r");
    eval( emailCodeFile.read() );
    emailCodeFile.close();
```

Finally, we send an error if for any reason we are unable to send the mail.

```
    var serverSetting = settings.getSetting("Email Settings", "Mail
    Server");
    var fromSetting = settings.getSetting("Email Settings", "Reply-
    to Address");
    var toSetting   = settings.getSetting("Email Settings", "Render
    Report Recipient");
    var myMail = new EmailSocket(serverSetting);
    if (! myMail.send (fromSetting, toSetting, "AE Render Completed", myMessage) ) {
      alert("Sending mail failed");
    }
  }
 }
}
```

Email methods

This script creates an email object for use with the Render and Email script, described above. It uses code that is specific to the socket object and therefore requires advanced understanding of networking to edit; the comments below describe its operation.

```
// Create an email object. The function may be called both
// as a global function and as a constructor. It takes the
// name of the email server, and an optional Boolean that,
// if true, prints debugging messages.
// This object is not guaranteed to work for all SMTP servers,
// some of them may require a different set of commands.

// functions:
// send (fromAddress, toAddress, subject, text) - send an email
// auth (name, pass) - do an authorization via POP3
// both functions return false on errors

// sample:
// e = new EmailSocket ("mail.host.com");
// authorize via POP3 (not all servers require authorization)
// e.auth ("myname", "mypass");
// send the email
// e.send ("me@my.com", "you@you.com", "My Subject", "Hi there!")

// This script makes use of the Socket object, and creates a new class
// called EmailSocket that is derived from Socket. For more information on
// creating new classes in this way, consult chapter 7 of JavaScript, The
// Definitive Guide, by David Flanagan (O'Reilly).

//This is the constructor for the email socket. It takes as arguments:
//server - the address of the email server (is not checked for validity here)
//dbg - a boolean, if true, prints additional error information

function EmailSocket (server, dbg) {
  var obj = new Socket;
  obj._host = server;
  obj._debug = (dbg == true);
  obj.__proto__ = EmailSocket.prototype;
  return obj;
}

// correct the protoype chain to point to the Socket prototype chain
// - this is what actually causes the derivation from Socket.

EmailSocket.prototype.__proto__ = Socket.prototype;

// This sets up the send() member function. send() takes as arguments:
// from - the email address of the sender. This is not validated.
// to - the email address of the recipient. If there is an error,
// and the from address is incorrect, you will not be notified.
// subject - the contents of the subject field.
```

```
// text - the body of the message.
//
// Returns:
// true if sending succeeded
// false otherwise (if there was an error)
//
// Note that this code uses a local function object to create
// the function that is assigned to send.

EmailSocket.prototype.send = function (from, to, subject, text) {
  // open the socket on port 25 (SMTP)
  if (!this.open (this._host + ":25"))
    return false;
  try {
    // discard the greeting
    var greeting = this.read();
    if (this._debug)
      write ("RECV: " + greeting);
    // issue EHLO and other commands
    this._SMTP ("EHLO " + from);
    this._SMTP ("MAIL FROM: " + from);
    this._SMTP ("RCPT TO: " + to);
    this._SMTP ("DATA");
    // send subject and time stamp
    this.writeln ("From: " + from);
    this.writeln ("To: " + to);
    this.writeln ("Date: " + new Date().toString());
    if (typeof subject != undefined)
      this.writeln ("Subject: " + subject);
    this.writeln();
    // send the text
    if (typeof text != undefined)
      this.writeln (text);
    // terminate with a single dot and wait for response
    this._SMTP (".");
    // terminate the session
    this._SMTP ("QUIT");
    this.close();
    return true;
  }
  catch (e) {
    this.close();
    return false;
  }
}

// Authorize via POP3. Supply name and password.
//
// Returns:
// true if sending succeeded
// false otherwise (if there was an error)
```

```
//
// Arguments:
// name - the userName of the account
// pass - the password

EmailSocket.prototype.auth = function (name, pass) {
  // open the connection on port 110 (POP3)
  if (!this.open (this._host + ":110"))
    return false;
  try {
    // discard the greeting
    var greeting = this.read();
    if (this._debug)
      write ("RECV: " + greeting);
    // issue POP3 commands
    this._POP3 ("USER " + name);
    this._POP3 ("PASS " + pass);
    this._POP3 ("QUIT");
    this.close();
    return true;
  }
  catch (e) {
    this.close();
    return false;
  }
}

// Users of the EmailSocket do not need to be concerned with
// the following method. It is an implementation helper.

// local function to send a command & check a POP3 reply
// throws in case of error
EmailSocket.prototype._POP3 = function (cmd) {
  if (this._debug)
    writeln ("SEND: " + cmd);
  if (!this.writeln (cmd))
    throw "Error";
  var reply = this.read();
  if (this._debug)
    write ("RECV: " + reply);
  // the reply starts by either + or -
  if (reply [0] == "+")
    return;
  throw "Error";
}

// Users of the EmailSocket do not need to be concerned with
// the following method. It is an implementation helper.

// local function to send a command & check a SMTP reply
// throws in case of error
```

```
EmailSocket.prototype._SMTP = function (cmd) {
  if (this._debug)
    writeln ("SEND: " + cmd);
  if (!this.writeln (cmd))
    throw "Error";
  var reply = this.read();
  if (this._debug)
    write ("RECV: " + reply);
  // the reply is a three-digit code followed by a space
  var match = reply.match (/^(\d{3})\s/m);
  if (match.length == 2) {
    var n = Number (match [1]);
    if (n >= 200 && n <= 399)
      return;
  }
  throw "Error";
}

// nice to have: a toString()
// This function allows the email object to be printed.

EmailSocket.prototype.toString = function() {
  return "[object Email]";
}
```

Email setup

A simple script that prompts the user for the server name, email sender, and email recipient that are saved as Settings for the Render and Email script (above). You can run this script as standalone any time you want to change the settings. The script will run email_setup.jsx whenever the settings don't exist; under normal circumstances this would happen only the first time, or if the settings/preferences file is deleted.

This script is a good example of how a script can create settings that are saved in Preferences for the sole use of scripting (as opposed to altering existing After Effects Preferences settings).

```
{
  // This script sets up 3 email settings.
  // It can be run all by itself, but it is also called
  // within "3-Render and Mail.jsx" if the settings aren't yet set.

  var serverValue = prompt("Enter name of mail server:");
  var fromValue = prompt("Enter reply-to email address:");
  var toValue   = prompt("Enter recipient's email address");
  if (serverValue != null && serverValue != "") {
    app.settings.saveSetting("Email Settings", "Mail Server",
    serverValue);
  }
  if (fromValue != null && fromValue != "") {
    app.settings.saveSetting("Email Settings", "Reply-to Address",
    fromValue);
  }
  if (toValue != null && toValue != "") {
```

```
    app.settings.saveSetting("Email Settings", "Render Report
    Recipient", toValue);
  }
}
```

Dialogs and console

This script shows how to use the various dialogs (alert(), prompt(), confirm()) and how to write to the info palette (write(), writeLn() and clearOutput()). Although this script serves no practical use, these dialogs and info palette prompts are highly useful and should be familiar to all script creators.

```
// Use confirm() to let the user tell us whether he can see the "info" window.
// Depending how the user clicks, true or false is returned.
if (confirm("Can you see the \"info\" palette?")){

  // Start by clearing the information area.
  clearOutput();

  // write and writeLn will write to the info tab with or without a
  //'newline'
  // at the end.
  write("Roses are red,");
  writeLn("violets are blue");
  write("Sugar is sweet,");
  writeLn("and so is Equal.");

  var reply = prompt( "Did you like my poem?");
  if (reply == "yes" || reply == "YES"){
    alert("See the info window for a special secret fortune.");
    // This gets rid of the old writing on the info tab.
    clearOutput();
    writeLn("You have a future as a literary critic.");
  }
  else {
    alert("Hmm, I'll try once more...");
    writeLn(".....");
    writeLn("Roses are red, violets are blue,");
    writeLn("I've got some gum, on the sole of my shoe.");
  }

  alert("Okay, all done with this test.");
}
else {
  // alert() just displays a message in a dialog box.
  alert("Please make it so you can see the info palette and run this script
  again");
}
```

File fun

This script shows how to open files, open projects, collect names of the Comps in the scene, prompt a user for where to write a file, write to a text file, and save the text file. It is useful only as an example of how the individual methods and attributes operate; it doesn't serve any useful production purpose.

```
// First, close any project that might be open.
if (app.project != null){
  // 3 choices here, CloseOptions.DO_NOT_SAVE_CHANGES,
  // CloseOptions.PROMPT_TO_SAVE_CHANGES, and CloseOptions.SAVE_CHANGES
  app.project.close(CloseOptions.DO_NOT_SAVE_CHANGES);
}

// Prompt the user to pick a project file:
// First argument is a prompt, second is the file type.
var pfile = fileGetDialog("Select a project file to open", "EggP aep");

if (pfile == null){
  alert("No project file selected. Aborting.");
} else {
  // Open that file. It becomes the current project.
  var my_project = app.open( pfile );

  // Build a default text file name from the project's filename.
  // Remove the ".aep" file extension (if present), then add
  //_compnames.txt.
  var default_text_filename;
  var suffix_index = pfile.name.lastIndexOf(".aep");
  if (suffix_index != -1){
    default_text_filename = pfile.name.substring(0,suffix_index);
  }else {
    default_text_filename = pfile.name;
  }
  default_text_filename += "_compnames.txt";

  // Create another file object for the file we'll write out.
  // First argument is the prompt, second is a default file name, third is
  //the file type.
  var text_file = filePutDialog("Select a file to output your results",
  default_text_filename, "TEXT txt");

  if (text_file == null){
    alert("No output file selected. Aborting.");
  } else {
    // opens file for writing. First argument is mode ("w" for writing),
    // second argument is file type (for mac only),
    // third argument is creator (mac only, "????" is no specific app).
    text_file.open("w","TEXT","????");

    // Write the heading of the file:
    text_file.writeln("Here is a list of all the comps in " +
    pfile.name);
```

```
    text_file.writeln();
    for (var i = 1; i <= app.project.numItems; i++){
      if (app.project.item(i) instanceof CompItem){
        text_file.writeln(app.project.item(i).name);
      }
    }

    text_file.close();

    alert("All done!");
  }
}
```

Creating User Interface Elements

A JavaScript framework for creating user interface (UI) elements is included in After Effects 6.5.

This framework allows developers to use JavaScript to create UI components such as windows, panels, buttons, checkboxes, and so on. The framework--called the *scripting user interface*--is built as an abstraction layer on top of the windowing framework provided by the host platform on which After Effects is running. Both Windows and MAC OS X native windowing systems are supported.

The motivation behind the creation of this scripting user interface was twofold:

- To enable JavaScripts to create dialogs and interact with controls. This satisfies a fundamental need on the part of developers to create parameterized scripts, whose actions can be controlled more directly by the end user.
- To extend the JavaScript environment to allow scripts to create UI elements dynamically. In this way, developers can create specialized interactive access to an application's functionality.

Types of interface elements

The following controls and UI elements are supported:

- Panels (frames) -- (classname `Panel`) a container to group and organize other control types
- Push buttons -- (classname `Button`) a button containing a text string
- Radio buttons-- (classname `RadioButton`) a dual-state control, usually grouped with other radio buttons, only one of which is set
- Checkbox buttons -- (classname `Checkbox`) a dual-state control showing a checked box (if true) or an empty box (if false)
- Edit text -- (classname `EditText`) an text field that the user *can* change.
- Static text -- (classname `StaticText`) a text field that the user *cannot* change
- Scrollbars -- (classname `Scrollbar`) a standard scrollbar with a moveable element and stepper buttons to incrementally move the element.
- Sliders -- (classname `Slider`) a standard slider with a moveable position indicator

In addition, the given classnames described above can used in window resource specifications to define controls within a window or panel. See "Creating a window using window resource specifications" on page 203 for more information.

JavaScript UI interface

This section provides a description of the scripting user interface programming model.

UI objects

The scripting user interface defines *Window* objects that wrap native windows and various control elements (Buttons, StaticText, etc.), which wrap simple native controls. These objects share common methods such as "query the element type", "move the elements around", and "set the title, caption or content". For a complete list of properties and methods, see "Reference" on page 21.

Creating a window

To create a new window, use the *Window* constructor function. The constructor takes the desired type of the window (`dialog`) as a parameter. You can supply optional arguments to specify an initial window title and bounds.

The code examples provided in the JavaScript Interface section consist of short segments from a complete script that is included later in this document. The examples presented build upon each other.

The following example creates an empty dialog with the variable name `dlg`. This dialog is carried though to subsequent examples:

```
// Create an empty dialog window near upper left of the screen var
var dlg = new Window('dialog', 'Alert Box Builder', [100,100,480,245]);
dlg.show();
```

.Newly created windows are initially invisible; the show() method makes them visible.

Roughly speaking, the numeric parameters to the constructor correspond to the top left and bottom right coordinates of the window. The *bounds* supplied when creating the dialog specify the requested size of the client area, which is the area of the dialog on which you can create controls. It does not include the title bar and borders around the client area. The size and position of the dialog as a whole are automatically adjusted to maintain the requested client area size.

For a more detailed description of window *bounds*, see “Element size and location” on page 198.

Container elements

All windows are *containers*, which is to say that they contain other elements such as panels, buttons, and check-boxes within their boundaries.

Within a window, you can create other types of container elements and add interface components to them, just as you add elements to a window. Elements added to a container are considered children of that container, and certain operations performed on a container element also apply to its children. For instance, calling the container’s *hide()* method makes the container invisible and makes all of its visible children invisible as well.

Along the same lines, calling the container’s *show()* method makes the container visible as well as any child elements that were visible before the container was hidden. The following properties and methods of containers also apply to all children of that container: *visible, enabled, hide(), show()*.

Element size and location

To set the size and location of windows and controls, use the *bounds* property. As is typical when working with window systems, the location of a window is defined as the point (pair of coordinates) where the top left corner of the window is specified in the screen coordinate system.

The location of an element within a window or other container element is defined as the point where the top left corner of an element is specified in the window coordinate system, relative to the container the element lies within. Size is specified by width and height in pixels. A complete bounds specification therefore consists of 4 integer values that define the position of the upper left corner of the object and its dimensions.

The value of the *bounds* property can take several forms: a string with special contents, an inline JavaScript "Bounds" object, or a four-element array. The following examples show equivalent ways of placing a 380-by-390 pixel window near the upper left corner of the screen:

```
var dlg = new Window('dialog', 'Alert Box Builder', [100,100,480,490]);
dlg.bounds = [100,100,480,490];
dlg.bounds = {left:100, top:100, right:480, bottom:490};
dlg.bounds = "left:100, top:100, right:480, bottom:490";
```

Note that the window dimensions define the size of the "client area" of the window, which is the portion of the window that an application can directly control. The actual window size will typically be larger, because the host platform's window system can add title bars and borders to windows.

When read, the `bounds` property returns a *Bounds* object--an array of four values representing the coordinates of the upper left and lower right corners of the element: *[left, top, right, bottom].*

Adding elements

To add elements to a window or other container, use the container's *add()* method. This method accepts the type of the element to be created and some optional parameters, depending on the element type. The return value is the UI object created or *null* on errors. The value of the element's visible property defaults to "true". The element is initially visible, but it will remain invisible as long as its parent object is invisible.

A second (optional) parameter may be used to specify the initial bounds. The bounds is relative to the working area of its parent container. For elements that display text, the text may be specified as the third (optional) parameter--other types of elements have different semantics for a third argument.

For more information on the way in which each type of element interprets optional parameters, see "JavaScript UI reference" on page 213. These optional parameters are positional, meaning that if you want to specify some text for an element, but don't care about its bounds, you must still provide an argument for the second parameter in order to supply a value for the third (text) parameter. You can 'skip over' a positional parameter by specifying the '*undefined*' value as its argument value. In the example below, a Button element is created with an initial *text* value, but no *bounds* value.

```
dlg.btnPnl = dlg.add('panel', [15,330,365,375], 'Build it');
dlg.btnPnl.testBtn = dlg.btnPnl.add('button', undefined, 'Test');
```

Dynamically creating a property such as `btnPnl` to reference the control object returned by `add()` is not required, but can make it easier to later refer to the control. See "Accessing child elements" on page 200 for more information.

Creation properties

Some element types have attributes that may only--in fact, *can only*--be specified when the element is created. These are not normal properties of the element, in that they cannot be changed during the element's lifetime, and they are needed only once. For these element types, an optional *creation properties* argument may be supplied to the *add()* method--this argument is an object with one or more properties that control things like the element's appearance, or special functions like 'read-only' for an edit text element.

All UI elements have a creation property called *name*, which can be used to assign a name for identifying that element. In the following example, the new *Button* element is assigned the name 'ok':

```
dlg.btnPnl.buildBtn = dlg.btnPnl.add('button', [125,15,225,35], 'Build',
        {name:'ok'});
```

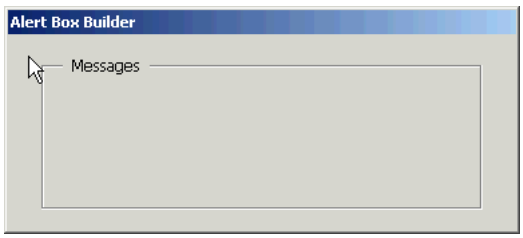
Accessing child elements

A reference to each element added to a window is appended to the window's *children* property.

The children collection is an array containing every defined element, indexed from 0 to the number of elements minus 1. For controls or other elements that do not have children, the *children* collection is empty.

The number of child elements in a window is equal to the value of the length property of the *children* collection. In the example below, since the 'msgPnl' panel was the first element created in dlg, the text for the panel's title can be set as follows:

```
  var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
  dlg.msgPnl = dlg.add('panel', [25,15,355,130]);
  dlg.children[0].text = 'Messages';
dlg.show();
```



Using creation properties, a name can be assigned to a newly created element. If this is done, a child can be referred to by its name. For instance, the *Button* in the example in the previous section was named 'ok', so the *Button* could now be referred to like this:

```
dlg.btnPnl.children['ok'].text = "Build";
```

An even simpler way to refer to a named child element is to use its name as a property of its parent element. We can also refer to the *Button* from the previous example like this:

```
dlg.btnPnl.ok.text = "Build";
```

The value of an element's internal *name* property is used by the scripting user interface when a script accesses a property of the element's parent object that does not match any of the predefined properties.

In this case, the framework searches the *names* of the parent element's children to see if a match exists, and if so, returns a reference to the matching child object.

Types of UI elements

This section introduces the types of user interface elements you can create within a *Window* or other type of container element.

The Panel element

The *Panel* element is the only type of non-window container that is currently defined. *Panels* are typically used to visually organize related controls.

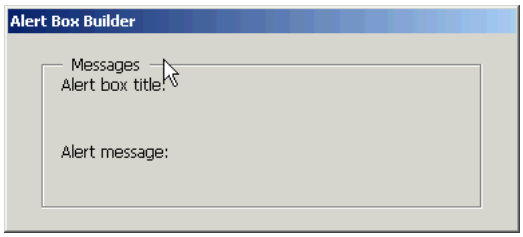
You can also use panels as separators: panels with width = 0 appear as vertical lines and panels with height = 0 appear as horizontal lines. When you create a Panel, you can specify an optional *borderStyle* property (used only at creation time) to control the appearance of the border drawn around the panel.

```
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');
dlg.show();
```

The Static Text element

StaticText elements are typically used to display text strings that are not intended for direct manipulation by a user, like informative messages or identifying information for other elements. In the following example, a *Panel* is created, and several *StaticText* elements are added to it:

```
// sample code for section 2.6.2
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');
dlg.msgPnl.titleSt = dlg.msgPnl.add('statictext', [15,15,105,35],
     'Alert box title:');
dlg.msgPnl.msgSt = dlg.msgPnl.add('statictext', [15,65,105,85],
     'Alert message:');
dlg.show();
```



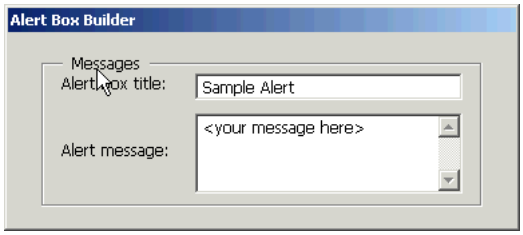
The EditText element

EditText elements are typically used to provide a means for users to enter text to be supplied to the script when the dialog is dismissed. Text in *EditText* elements can be selected by a user and copied from or pasted into. The text property can be assigned to in order to display text in the element, and it can be read from to obtain the current text value.

The *textselection* property can be assigned to in order to replace the current selection with new text, or to insert text at the cursor (insertion point). It can be read from to obtain the current selection, if any.

Using the same panel pictured above, the example now adds some *EditText* elements, with initial values that a user can accept or replace:

```
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');
dlg.msgPnl.titleSt = dlg.msgPnl.add('statictext', [15,15,105,35],
     'Alert box title:');
dlg.msgPnl.titleEt = dlg.msgPnl.add('edittext', [115,15,315,35], 'Sample Alert');
dlg.msgPnl.msgSt = dlg.msgPnl.add('statictext', [15,65,105,85], 'Alert message:');
dlg.msgPnl.msgEt = dlg.msgPnl.add('edittext', [115,45,315,105],
     '<your message here>', {multiline:true});
dlg.show();
```

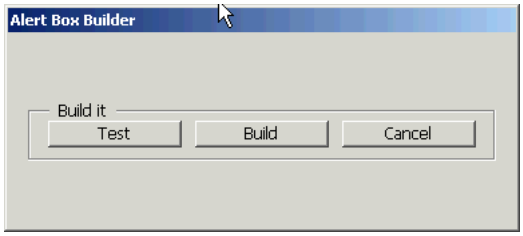


Note the *creation property* on the second *EditText* field, where *multiline:true* is specified. *multiline:true* indicates that the text in the item should wrap to the next page. In other words, it specifies a field in which a long text string may be entered, and the text will wrap to appear as multiple lines.

The Button element

Button elements are typically used to initiate some action from a *Window* when a user clicks the mouse pointer over the button; for example: accepting a dialog's current settings, canceling a dialog, bringing up a new dialog box, etc. The text property provides a label to identify a *Button's* function:

```
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.btnPnl = dlg.add('panel', [15,50,365,95], 'Build it');
dlg.btnPnl.testBtn = dlg.btnPnl.add('button', [15,15,115,35], 'Test');
dlg.btnPnl.buildBtn = dlg.btnPnl.add('button', [125,15,225,35],
      'Build', {name:'ok'});
dlg.btnPnl.cancelBtn = dlg.btnPnl.add('button', [235,15,335,35],
     'Cancel', {name:'cancel'});
dlg.show();
```



The Slider element

Slider elements are typically used to select within a range of values, allowing the user to hold the mouse pointer down over a moveable position indicator on the slider and drag this indicator within the range of the slider. If you click the mouse pointer on a point on the slider bar, the position indicator will jump to that location.

A *Slider* has a *value* property that reflects the position of the moveable indicator, and *minvalue* and *maxvalue* properties to define the endpoints of the slider's range of values.

To make a slider control appear like those used in After Effects, adjust the height of the control until the slider bar appears as a single line.

The Scrollbar element

Scrollbar elements are similar to *Slider* elements, in that they are often used to select within a range of values, and have a moveable position indicator. They have all the properties of sliders, and in addition, they have 'stepper buttons' at each end of the scrollbar for moving the position indicator in fixed-size steps.

You can control the size of each 'step' by setting the *stepdelta* property. Clicking ahead of or behind the position indicator makes the position indicator jump a fixed number of values toward the point where you clicked. You can control the size of this jump by setting the *jumpdelta* property.

You can create scrollbars with horizontal or vertical orientation; if width is greater than height, the orientation is horizontal, otherwise it is vertical. The following example creates a *Scrollbar* element with associated *StaticText* and *EditText* elements within a panel:

```
dlg.sizePnl = dlg.add('panel', [60,240,320,315], 'Dimensions');
dlg.sizePnl.widthSt = dlg.sizePnl.add('statictext', [15,15,65,35],
    'Width:';
dlg.sizePnl.widthScrl = dlg.sizePnl.add('scrollbar',
    [75,15,195,35],300, 300, 800);
dlg.sizePnl.widthEt = dlg.sizePnl.add('edittext', [205,15,245,35]);
```

Note that the last 3 arguments to the *add*() method that creates the scrollbar define the values for the *value*, *minvalue* and *maxvalue* properties. *Scrollbars* are often created with an associated *EditText* field to display the current value of the scrollbar, and to allow setting the scrollbar's position to a specific value.

Creating a window using window resource specifications

A specially formatted string provides a simple and compact means of creating a window and its component elements as a *resource specification*. A resource specification allows you to define and configure multiple window components in one easy-to-reference script.

The special string is passed as the type parameter to the *Window* constructor function, as follows:

```
// create a new dialog from a resource specification
var alertBuilderResource =
    "dialog { text: 'Alert Box Builder', bounds:[100,100,480,490], \
        msgPnl: Panel { text: 'Messages', bounds:[25,15,355,130], \
            titleSt:StaticText { text:'Alert box title:', \
                bounds:[15,15,105,35] }, \
      titleEt:EditText { text:'Sample Alert', bounds:[115,15,315,35] }, \
      msgSt:  StaticText { text:'Alert message:', \
          bounds:[15,65,105,85] }, \
      msgEt:  EditText { text:'<your message here>', \
            bounds:[115,45,315,105], properties:{multiline:true} } \
}, \
hasBtnsCb: Checkbox { text:'Has alert buttons?', alignment:'center', \
                    bounds:[125,145,255,165] }, \
alertBtnsPnl: Panel { text:'Button alignment', bounds:[45,180,335,225], \
    alignLeftRb:RadioButton { text:'Left', bounds:[15,15,95,35] }, \
    alignCenterRb:RadioButton { text:'Center', \
        bounds:[105,15,185,35] }, \
    alignRightRb:RadioButton { text:'Right', bounds:[195,15,275,35] } \
  }, \
sizePnl: Panel { text: 'Dimensions', bounds:[60,240,320,315], \
     widthSt:StaticText { text:'Width:', bounds:[15,15,65,35] }, \
    widthScrl:Scrollbar { minvalue:300, maxvalue:800, \
                    bounds:[75,15,195,35] }, \
     widthEt:EditText { bounds:[205,15,245,35] }, \
    heightSt:StaticText { text:'Height:', bounds:[15,45,65,65] }, \
    heightScrl:Scrollbar { minvalue:200, maxvalue:600, \
                    bounds:[75,45,195,65] }, \
    heightEt:EditText { bounds:[205,45,245,65] } \
      }, \
btnPnl: Panel { text: 'Build it', bounds:[15,330,365,375], \
     testBtn:Button { text:'Test', bounds:[15,15,115,35] }, \
    buildBtn:Button { text:'Build', bounds:[125,15,225,35], \
                    properties:{name:'ok'} }, \
```

```
        cancelBtn:Button { text:'Cancel', bounds:[235,15,335,35], \
                           properties:{name:'cancel'} } \
    } \
}";
dlg = new Window (alertBuilderResource);
```

The general structure of a window resource specification is a *Window* type specification (i.e., "dialog"), followed by a set of braces enclosing one or more property definitions. Controls are defined as properties within windows and other containers by specifying the classname of the control in a property definition, with properties of the control enclosed in braces {}, for example: `testBtn: Button { text: 'Test' }`.

Creation properties are specified in a *properties* property as named properties of an inline object (see example above). The syntax of window resource specification strings is completely described below.

Window resource specification syntax

The window resource specification syntax is given in BNF (Backus-Naur Form) below:

```
resourceSpec        = '"' windowTypeName inlineObject '"'
windowTypeName      = [a modal dialog]
inlineObject        = "{" propertiesList "}"
propertiesList      = propertyDefn { "," propertyDefn }
propertyDefn        = propertyName ":" propertyValue
propertyName        = [a JavaScript property name]
propertyValue       = "null" | "true" | "false" | string | number
                      | inlineArray |objectDefn
string              = [a JavaScript string literal]
number              = [any JavaScript integer or real number literal]
inlineArray         = "[" propertyValue { "," propertyValue } "]"
objectDefn          = ( namedObject | inlineObject )
namedObject         = [any object classname] inlineObject
```

***Note**: To create a UI element, the classname in the namedObject definition above can be any element classname referred to in "Types of interface elements" on page 197. For example:*

```
"dialog { \
    text: 'From Resource', bounds: [10, 10, 210, 110], \
    box: Panel { \
        bounds: [10, 10, 190, 90], \
        ok: Button { \
            text: 'OK', bounds:[40, 30, 140, 50], \
        } \
    } \
}";
```

Interacting with controls: events and event callbacks

When a script creates a window, it typically adds control elements to the window that a user can manipulate, for instance, by clicking a button, entering text in a text box, moving a scrollbar, etc.

These user actions or manipulations generate *events* within the user interface system. The script that creates a window needs a way to be notified of events from that window or from controls within the window. The scripting user interface provides a number of *event callback methods* that a script can define as properties of any UI element that the script needs to interact with.

Each class of UI element has a set of callback methods defined for it. For windows, there are callbacks like *onClose(), onMove(), and onResize()*. For controls, callbacks vary from type to type. A typical callback is *onClick()* for button, radiobutton, and checkbox elements, and *onChange()* for edittext fields, scrollbars, and sliders.

To handle a given event for some UI element, simply define a property of the same name as the event callback in the element and assign a JavaScript function you have defined to it. The example below uses "in line" functions, which employ a unique syntax and do not require a name. However, you can also define the function elsewhere in the script. In that case, simply assign the name of the function to the event handler property. The scripting user interface calls these functions on event notifications if defined.

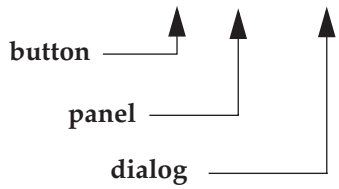
Examples:

```
/*'has buttons' checkbox enables or disables the panel that
determines the justification of the 'alert' button group */
dlg.hasBtnsCb.onClick =
    function () { this.parent.alertBtnsPnl.enabled = this.value; };

//The Build and Cancel buttons close this dialog
with (dlg.btnPnl) {
    buildBtn.onClick =
        function () { this.parent.parent.close(1); };
    cancelBtn.onClick =
        function () { this.parent.parent.close(2); };
};
```

Because event callback functions work as methods of the object in which they are defined, the functions have access to the object via the "this" JavaScript keyword. In the examples above, "this" refers to the UI object a given callback is defined in, so properties of the UI object can be accessed relative to the "this". For example, because each UI object has a *parent* property which is a reference to its container object, *this.parent* gets you a reference to the object's parent object.

To elaborate further on this point, a *button( )* is contained within a panel, which is contained within a window, all of which are ultimately closed. The progression is from smaller to larger UI moving from left to right.

```
buildBtn.onClick = function () {this.parent.parent.close(1);};
```



Also be aware that you can simulate user actions by sending an event notification directly to a UI element, via the element's *notify()* method. In this manner, a script can generate events in the controls of a window, as if a user was clicking buttons, entering text, moving a window, etc.

radiobutton and *checkbox* elements have a boolean *value* property; using *notify()* to simulate a click on these elements also changes the value of this property, just like clicking the element would do. For instance, if the *value* of a *checkbox* '*hasBtnsCb*' in our example above is true, the following example changes the value to false:

```
if (dlg.hasBtnsCb.value == true)
    dlg.hasBtnsCb.notify();
// dlg.hasBtnsCb.value is now false
```

For a complete description of the different event callback methods and notify(), see "Common methods and event handlers" on page 217.

Modal dialogs

A modal dialog is initially invisible. When calling its *show()* method, the dialog is displayed and starts executing. The call to *show()* does not return until the dialog has been dismissed, typically by the user clicking an OK or Cancel button.

When calling the *hide()* or *close()* methods during the execution of a modal dialog, the dialog is dismissed. The *close()* method accepts an optional argument that the call to *show()* returns.

***Warning**: You cannot use the JavaScript Debugger to debug event callback functions for modal dialogs, because once the dialog starts executing, it captures all mouse events. Setting a breakpoint in an event callback function for a modal dialog will result in an apparent application hang if the breakpoint is ever reached.*

To work around this restriction, an effective debugging technique is to create your dialog, but not call its show() method to make it visible. Then use the debugger to call the notify() method on controls whose event callback functions you wish to debug. It's considered good design practice to keep the code in the event callback functions simple, while deferring the primary script logic execution until after the dialog has been dismissed.

Default and Cancel elements

Modal dialogs can usually be dismissed by typing certain keyboard shortcuts. In addition to clicking the 'OK' or 'Cancel' buttons, typing the 'Enter' key normally produces the same results as clicking the 'OK' (or default) button, and typing the 'Esc' key is equivalent to clicking the 'Cancel' button. In each case, the keyboard shortcut is the same as if your script had called the *notify()* method for the associated *Button*. The dialog designer has explicit control over which *Button* elements are notified by these keyboard shortcuts: a newly-created dialog has *defaultElement* and *cancelElement* properties that are initially undefined. The dialog designer can set these properties to the objects representing the buttons that should be notified when the respective keyboard shortcut is typed.

The scripting user interface provides reasonable defaults if the *defaultElement* and *cancelElement* properties are still undefined when the dialog is about to be shown for the first time.

Default values for the *defaultElement* property are determined by the following algorithm:

- The scripting user interface searches the dialog's buttons for a button whose name property has the string value "ok" (case is not important). If one is found, *defaultElement* is set to that object.
- If no matching named object is found, the scripting user interface searches the dialog's buttons for a button whose *text* property has the string value "ok" (case is not important). If one is found, *defaultElement* is set to that object.

Default value for the *cancelElement* property are determined by the following algorithm:

- The scripting user interface searches the dialog's buttons for a button whose name property has the string value "cancel" (case is not important). If one is found, *cancelElement* is set to that object.
- If no matching named object is found, the scripting user interface searches the dialog's buttons for a button whose *text* property has the string value "cancel" (case is not important). If one is found, *cancelElement* is set to that object.

These algorithms handle most dialog boxes without the designer having to explicitly set these properties. When you add buttons to a dialog that will be used to dismiss the dialog, use *creation properties* to set the *name* property of such buttons to 'ok' or 'cancel', depending on the desired semantics; this precaution makes the above algorithm work properly even when the *text* of such buttons is localized. If the scripting user interface cannot find a matching button for either case, the respective property is set to *null*, which means that keyboard shortcuts for default or cancel will not notify any elements.

Guidelines for creating and using modal dialogs

When your script creates a dialog, you typically create controls that the user must interact with in order to enter values that your script will use. In general, you can minimize the number of event callback functions you attach to various controls in your dialogs, unless interaction with those controls changes the operation of the dialog itself. In most cases where you simply want to read the states of various controls when the dialog is dismissed, you do not need to handle events for them. For instance, you often don't need *onClick()* functions for every *checkbox* and *radiobutton* in your dialog: when the dialog is dismissed, read their states using their *value* properties.

Some exceptions to this guideline:

- *onChange()* functions are needed for *edittext* elements, if users enter values which must be validated (like a number within a range). The event callback must perform any necessary validation, and interact with the user on errors.
- Define *onClick()* for OK and Cancel buttons which close the dialog with a given value.

***Note**: Perform this function only if you have* not *defined the defaultElement and/or cancelElement properties* or *named these buttons in such a way that they will automatically be identified as the OK and Cancel buttons.*

Prompts and Alerts

Some JavaScript environments provide functions on the global window object to display message boxes or alert boxes and a prompt box that displays one or two lines of text and then allows the user to enter one line of text.

The scripting user interface defines functions *alert(), confirm()* and *prompt()* on the *Window* class that provides this standard functionality. The host application controls the appearance of these simple dialog boxes, so they are consistent with other alert and message boxes displayed by the application. See the "JavaScript UI reference" on page 213 for details.

JavaScript UI example

Having explored the individual scripting components that make up the user interface, you are now ready to see the parts assembled into real-world JavaScript code that produces a fully functional user interface.

The JavaScript UI code sample described below includes the following functions, which creates a simple user interface builder window populated with various panels, checkboxes, buttons and controls. When you run the builder, you can then cause it to create an Alert Box.

- *createBuilderDialog()* -- Creates an empty dialog window near the upper left of the screen and adds a title panel, a checkbox, a control panel and a panel with buttons to test parameters and create the Alert Box specification.
- *initializeBuilder()* --Sets up initial control states and attaches event callback functions to controls.
- *runBuilder()* -- Runs the builder dialog and returns the resulting Alert Box UI
- *createResource()* -- Creates and returns a string containing a dialog resource specification that creates the Alert Box UI using the parameters entered
- *stringProperty()* -- Returns a formatted string
- *arrayProperty()* -- Returns a formatted array
- *createTestDialog()* -- Creates a new Test dialog

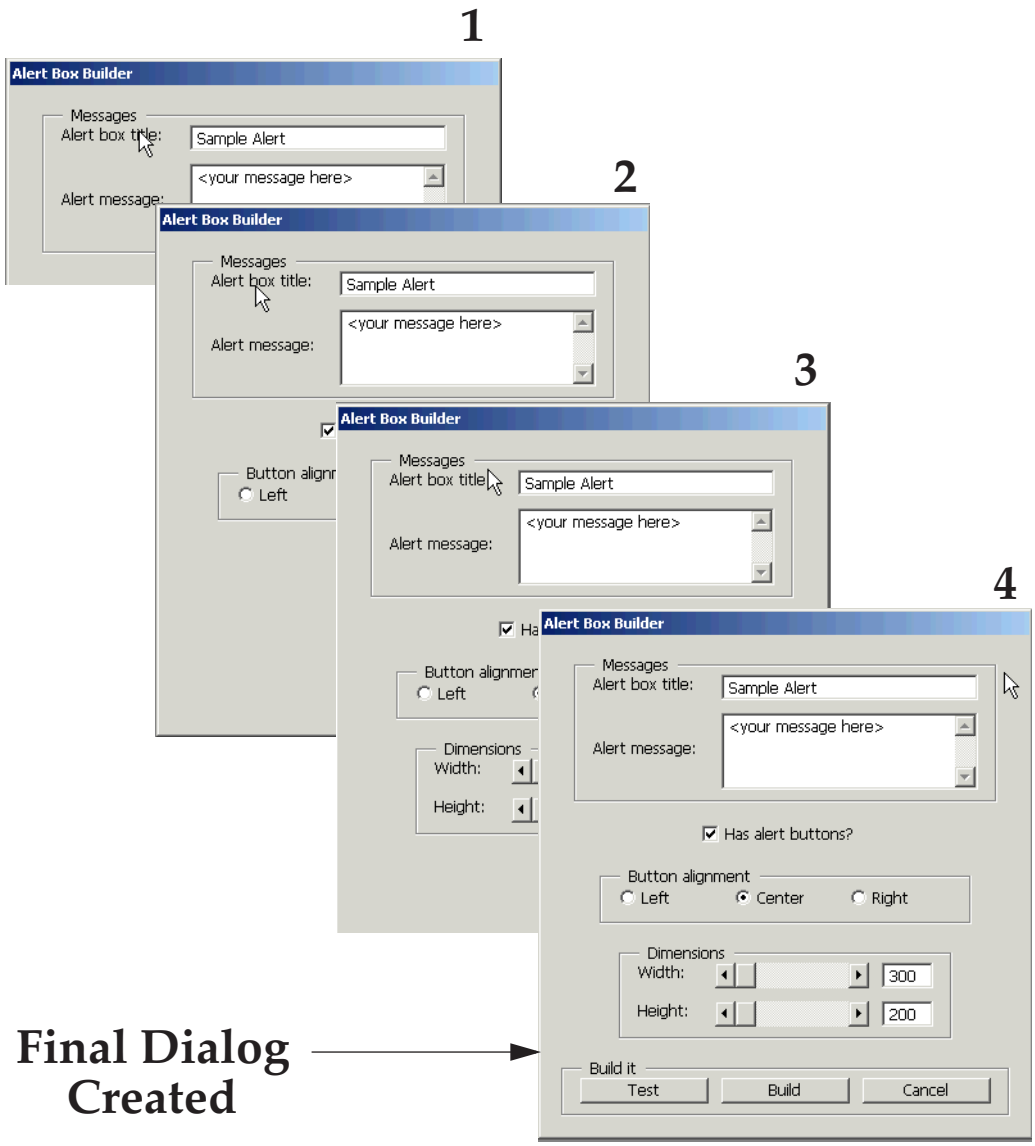
These functions are bundled together into a Main script, which assembles the final Alert Box dialog.

createBuilderDialog

Most of the heavy-lifting for visual components of the JavaScript UI code sample occurs in the *createBuilder-Dialog()* function, where the main components of the dialog are configured, as displayed below.

```
function createBuilderDialog()
{
    //Create an empty dialog window near the upper left of the screen
     var dlg = new Window('dialog', 'Alert Box Builder', [100,100,480,490]);                                    1

    //Add a panel to hold title and 'message text' strings
     dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');
     dlg.msgPnl.titleSt = dlg.msgPnl.add('statictext', [15,15,105,35], 'Alert box title:');
     dlg.msgPnl.titleEt = dlg.msgPnl.add('edittext', [115,15,315,35], 'Sample Alert');
     dlg.msgPnl.msgSt = dlg.msgPnl.add('statictext', [15,65,105,85], 'Alert message:');
     dlg.msgPnl.msgEt = dlg.msgPnl.add('edittext', [115,45,315,105], '<your message here>',
     {multiline:true});

    //Add a checkbox to control the presence of buttons to dismiss the alert box                               2
     dlg.hasBtnsCb = dlg.add('checkbox', [125,145,255,165], 'Has alert buttons?');

    //Add panel to determine alignment of buttons on the alert box
     dlg.alertBtnsPnl = dlg.add('panel', [45,180,335,225], 'Button alignment');
     dlg.alertBtnsPnl.alignLeftRb = dlg.alertBtnsPnl.add('radiobutton', [15,15,95,35], 'Left');
     dlg.alertBtnsPnl.alignCenterRb = dlg.alertBtnsPnl.add('radiobutton', [105,15,185,35], 'Center');
     dlg.alertBtnsPnl.alignRightRb = dlg.alertBtnsPnl.add('radiobutton', [195,15,275,35], 'Right');

    //Add a panel with controls for the dimensions of the alert box
     dlg.sizePnl = dlg.add('panel', [60,240,320,315], 'Dimensions');
     dlg.sizePnl.widthSt = dlg.sizePnl.add('statictext', [15,15,65,35], 'Width:');
     dlg.sizePnl.widthScrl = dlg.sizePnl.add('scrollbar', [75,15,195,35], 300, 300, 800);
     dlg.sizePnl.widthEt = dlg.sizePnl.add('edittext', [205,15,245,35]);                                        3
     dlg.sizePnl.heightSt = dlg.sizePnl.add('statictext', [15,45,65,65], 'Height:');
     dlg.sizePnl.heightScrl = dlg.sizePnl.add('scrollbar', [75,45,195,65], 200, 200, 600);
     dlg.sizePnl.heightEt = dlg.sizePnl.add('edittext', [205,45,245,65]);

    //Add a panel with buttons to test parameters and create the alert box specification
     dlg.btnPnl = dlg.add('panel', [15,330,365,375], 'Build it');                                               4
     dlg.btnPnl.testBtn = dlg.btnPnl.add('button', [15,15,115,35], 'Test');
     dlg.btnPnl.buildBtn = dlg.btnPnl.add('button', [125,15,225,35], 'Build', {name:'ok'});
     dlg.btnPnl.cancelBtn = dlg.btnPnl.add('button', [235,15,335,35], 'Cancel', {name:'cancel'});

     return dlg;

// createBuilderDialog
```

This code snippet, when broken down into smaller segments--and run in the context of the entire UI sample code that follows--produces the following succession of dialogs, which coalesce into one final Alert Box window.



For the final dialog to actually display, supporting code to initialize and run the Alert Box Builder must be included, as illustrated below.

```
function initializeBuilder(builder)
{
    //Set up initial control states
    with (builder) {
        hasBtnsCb.value = true;
        alertBtnsPnl.alignCenterRb.value = true;
        with (sizePnl) {
            widthEt.text = widthScrl.value;
            heightEt.text = heightScrl.value;
        }
```

```
        }

        //Attach event callback functions to controls

        /*'has buttons' checkbox enables or disables the panel that
              determines the justification of the 'alert' button group */

         builder.hasBtnsCb.onClick =
              function () { this.parent.alertBtnsPnl.enabled = this.value; };

        /*The edittext fields and scrollbars in sizePnl are connected */
         with (builder.sizePnl) {
              widthEt.onChange =
                   function () { this.parent.widthScrl.value = this.text; };
              widthScrl.onChange =
                   function () { this.parent.widthEt.text = this.value; };
              heightEt.onChange =
                   function () { this.parent.heightScrl.value = this.text; };
              heightScrl.onChange =
                   function () { this.parent.heightEt.text = this.value; };
        }

         with (builder.btnPnl) {
              //The Test button creates a trial Alert box from the current specifications
              testBtn.onClick =
                   function () {
                        Window.alert('Type Enter or Esc to dismiss the test Alert box');
                        createTestDialog(createResource(this.parent.parent));
                   };

              //The Build and Cancel buttons close this dialog
              buildBtn.onClick =
                   function () { this.parent.parent.close(1); };
              cancelBtn.onClick =
                   function () { this.parent.parent.close(2); };
        };
} // initializeBuilder

function runBuilder(builder)
{
     //Run the builder dialog, return its result
      return builder.show();
}

/*This function creates and returns a string containing a dialog
resource specification that will create an Alert dialog using
the parameters the user entered. */

function createResource(builder)
{
     //Define the initial part of the resource spec with dialog parameters
      var dlgWidth = Number(builder.sizePnl.widthEt.text);
      var dlgHeight = Number(builder.sizePnl.heightEt.text);
      var res = "dialog { " +
           stringProperty("text", builder.msgPnl.titleEt.text) +
           arrayProperty("bounds", 0, 0, dlgWidth, dlgHeight) +
              "\n";

     //Define the alert message statictext element, sizing it to the alert box
      var margin = 15; var l, t;
      var msgWidth, msgHeight;
      var hasButtons = builder.hasBtnsCb.value;
      var btnsHeightUsed = hasButtons ? 20 + margin : 0;
      msgHeight = 60;
      msgWidth = dlgWidth - (margin * 2);

      l = margin;
      t = (dlgHeight - msgHeight - btnsHeightUsed) / 2;
      res += "  msg: StaticText { " +
           stringProperty("text", builder.msgPnl.msgEt.text) +
           arrayProperty("bounds", l, t, l + msgWidth, t + msgHeight) +
           "justify:'center', properties:{multiline:true} }";

     //Define buttons if desired
      if (hasButtons) {
           var btnWidth = 90;
           //Align buttons as specified
           with (builder.alertBtnsPnl) {
                if (alignLeftRb.value)
```

```
                    l = margin;
                else if (alignCenterRb.value)
                    l = (dlgWidth - (btnWidth * 2 + 10)) / 2;
                else
                    l = dlgWidth - ((btnWidth * 2 + 10) + margin);
            }
            t = dlgHeight - btnsHeightUsed;
            res += ",\n" +
                "  okBtn: Button { " +
                stringProperty("text", "OK") +
                arrayProperty("bounds", l, t, l + btnWidth, t + 20) +
                  "},\n";
            l += btnWidth + 10;
            res += "  cancelBtn: Button { " +
                stringProperty("text", "Cancel") +
                arrayProperty("bounds", l, t, l + btnWidth, t + 20) +
                    "}";
        }

        //All done!
        res += "\n}";
        return res;
}

function stringProperty(pname, pval)
{
        return pname + ":'" + pval + "', ";
}

function arrayProperty(pname, l, t, r, b)
{
        return pname + ":[" + l + "," + t + "," + r + "," + b + "], ";
}

function createTestDialog(resource)
{
        var target = new Window (resource);
        return target.show();
}

//------------- Main script -------------//
var builder = createBuilderDialog();
initializeBuilder(builder);
if (runBuilder(builder) == 1) {
        //Create the Alert dialog resource specification string
        var resSpec = createResource(builder);
        //Write the resource specification string to a file, using the standard file open dialog
        var fname = File.openDialog('Save resource specification');
        var f = File(fname);
        if (f.open('w')) {
                var ok = f.write(resSpec);
                if (ok)
                    ok = f.close();
                if (! ok)
                    Window.alert("Error creating " + fname + ": " + f.error);
        }
}
```

Sample code summary

This sample code is used to demonstrate some practical applications of the scripting interface. Here a few of the major intentions of the script:

- To provide a simple real-world example of creating a user interface with multiple components and controls.
- To show how certain controls such as sliders and edit text boxes can interact.
- To show how radio buttons work and how to set radio buttons to true and initialize them.
- To show a multi-line text edit box as displayed in the messages panel of the dialog box.
- To show how you can associate static text fields with edit text fields and static text with other types of controls.

- To show how simple event callback functions work and how you can attach event handler functions to any controls that can generate events.
- To show how to enable and disable sets of controls. For example, in the alert checkbox, if you unclick the checkbox then everything in the button alignment field suddenly gets greyed out.
- To demonstrate how you typically dismiss a modal dialog by providing an OK and Cancel button.
- To show you can still read property values out of the dialog and its controls after the dialog has been dismissed.

Resource-specification sample code

To run this JavaScript UI code using a resource specification, change the lines indicated below and include the resource specification sample code. For more information on resource specifications, refer to “Creating a window using window resource specifications” on page 203.

***Note**: This is a complete example of a resource specification string. The alertBuilderResource() code displayed below is a way to create the same main dialog box created by the createBuilderDialog() function.*

```
//------------- Alternate dialog creation using resource specification -------------//
/*
To use this code, replace the line above that says
      var builder = createBuilderDialog();
   with
      var builder = createBuilderDialogFromResource();
*/

var alertBuilderResource =
      "dialog { text: 'Alert Box Builder', bounds:[100,100,480,490], \
            msgPnl: Panel { text: 'Messages', bounds:[25,15,355,130], \
                  titleSt:StaticText { text:'Alert box title:', bounds:[15,15,105,35] }, \
                  titleEt:EditText { text:'Sample Alert', bounds:[115,15,315,35] }, \
                  msgSt:  StaticText { text:'Alert message:', bounds:[15,65,105,85] }, \
                  msgEt:  EditText { text:'<your message here>', bounds:[115,45,315,105],
                      properties:{multiline:true} } \
            }, \
            hasBtnsCb: Checkbox { text:'Has alert buttons?', alignment:'center',
                  bounds:[125,145,255,165] }, \
            alertBtnsPnl: Panel { text:'Button alignment', bounds:[45,180,335,225], \
                  alignLeftRb:RadioButton { text:'Left', bounds:[15,15,95,35] }, \
                  alignCenterRb:RadioButton { text:'Center', bounds:[105,15,185,35] }, \
                  alignRightRb:RadioButton { text:'Right', bounds:[195,15,275,35] } \
            }, \
            sizePnl: Panel { text: 'Dimensions', bounds:[60,240,320,315], \
                  widthSt:StaticText { text:'Width:', bounds:[15,15,65,35] }, \
                  widthScrl:Scrollbar { minvalue:300, maxvalue:800, bounds:[75,15,195,35] }, \
                  widthEt:EditText { bounds:[205,15,245,35] }, \
                  heightSt:StaticText { text:'Height:', bounds:[15,45,65,65] }, \
                  heightScrl:Scrollbar { minvalue:200, maxvalue:600, bounds:[75,45,195,65] }, \
                  heightEt:EditText { bounds:[205,45,245,65] } \
            }, \
            btnPnl: Panel { text: 'Build it', bounds:[15,330,365,375], \
              testBtn: Button { text:'Test', bounds:[15,15,115,35] }, \
             buildBtn:Button { text:'Build', bounds:[125,15,225,35], properties:{name:'ok'} }, \
             cancelBtn:Button { text:'Cancel', bounds:[235,15,335,35], properties:{name:'cancel'} } \
            } \
      }";

function createBuilderDialogFromResource()
{
      //Create from resource
       return new Window(alertBuilderResource);
} // createBuilderDialogFromResource
```

JavaScript UI reference

The JavaScript user interface defines the global elements of the Window object and properties and methods of all the UI classes.

Global elements of the Window object

The following functions are class methods of the global *Window* class only; windows created via *new Window()* do not have these functions defined.

To call class methods, use the following example syntax: `Window.alert("Class method!");`

`alert (text)`

Displays the specified string in a user alert box that provides an OK button. The alert dialog is not intended for lengthy messages. When the string argument to the alert method is too long, the alert dialog truncates it.

`confirm (text)`

Displays the specified string in a self-sizing modal dialog box that provides Yes (default) and No buttons. When this user clicks one of these buttons, this method hides the dialog and returns a value indicating the button the user clicked to dismiss the dialog. A return value of *true* indicates that the user clicked the Yes button to dismiss the confirm box. The confirmation dialog displays lengthier messages than the alert and prompt dialogs do, but if this string is too long, the dialog truncates it.

find (type, title)
return value: *Object*

Finds an existing window already created by a script. *title* is the title of the window and type is modal dialog. This value is a hint in case more than one window has the same title; if the type is unimportant, null or an empty string can be passed. If the window was found, the corresponding JavaScript *Window* object is generated and returned; if the window cannot be determined, the return value is *null*.

prompt (prompt [, default])
Displays a modal dialog that returns the user's text input. When the dialog opens, it displays the given *prompt* text and its text edit field is initialized with any specified *default* text. When the user clicks OK to dismiss the dialog, it returns the text the user entered. If the user clicks the Cancel button in this dialog, this method's result is the value *null*.

Common object properties

The following table shows the common properties defined for each element type.

	Window	Panel	StaticText	EditText	Button	Checkbox	RadioButton	Scrollbar	Slider
active	x			x	x	x	x	x	x
bounds	x	x	x	x	x	x	x	x	x
children	x	x	x	x	x	x	x	x	x
enabled	x	x	x	x	x	x	x	x	x
jumpdelta								x	
justify	x	x	x	x	x	x	x		
maxvalue								x	x
minvalue								x	x
parent	x	x	x	x	x	x	x	x	x
stepdelta								x	
text	x	x	x	x	x	x	x		
textselection				x					
type	x	x	x	x	x	x	x	x	x
value						x	x	x	x
visible	x	x	x	x	x	x	x	x	x

Properties

Following are the properties defined for each element types listed above.

Property	Type	Description
`active`	*Boolean*	Contains *true* if the object is active, *false* otherwise. An active floating dialog is the front-most dialog. A modal dialog that is visible is by definition the active dialog. An active control is the one which will accept keystrokes, or in the case of a Button, be activated (clicked) when the user types a return. Set this true to make a given control or dialog active.
`bounds`	*Bounds*	Contains a *Bounds* object describing the location and size of the element as array values representing the coordinates of the upper left and lower right corners of the element: [*left, top, right, bottom*]. These are screen coordinates for window elements, and window-relative coordinates for other elements. See "Element Size and Location " for a definition of the *Bounds* object.
`children`	*Object*	The collection of UI elements that the UI object contains. This is an array indexed by number or by a string containing an element's name. The *length* property of this array is the number of child elements for container elements and is zero for controls; future implementations may return additional elements for composite controls. Read only.
`enabled`	*Boolean*	Contains true if the object is enabled, *false* otherwise. If set to true, control elements will accept input. If set to *false*, control elements will not accept input, and all types of elements may change to a 'grayed-out' appearance.
`jumpdelta`	*Number*	Contains the value to increment or decrement a *Scrollbar* element's position by, when the user clicks ahead or behind the moveable element of the *Scrollbar* to make the scroll position 'jump'.
`justify`	*String*	Controls justification of text in static text and edit text controls. The value is either *"left"*, *"center"*, or *"right"* and the default value is left-justified. Some implementations may not fully support this property, and it may be ignored for some types of controls.
`maxvalue`	*Number*	Contains the maximum value that the *value* property can have. If *maxvalue* is reset less than *value*, *value* will be reset to *maxvalue*. If *maxvalue* is reset less than *minvalue*, *minvalue* will be reset to *maxvalue*.
`minvalue`	*Number*	Contains the minimum value that the *value* property can have. If *minvalue* is reset greater than *value*, *value* will be reset to *minvalue*. If *minvalue* is reset greater than *maxvalue*, *maxvalue* will be reset to *minvalue*.
`parent`	*Object*	The parent object of a UI object. This property returns *null* for window objects. Read only.
`placement`	*Bounds*	An alternate name for the *bounds* property; *bounds* is the preferred name, and use of *placement* is deprecated.
`stepdelta`	*Number*	Contains the value to increment or decrement a *Scrollbar* element's position by, when a stepper button at either end of the scrollbar is clicked.
`text`	*String*	The title, label or text. May be ignored for certain window types. For controls, its usage depends on the control type. Many controls like buttons use the text as a label, while other controls, such as edit fields, use the text to access its content.
`textselection`	*String*	Replace the current text selection with the specified text string, modifying the value of the *text* property. If there is no selection, the specified text is inserted into the *text* property string at the current insertion point. Reading the *textselection* property returns any selected text, or an empty string if there is no selection.
`type`	*String*	Contains the type name of the element. For *Window* objects, this is the value of the first argument to the *Window* constructor function. For controls, this is the value of the first argument to the *add()* method. Read only.
`value`	*Boolean*	(for *Checkbox* and *RadioButton*) *true* if the control has been set (i.e., a checkbox shows a check mark), *false* if not set.

Property	Type	Description
value	*Number*	(for *Scrollbar* and *Slider*) the value of the control, for instance, the position of the moveable part of a *Scrollbar* or *Slider*. If *value* is reset outside the bounded range *minvalue, maxvalue, value* is set to the closest boundary.
visible	*Boolean*	Contains *true* if the object is physically visible, *false* otherwise. If set to *false*, the UI object is hidden, and if set to *true*, the object is made visible.

Properties found only in Window elements

Window elements contain the following properties, in addition to those described in the previous section.

defaultElement -- *Object*

The element to notify when a user types the Enter key, with the intent to dismiss the dialog as if the "OK" button had been clicked.

cancelElement -- *Object*

The element to notify when a user types the Esc key (or the <*Cmd* .> combination on a Mac), with the intent to dismiss the dialog as if the "Cancel" button had been clicked.

Objects used as property values

The values of certain properties are represented by objects that the scripting interface defines. This section describes those objects. It includes a description of their semantics, ways to create them, and descriptions of their properties.

The Bounds Object

A *Bounds* object is used to define the boundaries of a *Window* or UI element within its coordinate space. You cannot directly create a *Bounds* object; one is created when you set an element's *bounds* property. Reading the *bounds* property always yields a *Bounds* object. *Bounds* contains an array describing the position and size of a UI element. The array values represent the coordinates of the upper left and lower right corners of the element: [*left, top, right, bottom*]. These are screen coordinates for window elements, and are relative to the coordinate space of the parent (container) element for other element types.

You can set an element's *bounds* property and indirectly create a *Bounds* object in any of these ways:

e.bounds = *Object*

The object must contain properties named *left, top, right, bottom*, or *x, y, width, height*, where each property has an integer coordinate value.

e.bounds = *Array*

The array must have integer coordinate values in the order [*left, top, right, bottom*].

e.bounds = *String*

The string must be an executable JavaScript inline object declaration, containing the same property names as in the object case just described.

See "Element size and location" on page 198 for examples.

A *Bounds* object may be accessed as an array. In addition, it supports the following properties

Property	Type	Description
left	*Number*	The 'x' coordinate value of the left edge of the element.
top	*Number*	The 'y' coordinate value of the top edge of the element.

Property	Type	Description
right	*Number*	The 'x' coordinate value of the right edge of the element.
bottom	*Number*	The 'y coordinate value of the bottom edge of the element.
x	*Number*	Same as *left*.
y	*Number*	Same as *top*.
width	*Number*	*right - left*.
height	*Number*	*bottom - top*.

Common methods and event handlers

Following are the common methods and event handlers defined for each element type.

	Window	Panel	StaticText	EditText	Button	Checkbox	RadioButton	Scrollbar	Slider
add()	x	x							
center()	x								
close()	x								
hide()	x	x	x	x	x	x	x	x	x
notify()				x	x	x	x	x	x
show()	x	x	x	x	x	x	x	x	x
onChange()				x				x	x
onClick()					x	x	x		
onClose()	x								
onMove()	x								
onResize()	x								

Methods

Descriptions of the common methods and event handlers listed above follow:

Method	Returns	Description
`add (type [, bounds, text, { <creation properties> } ]);`	*Object*	Creates a new UI element and add it to the *children* array of its parent *Window* or *Panel* element. The optional parameter *bounds* is a *Bounds* object describing its position and size. This may also be a four-element array. The optional parameter *text* is assigned to the UI element as the initial text or title. The UI element itself decides how to use this string; it may be ignored. In general, a Button uses the text as its label, while a edit field uses it as its initial content. Internally, the text is assigned to the *text* property of the element. The optional parameter *<creation properties>* is an object with properties that specify attributes of the UI element that are used only when the element is created. *<creation properties>* are specific to the type of UI element, and are described below in the sections for each element type. The return value is the newly created UI element or *null* on errors.
`center([window])`	no return value	Centers a *Window* on screen, or optionally, within the specified window object.

Method	Returns	Description
`close ([value])`	no return value	Closes a *Window*. For modal dialogs, the optional value is returned as the result of the *show()* call that caused the dialog to display and execute.
`hide()`	no return value	Hides the element. If *hide()* is called on a modal dialog, dismiss the dialog and set the dialog result to 0. The application may choose to ignore this call for certain UI object types.
`notify([event])`	no return value	Sends a notification message to whatever listens to the UI object. *notify()* effectively lets you control a dialog programmatically. Calling this method with no argument on a control simulates the activation of the control; a Button signals that it has been clicked via its *onClick()* method, an EditText element tells its listener that it contents have changed via its *onChange()* method, and so on. You can supply an optional argument to *notify()*, which is the name of the event handler to call. For instance, to simulate a dialog *dlg* being moved by a user, you can send a notification message as follows: *dlg.notify("onMove")*.
`show()`	*Number*	Displays the UI object. A *Window* may choose to ignore the setting of the visibility state if it is not applicable, like for inspectors whose visibility is controlled by the application only. If *show()* is called for a modal dialog, the dialog is displayed and executed. The call to *show()* will not return until the dialog has been dismissed. The result of *show()* is the dialog result as supplied to *close()*. For all other elements, the result is 0.
`onClick()`	no return value	This method is called when a control has been activated by clicking it. Not all types of controls implement this callback. If you are interested in processing this event, define a function of this name in the control element.
`onChange()`	no return value	This method is called when the content of a control has been changed. Not all types of controls implement this callback. If you are interested in processing this event, define a function of this name in the control element.
`onClose()`	no return value	This method is called when a *Window* is closed. If you are interested in processing this event, define a function of this name in the *Window* object.

Method	Returns	Description
`onMove()`	no return value	This method is called when a *Window* has been moved. If you are interested in processing this event, define a function of this name in the *Window* object.
`onResize()`	no return value	This method is called when a *Window* has been resized. If you are interested in processing this event, define a function of this name in the *Window* object.

UI object descriptions

This section describes UI objects such as windows, panels, buttons, checkboxes and so on.

Window object

To create a new *Window* object:

Method	Returns	Description
`new Window ("dialog" [, title, bounds]);`	*Object*	Creates a new *Window*. The required *type* argument contains the requested element type for a modal dialog. The optional *title* argument is used to set the window title, if specified. Optionally, a *Bounds* object or array may be supplied that describes the *bounds* of the window. If no bounds are given, a default bounds is chosen. The return value is the newly created window or *null* on errors.

The panel element

To add a *Panel* element to a window *w*:

Method	Returns	Description
`w.add ("panel" [, bounds, text, {<creation properties>} ]);`	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter text is the *text* displayed in the border of the panel. The optional parameter *<creation properties>* is an object that can contain any of the following properties:

To add a *border style* around a panel.

Method	Returns	Description
`borderStyle`	*String*	Specifies the appearance of the border drawn around the panel. It can be one of: none, etched, raised, sunken, black. The default borderStyle is etched.

If you specify a *Panel* whose width is 0, it will appear as a vertical line; a *panel* whose height is 0 will appear as a horizontal line. Making a panel invisible will also hide all its children; making it visible again will also make visible those children that were visible when the panel was made invisible.

The statictext control

To add a *StaticText* element to a window:

Method	Returns	Description
w.add ("statictext" [, bounds, text, {<creation properties>}]);	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter text is the *text* displayed by the control. The optional parameter *<creation properties>* is an object containing any of the following properties:
multiline	*Boolean*	If false (default) the control accepts a single line of text. If true, the control accepts multiple lines, in which case the text wraps within the width of the control.
scrolling	*Boolean*	If false (default), the text displayed cannot be scrolled. If true, scrolling buttons appear and the text displayed can be vertically scrolled; this case implies *multiline*.

The edittext control

To add an *EditText* element to a window:

Method	Returns	Description
w.add ("edittext" [, bounds, text, {<creation properties>}]);	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter *text* is the initial text displayed by the control. The optional parameter *<creation properties>* is an object containing any of the following properties:
multiline	*Boolean*	If false (default) the control accepts a single line of text. If true, the control accepts multiple lines, in which case the text wraps within the width of the control.
readonly	*Boolean*	If false (default), the control accepts text input. If true, the control will not accept input text, but simply displays the contents of its text property.
noecho	*Boolean*	If false (default), the control displays text that is typed as input. If true, the control will not display input text (useful for password fields).

The *EditText* control calls the *onChange()* event method if the editable text is changed or if its *notify()* method is called. It also has a *textselection* property to access any text selection within the edit field.

The button control

To add a *Button* element to a window:

Method	Returns	Description
w.add ("button" [, bounds, text]);	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter *text* is the text displayed inside the button control.

The *Button* control calls the *onClick()* event method if the control is clicked or if its *notify()* method is called.

The checkbox control

To add a *Checkbox* element to a window *w*:

Method	Returns	Description
`w.add ("checkbox" [, bounds, text]);`	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter *text* is the text displayed next to the checkbox control.

The *Checkbox* control calls the *onClick()* event method if the control is clicked or if its *notify()* method is called. It also has a *value* property which indicates whether the control is set or not.

The radiobutton control

To add a *RadioButton* element to a window *w*:

Method	Returns	Description
`w.add ("radiobutton" [, bounds, text]);`	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter *text* is the text displayed next to the radiobutton control.

All *RadioButtons* in a group must be created sequentially, with no intervening creation of other element types. Only one *RadioButton* in a group can be set at a time; setting a different *RadioButton* unsets the original one. The *RadioButton* control calls the *onClick()* event method if the control is clicked or if its *notify()* method is called. It also has a *value* property which indicates whether the control is set or not.

The scrollbar control

To add a *Scrollbar* element to a window *w*:

Method	Returns	Description
`w.add ("scrollbar" [, bounds, value, minvalue, maxvalue]);`	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter *value* is the initial position of the moveable element. The optional parameters *minvalue* and *maxvalue* define the range of values that can be returned by changing the position of the moveable element.

The *Scrollbar* control will have a horizontal orientation if the specified width is greater than its height at creation time; its orientation will be vertical if its height is greater than its width. It calls the *onChange()* event method if the position of the moveable element is changed by the user, or if its *notify()* method is called. The value property contains the current position of the scrollbar's moveable position indicator within the scrolling area, within the range of *minvalue* and *maxvalue*.

The slider control

To add a *Slider* element to a window w:

Method	Returns	Description
`w.add ("slider" [, bounds, value, minvalue, maxvalue]);`	*Object*	The optional parameter *bounds* defines the element's position and size. The optional parameter *value* is the initial position of the moveable element. The optional parameters *minvalue* and *maxvalue* define the range of values that can be returned by changing the position of the moveable element.

All *Slider* controls have a horizontal orientation. The *Slider* control calls the *onChange()* event method if the position of the slider is changed by the user, or if its *notify()* method is called. The *value* property contains the current position of the slider's moveable position indicator, within the range of *minvalue* and *maxvalue*.

Appendix A: The Socket Object

TCP connections are the basic transport layer of the Internet. Every time your Web browser connects to a server and requests a new page, it opens a TCP connection to handle the request as well as the server's reply. The JavaScript Socket object lets you connect to any server on the Internet and to exchange data with this server.

The Socket object provides basic functionality to connect to a remote computer over a TCP/IP network or the Internet. It provides calls like open() and close() to establish or to terminate a connection, or read() or write() to transfer data. The object also contains a listen() method to establish a simple Internet server; the server uses the method poll() to check for incoming connections.

Many of these connections are based on simple data exchange of ASCII data, while other protocols, like the FTP protocol, are more complex and involve binary data. One of the simplest protocols is the HTTP protocol. The following sample TCP/IP client connects to a WWW server (which listens on port 80); it then sends a very simple HTTP GET request to obtain the home page of the WWW server, and then it reads the reply, which is the home page together with a HTTP response header.

```
reply = "";
conn = new Socket;
// access Adobe's home page
if (conn.open ("www.adobe.com:80")) {
  // send a HTTP GET request
  conn.write ("GET /index.html HTTP/1.0\n\n");
  // and read the server's reply
  reply = conn.read();
  conn.close();
}
```

After executing above code, the variable homepage contains the contents of the Adobe home page together with a HTTP response header.

Establishing an Internet server is a bit more complicated. A typical server program sits and waits for incoming connections, which it then processes. Usually, you would not want your application to run in an endless loop, waiting for any incoming connection request. Therefore, you can ask a Socket object for an incoming connection by calling the poll() method of a Socket object. This call would just check the incoming connections and then return immediately. If there is a connection request, the call to poll() would return another Socket object containing the brand new connection. Use this connection object to talk to the calling client; when finished, close the connection and discard the connection object.

Before a Socket object is able to check for an incoming connection, it must be told to listen on a specific port, like port 80 for HTTP requests. Do this by calling the listen() method instead of the open() method.

The following example is a very simple Web server. It listens on port 80, waiting until it detects an incoming request. The HTTP header is discarded, and a dummy HTML page is transmitted to the caller.

```
conn = new Socket;
// listen on port 80
if conn.listen (80)) {
  // wait forever for a connection
  var incoming;
  do incoming = conn.poll();
```

```
  while (incoming == null);
  // discard the request
  read();
  // Reply with a HTTP header
  incoming.writeln ("HTTP/1.0 200 OK");
  incoming.writeln ("Content-Type: text/html");
  incoming.writeln();
  // Transmit a dummy homepage
  incoming.writeln ("<html><body><h1>Homepage</h1></body></html>");
  // done!
  incoming.close();
  delete incoming;
}
```

Often, the remote endpoint terminates the connection after transmitting data. Therefore, there is a connected property that contains true as long as the connection still exists. If the connected property returns false, the connection is closed automatically.

On errors, the error property of the Socket object contains a short message describing the type of the error.

The Socket object lets you easily implement software that talks to each other via the Internet. You could, for example, let two Adobe applications exchange documents and data simply by writing and executing JavaScript programs.

JavaScript Reference

Properties

connected	Boolean	Contains true if the connection is still active. Read only.
eof	Boolean	This property has the value true if the receive buffer is empty. Read only.
error	String	Contains a message describing the last error. Setting this value clears any error message.
host	String	Contains the name of the remote computer when a connection is established. If the connection is shut down or does not exist, the property contains the empty string. Read only.
timeout	Number	The timeout in seconds to be applied to read or write operations. Defaults to 10 (ten seconds).

Methods

```
[new] Socket ();
```

Creates a new Socket object.

Returns

Object.

```
close();
```

Terminates the open connection. The return value is true if the connection was closed, false on I/O errors. Deleting the connection has the same effect. Remember, however, that JavaScript garbage collects the object at some null time, so the connection may stay open longer than you want to if you do not close it explicitly.

Returns

Boolean

```
listen (Number port [, String encoding]);
```

Instructs the object to start listening for an incoming connection. The port argument is the TCP/IP port number where the object should listen on; typical values are 80 for a Web server, 23 for a Telnet server and so on. The encoding parameter is optional. The call to listen() is mutually exclusive to a call to open(). The result is true if the connection object successfully started listening, false otherwise.

Parameters

port	Number	The port number to listen on. Valid port numbers are 1 to 65535.
encoding	String	The encoding to be used for the connection. Typical values are "ASCII", "binary", or "UTF-8". This parameter defaults to ASCII.

Returns

Boolean

```
open (String computer [, String encoding]);
```

Open the connection for subsequent read/write operations. The computer name is the name or IP address, followed by a colon and the port number to connect to. The port number is mandatory. Valid computer names are, for example, "www.adobe.com:80" or "192.150.14.12:80". The encoding parameter is optional; currently, it can be one of "ASCII", "binary" or "UTF-8". The call to open() is mutually exclusive to a call to listen().

Parameters

host	String	The name or IP address of the remote computer, followed by a colon and the port number to connect to. The port number is mandatory. Valid computer names are e.g. "www.adobe.com:80" or "192.150.14.12:80".
encoding	String	The encoding to be used for the connection. Typical values are "ASCII", "binary", or "UTF-8". This parameter defaults to ASCII.

Returns

Boolean

```
poll();
```

Check a listening object for a new incoming connection. If a connection request was detected, the method returns a new Socket object that wraps the new connection. Use this connection object to communicate with the remote computer. After use, close the connection and delete the JavaScript object. If no new connection request was detected, the method returns null.

Returns

a new Socket object or null.

```
read ([Number count]);
```

Read up to the given number of characters from the connection. Returns a string that contains up to the number of characters that were supposed to be read. If no count is supplied, the connection attempts to read as many characters it can get until the remote server closes the connection or a timeout occurs.

Parameters

count	Number	The number of characters to read. If no count is supplied, the connection attempts to read as many characters it can get until the remote server closes the connection or a timeout occurs.

Returns

String

```
readln();
```

Read one line of text up to the next line feed. Line feeds are recognized as CR, LF, CRLF or LFCR pairs.

Returns

String

```
write (String text, ...);
```

Write the given string to the connection. The parameters of this function are concatenated to a single string. Returns true on success.

Parameters

text	String	All arguments are concatenated to form the string to be written.

Returns

Boolean

```
writeln (String text, ...);
```

Write the given string to the connection and append a Line Feed character. The parameters of this function are concatenated to a single string. Returns true on success.

Parameters

text	String	All arguments are concatenated to form the string to be written.

Returns

Boolean

Chat server sample

The following sample code implements a very simple chat server. A chat client may connect to the chat server, who is listening on port number 1234. The server responds with a welcome message and waits for one line of input from the client. The client types some text and transmits it to the server who displays the text and lets the user at the server computer type a line of text, which the client computer again displays. This goes back and forth until either the server or the client computer types the word "bye".

```
function chatServer() {
  var tcp = new Socket;
  // listen on port 1234
  writeln ("Chat server listening on port 1234");
  if (tcp.listen (1234)) {
    for (;;) {
      // poll for a new connection
      var connection = tcp.poll();
      if (connection != null) {
        writeln ("Connection from " + connection.host);
        // we have a new connection, so welcome and chat
        // until client terminates the session
        connection.writeln ("Welcome to a little chat!");
        chat (connection);
        connection.writeln ("*** Goodbye ***");
        connection.close();
        delete connection;
        writeln ("Connection closed");
      }
    }
  }
}

function chatClient() {
  var connection = new Socket;
  // connect to sample server
  if (connection.open ("remote-pc.corp.adobe.com:1234")) {
    // then chat with server
    chat (connection);
    connection.close();
    delete connection;
  }
}

function chat (c) {
  // select a long timeout
  c.timeout=1000;
  while (true) {
    // get one line and echo it
    writeln (c.read());
    // stop if the connection is broken
    if (!c.connected)
      break;
    // read a line of text
    write ("chat: ");
    var text = readln();
    if (text == "bye")
      // stop conversation if the user entered "bye"
      break;
    else
      // otherwise transmit to server
```

```
        c.writeln (text);
    }
}
```

Appendix B: Encoding Names

Supported encoding names

The following list of names is a basic set of encoding names supported by the FileSystem object. Some of the character encoders are built in, while the operating system is queried for most of the other encoders.

Depending on the language packs installed, some of the encodings may not be available. Names that refer to the same encoding are listed in one line. Underlines are replaced with dashes before matching an encoding name.

Note, however, that the FileSystem object cannot process extended Unicode character with values greater than 65535. These characters are left encoded as specified in the UTF-16 standard in as two characters in the range from 0xD700-0xDFFF.

Built-in encodings are:

US-ASCII,ASCII,ISO646-US,ISO-646.IRV:1991,ISO-IR-6, ANSI-X3.4-1968,CP367,IBM367,US,ISO646.1991-IRV
UCS-2,UCS2, ISO-10646-UCS-2
UCS2LE,UCS-2LE,ISO-10646-UCS-2LE
UCS2BE,UCS-2BE,ISO-10646-UCS-2BE
UCS-4,UCS4, ISO-10646-UCS-4
UCS4LE,UCS-4LE,ISO-10646-UCS-4LE
UCS4BE,UCS-4BE,ISO-10646-UCS-4BE
UTF-8,UTF8,UNICODE-1-1-UTF-8,UNICODE-2-0-UTF-8,X-UNICODE-2-0-UTF-8
UTF16,UTF-16,ISO-10646-UTF-16
UTF16LE,UTF-16LE,ISO-10646-UTF-16LE
UTF16BE,UTF-16BE,ISO-10646-UTF-16BE
CP1252,WINDOWS-1252,MS-ANSI
ISO-8859-1,ISO-8859-1,ISO-8859-1:1987,ISO-IR-100,LATIN1
MACINTOSH,X-MAC-ROMAN
BINARY

The ASCII encoder raises errors for characters greater than 127, and the BINARY encoder simply converts between bytes and Unicode characters by using the lower 8 bits. This encoder is convenient for reading and writing binary data.

Additional encodings

In Windows, all encodings use so-called code pages. These code pages are assigned numeric values. The usual Western character set that Windows uses is, for example, the code page 1252. Windows code pages may be selected by prepending the number of the code page with "CP" or "WINDOWS- like "CP1252" for the code page 1252. The File object has a lot of other encoding names built-in that match predefined code page numbers. If a code page is not present, the encoding cannot be selected.

On Mac OS, encoders may be selected by name rather than by code page number. The File object queries Mac OS directly for an encoder. As far as Mac OS character sets are identical with Windows code pages, Mac OS also knows the Windows code page numbers.

Common encoding names

The following encoding names are implemented both on Windows and Mac OS:

UTF-7,UTF7,UNICODE-1-1-UTF-7,X-UNICODE-2-0-UTF-7
ISO-8859-2,ISO-8859-2,ISO-8859-2:1987,ISO-IR-101,LATIN2
ISO-8859-3,ISO-8859-3,ISO-8859-3:1988,ISO-IR-109,LATIN3
ISO-8859-4,ISO-8859-4,ISO-8859-4:1988,ISO-IR-110,LATIN4,BALTIC
ISO-8859-5,ISO-8859-5,ISO-8859-5:1988,ISO-IR-144,CYRILLIC
ISO-8859-6,ISO-8859-6,ISO-8859-6:1987,ISO-IR-127,ECMA-114,ASMO-708,ARABIC
ISO-8859-7,ISO-8859-7,ISO-8859-7:1987,ISO-IR-126,ECMA-118,ELOT-928,GREEK8,GREEK
ISO-8859-8,ISO-8859-8,ISO-8859-8:1988,ISO-IR-138,HEBREW
ISO-8859-9,ISO-8859-9,ISO-8859-9:1989,ISO-IR-148,LATIN5,TURKISH
ISO-8859-10,ISO-8859-10,ISO-8859-10:1992,ISO-IR-157,LATIN6
ISO-8859-13,ISO-8859-13,ISO-IR-179,LATIN7
ISO-8859-14,ISO-8859-14,ISO-8859-14,ISO-8859-14:1998,ISO-IR-199,LATIN8
ISO-8859-15,ISO-8859-15,ISO-8859-15:1998,ISO-IR-203
ISO-8859-16,ISO-885,ISO-885,MS-EE
CP850,WINDOWS-850,IBM850
CP866,WINDOWS-866,IBM866
CP932,WINDOWS-932,SJIS,SHIFT-JIS,X-SJIS,X-MS-SJIS,MS-SJIS,MS-KANJI
CP936,WINDOWS-936,GBK,WINDOWS-936,GB2312,GB-2312-80,ISO-IR-58,CHINESE
CP949,WINDOWS-949,UHC,KSC-5601,KS-C-5601-1987,KS-C-5601-1989,ISO-IR-149,KOREAN
CP950,WINDOWS-950,BIG5,BIG-5,BIG-FIVE,BIGFIVE,CN-BIG5,X-X-BIG5
CP1251,WINDOWS-1251,MS-CYRL
CP1252,WINDOWS-1252,MS-ANSI
CP1253,WINDOWS-1253,MS-GREEK
CP1254,WINDOWS-1254,MS-TURK
CP1255,WINDOWS-1255,MS-HEBR
CP1256,WINDOWS-1256,MS-ARAB
CP1257,WINDOWS-1257,WINBALTRIM
CP1258,WINDOWS-1258
CP1361,WINDOWS-1361,JOHAB
EUC-JP,EUCJP,X-EUC-JP
EUC-KR,EUCKR,X-EUC-KR
HZ,HZ-GB-2312
X-MAC-JAPANESE
X-MAC-GREEK
X-MAC-CYRILLIC
X-MAC-LATIN
X-MAC-ICELANDIC
X-MAC-TURKISH

Additional Windows encoding names

CP437,IBM850,WINDOWS-437
CP709,WINDOWS-709,ASMO-449,BCONV4
EBCDIC
KOI-8R
KOI-8U
ISO-2022-JP
ISO-2022-KR

Additional Mac OS encoding names

These names are alias names for encodings that Mac OS might know.

TIS-620,TIS620,TIS620-0,TIS620.2529-1,TIS620.2533-0,TIS620.2533-1,ISO-IR-166
CP874,WINDOWS-874
JP,JIS-C6220-1969-RO,ISO646-JP,ISO-IR-14
JIS-X0201,JISX0201-1976,X0201
JIS-X0208,JIS-X0208-1983,JIS-X0208-1990,JIS0208,X0208,ISO-IR-87
JIS-X0212,JIS-X0212.1990-0,JIS-X0212-1990,X0212,ISO-IR-159
CN,GB-1988-80,ISO646-CN,ISO-IR-57
ISO-IR-16,CN-GB-ISOIR165
KSC-5601,KS-C-5601-1987,KS-C-5601-1989,ISO-IR-149
EUC-CN,EUCCN,GB2312,CN-GB
EUC-TW,EUCTW,X-EUC-TW

```
Object Properties
(output of dump_objects.jsx from After Effects 6.5)

================================================================================
=======
AlphaMode enum
--------------------------------------------------------------------------------
-------
  AlphaMode.IGNORE
  AlphaMode.PREMULTIPLIED
  AlphaMode.STRAIGHT
--------------------------------------------------------------------------------
-------


================================================================================
=======
Application object
--------------------------------------------------------------------------------
-------
  beginSuppressDialogs()                                  no return
  beginUndoGroup(string undoName)                         no return
  buildName                       :  string         :   readOnly
  buildNumber                     :  integer        :   readOnly
  endSuppressDialogs(boolean showAlert)                   no return
  endUndoGroup()                                          no return
  endWatchFolder()                                        no return
  exitAfterLaunchAndEval          :  boolean        :   read/write
  exitCode                        :  integer        :   read/write
  isProfessionalVersion           :  boolean        :   readOnly
  isRenderEngine                  :  boolean        :   readOnly
  isUISuppressed                  :  boolean        :   readOnly
  isWatchFolder                   :  boolean        :   readOnly
  language                        :  Language       :   readOnly
  newProject()                                            no return
  open([File file])                                       returns Project
  pauseWatchFolder(boolean doPause)                       no return
  project                         :  Project        :   readOnly
  purge(PurgeTarget target)                               no return
  quit()                                                  no return
  registeredCompany               :  string         :   readOnly
  registeredName                  :  string         :   readOnly
  serialNumber                    :  string         :   readOnly
  setMemoryUsageLimits(float imageCachePercent,
      float maximumMemoryPercent)                         no return
  setSavePreferencesOnQuit(boolean doSave)                no return
  settings                        :  Settings       :   readOnly
  version                         :  string         :   readOnly
  watchFolder(File file)                                  no return
  onError(string errorString,
      string severity)                                    no return
--------------------------------------------------------------------------------
-------
```

```
================================================================================
AVLayer object
--------------------------------------------------------------------------------
  (integer propertyIndex)                                  returns
PropertyBase
  (string propertyName)                                    returns
PropertyBase
  active                          :  boolean        :  readOnly
  activeAtTime(float atTime)                               returns boolean
  addProperty(string propertyName)                         returns
PropertyBase
  adjustmentLayer                 :  boolean        :  read/write
  audioActive                     :  boolean        :  readOnly
  audioActiveAtTime(float atTime)                          returns boolean
  audioEnabled                    :  boolean        :  read/write
  blendingMode                    :  BlendingMode   :  read/write
  canAddProperty(string propertyName)                      returns boolean
  canSetCollapseTransformation    :  boolean        :  readOnly
  canSetEnabled                   :  boolean        :  readOnly
  canSetTimeRemapEnabled          :  boolean        :  readOnly
  collapseTransformation          :  boolean        :  read/write
  copyToComp(CompItem intoComp)                            no return
  duplicate()                                              returns AVLayer
  effectsActive                   :  boolean        :  read/write
  elided                          :  boolean        :  readOnly
  enabled                         :  boolean        :  read/write
  frameBlending                   :  boolean        :  read/write
  guideLayer                      :  boolean        :  read/write
  hasAudio                        :  boolean        :  readOnly
  hasTrackMatte                   :  boolean        :  readOnly
  hasVideo                        :  boolean        :  readOnly
  height                          :  float          :  readOnly
  inPoint                         :  float          :  read/write
  index                           :  integer        :  readOnly
  isEffect                        :  boolean        :  readOnly
  isMask                          :  boolean        :  readOnly
  isModified                      :  boolean        :  readOnly
  isNameFromSource                :  boolean        :  readOnly
  isTrackMatte                    :  boolean        :  readOnly
  locked                          :  boolean        :  read/write
  matchName                       :  string         :  readOnly
  motionBlur                      :  boolean        :  read/write
  moveAfter(Layer otherLayer)                              no return
  moveBefore(Layer otherLayer)                             no return
  moveTo(integer index)                                    no return
  moveToBeginning()                                        no return
  moveToEnd()                                              no return
  name                            :  string         :  read/write
  nullLayer                       :  boolean        :  readOnly
```

```
  numProperties                    :  integer         :  readOnly
  outPoint                         :  float           :  read/write
  parent                           :  Layer           :  read/write
  parentProperty                   :  PropertyGroup   :  readOnly
  preserveTransparency             :  boolean         :  read/write
  property(integer propertyIndex)                        returns
PropertyBase
  property(string propertyName)                          returns
PropertyBase
  propertyDepth                    :  integer         :  readOnly
  propertyGroup([integer countUp])                       returns
PropertyGroup
  propertyType                     :  PropertyType    :  readOnly
  quality                          :  LayerQuality    :  read/write
  remove()                                               no return
  selected                         :  boolean         :  read/write
  selectedProperties               :  Array of PropertyBase:  readOnly
  setParentWithJump(Layer newParent)                     no return
  shy                              :  boolean         :  read/write
  solo                             :  boolean         :  read/write
  source                           :  AVItem          :  readOnly
  startTime                        :  float           :  read/write
  stretch                          :  float           :  read/write
  threeDLayer                      :  boolean         :  read/write
  time                             :  float           :  readOnly
  timeRemapEnabled                 :  boolean         :  read/write
  trackMatteType                   :  TrackMatteType  :  read/write
  width                            :  float           :  readOnly
-------------------------------------------------------------------------
-------


=========================================================================
=======
BlendingMode enum
-------------------------------------------------------------------------
-------
  BlendingMode.ADD
  BlendingMode.ALPHA_ADD
  BlendingMode.CLASSIC_COLOR_BURN
  BlendingMode.CLASSIC_COLOR_DODGE
  BlendingMode.CLASSIC_DIFFERENCE
  BlendingMode.COLOR
  BlendingMode.COLOR_BURN
  BlendingMode.COLOR_DODGE
  BlendingMode.DANCING_DISSOLVE
  BlendingMode.DARKEN
  BlendingMode.DIFFERENCE
  BlendingMode.DISSOLVE
  BlendingMode.EXCLUSION
  BlendingMode.HARD_LIGHT
  BlendingMode.HARD_MIX
  BlendingMode.HUE
```

```
  BlendingMode.LIGHTEN
  BlendingMode.LINEAR_BURN
  BlendingMode.LINEAR_DODGE
  BlendingMode.LINEAR_LIGHT
  BlendingMode.LUMINESCENT_PREMUL
  BlendingMode.LUMINOSITY
  BlendingMode.MULTIPLY
  BlendingMode.NORMAL
  BlendingMode.OVERLAY
  BlendingMode.PIN_LIGHT
  BlendingMode.SATURATION
  BlendingMode.SCREEN
  BlendingMode.SILHOUETE_ALPHA
  BlendingMode.SILHOUETTE_LUMA
  BlendingMode.SOFT_LIGHT
  BlendingMode.STENCIL_ALPHA
  BlendingMode.STENCIL_LUMA
  BlendingMode.VIVID_LIGHT
-------------------------------------------------------------------------
-------


=========================================================================
=======
CloseOptions enum
-------------------------------------------------------------------------
-------
  CloseOptions.DO_NOT_SAVE_CHANGES
  CloseOptions.PROMPT_TO_SAVE_CHANGES
  CloseOptions.SAVE_CHANGES
-------------------------------------------------------------------------
-------


=========================================================================
=======
CompItem object
-------------------------------------------------------------------------
-------
  activeCamera                  :  Layer          :  readOnly
  bgColor                       :  Array of float :  read/write
  comment                       :  string         :  read/write
  displayStartTime              :  float          :  read/write
  draft3d                       :  boolean        :  read/write
  duplicate()                                        returns
CompItem
  duration                      :  float          :  read/write
  footageMissing                :  boolean        :  readOnly
  frameBlending                 :  boolean        :  read/write
  frameDuration                 :  float          :  read/write
  frameRate                     :  float          :  read/write
  hasAudio                      :  boolean        :  readOnly
  hasVideo                      :  boolean        :  readOnly
```

```
  height                          :  integer         :  read/write
  hideShyLayers                   :  boolean         :  read/write
  id                              :  integer         :  readOnly
  layer(integer layerIndex)                             returns Layer
  layer(string layerName)                               returns Layer
  layer(Layer otherLayer, integer relativeIndex)        returns Layer
  layers                          :  LayerCollection:  readOnly
  motionBlur                      :  boolean         :  read/write
  name                            :  string          :  read/write
  numLayers                       :  integer         :  readOnly
  parentFolder                    :  FolderItem      :  readOnly
  pixelAspect                     :  float           :  read/write
  preserveNestedFrameRate         :  boolean         :  read/write
  preserveNestedResolution        :  boolean         :  read/write
  proxySource                     :  FootageSource   :  readOnly
  remove()                                              no return
  resolutionFactor                :  Array of integer    :  read/write
  selected                        :  boolean         :  read/write
  selectedLayers                  :  Array of Layer  :  readOnly
  selectedProperties              :  Array of PropertyBase:  readOnly
  setProxy(File proxyFile)                              no return
  setProxyToNone()                                      no return
  setProxyWithPlaceholder(string name,
      integer width,
      integer height,
      float frameRate,
      float duration)                                   no return
  setProxyWithSequence(File proxyFile,
      boolean forceAlphabetical)                        no return
  setProxyWithSolid(ArrayOfFloat color,
      string name,
      integer width,
      integer height,
      float pixelAspecRatio)                            no return
  shutterAngle                    :  integer         :  read/write
  shutterPhase                    :  integer         :  read/write
  time                            :  float           :  read/write
  typeName                        :  string          :  readOnly
  useProxy                        :  boolean         :  read/write
  usedIn                          :  Array of CompItem   :  readOnly
  width                           :  integer         :  read/write
  workAreaDuration                :  float           :  readOnly
  workAreaStart                   :  float           :  readOnly
-------------------------------------------------------------------
-------


===================================================================
=======
FieldSeparationType enum
-------------------------------------------------------------------
-------
  FieldSeparationType.LOWER_FIELD_FIRST
```

```
  FieldSeparationType.OFF
  FieldSeparationType.UPPER_FIELD_FIRST
-------------------------------------------------------------------------
-------


=========================================================================
=======
FileSource object
-------------------------------------------------------------------------
-------
  alphaMode                       :  AlphaMode      :  read/write
  conformFrameRate                :  float          :  read/write
  displayFrameRate                :  float          :  readOnly
  fieldSeparationType             :  FieldSeparationType :  readOnly
  file                            :  File           :  readOnly
  guessAlphaMode()                                     no return
  guessPulldown(PulldownMethod pulldownMethod)         no return
  hasAlpha                        :  boolean        :  readOnly
  highQualityFieldSeparation      :  boolean        :  read/write
  invertAlpha                     :  boolean        :  read/write
  isStill                         :  boolean        :  readOnly
  loop                            :  integer        :  read/write
  nativeFrameRate                 :  float          :  readOnly
  premulColor                     :  Array of float :  read/write
  reload()                                             no return
  removePulldown                  :  PulldownPhase  :  readOnly
-------------------------------------------------------------------------
-------


=========================================================================
=======
FolderItem object
-------------------------------------------------------------------------
-------
  comment                         :  string         :  read/write
  id                              :  integer        :  readOnly
  item(integer itemIndex)                              returns Item
  items                           :  ItemCollection :  readOnly
  name                            :  string         :  read/write
  numItems                        :  integer        :  readOnly
  parentFolder                    :  FolderItem     :  readOnly
  remove()                                             no return
  selected                        :  boolean        :  read/write
  typeName                        :  string         :  readOnly
-------------------------------------------------------------------------
-------


=========================================================================
=======
FootageItem object
```

```
------------------------------------------------------------------------
-------
  comment                          :  string          :  read/write
  duration                         :  float           :  readOnly
  file                             :  File            :  readOnly
  footageMissing                   :  boolean         :  readOnly
  frameDuration                    :  float           :  readOnly
  frameRate                        :  float           :  readOnly
  hasAudio                         :  boolean         :  readOnly
  hasVideo                         :  boolean         :  readOnly
  height                           :  integer         :  read/write
  id                               :  integer         :  readOnly
  mainSource                       :  FootageSource   :  readOnly
  name                             :  string          :  read/write
  parentFolder                     :  FolderItem      :  readOnly
  pixelAspect                      :  float           :  read/write
  proxySource                      :  FootageSource   :  readOnly
  remove()                                               no return
  replace(File proxyFile)                                no return
  replaceWithPlaceholder(string name,
      integer width,
      integer height,
      float frameRate,
      float duration)                                    no return
  replaceWithSequence(File proxyFile,
      boolean forceAlphabetical)                         no return
  replaceWithSolid(ArrayOfFloat color,
      string name,
      integer width,
      integer height,
      float pixelAspecRatio)                             no return
  selected                         :  boolean         :  read/write
  setProxy(File proxyFile)                               no return
  setProxyToNone()                                       no return
  setProxyWithPlaceholder(string name,
      integer width,
      integer height,
      float frameRate,
      float duration)                                    no return
  setProxyWithSequence(File proxyFile,
      boolean forceAlphabetical)                         no return
  setProxyWithSolid(ArrayOfFloat color,
      string name,
      integer width,
      integer height,
      float pixelAspecRatio)                             no return
  time                             :  float           :  readOnly
  typeName                         :  string          :  readOnly
  useProxy                         :  boolean         :  read/write
  usedIn                           :  Array of CompItem   :  readOnly
  width                            :  integer         :  read/write
------------------------------------------------------------------------
-------
```

```
================================================================================
=======
ImportAsType enum
--------------------------------------------------------------------------------
-------
  ImportAsType.COMP
  ImportAsType.COMP_CROPPED_LAYERS
  ImportAsType.FOOTAGE
  ImportAsType.PROJECT
--------------------------------------------------------------------------------
-------


================================================================================
=======
ImportOptions object
--------------------------------------------------------------------------------
-------
  new ImportOptions(File fileToImport)                returns
ImportOptions
  canImportAs(ImportAsType asType)                    returns boolean
  file                          :  File           :  read/write
  forceAlphabetical             :  boolean        :  read/write
  importAs                      :  ImportAsType   :  read/write
  sequence                      :  boolean        :  read/write
--------------------------------------------------------------------------------
-------


================================================================================
=======
ItemCollection object
--------------------------------------------------------------------------------
-------
  addComp(string name,
      integer width,
      integer height,
      float pixelAspectRatio,
      float duration,
      float frameRate)                                returns
CompItem
--------------------------------------------------------------------------------
-------


================================================================================
=======
KeyframeEase object
--------------------------------------------------------------------------------
-------
  new KeyframeEase(float speed,
```

```
      float influence)                                  returns
KeyframeEase
  influence                       :  float          :  read/write
  speed                           :  float          :  read/write
-------------------------------------------------------------------
-------


===================================================================
=======
KeyframeInterpolationType enum
-------------------------------------------------------------------
-------
  KeyframeInterpolationType.BEZIER
  KeyframeInterpolationType.HOLD
  KeyframeInterpolationType.LINEAR
-------------------------------------------------------------------
-------


===================================================================
=======
Language enum
-------------------------------------------------------------------
-------
  Language.ENGLISH
  Language.FRENCH
  Language.GERMAN
  Language.JAPANESE
-------------------------------------------------------------------
-------


===================================================================
=======
Layer object
-------------------------------------------------------------------
-------
  (integer propertyIndex)                           returns
PropertyBase
  (string propertyName)                             returns
PropertyBase
  active                          :  boolean        :  readOnly
  activeAtTime(float atTime)                        returns boolean
  addProperty(string propertyName)                  returns
PropertyBase
  canAddProperty(string propertyName)               returns boolean
  canSetEnabled                   :  boolean        :  readOnly
  copyToComp(CompItem intoComp)                     no return
  duplicate()                                       returns Layer
  elided                          :  boolean        :  readOnly
  enabled                         :  boolean        :  read/write
  hasVideo                        :  boolean        :  readOnly
```

```
  inPoint                          :  float          :  read/write
  index                            :  integer        :  readOnly
  isEffect                         :  boolean        :  readOnly
  isMask                           :  boolean        :  readOnly
  isModified                       :  boolean        :  readOnly
  locked                           :  boolean        :  read/write
  matchName                        :  string         :  readOnly
  moveAfter(Layer otherLayer)                           no return
  moveBefore(Layer otherLayer)                          no return
  moveTo(integer index)                                 no return
  moveToBeginning()                                     no return
  moveToEnd()                                           no return
  name                             :  string         :  read/write
  nullLayer                        :  boolean        :  readOnly
  numProperties                    :  integer        :  readOnly
  outPoint                         :  float          :  read/write
  parent                           :  Layer          :  read/write
  parentProperty                   :  PropertyGroup  :  readOnly
  property(integer propertyIndex)                       returns
PropertyBase
  property(string propertyName)                         returns
PropertyBase
  propertyDepth                    :  integer        :  readOnly
  propertyGroup([integer countUp])                      returns
PropertyGroup
  propertyType                     :  PropertyType   :  readOnly
  remove()                                              no return
  selected                         :  boolean        :  read/write
  selectedProperties               :  Array of PropertyBase:  readOnly
  setParentWithJump(Layer newParent)                    no return
  shy                              :  boolean        :  read/write
  solo                             :  boolean        :  read/write
  startTime                        :  float          :  read/write
  stretch                          :  float          :  read/write
  time                             :  float          :  readOnly
-------------------------------------------------------------------
-------


===================================================================
=======
LayerCollection object
-------------------------------------------------------------------
-------
  add(AVItem theItem,
      [float duration])                                 returns AVLayer
  addCamera(string name,
      ArrayOfFloat centerPoint)                         returns Layer
  addLight(string name,
      ArrayOfFloat centerPoint)                         returns Layer
  addNull([float duration])                             returns AVLayer
  addSolid(ArrayOfFloat color,
      string name,
```

```
      integer width,
      integer height,
      float pixelAspectRatio,
      [float duration])                                  returns AVLayer
  addText([TextDocument textDoc])                        returns AVLayer
  addText(string text)                                   returns AVLayer
  byName(string name)                                    returns Layer
  precompose(ArrayOfInteger layerIndices,
      string name,
      [boolean moveAllAttributes])                       returns
CompItem
-------------------------------------------------------------------------
-------


=========================================================================
=======
LayerQuality enum
-------------------------------------------------------------------------
-------
  LayerQuality.BEST
  LayerQuality.DRAFT
  LayerQuality.WIREFRAME
-------------------------------------------------------------------------
-------


=========================================================================
=======
LogType enum
-------------------------------------------------------------------------
-------
  LogType.ERRORS_AND_PER_FRAME_INFO
  LogType.ERRORS_AND_SETTINGS
  LogType.ERRORS_ONLY
-------------------------------------------------------------------------
-------


=========================================================================
=======
MarkerValue object
-------------------------------------------------------------------------
-------
  new MarkerValue(string comment,
      [string chapter],
      [string url],
      [string frameTarget])                              returns
MarkerValue
  chapter                       :  string         :  read/write
  comment                       :  string         :  read/write
  frameTarget                   :  string         :  read/write
  url                           :  string         :  read/write
```

```
-------------------------------------------------------------------------
-------


=========================================================================
=======
MaskMode enum
-------------------------------------------------------------------------
-------
  MaskMode.ADD
  MaskMode.DARKEN
  MaskMode.DIFFERENCE
  MaskMode.INTERSECT
  MaskMode.LIGHTEN
  MaskMode.NONE
  MaskMode.SUBTRACT
-------------------------------------------------------------------------
-------


=========================================================================
=======
MaskMotionBlur enum
-------------------------------------------------------------------------
-------
  MaskMotionBlur.OFF
  MaskMotionBlur.ON
  MaskMotionBlur.SAME_AS_LAYER
-------------------------------------------------------------------------
-------


=========================================================================
=======
MaskPropertyGroup object
-------------------------------------------------------------------------
-------
  (integer propertyIndex)                              returns
PropertyBase
  (string propertyName)                                returns
PropertyBase
  active                          :  boolean        :  readOnly
  addProperty(string propertyName)                     returns
PropertyBase
  canAddProperty(string propertyName)                  returns boolean
  canSetEnabled                   :  boolean        :  readOnly
  color                           :  Array of float :  read/write
  duplicate()                                          returns
MaskPropertyGroup
  elided                          :  boolean        :  readOnly
  enabled                         :  boolean        :  readOnly
  inverted                        :  boolean        :  read/write
  isEffect                        :  boolean        :  readOnly
```

```
  isMask                          :  boolean         :  readOnly
  isModified                      :  boolean         :  readOnly
  locked                          :  boolean         :  read/write
  maskMode                        :  MaskMode        :  read/write
  maskMotionBlur                  :  MaskMotionBlur  :  read/write
  matchName                       :  string          :  readOnly
  moveTo(integer index)                                 no return
  name                            :  string          :  read/write
  numProperties                   :  integer         :  readOnly
  parentProperty                  :  PropertyGroup   :  readOnly
  property(integer propertyIndex)                       returns
PropertyBase
  property(string propertyName)                         returns
PropertyBase
  propertyDepth                   :  integer         :  readOnly
  propertyGroup([integer countUp])                      returns
PropertyGroup
  propertyIndex                   :  integer         :  readOnly
  propertyType                    :  PropertyType    :  readOnly
  remove()                                              no return
  rotoBezier                      :  boolean         :  read/write
  selected                        :  boolean         :  read/write
-------------------------------------------------------------------
-------


===================================================================
=======
OMCollection object
-------------------------------------------------------------------
-------
  add()                                                 returns
OutputModule
-------------------------------------------------------------------
-------


===================================================================
=======
OutputModule object
-------------------------------------------------------------------
-------
  applyTemplate(string templateName)                    no return
  file                            :  File            :  read/write
  name                            :  string          :  readOnly
  postRenderAction                :  PostRenderAction    :  read/write
  remove()                                              no return
  saveAsTemplate(string templateName)                   no return
  templates                       :  Array of string:   readOnly
-------------------------------------------------------------------
-------
```

```
================================================================================
=======
PlaceholderSource object
--------------------------------------------------------------------------------
-------
  alphaMode                       :  AlphaMode       :  read/write
  conformFrameRate                :  float           :  read/write
  displayFrameRate                :  float           :  readOnly
  fieldSeparationType             :  FieldSeparationType :  read/write
  guessAlphaMode()                                      no return
  guessPulldown(PulldownMethod pulldownMethod)          no return
  hasAlpha                        :  boolean         :  readOnly
  highQualityFieldSeparation      :  boolean         :  read/write
  invertAlpha                     :  boolean         :  read/write
  isStill                         :  boolean         :  readOnly
  loop                            :  integer         :  read/write
  nativeFrameRate                 :  float           :  readOnly
  premulColor                     :  Array of float  :  read/write
  removePulldown                  :  PulldownPhase   :  read/write
--------------------------------------------------------------------------------
-------


================================================================================
=======
PostRenderAction enum
--------------------------------------------------------------------------------
-------
  PostRenderAction.IMPORT
  PostRenderAction.IMPORT_AND_REPLACE_USAGE
  PostRenderAction.NONE
  PostRenderAction.SET_PROXY
--------------------------------------------------------------------------------
-------


================================================================================
=======
Project object
--------------------------------------------------------------------------------
-------
  activeItem                      :  Item            :  readOnly
  bitsPerChannel                  :  integer         :  read/write
  close(CloseOptions closeOptions)                      returns boolean
  consolidateFootage()                                  returns integer
  file                            :  File            :  readOnly
  importFile(ImportOptions importOptions)               returns Item
  importFileWithDialog()                                returns
ArrayOfItem
  importPlaceholder(string itemName,
      integer itemWidth,
      integer itemHeight,
      float frameRate,
```

```
      float duration)                                    returns
FootageItem
  item(integer itemIndex)                                returns Item
  items                          :  ItemCollection :  readOnly
  numItems                       :  integer        :  readOnly
  reduceProject(ArrayOfItem itemsToPreserve)             returns integer
  removeUnusedFootage()                                  returns integer
  renderQueue                    :  RenderQueue    :  readOnly
  rootFolder                     :  FolderItem     :  readOnly
  save(File toFile)                                      returns boolean
  saveWithDialog()                                       returns boolean
  selection                      :  Array of Item  :  readOnly
  showWindow(boolean doShow)                             no return
  timecodeBaseType               :  TimecodeBaseType     :  read/write
  timecodeDisplayType            :  TimecodeDisplayType  :  read/write
  timecodeFilmType               :  TimecodeFilmType     :  read/write
  timecodeNTSCDropFrame          :  boolean        :  read/write
  transparencyGridThumbnails     :  boolean        :  read/write
-------------------------------------------------------------------------
-------


=========================================================================
=======
Property object
-------------------------------------------------------------------------
-------
  active                         :  boolean        :  readOnly
  addKey(float atTime)                                   returns integer
  canSetEnabled                  :  boolean        :  readOnly
  canVaryOverTime                :  boolean        :  readOnly
  duplicate()                                            returns
Property
  elided                         :  boolean        :  readOnly
  enabled                        :  boolean        :  readOnly
  expression                     :  string         :  read/write
  expressionEnabled              :  boolean        :  read/write
  expressionError                :  string         :  readOnly
  hasMax                         :  boolean        :  readOnly
  hasMin                         :  boolean        :  readOnly
  isEffect                       :  boolean        :  readOnly
  isInterpolationTypeValid(
      KeyframeInterpolationType type)                    returns boolean
  isMask                         :  boolean        :  readOnly
  isModified                     :  boolean        :  readOnly
  isSpatial                      :  boolean        :  readOnly
  isTimeVarying                  :  boolean        :  readOnly
  keyInInterpolationType(integer keyIndex)               returns
KeyframeInterpolationType
  keyInSpatialTangent(integer keyIndex)                  returns
ArrayOfFloat
  keyInTemporalEase(integer keyIndex)                    returns
ArrayOfKeyframeEase
```

```
  keyOutInterpolationType(integer keyIndex)          returns
KeyframeInterpolationType
  keyOutSpatialTangent(integer keyIndex)             returns
ArrayOfFloat
  keyOutTemporalEase(integer keyIndex)               returns
ArrayOfKeyframeEase
  keyRoving(integer keyIndex)                        returns boolean
  keySelected(integer keyIndex)                      returns boolean
  keySpatialAutoBezier(integer keyIndex)             returns boolean
  keySpatialContinuous(integer keyIndex)             returns boolean
  keyTemporalAutoBezier(integer keyIndex)            returns boolean
  keyTemporalContinuous(integer keyIndex)            returns boolean
  keyTime(integer keyIndex)                          returns float
  keyTime(string markerName)                         returns float
  keyValue(integer keyIndex)                         returns type-
stored-in-property
  keyValue(string markerName)                        returns type-
stored-in-property
  matchName                      :  string         :  readOnly
  moveTo(integer index)                             no return
  name                           :  string         :  readOnly
  nearestKeyIndex(float atTime)                     returns integer
  numKeys                        :  integer        :  readOnly
  parentProperty                 :  PropertyGroup  :  readOnly
  propertyDepth                  :  integer        :  readOnly
  propertyGroup([integer countUp])                  returns
PropertyGroup
  propertyType                   :  PropertyType   :  readOnly
  propertyValueType              :  PropertyValueType   :  readOnly
  remove()                                          no return
  removeKey(integer keyIndex)                       no return
  selected                       :  boolean        :  read/write
  selectedKeys                   :  Array of integer    :  readOnly
  setInterpolationTypeAtKey(integer keyIndex,
      KeyframeInterpolationType inType,
      [KeyframeInterpolationType outType])          no return
  setRovingAtKey(integer keyIndex,
      boolean isRoving)                             no return
  setSelectedAtKey(integer keyIndex,
      boolean isSelected)                           no return
  setSpatialAutoBezierAtKey(integer keyIndex,
      boolean isAutoBezier)                         no return
  setSpatialContinuousAtKey(integer keyIndex,
      boolean isContinuous)                         no return
  setSpatialTangentsAtKey(integer keyIndex,
      ArrayOfFloat inTangent,
      [ArrayOfFloat outTangent])                    no return
  setTemporalAutoBezierAtKey(integer keyIndex,
      boolean isAutoBezier)                         no return
  setTemporalContinuousAtKey(integer keyIndex,
      boolean isContinuous)                         no return
  setTemporalEaseAtKey(integer keyIndex,
      ArrayOfKeyframeEase inEase,
```

```
      [ArrayOfKeyframeEase outEase])                    no return
  setValue(type-stored-in-property newValue)            no return
  setValueAtKey(integer keyIndex,
      type-stored-in-property newValue)                 no return
  setValueAtTime(float atTime,
      type-stored-in-property newValue)                 no return
  setValuesAtTimes(ArrayOfFloat atTimes,
      ArrayOf-type-stored-in-property newValues)        no return
  unitsText                     :  string         :  readOnly
  value                         :  type-stored-in-property:
readOnly
  valueAtTime(float atTime,
      bool preExpression)                               returns type-
stored-in-property
-------------------------------------------------------------------------
-------


=========================================================================
=======
PropertyGroup object
-------------------------------------------------------------------------
-------
  (integer propertyIndex)                               returns
PropertyBase
  (string propertyName)                                 returns
PropertyBase
  active                        :  boolean        :  readOnly
  addProperty(string propertyName)                      returns
PropertyBase
  canAddProperty(string propertyName)                   returns boolean
  canSetEnabled                 :  boolean        :  readOnly
  duplicate()                                           returns
PropertyGroup
  elided                        :  boolean        :  readOnly
  enabled                       :  boolean        :  readOnly
  isEffect                      :  boolean        :  readOnly
  isMask                        :  boolean        :  readOnly
  isModified                    :  boolean        :  readOnly
  matchName                     :  string         :  readOnly
  moveTo(integer index)                                 no return
  name                          :  string         :  readOnly
  numProperties                 :  integer        :  readOnly
  parentProperty                :  PropertyGroup  :  readOnly
  property(integer propertyIndex)                       returns
PropertyBase
  property(string propertyName)                         returns
PropertyBase
  propertyDepth                 :  integer        :  readOnly
  propertyGroup([integer countUp])                      returns
PropertyGroup
  propertyIndex                 :  integer        :  readOnly
  propertyType                  :  PropertyType   :  readOnly
```

```
  remove()                                                    no return
  selected                        :  boolean        :  readOnly
-------------------------------------------------------------------------
-------


=========================================================================
=======
PropertyType enum
-------------------------------------------------------------------------
-------
  PropertyType.INDEXED_GROUP
  PropertyType.NAMED_GROUP
  PropertyType.PROPERTY
-------------------------------------------------------------------------
-------


=========================================================================
=======
PropertyValueType enum
-------------------------------------------------------------------------
-------
  PropertyValueType.COLOR
  PropertyValueType.CUSTOM_VALUE
  PropertyValueType.LAYER_INDEX
  PropertyValueType.MARKER
  PropertyValueType.MASK_INDEX
  PropertyValueType.NO_VALUE
  PropertyValueType.OneD
  PropertyValueType.SHAPE
  PropertyValueType.TEXT_DOCUMENT
  PropertyValueType.ThreeD
  PropertyValueType.ThreeD_SPATIAL
  PropertyValueType.TwoD
  PropertyValueType.TwoD_SPATIAL
-------------------------------------------------------------------------
-------


=========================================================================
=======
PulldownPhase enum
-------------------------------------------------------------------------
-------
  PulldownPhase.OFF
  PulldownPhase.SSWWW
  PulldownPhase.SWWWS
  PulldownPhase.SWWWW_24P_ADVANCE
  PulldownPhase.WSSWW
  PulldownPhase.WSWWW_24P_ADVANCE
  PulldownPhase.WWSSW
  PulldownPhase.WWSWW_24P_ADVANCE
```

```
  PulldownPhase.WWWSS
  PulldownPhase.WWWSW_24P_ADVANCE
  PulldownPhase.WWWWS_24P_ADVANCE
-------------------------------------------------------------------------
-------


=========================================================================
=======
PulldownMethod enum
-------------------------------------------------------------------------
-------
  PulldownMethod.ADVANCE_24P
  PulldownMethod.PULLDOWN_3_2
-------------------------------------------------------------------------
-------


=========================================================================
=======
PurgeTarget enum
-------------------------------------------------------------------------
-------
  PurgeTarget.ALL_CACHES
  PurgeTarget.IMAGE_CACHES
  PurgeTarget.SNAPSHOT_CACHES
  PurgeTarget.UNDO_CACHES
-------------------------------------------------------------------------
-------


=========================================================================
=======
RenderQueue object
-------------------------------------------------------------------------
-------
  item(integer itemIndex)                              returns
RenderQueueItem
  items                          :  RQItemCollection    :  readOnly
  numItems                       :  integer         :  readOnly
  pauseRendering(boolean doPause)                      no return
  render()                                             no return
  rendering                      :  boolean         :  readOnly
  showWindow(boolean doShow)                           no return
  stopRendering()                                      no return
-------------------------------------------------------------------------
-------


=========================================================================
=======
RenderQueueItem object
```

```
-------------------------------------------------------------------------
-------
  applyTemplate(string templateName)                    no return
  comp                          :  CompItem       :  readOnly
  elapsedSeconds                :  float          :  readOnly
  logType                       :  LogType        :  read/write
  numOutputModules              :  integer        :  readOnly
  outputModule(integer outputModuleIndex)               returns
OutputModule
  outputModules                 :  OMCollection   :  readOnly
  remove()                                          no return
  render                        :  boolean        :  read/write
  saveAsTemplate(string templateName)                   no return
  skipFrames                    :  integer        :  read/write
  startTime                     :  float          :  readOnly
  status                        :  RQItemStatus   :  readOnly
  templates                     :  Array of string:  readOnly
  timeSpanDuration              :  float          :  read/write
  timeSpanStart                 :  float          :  read/write
  onStatusChanged()                                 no return
-------------------------------------------------------------------------
-------


=========================================================================
=======
RQItemCollection object
-------------------------------------------------------------------------
-------
  add(CompItem compToAdd)                               returns
RenderQueueItem
-------------------------------------------------------------------------
-------


=========================================================================
=======
RQItemStatus enum
-------------------------------------------------------------------------
-------
  RQItemStatus.DONE
  RQItemStatus.ERR_STOPPED
  RQItemStatus.NEEDS_OUTPUT
  RQItemStatus.QUEUED
  RQItemStatus.RENDERING
  RQItemStatus.UNQUEUED
  RQItemStatus.USER_STOPPED
  RQItemStatus.WILL_CONTINUE
-------------------------------------------------------------------------
-------
```

```
================================================================================
=======
Settings object
--------------------------------------------------------------------------------
-------
  getSetting(string sectionName,
      string sectionKey)                                  returns string
  haveSetting(string sectionName,
      string sectionKey)                                  returns boolean
  saveSetting(string sectionName,
      string sectionKey,
      string newValue)                                    no return
--------------------------------------------------------------------------------
-------


================================================================================
=======
Shape object
--------------------------------------------------------------------------------
-------
  new Shape()                                             returns Shape
  closed                          :  boolean         :  read/write
  inTangents                      :  Array of float[2]    :  read/write
  outTangents                     :  Array of float[2]    :  read/write
  vertices                        :  Array of float[2]    :  read/write
--------------------------------------------------------------------------------
-------


================================================================================
=======
SolidSource object
--------------------------------------------------------------------------------
-------
  alphaMode                       :  AlphaMode       :  read/write
  color                           :  Array of float  :  read/write
  conformFrameRate                :  float           :  readOnly
  displayFrameRate                :  float           :  readOnly
  fieldSeparationType             :  FieldSeparationType :  readOnly
  guessAlphaMode()                                        no return
  guessPulldown(PulldownMethod pulldownMethod)            no return
  hasAlpha                        :  boolean         :  readOnly
  highQualityFieldSeparation      :  boolean         :  readOnly
  invertAlpha                     :  boolean         :  read/write
  isStill                         :  boolean         :  readOnly
  loop                            :  integer         :  readOnly
  nativeFrameRate                 :  float           :  readOnly
  premulColor                     :  Array of float  :  read/write
  removePulldown                  :  PulldownPhase   :  readOnly
--------------------------------------------------------------------------------
-------
```

```
================================================================================
=======
System object
--------------------------------------------------------------------------------
-------
  machineName                   :  string         :  readOnly
  osName                        :  string         :  readOnly
  osVersion                     :  string         :  readOnly
  userName                      :  string         :  readOnly
--------------------------------------------------------------------------------
-------


================================================================================
=======
TextDocument object
--------------------------------------------------------------------------------
-------
  new TextDocument(string text)                      returns
TextDocument
  text                          :  string         :  read/write
--------------------------------------------------------------------------------
-------


================================================================================
=======
TimecodeBaseType enum
--------------------------------------------------------------------------------
-------
  TimecodeBaseType.FPS100
  TimecodeBaseType.FPS24
  TimecodeBaseType.FPS25
  TimecodeBaseType.FPS30
  TimecodeBaseType.FPS48
  TimecodeBaseType.FPS50
  TimecodeBaseType.FPS60
--------------------------------------------------------------------------------
-------


================================================================================
=======
TimecodeDisplayType enum
--------------------------------------------------------------------------------
-------
  TimecodeDisplayType.FEET_AND_FRAMES
  TimecodeDisplayType.FRAMES
  TimecodeDisplayType.TIMECODE
--------------------------------------------------------------------------------
-------
```

```
================================================================================
=======
TimecodeFilmType enum
--------------------------------------------------------------------------------
-------
  TimecodeFilmType.MM16
  TimecodeFilmType.MM35
--------------------------------------------------------------------------------
-------


================================================================================
=======
TrackMatteType enum
--------------------------------------------------------------------------------
-------
  TrackMatteType.ALPHA
  TrackMatteType.ALPHA_INVERTED
  TrackMatteType.LUMA
  TrackMatteType.LUMA_INVERTED
  TrackMatteType.NO_TRACK_MATTE
--------------------------------------------------------------------------------
-------
```