

Using Help

About online Help

Adobe Systems, Inc. provides complete documentation in the Adobe PDF Help system. The Help system includes information on all the tools, commands, and features for both Windows and Mac OS. The PDF format is designed for easy navigation online, and support for third-party screen readers compatible with Windows. The Help can also be printed as a desktop reference.

Navigating in Help

The Help will open in an Acrobat window with the bookmark pane open. If the bookmark pane is not open choose Window > Bookmarks. You can also navigate using the navigation bar, the index, or search the document.

At the top and bottom of each page is a navigation bar. Click Using Help to return to this introduction. Clicking Contents, or Index will take you to that section.

The Next Page ▶ and the Previous Page ◀ arrows let you move through the pages sequentially. Click Back to return to the last page you viewed. You can also use the navigation arrows in the Acrobat toolbar.

Using bookmarks, the table of contents, the index, and Find

The contents of Help are shown as bookmarks in the bookmark pane. To view subtopics, click the plus sign next to a bookmark. Each bookmark is a hyperlink to the associated section of the Help document.

To go to the information, click its bookmark. As the information is displayed in the document pane, its bookmark is highlighted.

You can turn highlighting on or off by selecting the Highlight Current Bookmark option from the bookmark pane menu.

To find a topic using the table of contents:

- 1 Click Contents in the navigation bar at the top or bottom of any page.
- 2 Click a topic on the Contents page to move to the first page of that topic.
- 3 In the bookmark pane, expand the topic to see its subtopics.

To find a topic using the index:

- 1 Click Index in the navigation bar at the top or bottom of any page.
- 2 Click the appropriate letter at the top of the page.

You can also expand the Index bookmark, and click the letter in the bookmark pane.

- 3 Locate your entry, and click the page number link to view the information.
- 4 To view multiple entries, click Back to return to the same place in the index.



To find a topic using the Find command:

- 1 Choose Edit > Find.
- 2 Enter a word or a phrase in the text box, and click OK.

Acrobat will search the document, starting from the current page, and display the first occurrence of the word or phrase you are searching for.

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

Printing the Help file

Although the Help has been optimized for on-screen viewing, you can print pages you select, or the entire file.

To print, choose Print from the File menu, or click the printer icon in the Acrobat toolbar.

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Learning About Adobe After Effects 6.0

Welcome

Welcome to the Adobe® After Effects® 6.0 application, the essential tool for motion graphics and visual effects. After Effects is widely used to produce professional output for film, video, DVD, and the Web.

Adobe provides a variety of options for you to learn After Effects, including online Help and tool tips. You can also use the Adobe Web site to easily access a host of continually updated Web resources for learning After Effects, from tips and tutorials to technical support information.

Adobe Acrobat® Reader™ software, included on the After Effects CD, makes it possible to view Adobe PDF files. Many of the files on the Adobe Web site are in PDF format.

The phrase “Pro only” means that the feature is available only in the Professional edition of After Effects.

Getting help

There are a number of ways to get the help you need in After Effects 6.0. The following table can help you find specific resources, based on the type of information you are looking for.

If you ...	Try this ...
Are new to After Effects	<ul style="list-style-type: none"> • Browse through the information in “Working with Adobe After Effects” on page 5 for information on specific tasks. • Choose Help > After Effects Help. Then select “Looking at the Work Area” from the links on the Contents tab. • Go to www.adobe.com/support/products/aftereffects.html and look for training information. • Move the pointer over a tool to display the name of the tool. • Use the Tip of the Day topics to get information on some of the key After Effects tasks. Choose Help > Tip of the Day.
Want information on installing After Effects	Install the After Effects application from the Adobe After Effects CD onto your hard drive; you cannot run the program from the CD. Follow the on-screen installation instructions. For more detailed information, see the HowToInstall.rtf file on the CD.
Are upgrading from a previous version of After Effects	Go to “What’s New in After Effects 6.0” on page 10 to get information on new functionality.



If you ...	Try this ...
Want step-by-step instructions	<ul style="list-style-type: none"> • Search for “example” in the online Help to find examples of animating text and using expressions. • Try one of the tutorials available on the Adobe Web site. (See “After Effects support page” on page 8.)
Are looking for detailed information about a feature	Use the index or search for the feature in Help.
Need information on a specific effect	Choose Help > Effects Help and search for the feature in the online Effects Help.
Are looking for background information on digital video	Go to www.adobe.com/support/products/aftereffects.html and look for background information.
Want answers to common troubleshooting questions	Search the Adobe Support Knowledgebase and After Effects Top Issues, which you can access from the After Effects support Web site at www.adobe.com/support/products/aftereffects.html . (See “After Effects support page” on page 8.)
Want a complete list of keyboard shortcuts	Look at the “Keyboard Shortcuts” on page 381.
Want detailed information on creating scripts with After Effects	Access the After Effects Scripting Guide by choosing Help > Scripting Help.
Want to download five free effect plug-ins	Register your copy of After Effects by choosing Help > Registration. Then click the link to the five free plug-ins. (See “Registration” on page 9.)

Working with Adobe After Effects

People work with After Effects in many different ways. In this section, you’ll find directions to specific information to help you accomplish some common After Effects tasks.

If you want to animate all the different elements of your project:

- Animate layer properties by setting keyframes (see [“Setting and animating a layer property in the Timeline window” on page 125](#)) and by editing keyframes on a Value graph or a motion path (see [“Editing keyframes on a Value graph or a motion path” on page 155](#)).
- Animate masks (see [“Animating a mask” on page 191](#)), create motion paths with masks (see [“Creating motion paths with masks” on page 131](#)), and work with masks in text layers (see [“Working with masks in text layers” on page 225](#)).
- Animate effects by setting and animating effect properties (see [“Setting and animating effects” on page 137](#)) and by applying and controlling effects (see [“Applying and controlling effects” on page 249](#)).
- Animate in 3D (see [“Understanding 3D” on page 260](#)) and import 3D-image files (see [“Importing 3D-image files” on page 55](#)).

- Create and animate both cameras (see [“Understanding cameras” on page 268](#)) and lights (see [“Understanding lights” on page 273](#)) and use cameras and lights with effects (see [“Using cameras and lights with effects” on page 255](#)).
- Animate text (see [“Animating text” on page 217](#)) and animate text on a path (see [“Creating and animating text on a path” on page 226](#)).

If you want to composite your elements:

- Create a transparent area in an image to see the layer underneath by creating masks (see [“Creating masks” on page 177](#)), using keying effects (see [“Using keying effects” on page 256](#)), using the eraser tool (see [“Using the eraser tool” on page 235](#)), and using transparent areas and layer masks from Adobe Photoshop® and Adobe Illustrator® (see [“Importing masks from Adobe Illustrator and Adobe Photoshop” on page 194](#)).
- Remove elements from or add elements to your footage by rotoscoping with the brush tool (see [“Rotoscoping with the brush tool” on page 233](#)), creating track mattes and traveling mattes (see [“Creating track mattes and traveling mattes” on page 198](#)), or adding synthetic elements (such as beams, lens flares, or lightning) using the Render effects (look for these terms in the online Effects Help).
- Add text elements such as credits or titles by creating a text layer (see [“Creating a text layer” on page 205](#)) and copying and pasting text from other applications (see [“Copying and pasting text from other applications” on page 207](#)).
- Align a layer to a moving image within a motion layer by tracking motion that you apply to other footage or images (see [“About tracking motion \(Pro only\)” on page 362](#)).
- Combine 2D and 3D elements (see [“Combining 2D and 3D layers” on page 263](#)) and work with 3D space (see [“Understanding 3D” on page 260](#)).

If you want to work with effects:

- Correct and enhance images by using the Adjust effects, Image Control effects, Keying effects, Matte Tools effects, Noise effects, and Reduce Interlace Flicker effect (look for these terms in the online Effects Help).
- Enhance your images’ artistic effects by using the Distort, Simulation, and Stylize effects (see the online Effects Help). Create the illusion of 3D by using cameras and lights with effects (see [“Using cameras and lights with effects” on page 255](#)) and by using the 3D Channel effects (look for this term in the online Effects Help).
- Reuse favorite effects easily (see [“Saving favorite effects for instant reuse” on page 251](#)).
- Determine the render order of effects by applying and controlling effects (see [“Applying and controlling effects” on page 249](#)), changing the rendering order (see [“Changing the rendering order” on page 313](#)), and changing render settings (see [“Changing render settings” on page 330](#)).

If you want to work with other Adobe tools:

- Import Adobe Photoshop files (see [“Importing Adobe Photoshop files” on page 48](#)) and create a filmstrip file for editing in Adobe Photoshop (see [“Creating a filmstrip file for editing in Adobe Photoshop” on page 350](#)).
- Import an Adobe Illustrator, PDF, or EPS file (see [“Importing an Adobe Illustrator, PDF, or EPS file” on page 51](#)) and collapse transformations to maintain image quality (see [“Collapsing transformations to maintain image quality” on page 315](#)).

- Import Adobe Photoshop and Adobe Illustrator footage containing alpha channels (see [“Importing footage containing an alpha channel” on page 46](#)).
- Import masks from Adobe Illustrator and Adobe Photoshop (see [“Importing masks from Adobe Illustrator and Adobe Photoshop” on page 194](#)).
- Import Adobe Premiere® projects (see [“Importing Adobe Premiere projects” on page 54](#)).

If you want to create a DV project:

- Get familiar with DV terminology by learning about digital video, D1, DV, and various pixel aspect ratio footage (see [“About D1, DV, and various pixel aspect ratio footage” on page 63](#)) and using square-pixel footage for output to D1 or DV NTSC (see [“Using square-pixel footage for output to D1 or DV NTSC” on page 65](#)).
- Use output templates for export by making a movie (see [“Making \(rendering\) a movie” on page 327](#)), changing output module settings (see [“Changing output module settings” on page 333](#)), and creating and using output module templates (see [“Creating and using output module templates” on page 337](#)).
- Choose correct composition size by understanding basic composition settings (see [“Understanding basic composition settings” on page 74](#)), setting frame size (see [“Setting frame size” on page 75](#)) and pixel aspect ratio (see [“Setting pixel aspect ratio for compositions” on page 76](#)), and setting frame rate and resolution (see [“Setting frame rate” on page 76](#)).
- View non-square pixels on a square monitor by seeing [“About D1, DV, and various pixel aspect ratio footage” on page 63](#).
- Create graphics in other applications to use in your DV project by seeing the [“Using square-pixel footage for output to D1 or DV NTSC” on page 65](#).

If you want to design or manage an efficient workflow:

- Organize complex projects in After Effects by visualizing organization with Flowchart View (see [“Visualizing organization with Flowchart View” on page 311](#)), customizing layer work and views (see [“Customizing layer work and views” on page 99](#)), reorganizing windows (see [“Reorganizing windows” on page 24](#)), designing projects for cross-platform usage (see [“Considerations for cross-platform projects” on page 17](#)), and learning techniques for working efficiently (see [“Techniques for working efficiently” in the online Help](#)).
- Automate complex or routine tasks by using scripts (see [“Using scripts to facilitate tasks” on page 319](#)), using expressions (see [“Understanding expressions” on page 279](#)), substituting a placeholder for footage (see [“Substituting a placeholder for footage” on page 71](#)), substituting a low-resolution proxy for footage (see [“Substituting a low-resolution proxy for footage” on page 71](#)), using the Pre-render command (see [“Using the Pre-render command” on page 317](#)), and using the Post-Render Action menu (see [“Using the Post-Render Action menu” on page 335](#)).
- Preview an individual element quickly by soloing a layer (see [“Soloing a layer” on page 102](#)), changing the region of interest (see [“Changing the region of interest” on page 85](#)), using RAM Preview (see [“Using RAM Preview” on page 143](#)), and setting Video Preview preferences (see [“Setting Video Preview preferences” on page 144](#)).

- Render your composition more quickly by rendering an item to multiple formats (see [“Rendering an item to multiple formats” on page 346](#)), creating and using output module templates (see [“Creating and using output module templates” on page 337](#)), and rendering on a network using a watch folder (Pro only)(see [“Rendering on a network using a watch folder \(Pro only\)” on page 353](#)).
- Reuse your favorite effects easily by using the Effects palette (see [“Using the Effects palette” on page 248](#)) and saving your favorite effects (see [“Saving favorite effects for instant reuse” on page 251](#)).
- Archive your projects by collecting files in one location (see [“Collecting files in one location” on page 351](#)).
- Print windows (see [“Printing Windows” on page 25](#)).

Other learning resources

In addition to the information included with your application, Adobe provides several other learning resources.

After Effects support page

On the After Effects support page on the Adobe Web site, you'll find product information and links for downloading plug-ins and updates, as well as information on training, support, vertical market solutions, and After Effects–related products. The many useful learning tools available at www.adobe.com/support/products/aftereffects.html include the following:

- Step-by-step tutorials
- Updates, patches, and plug-ins
- Links to the Adobe Support Knowledgebase, containing the latest After Effects technical support solutions
- Training resources in print and online form
- A searchable database of answers to technical questions
- Links to user forums

Adobe Press

Adobe Press offers books that provide in-depth training in Adobe software, including the acclaimed Classroom in a Book® series developed by experts at Adobe. For information on purchasing Adobe Press titles, visit the Adobe Web site at www.adobe.com, or contact your local book distributor.

The Adobe Certification program

The Adobe Certification program offers users, instructors, and training centers the opportunity to demonstrate their product proficiency and promote their software skills as Adobe Certified Experts, Adobe Certified Instructors, or Adobe Authorized Learning Providers. Certification is available for several different geographical regions. Visit the Partnering with Adobe Web site at www.partners.adobe.com to learn how you can become certified.

Adobe Solutions Network

The Adobe Solutions Network (ASN) provides various product and technical resources for developing with After Effects. Here, you can find software developer kits (SDKs), sample libraries, the developer knowledgebase, and technical guides for areas such as JavaScript.

To access the Adobe Solutions Network for After Effects:

Go to partners.adobe.com/asn/aftereffects/ (English only) on the Adobe Web site.

Registration

In order for Adobe to provide you with the highest quality software, offer technical support, and inform you about new After Effects software developments, please register your application.

When you first start the After Effects application, you're prompted to register online. You can choose to submit the form directly or fax a printed copy. You can also register by filling out and returning the registration card included with your software package.

When you register, several additional effects become available from the Adobe Web site, www.adobe.com, for download. For information, see ["Standard edition effects" on page 247](#).

To register online from After Effects:

- 1 Choose Help > Registration.
- 2 Follow the prompts to complete the registration.
- 3 Click the link to the five free plug-ins to download five additional effect plug-ins.

Note: If you've already registered and you did not receive the five free plug-ins, register online again, and make sure to click the link to the plug-ins.

Customer support

When you register your product, you may be entitled to technical support. Terms may vary depending on the country of residence. For more information, refer to the technical support card provided with the After Effects documentation.

Adobe also provides several forms of automated technical support:

- See the ReadMe file installed with the program for information that became available after this guide went to press.
- See the Adobe After Effects support page for information on top support issues and troubleshooting information for common problems. (See ["After Effects support page" on page 8](#).)

What's New in After Effects 6.0

Introduction

After Effects 6.0 is a powerful upgrade to the award-winning motion graphics and visual effects software. After Effects 6.0 delivers dramatic performance gains, an innovative new approach to text animation, integrated vector paint tools with Adobe Photoshop-style brushes, all-new motion tracking, and many other features.

Work more easily with leading Adobe products

New integration makes it easier than ever to work with Adobe Photoshop, Adobe Illustrator, and Adobe Premiere Pro files in your After Effects compositions.

Adobe Photoshop You can preserve layers in sequence files, set the layer's bounding box to the composition size, and preserve guides to specify how you want your Adobe Photoshop layers to import. After Effects tracks layer order even if you reorder them in the original PSD. When you import text, the formatting is preserved, and you can edit it directly in Composition window using the Convert to Editable Text command. For information on After Effects integration with Adobe Photoshop, see ["Importing Adobe Photoshop files" on page 48](#).

Adobe Illustrator Set a layer's bounding box to fit each layer when you import Adobe Illustrator documents, making it easier to manipulate individual layer elements and speeding up rendering. You can also apply effects and masks directly to Adobe Illustrator files that have continuous rasterization—no more precomposing. For information on After Effects integration with Adobe Illustrator, see ["Importing an Adobe Illustrator, PDF, or EPS file" on page 51](#).

Adobe Premiere Pro Import nested sequences from Adobe Premiere Pro as nested compositions. Now when you import files with keyframed transparency, cross-dissolve, and motion values, After Effects converts them to transform keyframes; it also converts crop marks to masks. For information on After Effects integration with Adobe Premiere Pro, see ["Importing Adobe Premiere projects" on page 54](#).

Animate text and create text in the Composition window

After Effects 6.0 lets you create text-based animations that are bound to change the look of motion graphics for film and video. In addition to making the process more direct—you can type, edit, and format text right in the Composition window—you can animate a text layer multiple ways simultaneously. This new approach means that animations that were previously labor-intensive and time-consuming to produce now require a minimum of keyframes.



Direct text creation Create text directly in the Composition window by using the new horizontal or vertical type tool. Format text using Character and Paragraph palettes like those in Adobe Photoshop, Adobe Illustrator, and Adobe InDesign®, and use familiar keyboard shortcuts as well. Mix and match formatting—each individual character on a text layer can use different fonts, styles, sizes, colors, and other attributes. Set text on a path using new controls that appear in the Timeline window. Create masks for each character using the Create Outlines command. For information on creating text in the Composition window, see [“Creating a text layer” on page 205](#).

Text animation Easily animate characters, words, or lines within a single text layer. Animate properties that move smoothly across the same range, or animate the entire text layer as a unit. Continue to edit animated text throughout the design process, making late-stage copy changes easy. For information on text animation, see [“Animating text” on page 217](#).

Paint layers with ease

The all-new vector paint tools are based on the same brush engine and tools as in Adobe Photoshop; you can use them to retouch footage, perform frame-by-frame touch-ups, and create new elements for your work.

Fully integrated vector paint engine Paint non-destructively on footage, making it easy to experiment, correct, and modify your work. Use the stamp tool to fix up footage and handle other rotoscoping tasks. Customize numerous brush dynamics by specifying Pen Pressure, Pen Tilt, and other settings. For information on these tools, see [“Using the brush tool” on page 233](#) and [“Rotoscoping with the brush tool” on page 233](#).

Cloning tools Easily fix challenging problems, such as removing powerlines, mike booms, and other unwanted elements from a sequential series of frames. Edit and animate individual brush strokes, so you can change the size, position, color, opacity of each individual stroke. For information on cloning tools, see [“Using the clone stamp tool” on page 234](#).

Track motion more precisely

The new Motion Tracker in After Effects 6.0 (Professional edition only) offers faster performance, enhanced accuracy, and controls that give you additional options for tracking motion.

Track motion up to 35 times faster than previously at a Subpixel Matching setting of 1/256 pixel. Track the motion of your source layer without applying the tracking data to a destination layer, and perform multiple tracks on a single layer and track as many individual points as you like.

Analyze motion forward, backward, or by stepping through footage frame by frame using VCR-like controls in the Tracker Controls palette. (This is especially helpful when you're working with hard-to-track footage.) Work with Motion Tracker keyframes in the Timeline window—use tracking data in expressions, edit the data manually, and use the Smoother keyframe assistant to produce better looking results.

For information on tracking motion, see [“About tracking motion \(Pro only\)” on page 362](#).

Work with new and enhanced effects

After Effects 6.0 includes sixteen new effects that enable you to correct and enhance your footage. The After Effects Professional edition also includes sixty-five effects that now support 16-bit per channel color.

Liquify Distort footage using ten brush-based liquify tools just like those in Adobe Photoshop. Use the turbulence tool to smoothly scramble pixels and create clouds, smoke, and other similar results. Use the clone stamp tool to clone the distortion from one part of an image to another. Use the twirl tools to rotate pixels clockwise or counter-clockwise. Use the shift pixels tool and reflection tool to move pixels perpendicular to the brush stroke in order to create the appearance of reflections in water. And use the reconstruction tool to make dramatic distortions more subtle or return the footage to its original state.

Warp Instantly transform layers with the new Warp effect. Specify any of the fifteen pre-set warp styles. Transform layers into regular geometric shapes, such as arches, arcs, waves, and flags, or simulate the look of objects viewed through a fisheye lens or inflated like a balloon.

Scribble Create unique draw-on effects by animating the fill or stroke for a mask with lines that look like hand-drawn scribbles.

Dust & Scratches With the Dust & Scratches effect, clean up footage by making dust, scratches, and other artifacts less noticeable. Adjust both radius and threshold controls to minimize the differences between dissimilar pixels.

For information on all these effects, see [“Learning about specific effects” on page 247](#) or search for a particular effect in the online Effects Help.

Touch up footage easily and work more effectively with solids

After Effects 6.0 provides new tools and new features to help you work more efficiently with footage—including solids.

Enhanced masking and frame-by-frame touch-up tools You can create, select, edit, and use masks for rotoscoping tasks with greater ease and more flexibility than ever. With Auto-trace, you can convert alpha channel information into vector-based masks. With RotoBezier masks, you can rotoscope more easily, eliminating the need to adjust Bezier handles to get precise results. For information on Auto-trace, see [“Converting alpha channels to masks” on page 181](#). For information on RotoBezier masks, see [“Drawing a RotoBezier mask with the pen tool” on page 183](#).

Improved handling of solids Now when you create solids, they appear in the Project window, where you can work with them the same way you work with other footage items, such sharing them between compositions or using them as placeholders; you can even specify a pixel aspect ratio for a solid. After Effects assigns solids a unique name, based on the solid's color—if you change the color, the name automatically changes to match. For more information on using solids, see [“Creating a new solid layer” on page 93](#).

Render and output compositions more easily

Enhancements in After Effects 6.0 allow you to render and output your compositions more easily.

OpenGL support [Use OpenGL, a cross-platform standard for accelerating the rendering of 2D and 3D graphics, to dramatically improve the speed and interactivity of on-screen rendering. See nearly instant results when you adjust lights and cameras, transform layers, manipulate text layers, adjust shadows, or scrub the Timeline. Manipulate your composites without resorting to a lower resolution or using a wireframe view. For information on working with OpenGL, see [“Previewing animation” on page 139](#).

Rendering improvements In After Effects Professional edition, automate production tasks such as importing footage items and managing the Render Queue with new scripting support. Write JavaScript scripts to improve production workflows by accessing footage and render queue items and working with them in various ways. For information on rendering in After Effects 6.0, see [“About rendering” on page 325](#).

Printing windows Print directly from the Timeline, Project, Project Flow Chart, and Render Queue windows in After Effects 6.0. For information on printing windows, see [“Printing Windows” on page 25](#).

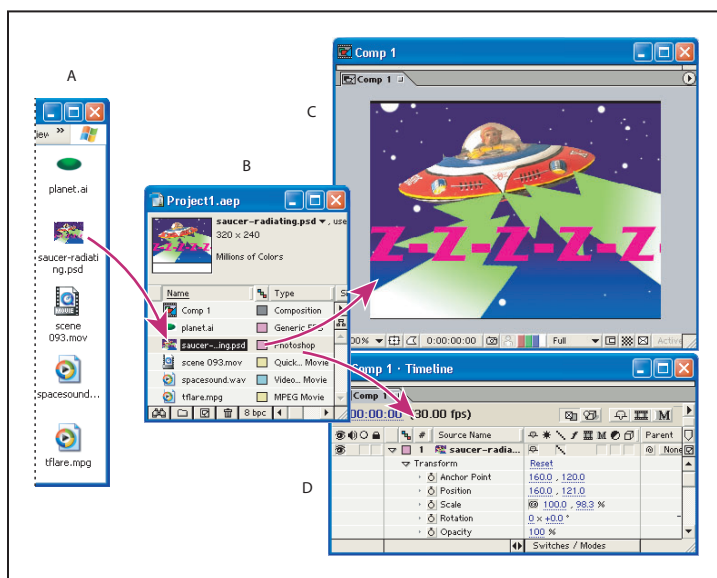
New output options Use the new DV Output Module Template for fast and consistent export of your work to digital video formats. Use the new Windows® Media and Real Media export options to access standard settings quickly using pre-set profiles. Also, embed metadata and optimize audio and video independently. For information on output options, see [“Creating and using output module templates” on page 337](#) and [“Exporting to Windows Media or RealMedia format \(Windows only\)” on page 340](#).

Looking at the Work Area

Where you work with footage items

In After Effects, you work with items using primarily three windows: the *Project window*, which lists all the source footage items you import; the *Composition window*, which displays images as they relate in space; and the *Timeline window*, which displays compositions and animation events in terms of time. Add footage items to a composition by dragging them from the Project window into either the Composition window or the Timeline window.

Each Composition window has a corresponding Timeline window. When you edit a composition in a Composition window, After Effects automatically displays the corresponding Timeline window, and vice versa.



Commonly used windows **A.** Source footage **B.** Project window **C.** Composition window **D.** Timeline window

As you work with compositions, you also use three other types of windows: Footage windows, Layer windows, and Effect Controls windows.

- Footage windows are useful for viewing and evaluating footage items in their original form. (See [“Viewing imported footage” on page 67.](#))
- To view a layer’s original source independently of other layers or to trim footage, you can open a Layer window. (See [“Working with the Composition, Layer, and Footage windows” on page 28.](#))
- As you work with effects, you use the Effect Controls window to modify and animate the effects. (See [“Working with effects” on page 248.](#))



When you render your compositions into a movie, you work in the Render Queue window to select rendering options and queue compositions for rendering. (See [“Using the Render Queue window” on page 328.](#))

Working in a project

In After Effects, every animation starts as a project. An After Effects *project* is a single file that stores references to all the footage you use in that project. It also contains information about how you’ve arranged the footage in compositions, including the details of any effects or animation you applied. Inside a project, you create one or more compositions. After you have imported source footage into the project, you can add footage items into the compositions.

Starting a project involves two tasks: (1) planning your project based on the formats of the final output and (2) creating a project file. Once you have planned your project and learned how to perform some basic tasks related to working in After Effects, you’ll be ready to start importing footage. (See [“Importing files into a project” on page 42.](#)) You then create a composition and begin working with your source footage. (See [“Working with imported footage” on page 67.](#))

For information on project planning, see [“Planning your project” on page 15.](#)

Planning your project

Planning your project before you start importing footage makes your work easier. A large part of planning is simply determining the best settings for your source footage based on the media for which you will render your finished project. This step is essential to achieving optimal image quality. Rendering order and nesting may also be part of project planning. (See [“Organizing a project using nesting” on page 313.](#))

Choosing the right media

Before you start importing footage items into your project, decide which media you’ll use for your finished movies. Then determine the best settings for your compositions and source material. For example, if you will be rendering your project to videotape, create footage at an image size, color bit-depth, and frame rate that will produce the best image quality on videotape. Likewise, if your project is intended for streaming video on the Web, the image size, color bit-depth, and frame rate may need to be reduced to work with the data-rate limits of streaming video on the Web. However, any footage item that can be imported can be used in any composition.

If you will be rendering a project to more than one media format, always match the resolution setting for your composition to the highest resolution setting used for your output. Then set up the Render Queue window to render a separate version of the project for each format.

For film and video, try to match import and composition settings with settings in the output module used to render a movie. For example, to ensure smooth playback, the footage frame rate selected in the Interpret Footage dialog box should match the setting in the Composition Settings dialog box and the output module in the Render Queue window. Also, the composition-frame size should be determined by the image size in the playback medium. However, any footage item that can be imported can be used in any composition. (See [“Preparing motion-footage frame rates for final output” on page 59](#), [“Understanding basic composition settings” on page 74](#), and [“Changing output module settings” on page 333](#).)

If you will be mixing source footage with different pixel aspect ratios, correctly specify this ratio for each footage item in the Interpret Footage dialog box. (See [“About D1, DV, and various pixel aspect ratio footage” on page 63](#).)

The suggestions that follow will help you select composition settings. However, the best way to ensure that your project is suitable for a specific medium is to make a test composition and view it using the same type of equipment your audience will use to view it.

Film If you will be rendering for film, consider both the aspect ratio of the frame size you select for your composition and the frame rate of your source footage. For footage that was transferred from film to video using the 3:2 pulldown telecine method, you must remove 3:2 pulldown before adding effects. (See [“Removing 3:2 or 24Pa pulldown from video transferred from film or DV cameras” on page 62](#).)

CD-ROM When you create a movie that you plan to render for playback from a CD-ROM, you may need to specify import and composition settings that take into account the wide range of hardware that your audience may be using, possibly including older single- or double-speed CD-ROM drives.

To make your final output compatible with older CD-ROM drives, try to reduce the data-transfer rate of your final output by specifying certain settings for footage items:

- Lower the frame rate as far as you can in the Composition Settings dialog box without making motion seem too jerky. Start at 15 frames per second (fps).
- When rendering your final composition, choose a file type and compressor/decompressor (*codec*) appropriate for the final media. For example, for a cross-platform CD-ROM, you might specify a QuickTime codec or a codec designed for low data rates, such as Indeo, Cinepak, or Sorenson Video. Regardless of which codec you select, however, it must be available on the system used by your intended audience to ensure successful playback. Also consider the keyframe rate of the codec you have selected. (See the Adobe Web site for more information on QuickTime compressors and codec keyframe rates.)

Videotape If your final output will be videotape, set up your composition with a specific video format in mind, such as NTSC or PAL. Using broadcast-safe colors and maintaining frame size and compression ratios are also important considerations. These guidelines will help in setting up a composition intended for videotape:

- Select a frame size in the Composition Settings dialog box that matches the frame size of the destination video format.
- Use only NTSC-safe colors when adding or changing color in a project.

- If you will be using an MJPEG codec, keep in mind that the frame sizes and resolutions available for rendering are determined by the specific MJPEG board you are using. Refer to the specifications for your MJPEG board.

Animated GIF When you render an animated GIF, colors are dithered to an 8-bit palette. Before rendering your final project, render a test composition so that you can adjust colors if the results are not what you expected. If any source footage includes an alpha channel, be sure that you know how it will affect your final project before you start rendering.

Streaming video over the World Wide Web Streaming video resembles a conventional television signal in that video is sent to the viewer frame by frame, instead of by downloading a large file to the hard disk. Streaming video on the Web is constrained by the limited bandwidth (56 Kbps or less) of most consumer modems, which is even lower than those used for CD-ROM playback. Use the same techniques that are listed for CD-ROM playback, but adapt them for further reduction in file size and data-transfer rate. You can export QuickTime streaming directly from After Effects. (See [“Exporting footage using QuickTime components” on page 346.](#))

Downloading video over the World Wide Web If your final output will be downloaded as a file from the World Wide Web, the main concern is the size of the file, which directly affects how long it takes to download the file. QuickTime and Microsoft Video for Windows are formats often used when rendering final output that will be downloaded. When you render a QuickTime movie, After Effects automatically creates a movie that can play on both Windows and Mac OS without modification.

Intranet playback An *intranet* is an in-house or private network that uses Internet network protocols. Intranets generally use higher-quality communications lines than standard telephone lines, so they are usually much faster than the Internet. The data-transfer rate for playback can be 100K per second or faster, depending on the speed of your intranet.

Flash (.swf) files When you export compositions as Flash (.swf) movies, After Effects maintains vectors as much as possible. However, some items cannot be represented as vectors in the Flash file. (See [“Exporting to Macromedia Flash \(SWF\) format” on page 342.](#))

Considerations for cross-platform projects

After Effects project files are compatible with both the Mac OS and Windows platforms. You can do several things to ease the process of exchanging projects between platforms.

Project hierarchy When you move a project to a different computer and open it, After Effects attempts to locate the project’s footage files, first looking in the folder in which the project file is located, second using the file’s original path or folder location, and third searching the root of the directory where the project is located.

If you are building cross-platform projects, it is best if the full paths have the same names on Mac OS and Windows systems. If the footage is on a different volume than the project, make sure that the appropriate volume is mounted before opening the project and that network volume names are the same on both systems.

It helps to store footage in the same folder as the project file or in another folder within that folder. Here’s a sample hierarchy:

```
c:\newproject\project_file.aep
```

```
c:\newproject\source\footage1.psd
```

c:\newproject\source\footage2.avi

The newproject folder can then be copied in its entirety across platforms, and After Effects will properly locate all of the footage.

File-naming conventions When possible, name your footage and project files with Windows-compatible filename extensions, such as .mov for QuickTime movies and .aep for After Effects projects. If files will be used on the World Wide Web, be sure that filenames adhere to the appropriate conventions for extensions and paths.

For a list of common extensions and their associated file types, see the Adobe Web site.

Resources Ensure that all resources are available on both systems. Resources can include fonts, effects, and compressors.

Time basics

Time is central to many operations in After Effects. You can view, specify, and manage time in various ways. Whichever way you handle time, there are several specific time concepts you should understand as you create a project.

Time display

The way you view and specify time in After Effects depends on the display style, or unit of measure, that you use to describe time. By default, After Effects displays time in Society of Motion Picture and Television Engineers (SMPTE) *timecode*: hours, minutes, seconds, and frames. You can change to another system of time display, such as film frames, or feet and frames of 16mm or 35mm film. (See [“Setting time-display options” on page 19.](#))

Video-editing workstations use SMPTE timecode that is often striped (encoded) onto videotape for reference. If you are creating video that will be synchronized with video that uses SMPTE timecode, use the default timecode display style.

Frame rate

Each composition you create can have its own *frame rate*. The frame rate is the number of frames the rendered composition produces in every second when played back. The frame rate you use is generally determined by the type of output you will produce. For example, video for NTSC television plays at 29.97 frames per second (fps), and PAL plays at 25 fps.

When you set up changes over time, After Effects treats the changes as continuous throughout a composition timeline. Each frame is rendered as a slice out of the timeline at the frame rate you specify. Because After Effects treats time continuously, it is possible to change a composition's frame rate at any time or override the frame rate of a composition when you render the final movie. (See [“Setting frame rate” on page 76.](#))

NTSC (29.97) drop-frame timecode

When you work with a composition that is set to a frame rate of 29.97 fps, After Effects uses SMPTE 30-fps drop-frame timecode by default, making adjustments using the SMPTE-standard method of renumbering the first two frame numbers of every minute, except at every tenth minute. For example, the frame after 59:29 is labeled 1:00:02 instead of 1:00:00. Non-drop-frame timecode is also available. In both cases, frames are not discarded or skipped; they are merely numbered differently.

After Effects displays drop-frame timecode by using semicolons between the numbers and displays non-drop-frame timecode using colons between the numbers. In the Project Settings dialog box, you can choose how 29.97-fps compositions and footage display their timecode. (See [“Setting time-display options” on page 19.](#))

Duration

Each video footage item, layer, and composition in a project has its own duration. Duration determines the beginning and ending times of the timelines in the Footage, Layer, and Timeline windows. It is important to notice which duration you are viewing while you edit in multiple windows. (See [“Understanding trimming” on page 102](#) and [“Aligning and distributing layers in 2D space” on page 96.](#))

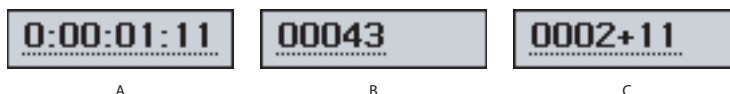
Frames and fields

Each frame in an interlaced video source is made up of *fields*. It's important not to confuse frames with fields. For video, every frame contains two interlaced fields. If you want to use interlaced video as source footage, you'll usually want After Effects to separate the interlaced fields. Separating fields ensures maximum image quality when you apply animations and effects to video that was originally interlaced. If you're producing a movie for videotape, you can render the composition to fields in a process known as *field rendering*. (See [“Interlaced and noninterlaced footage” on page 57](#) and [“Field rendering” on page 61.](#))

Setting time-display options

After Effects supports several methods of measuring and displaying time. The method you choose applies to time display in the current project and in any subsequent project you create. Changing the method does not alter the frame rate of footage or a composition—it changes only how frames are numbered. You can choose from three time-display options:

- Timecode, which counts frames in frames per second (hours, minutes, seconds, frames).
- Frames, which counts frames of footage without reference to time.
- Feet + Frames, which counts feet of 16mm or 35mm motion-picture film and counts fractions of feet in frames; 35mm film has 16 frames per foot, and 16mm film has 40 frames per foot.



Time-display options **A.** Timecode **B.** Frames **C.** Feet + Frames

When working with footage digitized from NTSC video, you usually use the 30-fps, drop-frame timecode base. This counts NTSC-created frames using standard drop-frame timecode for maximum device compatibility. For frames (or Feet + Frames) timecode, you can also change the starting frame number to match the time-counting method of another editing system you may be using.

Setting up a project

After you create a new project, you import footage into the project. You can also specify project settings or application-wide preferences.

Creating a new project


By default, After Effects opens a new Project window when you start the application. When you know the media for your final project, you are ready to create a project by importing your footage items into a new Project window. You can also open a new Project window at any time from the File menu. (See [“Working with the Project window” on page 26.](#))

To create a new project after closing the current project in After Effects:

Choose File > New > New Project.

To specify project settings:

- 1 Open the project and choose File > Project Settings.
- 2 Select a time setting:
 - To use timecode, click Timecode Base, and then choose a frame rate from the Timecode pop-up menu.
 - To use drop-frame timecode for footage and compositions with a frame rate of 29.97 fps, click Timecode Base, and then choose 30 fps from the Timecode Base pop-up menu and Drop Frame from the NTSC menu.
 - To use non-drop-frame timecode for footage and compositions with a frame rate of 29.97 fps, click Timecode Base and then choose 30 fps from the Timecode Base pop-up menu and Non-Drop Frame from the NTSC menu.
 - To use frames for the display style, click Frames.
 - To use Feet + Frames for the display style, click Feet + Frames, and then choose a film type from the Feet + Frames pop-up menu.
- 3 If desired, type a value in the Start Numbering Frames At option. This value applies only when you have chosen Frames or Feet + Frames.
- 4 Select 8 or 16 bits per channel for Color Depth, and click OK.

 To instantly cycle through Timecode, Frames, and Feet + Frames, Ctrl-click (Windows) or Command-click (Mac OS) the timecode display at the bottom of the Composition window or at the top of the Timeline window.

Importing footage items

When you import a footage item, After Effects creates only a reference to the file and does not copy or move the file itself. These references to your source files are displayed in the Project window.

To import source footage items into an After Effects project:

- 1 Choose File > Import > File or Multiple Files.
- 2 Locate and select footage files and click Open.

For details, see [“Importing files into a project” on page 42.](#)

Opening and closing a project

You can have only one project open at a time. If you try to open another project, After Effects prompts you to save changes in the first project and then closes the first project. Closing the Project window closes any associated windows, but palettes remain open.

To open a project:

Choose File > Open Project, locate the project, and then click Open.

To close a project:

Click the Project window title bar to make it active and choose File > Close.

Saving a project

Save your work frequently as you develop a project.

To save a project:

Choose File > Save.

To save a project using a different name or location:

Choose File > Save As. Specify a filename and location and click Save.

The project currently open takes the new name and location; the original file remains as it was.

To save a copy of the project using a different name or location:

Choose File > Save a Copy. Specify a filename and location and click Save.

The project currently open retains its original name and location, and a copy is created but not opened.

Correcting mistakes

If you change your mind or make a mistake, undo your work. You can undo previous actions using the Undo, History, or Revert commands. You can undo only those actions that alter the project; for example, you can undo an edit, but you cannot undo scrolling a window. You can sequentially undo as many as 99 of the most recent changes made to the project in any After Effects window, depending on how many undo levels are set in Preferences; the default is 20. Specifying more levels increases memory requirements but does not affect performance.

Note: The Vector Paint effect (Pro only) can perform only one level of undo, regardless of the number of levels you set.

You can also discard changes by reverting to the last saved version of the project. Note that when you revert to the last saved version, all editing and footage imported since you last saved are lost. You cannot undo this action.

To undo the last change:

Choose Edit > Undo.

To undo a recent change:

Choose Edit > History, and select the change you want to undo.

Note: Using the History command to undo an action reverses all actions back to that point in time. That is, any actions completed after the action you undo are lost.

To set the number of undo levels:

- 1 Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS).
- 2 Specify a number for Levels of Undo, and then click OK.

To revert to the last saved version:

Choose File > Revert.

Selecting 16-bpc color depth (Pro only)

After Effects can work in 16-bit-per-channel mode, making a larger range of colors available. When you work with high-resolution images that use a narrow range of colors, such as when you're creating subtle gradients for film effects or HDTV output, transitions between colors are smoother with less visible banding, and more detail is preserved.

You can choose whether to work in 8-bit-per-channel or 16-bit-per-channel color mode for each project. Directly import 16-bit images, including those from Adobe Photoshop, and composite and color-correct footage in 16-bit mode. Take advantage of 16-bit color when performing most After Effects tasks, including layer adjustment, frame blending, 3D, and Cineon file import. The Info palette displays 16-bit color values with exact precision.

Many effects support 16 bits per channel. If an effect supports only 8 bits, and your project is set to 16 bits, After Effects displays a warning icon ⚠ next to the effect name in the Effect Controls palette. Using an 8-bit effect in a 16-bit project will result in a loss of detail for the effect's layer.

When rendering to output module depths of Trillions of Colors, set the project to 16-bit color depth to take advantage of the output file's extra color precision. To optimize performance, rough out a composition in 8-bit color mode, and then finalize and output 16-bit files for maximum quality.

To specify color depth:

- 1 Open the project and choose File > Project Settings.
- 2 For Color Depth, choose 8 bits per channel or 16 bits per channel, and then click OK.

💡 Hold down Alt (Windows) or Option (Mac OS) and click the color depth indicator at the bottom of the project window to toggle between 8- and 16-bit-per-channel color.

Setting preferences

When you start After Effects for the first time, the default settings are used. You may want to change some of these default settings so that each time After Effects is opened, it uses your selections instead of the defaults. You can easily restore the default settings at any time. All of the After Effects default settings are stored in a single preferences file.

After Effects saves the location and type of each open window with the project. Palette positions are saved in an After Effects preferences file, which applies to all projects. You can also save custom workspaces. (See ["Customizing the workspace" on page 23.](#))

To open a preferences dialog box:

- 1 Choose Edit > Preferences (Windows) or After Effects > Preferences (Mac OS).

- 2 Choose a preferences command.
- 3 To switch to another dialog box, do any of the following:
 - Choose a preference category from the pop-up menu at the top of the dialog box.
 - Click Next to display the next dialog box in the menu list; click Previous to display the previous dialog box.

For information on a specific option, see the index.

To restore all preferences to their default settings:

Press and hold Alt + Control + Shift (Windows) or Option + Command + Shift (Mac OS) immediately after launching After Effects. You will be prompted to delete the current settings. When After Effects starts, it uses a newly created preferences file.

Customizing the workspace

Depending on the type of work you are doing, you may want to size and arrange palettes and windows. This arrangement of windows is called a *workspace*. You can use the preset workspaces (one, two, and four comp views), save your own custom workspace, or restore the default workspace.

When you make changes to the workspace, such as dragging palettes or windows to combine them, After Effects uses that version in subsequent sessions until you restore the default workspace or choose a custom workspace. If you've cluttered the workspace during the course of working, you can reset it as desired.

To restore default palette and window positions:

Do one of the following:

- Choose Window > Workspace, and choose the name of a preset Workspace.
- Choose Window > Reset Palette Locations.

To save the workspace:

- 1 Arrange the palettes and windows the way you want them, including size and location. After Effects uses the frontmost of each window type for its workspace settings.
- 2 Choose Window > Workspace > Save Workspace.
- 3 Type a name for the workspace, and click OK. The new workspace is added to the Workspace menu.

To select or delete a custom workspace:

- 1 To select a workspace, choose Window > Workspace, and then choose the name of the workspace.
- 2 To delete a workspace, choose Window > Workspace > Delete Workspace, choose a name, and click OK.

Using context menus

In addition to the menus at the top of your screen, context menus display commands relative to the active tool or selected item.

To display context menus:

- 1 Position the pointer over the footage or over a label in a palette or window, such as a button in the Time Controls palette.
- 2 Click the right mouse button (Windows) or press Control and hold down the mouse button (Mac OS).

Using windows

Many After Effects windows are organized in groups by default. You can customize and display these windows in certain ways depending on the type of window:

Composition window The title of a Composition window appears as a tab under the group window's title bar. By default, Composition windows are grouped into one window with Layer and Footage windows.

Layer and Footage windows As with Composition windows, the title of a Layer or Footage window appears as a tab under the group window's title bar. By default, Layer, Footage, and Composition windows are grouped into one window.

Timeline window Each composition name appears as a tab in the Timeline window. You can combine Timeline windows only with other Timeline windows. You can print Timeline windows.

Effect Controls window By default, effects you apply to layers are grouped in one Effect Controls window. You can combine Effect Controls tabs only with other Effect Controls tabs.

Project window You cannot group Project windows with any other windows. You can print Project windows.

Reorganizing windows

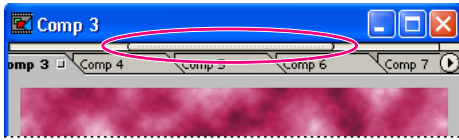
In After Effects, you can organize windows in an arrangement that best suits your workflow.

To reorganize windows:

Do any of the following:

- To change the default from grouped windows to ungrouped windows, choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS), deselect Tabbed Windows, and click OK.
- To rearrange or separate a group window, drag the tab for a window.
- To move a window to another group window, drag its tab to that group.
- To group Layer or Footage windows with Composition windows by default, open a Layer or Footage window and choose Window > Group Tab with Comps.
- To display a window menu, click the triangle in the upper right corner of the palette or window (not available for all windows or palettes).
- To resize a window, drag any edge (Windows) or drag its lower right corner (Mac OS).

- If a window contains more grouped windows than After Effects can display at once, drag the slider bar that appears above the tabs.



Drag the slider bar to display other tabs.

- To open a Timeline window from its Composition window, select the tab for the window and then click the Timeline button at the bottom of the Composition window.
- To open a Composition window from its Timeline window, select the tab for the window and then click the Comp button above the vertical scroll bar.
- To display a window that is obscured by other windows, choose it from the Window menu.
- If both the Composition and Timeline windows are closed, double-click the composition's icon in the Project window to open both windows again.

Closing multiple-view Composition windows simultaneously

When working in a multiple comp view, you can make sure all Composition windows close simultaneously when you close one window in the composition. For more information on working in different views, see [“Using multiple views” on page 266](#).

To close all the windows associated with a composition simultaneously:

- 1 Choose Window > Closing in Groups.
- 2 Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS) and select Close Multiple Views Simultaneously; then click OK.

Printing Windows

In After Effects, you can print the Timeline window, Project window, Composition Flow Chart, Project Flow Chart, and the Render Queue.

To print a window:

- 1 Select the window you want to print.
- 2 Choose File > Print, select the desired print settings, and then click Print.

Working with the Layer and Footage windows

Although the Layer and Footage windows share some controls (see [“Working with the Composition, Layer, and Footage windows” on page 28](#)), you typically perform different tasks in each window. Use the Layer window to create or edit masks, animate anchor points and paint. Use the Footage window to evaluate, trim, and insert a movie into the composition.

In addition to the shared controls, the Layer window also contains the View pop-up menu and the Render checkbox. After Effects switches the view according to your actions. For example, if you select the pen tool, After Effects switches to the Masks view so you can create or edit a mask. Select Render to view any changes to the layer (such as masks or effects) and deselect it to view the original, unaltered layer.

To choose a view in the Layer window:

- 1 Open a Layer window by double-clicking the layer in the Timeline window.
- 2 Choose a view from the View pop-up menu:
 - Masks to display existing masks
 - Anchor Point Path to display existing anchor points
 - Motion Tracker Points to display existing tracking points
 - Effects (appear as effect name, such as Paint) to display the effect when Render is selected

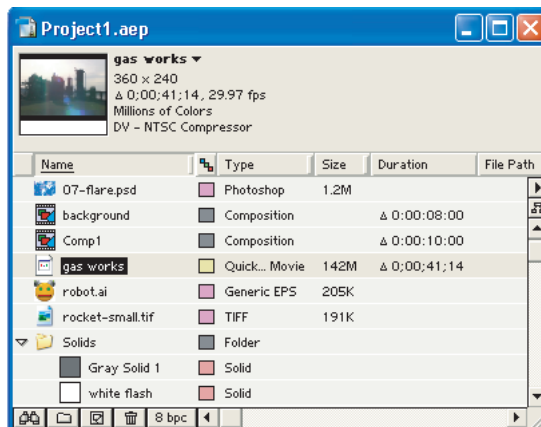
Working with the Project window

The Project window is a storage area for compositions, solids, and references to footage items. In the Project window you import, identify, replace, remove, and interpret footage items, compositions, and solids.

💡 You can print the Project window by choosing File > Print.

Organizing footage in the Project window


You can organize footage and compositions in the Project window using folders. Solids are automatically placed in the Solids folder. The folders you create in the Project window exist only in the Project window. You can expand a folder to reveal its contents. You can also put folders inside other folders.



Project window

To organize footage items using folders:

Do any of the following:

- To create a folder in the Project window, choose File > New > New Folder, or click the create folder icon  at the bottom of the Project window.
- To move a file or folder into a Project folder, drag the file or folder from the Project window list into a folder.
- To move a file or folder from a folder to the top level of the Project window, drag the file or folder to the gray information area at the top of the window.
- To show or hide the contents of a folder, click the triangle to the left of the folder icon.


To remove footage from a project:

Do any of the following:

- To eliminate an item from a project, select the item and press Delete.
- To remove all unused footage items from a project, choose File > Remove Unused Footage.
- To remove all compositions and footage items that are not used in the selected composition, choose File > Reduce Project.
- To remove all duplicate footage items from a project, Choose File > Consolidate All Footage.


To create a new composition from the Project window:

Click the create new composition icon  at the bottom of the Project window.

 To create a new composition that automatically uses the same dimensions, duration, and frame-rate settings as a footage item, drag the selected item or items onto the create new composition icon.

To manage footage items in the Project window:

Do any of the following:

- To display information about a footage item or composition, select the footage or composition. Information is displayed at the top of the Project window next to the thumbnail image.
- To sort footage items by any column, click the column name in the Project window. For example, click Type to sort items by footage type.
- To rename a composition or folder, select the composition name or folder, press Enter (Windows) or Return (Mac OS), type the new name, and then press Enter or Return again.
- To find footage items in the Project window, choose File > Find, or click the binoculars , type the name of the footage item, and click OK. Select Find Missing Footage to locate all footage items that refer to a file that has been moved, deleted, or renamed.

Customizing the Project window

When you open a new project, the application creates a default project window that contains a thumbnail area, labeled columns, and a series of buttons on the bottom of the window. You can customize the columns and the appearance of the thumbnail area.

To display or hide a column:

- 1 Choose Project Window > Columns.
- 2 Select the column you want to display or hide. A check mark indicates the column is showing.

To resize a column:

Drag the bar on the right of a column name. Drag to the left to decrease the size of a column, and drag to the right to increase the size of a column.

Note: You cannot change the size of the Duration column.

To change the order of the columns:

Select the column name and drag it to a new location.

To hide the thumbnail view:

- 1 Choose Edit > Preferences > Display (Windows) or After Effects > Preferences > Display (Mac OS).
- 2 Select Disable Thumbnails in the Project Window, and then click OK.

To add a transparency grid to the thumbnail view:

Choose Project Window > Thumbnail Transparency Grid. A check mark indicates that the grid is turned on.


Working with the Composition, Layer, and Footage windows


Use the Composition, Layer, and Footage windows to preview and edit different parts of a project. These windows share a set of controls that you can use to view *safe zones* (the visible areas of a television screen), identify RGB and alpha channels, and change the magnification. These controls function the same way in all three windows.

Setting view options for the Composition window

Manage the combination of layer handles, motion paths, wireframes, and so forth that you see in the Composition window from within the View Options dialog box. In the View Options dialog box, you can select, deselect, or choose the particular element you want to be visible; in the case of the Camera and Light wireframes, you can also choose that they become visible only when they are selected.

To set options in the View Options dialog box:

- 1 Open the View Options dialog box by doing one of the following:
 - Click the triangle in the upper right corner of the Composition window and choose View Options from the menu that appears.
 - Choose View > View Options.
 - Press Alt (Windows) or Option (Mac OS) and click the Layer Wireframes button .
- 2 Specify the desired settings in the View Options dialog box, and click OK.

 To hide or show all of the layer controls simultaneously, choose View > Hide Layer Controls, or View > Show Layer Controls.

Displaying After Effects viewing and editing controls in the Footage window

The standard Footage window displays viewing and editing controls (the View menu, trimming tools, and so forth) that are also found in the Layer and Composition windows. The default Footage window for movie files, however, displays movie controls instead. Use these movie controls (either QuickTime or Video for Windows controls, depending on the footage type) to play the movie and any included audio. To use the viewing and editing controls for movie files, you must open movie files in the standard Footage window.

Note: AVI files created with the Microsoft DirectX DV Codec and AVI files larger than 2 GB will appear in the standard Footage window, not the default movie file Footage window.

To display a footage item in the Footage window:

Double-click a footage item in the Project window.

To display .mov or .avi movies in the standard After Effects Footage window:



Press Alt (Windows) or Option (Mac OS) as you double-click a footage item in the Project window.

Changing magnification in windows

The lower left corner of a Composition, Layer, or Footage window shows the current magnification. When you change magnification, you change the appearance of the pixels in the window, not the actual resolution of the composition.


To zoom in:

Do one of the following:

- Select the zoom tool . The pointer becomes a magnifying glass with a plus sign in its center . Click the area in the window you want to magnify. Each click magnifies the image to the next percentage, centering the display around the point you click. You can also drag the tool to magnify a specific area. The maximum magnification level is 6400%.
- Choose View > Zoom In to magnify the image to the next percentage. When the window reaches its maximum magnification level, the command has no effect.
- Choose a zoom level from the Magnification Ratio pop-up menu at the bottom left of the Footage, Layer, or Composition window. To change the magnification of all views, hold down Ctrl (Windows) or Command (Mac OS).
- In the Layer and Footage windows only, press the plus key (+) to magnify the image to the next percentage.

To zoom out:

Do one of the following:

- Select the zoom tool. Hold down Alt (Windows) or Option (Mac OS) to activate the zoom-out tool. The pointer becomes a magnifying glass with a minus sign in its center . Click the center of the area in the window you want to reduce. Each click reduces the image to the previous percentage. When the file has reached its maximum reduction level, the command has no effect.
- Choose View > Zoom Out to reduce the image to the previous percentage. When the window reaches its maximum reduction level, the command has no effect.

- Choose a zoom level from the Magnification Ratio pop-up menu at the bottom left of the Footage, Layer, or Composition window. To change the magnification of all views, hold down Ctrl (Windows) or Command (Mac OS).
- In the Layer and Footage windows only, press the minus key (–) to reduce the image to the previous percentage.

To change the view to 100%:


Double-click the zoom tool in the Tools palette.

To change the view to fit the screen:

Double-click the hand tool in the Tools palette.

Using Wireframe view in the Composition window

You can easily toggle back and forth between your standard view and Wireframe view in the Composition window. Wireframe view allows you to quickly reposition a high-resolution or data-intensive layer using a wireframe representation. For more information on using Wireframe views for specific layers, see [“Changing the layer image quality” on page 109](#).

To turn Wireframe view on and off: Click the Layer Wireframes button  at the bottom of the Composition window.

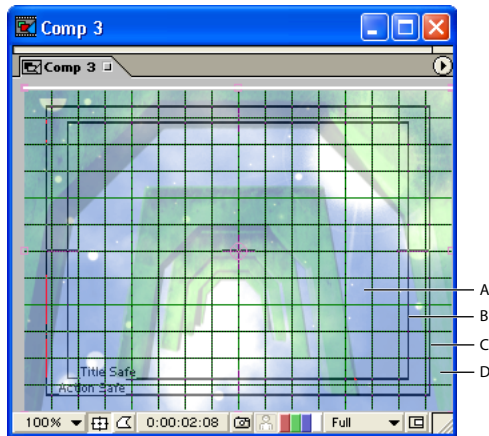
Viewing safe zones and grids

In the Footage, Layer, or Composition windows, you can display safe zones for titles and actions as well as grids used for aligning layers.

Television sets enlarge a video image and allow some portion of its outer edges to be cut off by the edge of the screen. This is known as *overscan*. The amount of overscan is not consistent across television sets, so you should keep important parts of a video image, such as action or titles, within margins known as *safe zones*. When you arrange layers in a composition, do the following:


- Keep important scene elements, graphics, and actors within the *action-safe* zone.
- Keep titles and other text within the *title-safe* zone.

After Effects also provides grids that you can use to help arrange and align layers. Set the grid spacing using the Grids & Guides Preferences dialog box.



Composition window's zones and grids **A.** Grid **B.** Title-safe zone **C.** Action-safe zone **D.** Overscan

To view safe zones:

In a Footage, Layer, or Composition window, click the Title-Action Safe button  to show or hide the safe zones.

To view a standard grid:

With a Footage, Layer, or Composition window active, choose View > Show Grid.

To view a proportional grid:

Hold down Alt (Windows) or Option (Mac OS) and click the Title-Action Safe button .

To snap a layer to a grid:

With a Footage, Layer, or Composition window active and the grid shown, choose View > Snap to Grid, and then drag a layer until it snaps to the desired grid lines.

Changing safe-zone margins and grid spacing

You can change the percentage of window area marked as title-safe or action-safe, and you can change the number of grid cells. Safe-zone margins represent the percentage of image area not included in the safe area. You can set spacing options for standard grids or proportional grids. The size of proportional grids increases or decreases when the composition size changes; the size of standard grid squares remains the same regardless of composition size.

To change safe-zone margins:

- 1 Choose Edit > Preferences > Grids & Guides (Windows) or After Effects > Preferences > Grids & Guides (Mac OS).
- 2 Type values for Action-Safe and Title-Safe margins, and click OK.

To change grid spacing:

- 1 Choose Edit > Preferences > Grids & Guides (Windows) or After Effects > Preferences > Grids & Guides (Mac OS).

2 Type a value for Gridline Every, type a value for Subdivisions, and click OK.

To change proportional grid spacing:

1 Choose Edit > Preferences > Grids & Guides (Windows) or After Effects > Preferences > Grids & Guides (Mac OS).

2 Type Horizontal and Vertical values for Proportional Grid, and click OK.

Using rulers and guides

You can display rulers along the sides of the Composition, Layer, and Footage windows to provide a visual guide for positioning and editing your footage. Using the cross hair in the upper left corner of the rulers, you can change the origin, or *zero point*, in both rulers. Changing the zero point makes it easy to measure from a specific point in the image. By default, rulers are hidden.

For added precision in positioning objects, you can create guide lines. You can also lock guide lines to prevent them from being repositioned.

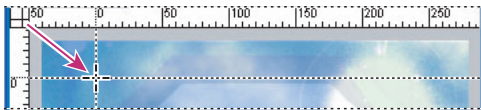
Note: *Rulers and guide lines are only a reference in the Composition, Layer, and Footage windows. They do not appear in your rendered movie.*

To display or hide rulers:

Choose View > Show Rulers or Hide Rulers.

To set the zero point in rulers:

Drag the cross hair from the intersection of the two rulers (in the upper left corner) into the image area.



Dragging the zero point cross hair

To create, reposition, lock, hide, or remove a guide line:

Do any of the following:

- Position the pointer inside either ruler and drag where you want to create a guide line.




Dragging a guide from the ruler

- In the image area, drag a guide to reposition it.
- To lock or unlock guides, choose View > Lock Guides.
- In the image area, drag a guide line into a ruler to remove it.
- To display or hide all guide lines, choose View > Show Guides or Hide Guides.
- To remove all guide lines, choose View > Clear Guides.

Viewing color and alpha channels

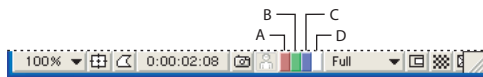
You can preview the red, green, blue, and alpha channels of a still image or movie in a Footage window, Layer window, or Composition window. When you view a color channel, areas with that color are displayed according to the color value of each pixel. For example, if you view the red channel, areas with high red values are displayed as white.

 To see the color values in a color channel displayed in the channel's own color instead of white, hold down Shift and click the desired color channel icon.

When you preview the alpha channel, After Effects displays transparent and opaque areas as black and white to make identification easier. Degrees of opacity appear as shades of gray.

To view a color channel or alpha channel:

- 1 Open the Composition, Layer, or Footage window to view a channel for a composition, layer, or footage item, respectively.
- 2 At the bottom of the window, click the icon that corresponds to the channel you want to display.



Channel icons **A.** Red channel **B.** Green channel **C.** Blue channel **D.** Alpha channel

Taking and viewing a window snapshot

When you want to compare one view to another in the Composition, Layer, or Footage window, take a *snapshot* of one view and temporarily replace the window image with the snapshot. For example, you might want to compare two frames in different locations in a movie. You can instantly show and hide the snapshot to identify differences between the views. If you have a sound card installed, you hear a sound when you take a snapshot.


When working with snapshots, here are some tips to keep in mind:

- Snapshots taken in one kind of window can be displayed in another kind. For example, you can take a snapshot of a Layer window and display the snapshot in the Composition or Footage window.
- Displaying a snapshot does not replace the content of the window.
- If the snapshot has a different size or aspect ratio than the window in which you display it, the snapshot is resized to fit the window.
- Choose Edit > Purge > Snapshot to free up memory used by your snapshots.
- Snapshots are for reference only and do not become part of the layer, composition, or rendered movie.

To take a snapshot:

Click the take-snapshot icon  at the bottom of the window.

To view a snapshot:

Click and hold the display-snapshot icon  at the bottom of the window.

To take and view multiple snapshots:

Do any of the following:

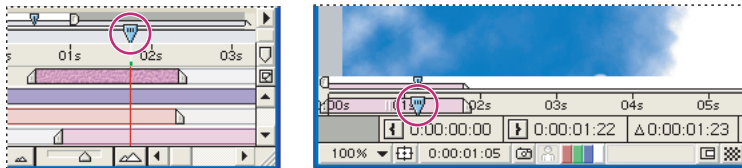
- Hold down Shift and press F5, F6, F7, or F8 to take separate snapshots.
- Press and hold F5, F6, F7, or F8 to view the corresponding snapshots.
- To purge any snapshot, hold down Ctrl + Shift (Windows) or Command + Shift (Mac OS) and press F5, F6, F7, or F8.

💡 For information on taking and viewing multiple snapshots using keyboard shortcuts, see the Shortcuts Appendix.

Viewing a specific frame

The duration of a composition, a layer, or a footage file is represented visually by the *time ruler*. On the time ruler, the *current-time indicator* indicates the frame you are viewing or editing, and the frame appears in the corresponding window. You can view a different frame by typing a number in the Go To Time dialog box or by dragging the current-time indicator.

In a Layer or Footage window, the time ruler appears near the bottom of the window. In a Composition window, the time ruler appears in the corresponding Timeline window. Keep in mind that the time rulers in different windows represent different durations. The time ruler in Layer and Footage windows represent the duration of the contents of that window, in contrast to the time ruler in the Timeline window, which represents the duration of the entire composition.



Current-time indicator in the Timeline window (left) and in the Layer window (right)

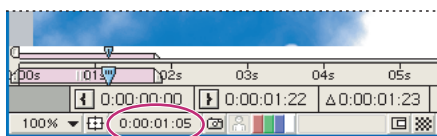
Like the Timeline window, Layer and Footage windows include viewing-area markers that you can use to magnify or shrink the part of the time ruler displayed.

To view a specific frame by dragging:

In the time ruler, drag the current-time indicator to a new point in time.

To view a specific frame numerically:

1 Choose View > Go To Time, or click the current-time display in a Footage, Layer, Composition, or Timeline window.



Current-time display in the Layer window

2 Type a new time and click OK.

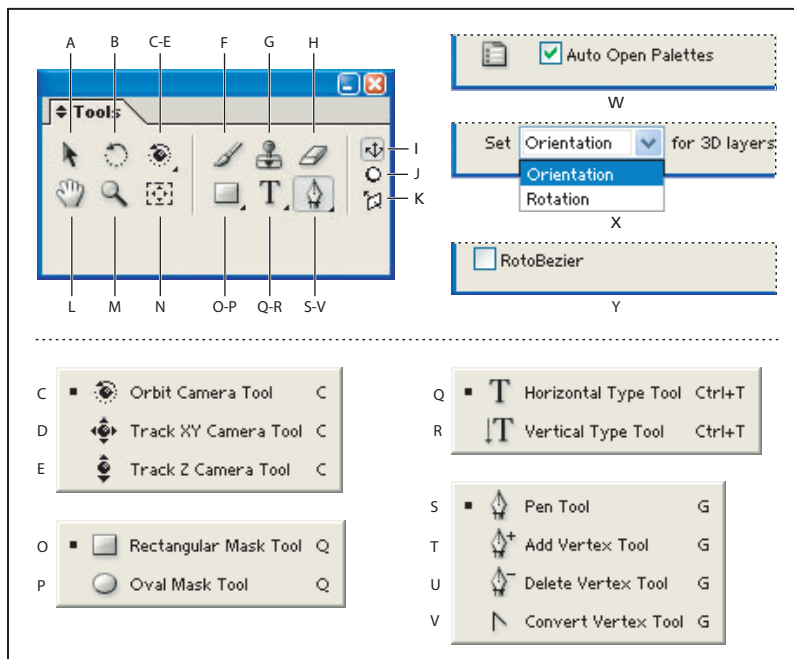
💡 To step forward or backward a specified number of frames from the Go To Time dialog box, type + or +- in front of the number, such as +5 or +-5. (If you simply type - in front of the number, After Effects jumps to a negative time.)

Discontinuing window updates

Press the Caps Lock key to prevent After Effects from updating the Footage, Layer, or Composition windows. This is useful for a Layer or Composition window that takes a long time to update. When Caps Lock is active, all open Footage, Layer, or Composition windows display the last update you made before pressing Caps Lock, regardless of the changes you make. As soon as you make a change that would appear in a window, After Effects adds a red outline to any affected windows, and the windows are not updated. After Effects continues to update window controls such as motion paths, anchor points, and mask outlines as you move them. To resume window updates and display all changes made while Caps Lock was active, press Caps Lock again to deactivate it.

Using the Tools palette

The first time you start the application, the Tools palette appears on the right side of the screen. Some tools in the palette have options that appear in the Tool Options section of the palette. Use the tools in the palette to select, edit, and view layers. You can edit layer properties, masks, and motion paths graphically, and you can change the magnification of a Footage, Layer, or Composition window.



Tools palette **A.** Selection **B.** Rotation **C.** Orbit Camera **D.** Track XY Camera **E.** Track Z Camera **F.** Brush **G.** Clone Stamp **H.** Eraser **I.** Local Axis Mode **J.** World Axis Mode **K.** View Axis Mode **L.** Hand **M.** Zoom **N.** Pan Behind **O.** Rectangular Mask **P.** Oval Mask **Q.** Horizontal Type **R.** Vertical Type **S.** Pen **T.** Add Vertex **U.** Delete Vertex **V.** Convert Vertex **W.** Auto Open Palettes **X.** Set [property] for 3D layers **Y.** RotoBezier

To display or hide the Tools palette:

Choose Window > Tools. A check mark indicates that the palette is showing.

To move the Tools palette:

Drag the palette's title bar to a new location.

To select a tool:

Do one of the following:

- Click the tool's icon. If the icon has a small triangle at its lower right corner, hold down the mouse button to view the hidden tools. Then, click the tool you want to select.
- Press the tool's keyboard shortcut. Positioning the pointer over a tool displays a tool tip with the tool's name and keyboard shortcut.

To cycle through hidden tools:

Hold down Shift and press the tool's shortcut key.

To momentarily change from one tool to another tool:

Hold down the shortcut key for the desired tool and perform an action. Release the shortcut key to return to the previous tool.



For information on changing tools using keyboard shortcuts, see the Shortcuts Appendix.

To display or hide tool tips:

- 1 Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS).
- 2 Select or deselect Show Tool Tips.

To view optional palettes for a tool:

Click the desired tool icon, and then click the palette icon  if available.

Note: To automatically always open optional palettes for tools, select the Auto Open Palettes option in the Tools palette.

Using the Info palette

The Info palette describes the area under the mouse pointer as you drag across a footage frame in the Composition, Layer, or Footage window. This palette displays values for the pixel color (R,G,B), alpha channel (A), and coordinates of the current position. When you modify a layer property graphically, the bottom portion of this palette displays precise values that relate to the layer instead of the pointer. For example, when you drag a layer, the Info palette displays the coordinates of the layer's center point and the offset from its last position. This makes it easy to move a layer by a specific number of pixels in either direction. During other operations, the Info palette provides context-sensitive information, such as the progress of rendering a window preview. If a keyframe is selected, the Info palette displays the keyframe's spatial and temporal state as well as its position in time. Alt-click (Windows) or Option-click (Mac OS) two markers or keyframes to display the duration between them in the Info palette.

The X coordinate represents position in the horizontal axis, and the Y coordinate represents position in the vertical axis. Values for these coordinates are in pixels. The X and Y coordinates are relative to the origin (0,0), which is fixed at the upper left corner of the image area. The upper right portion of the Info palette displays the X and Y coordinates of the pointer. As you drag a layer, the lower portion of the Info palette displays the X and Y coordinates of the layer's anchor point. The lower portion of the Info palette also displays Z coordinates if the layer includes 3D animation.

If the zero point differs from the origin, X' and Y' coordinates appear in the Info palette below the X and Y coordinates. These values measure the distance from the zero point or the ruler.

Note: *The origin of the image area is different than the origin, or zero point, of the rulers. You can set the ruler's zero point to match the origin of the image area, but you cannot change the origin of the image area.*

To change the Info palette RGBA display:

Choose an option such as Percent or Web from the Info palette menu. Selecting Auto Color Display automatically switches between 8 bits per channel and 16 bits per channel depending on the project's color depth. Clicking anywhere on the palette cycles through the display options.

Preparing and Importing Footage

How After Effects works with imported files

When you import files, After Effects does not copy the footage item itself into your project but creates a *reference link* in the Project window to the footage item. This saves disk space.

If you delete, rename, or move an imported source file, you break the reference link to that file. When a link is broken, the name of the source file appears in italics in the Project window, and the File Path column lists it as missing. If the footage item is available, you can reestablish the link—usually just by double-clicking the item and selecting the file again. (See [“Replacing and substituting footage” on page 69.](#))

If you use another application to modify footage that is used in a project, the changes appear in After Effects the next time you open the project. (See [“Opening footage in its original application” on page 68.](#))

When you add a footage item to an After Effects composition, you create a new layer, and the footage item becomes the *source* for the new layer. You can replace the source without affecting any edits you make to the layer properties.

File formats supported for import by After Effects

You can import the following file formats into After Effects 6.0.

Format	Windows	Mac OS
Adobe Illustrator (.ai, .ai4, .ai5, .eps, .ps)	Yes	Yes
Adobe PDF (.pdf)	First page only	First page only
Adobe Photoshop (.psd)	16 bpc	16 bpc
Adobe Premiere 6.0 (.ppj)	Yes	Yes
Adobe Premiere 7.0 (.prproj)	Yes	No
Animated GIF (.gif)	Requires QuickTime 5.0	Requires QuickTime 5.0
AU (.au)	Requires QuickTime 5.0	Requires QuickTime 5.0
Audio Interchange File Format AIFF (.aiff)	Requires QuickTime 5.0	Requires QuickTime 5.0
Bitmap (.bmp, .rle)	Yes	Yes
Cineon (.cin)	Converts to 8 or 16 bpc, per Project Settings	Converts to 8 or 16 bpc, per Project Settings



Format	Windows	Mac OS
DirectShow (.grf)	Yes	No
Discreet RLA/RPF (.rla, .rpf)	16 bpc (imports camera data)	16 bpc (imports camera data)
ElectricImage (.img, .eiz)	Yes	Yes
EPS (.eps)	Yes	Yes
Filmstrip (.flm)	Yes	Yes
FLC (.flc)	Yes	Yes
FLI (.fli)	Yes	Yes
JPEG (.jpg, .jpe)	Yes	Yes
Macromedia Flash (.swf)	Requires QuickTime 5.0	Requires QuickTime 5.0
Maya camera data	Professional edition only	Professional edition only
Maya IFF (.iff)	16 bpc	16 bpc
MP3 (.mp3)	Requires QuickTime 5.0	Requires QuickTime 5.0
MPEG-1 (.mpg)	Yes	Requires QuickTime 5.0
PCX (.pcx)	Yes	Yes
Pict (.pct, .pic)	Yes	Yes
Pixar (.pxr)	Yes	Yes
Portable Network Graphics (.png)	16 bit	16 bit
QuickTime (.mov)	16 bpc and requires QuickTime 5.0	16 bpc and requires QuickTime 5.0
SGL (.sgi, .rgb)	16 bpc	16 bpc
Softimage (.pic)	Yes	Yes
Targa (.tga, .vda, .icb, .vst)	Yes	Yes
TIFF (.tif)	Yes	Yes
Video for Windows (.avi, .wav)	Yes	Requires QuickTime 5.0
Windows Media File (.wmv)	Yes	No

Note: File formats that use Adobe Photoshop plug-ins include BMP, PCX, and Pixar.

For more information on 16 bpc, see [“Rendering and exporting 16-bits-per-channel files \(Pro only\)” on page 327](#). For more information and an extensive list of QuickTime-supported formats, see the Apple Web site. You can also check the Adobe Web site for updates.

Preparing a still-image file for import into After Effects

Before you import a still image into After Effects, prepare the file as completely as possible. It is usually easier and faster to prepare a file in its original application; this also reduces rendering time in After Effects. Consider doing the following before you import still-image files into After Effects:

- Make sure that the file format is supported on the operating system you plan to use.
- Set the pixel dimensions to the resolution you will use in After Effects. If you plan to scale the image over time, set image dimensions that provide enough detail at the largest size the image has in the project. The maximum resolution you can use in After Effects is 30,000 x 30,000 pixels.
- Specify an even-numbered resolution for files imported into compositions that also use even-numbered resolution, and odd numbers for compositions using odd-numbered resolution.
- Crop the parts of the image that you do not want to be visible in After Effects.
- Correct the contrast and color balance for broadcast video, if necessary.
- If you want to designate areas as transparent, create an alpha channel.
- If final output will be broadcast video, avoid using thin lines (such as 1-pixel lines) for images or text because they may appear to flicker. If you must use thin lines, add a slight blur so the line or text displays on both video fields instead of flickering between them.
- Save the file using the correct naming convention. For example, if you plan to import the file to After Effects on a Windows system, save the file using a three-character extension.

For information on preparing and importing interlaced motion video to After Effects, see [“Preparing motion footage for import” on page 56](#).

Working with higher image resolutions

After Effects supports a maximum image resolution of 30,000 x 30,000 pixels for importing and rendering files. *Resolution* refers to the dimensions (width and height) of an image measured in pixels. When you work with higher resolutions, you can use a wider variety of formats, such as IMAX frames (4096 x 3002 pixels), full-aperture/silent frames (4096 x 3112 pixels), and other large-format media.

When working with high-resolution images, consider the following:

- All input and output modules in After Effects support increased resolutions except PICT (4,000 x 4,000 pixels), BMP (16,000 x 30,000 pixels), and PXR (30,000 x 16,000 pixels).
- The maximum resolution you can import or export is limited by the amount of physical RAM available to After Effects. When working with large frame sizes, minimize the RAM used by the system or other software running on your computer, but be sure to leave at least 4 MB of unused RAM to handle system software requirements.
- The following formula helps you determine the amount of RAM you need based on the footage: Image Width in Pixels x Image Height in Pixels x 4 Bytes of Memory for 32 bits-per-pixel (bpp) or 8 Bytes of Memory for 64 bpp. For example, a 30,000-x-30,000-pixel image requires 3.5 GB of RAM to import and display each frame. However, a 30,000-x-

486-pixel image requires only 60 MB of RAM. Memory requirements for 16-bits-per-channel (bpc) project color depth are approximately double those for 8 bpc.

Changing the default duration of still images

When you add a still image to a composition, its default duration is the duration of the composition. You can manually trim the duration of a still image and change the default duration of still footage in the Import Preferences dialog box. (See [“Understanding trimming” on page 102.](#))

To change the default duration of still footage:

- 1 Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import (Mac OS).
- 2 Under Still Footage, do one of the following, and then click OK:
 - Select Length of Composition to set the same duration for the still image as the composition into which it is placed.
 - Type numbers in the text box for the duration you want to use.

Specifying interpretation rules

The interpretation rules.txt file describes how After Effects interprets field order, alpha channel, frame rate, and pixel aspect ratio when importing footage. You can customize this file in any text editor, and add or delete entries, to save time. When you import, After Effects reads the file and follows any applicable rules, as long as interpretation rules.txt is stored in the same folder as the After Effects application. You can always override these interpretations after importing. For more information, see [“Using interpretation rules” on page 41.](#)

Using interpretation rules

You can automate how After Effects interprets different types of imported footage. For example, each time you import a clip with unlabeled fields, you must specify the field separation order; but when you import dozens of clips, you can save time by using the interpretation rules.txt file, which handles this for you.

The interpretation rules.txt file defines how After Effects identifies and matches footage by using parameters for frame dimensions, frame rates, file type, and codec. If it finds a match for the footage you’re importing, it then automatically sets the field order, frame rate, alpha channel interpretation, and pixel aspect ratio.

Ordinarily, the interpretation rules.txt file is stored in the same location as the application. You can modify this file to produce the custom rules file you need. Editing this file is straightforward if you follow the samples listed in the file. However, the more experience you have with scripting or related tasks, the more comfortable you’ll feel editing this file. As a precaution, you might make a backup copy of the file before changing the original.

When you edit the interpretation rules.txt file, you must supply a four-character file-type code for each footage type or codec. If you don't know the file-type code for a file or codec in a project, press Alt (Windows) or Option (Mac OS) as you select the file in the Project window. The file's file-type code and codec code (if compressed) appear in the last line of the file description at the top of the Project window.

Note: Any changes to the interpretation rules.txt file take effect the next time you open After Effects. If After Effects is already open when you edit the rules, you must exit and reopen the application to activate the new rules.

Importing files into a project

With After Effects 6.0, you use the same Import File dialog box to import any usable file into After Effects. To save time and minimize the size and complexity of a project, import a footage item once and then use it multiple times in a composition. It is occasionally useful, however, to import a footage item more than once, such as when you want to use it at two different frame rates.

After Effects supports 24- and 32-bit files using 8 bpc—including alpha channels—and the RGB, Grayscale, and Black-and-White color modes. After Effects can also read and write 16-bpc color depth to some QuickTime codecs.

Note: The After Effects Professional edition provides support for 16 bpc.

For information on supported formats, see [“File formats supported for import by After Effects” on page 38](#).

To import footage into a Project window:

- 1 Open a project or choose File > New > New Project.
- 2 With the Project window active, choose File > Import > File.
- 3 Do one of the following:
 - Select a file and then click Open (Windows) or Import (Mac OS).
 - Hold down Ctrl (Windows) or Command (Mac OS), select the items you want, and then click Open (Windows) or Import (Mac OS).
 - Select an entire folder, and then click the Import Folder button.

The imported footage appears in the Project window.

The following options appear in the Files of Type pop-up menu (Windows) or the Show pop-up menu (Mac OS):

All Acceptable Files Shows files that After Effects recognizes as supported formats. This is the default selection.

All Footage Files Shows only supported footage files. Project files are not shown.

All Files (*.*) Shows all files, whether or not After Effects recognizes them as supported formats. (This is useful for compatible files transferred from another platform, such as a Silicon Graphics workstation.) This option requires you to identify the format.

A specific format Restricts the files shown to the format you choose from the menu. (Use this option as a convenience when the files you want are in large folders containing files of mixed types.)

For more information about importing folder contents, see [“Importing a sequence of still-image files” on page 43](#).

Note: *If the Interpret Footage dialog box appears instead, the imported footage item contains an unlabeled alpha channel, and you’ll need to select a type or click Guess to let After Effects determine the type. (See [“Interpreting alpha channels as straight or premultiplied” on page 47](#).)*



To search for a file from the Import File dialog box in Mac OS, click Find, type the name of a file or folder, and click OK. After Effects finds the first file or folder that matches the text.

To import items by dragging:

From the desktop or a folder, select one or more items you want to import and drag them to the After Effects application icon (in Windows Explorer or Mac OS Finder) or to the Project window (in After Effects).

If you import a folder by dragging it from the desktop, the contents of that folder are imported as a sequence. To import the contents as individual footage files, press Alt (Windows) or Option (Mac OS) as you drag. (This is the equivalent of clicking the Import Folder button when importing footage into a Project window.) If you always want the layered footage that you drag into After Effects to be imported as a composition, you can specify this in your Import Preferences.

To set default preference for dragging layered footage:

- 1 Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import (Mac OS).
- 2 In the Default Drag Import As pop-up menu, choose Comp.

For more information about importing sequences, see [“Importing a sequence of still-image files” on page 43](#).

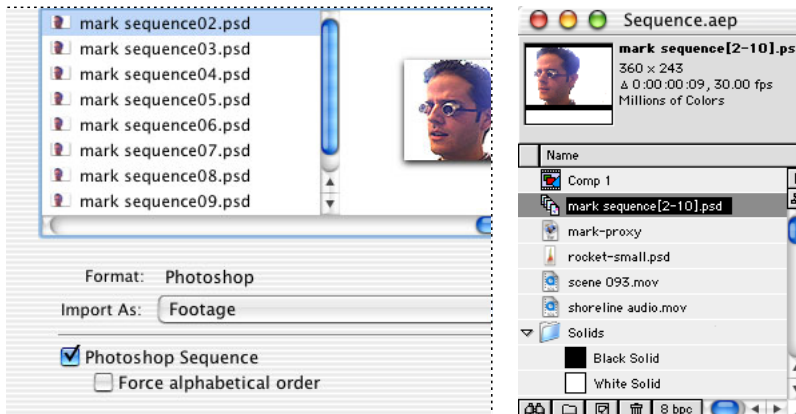
Importing a sequence of still-image files

After Effects can import a sequence of still images if they all reside within one folder and use the same numeric or alphabetic filename pattern (such as Sequence1, Sequence2, Sequence3, and so forth). You can import them by using any of the following methods:

- As a sequence file where the layers in the file, if any, are merged.
- As a sequence file (Adobe Photoshop and Adobe Illustrator files with layers only) where the same layer in each file, for example, *layername 3*, is imported and used in the sequence.
- As a composition (Adobe Photoshop and Adobe Illustrator files with layers only) where every layer across the group of files is imported as a separate sequence and appears as a separate layer in the Timeline window.

After Effects uses the dimensions and bit depth of the first image in the sequence. It then imports (in numeric or alphabetic order) all still images in the folder that have the same filename pattern and file type as the one you selected. Each image, once imported into the sequence, represents one frame.

Note: When you render a composition that contains a numbered sequence, the output module uses the start frame number as the first frame number. For example, if you start to render on frame 25, the name of the file is 00025. (See [“Working in the Render Queue window” on page 328.](#))



A sequence of still-image files (left) becomes one image sequence when imported into After Effects (right).

To import a sequence of still images as a sequence file:

- 1 Choose File > Import > File.
- 2 Locate and select any file in the sequence.
 - To import a subset of files in a sequence, select the first file, hold down Shift, and then select the last file you want to include.
- 3 Choose Footage from the Import As pop-up menu.
- 4 Select the *file format name* Sequence option.
- 5 If you want to import alphabetically, select Force Alphabetical Order.
- 6 Click Open (Windows) or Import (Mac OS).
- 7 In the *filename* dialog box, choose one of the following from the Choose Layer pop-up menu:
 - Merged Layers to merge all the layers in each individual file to one layer.
 - Layer Name to import only a specific layer from each file in the sequence.
- 8 Click OK.

To import a sequence of still images as a composition:

- 1 Choose File > Import File.
- 2 Locate and select any file in the sequence.
 - To import a subset of files in a sequence, select the first file, hold down Shift, and then select the last file you want to include.

3 Choose one of the following from the Import As pop-up menu:

- Composition - Cropped Layers to import the layers with their original dimensions. This option makes it easier to manipulate layers and speeds their rendering time.
- Composition to import layers and have them match the dimensions of the composition. This option is helpful when you need to align layers manually.

4 Select the *file format name* Sequence option.

5 If you want to import alphabetically, select Force Alphabetical Order.

6 Click Open (Windows) or Import (Mac OS).

To import a folder of still images as a sequence by dragging:

Drag the folder from the desktop to the After Effects Project window. After Effects imports the first sequence that is listed in the folder, based on the filename.

To import a sequence as individual footage files:

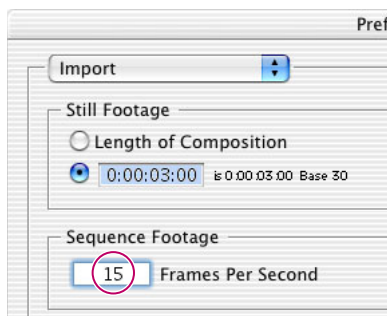
Do either of the following:

- Choose File > Import > File to open the Import File dialog box, locate and select the folder, and then click the Import Folder button.
- On the desktop, hold down Alt (Windows) or Option (Mac OS) and drag the folder into either the After Effects icon on the desktop or into the Project window. You must release the mouse and then release Alt (Windows) or Option (Mac OS) for this to work properly.

When you import a sequence of still images, they assume the frame rate specified in the Preferences. The default rate is 30 frames per second (fps). You can change the frame rate for the sequence either before or after importing.

To change the default frame rate for a sequence before importing:

- 1 Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import (Mac OS).
- 2 Under Sequence Footage, type a new default frame rate, and then click OK.



Default frame rate for sequences

To assign a frame rate to a sequence you've already imported:

- 1 In the Project window, select the sequence of still images.
- 2 Choose File > Interpret Footage > Main.
- 3 Select Assume This Frame Rate.

- 4 Type the frame rate you want, and then click OK.

Importing footage containing an alpha channel

The color information in a typical footage item is contained in three channels: red, green, and blue. In addition, a footage item can include a fourth channel, called an *alpha channel*, that contains transparency information for the parts of the image that are partially or completely transparent. An alpha channel is often used as a *matte* for creating effects. When used in After Effects, a matte defines the transparent areas for its own or another layer. White areas define what is opaque, and black areas define what is transparent. (See [“Using a footage item with an alpha channel” on page 176.](#))

Many file formats can include an alpha channel, including Adobe Photoshop, ElectricImage, TGA, TIFF, EPS, PDF, QuickTime (saved at a bit depth of Millions of Colors+), and Adobe Illustrator. For Adobe Illustrator EPS and PDF files, After Effects automatically converts empty areas to an alpha channel.

Using straight or premultiplied alpha channels

Footage files with alpha channels fall into two categories: straight and premultiplied. Although the alpha channels are the same, the color channels differ.

With a *straight* alpha channel, a footage item keeps the transparency information in a separate channel (the alpha channel only), not in any of the visible color channels. This kind of alpha channel is also known as *unmatted* alpha. With a straight alpha channel, the effects of transparency are not visible until the image is displayed in an application that supports straight alpha.

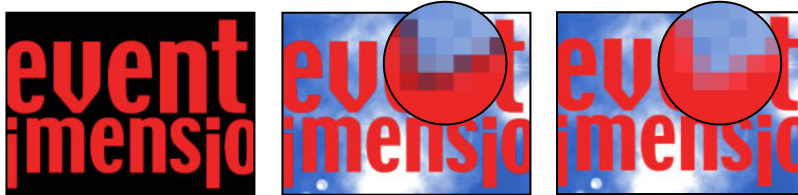
With a *premultiplied* alpha channel, a footage item keeps the transparency information in the alpha channel and also keeps the same information in the visible RGB channels, which are modified, or multiplied, with a background color. A premultiplied alpha channel is known as *matted alpha* with a background color. The colors of semitransparent areas, such as feathered edges, are shifted toward the background color in proportion to their degree of transparency.

Some software lets you specify the background color with which the alpha channel is premultiplied; otherwise, the background color is usually black or white.

Straight alpha channels can produce better results when used in movies that require the highest level of color precision. Premultiplied alpha channels are compatible with a wider range of programs, such as Apple QuickTime Player. After Effects recognizes both types, so for most projects, either type will produce satisfactory results.

Interpreting alpha channels as straight or premultiplied

When you import a footage file containing an alpha channel, After Effects determines whether it is straight or premultiplied. If the alpha channel is unlabeled, After Effects displays the Interpret Footage dialog box and prompts you to select Ignore, Straight - Unmatted, Premultiplied - Matted with Color, or Guess. When you select Guess, After Effects determines the interpretation method. For information on straight and premultiplied alpha channels, see [“Using straight or premultiplied alpha channels” on page 46](#). For information on interpretation methods, see [“Choosing an interpretation method for alpha channels” on page 47](#).



A footage file with a black alpha channel (left) appears with a black halo (center) when interpreted as Straight-Unmatted, or Premultiplied-Matted with Color (white selected). When the footage file is interpreted as Premultiplied-Matted with Color (black selected) the halo does not appear (right).

Correctly identifying the type of alpha channel when you import a file can prevent problems, such as undesirable colors at the edge of an image or a loss of image quality at the edges of the alpha channel. If a color inaccuracy, such as a halo, appears along the edges of an alpha channel in a composition, try changing the interpretation method.

If a footage item doesn't have an alpha channel or transparency information, you can create an alpha channel in After Effects by using a layer mask. (See [“Working with masks” on page 176](#).)

Choosing an interpretation method for alpha channels

You can change the interpretation method for a file after you import the file. You can also change the default alpha channel interpretation in the Import Preferences dialog box, in the Interpret Unlabeled Alpha As pop-up menu. This is especially useful for importing footage from an application that consistently uses one type of unlabeled alpha channel.

The interpretation methods include:

Ask User Displays a dialog box containing interpretation options each time you import an unlabeled alpha channel.

Guess Attempts to determine the type of alpha channel used in the image. If After Effects cannot guess confidently, it beeps.

Ignore Alpha Disregards all transparency data in the file.

Straight (Unmatted) Interprets the alpha channel as straight alpha. If the application you used to create the footage does not premultiply the alpha channel, select this option.

Premultiplied (Matted with Black) Interprets the alpha channel as premultiplied with black.

Premultiplied (Matted with White) Interprets the alpha channel as premultiplied with white.

To import a footage file containing an alpha channel:

- 1 Choose File > Import > File.
- 2 Select the name of the file you want to open. If the file does not appear, select the option for showing all files from the Files of Type (Windows) or Show (Mac OS) pop-up menu.
- 3 Click Open (Windows) or Import (Mac OS).
- 4 Select an option for the alpha channel in the Interpret Footage dialog box, and click OK.

To set the alpha channel interpretation method for a file:

- 1 In the Project window, select a footage item that includes an alpha channel.
- 2 Choose File > Interpret Footage > Main.
- 3 In the Alpha section, select an interpretation method.
- 4 If you want to switch the opaque and transparent areas of the image, select Invert Alpha.
- 5 Click OK.

To set the default alpha channel interpretation:

- 1 Choose Edit > Preferences > Import (Windows) or After Effects > Preferences > Import (Mac OS).
- 2 Choose a default interpretation method from the Interpret Unlabeled Alpha As pop-up menu, and click OK.

Importing Adobe Photoshop files

You can import an Adobe Photoshop file directly into an After Effects project with the option of preserving individual layers, layer masks, guides, and so forth from Adobe Photoshop. Importing layers makes it easy to prepare still images for animation using the image-editing tools in Adobe Photoshop.

You can also import text from Adobe Photoshop and convert it to editable text within After Effects. (See [“Copying and pasting text from other applications” on page 207.](#))

Preparing layered Adobe Photoshop files

Importing layers into After Effects makes it possible to prearrange a composition in Adobe Photoshop using layers and preserve those layers in After Effects so that they are ready for animation. Preserving layers is also useful if you want to use a single Adobe Photoshop file as a source for both print and dynamic media.

Before you import a layered Adobe Photoshop file, prepare it thoroughly to reduce preview and rendering time. Avoid problems importing and updating Adobe Photoshop layers by naming them properly. Before you import them into After Effects, do the following:

- Organize and name layers. If you change a layer name in an Adobe Photoshop file after you have imported it into After Effects, After Effects retains the link to the original layer. However, if you delete a layer, After Effects is unable to find the original layer and lists it as Missing in the Project window.
- Make sure that each layer has a unique name to avoid confusion.

- If you want to import a composited version of a layered Adobe Photoshop file along with a layered version, select Always Maximize Compatibility for Photoshop (PSD) Files in the Photoshop File Handling Preferences dialog box.

Importing layered Adobe Photoshop files

After Effects imports attributes that were applied in Adobe Photoshop, including position, blending modes, opacity, visibility, transparency (alpha channel), layer masks, layer sets (imported as nested compositions), adjustment layers, common layer effects, layer clipping paths, vector masks, image guides, and clipping groups.

You can import a multilayered Adobe Photoshop file in the following ways:

- As a new composition, with each layer in the Adobe Photoshop file becoming a separate layer in the composition that keeps its original dimensions; this option, Composition - Cropped, makes it easier to manipulate layers and speeds their rendering time.
- As a new composition, with each layer in the Adobe Photoshop file becoming a separate layer in the composition and changing dimensions to match the composition size; this option, Composition, is helpful when you need to align layers manually.
- As a single still footage item imported from any one layer in the Adobe Photoshop file.
- As a single still footage item merged as you import multiple Adobe Photoshop layers.

When you import a layered Adobe Photoshop file as a composition, all the layers contained in the composition retain their original positions as set in Adobe Photoshop. You can open the composition in After Effects and animate the layers.

Note: When you import an Adobe Photoshop file as a composition, guides in the file are imported as well.

To import a layered Adobe Photoshop file as a new composition:

- 1 Choose File > Import > File.
- 2 Select the name of the file you want to open. If the file does not appear, select the option for showing all files from the Files of Type (Windows) or the Show (Mac OS) pop-up menu.
- 3 Choose Composition or Composition - Cropped Layers from the Import As pop-up menu, and then click Open (Windows) or Import (Mac OS).

The original filename is used twice in the Project window: for the file as a composition and for the folder containing each Adobe Photoshop layer as separate footage items.

To import an Adobe Photoshop file or one of its layers as a single footage item:

- 1 Choose File > Import > File.
- 2 Select the name of the file you want to open. If the file does not appear, select the option for showing all files from the Files of Type (Windows) or the Show pop-up menu (Mac OS).
- 3 Choose Footage from the Import As pop-up menu, and then click Open (Windows) or Import (Mac OS). The *filename.psd* dialog box appears (unless you have set Preferences to skip this dialog box).
- 4 Specify the following options in the *filename.psd* dialog box, and then click OK:

- Choose the name of the layer to import, or choose Merged Layers to import all layers from the Choose Layer pop-up menu.
- Choose Layer Size or Document Size from the Footage Dimensions pop-up menu.

Note: When you import one Adobe Photoshop layer as a single footage item, its name in the Project window consists of the layer name followed by the Adobe Photoshop filename.

Using transparent areas and layer masks from Adobe Photoshop

Adobe Photoshop supports a transparent area and one optional layer mask (alpha channel) for each layer in a file. You can use these layer masks to specify how different areas within a layer are hidden or revealed. When you import one layer of an Adobe Photoshop file, After Effects combines the layer mask (if present) with the transparent area and imports it as a straight alpha channel.

If you import a layered Adobe Photoshop file as a merged file, After Effects merges the transparent areas and layer masks of all the layers into one alpha channel that is premultiplied with white. (See [“Importing layered Adobe Photoshop files” on page 49](#).)

If a layered Adobe Photoshop file contains clipping groups, After Effects imports each clipping group as a composition nested within the main composition. After Effects automatically applies its Preserve Underlying Transparency option to each layer in the clipping-group composition, to maintain transparency settings.

When you import an Adobe Photoshop file as a composition, any vector masks in the imported layers are converted to After Effects masks. You can then modify and animate these masks within After Effects.

After Effects also supports any blending modes applied to the file. (See [“Preserving underlying transparency during compositing” on page 199](#).)

Using adjustment layers from Adobe Photoshop

Adjustment layers in Adobe Photoshop change the color and tonal qualities of an image without permanently modifying the original image. Adobe Photoshop adjustment layers affect the appearance of all layers below them. When you import an Adobe Photoshop file containing one or more adjustment layers as a composition, After Effects directly converts the Adobe Photoshop adjustment layers to After Effects adjustment layers. Turn off the Adjustment Layer switch in After Effects to remove the effect and display the layer as a white solid. To remove the effect and the white solid, either delete the adjustment layer or turn off the Video switch for the layer. (See [“Creating an adjustment layer” on page 94](#) and [“About After Effects Audio/Video switches” on page 107](#).)

Using Adobe Photoshop layer effects

In Adobe Photoshop you can use a layer effect to modify the layer style to which it is applied. When you import an Adobe Photoshop file as a composition, and one or more of the layers contain layer effects, then After Effects includes the effects and the layer as two or more separate layers in the Timeline window.

Note: Only some Adobe Photoshop layer effects can be imported into After Effects. These include Drop Shadow, Inner Shadow, Outer Glow, Inner Glow, Bevel and Emboss, and Color Fill.

You can edit or remove a layer effect by using either the Timeline window or the Effect Controls window. You can also animate Adobe Photoshop layer effects over time.

To edit an Adobe Photoshop layer effect in After Effects:

- 1 Open the composition containing the layer effect.
- 2 In the Timeline window, select the layer containing the effect and press E to display the effect properties.
- 3 Click the underlined value you want to change and type a new value.

A single Adobe Photoshop layer effect can be translated as up to five layers and effects in After Effects. You may need to edit multiple copies of each Adobe Photoshop layer in After Effects to achieve the desired result.

Importing an Adobe Illustrator, PDF, or EPS file

You can import Adobe Illustrator, many PDF, and EPS files directly into After Effects. When you import an Adobe Illustrator file, After Effects converts all text information to paths, eliminating the need to create outlines in Adobe Illustrator before importing. If you import a file without creating outlines, make sure that all fonts used in the file are available to After Effects when you import.

When you import an Adobe Illustrator file, After Effects automatically makes all empty areas transparent by converting them into an alpha channel.



After Effects can import Adobe Illustrator CMYK files. However, to maintain accurate color, convert your CMYK images to RGB images in Adobe Illustrator. When you import Adobe Illustrator CMYK images, After Effects remaps the CMYK colors to RGB and this may cause a subtle shift in colors.

Preparing your Adobe Illustrator file for import

Before you save your file from Adobe Illustrator, consider the following:

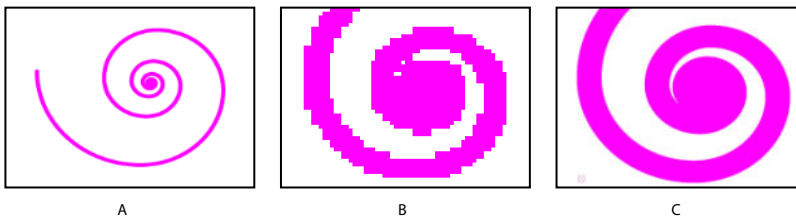
- To ensure that Adobe Illustrator files display correctly in After Effects, select the Create PDF Compatible File option in the Illustrator Native Format Options dialog box.
- To copy paths between Adobe Illustrator and After Effects, make sure the AICB option is selected in the Files & Clipboard section of the Adobe Illustrator Preferences dialog box.
- To ensure that files rasterize completely in After Effects, save your file in the AI format instead of the Adobe Illustrator 9.x EPS format.
- To ensure that all the layers in your Adobe Illustrator file display when you merge the layers in After Effects, make sure that Visibility is turned on for all layers in Adobe Illustrator before you save the file.

Continuously rasterizing an Adobe Illustrator file

You can continuously rasterize an Adobe Illustrator file at any time while designing your project. When you apply an effect to a continuously rasterized layer, the results of the effect may be different than when you apply the effect to a non-rasterized layer. This is because the default rendering order for the layer changes. When applying effects, keep in mind that the default rendering order for a non-rasterized layer is masks, effects, and then geometrics (transformations), whereas the default rendering order for a continuously rasterized layer is masks, geometrics (transformations), and then effects. So, for example, if you have an Adobe Illustrator file that has a picture of a dog in it and you want to animate the scale of the dog and apply the Bulge effect to the dog's nose, turn off continuous rasterization so that the bulge will stay on the dog's nose as the picture scales larger and smaller. If you apply an effect to a continuously rasterized layer, make sure to check the results of the effect before continuing to work on your project.


Note: You cannot paint interactively on a continuously rasterized layer; however, you can apply a paint effect by copying and pasting or using the Favorites menu.

Whether you choose to continuously rasterize or not, if you view and render a composition using Best Quality, After Effects *anti-aliases* (smooths) the art.



Adobe Illustrator file imported and rasterized in After Effects **A.** Original **B.** Enlarged with Continuously Rasterize switch turned off **C.** Enlarged with Continuously Rasterize switch turned on

To continuously rasterize an Adobe Illustrator file:

- 1 Select the layer containing the Adobe Illustrator file in the Timeline window.
- 2 Click the Collapse Transformations/Continuously Rasterize switch so that the “on” icon  appears for that layer.

Note: When you turn on Collapse Transformations/Continuously Rasterize, the Layer window closes and you cannot open it until you turn the switch off.

Importing layers from Adobe Illustrator

You can import a multilayered Adobe Illustrator file in the following ways:

- As a new composition, with each layer in the Adobe Illustrator file becoming a separate layer in the composition that keeps its original dimensions; this option, Composition - Cropped, makes it easier to manipulate layers, and speeds their rendering time.
- As a new composition, with each layer in the Adobe Illustrator file becoming a separate layer in the composition and changing dimensions to match the composition size; this option, Composition, is helpful when you need to align layers manually.
- As a single still image imported from any one layer in the Adobe Illustrator file.

- As a single still image imported from all the Adobe Illustrator layers merged together.

Note: When you import a multilayered Adobe Illustrator file as a composition, the Adobe Illustrator layer blending modes are preserved.

To import a layered Adobe Illustrator file as a layered composition:

- 1 Choose File > Import > File.
- 2 Select the name of the file you want to open. If the file does not appear, select the option for showing all files from the Files of Type (Windows) or the Show (Mac OS) pop-up menu.
- 3 Choose Composition, or Composition - Cropped Layers from the Import As pop-up menu, and then click Open (Windows) or Import (Mac OS).

The original filename is used twice in the Project window: for the file as a composition and for the folder containing each Adobe Illustrator layer as separate footage items.

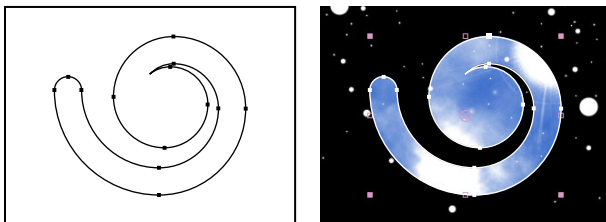
To import an Adobe Illustrator file or one of its layers as a single footage item:

- 1 Choose File > Import > File.
- 2 Select the name of the file you want to open. If the file does not appear, select the option for showing all files from the Files of Type (Windows) or the Show (Mac OS) pop-up menu.
- 3 Choose Footage from the Import File As pop-up menu, and then click Open (Windows) or Import (Mac OS).
- 4 In the *filename.ai* dialog box, choose a layer to import or choose Merged Layers from the Choose Layer pop-up menu, and then choose Layer Size or Document Size from the Footage Dimensions pop-up menu.
- 5 Click OK.

Importing Adobe Illustrator paths as masks

You can use an Adobe Illustrator path as a mask in an After Effects layer composition by copying the path in Adobe Illustrator and pasting it directly into the Layer or Composition window in After Effects. After Effects creates a mask for each closed path copied from Adobe Illustrator. (See [“Working with masks” on page 176.](#))

Note: You can also use a copied Adobe Illustrator or Adobe Photoshop path as an After Effects motion path. (See [“Creating motion paths with masks” on page 131.](#))



Shape drawn in Adobe Illustrator (left) and pasted into After Effects as a mask (right)

To import an Adobe Illustrator path as a mask:

- 1 In Adobe Illustrator, create your path, select all of the points along the path, and then choose Edit > Copy.

2 In After Effects, open the Layer window for the layer into which you want to import the path.

3 Choose Edit > Paste.

Important: You must select the AICB option in the Files & Clipboard section of the Adobe Illustrator Preferences dialog box for this method to work.

Importing an After Effects project

You can import one After Effects project into another. Everything from the imported project, including footage files, compositions, and folders, appears inside a new folder in the current Project window. When you want to repeat a complicated mask, effect, or animation in a different project, you can import the project containing the effect and simply replace the source footage, keeping all the effect, composition, and layer settings intact. (See [“Importing files into a project” on page 42.](#))

Importing After Effects projects from different platforms

You can open and import an After Effects project from a different operating system as long as you maintain the filenames, folder names, and either full paths or relative paths (folder locations) for all files in the project. To maintain relative paths, the source footage must reside on the same volume as the project file.

If a file format is not supported on the operating system you are using, if the file is missing, or if the reference link is broken, After Effects substitutes a placeholder item containing color bars. You can reconnect the placeholder to the appropriate file. You can use the same process to connect a footage item in the Project window to a different source file.

To relink a reference:

1 Select the placeholder or footage file in the Project window, and choose File > Replace Footage > File.

2 In the Replace Footage File dialog box, locate and select the footage file you want to use.

Note: You can also open this dialog box by double-clicking the placeholder.

For more information on substituting footage, see [“Replacing and substituting footage” on page 69.](#)

Importing Adobe Premiere projects

The ability to import Adobe Premiere projects eliminates the need to render the project before applying visual effects and animations in After Effects. When you import an Adobe Premiere project, After Effects imports it into the Project window as both a new composition containing each Adobe Premiere clip as a layer, and as a folder containing each clip as an individual footage item. If your Adobe Premiere project contains bins, After Effects converts them to folders within the Adobe Premiere project folder.

After Effects preserves the order of clips in the Timeline, the footage duration (including all trimmed In and Out points), and the marker and transition locations. The arrangement of layers in the Timeline window is based on the arrangement of clips in the Adobe Premiere Timeline. After Effects adds Adobe Premiere clips to the Timeline window as layers in the order they appeared—from the bottom up and from left to right—in the Adobe Premiere Timeline.

Changes made to the speed of a clip, for example, with the Clip > Speed command, are preserved in After Effects and appear as a value in the Stretch column in the After Effects Timeline window. Common effects used by Adobe Premiere and After Effects are also imported, and keyframes for these effects are preserved as well. If you are working in Adobe Premiere, an After Effects icon in the Effects palette denotes common effects used by the two applications. Transitions and titles included in your Adobe Premiere project appear in the After Effects composition as solid layers, maintaining their original location and duration. After Effects discards all transparency and motion settings. (See [“Importing files into a project” on page 42.](#))

Import Adobe Premiere projects in the same way you import footage files: Choose File > Import > File, and locate the Adobe Premiere project file that you want to import.

Importing 3D-image files

After Effects can import 3D-image files saved in Softimage PIC, RLA, RPF, and Electric Image EI format. These 3D-image files contain red, green, blue, and alpha (RGBA) channels, as well as auxiliary channels with optional information, such as z depth, object IDs, texture coordinates, and more.

With RLA and RPF files, all of the auxiliary channels are included in a single file. Softimage PIC files have a corresponding ZPIC file that contains the z-depth channel information. Although you can't import a ZPIC file, you can access the additional channel information as long as the ZPIC file is stored in the same folder as the imported PIC file.

Similarly, Electric Image (EI) files can now have associated EIZ files with z-depth channel data. Just as with ZPIC files, you cannot import EIZ files into After Effects; instead, you simply store them in the same folder as the EI files. For information about creating EIZ files, see your Electric Image documentation.

Importing an audio file

You can import a variety of audio file formats directly into After Effects. When you add audio-only files to a composition, they appear as layers in the Timeline window. You can adjust the audio preview settings, such as sample rate, in the Previews section of the Preferences dialog box. These settings change the quality of audio playback when you preview the composition, not when you render it. (See [“Using audio layers” on page 112.](#))

Importing Cineon files

You can import Cineon 4.5 or Digital Picture Exchange (DPX) files directly into an After Effects project as individual frames or as a sequence of numbered stills. Once you have imported a Cineon file, you can use it in a composition and then render the composition as a Cineon sequence. (See [“Importing a sequence of still-image files” on page 43.](#))

Cineon files are commonly used to transfer motion-picture film to a digital format. To preserve the full dynamic range of motion-picture film, Cineon files are stored using logarithmic 10 bits per channel (bpc) color. However, After Effects internally uses linear 8-bpc color, (or 16-bpc color for the After Effects Professional Edition only). By default, After Effects stretches the attendant logarithmic values to the full range of values available. You can then use the Cineon Import Options dialog box or the Cineon Converter effect to control the conversion. If you are working with a film sequence in which exposure conditions vary over time, you can vary the conversion over time by setting keyframes.



For information on using the Cineon converter, see “Cineon Converter” in the online Effects Help.

To import a Cineon sequence:

- 1 Choose File > Import > File.
- 2 For the file type, select Cineon, and then select Cineon Sequence.
- 3 Locate and select the first numbered Cineon sequence file.
- 4 Select the Cineon Sequence option, and then click Open.

The Cineon file or sequence appears in the Project window.

To convert a Cineon sequence from logarithmic to linear:

- 1 Select the sequence in the Project window, and choose File > Interpret Footage > Main.
- 2 In the Interpret Footage dialog box, click More Options.
- 3 In the Cineon Conversion dialog box, select the Logarithmic Conversion option, click OK, and click OK again.

When you are ready to produce output from the Cineon file, it is important that you reverse the conversion from logarithmic to linear.

Preparing motion footage for import

Some of the source footage you use may have been created digitally (for example, in Adobe Photoshop or Adobe Premiere), but other footage may need to be transferred to the computer from analog sources, such as film and videotape. When you work with After Effects, understanding some of the differences among media can help you decide how to handle footage as you transfer it between digital and analog devices. For more information, see [“Analog video” on page 56](#), [“Analog film” on page 56](#), [“Digital video” on page 57](#), and [“Interlaced and noninterlaced footage” on page 57](#).

Analog video

Analog video carries picture and sound information by creating variations in an electromagnetic signal. Before you can import analog video into After Effects, you need to digitize it. Digitizing converts the electromagnetic signal to a binary signal, which can be read by a computer.

Analog film

Analog film, such as a still transparency or common motion-picture film, carries picture information by creating variations in colored dyes on a strip of acetate.

To apply digital effects to motion-picture film using After Effects, you must first transfer the film to a digital format. You can transfer film in two ways:

- Use a film scanner to transfer each analog film frame directly to a digital movie frame. This method best preserves the image quality. Using a film scanner is preferable, because you scan the footage directly to the computer as noninterlaced, full-resolution, 24-fps footage; in other words, it is ready to use in After Effects. (See [“Importing Cineon files” on page 55.](#))
- Transfer the analog film to analog videotape, and then digitize the videotape. This process is called *telecine transfer*. It converts 24-fps film footage to 30-fps videotape using *3:2 pulldown*. Transferring using the 3:2 pulldown method introduces two issues: You must resolve the different frame rates of videotape and motion-picture film, and you must separate the fields of the interlaced video. After Effects can automatically resolve both of these issues while preserving image quality. (See [“About 3:2 pulldown” on page 61.](#))

Note: To use an After Effects movie in an analog motion-picture film, you must transfer the movie back to the analog film medium. This transfer process is generally done at a post-production facility.

Digital video

Digital video carries picture information by representing each pixel of a video frame as a discrete color value and transmitting and storing the pixel values in the binary data format used by computers. Sound is also carried as binary data.

Digital video is not one format, but a medium within which many file formats exist. Even if your source footage was created digitally, you still need to make sure that it is stored in a file format that After Effects can import.

If you plan to distribute the movie digitally, for example on CD-ROM, you must render it in a file format appropriate for your distribution method. (See [“Making \(rendering\) a movie” on page 327.](#))

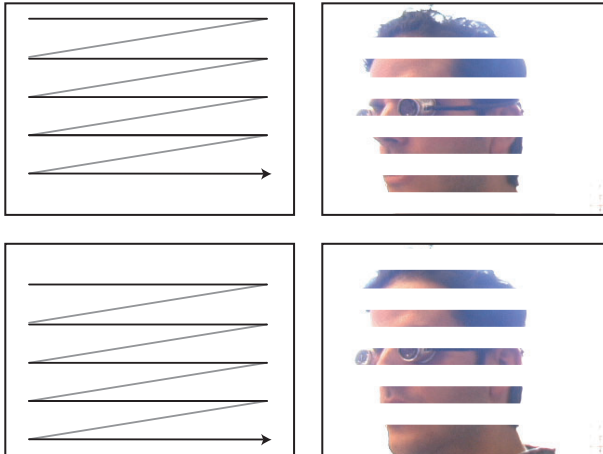
Note: DV video format is a form of digital video that can be downloaded directly to your hard disk for editing in applications such as Adobe After Effects and Adobe Premiere. Many DV decks can connect directly to a computer using an IEEE 1394 (FireWire™/i.Link) interface. (See [“About D1, DV, and various pixel aspect ratio footage” on page 63.](#))

Interlaced and noninterlaced footage

Another way to classify analog or digital footage is as *interlaced* or *noninterlaced*. Currently, most broadcast video is interlaced; each frame consists of two fields displayed in turn. The computer operating system and After Effects display noninterlaced video, also known as *progressive scan*, in which each frame is displayed completely from top to bottom. When you finish creating a movie for display on a television, After Effects can render it back to fields, maintaining high quality for broadcast display.

Interlaced video consists of two fields, known either as Field 1 and Field 2, even and odd, or (as After Effects refers to them) upper and lower. When these fields are presented sequentially on an NTSC or PAL video monitor, they create a smooth, unified picture.

In interlaced video, a frame is divided into two fields. Each field contains every other horizontal line in the frame. A TV displays the first field of alternating lines over the entire screen, and then displays the second field to fill in the alternating gaps left by the first field. One NTSC video frame, displayed for approximately $1/30$ of a second, contains two interlaced fields, displayed for approximately $1/60$ of a second each.



Interlaced video describes a frame with two passes of alternating scan lines.

In noninterlaced video, scan lines are drawn in order from top to bottom, in one pass. Computer video and computer movie formats are generally noninterlaced. Motion-picture film is similar to noninterlaced video because it also displays an entire frame in one pass.

Interlacing is a factor in image quality only for certain effects, such as rotating a frame or compositing video with digital effects. It is a characteristic of footage capture and display, not a structural component of file formats or media. You can easily play back a digitized NTSC or PAL movie (interlaced) on a computer display (noninterlaced), or display a 35mm photograph (noninterlaced) on an NTSC or PAL video monitor (interlaced).

If you use interlaced video in a composition or want to use an After Effects movie in an interlaced-video medium such as NTSC, you must separate fields as you import and field-render the composition to a finished movie file. (See [“Using interlaced video in After Effects” on page 59](#), [“Field rendering” on page 61](#), and [“Testing the field-rendering order” on page 360](#).)

Preparing a movie for import when final output is NTSC interlaced video

You can edit and prepare video footage in other applications, such as Adobe Premiere, before importing it into After Effects. If you want to render the footage from After Effects as NTSC interlaced video, do not field-render or create interlaced frames when you render the movie from the other application. It's acceptable to render interlaced video for temporary files, but 60 progressive gives better quality. Make sure that you keep track of the original field order so you can correctly render it in After Effects. (See [“Field rendering” on page 61](#) and [“Testing the field-rendering order” on page 360](#).)

As long as the footage is on a computer, it should remain noninterlaced. Keeping the footage in noninterlaced format preserves more image quality and saves you the extra step of separating fields in After Effects. Once it's ready to go to your nonlinear editor, such as Adobe Premiere, it should be interlaced.

When you render the movie from the other application, render it at 60 fps of frame-rendered (noninterlaced) video. After you integrate it into a composition, After Effects can render it to high-quality field-rendered (interlaced) frames at 30 fps for videotape.

Preparing motion-footage frame rates for final output

When you import motion footage into After Effects, the file's frame rate does not change. If you plan to output your footage to a different frame rate, you can make it conform to the new frame rate in After Effects. Conforming ensures that frames disperse evenly over the new output frame rate.

Conforming footage does not alter the original footage, only the reference that is used by After Effects. When it conforms, After Effects changes the internal duration of frames but does not change the frame content. If the conformation is a large amount, the footage plays back at a different speed. For example, if you change the frame rate from 15 fps to 30 fps, the footage plays back faster.

It's best to make the frame rate the same as the final output frame rate for your project. This way, After Effects renders each frame, and the final output does not omit or duplicate frames. However, in order not to drastically change the speed of your motion footage, it may be beneficial to conform only by a small amount, making the new frame rate divisible by the output rate. For example, if your original footage has a frame rate of 29.97 fps and you want to output it for playback on CD-ROM at 10 fps, you can conform to 30 fps. At 30 fps, the frames are divisible by 10, so After Effects can evenly render every third frame.

Note: *If you want to output original NTSC footage as PAL or vice versa, you must have access to hardware that supports each format.*

To change the frame rate of a motion footage file:

- 1 Select the footage file in the Project window.
- 2 Choose File > Interpret Footage > Main.
- 3 Select Conform to Frame Rate, type a new frame rate for Frames Per Second, and then click OK.

Note: *This procedure can change the synchronization of audio and video files. Be sure to check your files and make any necessary adjustments.*

Using interlaced video in After Effects

If you want to use interlaced or field-rendered footage (such as from NTSC video) in an After Effects project, you will get the best results if you separate the video fields when you import the footage. After Effects separates video fields by creating a full frame from each field, preserving all of the image data from the original footage.

When importing interlaced video that was originally transferred from film, you can remove the 3:2 pulldown that was applied during the transfer from film to video as you separate fields so that effects you apply in After Effects don't appear distorted. (See [“Removing 3:2 or 24Pa pulldown from video transferred from film or DV cameras” on page 62.](#))

Separating fields

Separating fields is critical if you plan to make significant changes to the footage. When you scale, rotate, or apply effects to interlaced video, unwanted artifacts, such as crossed fields, are often introduced. By separating fields, After Effects accurately converts the two interlaced frames in the video to noninterlaced frames, while preserving the maximum amount of image quality. Using noninterlaced frames allows After Effects to apply edits and effects consistently and at the highest quality.

After Effects creates field-separated footage from a single formerly interlaced field by splitting fields into two independent frames. Each new frame has only half the information of the original frame, so some frames may appear to have a lower resolution than others when viewed at Draft quality. When you render the final composition, After Effects reproduces high-quality interlaced frames for videotape. When you render a movie at Best quality, After Effects interpolates between the scan lines of a field to produce maximum image quality.

Note: After Effects automatically separates fields for D1 and DV video footage files. You can manually separate fields for all other types of video footage in the Interpret Footage dialog box. (See [“Specifying interpretation rules” on page 41.](#))

To separate video fields in imported footage:

- 1 Select the footage item in the Project window.
- 2 Choose File > Interpret Footage > Main.
- 3 Choose an option from the Separate Fields pop-up menu.
- 4 Click Motion Detect (Best Quality Only) to increase image quality in nonmoving areas when the image is rendered at Best quality. Then click OK.


Interpreting field order

Interlaced video has a *field order* defining the order in which the two video fields (upper and lower) are displayed. A system that draws the upper lines before the lower lines is called *upper-field first*; one that draws the lower lines before the upper lines is called *lower-field first*. The order in which the fields are displayed is important, especially when the fields contain motion. If you separate video fields using the wrong field order, motion will not appear smooth.

Some programs, including After Effects, label the field order when rendering interlaced video files. When you import a labeled video file, After Effects honors the field order label automatically. You can override the field order using the Interpretation Rules file. For more information about field order, see [“Specifying interpretation rules” on page 41.](#)

If a file does not contain a field order label, you can match the original field order of your footage. If you are not sure which field order was used to interlace a footage item, use the procedure below to find out.

To determine the original field order:

- 1 Select the item in the Project window.
- 2 Choose File > Interpret Footage > Main.
- 3 In the Interpret Footage dialog box, select Upper Field First from the Separate Fields pop-up menu, and then click OK.
- 4 In the Project window, press Alt (Windows) or Option (Mac OS) as you double-click the footage to open it in a Footage window.
- 5 If the Time Controls palette is not visible, choose Window > Time Controls.
- 6 In the Footage window, find a segment that contains one or more moving areas.
- 7 Using the Frame Advance button  on the Time Controls palette, step forward at least five frames in the Footage window. Moving areas should move consistently in one direction. If the moving areas move backward every other frame, the wrong field-separation option has been applied to the footage.

Note: Analog capture cards can vary. DV or footage captures from IEEE 1394 FireWire/i.Link are always lower-field first.

Field rendering

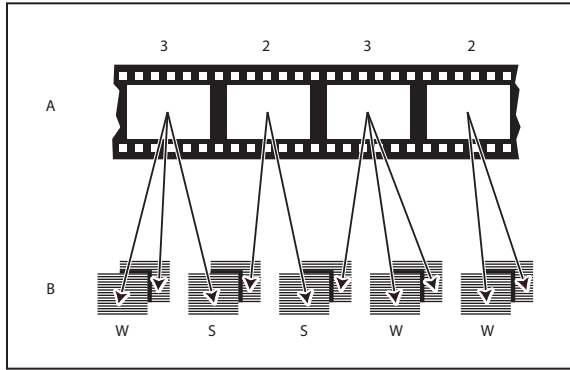
When you render a composition containing separated footage, set the Field Rendering option to the same field order as your video equipment. If you don't field-render the composition, or if you field-render with the incorrect settings, the final movie may appear too soft, jerky, or distorted. (See [“Testing the field-rendering order” on page 360.](#))

About 3:2 pulldown

When you transfer 24-fps film to 29.97-fps (NTSC) video, you use a process called 3:2 *pulldown*, in which the film frames are distributed across video fields in a repeating 3:2 pattern. The first frame of film is copied to fields 1 and 2 of the first frame of video, and also to field 1 of the second video frame. The second frame of film is then spread across the next two fields of video—field 2 of the second video frame and field 1 of the third frame of video. This 3:2 pattern is repeated until four frames of film are spread over five frames of video, and it is then repeated.

The 3:2 pulldown process results in *whole frames* (represented by a W) and *split-field* frames (represented by an S). The three whole video frames contain two fields from the same film frame. The remaining two split-field frames contain a video frame from two different film frames. The two split-field frames are always adjacent to each other. The *phase* of 3:2 pulldown refers to the point at which the two split-field frames fall within the first five frames of the footage.

Phase occurs as a result of two conversions that happen during 3:2 pulldown: 24-fps film is redistributed through 30-fps video, so each of four frames of 24-fps film is spread out over five frames of 30(29.97)-fps video. First, the film is slowed down 0.1% to match the speed difference between 29.97 fps and 30 fps. Next, each film frame is repeated in a special pattern and mated to fields of video.



When you apply 3:2 pulldown to footage, one frame of the film (A) is separated into two or three interlaced video fields (B), which are grouped into video frames containing two fields each.

Removing 3:2 or 24Pa pulldown from video transferred from film or DV cameras

It's important to remove 3:2 pulldown from video footage that was originally film so that effects you add in After Effects synchronize perfectly with the original frame rate of film. Removing 3:2 pulldown reduces the frame rate by 4/5: from 30 to 24 fps or from 29.97 to 23.976 fps, which also reduces the number of frames you have to change. To remove 3:2 pulldown, you must also indicate the phase of the 3:2 pulldown. (See [“About 3:2 pulldown” on page 61.](#))

Before you remove 3:2 pulldown, separate the fields as either upper-field first or lower-field first. Once the fields are separated, After Effects can analyze the footage and determine the correct 3:2 pulldown phase and field order. If you already know the phase and field order, choose them from the Separate Fields and the Remove Pulldown pop-up menus in the Interpret Footage dialog box.

After Effects also supports Panasonic DVX100 24p DV camera pulldown, called 24P Advance (24Pa). This format is used by some cameras to capture 23.976 progressive-scan imagery using standard DV tapes.

To remove 3:2 or 24Pa pulldown from video:

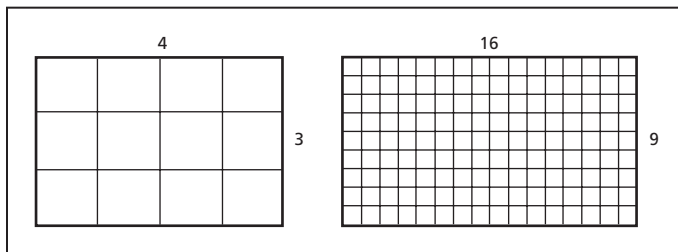
- 1 In the Project window, select the footage from which you want to remove 3:2 pulldown.
- 2 Choose File > Interpret Footage > Main.
- 3 In the Fields and Pulldown section, select Upper Field First or Lower Field First from the Separate Fields pop-up menu.
- 4 Do one of the following and click OK:
 - If you know the phase of the 3:2 or 24Pa pulldown, choose it from the Remove Pulldown pop-up menu.

- To have After Effects determine the correct settings, click Guess 3:2 Pulldown or Guess 24Pa Pulldown.

Note: If your footage file contains frames from different sources, the phase may not be consistent. If this is the case, import the footage once for each phase. Then, add the footage to your composition as many times as there are phases and trim each layer to use only the appropriate frames for each phase.

About D1, DV, and various pixel aspect ratio footage

Pixel aspect ratio specifies the ratio of width to height of one pixel in an image. *Frame aspect ratio* describes the ratio of width to height in the frame dimensions of an image. For example, D1 NTSC has a pixel aspect ratio of 0.9 (or 0.9 width by 1.0 height). It also has a frame aspect ratio of 4:3 (or 4.0 width by 3.0 height).

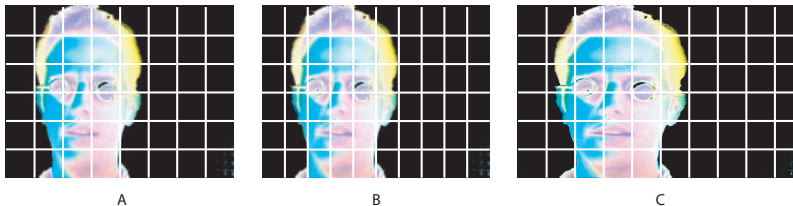


A 4:3 frame aspect ratio (left), and a wider 16:9 frame aspect ratio (right)

Some video formats output the same frame aspect ratio but use a different pixel aspect ratio. For example, some NTSC digitizers produce a 4:3 frame aspect ratio, with square pixels (1.0 pixel aspect ratio), and a resolution of 640 x 480. D1 NTSC produces the same 4:3 frame aspect ratio but uses rectangular pixels (0.9 pixel aspect ratio) and a resolution of 720 x 486. D1 pixels, which are always rectangular, are vertically oriented in systems producing NTSC video and horizontally oriented in systems producing PAL video.

If you display rectangular pixels on a square-pixel monitor without alteration, images and motion appear distorted; for example, circles distort into ovals. However, when displayed on a broadcast monitor, the images are correct.

💡 To view rectangular pixels on a square pixel monitor, choose View Options from the Composition Window options menu and then select Pixel Aspect Ratio Correction. Because it slows performance, this is recommended for viewing only.



Square and nonsquare pixels **A.** Square pixels and 4:3 frame aspect ratio **B.** Nonsquare pixels and 4:3 frame aspect ratio **C.** Nonsquare pixels displayed on a square-pixel monitor

When you import D1 NTSC or DV source footage into After Effects, the image looks slightly wider than it does on a D1 or DV system. (D1 PAL footage looks slightly narrower.) The opposite effect occurs when you import anamorphic footage using D1/DV NTSC Widescreen or D1/DV PAL Widescreen. Widescreen video formats have a frame aspect ratio of 16:9.

If a file uses rectangular pixels, After Effects displays the pixel aspect ratio next to the file's image thumbnail in the Project window. You can change the pixel aspect ratio interpretation for individual files in the Interpret Footage dialog box. By ensuring that all footage files are interpreted correctly, you can combine footage with different ratios in the same project or composition and generate output that plays correctly.

When you import footage with either the D1 resolution of 720 x 486, or the DV resolution of 720 x 480, After Effects automatically sets the pixel aspect ratio for that file to D1/DV NTSC. When you import footage with the D1 or DV resolution of 720 x 576, After Effects automatically sets the pixel aspect ratio for that file to D1/DV PAL. However, it is always a good idea to make sure that all files are interpreted correctly by looking in the Project window or the Interpret Footage dialog box. For information about using interpretation rules to automate the import process, see [“Specifying interpretation rules” on page 41](#).

Note: Make sure to reset the pixel aspect ratio to Square Pixels when you import a square-pixel file that happens to have a D1 or DV resolution—for example, an Adobe Photoshop image with a resolution of 720 x 480.

Setting pixel aspect ratio

It is important to set the pixel aspect ratio for a footage file at its original ratio, not the ratio of the final output. After Effects reads and writes pixel aspect ratios directly from QuickTime movies. For example, if you import a movie captured as widescreen (16:9 DV), After Effects automatically tags it correctly.

For general information about pixel aspect ratio, see [“About D1, DV, and various pixel aspect ratio footage” on page 63](#).

Set pixel aspect ratios for footage and compositions with these approximate values:

Format	Aspect ratio in pixels	When to use
Square Pixels	1.0	Your footage has a 640 x 480 or 648 x 486 frame size.
D1/DV NTSC	0.9	Your footage has a 720 x 480 or 720 x 486 frame size, and your desired result is a 4:3 frame aspect ratio.
D1/DV NTSC Widescreen	1.2	Your footage has a 720 x 480 or 720 x 486 frame size, and your desired result is a 16:9 frame aspect ratio.
D1/DV PAL	1.0666	Your footage has a 720 x 576 frame size, and your desired result is a 4:3 frame aspect ratio.

Format	Aspect ratio in pixels	When to use
D1/DV PAL Widescreen	1.422	Your footage has a 720 x 576 frame size, and your desired result is a 16:9 frame aspect ratio.
Anamorphic 2:1	2.0	Your footage was shot using an anamorphic film lens.
D4/D16 Standard	0.948	Your footage has a 1440 x 1024 or 2880 x 2048 frame size, and your desired result is a 4:3 frame aspect ratio.
D4/D16 Anamorphic	1.896	Your footage has a 1440 x 1024 or 2880 x 2048 frame size, and your desired result is an 8:3 frame aspect ratio.

To set the pixel aspect ratio for imported footage:

- 1 Select the footage in the Project window.
- 2 Choose File > Interpret Footage > Main.
- 3 Choose a ratio from the Pixel Aspect Ratio pop-up menu and click OK.

If you are planning to render to the same pixel aspect ratio as your footage, you also need to set the pixel aspect ratio for the composition.

To set the pixel aspect ratio for a composition:

- 1 Open the composition.
- 2 Choose Composition > Composition Settings.
- 3 Choose a ratio from the Pixel Aspect Ratio pop-up menu and click OK.

In some circumstances, you may need to work on a monitor that doesn't match the pixel ratio, so that your working view doesn't match the final output. You can correct the pixel aspect for previewing purposes.

To correct pixel aspect distortion (for previewing only):

With the appropriate composition open, click the Toggle Pixel Aspect Ratio Correction button  at the bottom of the Composition window.

Using square-pixel footage for output to D1 or DV NTSC

You can use square-pixel footage in a D1/DV NTSC composition and generate output that does not appear distorted. Note that the pixel aspect ratio is identical between D1 and DV, but there is a slight difference in composition frame size. The steps that follow contain information about issues discussed elsewhere in this guide.

To use square-pixel footage when outputting to D1 or DV NTSC:

- 1 Prepare square-pixel footage that fills the entire frame using one of the following methods:
 - If your final output is DV NTSC, create and save it at a 720 x 534 frame size.
 - If your final output is D1 NTSC, create and save it at a 720 x 540 frame size.

- If your final output is D1/DV PAL, create and save it at a 768 x 576 frame size.
- 2** Import the file into After Effects.
- If your square-pixel footage was created and saved at 720 x 486 or 720 x 480, select it and choose File > Interpret Footage > Main. Then choose Square Pixels from the Pixel Aspect Ratio pop-up menu and click OK.
- 3** Choose Composition > New Composition, and then select one of the following:
 - If your final output is DV, choose NTSC DV, 720 x 480 for Preset, and D1/DV NTSC (0.9) for Pixel Aspect Ratio.
 - If your final output is D1, choose NTSC D1, 720 x 486 for Preset, and D1/DV NTSC (0.9) for Pixel Aspect Ratio.
- 4** Select your other Composition settings as desired, and then click OK.
- 5** Add your footage to the new composition.
- 6** Select the layer containing the square-pixel footage and apply the Shrink to Fit command: press Ctrl+Alt+F (Windows) or Command+Option+F (Mac OS).

Note: If your footage was created and saved at a frame size other than those noted in step 1, skip step 6.

Importing DDR-based footage

To find out if After Effects plug-ins are available for your digital disk recorder (DDR), contact your DDR manufacturer.

You can bring DDR-based footage into an After Effects project in two ways. First, you can work with the footage while it remains on the DDR, essentially treating the DDR as a remote hard disk. You can also transfer the footage to your hard disk and import it into an After Effects project as you would any other file.

For information on using your specific DDR with After Effects, refer to your DDR manufacturer's plug-in documentation.

Setting up frames and fields for DDR-based footage

When working with DDR-based footage in After Effects, make sure that your Composition Settings, Render Settings, and the Interpret Footage dialog boxes for the footage files are all set to the fps used by your DDR. If the frame rate in the Interpret Footage dialog box is 29.97 and the Composition Settings frame rate is 30 fps, the footage will appear with duplicate frames.

It is also important to separate fields when importing DDR-based footage. Make sure that the field settings in the Interpret Footage and Render Settings dialog boxes are the same; otherwise, the footage will preview and render with the wrong field order, causing the footage to play back with a jerky appearance. (See [“Using interlaced video in After Effects” on page 59.](#))

For information on using your specific DDR with After Effects, refer to your DDR manufacturer's documentation.

Building a Composition

Working with imported footage

After you have imported footage, you can view, edit, and change settings for your imported footage without using a Composition window.

Viewing imported footage

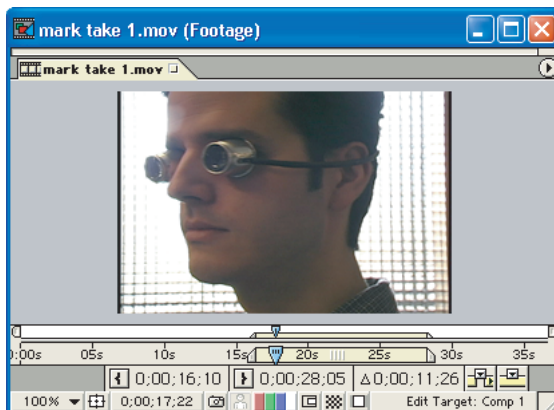
You can view any movie or graphic item listed in a Project window at full size by opening it in a Footage window. You can also view the footage at different magnifications and examine individual frames.

When you double-click a movie in the Project window, it opens by default in the appropriate Footage window: QuickTime (.mov) files open in the QuickTime Footage window; Video for Windows (.avi) files open in the Video for Windows Footage window. Still images always appear in an After Effects Footage window.

Note: Certain AVI files are not supported by the AVI Footage window, and will open in the After Effects Footage window. These include files created with Microsoft's DirectX DV Codec, and all files over 2 GB. If the AVI Footage window is empty, Alt-double-click to open the footage in the After Effects Footage window.

The QuickTime and Video for Windows Footage windows do not display the effect of settings made in the Interpret Footage dialog box, such as the alpha channel interpretation. However, for any footage item that includes audio, the QuickTime and Video for Windows Footage windows play the audio, while the After Effects Footage window does not.

To view the footage with more controls and information but without audio, view it in an After Effects Footage window, where you can trim the footage and insert it into the Timeline window. (See [“Working with the Composition, Layer, and Footage windows” on page 28](#) and [“Trimming layer footage” on page 103](#).)



In the After Effects Footage window, you can trim the footage and insert it into the Timeline window.



To open a movie in the default Footage window:

Do one of the following:

- Double-click a movie in the Project window.
- Press Alt (Windows) or Option (Mac OS) and double-click on the layer in the Timeline window.
- Press Alt (Windows) or Option (Mac OS) and double-click on the movie in the Composition window.

To open a movie in an After Effects Footage window:

Press Alt (Windows) or Option (Mac OS) as you double-click a movie in the Project window.

Opening footage in its original application

You can open and edit a footage item in the application in which it was created, directly from an After Effects project. The original application must be installed on the computer you are using, and there must be enough unused RAM for it to run. When you edit and save changes to the footage in the original application, the changes are applied to all instances of the footage as soon as After Effects becomes the active application.

When you edit a still-image sequence selected in the Timeline or Composition windows, After Effects opens the individual image that is currently displayed. When you edit a still-image sequence selected in the Project window, the first image in the sequence opens.

To open a footage item in the original application:

- 1 In the Project window, Composition window, or Timeline window, select the footage or a layer containing the footage. If you selected a still-image sequence from the Composition or Timeline window, move the current-time indicator to the frame displaying the still image you want to edit.
- 2 Choose Edit > Edit Original.
- 3 Edit the footage in its original application, and save the changes.

Note: If you're editing footage that has an alpha channel, make sure that you're viewing and editing all the channels, including the alpha channel, in the other application. Otherwise, changes you make might not be applied to the alpha channel, and it may become misaligned with the color channels.

If your project is open when you make a change to a footage file, After Effects can reload the new version of the file while the project is open.

To reload an edited file:

- 1 In After Effects, select the footage file in the Project window.
- 2 Choose File > Reload Footage.

Setting the frame rate for footage

You can change the frame rate for any movie or sequence of still images. For example, you can import a sequence of ten still images and specify a frame rate of 5 frames per second (fps). (See ["Time basics" on page 18.](#))

To set the frame rate for footage:

- 1 Select an item in the Project window.

2 Choose File > Interpret Footage > Main.

3 In the Frame Rate section of the Interpret Footage dialog box, specify a frame rate for Assume this frame rate.

Note: If you remove 3:2 pulldown from interlaced video footage, After Effects automatically sets the frame rate of the resulting footage to four-fifths of the original frame rate. When removing 3:2 pulldown from NTSC video, the resulting frame rate is 24 fps.

For more information on 3:2 pulldown, see [“About 3:2 pulldown” on page 61](#).

Looping footage

If you intend to loop visual footage continuously in your project, you need to create only one cycle of the footage in After Effects.

To loop footage:

- 1 In the Project window, select the footage you want to loop.
- 2 Choose File > Interpret Footage > Main.
- 3 Type an integer value for Loop and click OK.

Copying Interpret Footage settings

If you want to ensure that different footage items use the same Interpret Footage settings, copy settings from one item and apply them to others.

To apply Interpret Footage settings to several footage items:

- 1 In the Project window, select the item whose footage interpretations you want to apply.
- 2 Choose File > Interpret Footage > Remember Interpretation.
- 3 Select one or more footage items.
- 4 Choose File > Interpret Footage > Apply Interpretation. After Effects applies the footage interpretation options to the selected items.

Replacing and substituting footage

After Effects offers a number of ways to replace and substitute footage in a composition. Using *proxies* or other items in place of original footage can be useful when the footage you want to use is not available. Also, when you are working with large, high-resolution items, you may want to use low-resolution proxies to work more quickly and efficiently.

Replacing footage throughout a project

You can replace one footage item with another at any time while working on a project. This can be useful if you receive a new version of a source file used in your project, and you want to replace the original footage with the new version. The new footage item replaces the existing one in layers and compositions throughout the project. When you replace footage, all values (property settings, effect settings, and so on) remain applied to the layer.

To replace footage throughout a project:

- 1 In the Project window, select the name of the footage item you want to replace.

2 To import a replacement file, choose File > Replace Footage > File, select the file, and then click Open (Windows) or Import (Mac OS).

Note: If the new footage item is a different size, it is not scaled to fit the original item's size.

To replace footage with another footage item already in the Project window:

- 1** In the Project window, select the name of the footage item you want to use as a replacement.
- 2** Press down Alt (Windows) or Option (Mac OS) as you drag the footage item over the item in the Project window you want it to replace.
- 3** Release the mouse and then the keyboard key. The replaced item will remain in the Project window but will no longer be used in any compositions.

Note: If the new footage item is a different size, it is not scaled to fit the original item's size.

Replacing footage of one or more layers

You can replace the original source footage of one or more layers without changing any settings applied to the original footage. The new source footage or composition takes the place of the old source of the layers while retaining all the properties from the old layer.

To replace the source footage of one or more layers:

- 1** In a Timeline window, select the layer or layers to be replaced.
- 2** Hold down Alt (Windows) or Option (Mac OS) as you drag a footage item or composition from the Project window to either of the following places containing the selected layers: the Composition window or the Timeline window.
- 3** Release the mouse and then the keyboard key.

About placeholders and proxies

When you want to temporarily use a substitute for footage, choose one of two alternatives: a *placeholder* or a *proxy*.

Placeholder A still image of color bars used to temporarily take the place of missing footage. Use a placeholder when you are building a composition and want to try out ideas for footage that is not yet available. After Effects generates placeholders automatically, so you do not have to provide any placeholder footage.

Proxy Most often a lower-resolution or still version of existing footage used to replace the original to save processing time. Use a proxy when you have the actual footage but you want to speed up previewing or rendering of test movies. You must have a file available to use as a proxy.

Using either method, any attributes and keyframes you apply to the placeholder or proxy are transferred to the actual footage when you insert it. You can even set a proxy for a placeholder, so that you use a low-resolution or still version of full-resolution footage that is not yet available. (See [“Working with missing source footage” on page 71](#) and [“Substituting a low-resolution proxy for footage” on page 71](#).)

If final footage is unavailable, and you simply want to substitute draft footage or a storyboard still image, you can import the draft footage and replace it with final footage later.

Working with missing source footage

If After Effects cannot find source footage when you open a project, the footage item appears in the Project window labeled Missing, and the name of the missing footage appears in italics. Any composition using that item as a layer replaces it with placeholder color bars.

You can still work with the missing item in the project, and any effects you applied to the original footage remain intact. When you replace the placeholder with the source footage, After Effects places the footage in its correct location in all the compositions that use it. (See [“Substituting a placeholder for footage” on page 71.](#))

Substituting a placeholder for footage

A placeholder appears in After Effects as a still image of color bars. You can apply a mask, effects, and geometric properties to a placeholder. When the actual footage item becomes available, you can replace the placeholder with it, and the applied attributes and keyframes are transferred to the actual footage.

For best results, set the placeholder to exactly the same size, duration, and frame rate as the actual footage.

To use a placeholder:

- 1 Choose File > Import > Placeholder or File > Replace Footage > Placeholder.
- 2 In the New Placeholder dialog box that appears, specify the placeholder’s name, size, frame rate, and duration, and then click OK.

To replace a placeholder with the actual footage:

- 1 In the Project window, double-click the placeholder you want to replace, or choose File > Replace Footage > File.
- 2 Locate and select the actual footage, and then click OK (Windows) or Import (Mac OS).

Substituting a low-resolution proxy for footage

Movies, images, and compositions used as layers can take up significant amounts of RAM and disk space when used in compositions, and can slow down working and rendering in elaborate projects. Using low-resolution proxy items in place of actual items is a way to lighten the burden on your computer and speed your work. Effects, masks, and properties applied to the proxy are applied to the actual footage item when you replace the proxy with the actual footage.

When you use a proxy, After Effects replaces the actual footage with the proxy in all compositions that use the actual footage item. When you finish working, you can switch back to the actual footage item in the project list. After Effects then replaces the proxy with the actual footage item in any composition.

When you render your composition as a movie, you may choose to use either all the actual high-resolution footage items or their proxies. You might want to use the proxies for a rendered movie if, for example, you simply want to test motion using a rough movie that renders quickly.

For best results, set a proxy so that it has the same aspect ratio as the actual footage item. For example, if the actual footage item is a 640 x 480-pixel movie, create and use a 160 x 120-pixel proxy. When a proxy item is imported, After Effects scales the item to the same size and duration as the actual footage. If you create a proxy with an aspect ratio that is different from that of the actual footage item, scaling will take longer.

To locate and use a proxy:

- 1 In the Project window, select a footage item.
- 2 Choose File > Set Proxy > File.
- 3 In the Set Proxy File dialog box, locate and select the file you want to use as the proxy, and click Open (Windows) or Import (Mac OS).

To toggle between using the original footage and its proxy:

In the Project window, click the proxy indicator to the left of the footage name.

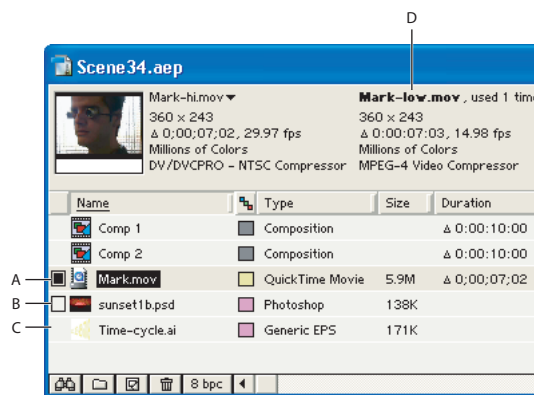
To stop using a proxy:

- 1 In the Project window, select the original footage item.
- 2 Choose File > Set Proxy > None.

Identifying proxy items in the Project window

In the Project window, After Effects marks the footage name to indicate whether the actual footage item or its proxy is currently in use:

- A box containing a black square indicates that a proxy item is currently in use throughout the project; the name of the proxy appears in boldface in the project list.
- An empty box indicates that the actual footage item is in use throughout the project.
- No box indicates that no proxy is assigned to the footage item.



Proxy items in the Project window **A.** Proxy assigned and in use **B.** Proxy assigned, but original in use **C.** No proxy assigned **D.** Proxy name

Creating a composition

When you first create a new project, you must create a composition before you can start working with your footage items.

Creating a new composition and changing settings

Once you have created a composition, you can change its settings at any time. Remember, however, that changing frame size or pixel aspect ratio can affect your final movie, so set these as early in the project as possible. Use the Flowchart View to get a “big picture” perspective of complex projects. (See [“Visualizing organization with Flowchart View” on page 311.](#))

When you create a composition without changing settings in the Composition Settings dialog box, the new composition uses the same settings as the previous composition. (See [“Understanding basic composition settings” on page 74.](#))

To create a composition:

- 1 Choose Composition > New Composition.
- 2 Type a Composition Name.
- 3 Either choose a preset from the Preset pop-up menu or specify basic composition settings as follows:
 - Type a value for frame size in the Width and Height text boxes. As a general rule, frame size and aspect ratio should match your intended output media. This is set automatically if you choose a preset.
 - Select Lock Aspect Ratio if you want to type a width or height not included in the menu and if you want After Effects to ensure that the composition dimensions conform to the aspect ratio for the current values.
 - Choose a pixel aspect ratio from the Pixel Aspect Ratio pop-up menu. This is set automatically if you choose a preset.
 - Type a value for frames per second in the Frame Rate text box. This is set automatically if you choose a preset.
 - Choose a resolution from the Resolution pop-up menu.
 - Type a value in the Start Timecode or Start Frame text box to determine the time value that will be displayed for the first frame of the composition. This value does not affect rendering.
 - Type a duration for your composition in the Duration text box.
- 4 If desired, click the Advanced tab and specify advanced settings as follows:
 - Use the Anchor control if you want to anchor the layers to a corner or edge of the composition as it is resized.
 - Specify Shutter Angle and Shutter Phase settings for motion blur.
 - Select the Preserve Resolution option so that the nested composition retains its resolution setting. Select the Preserve Frame Rate option to lock a composition to a specific frame rate.
 - Select a 3D rendering plug-in from the Rendering Plug-In pop-up menu.
- 5 Click OK.

For additional information, see [“Understanding basic composition settings” on page 74](#), [“Understanding advanced composition settings” on page 78](#), and [“Adjusting the shutter angle for motion blur” on page 112](#).

To change a composition's settings:

- 1 Choose Composition > Composition Settings.
- 2 Adjust basic settings.
- 3 If desired, click the Advanced tab and adjust advanced settings.
- 4 Click OK.

For more information, see [“Understanding basic composition settings” on page 74](#) and [“Understanding advanced composition settings” on page 78](#).

Creating new compositions from Project window footage

You can create new compositions from multiple footage items stored in the Project window. You can create single or multiple compositions, and specify composition options for each new composition in the New Composition From Selection dialog box.

To create a single or multiple compositions from Project window footage:

- 1 In the project window, select one or more footage items.
- 2 Do one of the following:
 - Drag the selected footage to the Create a new Composition button at the bottom of the Project Window.
 - Choose File > New Comp From Selection.
- 3 If you have selected multiple footage items, select either Single Composition or Multiple Composition in the New Composition From Selection dialog box, select settings as desired, and then click OK.
 - Choose a footage item from the Use Dimensions From pop-up menu to specify the dimensions for the new composition.
 - Specify a value for Still Duration to set the duration of the stills in the new composition or compositions.
 - Select the Add to Render Queue option to add the new composition to the render queue.
 - Select the Sequence Layers option to arrange layers in a sequence.
 - Select the Overlap option to overlap layers from the footage.
 - Specify a value for Duration and choose a setting from the Transition pop-up menu to control how layers in the footage overlap.

Understanding basic composition settings

When you create a new composition, it appears as a new item in the Project window. Before you set up a new composition, determine the specifications of the final output. These specifications influence the composition settings you choose for frame size, duration, frame rate, and pixel aspect ratio. Four factors determine composition settings:

- The type of output you are producing
- The specifications of the footage you will be working with
- The requirements of any systems that will process the output that After Effects renders
- The final delivery medium of the output

For best results, specify the composition settings at the beginning of your design process. After Effects bases certain calculations on the composition settings, so changing settings such as frame size and pixel aspect ratio late in the project can affect your final output. (However, you can override some composition settings when rendering. For example, you might change the composition-frame size to a smaller image size when rendering.)

For more information on basic composition settings, see [“Planning your project” on page 15](#), and [“Time basics” on page 18](#).

Undoing composition settings

If you change your mind about composition settings after choosing the Composition Settings command, you can undo the settings with the Undo Compositions Settings command. If you make changes to the project changing the Composition Settings and then undo the Composition Settings, use the Redo command to add back all of your changes.

To undo composition settings immediately after closing the Composition Settings dialog box:

Choose Edit > Undo Composition Settings.

To undo the settings after you have made other changes to the project:

- 1 Choose Edit > History > Undo Composition Settings.
- 2 Choose Edit > History > Redo [action] for all of the changes you want to add back to the composition.

Note: You can sequentially undo as many as 99 of the most recent changes made to the program, depending on how many undo levels are set in Preferences. To set the number or undo levels, choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS).

Setting frame size

The Composition window in After Effects contains the viewing frame and an area outside the frame that you can use to move layers into and out of the frame. For your convenience, After Effects includes a variety of presets, each containing settings for frame size, pixel aspect ratio, and frame rate. You can also create a custom preset and save it for later use.

Because After Effects can position footage items outside the frame, specify a frame size no larger than the actual size of the final viewing screen. After Effects previews and renders only the footage items within the frame. (See [“Working with higher image resolutions” on page 40](#).)

The viewing frame occupies the center of the frame’s pixel area, which is centered in a larger work area. You can position items outside the frame if, for example, you want a layer to enter the frame from one side, cross the screen, and leave the frame on the other side.




Example of moving a layer across a frame

Saving custom preset values

You can save values you set in the Composition Settings dialog box so that you can reapply them to other compositions. Settings for the Width, Height, Pixel Aspect Ratio, and Frame Rate options are saved with the presets. However, the Resolution, Start Timecode, Duration, and Advanced composition options are not saved.

To save custom preset values:

- 1 In the Composition Settings dialog box, specify the Width, Height, Pixel Aspect Ratio, and Frame Rate values, and then click the Save button .
- 2 Type a name for the preset and then click OK.

To reuse custom preset values:

In the Composition Settings dialog box, select the custom name from the Preset pop-up menu.

To delete a preset:

Choose the custom name from the Preset pop-up menu and click the trash button .

Setting pixel aspect ratio for compositions

Most computer monitors use square pixels, while ITU-R 601 (D1) and DV video use rectangular pixels. The Pixel Aspect Ratio option compensates for the rectangular pixels of D1 video format. Set the pixel aspect ratio that corresponds to your final output format. (See [“Setting pixel aspect ratio” on page 64.](#))



If you intend to create a movie for the D1 output format, choose D1 NTSC or D1 PAL. For more information about D1 format, see [“About D1, DV, and various pixel aspect ratio footage” on page 63.](#)

Note: The correct pixel aspect ratio for D1 NTSC or D1 PAL is chosen automatically when you choose the corresponding preset item.

Setting frame rate

The composition *frame rate* determines the number of frames displayed per second. Frame rate is usually determined by the type of output you produce. NTSC video has a frame rate of 29.97 frames per second (fps), PAL video has a frame rate of 25 fps, and motion picture film has a frame rate of 24 fps. Depending on the broadcast system, DVD video can have the same frame rate as NTSC video or PAL video, or a frame rate of 23.976. Video intended for CD-ROM or the World Wide Web is often 10 to 15 fps.

Each motion-footage item in a composition can also have a frame rate, and the relationship between the footage-item frame rate and the composition frame rate determines how smoothly the layer plays. For example, if the footage-item frame rate is 30 fps and the composition frame rate is 30 fps, whenever the layer advances one frame, the next composition frame is displayed. If the footage-item frame rate is 15 fps and the composition frame rate is 30 fps, then two composition frames are displayed before the current layer advances one frame, unless frame blending is enabled. (See [“Using frame blending” on page 110.](#))

When you use footage that was shot or rendered at the NTSC-standard rate of 29.97 fps and the composition frame rate is 30 fps, approximately two footage frames will be repeated every minute to compensate for the differing rates. To avoid repeated frames, make sure that your composition frame rate matches your source footage, or enable frame blending for the layers.

Setting resolution

Resolution determines the dimensions of the image in pixels, which affects the image quality of the rendered composition. Setting a low resolution significantly increases frame-rendering speed and decreases the amount of memory required to render. You can use a low-resolution setting when animating or previewing a movie, and then increase the resolution before rendering your final movie.

Select one of the following resolution settings in the Composition Settings dialog box:

Full Renders each pixel in a composition. This setting gives you the best image quality, but takes the longest to render.

Half Renders one-quarter of the pixels contained in the full-resolution image—half the columns and half the rows. This results in a rendering time approximately one-fourth of the time required to render the entire image at full resolution.

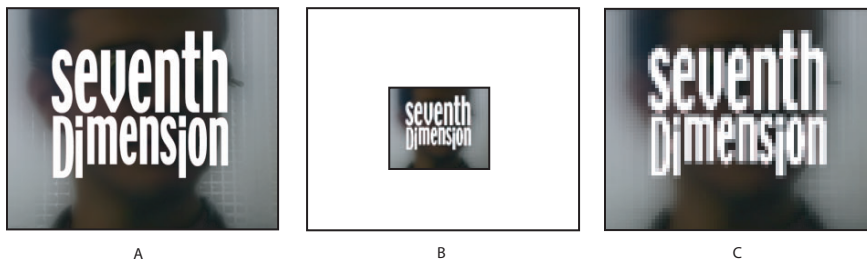
Third Renders one-ninth of the pixels contained in the full-resolution image. This results in a rendering time approximately one-ninth of the time required to render the entire image at full resolution.

Quarter Renders one-sixteenth of the pixels contained in the full-resolution image. This results in a rendering time approximately one-sixteenth of the time required to render the entire image at full resolution.

Custom Renders the image at the resolution you specify.

Adjusting the appearance of low-resolution compositions

When setting resolution, you can determine the size and appearance of the composition. When you lower the resolution of a composition, you can maintain image clarity by reducing the composition's size. You can also maintain its size but reduce image clarity, with the layers appearing blockier and more pixelated. The smaller on-screen image will update faster than the original-size image with a lower resolution.



Example of an image at composition resolution and half resolution **A.** Original composition resolution **B.** Half resolution with the same clarity but with a reduction in screen size **C.** Half resolution with the same screen size but with a reduction in clarity

To determine the appearance of lower-resolution compositions:

- 1 Choose Edit > Preferences > Display (Windows) or After Effects > Preferences > Display (Mac OS).
- 2 Select Auto-zoom When Resolution Changes to reduce the size of the composition while maintaining image clarity. Deselect this option to maintain the composition size in the Composition window but display layers with less clarity.
- 3 Click OK.



You can also set the magnification using the pop-up menu in the Composition window.

Setting start timecode or start frame

Use the Composition Settings dialog box to determine when the composition will begin. The name of the option in the Composition Settings dialog box is determined by whether Timecode, Frames, or Feet + Frames is selected in the Project Settings dialog box. For example, if Timecode Base is specified, you can use the Start Timecode option to specify when the composition will begin; if Frames is selected, you can use the Start Frame option to specify the frame number where the composition will begin.

Setting duration

The duration is the overall length of the composition. Set duration by typing values in the Duration box in the Composition Settings dialog box.

When you preview or render a movie, you can choose to preview or render only a portion of the total duration. (See [“Setting up a work area” on page 89.](#))

Understanding advanced composition settings

When you click the Advanced tab in the Composition Settings dialog box, you can change the anchor setting, adjust the shutter angle for motion blur, specify when the shutter opens relative to the frame start, set precompose options, and specify a rendering plug-in. (See [“Adjusting the shutter angle for motion blur” on page 112.](#))

Setting the anchor

When you change the frame size of a composition, by default the layers are centered within the new dimensions. Use the Anchor control to anchor the layers to a corner or edge of the composition as it is resized. Set the anchor by clicking the arrow button in the Anchor diagram (in the Advanced column of the Composition Settings dialog box) to indicate where to position the existing layers.

Setting nesting options

The Advanced tab of the Composition Settings dialog box includes two nesting options. If the Preserve Resolution When Nested option is selected, the nested composition retains its resolution setting. If this option is not selected, the containing composition's resolution overrides the nested composition's resolution. You can use the Preserve Resolution option, for example, to retain a low resolution for a nested composition and improve its preview time.

When selected, the Preserve Frame Rate When Nested or in Render Queue option locks a composition to a specific frame rate, which should improve performance in many cases as well as eliminate the need to use Posterize Time in creating reduced frame rate effects. If this option is not selected, the containing composition's frame rate overrides the nested composition's frame rate.



For more information on Posterize Time, look for that effect in the online Effects Help.

Setting the rendering plug-in

You can animate layers inside a 3D space. This 3D environment includes shadows, specular highlights, rack focus, and an automatic method of compositing layers based on depth. The default 3D rendering plug-in is Advanced 3D. You can use the Advanced tab of the Composition Settings dialog box to specify the Standard 3D or Advanced 3D rendering plug-in. You can also specify third-party rendering plug-ins as they become available. Note that the Standard 3D rendering plug-in does not support intersecting 3D layers. (See [“3D rendering” on page 276](#).)



Example of a 3D file with intersecting layers rendered with the Standard 3D rendering plug-in (left) and the Advanced 3D rendering plug-in (right).

To set the rendering plug-in:

- 1 Choose Composition > Composition Settings, and click on the Advanced tab in the Composition Settings dialog box.
- 2 Choose Standard 3D, Advanced 3D, or a third-party plug-in (if available), from the Rendering Plug-in pop-up menu.
- 3 Click Options and specify the following settings in either the Standard 3D Options, or the Advanced 3D Options dialog box, and then click OK:
 - For Standard 3D Options, choose an option from the Antialiasing pop-up menu.
 - For Advanced 3D Options, choose an option from the Shadow Map Resolution pop-up menu.

For more information on the Advanced 3D renderer or the Standard 3D renderer, see [“3D rendering” on page 276](#).

Adding and revealing composition footage items

Once you have created a new composition and imported footage into the project, you can add footage items or another composition to it. To do this, drag footage items or folders from the Project window to a Timeline window, a Composition window, or a composition name or icon in the Project window. You can use individual items in the Project window any number of times in one or more compositions.

Note: *Although you cannot directly add a composition to itself, you can duplicate a composition and add the copy to the original.*

When you drag a footage item to the Timeline window, you can specify a precise layer order and start time for the item. If you add multiple footage items to a composition, the items appear in the order in which they were selected in the Project window. If you drag a footage item into the Composition window, the layer appears where you drop it. If you drag a footage item onto a composition in the Project window, the layer snaps to the center of the Composition window. After you add a layer, you can move it to any position within the Composition window. When you add multiple footage items, they appear in the composition in the order selected.

Adding footage items to a composition

Items added to a composition begin at the time indicated on the current-time indicator in the Timeline window. For example, if the current time box displays 0:00:04:00 (4 seconds), when you place the item in the Composition window, the item begins its first frame at 4 seconds. By changing the location of the current-time indicator (Timeline window) or the time displayed in the Current Time button (Composition window), you can add a layer at any point in the composition.

In the Composition window, layers are visible only if they are active at the time currently displayed. For example, if you have three layers in a composition, with two of the layers starting at the beginning of the composition and one layer starting at 6 seconds, only two of the layers appear in the Composition window when the current-time indicator is set to the beginning of the composition.

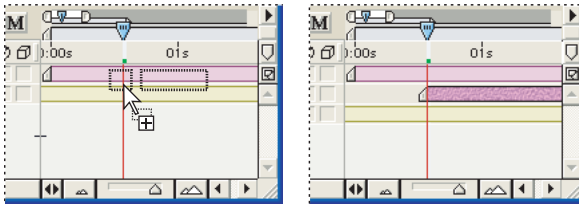
For more information on adjusting the duration or speed of a layer, see [“Understanding trimming” on page 102](#) and [“Time-stretching a layer” on page 165](#). For more information on setting and adjusting the current time, see [“Viewing and setting the current time” on page 89](#).

To add a footage item to a composition:

- 1 Activate the Timeline window for the composition to which you want to add an item.
- 2 To set the current-time indicator, do one of the following:
 - Click the current-time display, specify a new time, and then click OK.
 - Drag the current-time indicator to the desired time.
- 3 Drag the name of the footage item, the footage-item thumbnail, or a folder from the Project window to one of three places:
 - The Composition window.
 - The Timeline window. When you drag the item into the Timeline window, a highlight bar indicates where the layer will appear when you release the mouse button. If you

drag the item over the time graphic area, a time marker indicates where the layer's In point will be when you release the mouse button.

Note: When you click on a footage item in the Timeline window, the Info palette displays the item's name, duration, and In and Out points.



While dragging an item into the Timeline window, you can specify the layer order and In point.

- The composition name or icon in the Project window.

💡 You can also add a footage item to a composition by selecting the name of the footage item in the Project window and pressing Ctrl+/ (Windows) or Command+/ (Mac OS).

To add several footage items to a composition at the same time:

1 Do any of the following:

- Select multiple footage items. To select a *contiguous* range of items, press Shift as you click the footage items in the Project window. To select a *discontiguous* set of items, press Ctrl (Windows) or Command (Mac OS) as you select the footage item names.
- Move *multiple* footage items into a folder in the Project window.

2 Drag the names of the footage items or the folder from the Project window onto a composition name in the Project window, into the Composition window, or into the Timeline window. The items appear in the order in which they were selected in the Project window.

For more information, see [“Working with the Project window” on page 26](#).

Revealing footage in a composition

In large or complex projects it can be difficult to locate specific instances of footage used, especially if you use items more than once. Using the Reveal in Composition command, you can easily locate and select an instance of a footage item in any of its locations in the Timeline window.

To reveal a footage item in the Timeline window:

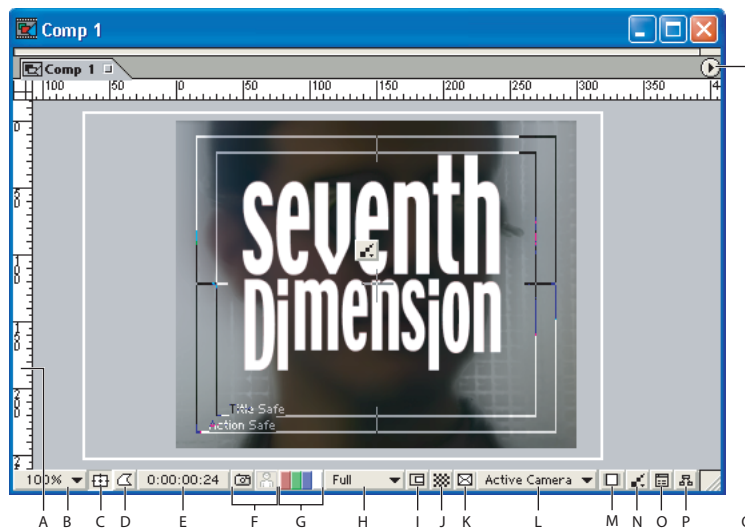
Right-click (Windows) or Control-click (Mac OS) the footage item in the Project window and choose Reveal in Composition; then select the specific instance you want to reveal (*Composition Name, Layer Name*).

Nesting a composition

When creating an elaborate composition, you may find it easier to organize the layers that make up the composition by using a technique called *nesting*—putting one or more compositions into another composition. You can create many levels of nesting. (See [“Organizing a project using nesting” on page 313.](#))



Using the Composition window


Use the Composition window to preview the composition and animate its contents manually. Move a layer by dragging it; scale a layer by dragging its handle; scroll through the window by using the hand tool. The Composition window contains a number of features and controls to help you work with layers. You can also change the background color of the composition.




Features and controls in the Composition window

- A. Rulers** Align layers in the composition window using the rulers. The ruler scale is in pixels. (See [“Using rulers and guides” on page 32.](#))
- B. Magnification ratio pop-up menu** Specifies a magnification from the menu. Hold down Alt (Windows) or Option (Mac OS) as you press the mouse button to view composition information. (See [“Changing magnification in windows” on page 29.](#))
- C. Title-Action Safe button** Toggles between viewing the title-safe and action-safe zones and viewing just the image. To display the animator grid, hold down Alt (Windows) or Option (Mac OS) and click this button. (See [“Viewing safe zones and grids” on page 30.](#))
- D. Toggle View Masks button** Toggles between viewing masks in a composition and viewing the image without masks.
- E. Current Time button** Opens the Go To Time dialog box. Specify a new frame or time in the text box.

F. Take Snapshot and Show Last Snapshot buttons   Captures a screen image of the window. Snapshots are not saved to disk, and only the most recent snapshot can be viewed. Click and hold the Show last Snapshot button to view the most recent snapshot instead of the active composition. (See [“Taking and viewing a window snapshot” on page 33.](#))

G. Show only Red, Green, Blue, and Alpha channel buttons  Click one of the first three buttons to view the composition's red, green, or blue channel. Areas with high values of that channel's color are displayed as white. Click the fourth button to view the composition's alpha channel. Transparent and opaque areas are displayed as black and white, and degrees of opacity appear as shades of gray. (See [“Viewing color and alpha channels” on page 33.](#))


H. Resolution/Down Sample Factor pop-up menu Specifies the resolution for the current composition from the pop-up menu.


I. Region of Interest button  Narrow the composition area for previewing. (See [“Changing the region of interest” on page 85.](#))

J. Toggle Transparency Grid button  Toggles between viewing a checkerboard background to display transparency, or viewing the background color.


K. Layer Wireframes button  Toggles between a wireframe and normal view of layers. (See [“Using Wireframe view in the Composition window” on page 30.](#))

L. 3D View pop-up menu Specifies a view for a 3D layer from the pop-up menu. (See [“Using 3D views” on page 265.](#))

M. Toggle Pixel Aspect Ratio Correction button  Toggles between turning on and off pixel aspect ratio correction. Turn on Pixel Aspect Correction to squash or stretch an image and correct a non-square pixel aspect ratio. Pixel Aspect Correction has no effect on square-pixel compositions, layers, or footage. It also has no effect when you create files with the Make Move or Export command. Because the scaling is not high quality, use Pixel Aspect Correction to evaluate shapes, not fine pixel details.

N. Dynamic Preview Acceleration button  Specifies a preview option from the pop-up menu. (See [“Previewing animation” on page 139](#), and [“Using OpenGL interactive previewing” on page 141.](#))

O. Timeline button  Brings forward the Timeline for the current composition.

P. Comp Flowchart button  Brings forward the Flowchart View for the current composition. (See [“Visualizing organization with Flowchart View” on page 311.](#))

Q. Comp Window Options Allows you to open the View Options dialog box, the Composition Settings dialog box, enable frame blending and motion blur, and select options for Dynamic Preview Acceleration, Disable Dynamic Preview, Draft 3D, and Transparency Grid.


Arranging a footage item in a composition by dragging

You can change the spatial position of a layer in a composition by selecting and dragging the layer in the Composition window. When you want to move a layer into or out of the frame, you can position it completely or partially outside the frame.


When you arrange a layer in the Composition window, you determine the position of the layer at the current time, indicated by the current-time indicator in the Timeline window. If no keyframes are set for a layer, the position values you set will apply for the duration of the layer. The layer remains in position until you set up a change over time in the Timeline window. (See [“Understanding keyframes” on page 117](#) and [“Changing the layer stacking order” on page 95](#).)

To arrange a layer in a composition by dragging:

- 1 Select the selection tool from the Tools palette.
- 2 Click a layer in the Composition window to select it or, if the layer is obscured by another layer, select the layer name in the Timeline window.

 You can select layers behind other layers in a Composition window. Using the selection tool, right-click (Windows) or Control-click (Mac OS) the top layer, choose Select, and then choose a layer name.

- 3 Position the pointer within the layer (but not on a handle) and drag the layer to a location within the Composition window.

 After you start dragging a layer, hold down Shift to constrain the dragging to horizontal or vertical movements, or hold down Ctrl+Shift (Windows) or Command+Shift (Mac OS) to snap to the frame edges or center.

For information on positioning a 3D layer in the Composition window, [“Moving a 3D layer in the Composition window” on page 261](#)

Setting the background color of a composition

The default background color for the Composition window is black, but you can change the color at any time. When you add one composition to a second composition (*nesting*), the second composition's background color is preserved, and the first composition's background becomes transparent. If you want to preserve the first composition's solid background color, create a new, colored solid to use as a background layer in the first composition. (See [“Creating a new solid layer” on page 93](#) and [“Organizing a project using nesting” on page 313](#).)

You can also change the color of the pasteboard in the Composition window.

To set the background color of a composition:

- 1 Choose Composition > Background Color.
- 2 Click the color swatch to select a color, or click the eyedropper to sample a color from anywhere on the screen. Then click OK.

To set the pasteboard color of a composition:

- 1 Choose Edit > Preferences > Display (Windows) or After Effects > Preferences > Display (Mac OS).
- 2 Click the color swatch to select a color, or click the eyedropper to sample a color from anywhere on the screen. Then click OK.

Note: The pasteboard color you select will be used for all After Effects compositions.

Using a transparency grid to display transparency

You can toggle a transparency grid on or off (like the grid that Adobe Photoshop uses to indicate transparency). Viewing the transparency grid may slow down window redraw.

To turn the transparency grid on or off:


Choose Transparency Grid from the Composition window menu, or click the Toggle Transparency Grid button  at the bottom of the Composition window.

Changing the region of interest


Use the Region of Interest button to create a rectangular preview of the composition window. Reducing the region of interest requires less memory when previewing, thereby improving interaction speed and increasing RAM preview duration. Changing the region of interest does not affect file output.

You can permanently change the size of your composition by cropping it to the region of interest.

To change the region of interest:

- 1 In the Composition window, do any of the following:
 - To draw a region of interest, click the Region of Interest button , and then drag the marquee tool across the area of the composition window where you want images to appear.
 - To toggle between viewing the region of interest and the full composition area, click the Region of Interest button again.
 - To start over with the marquee tool, hold down Alt (Windows) or Option (Mac OS) and click the Region of Interest button.

To crop to the region of interest:

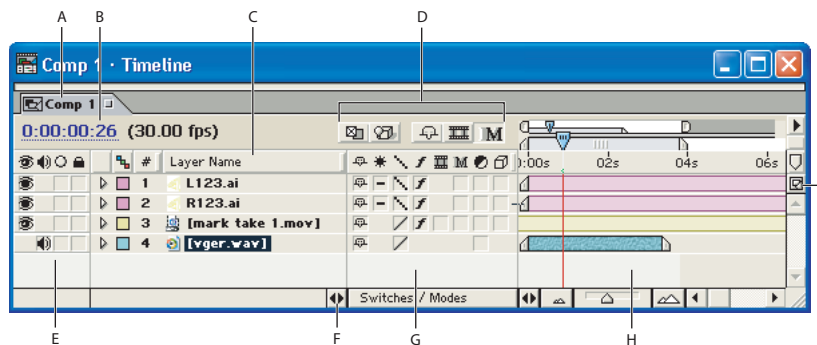
- 1 Click the Region of Interest button , and then drag the marquee tool across the area of the composition window where you want images to appear.
- 2 Choose Composition > Crop Comp to Region of Interest.

Using the Timeline window

Use the Timeline window to set up changes over time, animate layer properties numerically, and set In and Out points for a layer. The Timeline window controls are organized in columns of related functions.

Default controls and columns

By default, the Timeline window contains a number of columns and controls. Optional columns are also available. (See [“Optional columns” on page 86.](#))



Default controls and columns in the Timeline window

A. Composition tab Use to close or move the window. Click a tab to display its composition in the current window. Drag a tab to move its composition to another existing window or to put it in a new window.

B. Current time Displays the current time in the project. Click to open the Go to Time dialog box. (See [“Viewing and setting the current time” on page 89.](#))

C. Source Name/Layer Name column Includes a label, a number (assigned by After Effects), and a source name or layer name for each layer. Click on the column heading to alternate between viewing the source name or layer name. Clicking the triangle to the left of a layer lets you examine and set properties for the masks, effects, and transform functions. (See [“About layer properties” on page 116.](#))

D. Timeline window buttons Contains the Disable Dynamic Preview, Draft 3D, Shy Layers, Frame Blending, and Motion Blur buttons. The Disable Dynamic Preview and Draft 3D buttons affect all layers in the Timeline window. The Shy Layers, Frame Blending, and Motion Blur buttons enable or disable these features for layers in the Timeline window for which the corresponding switch has been set. (See [“Previewing 3D” on page 275](#), [“Showing and hiding layers in the Timeline window” on page 101](#), and [“Altering appearances on the layer level” on page 108.](#))

E. Audio/Video Features column Contains switches for enabling and disabling audio and video. This column also includes a lock switch for locking layers and a solo switch for displaying only one layer. (See [“About After Effects Audio/Video switches” on page 107.](#))

F. Switches column button Displays or hides the Switches/Modes column.

G. Switches/Modes column Contains options for controlling a number of display and performance features for a layer. (See [“Optional columns” on page 86.](#))

H. Time graph Visually represents the values of the In/Out column and displays the positions of the keyframes and timeline for each layer. (See [“Understanding the time graph” on page 88.](#))

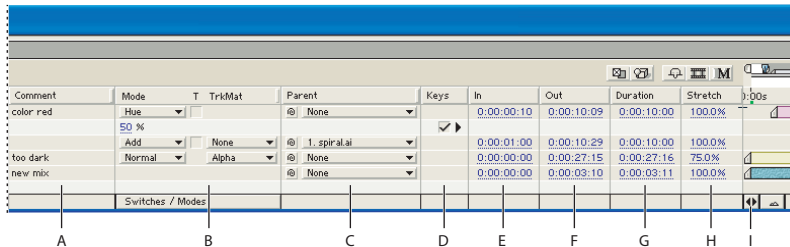
I. Comp button Brings forward the corresponding composition window.

Optional columns

You can display or hide several optional columns in the Timeline window.

To display or hide optional columns:

Right-click (Windows) or Control-click (Mac OS) a Timeline window column heading, and then choose the column you want to display or hide in the Columns submenu.



Optional columns in the Timeline window

A. Comment column Type comments for the layer.

B. Modes column Specify blending modes and track mattes. (See [“Using blending modes” on page 200](#) and [“Creating track mattes and traveling mattes” on page 198.](#))

C. Parent column Specify a parent layer. (See [“Understanding parent layers” on page 137.](#))

D. Keys column Displays or hides the keyframe navigator. (See [“Keyframe navigator” on page 118.](#))

E. In column View or change the In point of a layer.

F. Out column View or change the Out point of a layer.

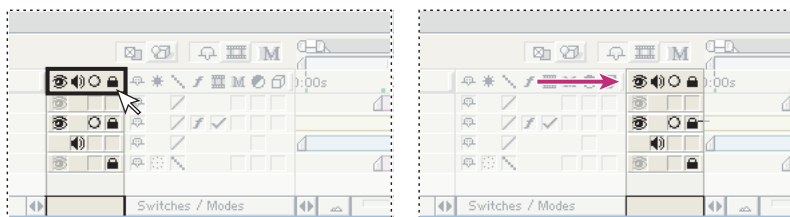
G. Duration column View or change the duration of a layer.

H. Stretch column Time-stretch a layer. (See [“Understanding trimming” on page 102.](#))

I. Expand or Collapse the In/Out/Delta/Stretch columns button Displays or hides the In, Out, Delta, or Stretch columns.

To rearrange columns:

Drag the column heading to a different location along the Timeline window. When the column outline appears where you want the column to appear, release the mouse.



Rearranging a column in the Timeline window: An outline appears when you drag a column (left). When you release, the column appears in a new position.(right).

Note: All layer switches move together—you can move the entire switch column to a different position between other columns, but you can’t rearrange the switches within the column.

To change the width of a column:

Drag the raised vertical bar left or right to set the new width. If the column does not have a raised vertical bar at its right edge, it cannot be resized.

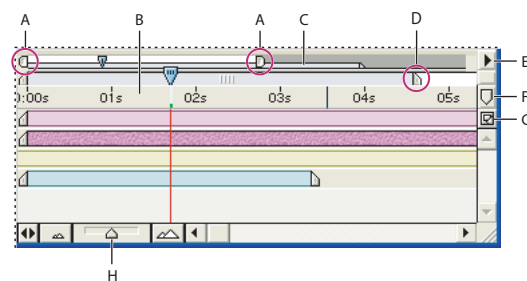


You can print the Timeline window by choosing File > Print.

Understanding the time graph

The time graph portion of the Timeline window contains a time ruler, markers to indicate specific times and current work area, and duration bars for the layers in your composition. Use the time graph to adjust the range of time shown in the Timeline window, and to specify a range of time to render when creating or previewing a movie.

The time graph also contains controls for adjusting time for layers and controlling motion and changes over time. (See [“Positioning a layer in time” on page 97.](#))



Time graph portion of the Timeline window

A. Time Navigator Start and End brackets Drag to magnify or shrink a section of the time ruler. These markers are part of the navigator view, described below. Drag to view a specific area. (See [“Viewing and setting the current time” on page 89.](#))

B. Time ruler Indicates the part of the composition duration currently displayed in the time graph.



C. Navigator view Uses smaller versions of the work-area markers and current-time indicator to show their relationship to the entire composition. As you drag the viewing-area markers to change the view, the miniature markers in the navigator view show your view and the location of the current-time indicator in the context of the full duration of the composition.

D. Work area markers Indicate an area of the composition for rendering or previewing. To render only part of the composition, drag the work area marker to specify the part of the composition to render. (See [“Setting up a work area” on page 89.](#))

E. Timeline Window Options Displays the Timeline Options Menu, which includes functions affecting layers and keyframes, as well as providing access to the Composition Settings dialog box.

F. Comp marker bin Add markers to the time ruler. Drag the marker to a point on the time ruler. Drag it back to remove it.

G. Comp button Click to bring forward the composition related to the active Timeline.

H. Zoom slider Drag to magnify a portion of the time graph or to see more of the time graph. You can also use the zoom-in button  or the zoom-out button .

Viewing and setting the current time

A composition's current time is indicated by the current-time indicator. For convenience, you can view and move the current-time indicator in both the navigator view and the time ruler. The navigator view shows the complete duration of a composition. When you view the duration of the entire composition, detailed work can be difficult. You can magnify a portion of the time graph so as to work on only the portion you need.

To move the current-time indicator by dragging:


In the navigator view or on the time ruler, drag the current-time indicator to a new location on the time graph, or click a new setting on the time ruler.

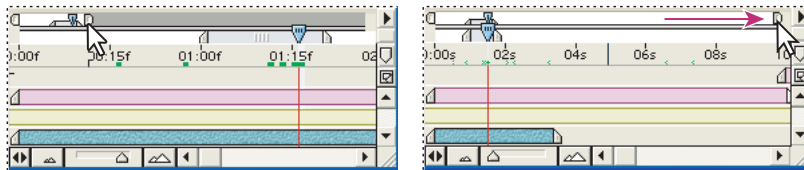
To move the current-time indicator numerically:

- 1 Click the current time in the Timeline or Composition window.
- 2 Type a new time and click OK.

To magnify a portion of the time graph:

Do one of the following:


- In the Timeline window, click the zoom-in button  or drag the zoom slider.
- Press the = (equal sign) key on the main keyboard.
- In the navigator view, drag the Time Navigator Start, or Time Navigator End, or both brackets until the time ruler displays the portion you want.



Drag the Time Navigator Start and End brackets to magnify or shrink the part of the time ruler displayed.

To see more of the time graph:

Do one of the following:

- In the Timeline window, click the zoom-out button .
- Press the – (minus) key on the main keyboard.
- In the navigator view, drag the left and right time view brackets until the time ruler displays the portion you want.

Setting up a work area

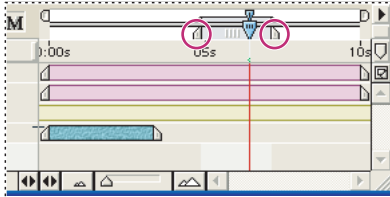
When you work on a composition, you may want to preview or render only part of the composition. Do this by specifying a part of the composition time ruler as a *work area*. In the Timeline window, the work area appears in a lighter shade of gray. (See [“Previewing animation” on page 139](#) or [“Making \(rendering\) a movie” on page 327](#).)



Set the work area start and end points to the current time by pressing B (begin) or N (end), respectively.

To set up a work area:

In the time ruler, move the start and end work-area markers until they mark the start and end of the part of the composition you want to use as a work area.



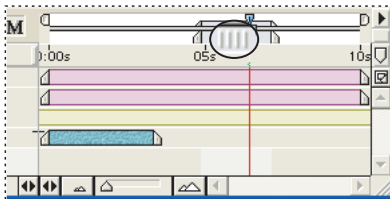
The work-area markers indicate the part of the composition displayed when previewing or rendering.

To move the work area:

In the time ruler, drag the center of the work area bar left or right.

To expand the work area to the size of the composition:

Double-click the center of the work area bar.



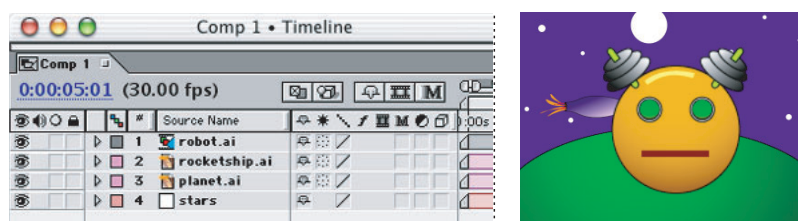
The center of the work area bar

Managing Layers

Managing layers

Layers are the components you use to build a composition. Any item you add to a composition—such as a still image, moving image file, audio file, lights and cameras, or even another composition—becomes a new layer. Without layers, a composition consists only of an empty frame.

Using layers, you can work with specific footage items in a composition without affecting any other footage. For example, you can move, rotate, and draw masks for one layer without disturbing any other layers in the composition, or you can use the same footage in more than one layer and use it differently in each instance. (See [“Working with masks” on page 176.](#))



Four layers as viewed in the Timeline window (left) and the Composition window (right)

Adding layers to compositions

When you add an item to a composition, you create a new layer for that composition. You can duplicate layers within a composition or even copy and paste layers from one composition to another. Use as many layers as necessary to create your composition.

A composition layer can be any of the following:

- Any footage item in the Project window list (including audio)
- Another composition in the project
- A text layer
- A solid, camera, or light you create
- An After Effects adjustment layer, which modifies all layers below it
- A duplicate of another existing layer
- A split layer
- A null object (See [“Using null objects” on page 138.](#))



Creating new layers

Of the numerous ways to create layers in an After Effects composition, the most obvious is to begin with a footage file you want to use.

Creating a new layer from a footage item

You can create a new layer from any footage item in your Project window, including audio. After you add a footage item to a composition, you can modify and animate the resulting layer.

To create a layer from a footage item:

- 1 In the Project window, double-click the composition you want to work on to open its Composition and Timeline windows.
- 2 In the Timeline window, move the current-time indicator to the time where you want the layer to begin playing.
- 3 Drag the footage item from the Project window to the Composition window.

Note: To position the new layer in a particular order among existing layers or at a specific starting time in the composition, drag the item to the Timeline window and release it in that layer position and starting time instead of dragging it to the Composition window.



To create multiple layers simultaneously, follow this procedure but hold down Ctrl (Windows) or Command (Mac OS) and click to select footage files in Step 3. When you drag them to the Timeline window, the footage files form layers in the order in which you selected them.

Creating layers by nesting compositions

When you add a composition to another composition, it creates a new layer in a process called *nesting*. The composition you add becomes a layer in the other (target) composition. Nested compositions can change composition structure, memory usage, and rendering order. (See [“Organizing a project using nesting” on page 313.](#))

To create a layer from another composition:

- 1 Display the Composition window or Timeline window for the target composition.
- 2 Drag a composition from the Project window list to the target Composition window or Timeline window.

For nested compositions, if you change certain settings in the parent composition, these propagate through to the nested (child) compositions. These settings include the Quality options under Layer > Quality, several options under Layer > Switches, and three options on the Timeline window menu: Enable Motion Blur, Enable Frame Blending, and Draft 3D. The Resolution setting for the parent composition also applies to nested compositions.

If you do not want these switch settings for the parent compositions to apply to the individual nested compositions, you can change that at the preferences level.

To prevent switches from operating through nested compositions:


- 1 Choose Edit > Preferences > General (Windows), or After Effects > Preferences > General (Mac OS).
- 2 Deselect the Switches Affect Nested Comps option, and click OK.

Creating a new solid layer

You can create solid images of any color or size (up to 30,000 x 30,000 pixels) using After Effects. After Effects treats solids as it does any other footage item: You can modify the mask, transform properties, and apply effects to the solid layer. If you change settings for a solid that is used by more than one layer, you can apply the changes to all layers that use the solid or to only the single occurrence of the solid. Use solid layers to color a background or create simple graphic images.

Note: After Effects stores all solids in the Solids folder in the Project window. When you create a solid for the first time, After Effects creates the Solids folder.

To create a solid-color layer:

- 1 With the Composition or Timeline window active, choose Layer > New > Solid.
- 2 In the Solid Footage Settings dialog box, type a name for the layer or accept the color-based name supplied.
- 3 Under Size, do one of the following:
 - Type width and height dimensions for the layer.
 - Click the Make Comp Size button to make the layer's dimensions the same as the composition.
 - If necessary, choose a new unit of measurement from the Units pop-up menu, and choose a new pixel aspect ratio from the Pixel Aspect Ratio pop-up menu.
- 4 Under Color, set the color of the layer in one of two ways:
 - Use the color picker: Click the color swatch, select the color you want, and click OK.
 - Use any color visible in the After Effects interface: Click the Eyedropper , and then click the color you want.

Note: You can click the eyedropper in any area of your screen.

- 5 Click OK.

In the Timeline window, you can then drag the new solid layer to any position above or below, as needed.

To change settings for a solid used by more than one layer:

- 1 Select a solid layer.
- 2 Choose Layer > Solid Settings.
- 3 Enter the new settings, and then do one of the following:
 - Select "Affect all layers that use this solid" to apply the changes to all layers that use the solid.
 - Deselect "Affect all layers that use this solid" to create a new solid without applying the change to other layers that use the solid.

Creating a light or camera layer

You can use light and camera layers to create interesting results for the 3D layers in a composition. (See ["Understanding cameras" on page 268](#) and ["Understanding lights" on page 273](#).)

To create a light or camera layer:

- 1 With the Composition or Timeline window active, choose Layer > New > Camera, or Layer > New > Light.
- 2 In the Camera or Light Settings dialog box, select the settings you want, and then click OK.

Creating an adjustment layer

When you apply an effect to an ordinary layer, the effect affects only that layer and no others. However, an effect can exist independently if you create an *adjustment layer* for it. Any effects applied to an adjustment layer affect all layers below it in the composition stacking order. An adjustment layer at the bottom of the stacking order has no visible result.

Because adjustment layer effects apply to all layers beneath them, they are useful for applying effects to many layers at once. In all other aspects, an adjustment layer behaves exactly like other layers; for example, you can use keyframes with any adjustment layer property, and rename the layer. You can also create masks on adjustment layers.

To create a new adjustment layer:

- 1 Display the Composition or Timeline window to which you want to add an adjustment layer.
- 2 Choose Layer > New > Adjustment Layer. A new adjustment layer appears at the top of the Timeline window.
- 3 Apply one or more effects to the adjustment layer.

For information about effects, see [“Working with effects” on page 248](#).

Note: *Transformations on adjustment layers behave slightly differently; they transform only the matte but not the fill.*

To change an existing layer into an adjustment layer:

- 1 In the Timeline window, select the name of the layer you want to make into an adjustment layer. (Typically, this layer already has effects applied to it, but you can add effects after making it an adjustment layer.)
- 2 Choose Layer > Switches > Adjustment Layer.



If you want to apply an effect to just part of an image, draw a mask on an adjustment layer. The mask restricts the area to which the effect applies. You can animate the mask to follow a moving subject. (See [“Working with masks” on page 176](#).)

For more information about switches, see [“About After Effects Audio/Video switches” on page 107](#).

Duplicating a layer

When you *duplicate* a layer, After Effects copies all property keyframes, masks, and effects to the duplicate. The duplicate is added above the original layer and automatically selected. If you want to duplicate a layer without duplicating its keyframes, masks, or effects, add the original source footage file to the composition again.

Note: *Track mattes retain their order, on top of the layer when you duplicate or split the layer. (See [“Creating track mattes and traveling mattes” on page 198](#).)*

To duplicate a layer:

In a Composition or Timeline window, select the layer and choose Edit > Duplicate.

Creating new layers by splitting a layer

In the Timeline window, you can split a layer at any point in time, creating two independent layers. This is a time-saving alternative to duplicating and trimming the layer—something you might do when you want to change the stacking-order position of the layer in the middle of the composition, such as an object revolving in front of and then behind another object.

When you split a layer, both resulting layers contain all the keyframes that were in the original layer in their original positions. Any applied track mattes retain their order, on top of the layer. (See [“Understanding keyframes” on page 117](#) and [“Creating track mattes and traveling mattes” on page 198](#).)

To split a layer:

- 1 In the Timeline or Composition window, select a layer.
- 2 In the Timeline window, move the current-time indicator to the time where you want to split the layer.
- 3 Choose Edit > Split Layer.

Rearranging layers

You can change the stacking order (which layers appear above or below other layers), the positions of layers in visual space, and the point in the play time at which different layers appear. The Timeline window provides intuitive methods for dragging layers vertically into different stacking orders and dragging time indicators for a layer horizontally to achieve the results you want. The Align palette makes it easy to arrange spatial relationships between elements on different layers.

Changing the layer stacking order

The Timeline window displays the layer stacking order. The uppermost layer in the composition appears at the top of the layer outline list, the second layer is immediately below it, and so on. Changing the order of footage layers modifies the appearance of your composition by repositioning footage in front of or behind other footage.

Changing the position of an adjustment layer in the stacking order changes which layers it affects, because it affects only the layers below it. (See [“Creating an adjustment layer” on page 94](#).)

Note: Because of their depth properties, the stacking order of 3D layers in the Timeline window does not necessarily reflect their position in the Composition window. (See [“Combining 2D and 3D layers” on page 263](#).)

To rearrange layer order:

In the Timeline window, select the layers you want to move by name and drag up or down the stacking order.

Note: As you drag a layer name up or down, a horizontal line appears between other layer names, indicating the position to which the layer will move if you release the mouse.

To move a layer to a specific position in the order:

In the Composition or Timeline window, select the layer. To move a layer up or down one level, choose Layer and then choose Bring Layer Forward or Send Layer Backward. Choose Bring Layer to Front to move a layer to the top of the composition and choose Send Layer to Back to move the layer to the bottom of the composition.

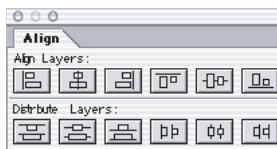
Selecting a layer by position number

After Effects automatically numbers all layers in a composition. The number reflects the position of that layer in the stacking order. When the stacking order changes, After Effects changes all numbers accordingly.

Select a layer by its number by pressing the layer number on the numeric keypad. If the layer number has more than one digit, type the numbers quickly so that After Effects can recognize them as a unit.

Aligning and distributing layers in 2D space

Use the Align palette to line up or evenly space selected layers across a composition. You can align or distribute layers along the vertical or horizontal axes of selected objects.



Align and distribute options

When you align and distribute selected layers, keep the following in mind:

- An alignment option aligns selected layers to the object that most closely represents the new alignment. For example, for right-edge alignment, all selected layers align to the selected object that is farthest to the right.
- A distribution option evenly spaces selected layers between the two most extreme layers. For example, for a vertical distribution option, the selected layers are distributed between the topmost and bottommost selected objects.
- When you distribute layers of different sizes, the spaces between layers may not be uniform. For example, distributing layers by their centers will create equal space between the centers—but different-sized layers will extend by different amounts into the space between layers.
- Locked layers cannot be moved by alignment or distribution options.
- Text alignment is not affected by the Align palette. For information on aligning text, see [“Aligning and justifying text” on page 213](#).

To align or distribute layers:

1 Select the layers you want to align or distribute.

Note: To align, you must select two or more layers; to distribute, you must select three or more layers.

2 Choose Window > Align & Distribute.

3 In the Align palette, click the icon representing the type of alignment or distribution you want.

Positioning a layer in time

Move a layer in time by changing its In or Out point in the Timeline window. After Effects provides two ways to view and change the In and Out points of a layer in the Timeline window:

- The In and Out columns represent the layer duration numerically.
- The duration bar represents the layer duration visually.

To change the In and Out points of a layer numerically:

1 If the In and Out columns are not visible in the Timeline window for the composition layer you want to change, open the Timeline Options menu and choose Columns > In. On the same menu, choose Columns > Out.

2 Click the number in the In or Out column of the layer you want to change.

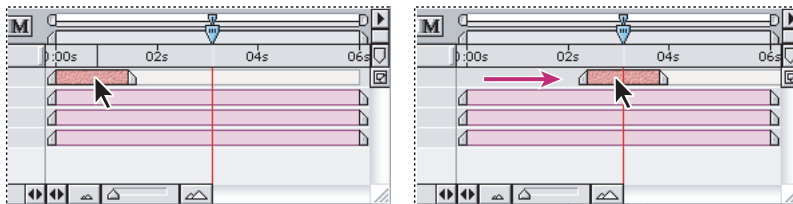
3 In the Layer In Time or Layer Out Time dialog box, type a new time and click OK.

Note: Do not use this method to adjust the In and Out points in the Timeline window if your aim is to trim, speed up, slow down, or distort time within layer footage. (See [“Understanding trimming” on page 102](#) and [“About time-remapping” on page 168](#).)

To move a layer in time by dragging:

In the Timeline window, drag the layer duration bar to the left or right. To snap the layer duration bar to significant points in time (such as markers, or the start or end of the composition), press Shift as you drag.

Note: When you drag a layer in the Timeline window, the Info palette displays the name, duration, delta timecode, and In and Out settings for the layer. To display the Info palette, choose Window > Info.



Before and after moving the duration bar

To move a layer in time by moving its In point:

1 In the Timeline window, drag the current-time indicator to the time at which you want the layer to begin playing.

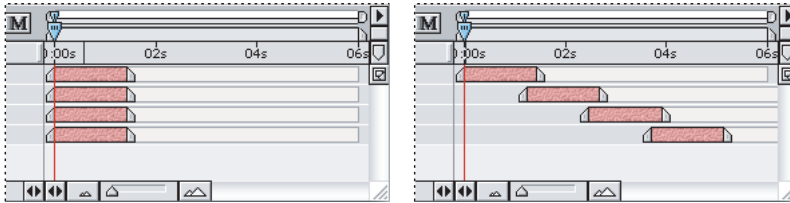
2 In the Timeline window, if the In column is not displayed, right-click (Windows) or Ctrl-click (Mac OS) any column heading, and then choose Columns > In.

3 In the In column, press Alt (Windows) or Option (Mac OS) and click the number that appears for that layer.

Note: To move a layer by its Out point, use the same steps with the Out point column.

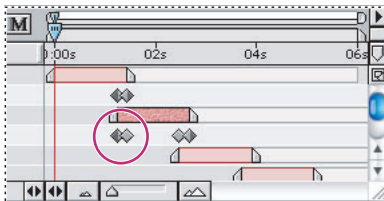
Automatically arranging layers as a sequence

Use the Sequence Layers keyframe assistant to automatically arrange layers in a sequence. When you apply the keyframe assistant, the first layer you select remains in its initial time position, and the other selected layers move to new positions in the Timeline window based on the order in which you select them.



Layers selected in Timeline window (left). Layers arranged in sequence after applying the Sequence Layers Keyframe Assistant (right).

You can specify whether the layers overlap or are arranged end to end. For overlapping layers, you determine how long the layers overlap and whether they cut or cross dissolve from one to the next. If you specify a cross dissolve, After Effects creates opacity keyframes that control how the layers dissolve into each other.



Overlapping layers can have opacity keyframes set automatically to create a cross dissolve.

For a layer to be sequenced, its duration must be less than the length of the composition so that it leaves time for other layers. If you plan to sequence still-image footage that you haven't imported yet, choose **Edit > Preferences > Import (Windows)**, or **After Effects > Preferences > Import (Mac OS)** before you import, and specify a short Still Footage duration. If you've already imported still images that are the length of the composition, you can trim all of them at once by selecting all of the still image layers, positioning the current-time indicator to set the duration you want them to have, and pressing **Alt +]** (Windows) or **Option +]** (Mac OS).

To arrange layers in a sequence:

- 1 In the Timeline window, hold down **Ctrl** (Windows) or **Command** (Mac OS) and select layers in sequential order, beginning with the layer you want to appear first.
- 2 Choose **Animation > Keyframe Assistant > Sequence Layers**.
- 3 In the Sequence Layers dialog box, do one of the following, and then click **OK**:
 - To arrange the layers end to end, leave the **Overlap** option unselected.
 - To overlap ends of layers, select the **Overlap** option and type a duration in timecode for how long the layers should overlap.
- 4 If you selected the **Overlap** option in step 3, select a **Transition** option to specify which layers' opacity After Effects adjusts to create cross dissolves.

- If none of the selected layers uses an alpha channel or mask, select Dissolve Front Layer.
- If any of the selected layers uses an alpha channel or a mask, select Cross Dissolve Front and Back Layers.

Creating simple cuts and transitions between layers

A simple *cut* (shifting view from one layer to another) is easy to create in the Timeline window.

To cut from one layer to another:

- 1 Display the Timeline window containing the two layers for which you want to create the transition.
- 2 Set the In point of the second layer at one frame later than the Out point of the first layer.

For more information about setting In and Out points, see [“Understanding trimming” on page 102](#).

Other kinds of transitions, such as fading or dissolving one layer into another, involve opacity settings, In and Out points, and keyframes. However, you can apply certain effects (including transition effects) to create different transitions instead of building them yourself, as described in [“Applying and controlling effects” on page 249](#). For more information about creating your own transitions, see [“Setting layer opacity” on page 133](#), [“Understanding trimming” on page 102](#), and [“Understanding keyframes” on page 117](#).

Copying and pasting layers

Through the copy and paste commands, you can manipulate and place layers and layer attributes. When copying and pasting a layer in the Timeline window, you can paste a layer’s In point to a specific time in the Timeline window.

You can also copy keyframe attributes from one layer to multiple layers, or from one property to other properties on a single layer—all in one operation. For more information on copying keyframes, see [“Copying and pasting keyframes” on page 122](#).

To copy a layer to the current time:

- 1 In the Timeline window, copy the layer or source footage.
- 2 Drag the current-time indicator to the time at which you want the layer to begin.
- 3 Press Ctrl + Alt + V (Windows) or Command + Option + V (Mac OS).

Customizing layer work and views

You can change a number of layer properties to suit the way you work. For example, you can rename a layer, giving it a unique name. This is especially helpful when you use the same source footage for more than one layer. You can also change color labels.

Certain settings affect both the working view and the rendered view. (See [“Changing the layer image quality” on page 109](#) and [“Showing and hiding applied effects” on page 109](#).)

Renaming a layer

By default, the layer outline in the Timeline window uses the source footage names for layers. You can rename any layer at any time. Unique layer names can help you identify layers when you use the same source footage for more than one layer. You can switch between displaying the original filename and the layer name you've specified. (See ["Viewing the source name of a layer" on page 100.](#))

After you rename a layer, all other layers in the composition display with brackets around the names. Renamed layers display without brackets.

To rename a layer:

- 1 In the Timeline window's layer outline, select the layer you want to rename.
- 2 Press Enter (Windows) or Return (Mac OS) and type a new name.
- 3 Press Enter or Return again to apply the new name.

Viewing the source name of a layer

The Timeline window can list a layer by the name of its source footage or by a name you give the layer. You can switch between viewing source names and layer names. After Effects can also display the source filename in the Info palette, which is useful when the source footage is a still-frame sequence, because each still image has a different filename. (See ["Renaming a layer" on page 100.](#))

To switch the type of layer name in the Timeline:

In the layer outline in the Timeline window, click the heading Source Name or Layer Name.

To see a layer source name in the Info palette:

- 1 Choose Window > Info if the Info palette is not already open.
- 2 In the Timeline window, select the layer.
- 3 Press Ctrl + Alt + E (Windows) or Command + Option + E (Mac OS). The name of the source footage appears in the Info palette.

Changing layer color labels

The Timeline window uses different colored boxes as labels to indicate different kinds of layers, such as compositions or source footage layers. Layer handles and motion paths display the label color of the layer. Use the Edit > Label submenu to select all layers of a particular type, either by a specific label color or to match the current layer selection (using the Select Label Group command).

You can customize the label colors at any time for an individual layer, for all similarly labeled layers in a composition, or at the default level.

To change a color label for an individual layer:

- 1 In the Timeline window, select the layer.
- 2 Choose Edit > Label > *color name*.

To change the color for a label group:

- 1 In the Timeline window, select one of the layers belonging to the label group.
- 2 Choose Edit > Label > Select Label Group.

3 Choose Edit > Label > *color name*.

To change the default color label and options for a source type:


- 1 Choose Edit > Preferences > Label Colors (Windows), or After Effects > Preferences > Label Colors (Mac OS).
- 2 Click a color swatch or Eyedropper button, select new colors to replace the existing colors you want to change, and type new names for the colors as needed.
- 3 Click Next, or click the Label Colors pop-up menu and choose Label Defaults.
- 4 Using the pop-up menus for each type of composition element (Composition, Video, Audio, and so forth), choose new default colors. When finished, click OK.

Hiding layers in the Composition window

Use the Video switch to exclude or include layers from appearing in the Composition window. The Video switch is on by default, so the layer displays in the Composition window. When you want to speed up redraw or exclude a layer from appearing in both the preview and the rendered version, turn off the Video switch.

To show or hide a layer in the Composition window:

Do either of the following:

- Click the Video  switch for a layer in the Timeline window to show or hide the layer.
- Select a layer, choose Layer > Switches, and make sure that the Video command is selected (to display the layer) or deselected (to hide the layer).

To hide all layers that are not selected in the Composition window:

Choose Layer > Switches > Hide Other Video.

To show all layers in the Composition window:

Choose Layer > Switches > Show All Video.



Showing and hiding layers in the Timeline window

You can mark a layer as *shy*, or hidden from display, and then use the Hide Shy Layers button in the Timeline window to hide all shy layers on the Timeline list. Making layers shy is useful when you want to make room in the Timeline window to show the layers and layer properties you want to adjust.


Shy layers still appear in the Composition window. If you want to hide or show layers in the Composition window, use the Video switch. (See [“Hiding layers in the Composition window” on page 101](#).)

To mark a layer as shy or not shy:

Select the layer in the Timeline window, and choose Layer > Switches > Shy to apply or undo shy status for that layer.

The icon in the Switches column indicates whether a layer is shy  or not shy . You can also click this Shy switch to toggle between shy and not shy status.


To hide or show all shy layers:

Click to select or deselect the Hide Shy Layers button  at the top of the Timeline window.

You can also choose Hide Shy Layers from the Timeline window menu to switch back and forth between showing and hiding shy layers.


Locking and unlocking a layer

The Lock switch prevents layers from being edited accidentally. When a layer is locked, you cannot select it in either the Composition or Timeline windows. If you try to select or modify a locked layer, the layer flashes in the Timeline window.

When a layer is locked, the Lock icon  appears in the Features column, which appears by default to the left of the layer name in the Timeline window.

To lock or unlock layers:

Do one of the following:


- In the Timeline window, click the Lock switch for the layer to place (lock) or clear (unlock) the Lock icon .
- Select one or more layers in the Timeline window and choose Layer > Switches > Lock.
- To unlock all layers in the active composition, choose Layer > Switches > Unlock All Layers.

Soloing a layer

You can isolate one or more layers for animating, previewing, or rendering by *soloing*. Soloing excludes all other layers of the same type from appearing in the Composition window. For example, if you solo a video layer, any lights and audio layers are unaffected, so they appear when you preview or render the composition. However, the other video layers do not appear. Soloing is useful for speeding up redraw and rendering.

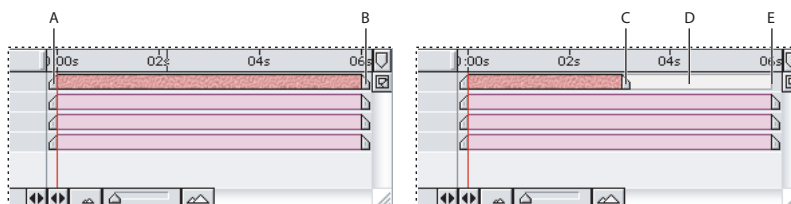
To solo a layer:

In the Timeline window, select the layers you want to isolate, and choose Layer > Switches > Solo to add a checkmark next to the Solo command.

The Solo icon  appears in the Switches column to the left of the layer names in the Timeline window. You can also click this icon to turn soloing on or off for a layer.

Understanding trimming

You can *trim* (hide) footage at the beginning or end of a layer, changing which frames are first or last in the composition. The first frame to appear is called the *In point*, and the last frame is called the *Out point*.



Trimming a layer **A.** Original In point **B.** Original Out point **C.** Out point after trimming **D.** Underlying (trimmed) footage or composition **E.** Original Out point reference

When you use a footage item as a source for different layers, you can trim it differently in each layer. Trimming does not alter the original source file.

Note: *Trimming a still image layer changes the length of time the image appears in the composition; it does not crop the image (affect what portion of the image appears).*

Trimming layer footage

You can trim by changing the In and Out points in the Layer window or the Timeline window, depending on what you want to change.

In the Layer window, In and Out points relate to time positions within source files, not the time at which the layer appears in the composition. For example, if you want to show only specific frames of a movie, trim the movie footage in the Layer window. However, if you want to begin the movie at the first frame in the source file and then cut it at some point in the play time, trim the Out point in either the Layer window or the Timeline window.

The numbers below the layer image indicate the In point **I** and Out point **O** relative to running the source file, and the duration **Δ** (the difference between the In point and the Out point).

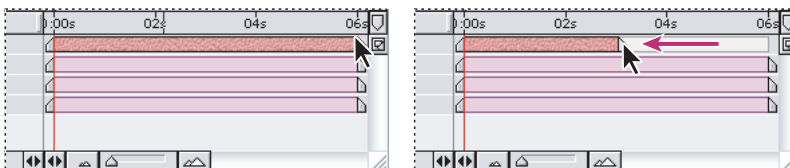
In the Timeline window, the In and Out columns tell you at what points in the composition the footage appears. For example, if you want a still image to appear at a specific point in the composition and then disappear again, trim the image In and Out points in the Timeline window.

Note: *If the In and Out columns do not appear in the Timeline window, click the Expand/Collapse icon **⏏** at the bottom of the Timeline window.*

To trim or restore layer footage:

Use one of the following techniques:

- Drag either end of the layer duration bar in the Timeline window.
- Move the current-time indicator in the Layer window to the time at which you want the footage to begin or end, and then click the In **I** or Out **O** button to set the In or Out point.



Dragging the Out point of a layer duration bar.

A pale rectangle behind the layer duration bar represents the footage you trimmed.



Move the current-time indicator precisely in either the Layer or Timeline window by choosing View > Go to Time.

Note: *If the entire layer duration bar moves when you drag, you've accidentally grabbed the layer itself; choose Edit > Undo Layer Time Change and try again.*

Moving a trimmed layer in time

After you trim a layer by setting In and Out points, you can adjust the duration position in two ways that have different results.

Dragging the duration bar If you drag the colored area of the duration bar, the trimmed footage starts and finishes playing at a different point in time. The length of the play time and the frames that appear remain unchanged.

Dragging the dimmed outline If you drag the pale rectangle behind the duration bar, the footage starts and ends at the same point in time as the original position, but different frames appear. For example, if you drag the pale rectangle to the left, then the In and Out points shift to later frames in the footage. (This is similar to a “slip edit” in common editing applications.)

Removing a section of a layer


Remove a portion from the middle of one or more layers from the Timeline using the following two methods:

- *Lifting* removes a section from the layers and leaves a gap of the same duration as the section you remove.
- *Extracting* removes a section from the layers and closes the resulting gap by ripple deletion.

To remove a section and leave a gap in time (lift):

1 In the Timeline window, adjust the work area to include only the portion of the layer or layers that you want to remove:

- Move the time indicator to the time at which you want the work area to begin and press B on your keyboard.
- Move the time indicator to the point where you want the work area to end, and press N.

2 Select the layers you want to remove a section from or turn on the lock switch  for any layers you do not want affected by the extraction.

3 Choose Edit > Lift Work Area to remove the section from all unlocked layers.

To remove a section and close the resulting gap (extract):

1 Follow steps 1 and 2 of the procedure for lifting (above).

2 Choose Edit > Extract Work Area.

Using markers

Use *composition-time* and *layer-time* markers to mark important points in a composition or in a specific layer. Composition-time markers are numbered, while layer-time markers use specified text labels. Markers also make it easier to align layers or the current-time indicator with specific points in time: You can snap items to markers when you drag them in the Timeline window by holding down Shift as you drag.


Layer-time markers can also include a *comment*, a *Web link*, or a *chapter link*. Comments appear only in the Timeline window. Web links initiate a jump to a Web page in your browser. Chapter links initiate a jump to a chapter in a QuickTime movie or in other formats that support chapter marks.

Creating composition-time markers

Composition-time markers appear on the time ruler in the Timeline window. After Effects automatically numbers them with a single digit that reflects the order in which you add them. You can place up to ten composition-time markers within a composition. If you remove a marker, the other markers remain numbered as they were.

To add a composition-time marker:

Do one of the following:

- Drag a composition-time marker from the Comp marker bin  to the desired point in the composition.



Dragging a composition time marker from the Comp marker bin.

- Move the current-time indicator to the position you want to mark and press Shift + a number key (0-9) on the main keyboard (*not* on the numeric keypad). A new composition-time marker appears at the current-time position, labeled with the number of the key you pressed.

Note: If the number you press is already used by another composition-time marker, After Effects does not create a new marker. Instead, it moves the existing marker with that number to the new position.

To move a composition-time marker:

Do one of the following:

- Drag the composition-time marker to another position in the Timeline window.
- Move the current-time indicator to the position you want, and then press Shift + the number (on the main keyboard, not the keypad) of the composition-time marker you want to move.

To snap the current-time indicator or layer duration bars to a marker:

Press Shift as you drag the current-indicator or a layer duration bar.

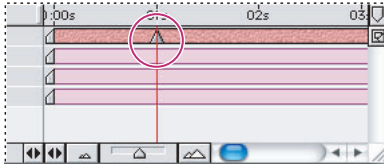
To remove a composition-time marker:

Drag the marker onto the Comp marker bin  on the Timeline window.

Note: To delete markers on a layer, right-click (Windows) or Ctrl-click (Mac OS) on a marker and choose *Delete This Marker* or *Delete All Markers* from the menu that appears.

Creating layer-time markers

Layer-time markers appear as small triangles on a layer-duration bar. You can have any number of layer-time markers in a layer. You can also drag existing markers to new time locations or remove them, as needed.



Layer-time marker

To add a layer-time marker:

- 1 With the appropriate layer selected, move the current-time indicator to the frame you want marked.
- 2 Choose Layer > Add Marker.
- 3 Double-click the layer-time marker.
- 4 In the Marker dialog box, type a name or comment in the Comment box and click OK.

To remove a layer-time marker:

- 1 Press Ctrl (Windows) or Command (Mac OS) and move the pointer near the marker you want to remove.
- 2 When the pointer appears as a pair of scissors, click the layer-time marker.

Note: To delete all markers on a layer, right-click (Windows) or Ctrl-click (Mac OS) on a marker and choose Delete All Markers from the menu that appears.

Creating Web links from markers

When you create a marker, you can type a Uniform Resource Locator (URL) under Web Links in the Marker dialog box to create an automatic link to that site. After Effects embeds this information within movies. When these movies are included in Web pages created by programs such as Adobe GoLive, the embedded URL is recognized at playback, initiating a jump to the specified URL. You can even target a specific frame within the site.

Web link markers work only with layer-time markers and supported output formats, such as QuickTime, Macromedia Flash (SWF), and others.

To create a Web link:

- 1 Create a layer-time marker and then double-click it to open the Marker dialog box.
- 2 For Web Links, type the URL for the site.
- 3 To activate a specific frame in a site, type the filename of the frame for Frame Target and click OK.

To view or modify information for a Web link:

- 1 Double-click a layer-time marker.
- 2 In the Marker dialog box, view the information and make any changes you want; then click OK.

Creating chapter links

You can also create a layer-time marker as a chapter reference point, similar to chapters used in CD-ROM and DVD discs. Like the chapters of a book, a chapter link divides a movie into segments. Chapter links are supported in QuickTime movies.

To create a chapter link:

- 1 Create a layer-time marker and then double-click it to open the Marker dialog box.
- 2 For Chapter Links, type the chapter name and number (if available), and click OK.



Nesting compositions containing layer-time markers

If you add one composition to another, the original composition becomes a layer in the parent composition. All the nested composition's composition-time markers become layer-time markers in the Timeline window of the parent composition. These markers are not linked to the original composition-time markers: Changes you make to the composition-time markers in the original composition do not affect layer-time markers in the nested composition. For example, if you remove one of the original composition-time markers, the corresponding layer-time marker for the nested composition remains in place. (See ["Organizing a project using nesting" on page 313.](#))

Adding markers synchronized to audio

After Effects provides a quick way to add and label markers for significant points in a layer's audio track, such as a rhythmic beat in music or spoken words in dialogue. Once markers are created, you can use them to synchronize video or other effects.













To synchronize markers to dialogue:


- 1 In the Time Controls window, click the Audio button  and then click the RAM preview button .
- 2 At the points in time where you want to add a marker, press the asterisk key (*) on the numeric keypad to create a layer marker.
- 3 When previewing is complete, double-click a marker you just created, type a descriptive label in the Comment box (such as a word being spoken at that time), and click OK. Repeat for any other markers you added.

About After Effects Audio/Video switches

The Timeline window contains the Audio/Video Features and the Switches columns. By default, these columns appear to the left (A/V Features) and right (Switches) sides of each layer name, but you can hide a column or arrange columns in a different order. (See ["Default controls and columns" on page 86](#) and ["Optional columns" on page 86.](#))

Use the switches to adjust the balance between display performance and display quality during your work session, clicking switch icons for individual layers to turn them off or on. You can also control them for selected layers by choosing Layer > Switches > *command*. Check marks next to commands indicate that those switches are currently turned on.


The A/V Features column includes the Video , Audio , Solo , and Lock  switches. The Switches column contains the Shy , Collapse Transformations , Quality , Effects , Frame Blending , Motion Blur , Adjustment Layer , and 3D Layer  switches.

 Quickly change switches for multiple layers by clicking the switch for one layer and dragging up or down that column for the adjacent layers.

By default, the layers' Switches column shares space in the Timeline window with the Modes column, so one or the other is visible—but not both. You can toggle between the two columns or show both columns simultaneously.

To toggle between the layers' Switches column and the Modes column:

Click Switches/Modes at the bottom of the Timeline window.

Note: The Expand or Collapse button  at the bottom of the Layer Names column hides and reshows the Switches column. If you do not see Switches, click the Expand or Collapse button.

To display both the Switches and Modes columns:

- 1 Click the right arrow above the Timeline window vertical scroll bar to open the Timeline window options menu.
- 2 Choose Columns > Modes (if Modes is not checked) or Columns > Switches (if Switches is not checked).

When you set the layer quality, enable motion blur or enable frame blending switches in a composition with other compositions nested within it, After Effects also sets these switches in the subordinate compositions. (The per-layer motion blur and per-layer frame blending switches are not affected in subordinate compositions.)

If you do not want the switch settings you add to parent compositions to apply to the compositions nested within them, change that at the Preferences level.


To prevent switches from operating through nested compositions:

- 1 Choose Edit > Preferences > General (Windows), or After Effects > Preferences > General (Mac OS).
- 2 Deselect the Switches Affect Nested Comps option, and click OK.

Altering appearances on the layer level

Use switches to make changes at the layer level that affect the appearance of your final output. These switches include Collapse Transformations (for composition layers)/Continuously Rasterize (for Adobe Illustrator layers), Quality, Effect (to turn effects on or off), Frame Blend, Motion Blur, and 3D Layer. By using the switches, you can specify the balance you want between the way the image looks and rendering time. (See [“Customizing layer work and views” on page 99](#).)

Collapsing transformation properties

The Collapse Transformations/Continuously Rasterize layer switch  in the Timeline window affects nested compositions and Adobe Illustrator files. However, it affects these layers differently.

When the layer source is a composition, this switch acts as the Collapse Transformations switch. Selecting it may improve image quality and decrease viewing and rendering time.

When the layer source is an Adobe Illustrator file, this switch acts as the Continuously Rasterize switch. Selecting this switch causes After Effects to rasterize the Adobe Illustrator file for each frame, which improves image quality, but also increases the time required for previewing and rendering.

When masks or effects are applied to a nested composition that has the Collapsed Transformations switch set, the layers in that nested composition are first rendered on their own, then masks and effects are applied, and then the result is composited into the main composition. This rendering order means that the blending modes of the nested layers are not applied to any underlying layers in the main composition, and that 3D layers above and below the collapsed layer cannot intersect or cast shadows on one another. (See [“Rendering compositions containing both 2D and 3D layers” on page 276.](#))

To collapse transformations or change the rasterization method for a layer:

Do one of the following:

- In the Timeline window, click the Collapse Transformations/Continuously Rasterize switch.
- Select a layer, choose Layer > Switches, and make sure that the Collapse command is selected (to turn it on), or deselected (to turn it off).

Changing the layer image quality


You can select three levels of quality for the layer image: Best, Draft, and Wireframe. A higher quality setting shows more detail at higher resolution, but at the expense of redraw and rendering speed. The three levels of quality are as follows:

- *Best* quality displays and renders a layer using subpixel positioning, anti-aliasing, 3D shading, and complete calculation of any applied plug-in effects. Best provides the slowest display and rendering time.
- *Draft* quality displays a layer so that you can see it, but only at rough quality. It displays and renders a layer without anti-aliasing and subpixel positioning, and some effects are not precisely calculated. Draft quality is often the most useful setting for general work and for video layers (to avoid blurring when matching compositions to raw video footage).
- *Wireframe* quality represents a layer as a box with an X across it. Layer wireframes display and render faster than other settings. However, layer contents or masks are not visible—only position and size. Because of this limitation, wireframe quality is available only from the Layer menu.

To change the layer image quality:

With the layer selected in the Timeline window, choose Layer > Quality, and then choose Best, Draft, or Wireframe.

Showing and hiding applied effects

Using the Effect switch , you can control whether a layer's effects appear in both previews and rendered versions. When you deselect this switch, the layer is displayed and rendered without its effects, saving previewing and rendering time. This switch is available only if a layer has effects applied to it.

To show or hide all effects applied to one layer:

Do one of the following:

- In the Timeline window, click the Effect switch for a layer to toggle between showing and hiding effects.
- Select a layer, choose Layer > Switches, and make sure that the Effect command is selected (to show effects) or deselected (to hide effects).


You can temporarily turn on or off an individual effect applied to a layer. (See [“Applying and controlling effects” on page 249.](#))

Enhancing time-altered motion by blending frames

When you time-stretch footage to a slower frame rate or to a rate lower than that of its composition, movement can appear jerky. This jerky appearance results because the layer now has fewer frames per second than the composition. By default, After Effects fills in the missing frames in slow-motion footage by repeating the last frame shown. After Effects can create a more gradual transition between frames by interpolating new frames between existing ones.

When you time-stretch or time-remap footage to a frame rate that is faster than the original or higher than that of its composition, After Effects skips many of the original frames to achieve the new rate and, consequently, movement can appear jerky. *Frame blending* combines the remaining original frames to create smoother fast motion. (See [“Time-stretching a layer” on page 165](#) and [“About time-remapping” on page 168.](#))


Using frame blending

Use the Frame Blending switch  when motion already exists in the source footage for a layer, such as live-action video. You can apply frame blending to a sequence of still images, but not to a single still image. If you are animating a layer—for example, moving a layer of type across the screen—use the motion blur switch. (See [“About motion blur” on page 111.](#))


Frame blending slows previewing and rendering. To speed things up, you can apply frame blending without using it to redraw or render. The Quality setting you select also affects frame blending. When the layer is set to Best quality, frame blending results in smoother motion but may take longer to render than when set to Draft quality. You can also enable frame blending for all compositions when you render a movie. (See [“Changing render settings” on page 330.](#))

To apply frame blending to a layer:


Select the layer in the Timeline window and choose Layer > Switches > Frame Blending.

A check mark by the Frame Blending command indicates that it is applied to the selected layer. Also, the Frame Blending switch  appears in the Switches column for the layer in the Timeline window. Remove frame blending either by clicking the Frame Blending switch or by choosing the Frame Blending command again.

To enable or disable Frame Blending for redraw and rendering:

Select Enable Frame Blending from the Timeline window Options menu, or click the Enable Frame Blending button  at the top of the Timeline window.

Using three dimensions

Use the 3D switch  to turn a layer into a 3D item that you can manipulate. When you use the 3D switch for a layer, you can add camera and light layers to take full advantage of the additional dimension. (See [“Understanding cameras” on page 268](#) and [“Understanding lights” on page 273](#).)

About motion blur


When you view one frame of motion-picture film or video containing a moving object, the image is often blurred. This is because a frame represents a sample of time (in film, a sample is 1/24 of a second long). In that time, a moving object occupies more than one position as it travels across the frame, so it cannot be shown as a sharp, still object. The faster the object moves, the more it blurs. The camera shutter angle also affects the appearance of the blur.


In contrast, in a single frame of a computer-generated animation, you may not be able to tell which objects are moving because all moving objects may appear as sharp and clear as nonmoving objects. Without *motion blur*, layer animation produces a strobe-like effect of distinct steps instead of an appearance of continuous change. Adding motion blur to layers you animate in After Effects makes layer motion appear smoother and more natural.


You can use motion blur when you animate a layer—for example, moving a layer of text across the screen. You cannot add motion blur to motion that already exists within a layer, such as live-action video. If you want to smooth live-action video where you assigned a frame rate much lower or higher than the original, use frame blending. (See [“Enhancing time-altered motion by blending frames” on page 110](#) and [“Using frame blending” on page 110](#).)

Note: Previous versions of After Effects included an effect called Motion Blur. That effect is now named Directional Blur, to avoid confusion with motion blurring applied to layers.

Applying motion blur to layers

The Motion Blur switch  creates a true motion blur based on the layer’s movement in a composition and what you specify for the shutter angle and phase. (See [“Adjusting the shutter angle for motion blur” on page 112](#).)


 For information about the Directional Blur effect (called “the Motion Blur effect” in earlier versions of After Effects), see “Blur and sharpen effects” in the online Effects Help.

Motion Blur slows previewing and rendering, but you can apply motion blur without displaying it in the Composition window. Use the Enable Motion Blur button  near the top of the Timeline window to control whether layers that use motion blur affect redraw and rendering. You can also enable motion blur for all compositions when you render a movie. (See [“Changing render settings” on page 330](#).)

To apply motion blur to a layer:

Select the layer or composition you want to blur in the Timeline window, and choose Layer > Switches > Motion Blur.

You can also apply motion blur by clicking the Motion Blur switch to place a checkmark for that layer.

Note: A checkmark by the Motion Blur command indicates that motion blurring is turned on for the selected layer or composition. The checkmark also appears in the Motion Blur switch  for that layer in the Timeline window.

Adjusting the shutter angle for motion blur

Adjust the intensity of motion blur by changing the *shutter angle* setting. The shutter angle is measured in degrees, simulating the exposure allowed by a rotating shutter. If you are not applying motion blur, shutter angle has no effect.

The shutter angle uses the footage frame rate to determine the simulated exposure. For example, typing 90 degrees (12.5% of 720 degrees) for 24-fps footage creates an effective exposure of $1/96$ of a second (25% of $1/24$ of a second). Typing 1 degree applies almost no motion blur, and typing 720 degrees applies a high degree of blur. By default, the shutter angle is set to 180 degrees.

To set the shutter angle and phase for motion blur:

- 1 Choose Composition > Composition Settings.
- 2 On the Advanced tab, type a value for Shutter Angle.
- 3 In Shutter Phase, type a number (up to 360) for when you want the shutter to open relative to the frame start (optional) and click OK.

Note: You can also change the shutter angle for a composition in the Render Queue window. (See [“Changing render settings” on page 330.](#))

Using audio layers

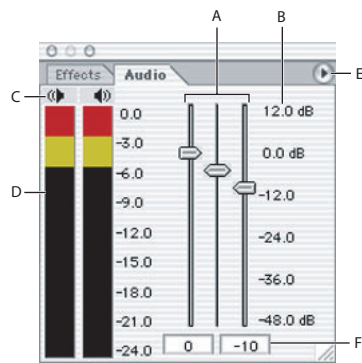
In After Effects, you can change volume levels of audio layers, preview them at a specified quality, and identify and mark locations. An audio layer contains different properties than a video layer, but you modify them the same way. You can apply special audio effects to audio layers, and adjust the waveform values. (See [“Adding markers synchronized to audio” on page 107.](#))

Previewing audio

When you preview audio, you control the quality and length of the preview. The audio preview preferences you set do not affect rendering; the quality of audio in rendered video is determined by the output module setting. (See [“Changing output module settings” on page 333.](#))

While previewing audio, After Effects displays clipping signals that indicate when the audio is clipping. Clipping is a distortion that occurs when the audio signal exceeds the maximum level that the audio device allows.

After Effects also displays a Volume Unit (VU) meter that actively displays audio levels during playback. To view the VU meter and levels controls in more detail, increase the height of the Audio palette.



Audio Palette **A.** Level controls **B.** Level units **C.** Audio clipping warning icons **D.** VU meter **E.** Audio Options menu **F.** Level values

You can quickly preview audio in the work area of the Timeline window without rendering frames or wireframes of the video. You can also preview audio synchronized with layer motion. (See [“Previewing animation” on page 139.](#))

To set display options for the Audio palette:

- 1 In the Audio palette, click the triangle in the upper-right corner and choose Options.
- 2 In the Audio Options dialog box, select one of the following:
 - Decibels to display audio levels as decibels.
 - Percentage to display audio levels as a percentage, where 100% equals 0 dB.
- 3 From the Slider Minimum pop-up menu, select the minimum decibel level you want to display in the Audio palette, and then click OK.

To set preferences for audio preview:

- 1 Choose Edit > Preferences > Previews (Windows), or After Effects > Preferences > Previews (Mac OS).
- 2 In the Audio Preview section, type a duration for the audio preview. An audio preview begins at the current-time indicator and continues for the duration you specify here. This option is useful when you are checking short passages of a composition, although you can interrupt an audio preview at any time.
- 3 Choose an audio sample rate from the first menu.
- 4 Choose an audio sample size from the second menu.
- 5 Choose Stereo or Mono playback from the third menu.
- 6 Click OK.








CD-quality sound is 44.1 KHz, 16-bit stereo. However, to reduce the time and memory required to preview, you may want to choose a lower bit depth and sample rate.

To preview audio:

- 1 In the Composition window or Timeline window, move the current-time indicator to the time where you want the preview to begin.
- 2 Choose Composition > Preview > Audio Preview (Here Forward), or press the period key (.) on the numeric keypad.

To preview audio and rendered images:

- 1 If the Time Controls palette is not open, choose Window > Time Controls. Click the double arrow on the Time Controls tab, as needed, until you see the RAM Preview Options, and then do one of the following:
 - If the From Current Time option is selected, move the current-time indicator in the Timeline window to the time at which you want the preview to begin.
 - If From Current Time is not selected, set the work area for the area you want to preview.
- 2 On the Time Controls palette, click the Audio button .
- 3 If needed, click the Loop button repeatedly to select the preview direction you want: looping from start to finish , single play (forward) , or cycling forward and backward .
- 4 Click the RAM Preview button  or press 0 on the numeric keypad.

To preview audio in the work area:

Select the layer and press Alt (Windows) or Option (Mac OS) + . (period).

Note: To stop the preview, press the spacebar.

For more information on the work area, see [“Setting up a work area” on page 89](#).

Dragging to preview composition audio

You can preview audio by dragging the time marker in a composition. Use this technique to easily identify and mark a location to synchronize audio and visual effects. Instead of using the audio waveform, you can identify a location in the layer by moving the current-time indicator in the Timeline window and listening to audio playback.

To preview composition audio:

In the Timeline window, press Ctrl (Windows) or Command (Mac OS) while you move the current-time indicator.

As you drag across time, After Effects plays segments of the audio. You can play the audio forward or backward. If you stop moving the current-time indicator while keeping the mouse button depressed, a short section of audio will loop.

Changing volume levels of an audio layer

When you use footage containing audio, the audio level in the footage plays at 0 db, meaning that the level is unadjusted in After Effects. Setting a positive decibel level increases volume, and setting a negative decibel level decreases volume.

The VU meter in the Audio palette displays the volume range for the audio as it plays. The red blocks at the top of the meter represent the limit of what your system can handle. When the audio volume extends past the top of the meter, After Effects makes the speaker icons red as a warning that audio is clipping. If you don't lower the level, the audio playback may be distorted when rendered. Reset the warning signal to black by clicking the red speaker icon.

Adjust the audio level and set level keyframes by dragging the level sliders as you preview an audio layer.

To set the volume level of an audio layer in the Audio palette:


- 1 Select the layer in the Composition window or Timeline window.
- 2 If the Audio palette is not visible, choose Window > Audio. For greater precision in setting levels, drag the resize icon in the lower right corner of the Audio palette to increase its size.
- 3 In the Audio palette, adjust volume in one of the following ways:
 - To set the level of the left and right channels together, drag the center slider up or down.
 - To set the level of the left channel, drag the left slider up or down, or type a new value in the levels box at the bottom of the left slider.
 - To set the level of the right channel, drag the right slider up or down, or type a new value in the levels box at the bottom of the right slider.

Including and excluding audio

You can include or exclude audio in the preview or rendered version, applying this option at either the composition or layer level. By default, audio is included.

To include or exclude an audio track from a composition:

Choose Layer > Switches > Audio to remove or add the checkmark by the Audio command.

By default, a check mark appears by the Audio command to indicate that audio is included for previews and rendering of the selected composition or layer. Audio icons  in the Features switches in the Timeline window also indicate whether or not audio is included.

Animating Layers

About layer properties

Each layer can contain several sets of properties. Layers that contain video or still images have mask and transform properties, such as mask shape or layer rotation. A layer can also include other properties, such as time remapping, video effects, and audio effects.

After Effects provides three ways to animate layer properties. You can animate a layer graphically in a Composition or Layer window by dragging a particular layer property value, or by typing numbers into the selected value or a dialog box. Each method is slightly different:

- When you animate a layer graphically, you change a value relative to the previous value. For example, you move a layer by selecting it at its existing position and then dragging it ten pixels to the left.
- When you animate a layer by dragging a particular layer property value, you change a value by positioning the pointer over the underlined value and dragging to decrease or increase the value.
- When you animate a layer numerically, you change a value by specifying an *absolute* number. For example, you move a layer by typing new coordinate values for the Position property.

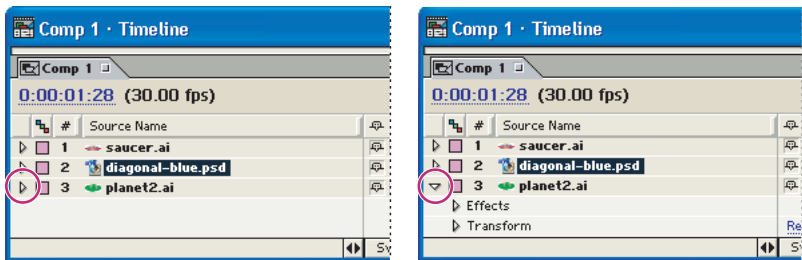
Viewing layer properties in the Timeline window

As you add layers to a composition, they appear in the layer outline in the Timeline window. You can expand the layer outline to display layer properties and change property values.

Keyboard shortcuts can help you quickly display a layer property, hide others, and save space in the Timeline window. For a list of Keyboard shortcuts, see the After Effects Keyboard Shortcut appendix.

To expand a layer outline heading:

- 1 Click the triangle to the left of the layer name so that it points downward.



Collapsed layer (left), expanded layer (right)



2 Click the triangle to the left of a property group such as Masks, Effects, or Transform to further expand the outline.

To collapse a layer outline heading:

Click the triangle to the left of the layer name so that it points to the right.

To expand or collapse all layer outline headings:

Select the layer and then press the grave accent (`) key.

Viewing only modified properties

When working on a composition containing a mix of animated, modified, and unmodified properties, you can choose to display only the modified properties. Viewing only modified properties makes it easier to access the properties for editing because you can concentrate on the properties that you have just been working with.

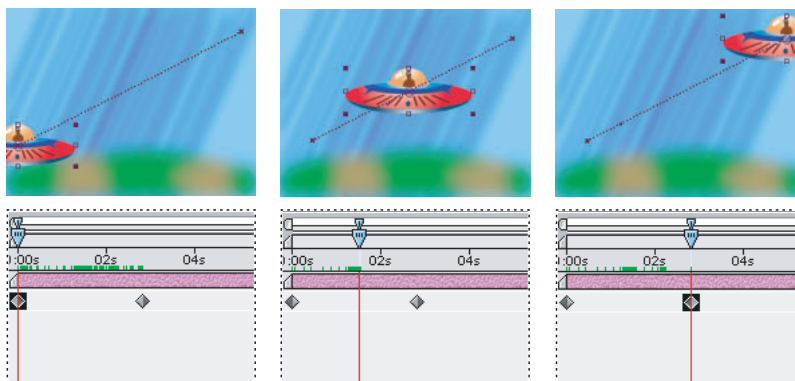
To view only modified properties:

Select a layer and do one of the following:

- Press U twice in rapid succession.
- Choose Animation > Reveal Modified Properties.

Understanding keyframes


After Effects uses keyframes to create and control animation. (After Effects can also use expressions to create and control animation. See [“Understanding expressions” on page 279](#).) A keyframe marks the point in time in a composition where you specify a value for a layer property. Animation using keyframes requires at least two keyframes. After Effects creates animation between keyframes by interpolating transition frames between each keyframe using intermediate values based on the changing property values from one keyframe to the next. A keyframe contains information on the type and speed of change between the adjacent intermediate values.

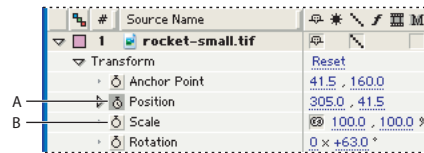


Two Position keyframes and the interpolated frames in between create a motion path.

You can modify layer properties with or without setting keyframes. If you do not set keyframes, or if you set only one keyframe, changes you make to the property value remain in effect for the duration of the layer.

Time-vary stopwatch

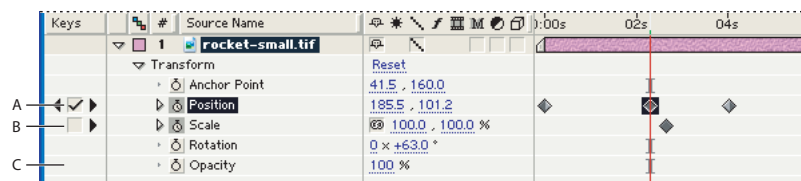
Each layer property has a time-vary stopwatch icon  that you click to begin the animation process. Once the stopwatch is active for a specific property, After Effects automatically sets new keyframes whenever you change the current time and the property value. When the stopwatch is inactive, no keyframes are present. If you type a value for a layer property while the stopwatch is inactive, the value remains in effect for the duration of the layer.



Stopwatch icons **A.** active stopwatch **B.** inactive stopwatch

Keyframe navigator

After you set the initial keyframe for a property, After Effects displays the keyframe navigator, which you can use to move from keyframe to keyframe or to set or remove keyframes. When the keyframe navigator box is selected, the current-time indicator lies precisely at a keyframe for that layer property. When it is deselected, the current-time indicator lies between keyframes. When arrows appear on each side of the keyframe navigator box, other keyframes for that property exist on both sides of the current time. Click the arrows to move to the previous or next keyframe. The keyframe navigator can be detached from the A/V Features column to function as its own column by choosing Column > Keys from the Timeline window menu.

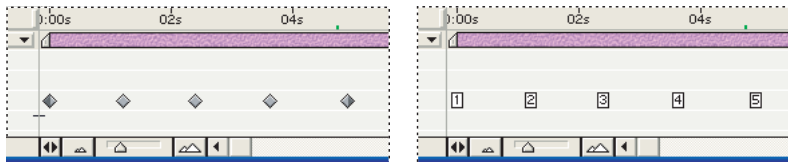


Keyframe navigator box in Timeline window **A.** Keyframe at current time **B.** No keyframe at current time **C.** No keyframes for layer property

Keyframe icons

The appearance of a keyframe icon depends on the interpolation method you chose for the interval between keyframes. When half of the icon is gray, the gray half indicates that there is no keyframe adjacent to that side, or that its interpolation is overridden by the Hold interpolation applied to the preceding keyframe. (See [“Comparing interpolation methods” on page 148.](#))

Change the keyframe icons to numbers by choosing Use Keyframe Indices in the Timeline window menu, located on the right side of the window.



Keyframes as icons and keyframes as numbers

Setting keyframes

You can set keyframes for any type of layer and any combination of layer properties at any point in time. You can also move, delete, or change the value or interpolation method of a keyframe.

Setting keyframes for layer properties

This section provides an overview of setting keyframes. For details on setting or changing individual layer properties, see the specific sections for each property, for example, [“Setting layer position” on page 126](#). For details on animating layer properties, see [“Setting and animating a layer property in the Timeline window” on page 125](#).

To set the first keyframe for a layer property:

- 1 In the Timeline window, select the layer you want to animate, and then display the layer property you want to animate.
- 2 Move the current-time indicator to a point in time where you want to add a keyframe.
- 3 Set the layer property to the value you want at that point in time; for example, move the layer to a new position.
- 4 Do one of the following:
 - Click the stopwatch icon ⌚ next to the property name to activate it. After Effects creates a keyframe at the current time for that property value.
 - Choose Animation > Add x Keyframe, where x is the name of the property you are keyframing.

To add additional keyframes for a layer property:

- 1 In the Timeline window, select the layer you want to animate.
- 2 Display the layer property for which you want to add a keyframe. It must already contain at least one keyframe, and the stopwatch must be activated.
- 3 Move the current-time indicator to the point where you want to add a new keyframe, and change the value for the layer property you are animating. After Effects adds a keyframe automatically.

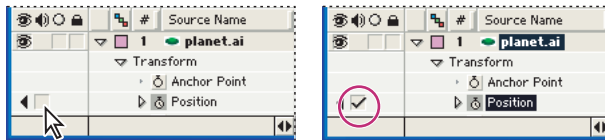
To add a keyframe without changing a value:

- 1 Display the Timeline window for the composition containing the layer you want to animate.
- 2 Display the layer property for which you want to add a keyframe. The property must already contain at least one keyframe, and the stopwatch must be activated.

3 Move the current-time indicator to the point where you want to add a new keyframe. If the current-time indicator is after the last keyframe for that layer property, the new keyframe will have the same value as the preceding keyframe. Otherwise, the new keyframe's value will be an interpolated value based on the previous and next keyframe values.

4 Do one of the following:

- Click the keyframe check box for the layer property.
- Choose Animation > Add x Keyframe, where x is the name of the property you are keyframing.



Click the keyframe navigator box to enable animation.

Navigating to and selecting keyframes

If you want to modify or copy a keyframe, first select it. After Effects provides many methods for navigating to and selecting one or more keyframes.

To move the current-time indicator to the previous or next keyframe:

Click a keyframe navigator arrow. The arrow to the left moves the current-time indicator to the previous keyframe. The arrow to the right moves the current-time indicator to the next keyframe.

To snap the current-time indicator to a keyframe:

Press Shift as you drag the current-time indicator to a keyframe.

To select a keyframe:

Click the keyframe icon in the Timeline window's time graph.

To select multiple keyframes:

Do one of the following:

- Press Shift as you click to select multiple contiguous or noncontiguous keyframes.
- Drag a marquee around the keyframes to select contiguous keyframes.

To select all keyframes for a layer property:

In the layer outline, click the layer property name. For example, click the word "Position" to select all the Position keyframes for a layer.

To select all keyframes in a property that have the same value:

Right-click (Windows) or Control-click (Mac OS) a keyframe and choose Select Equal Keyframes from the context menu that appears.

Accessing and editing keyframe values

You can quickly check the value of a single keyframe and edit the value, if desired.

To access and edit a keyframe value:

- 1 Right-click (Windows) or Control-click (Mac OS) the keyframe you want to check. The keyframe value appears at the top of the context menu that appears.
- 2 Choose Edit Value to edit the value, if desired.

Deleting keyframes

If you make a mistake while setting keyframes, or if you decide a keyframe is no longer needed, you can easily delete one or more keyframes from a layer.

To delete a keyframe:

- 1 Select a keyframe. (See [“Navigating to and selecting keyframes” on page 120.](#))
- 2 Press Delete on the keyboard.

To delete all keyframes of one layer property:

Click the stopwatch icon to the left of the name of the layer property to deactivate it.

Note: When you deselect the stopwatch icon, keyframes for that property are permanently removed and the value of that property becomes the value at the current time. You cannot restore deleted keyframes by reselecting the stopwatch. If you accidentally delete keyframes, choose Edit > Undo.

Moving and copying keyframes

You can easily move keyframes to different points in time or copy them to different layers. Moving keyframes makes it easy to change when animations occur. Copying keyframes makes it easy to use the same property setting in different layers. You can also copy a property value from a layer that contains no keyframes. (See [“Copying a value from a layer without keyframes” on page 123.](#))

Note: To copy an entire layer, including the source footage and keyframes, see [“Duplicating a layer” on page 94.](#)

Moving keyframes

You can move any keyframe to a different point in time. When you move keyframes, you move the values and settings they contain.

To move a keyframe to another time:

Drag one keyframe icon to the desired time.

To move multiple keyframes to another time:

- 1 Select the keyframes you want to move. (See [“Navigating to and selecting keyframes” on page 120.](#))
- 2 Drag any selected keyframe icon to the desired time. All of the other selected keyframes maintain their relative distance from the keyframe you drag.

To expand or contract a group of keyframes:

- 1 Select at least three keyframes.
- 2 Hold down Alt (Windows) or Option (Mac OS) and drag the first or last selected keyframe to the desired time.

For more information on modifying and copying keyframes, see [“Navigating to and selecting keyframes” on page 120](#).

To move a keyframe precisely to a different time:

- 1 Move the current-time indicator to the desired time.
- 2 Hold down Shift after you begin to drag a keyframe icon to the current-time indicator. When you drag over the current-time indicator, the keyframe snaps to the current-time indicator.

Copying and pasting keyframes

To use the same keyframe values at another point in time or in another layer, copy and paste them. You can copy keyframes between layers for the same property (such as Position) or between different properties that use the same type of data. The keyframe properties you can copy between include the following:

- Properties within the same dimension, for example, Opacity and Rotation, which have adjustable parameters in one dimension; or Mask Feather and 2D scale, which have adjustable parameters in two dimensions
- Rotation, effect angle control, and effect slider control properties
- Effect color properties
- Mask properties and spatial properties (effect points, anchor points, etc.).

You can copy keyframes from only one layer at a time. When you paste keyframes into another layer, they appear in the corresponding property in the destination layer. The earliest keyframe appears at the current time, and the other keyframes follow in relative order. The keyframes remain selected after pasting, so you can immediately move them in the destination layer.

Note: When copying and pasting between the same properties, you can copy from more than one property to more than one property at a time. However, when copying and pasting to different properties, you can copy only from one property to one property at a time.

To copy and paste keyframes:

- 1 In the Timeline window, display the layer property containing the keyframes you want to copy.
- 2 Select one or more keyframes.
- 3 Choose Edit > Copy.
- 4 In the Timeline window containing the destination layer, move the current-time indicator to the point in time where you want the keyframes to appear.
- 5 Do one of the following:
 - To paste to the same property of the copied keyframes, select the destination layer.
 - To paste to a different property from the copied keyframes, select the destination property.
- 6 Choose Edit > Paste.

For more information on modifying keyframes, see [“Navigating to and selecting keyframes” on page 120](#).

Moving a layer duration bar independently of its keyframes

Once you set keyframes, they maintain their position relative to their layer's duration bar. If you move the duration bar earlier or later in the composition, its keyframes move with it. You can prevent this by cutting and pasting keyframes.

To move keyframes without moving the layer duration bar, select the keyframes and drag them. (See [“Moving keyframes” on page 121.](#)) You can also change the displayed frames of a trimmed layer without moving either its keyframes or the layer duration bar. (See [“Moving a trimmed layer in time” on page 103.](#))

To move a layer duration bar but not its keyframes:

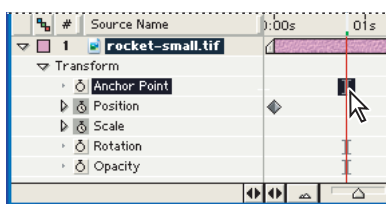
- 1 Make a note of the time at which the first keyframe appears.
- 2 In the layer outline, click the name of one or more layer properties containing the keyframes you want to keep at the same times.
- 3 Choose Edit > Cut.
- 4 Move or stretch the layer duration bar to its new In and Out points.
- 5 Move the current-time indicator to the time at which the first keyframe appeared before you cut the keyframes.
- 6 Choose Edit > Paste.

Copying a value from a layer without keyframes

You can copy the current value of a layer property to another layer, even when the original layer contains no keyframes. This can save you the time of having to set up a property the same way on various layers.

To copy a value from a layer without keyframes:

- 1 In the Timeline window, display the layer property containing the value you want to copy.
- 2 Click the I-beam icon for the layer property to select it.



Anchor Point property selected.

- 3 Choose Edit > Copy.
- 4 Select the layer into which you want to paste the value.
- 5 If the target layer contains keyframes, move the current-time indicator to the time where you want to paste the value. If the target layer does not contain keyframes, the new value applies to the entire duration of the layer.
- 6 Choose Edit > Paste.

Changing several keyframe values at once

You can change the values of multiple keyframes on multiple layers at one time; however, all keyframes you select must belong to the same layer property. The way the values change depends on the method you use to make the change:

- If you change a value numerically, all selected keyframes use the new value exactly. In other words, you make an *absolute* change. For example, if you select several Position keyframes on a motion path and numerically specify a Position value for one of them, all selected keyframes change to the same position value.
- If you change a value by dragging the underlined value, all selected keyframes change by the same amount. In other words, you make a *relative* change. For example, if you select several Position keyframes on a motion path and drag the underlined value for one of them, all selected keyframe values change by the same amount.
- If you change a value graphically in the Composition or Layer window, all selected keyframes change using the difference between the old and new values, not the values themselves. In other words, you make a relative change. For example, if you select several Position keyframes on a motion path and then drag one of them 10 pixels to the left, they all move 10 pixels to the left of their original positions.

You can also change the value of several layers at once by parenting them. (See [“Understanding parent layers” on page 137.](#))

To set multiple keyframes to the same value:

- 1 Select the keyframes you want to change. All keyframes you select must be for the same property. (See [“Navigating to and selecting keyframes” on page 120.](#))
- 2 Change the value of any selected keyframe by one of the methods above. All other selected keyframes change accordingly.

Determining where to set and modify keyframes

You can freely change any keyframe attribute. Because After Effects provides more than one view of a keyframe, where you modify it depends on what you want to do as well as the type of keyframe and layer property. All layer properties are temporal—they can change the layer over time. Some layer properties, such as Position, are also spatial—they can move the layer across composition space. You modify some attributes of a spatial layer property in different windows than you do temporal properties. (See [“Comparing interpolation methods” on page 148.](#))

Before you make any changes to a keyframe, make sure that the current-time indicator is positioned at an existing keyframe. If you change a property value when the current-time indicator is not at an existing keyframe, After Effects adds a new keyframe. However, if you double-click a keyframe to modify it, the current-time indicator location is not relevant, nor is it relevant when you change a keyframe’s interpolation method. (See [“Comparing interpolation methods” on page 148.](#))

Note: You can also copy and paste keyframes into a tab-delimited spreadsheet application, such as Microsoft Excel, and modify the values. This method works for all keyframe types except masks and some effects properties.

Setting and animating a layer property in the Timeline window

You can change a keyframe attribute in the Timeline window either by dragging the corresponding underlined value or by typing new values in a dialog box. After setting an initial keyframe, changing layer values creates animated layers. Follow the guidelines below to set and animate any layer property in the Timeline and Composition windows.

To set a layer property by dragging in the Timeline window:

- 1 Select a layer.
- 2 Expand the layer outline to display the layer properties.
- 3 Place the cursor over the underlined value and drag to the left or right to change the value.

To change a layer value numerically in the Timeline window:

- 1 In the Timeline window, select the layer you want to modify.
- 2 Display the layer property that you want to change.
- 3 Do one of the following:
 - Click the underlined value that you want to change, type a new value, then press Enter (Windows) or Return (Mac OS).
 - Right-click (Windows) or Control-click (Mac OS) the underlined value you want to change and choose Edit Value. Type new values and click OK.

Note: If you are changing Anchor Point values, note that the anchor point's coordinates are relative to the Layer window, not the Composition window. (See [“Using the Info palette” on page 36.](#))

To animate a layer property:

- 1 Display the Timeline and Composition windows for a composition.
- 2 In the Timeline window, select the layer that you want to animate.
- 3 Move the current-time indicator to the time where you want to begin the animation.
- 4 Display the layer property that you want to change.
- 5 Set the property's value.
- 6 Set an initial keyframe.
- 7 Move the current-time indicator to the time where you want to add the second keyframe.
- 8 Change the value for the property.
- 9 Repeat steps 7 and 8 as many times as you want to add more keyframes.

For more information on working with layer properties, see [“Setting keyframes” on page 119.](#)

Setting layer position

Every layer appears at a specific position in the Composition window. You determine the initial position when you add a layer to a composition. You can move a layer by dragging in the Composition window, by changing the position property value in the Timeline window, or by using keys on your keyboard. (See [“Using the Info palette” on page 36.](#))

To move a layer by dragging in the Composition window:

In the Composition window, drag the layer to a new location.

💡 If you have difficulty selecting a layer in the Composition window, first select it in the Timeline window, and then drag it in the Composition window. Make sure that you do not drag the layer by its layer handle.

To move a layer precisely:

To move a layer by a specific amount, do one of the following:

- To nudge a layer by 1 pixel at the current magnification, press the Left, Right, Up, or Down arrow key.
- To nudge a layer by 10 pixels at the current magnification, hold down Shift as you press the Left, Right, Up, or Down arrow key.
- To constrain horizontal and vertical movement while dragging a layer, press Shift after you start dragging the layer in the Composition window.
- To snap the edge of the layer to the edge of the Composition window frame, press Alt + Shift (Windows) or Option + Shift (Mac OS) after you start dragging the layer in the Composition window.

Creating a motion path

When you animate position values, After Effects displays the movement as a motion path. (For information on animating position values, see [“Setting and animating a layer property in the Timeline window” on page 125.](#)) You can create a motion path for the position of the layer or for the anchor point of a layer. A position motion path displays in the Composition window; an anchor point motion path displays in the Layer window. A motion path appears as a sequence of dots, where each dot marks the position of the layer at each frame. An X in the path marks the position of a keyframe.

💡 The density of dots between the X's in a motion path indicates the layer's relative speed. Dots close together indicate a slower speed; dots farther apart indicate a greater speed.

You can control the display of motion paths by setting View Options in the Composition window menu or Display preferences. (See [“Setting preferences” on page 22.](#))

To create a motion path:

- 1 In the Composition window, position the layer at the point where you want the motion to begin.
- 2 In the Timeline window, Press P to display the Position property, and then click the Position stopwatch to create an initial keyframe.
- 3 Move the current-time indicator to a point further in time.

- 4 In the Composition window, drag the layer to a new position. After Effects automatically creates another keyframe.
- 5 Repeat steps 3 and 4 until the motion path is complete.

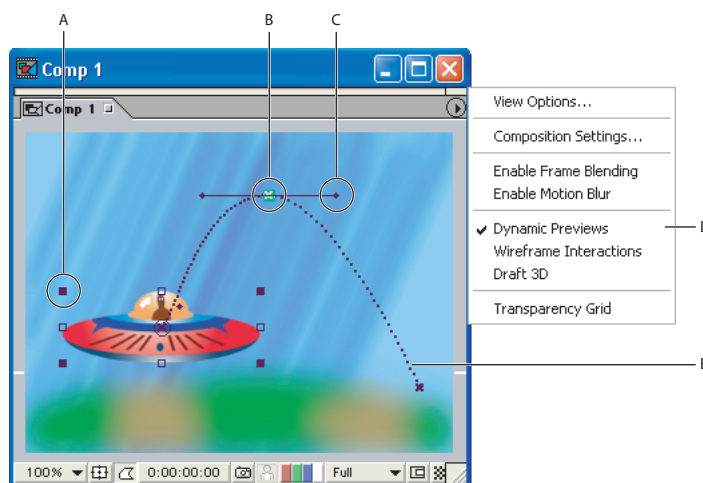
Modifying a motion path

You can modify a motion path either by changing an existing keyframe or adding a new keyframe. A motion path is less complex and generally easier to modify when you use fewer keyframes to describe the path.

Working with position keyframes and motion paths

If you want to add a new keyframe to a motion path, make sure that the current-time indicator is positioned at the time you want the new keyframe to occur. If you want to change an existing keyframe, make sure that the current-time indicator is positioned at the existing keyframe; otherwise, After Effects adds a new keyframe if you move the layer instead of moving points on the motion path. (See [“Controlling speed along a motion path” on page 157.](#))

The motion-path controls that you see in the Composition window depend on the options selected in the Composition window menu. For maximum control over the shape of a motion path, use the pen tools and the spatial interpolation methods that After Effects provides. (See [“Comparing interpolation methods” on page 148](#) and [“Bezier interpolation” on page 150.](#))



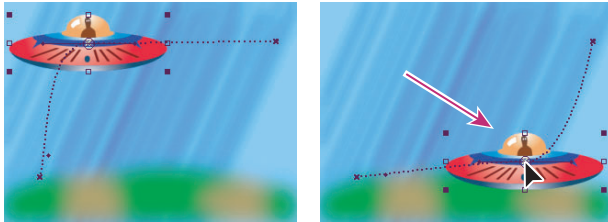
Composition window with spaceship layer selected **A.** Layer handle **B.** Layer keyframe **C.** Direction handle on direction line **D.** Composition window menu **E.** Motion path

To move a position keyframe:

- 1 Display the Timeline and Composition windows for a composition.
- 2 In the Timeline window, select the layer you want to modify.
- 3 Press P to display the Position property for the layer.
- 4 If you cannot see the keyframe you want to modify in the Composition window, move the current-time indicator in the Timeline window to the keyframe.

5 In the Composition window, use the pointer tool to drag a keyframe marker or its control handles on the motion path to a new position.

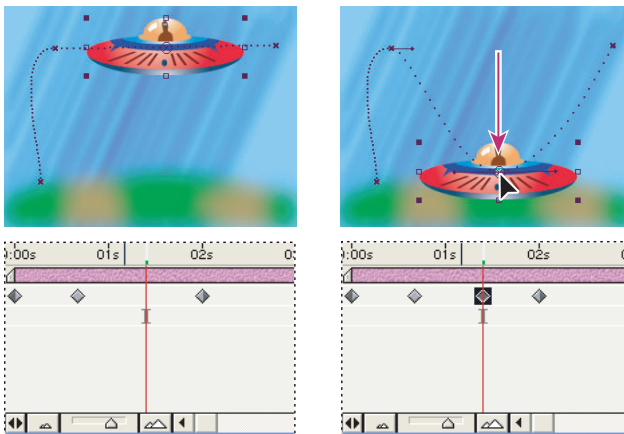
Note: The current-time indicator does not need to be located on a keyframe before you drag it.



Drag a layer in the Composition window to move a selected position keyframe.



To add a position keyframe by moving the layer:

- 1 Display the Timeline and Composition windows for a composition.
- 2 In the Timeline window, select the layer you want to modify.
- 3 Press P to display the Position property.
- 4 In the Timeline window, move the current-time indicator to the time where you want to add a new keyframe.
- 5 Move the layer by dragging it in the Composition window or by changing its Position property value.



Drag a layer in the Composition window to add a new position keyframe.

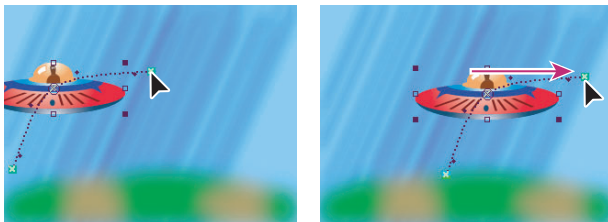
To add a keyframe using the pen tool:

- 1 Display the Timeline and Composition windows for a composition.
- 2 Select the layer you want to modify.
- 3 Select the pen tool  or pen + tool  from the Tools palette.
- 4 In the Composition window, move the pen tool over the motion path where you want to add the new keyframe and click to add the keyframe.

A new keyframe appears at the frame you clicked, on the motion path and in the Timeline window. To move the keyframe, use the selection tool.

To move all points on a motion path in unison:

- 1 Display the Composition and Timeline windows for a composition.
- 2 In the Timeline window, select the layer containing the motion path you want to move.
- 3 Press P to open the Position property.
- 4 Click the word "Position" to select all Position keyframes.
- 5 In the Composition window, click a keyframe with the selection tool and drag the path to a new position.



Dragging the motion path by a keyframe

Changing the number of visible motion-path keyframes

By default, After Effects displays motion path keyframes and dots in the Composition window that fall within a 15-second range from the current-time indicator. However, you can change this default. For greater precision when extensively modifying a motion path, you can display more keyframes. If you want to speed up screen updates, you can display fewer keyframes.

To change the number of visible motion-path keyframes:

- 1 Choose Edit > Preferences > Display (Windows) or After Effects > Preferences > Display (Mac OS).
- 2 In the Motion Path section of the Display Preferences dialog box, select one of the following options, and then click OK:
 - No Motion Path to prevent the display of a motion path and its keyframes.
 - All Keyframes to display every keyframe in the window.
 - No More Than: ___ Keyframes to specify a maximum number of keyframes to display, centered on the current-time indicator.
 - No More Than: ___ to specify a range of time within which keyframes display, centered on the current-time indicator.

Using Motion Sketch to draw a motion path

You can draw a path for the motion of a selected layer using Motion Sketch, which records the position of the layer and the speed at which you draw. As you create the path, After Effects generates a position keyframe at each frame, using the frame rate specified in the composition.

Motion Sketch does not affect keyframes that you have set for other properties. For example, if you set rotation keyframes for an image of a ball, you can use Motion Sketch to generate position keyframes, so that the ball appears to roll along the path you created.

For a more fluid animation after you create a motion path using Motion Sketch, use the Smoother to eliminate unnecessary keyframes. (See [“Smoothing motion and velocity” on page 130](#) for information on using the Smoother.)

To sketch a motion path:

- 1 In the Composition or Timeline window, select the layer for which you want to sketch a motion path.
- 2 In the Timeline window, set the work-area markers to the area in which you want to sketch motion.
- 3 Choose Window > Motion Sketch.
- 4 Select the appropriate Motion Sketch options:
 - Show Wireframe displays a wireframe view of the layer as you sketch the motion path. In addition, you can see any rotation or scaling that you have applied to the layer.
 - Keep Background displays the contents of the Composition window while you sketch. This is useful if you want to sketch motion relative to other images in your composition. After Effects does not show the animation of other layers, however; while you sketch, After Effects displays only the first frame at the time you start sketching. If you do not select this option, After Effects displays the motion path as a series of white dots on a black background.
- 5 If the composition contains audio, choose Window > Time Controls and click the Audio button to play all audio in the composition as you sketch.
- 6 For Capture Speed At, set the capture speed of the motion by specifying a percentage for how fast the motion plays back in relation to how fast you draw the path. Set the playback speed in one of the following ways:
 - To set the playback speed to the exact speed at which you sketch, set the capture speed to 100%.
 - To set the playback speed faster than the sketching speed, set the capture speed greater than 100%.
 - To set the playback speed slower than the sketching speed, set the capture speed less than 100%.
- 7 Click Start Capture and then, in the Composition window, drag the layer to create the motion path. Release the mouse button to end the path.

Note: After Effects automatically ends the motion path when the capture time reaches the end of either your composition or the work area.

Smoothing motion and velocity

Smooth motion paths, value curves, and velocity curves to eliminate bumpiness or excess keyframes using The Smoother, which adds keyframes or removes unnecessary keyframes. You can also use the smooth expression to accomplish this. (See [“Property attributes and methods” on page 308](#).)

Although you can smooth a curve for any property, The Smoother is most useful when applied to curves that have been automatically generated by either Motion Math or Motion Sketch, where you may have excess keyframes. Applying The Smoother to keyframes that have been set manually may result in unexpected changes to the curve. (See [“Using Motion Sketch to draw a motion path” on page 129.](#))

When you apply The Smoother to properties that change spatially (such as position), you can smooth only the spatial curve (the curve defined by the motion). When you apply The Smoother to properties that change only in time (such as opacity), you can smooth only the value and velocity curves (the curve defined by the value or the velocity).

In addition to adding keyframes or eliminating unnecessary keyframes, The Smoother also applies Bezier interpolation at each keyframe when smoothing the temporal curve.

To smooth a spatial or temporal curve:

1 In the Timeline window, either select all the keyframes for a property to smooth the entire curve, or select at least three keyframes to smooth only a portion of a curve.

2 Choose Window > The Smoother.

In the Apply To menu, The Smoother automatically selects Spatial Path or Temporal Graph, depending on the type of property for which you selected keyframes in step 1.

3 Set a value for Tolerance. The units of Tolerance match those of the property you are smoothing. New keyframe values will vary no more than the specified value from the original curve. Higher values produce smoother curves, but too high a value may not preserve the original shape of the curve.

4 Click Apply and preview the results.

5 If necessary, choose Edit > Undo The Smoother to reset the keyframes, adjust the value for Tolerance, and then reapply The Smoother.

Creating motion paths with masks

You can instantly create a motion path from any mask that you draw in After Effects (or from a path that you copy from Adobe Illustrator or Adobe Photoshop), by pasting the mask or path into a layer's Position property, a layer's Anchor Point property, or the effect point property of an effect. The assigned keyframes are set to rove in time, except for the first and last ones, to create a constant velocity along the mask or path. By default, After Effects assigns a duration of 2 seconds to the motion path. Adjust the default duration by dragging the first or last keyframe to a new point in time.

For more information on importing masks from Adobe Illustrator and Adobe Photoshop, see [“Importing masks from Adobe Illustrator and Adobe Photoshop” on page 194.](#)

To create a motion path from a mask:

1 Do one of the following:

- Select a mask.
- Create and select a path from Adobe Illustrator or Adobe Photoshop. (For information on creating paths in those products, see the respective User Guides.)

2 Copy the mask or path to the clipboard.

3 In the Timeline window, select the destination keyframe property.

4 Paste the mask or path.

Setting layer size

By default, a layer appears at 100% of its original size in the Layer window. Change the scale (x, y, and z values) of a layer over time by dragging the layer's handles in the Composition window or by changing the Scale property values in the Timeline window.

Scaling a layer


You can scale the layer partially or completely outside the frame. When you scale, the layer is scaled around its anchor point. (See [“Setting and animating an anchor point” on page 135.](#))


To scale a layer by dragging in the Composition window:

Do one of the following:

- To scale proportionally, hold down Shift as you drag any layer handle.
- To scale freely, drag a corner layer handle.
- To scale one dimension only, drag a side layer handle.

To scale a layer proportionally in the Timeline window:

- 1 Select a layer and press S to display the Scale property.
- 2 Click the constrain proportions icon  to the left of the Scale values.
- 3 Drag the underlined value or type a new value for either the x, y, or z value.

 Alt-click (Windows) or Option-click (Mac OS) the constrain proportions icon to activate it and match the height to the width.

To scale a layer by nudging it 1%:

Select a layer and then hold down Alt (Windows) or Option (Mac OS) as you press + or – on the numeric keypad.

To scale a layer by nudging it 10%:

Select a layer and then hold down Alt + Shift (Windows) or Option + Shift (Mac OS) as you press + or – on the numeric keypad.

Flipping a layer using Scale property keyframes

You can flip a layer using the numerical Scale option. A layer flips around its anchor point, so if you move the anchor point away from the center of the layer, it may move when you flip it. (See [“Setting and animating an anchor point” on page 135.](#))

To flip a layer by dragging in the Composition window:

Drag a layer handle over and past the layer's anchor point.

To flip a layer numerically:

- 1 In the Timeline window, select the layer you want to modify.
- 2 Expand the layer outline to display the Scale property (under Transform) or press S.
- 3 Ctrl-click (Mac OS) or right-click (Windows) the underlined Scale value and choose Edit Value from the pop-up menu that appears.
- 4 In the Scale dialog box, choose None from the Preserve pop-up menu.

5 Do one of the following and then click OK:

- To flip horizontally, type a negative Width value.
- To flip vertically, type a negative Height value.



Layer flipped with varying height and width values **A.** Width 100, Height 100 **B.** Width -100, Height 100 **C.** Width 100, Height -100 **D.** Width -100, Height -100

Setting layer opacity

By default, a layer is displayed at full opacity except for areas excluded by a mask or alpha channel. Make a layer more transparent by setting an opacity value of less than 100%. Set and change opacity only in the Timeline window. (See [“Setting and animating a layer property in the Timeline window” on page 125.](#))


Setting layer rotation

A layer can rotate any number of degrees in relation to its original orientation. You can rotate a layer as many times as you want, which is useful when you want to spin an object continuously over time. You can animate a layer's rotation in the Composition window using the rotation tool, or in the Timeline window by typing a revolution or degree value. You can rotate a layer partially or completely outside the frame. Rotation in 3D adds other options for rotation. (See [“Understanding 3D rotation” on page 262.](#))

Rotating a layer

When you rotate a layer, it rotates around its anchor point. (See [“Setting and animating an anchor point” on page 135.](#))

To change the angle of a layer by dragging in the Composition window:

- 1 Select the rotation tool  from the Tools palette.
- 2 In the Composition window, click anywhere on the layer and drag in an arc around the layer. For finer control over rotation, drag in a wide arc away from the layer's anchor point. To add multiple rotations, drag the rotation tool around the layer continuously for the desired number of rotations. To constrain rotation to 45-degree increments, hold down Shift as you drag.

To change an angle of a layer by entering rotation values in the Timeline window:

- 1 In the Timeline window, select the layer you want to rotate.
- 2 Expand the layer outline to display the Rotation property (under Transform) or press R.
- 3 Do one of the following:
 - Click the first underlined value and enter the number of times you want the layer to rotate completely.

- Click the second underlined value and enter the number of degrees by which to rotate the layer.

To rotate a selected layer by nudging it 1 degree:

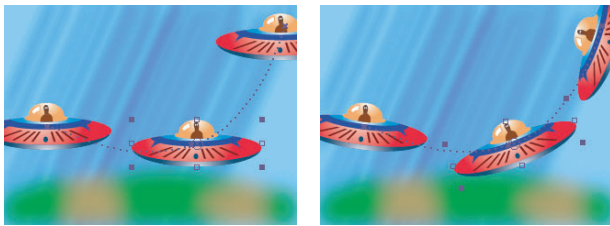
Press + or – on the numeric keypad.

To rotate a selected layer by nudging it 10 degrees:

Hold down Shift as you press + or – on the numeric keypad.

Rotating a layer along a motion path

You can make a layer rotate automatically as it moves along a motion path. For example, if you animate a toy airplane careening through the sky, you can apply auto-orient rotation to make the plane turn and change direction.



Before applying auto-orient rotation (left) and after (right)

To activate or deactivate Auto-Orient for a layer:

- 1 Display the Timeline and Composition windows for a composition.
- 2 In the Timeline window, select the layer you want to modify.
- 3 Choose Layer > Transform > Auto-Orient.
- 4 Do one of the following, and click OK:
 - To activate Auto-Orient, choose Orient Along Path.
 - To deactivate Auto-Orient, choose Off.

Setting and animating an anchor point

After Effects rotates and scales from a layer's anchor point. By default, the anchor point is at the center of a layer. You can move the anchor point to change rotation into revolution, making the layer rotate from one end or the other. For example, if you want to animate a maraca so it appears to be shaking, you first need to move the anchor point from the center of the maraca to the end of the handle.



With anchor point in center of layer (left), layer rotates around the center. With anchor point moved to end of handle (right), layer rotates from one end.

Moving an anchor point

Move an anchor point in the Layer window. As you do so, the selected layer moves in the Composition window, so you can view its position in relation to other layers. If Snap To Guides or Snap to Grids is enabled, the anchor point will snap to them.

You can also use the pan behind tool to move a layer's anchor point without moving the layer's relative position in the Composition window. When you select a layer in either the Composition or Timeline window and then select the pan behind tool, that layer's anchor point becomes active and adjustable. Again the pan behind tool saves you steps, because moving the layer's anchor point with the selection tool would shift its resulting position in the Composition window; using the pan behind tool changes the layer's position in order to compensate for your anchor point adjustment. As a result, you can move the anchor point without disturbing the Composition window.



When you use the pan behind tool to move the anchor point in the Composition window (left), After Effects automatically compensates for the move so that the layer maintains its position relative to the Composition window (right).

Note: Because a layer's Anchor Point and Position properties change when you drag the anchor point using the pan behind tool, using the pan behind tool to change the anchor point of a moving layer alters the motion path. If your layer contains a motion path, move the anchor point in the Layer window, and then select the motion path and adjust it accordingly. (See [“Setting and animating an anchor point” on page 135.](#))

To move the anchor point by dragging in the Layer window:

- 1 In the Composition or Timeline window, double-click the layer you want to modify or select the layer and choose Layer > Open Layer Window.
- 2 Choose Anchor Point Path from the View menu at the bottom right of the Layer window. The anchor point appears as a circle with an X through it.
- 3 Use the selection tool to drag the anchor point to a new location.

To move a layer anchor point by nudging it 1 pixel at the current magnification:

- 1 In the Timeline window, double-click the layer.
- 2 Select Anchor Point Path from the View menu at the bottom right of the Layer window.
- 3 Press the Left, Right, Up, or Down arrow key.

To move a layer anchor point by nudging it 10 pixels at the current magnification:

- 1 In the Timeline window, double-click the layer.
- 2 Select Anchor Point Path from the View menu at the bottom right of the Layer window.
- 3 Hold down Shift as you press the Left, Right, Up, or Down arrow key.

To move a layer's anchor point using the pan behind tool:

- 1 Select a layer in either the Composition or Timeline window.
- 2 Select the pan behind tool.
- 3 In the Composition window, use the pan behind tool to drag the anchor point to a new location. Notice that the Position and Anchor point values change for that layer.

Resetting the anchor point

After moving the anchor point with the pan behind tool, you can quickly reset the anchor point to the center of the layer. Dragging the anchor point with the pan behind tool repositions the layer's anchor point and changes the layer's position value but does not visually move the layer. When you reset the anchor point, the position value remains the same, but the visual location changes.

To reset the anchor point:

Double-click the pan behind tool  in the Tools palette.

To reset the anchor point and reset the position to the center of the composition:

Hold down Alt (Windows) or Option (Mac OS) and double-click the pan behind tool.

Converting audio to keyframes

The Convert Audio to Keyframes keyframe assistant analyzes amplitude within the composition work area and creates keyframes to represent the audio. This keyframe assistant creates a new layer called "Audio Amplitude" with three Expressions effects that contain the keyframes: Left Channel, Right Channel, and Both Channels.

You can use the Convert Audio to Keyframes keyframe assistant, along with expressions, to link the changes in audio amplitude to other layer properties, such as Scale or Opacity. For example, link the audio keyframes to the Scale property of a layer to make the layer grow and shrink as the amplitude increases and decreases.

To convert audio to keyframes:

Select the audio layer in the Timeline window, and then choose Animation > Keyframe Assistant > Convert Audio to Keyframes.

Setting and animating mask properties

Masks are paths that you draw or import into a Composition or Layer window to create transparent areas for a layer. In the Timeline window, you can set Mask Shape, Mask Feather, Mask Opacity, and Mask Expansion properties and change these properties over time. You can also set interactions between different masks within a layer and set the type of interaction used between the mask and the layer itself. For information on setting mask properties, see the corresponding section for the property you want to set. For example, to set the Mask Opacity property, see [“Adjusting the opacity of a mask” on page 188](#). For information on animating mask properties, see [“Animating a mask” on page 191](#).

Setting and animating effects

Once you apply an effect to a layer, you can set keyframes for the effect property values. You can also set multiple keyframes to animate effects. The properties available vary depending on the effect. (See [“Changing effect property values” on page 252](#) and [“Changing effects over time” on page 254](#).)

Understanding parent layers

To assign one layer’s transformations to the transformations of another layer, use *parenting*. Parenting can affect all transform properties except opacity. Assign parent layers in the Parent column in the Timeline window. A layer can have only one parent, but a layer can be a parent to any number of 2D or 3D layers within the same composition. You cannot animate the act of assigning and removing the parent designation—that is, you cannot designate a layer as a parent at one point in time and then designate it as a normal layer at a different point in time. Parenting layers is useful for creating complex animations such as linking the movements of a marionette or depicting the orbits of planets in the solar system.



Dragging the pick whip to designate the spaceship layer as the parent to the star layer.

Once a layer is made a parent to another layer, the other layer is called the *child* layer. Creating a parenting relationship between layers synchronizes the changes in the parent layer with the corresponding transformation values of the child layers. For example, if a parent layer moves 5 pixels to the right of its starting position, then the child layer will also move 5 pixels to the right of its position. You can animate child layers independent of their parent layers. You can also parent using null objects, which are hidden layers. (See [“Using null objects” on page 138](#).)

Working with parent and child layers

When you assign a parent, the child layer's properties become relative to the parent layer instead of to the composition. By default, After Effects adjusts any keyframe values of the child layer so that its properties appear to remain relative to the composition and, thereby, there is no visible alteration to the layer itself. However, you can choose to have the child layer *jump*, or visibly alter its properties relative to the parent layer. For example, consider two layers in a composition, where one of the layer's position property has been changed and the other has not. If you assign the unchanged layer as the child of the changed layer and do not choose the jump option, then the child layer will not move. If you do choose the jump option, then the child layer's position shifts so that its position is now relative to the parent layer.

Alternately, when you remove a parent from a child layer, you can choose to have the child layer jump to show that its transform properties are now relative to the composition.

Jumping a layer is useful to depict a change in focus for a particular layer or layers' animation. For example, you could animate one child layer to encircle a parent layer, then jump the child to another layer that may be positioned away from the first parent layer. The child layer can then encircle the new parent at a position relative to the new parent.

To show or hide the Parent column:

Choose Columns > Parent from the Timeline window menu.

To parent a layer:

In the Parent column in the Timeline window, do one of the following:

- Drag the pick whip of the layer you want to be the child layer to the layer you want to be the parent layer.
- Click the menu of the layer you want to be the child, and choose a parent layer name from the menu.

To remove a parent from a layer:

In the Parent column, click the menu of the layer you want to remove the parent from, and choose None.

To make a child layer jump when a parent is assigned or removed:

Hold down Alt (Windows) or Option (Mac OS) as you assign or remove the parent.

Using null objects

If you want to assign a parent layer, but do not want that layer to be a visible element in your project, use a *null object*. A null object is an invisible layer that has all the properties of a visible layer so it can be a parent to any layer in the composition. (See [“Understanding parent layers” on page 137](#).) Adjust and animate a null object as you would any other layer. (See [“Setting and animating a layer property in the Timeline window” on page 125](#).)


A composition can contain any number of null objects. A null object is visible only in the Composition and Layer windows and appears in the Composition window as a rectangular outline with layer handles. Effects are not visible on null objects.

To create a null object:

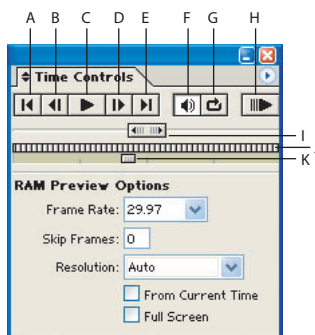
Select the Timeline or Composition window and choose Layer > New > Null Object.

Note: The anchor point of a new null object layer appears in the upper left corner of the layer, and the layer is anchored in the center of the composition at its anchor point. Change the anchor point as you would for any other layer. (See [“Setting and animating an anchor point” on page 135](#)).

Previewing animation

After Effects provides five options for previewing your animations: OpenGL interactive preview, RAM Preview, standard preview, manual preview, and wireframe preview. OpenGL preview is the default preview option if you have the necessary OpenGL hardware installed. You can enable and disable it as necessary by using the Dynamic Preview button  on the Composition window or by changing the OpenGL preference. You can access RAM, standard, and manual previews using the Time Controls palette. Access wireframe preview from the Composition > Preview menu.

After Effects also uses caching and dynamic resolution to facilitate quicker previews and Composition window updates whether you're using RAM Preview, using OpenGL interactive preview, advancing sequentially or nonsequentially through the frames, or dragging layers in the Composition window. Wireframe mode is also available to speed up Composition window updates. (See [“Previewing 3D” on page 275](#) for information on using Wireframe mode.)



Time Controls palette **A.** First Frame **B.** Previous Frame **C.** Play **D.** Next Frame **E.** Last Frame **F.** Audio **G.** Loop **H.** RAM Preview **I.** Jog control **J.** Time indicator **K.** Shuttle control

The preview options represent different balances between preview quality and speed:

OpenGL interactive preview This option plays a preview of the frames by using installed OpenGL hardware. During OpenGL preview, memory is supplied by the OpenGL hardware and frames are only displayed onscreen rather than being cached, so the quality is high and the speed is exceptionally fast. Use OpenGL preview to interactively preview footage in the Timeline window by dragging underlined values, scrubbing the timeline, or dragging footage in the Composition window. This option is invaluable for client demonstrations when you want to show your work in a fluid manner without waiting for After Effects to render each change. (See [“Using OpenGL interactive previewing” on page 141](#).)

RAM Preview This option plays a preview of the frames (including audio) at the frame rate of your composition or as fast as your system allows. Use RAM Preview to preview the footage in the Timeline, Layer, or Footage windows. The number of frames previewed depends on the amount of contiguous RAM available to the application. After Effects displays the total number of frames requested for the preview and the number it can render. (See [“Using RAM Preview” on page 143.](#))

You have two choices of RAM Preview settings: RAM Preview and Shift+RAM Preview. Each provides different options. In the Timeline window, RAM Preview previews either the span of time you specify as the work area or from the current time indicator forward. In the Layer and Footage windows, RAM Preview previews only untrimmed footage. Before you preview, check which frames are designated as the work area. (See [“Setting up a work area” on page 89.](#)) Before you preview the Layer or Footage windows, check to see that footage you may want to preview has not been trimmed.

Audio plays only for layers in which the Audio switch is on. (See [“Previewing audio” on page 112.](#))

Standard preview This option provides a preview of all frames in your composition. When you use this option, After Effects displays every frame as quickly as it can using the current settings of the layer switches, composition switches, and composition resolution. This preview generally plays slower than real time. Standard preview is useful when your composition is simple or in its early stages and doesn't require additional memory for displaying complex animations, effects, 3D layers, cameras, and lights. (See [“Using standard preview” on page 142.](#))

Manual preview Using the shuttle control, the jog control, and the current time indicator, you can manually navigate through a composition, layer, or footage file. The current time indicator shows the position of a frame relative to the beginning and end of a composition, layer, or footage file. Because the current time indicator travels only a fixed distance in the Time Controls palette, it is less precise with long compositions. (See [“Using standard preview” on page 142.](#))

Wireframe preview This option displays a preview of the frames for all layers in your active workspace. Each layer is represented by a rectangle or, if a still-image layer has a mask or an alpha channel created in another program, by the outline of the mask or alpha channel. (See [“Using standard preview” on page 142.](#))

Adaptive Resolution preview This option degrades the resolution of the layers by an amount you choose, so that they use less memory to display. Use this option when you want to preview complex or animated effects or when you want to preview movies and layers that require extensive memory. You can toggle this option on and off by using the Dynamic Preview button in the Composition window. (See [“Using Adaptive Resolution previews” on page 144.](#))

You can also use the Motion with Trails preview, which preserves the outline of each frame of each selected layer so that you can see an outline trail for every frame. (See [“Using standard preview” on page 142.](#))

Note: *Previews use the frontmost composition view for 2D compositions and the Active Camera view for 3D compositions when multiple views are opened. To turn off the Active Camera, deselect Previews Favor Active Camera in the Time Palette options menu.*

Using OpenGL interactive previewing

OpenGL is an interactive preview option that provides fast screen previewing of a composition without degrading resolution. For example, the display resolution is the same high level regardless of whether you use OpenGL to preview three layers or 20 layers, because OpenGL uses the memory and graphics processing capabilities on the installed OpenGL hardware. OpenGL is automatically activated when you manipulate layers in the Composition window or the Timeline window by using the mouse.

AfterEffects requires OpenGL 1.1 or later. After Effects detects OpenGL hardware if it is installed and sets the default preview to OpenGL. OpenGL hardware supports layers up to 2000 x 2000 pixels. For larger layers, After Effects downsamples the resolution of the layer to make it fit the size limitation. Using complex effects can slow down the OpenGL preview. If the preview is too slow, turn off OpenGL and use another preview option.

OpenGL works with both still images and moving images. If a layer contains a movie or moving image, OpenGL can either use each frame from the movie or moving image to create the preview, or it can use a single, designated frame of the layer as a proxy to further enhance the speed of previews.

The Dynamic Preview button turns green when OpenGL is engaged. OpenGL previewing is faster and smoother than Adaptive Resolution previewing.

OpenGL supports most of the basic After Effects features, including transformations, 3D layers, lights, adjustment lights, masks, alpha channel track mattes, and Stained Glass. OpenGL supports only the Normal blending mode.

When OpenGL does not support a feature, it simply creates a preview without using that feature. For example, if you have a layer that uses an Add blending mode, OpenGL previews the layers using the Normal blending mode instead. Or if your layers contain shadows and your OpenGL hardware does not support them, the preview will not contain shadows. However, when you release the mouse and return from OpenGL preview, any unsupported features are rendered and appear again.

Shadow support in After Effects is dependent on the OpenGL hardware; contact the hardware manufacturer for details. For information regarding specific OpenGL hardware, see the After Effects section on the Adobe Web site at www.adobe.com/aftereffects.

To turn on OpenGL interactive previewing:

- 1 Choose Edit > Preferences > Previews (Windows) or After Effects > Preferences > Previews (Mac OS).
- 2 Select OpenGL Hardware With Moving Textures or OpenGL Hardware With Static Textures.
- 3 To view the hardware information, including hardware supported features, click Info.

Note: Adobe recommends leaving your video card's Advanced settings at their default.

- 4 Enter a value for Texture Memory (Windows only) of no more than 80% of the installed Video Ram (VRAM) on your display card. (On Mac OS, After Effects queries the display card directly to determine the optimal value.)

To use OpenGL preview:

- 1 In the Timeline window, make sure that the video switch is selected for the layers you want to preview.

2 Click the Dynamic Preview button and choose an OpenGL option from the pop-up menu that appears:

- Choose OpenGL with Moving Textures to preview each frame of the layer.
- Choose OpenGL with Static Textures to preview using a proxy frame. After Effects uses the first frame encountered during previewing as the proxy frame.

3 Do one of the following:

- Drag a layer around the Composition window.
- Drag an underlined, motion-related property value, such as rotation or scale, in the Timeline window.
- Scrub the current-time indicator in the Timeline window.

Using standard preview

When you want to preview a simple animation, you can use the standard preview tools for playing back all or a portion of the composition or for manually previewing frame by frame.

To stop any preview before it is complete:

Press the spacebar.

To display the Time Controls palette:


Choose Window > Time Controls.

To use standard preview:

- 1** In the Timeline window, make sure that the video switch is selected for the layers you want to preview.
- 2** Move the work-area markers to set the time span you want to preview.
- 3** Do one of the following:
 - Choose Window > Show Time Controls, and then in the Time Controls palette, click the Play button ▶.
 - Press the spacebar to start; press again to stop.

To use the manual preview options:

Do any of the following:

- To go forward one frame, click the Frame Advance button ►.
- To go forward ten frames, press Shift as you click the Frame Advance button.
- To go backward one frame, click the Frame Reverse button ◀.
- To go backward ten frames, press Shift as you click the Frame Reverse button.
- To preview with finer precision, drag anywhere along the jog control or drag the time indicator or shuttle control .
- To go to the beginning of the composition, layer, or footage, click the First Frame button ⏮.
- To go to the end of the composition, layer, or footage, click the Last Frame button ⏭.

To use the wireframe preview:


- 1 In the Timeline window, select the layers you want to preview. To preview all layers, make no selection.
- 2 Set the work area to the time span you want to preview.
- 3 Do one of the following:
 - Choose Composition > Preview > Wireframe Preview. To display a rectangular layer boundary instead of an alpha channel outline, press Ctrl (Windows) or Command (Mac OS) as you choose the preview method.
 - Choose Composition > Preview > Motion with Trails.

Using RAM Preview

When you preview a composition in After Effects, the more detail and precision you want to see, the more slowly the composition displays in standard preview and the more RAM is required for RAM Preview. You can control the amount of detail shown in either the standard or RAM Preview by changing the resolution, magnification, and preview quality of your composition. (See [“Setting resolution” on page 77](#) and [“Changing the layer image quality” on page 109](#).)



You can also limit the number of layers previewed by turning off the video switch for certain layers, or limit the number of frames previewed by adjusting the composition’s work area. (See [“Hiding layers in the Composition window” on page 101](#) or [“Setting up a work area” on page 89](#).) When you use RAM Preview, the Time Controls palette displays the frames rendered and previewed and the frame rate of the preview.

To use RAM Preview:

- 1 Activate the Timeline window or display a Layer or Footage window, depending on which one contains the footage you want to preview.
- 2 Do one of the following:
 - If you are previewing footage in the Timeline, make sure that the video is turned on for the layers you want to preview, and set the work area to the time span you want to preview.
 - If you are previewing footage in a Layer or Footage window, make sure that the layers you want to preview have not been trimmed.
- 3 Click the Audio button  on the Time Controls palette if you want to preview audio with video.
- 4 In the Time Controls window menu, choose Show RAM Preview Options or Show Shift+RAM Preview Options.
- 5 Set the Preview Options as follows:
 - For Frame Rate, either choose a desired frame rate from the list or type a frame rate in the box. To enter a two-digit frame rate, choose a two-digit frame rate from the list, and then change each digit individually. Choose Auto to have After Effects use the composition frame rate.
 - For Skip Frames, type the number of interim frames you want to remain unrendered. For example, if you type “2,” After Effects renders the first frame and then each third frame following.




- For Resolution, choose an option from the list. Choose Auto to use the current composition resolution.
- Select From Current Time to render the RAM Preview from the current time.
- Select Full Screen to have the RAM Preview play back on a black screen at the composition size.

6 Do one of the following:

- To have the RAM Preview play back using the RAM Preview Options settings, click the RAM Preview button .
- To have the RAM Preview play back using the Shift+RAM Preview Options settings, hold down Shift and click the RAM Preview button .

To change the number of times the RAM Preview plays back:

Do one of the following:

- To have the preview play back once, click the Loop button until it displays the loop once icon , and then click the Play or RAM Preview button.
- To have the preview loop continuously, click the Loop button until it displays the loop icon , and then click the Play or RAM Preview button.
- To have the preview play back forward and then backward continuously, click the Loop button until it displays the palindrome icon , and then click the Play or RAM Preview button.

Using Adaptive Resolution previews

As you drag layers in the Composition window, or use the Manual Preview option, After Effects dynamically updates each frame in the Composition window. If necessary, After Effects dynamically degrades the resolution of the composition. This reduces the amount of data that needs to be compiled during the edit and thereby facilitates a smooth, quick update. Once the update is complete, the composition returns to the designated resolution. You can set the maximum level of degradation to apply to a composition.

To specify dynamic preview acceleration:

- 1 Choose Edit > Preferences > Previews (Windows) or After Effects > Preferences > Previews (Mac OS).
- 2 Select Dynamic Preview Acceleration and Adaptive Resolution. (This option is selected by default if you do not have OpenGL hardware installed.)
- 3 Select an amount from the Degradation Limit menu. The amount you select represents the maximum fraction of data removed from a layer's current composition resolution when After Effects enacts dynamic resolution.

Setting Video Preview preferences

You can preview the contents of your Layer, Footage, or Composition window on an external video monitor if you have a third-party device that facilitates this, such as a video digitizing card or a FireWire port (Mac OS). This feature does not work with Windows OHCI cards. Set the Video Preview preferences to identify the device After Effects uses for output, to adjust the display, and to specify the use of OpenGL previews.

To set Video Preview preferences:

- 1 Choose Edit > Preferences > Video Preview (Windows) or After Effects > Preferences > Video Previews (Mac OS).
- 2 Set any of the options below, and click OK:
 - Choose a device from the Output Device menu. If a device is available, it will appear here.
 - Choose a mode from the Output Mode menu. The choices listed here depend on the device you are using. The Frame Size and Frame Rate indicators below the menu reflect the choices you made in the Output Mode menu and are independent of any After Effects setting.
 - Select Mirror Previews on Computer Monitor to play the preview simultaneously on the computer screen and the external monitor.
 - Select a Show Output option. Select RAM Previews to see all RAM Previews on the external monitor. Select Interactions to always update the video preview on the external monitor. Select Renders to view each frame on the external monitor as it renders.

About caching

As After Effects displays a frame or compiles a RAM Preview, it places each of those displayed or compiled frames into a cache. Once the frames are cached, they display or play back quicker because they are now playing or displaying from RAM. Currently cached frames are designated by green bars in the time ruler; choose Show Cache Indicators from the Timeline window menu to toggle the cache indicators on and off.

Note: When you use OpenGL previews, After Effects does not cache frames until the preview is complete.

When you advance either sequentially or nonsequentially through frames in your composition, or play back using the Standard Preview option, each of the frames is compiled and placed into the cache, and the green bars appear in the Timeline at the point where the cached frame occurs. When you compile a RAM Preview, the frames you designate to be included in the preview are compiled, and the green bars appear in the time ruler to indicate which frames were cached. If you make a change to any of the cached frames in the composition, the cache purges only the frames affected by that change. You can also manually purge the entire cache.

Once the cache is full, and you continue to advance either sequentially or nonsequentially through frames in your composition, any additional frame added to the cache replaces the earliest cached frame in order to make room for the new frame. When you compile frames for RAM Previews, once the cache is full, After Effects ceases adding frames to the cache and the preview begins playback of only the frames that could fit in the cache. You can specify the size of the cache in the Cache preferences. The number of frames that can occupy the cache depends on the composition settings, layer sizes and several other variables.

To set Cache preferences:

- 1 Choose Edit > Preferences > Cache (Windows) or After Effects > Preferences > Cache (Mac OS.)
- 2 Set any of the options below:

- Enter an amount for Image Cache Size as a percent of the amount of installed RAM. (The default value is 60%; Adobe does not recommend values over 90%.) The amount you enter determines the maximum amount of memory After Effects uses for cached frames. The number of frames that RAM Preview displays is also limited by this setting: Increase it to get longer RAM Previews; decrease it if RAM Previews are jerky or halting because of virtual memory paging activity.
- Enter an amount for Maximum Memory Usage as a percent of the amount of installed RAM. (The default value is 120%; Adobe does not recommend values over 200%.) This setting limits the amount of memory After Effects can use. Increase the amount if insufficient memory errors occur. You can specify amounts greater than 100% because virtual memory is not limited to the amount of installed RAM.

To purge the cache:

Make sure that the Timeline window is selected, and choose Edit > Purge > Image Caches.

Fine-tuning Animation

Controlling change through interpolation

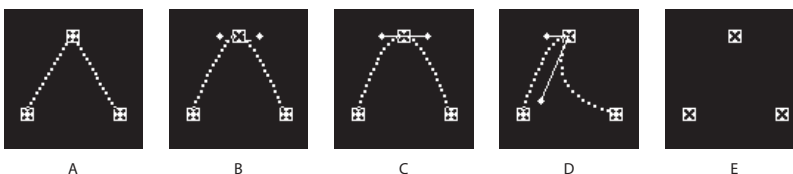
After you create your keyframes and motion paths, you may want to make more precise adjustments to the way the change occurs. After Effects provides several interpolation methods that affect how change occurs through and between keyframes. For example, if you are setting up motion, you can choose to make a layer change direction abruptly or smoothly through a curve. After Effects interpolates values for a change using the values of the keyframes on both ends of the change.

You can control *temporal* interpolation (the interpolation between keyframe values over time) for all layer properties. For layer properties that involve movement, such as Position, Anchor Point, Effect Point, and 3D Orientation, you can also control *spatial* interpolation (the interpolation between motion-path keyframes through space).

When you make a layer property vary over time, After Effects displays a set of related graphs specific to the property type (temporal or spatial). For temporal properties, such as Opacity, After Effects displays the interpolated values as a Value graph and the rate of change as a Velocity graph. The Value and Velocity graphs appear in the Timeline window. For spatial properties, After Effects displays the interpolated values as a motion path in the Composition or Layer window and the rate of change as a Speed graph in the Timeline window. (See [“Fine-tuning speed and velocity” on page 158.](#))

Spatial interpolation and the motion path

When you apply or change the spatial interpolation for a property such as Position, you automatically adjust the motion path in the Composition window. The different keyframes on the motion path provide information about the type of interpolation at any point in time. The Info palette displays the spatial interpolation method of a selected keyframe.

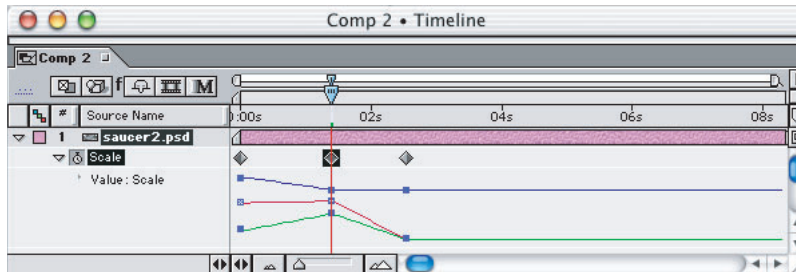


Motion path interpolation **A.** Linear **B.** Auto Bezier **C.** Continuous Bezier **D.** Bezier **E.** Hold



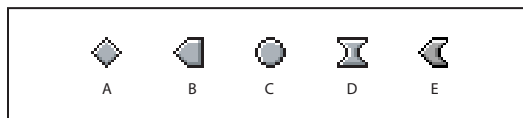
Temporal interpolation and the Value graph

Using the Value graph in the Timeline window, you can make precise adjustments to the temporal property keyframes you've created for your animation. The Value graph displays x values as red, y values as green, and z values (3D only) as blue. The Value graph provides complete information about the value of keyframes at any point in time in a composition and allows you to control it. In addition, the Info palette displays the temporal interpolation method of a selected keyframe. (See [“Using the Value graph to change a layer property value” on page 154.](#))



The Value graph appears when a nonspatial layer property contains two or more keyframes.

Each temporal interpolation method appears as a specific icon, so you can immediately see what kind of interpolation is applied to a keyframe. (See [“Comparing interpolation methods” on page 148.](#))



Timeline keyframe icons **A.** Linear **B.** Linear in, Hold out **C.** Auto Bezier **D.** Continuous Bezier or Bezier **E.** Linear in, Bezier out

Comparing interpolation methods

All interpolation methods provided by After Effects are based on the *Bezier* interpolation method, which provides direction handles so that you can control the transitions between keyframes. Interpolation methods that don't use direction handles are constrained versions of Bezier interpolation and are convenient for certain tasks.

To learn more about how different *temporal* interpolation methods affect layer properties, experiment by setting up at least three keyframes with different values for a temporal property such as Rotation, and change the interpolation methods for all keyframes as you view the Value graph in the Timeline window. (See [“Changing the interpolation method” on page 151.](#))

To learn more about how different *spatial* interpolation methods affect a motion path, experiment by setting up three keyframes for a spatial property, such as Position, with different values on a motion path, and change the interpolation methods as you view the motion path in the Composition window. (See [“Changing the interpolation method” on page 151.](#))

In the following descriptions of interpolation methods, the result of each method is described as if you had applied it to *all* the keyframes for a layer property. This is done to clarify the examples. In practice, you can apply any available interpolation method to any layer property keyframe.

No interpolation

No interpolation is the state in which there are no keyframes for a layer property—when the stopwatch is turned off and the I-beam icon **I** displays in the Timeline window under the current-time indicator. In this state, when you set the value of a layer property, it maintains that value for the layer's duration, unless overridden by an expression. By default, no interpolation is applied to a layer property. If any keyframes are present for a layer property, some kind of interpolation is in use. Removing all keyframes from a layer property also removes all interpolation methods from the layer property.

Linear interpolation

Linear interpolation creates a uniform rate of change between keyframes, adding a rhythmic or mechanical look to animations. After Effects interpolates the values to the next keyframe as directly as possible without accounting for the values of other keyframes.

If you apply Linear interpolation to all keyframes of a temporal layer property, change begins instantly at the first keyframe and continues to the next keyframe at a constant speed. At the second keyframe, the rate of change switches immediately to the rate between it and the third keyframe. When the layer reaches the final keyframe value, change stops instantly. In the Value graph, the segment connecting two Linear keyframes appears as a straight line.

If you apply Linear interpolation to all keyframes of a spatial property such as position via the motion path, After Effects creates a straight line between each keyframe. At each Linear keyframe ♦ where a change of direction occurs, the motion path forms a corner. For example, you might use Linear interpolation on the position keyframes of the motion path to create the path of a pinball.

Auto Bezier interpolation


Auto Bezier interpolation creates a smooth rate of change through a keyframe. You might use Auto Bezier spatial interpolation to create the path of a car turning on a curving road.

As you change an Auto Bezier keyframe ● value, the positions of Auto Bezier direction handles change automatically to maintain a smooth transition between keyframes. The automatic adjustments change the shape of the Value graph or motion path segments on either side of the keyframe. If the previous and next keyframes also use Auto Bezier interpolation, the shape of the segments on the far side of the previous or next keyframes also changes. If you adjust an Auto Bezier direction handle manually, you convert it to a Continuous Bezier keyframe ☒.

Auto Bezier is the default spatial interpolation. To change the default, see [“Changing the default spatial interpolation” on page 152](#).

Continuous Bezier interpolation

Like Auto Bezier interpolation, Continuous Bezier interpolation creates a smooth rate of change through a keyframe. However, you set the positions of Continuous Bezier direction handles manually. Adjustments you make change the shape of the Value graph or motion path segments on either side of the keyframe.

If you apply Continuous Bezier interpolation to all keyframes of a property, After Effects adjusts the values at each keyframe to create smooth transitions. After Effects maintains these smooth transitions as you move a Continuous Bezier keyframe  on either the motion path or the Value graph.

Bezier interpolation

Bezier interpolation provides the most precise control because you manually adjust the shape of the Value graph or motion path segments on either side of the keyframe. Unlike Auto Bezier or Continuous Bezier, the two direction handles on a Bezier keyframe operate independently in both the Value graph and motion path.


If you apply Bezier interpolation to all keyframes of a layer property, After Effects creates a smooth transition between keyframes. The initial position of the direction handles is calculated using the same method used in Auto Bezier interpolation. After Effects maintains existing direction handle positions as you change a Bezier keyframe value.

Unlike other interpolation methods, Bezier interpolation lets you create any combination of curves and straight lines along the motion path. Because the two Bezier direction handles operate independently, a curving motion path can suddenly turn into a corner at a Bezier keyframe. Bezier spatial interpolation is ideal for drawing a motion path that follows a complex shape, such as a map route or the outline of a logo.

Existing direction handle positions persist as you move a motion-path keyframe. The speed of motion along the path is controlled by the temporal interpolation applied at each keyframe. (See [“Controlling speed along a motion path” on page 157.](#))

Hold interpolation

Hold interpolation is available only as a temporal interpolation method. Use it to change the value of a layer property over time, but without a gradual transition. This method is useful for strobe effects, or when you want layers to appear or disappear suddenly.

If you apply Hold temporal interpolation to all keyframes of a layer property, the value of the first keyframe holds steady until the next keyframe, when the values change immediately. In the Value graph, the graph segment following a Hold keyframe  appears as a horizontal straight line.

Even though Hold interpolation is available only as a temporal interpolation method, the keyframes on the motion path are visible, but they are not connected by layer-position dots. For example, if you animate a layer's Position property using Hold interpolation, the layer holds at the position value of the previous keyframe until the current-time indicator reaches the next keyframe, at which point the layer disappears from the old position and appears at the new position.

You can use Hold interpolation only for outgoing temporal interpolation (for the frames following a keyframe). If you create a new keyframe following a Hold keyframe, the new keyframe will use incoming Hold interpolation. (See [“Adjusting direction handles to create curves and corners” on page 152.](#))

Changing the interpolation method

You can apply and change the interpolation method for any property keyframe. Setting different interpolation methods for different keyframes can create a more complex appearance and add variety to your animations. You can apply changes using the Keyframe Interpolation dialog box or apply them graphically in a window. You can also change the default interpolation After Effects uses for spatial properties.

Using the Keyframe Interpolation dialog box

The Keyframe Interpolation dialog box provides options for setting temporal and spatial interpolation and, for spatial properties only, roving settings. (See [“Creating smooth changes using roving keyframes” on page 162.](#))

To change an interpolation method for a keyframe using the Keyframe Interpolation dialog box:



- 1 In the Timeline window, select the keyframes you want to change. Note whether the property is spatial (if it has a speed graph) or temporal (if it has a velocity graph).
- 2 Choose Animation > Keyframe Interpolation.
- 3 For Temporal Interpolation, choose one of the following options:
 - Current Settings preserves the interpolation values already applied to the selected keyframes. Choose this option when multiple or manually adjusted keyframes are selected and you do not want to change the existing settings.
 - Linear, Bezier, Continuous Bezier, Auto Bezier, and Hold apply a temporal interpolation method using default values.
- 4 If you selected keyframes of a spatial layer property, choose one of the following options for Spatial Interpolation (available only for Position, Anchor Point, Effect Point, and 3D Orientation keyframes):
 - Current Settings preserves the interpolation settings already applied to the selected keyframes.
 - Linear, Bezier, Continuous Bezier, and Auto Bezier apply a spatial interpolation method using default values.
- 5 If you selected keyframes of a spatial layer property, use the Roving menu to choose how a keyframe determines its position in time, and then click OK:
 - Current Settings preserves the currently applied method of positioning the selected keyframes in time.
 - Rove Across Time smooths the rate of change through the selected keyframes by automatically varying their position in time, based on the positions of the keyframes immediately before and after the selection.
 - Lock to Time keeps the selected keyframes at their current position in time. They stay in place unless you move them manually.

For more information on smoothing the rate of change through selected keyframes, see [“Creating smooth changes using roving keyframes” on page 162.](#)

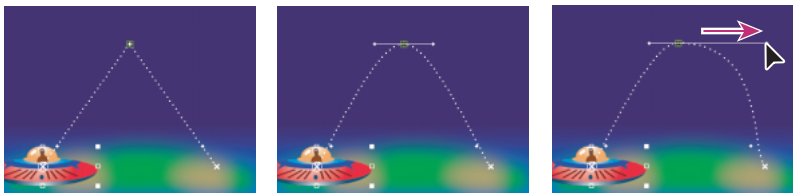
Changing interpolation graphically in a window

If you are working directly on the Value graph or motion path for a layer property, you can change interpolation methods graphically. This method is often more efficient than opening the Keyframe Interpolation dialog box for each change.

To change an interpolation method directly in a window:

- 1 Display the Value graph in the Timeline window or the motion path in the Composition or Layer window.
- 2 Using the selection tool, do one of the following:
 - If the keyframe uses Linear interpolation, Ctrl-click (Windows) or Command-click (Mac OS) the keyframe to change it to Auto Bezier . You can then Ctrl-click (Windows) or Command-click (Mac OS) the keyframe again and drag a direction handle as you continue to hold the mouse to change it to Bezier. Bezier interpolation lets you control each direction handle separately.
 - If the keyframe uses Linear interpolation, Ctrl-click (Windows) or Command-click (Mac OS) the keyframe and drag a direction handle as you continue to hold the mouse to change it to Continuous Bezier .
 - If the keyframe uses Bezier, Continuous Bezier, or Auto Bezier, Ctrl-click (Windows) or Command-click (Mac OS) the keyframe to change it to Linear.

Note: You can change interpolation methods directly for temporal keyframes in the Timeline window and for spatial keyframes in the Composition and Layer windows.



A Linear spatial keyframe (left) changes to Auto Bezier (center), which changes to Continuous Bezier (right) if you drag the direction handle.


Changing the default spatial interpolation

When you create spatial changes in a layer, After Effects uses Auto Bezier as the default spatial interpolation. You can change this default to Linear.

To set the default spatial interpolation to Linear:



- 1 Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS).
- 2 Select the Default Spatial Interpolation to Linear option and click OK.

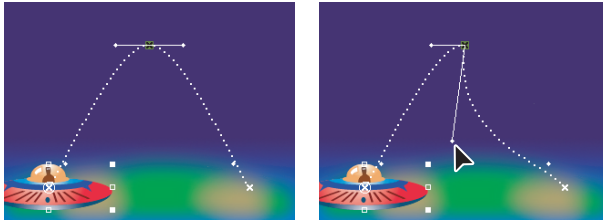
Adjusting direction handles to create curves and corners

By default, Bezier interpolation creates a curved transition at a keyframe. Clicking the keyframe with the Convert Vertex tool  creates a corner at the keyframe. On a Value graph, a corner results in an abrupt transition. On a motion path, the keyframe becomes a corner in the path.

You can also change a Bezier keyframe so that the two handles move together, forming a curve through the keyframe.

To change a Bezier keyframe from a curve to a corner:

- 1 Select the pen tool  or Convert Vertex tool  from the Tools palette.
- 2 In the Composition window, drag a keyframe's direction handle in any direction.



Continuous Bezier direction handles (left) become two separate Bezier direction handles (right).


Retracting and extending Bezier direction handles

You can retract or extend the direction handles that appear by default. When the direction handles are extended, the keyframe represents Continuous Bezier interpolation. (See [“Continuous Bezier interpolation” on page 150.](#)) When both direction handles are retracted, the interpolation method is Linear, which creates a corner point instead of a curve. (See [“Linear interpolation” on page 149.](#))


To retract one direction handle:

Using the selection tool, on a Value graph in the Timeline window or motion path in the Composition or Layer window, drag the direction handle to the center of its keyframe.

To retract both Bezier direction handles:

- 1 Select the Convert Vertex tool  from the Tools palette.
- 2 On a Value graph or motion path, click the keyframe marker.

To extend retracted Bezier direction handles:

- 1 Select the Convert Vertex tool  from the Tools palette.
- 2 On a Value graph or motion path, click the keyframe marker and drag outward from the keyframe.

To toggle between the selection tool and the pen tool:

Hold down Ctrl (Windows) or Command (Mac OS).

Mixing incoming and outgoing interpolation methods

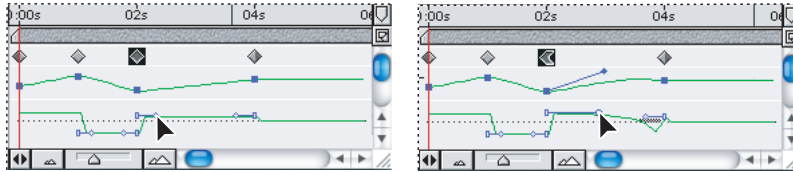
By default, a keyframe icon uses one interpolation method, but you can apply two methods: the *incoming* method applies to the property value as the current time approaches a keyframe, and the *outgoing* method applies to the property value as the current time leaves a keyframe. When you set different incoming and outgoing interpolation methods, the keyframe icon changes accordingly. It displays the left half of the incoming interpolation method icon and the right half of the outgoing interpolation icon.

You can freely mix Linear and Bezier interpolation methods using the Speed or Velocity graph. (See [“Fine-tuning speed and velocity” on page 158.](#)) Because Auto Bezier interpolation automatically adjusts both incoming and outgoing direction handles, once you mix Auto Bezier with another method, the original half of the keyframe becomes Bezier.

To mix Bezier and Linear interpolation methods:

- 1 In the Timeline window, select the Bezier or Linear keyframe you want to change.
- 2 Expand the layer outline to display the Speed or Velocity graph for the layer property containing the keyframe.
- 3 Drag the incoming or outgoing handle to adjust the speed of the keyframe.

Note: Make sure that you adjust the handles on the Speed or Velocity graph, not the Value graph. (See [“Factors affecting rate of change \(speed and velocity\)” on page 155.](#))



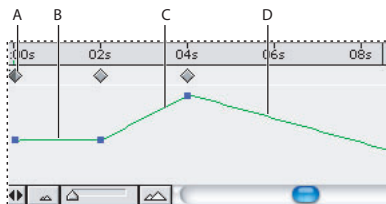
Dragging the handle of a linear keyframe (left) transforms it to a bezier keyframe (right).

To apply or remove Hold interpolation as outgoing interpolation:

- 1 In the Timeline window, select the keyframe you want to change.
- 2 Choose Animation > Toggle Hold Keyframe.

Using the Value graph to change a layer property value

The Value graph in the Timeline window displays the values for each keyframe and the interpolated values between keyframes. When the Value graph of a layer property is level, the value of a layer property is unchanged between keyframes. When the Value graph goes up or down, the value of a layer property increases or decreases between keyframes.



Value Graph **A.** Keyframe marker **B.** A level value graph indicates unchanging values. **C.** A rising graph indicates increasing values. **D.** A falling graph indicates decreasing values.

You can change layer property values by moving the points on the Value graph up or down. For example, you can increase a Rotation keyframe's value by dragging a keyframe marker on the Rotation property's Value graph higher up the graph.

Note: Values for the Anchor Point, Mask Shape, Effect Point controls, 3D Orientation, and Position properties are spatial, so they are graphically represented in the Composition and Layer window, not in the Value graph in the Timeline window.

To change the value of a layer property using the Value graph:

- 1 In the Timeline window, display a temporal property for a layer.
- 2 Click the triangle next to the property name to display the Value graph, and then drag a keyframe marker up or down.

3 To see the new value displayed next to the property name, position the current-time indicator on the keyframe.

Editing keyframes on a Value graph or a motion path


You can add keyframes to, or otherwise edit, a Value graph or motion path using a variety of methods. To edit the temporal values of the Value graph, it's easiest to change the numerical value of the property, which updates the Value graph automatically. (See [“Setting and animating a layer property in the Timeline window” on page 125.](#))

Editing the motion path or other spatial values, however, is most easily accomplished with the pen tool. Editing with the pen tool is similar to modifying a path in a drawing application such as Adobe Illustrator. (See [“Drawing a Bezier mask with the pen tool” on page 182.](#)) For best results with the pen tool, you should understand how Bezier interpolation affects graphs and the paths. With Bezier interpolation, you can control the shapes of corners, making them into smooth curves or angled corners. (See [“Bezier interpolation” on page 150.](#))

To edit a keyframe and update the Value graph by changing numeric values

- 1** In the Timeline window, display a temporal layer property and select the keyframe you want to edit, or position the current time indicator at the point where you want to add a keyframe.
- 2** Do one of the following:
 - Drag the underlined value in the Switches/Modes column to the new value.
 - Click the underlined value and enter a new value. The Value graph is updated automatically.

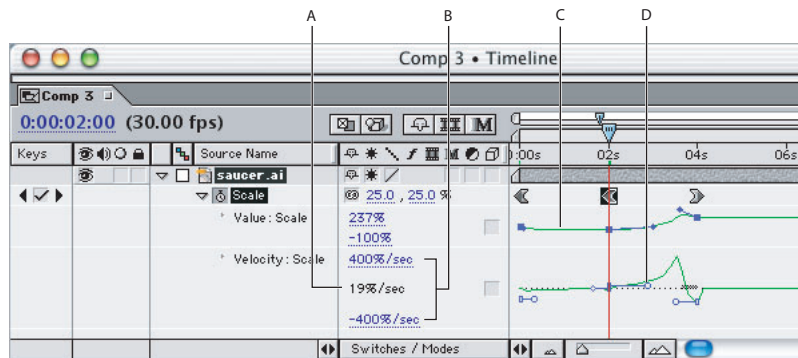
To edit a keyframe for spatial properties using the pen tool:

- 1** In the Timeline window, select the property for the layer you wish to edit.
- 2** Select the pen tool  from the Tools palette.
- 3** In the Composition or Layer window (depending on where the controls appear), do any of the following:
 - Click the path to add a keyframe.
 - Drag an existing keyframe to a new location.
 - Adjust the direction handles or change the interpolation method. (See [“Changing the interpolation method” on page 151.](#))

Factors affecting rate of change (speed and velocity)

The terms *speed* and *velocity* are usually used interchangeably to refer to changes in rate of acceleration. After Effects uses the terms speed and velocity in a more precise manner: velocity is the rate of change for temporal values and speed is the rate of change for spatial values.

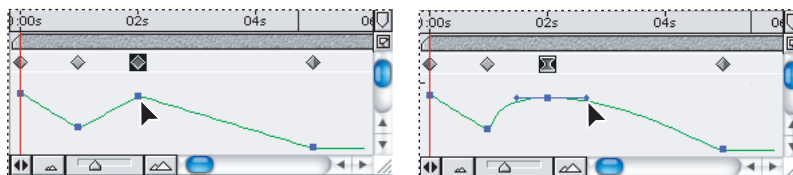
You can fine-tune nearly all changes over time using the Speed graph or Velocity graph in the Timeline window. The Speed graph provides complete information about and control of the value and rate of change for all *spatial* values (such as Position) at any frame in a composition. The Velocity graph provides complete information about and control of the value and rate of change for all *nonspatial* values (such as Opacity) at any frame in a composition.



Velocity (nonspatial) controls **A.** Value at the current-time indicator **B.** Maximum, current, and minimum speeds **C.** Value graph **D.** Direction handle (controls speed)

The change of velocity or speed over time is affected by the following factors:

- The time difference between keyframes in the Timeline window. The shorter the time interval between keyframes, the more quickly the layer has to change before reaching the next keyframe value. If the interval is longer, the layer changes more slowly, because it must make the change over a longer period of time. Use distance to adjust the rate of change by moving keyframes forward or backward along the timeline.
- The difference between the values of adjacent keyframes. A large difference between keyframe values, such as the difference between 75% and 20% opacity, creates a faster rate of change than a smaller difference, such as the difference between 30% and 20% opacity. Use value differences to adjust the rate of change by increasing or decreasing the value of a layer property at a keyframe.
- The interpolation type applied for a keyframe. For example, it is difficult to make a value change smoothly through a keyframe when the keyframe is set to Linear interpolation; but at any time, you can switch to Bezier interpolation, which provides a smooth change through a keyframe. If you use Bezier interpolation, you can adjust the rate of change even more precisely using direction handles. (See [“Fine-tuning speed and velocity” on page 158.](#))

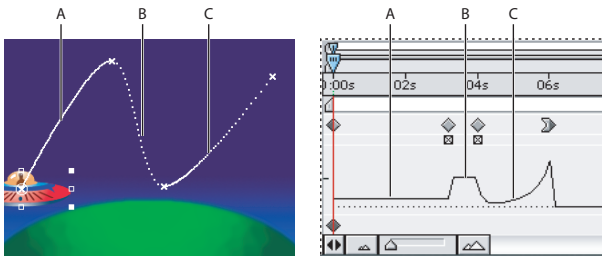


Linear interpolation (left) causes sharp changes. Bezier interpolation (right) creates smoother change.

Controlling speed along a motion path

When you animate a spatial property such as Position, Anchor Point, Effect Point, or 3D Orientation, you can view and adjust the rate of change of the layer in the Speed graph in the Timeline window or on the motion path in the Composition or Layer window. As you adjust the rate in one window, you can view the changes in the other window. In the Timeline window's Speed graph, change in the graph height indicates changes in speed. Level values indicate constant speed; higher values indicate increased speed. Level values indicate constant speed; higher values indicate increased speed.

In the Composition or Layer window, the spacing between dots in a motion path indicates speed. Each dot represents a frame, based on the frame rate of the composition. Even spacing indicates a constant speed, and wider spacing indicates a higher speed. Keyframes using Hold interpolation display no dots because there is no intermediate transition between keyframe values; the layer simply appears at the next keyframe's position.

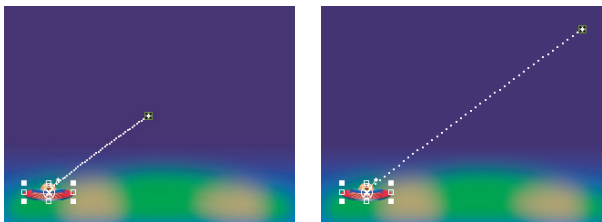


Motion path in Composition window (left), Speed graph in Timeline window (right) **A.** Dots are close together, indicating slower speed (left), and the speed is constant (right). **B.** Dots are far apart, indicating faster speed (left), and the speed is constant (right). **C.** Inconsistent spacing of dots indicates changing speed (left), and the speed slows then increases (right).

To control speed between keyframes:

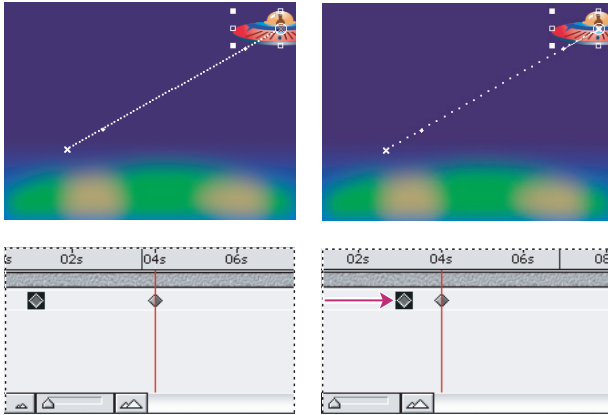
Use any combination of the following options:

- In the Composition or Layer window, adjust the spatial distance between two keyframes on the motion path. Increase speed by moving one keyframe position farther away from the other, or decrease speed by moving one keyframe position closer to the other.



More spatial distance between keyframes increases layer speed.

- In the Timeline window, adjust the time difference between two keyframes. Decrease speed by moving one keyframe farther away from the other, or increase speed by moving one keyframe closer to the other.



Shorter temporal distance between keyframes increases layer speed.

- Apply the Easy Ease keyframe assistant, which automatically adjusts the speed of change as motion advances toward and retreats from a keyframe. (See [“Automatically easing speed using Easy Ease” on page 164.](#))

Fine-tuning speed and velocity

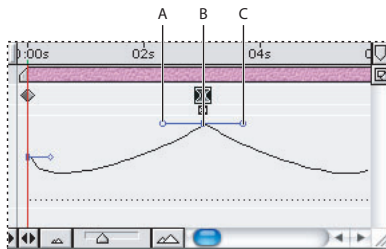
After you have set the shape of a motion path or created keyframes for a property, you need to adjust the speed (for spatial properties) or velocity (for temporal properties) to better simulate the natural world. Using the Speed graph or the Velocity graph, you can adjust motion or the rate of change for a value just before and just after a keyframe.

For example, you can change the motion of a layer so that it slows just before a keyframe and then speeds up just after the keyframe; or so that it moves quickly over a certain distance and then slows down smoothly. By adjusting the rise and fall of the appropriate graph, you can control how fast or slow a value changes from keyframe to keyframe.

Note: Like the Value graph, the Velocity graph displays x, y, and z (3D only) values in different colors: x values are red, y values are green, and z values are blue.

Adjusting rate change with the Speed and Velocity graphs

You can control the values approaching and leaving a keyframe together, or you can control each value separately. The incoming handle increases the speed or velocity when you drag it up and decreases the speed or velocity when you drag it down. The outgoing handle influences the next keyframe in the same way. You can also control the influence of the speed or velocity by dragging the handles left or right. (See [“Extending the influence of a direction handle” on page 161.](#))




A. Incoming direction handle **B.** Speed control **C.** Outgoing direction handle

Note: If you want a handle to have influence over more than one keyframe, use roving keyframes. (See [“Creating smooth changes using roving keyframes” on page 162.](#))

To adjust the incoming and outgoing rate changes together:

- 1 In the Timeline window, expand the outline for the keyframe you want to adjust. Then click the triangle to the left of the property to display the Speed graph or the Velocity graph.
- 2 Using the selection tool, click the keyframe you want to adjust.
- 3 If the direction handles are not joined, drag a split direction handle up or down until it meets the other handle, and then press Ctrl (Windows) or Command (Mac OS) and click the handle again.
- 4 Drag the joined direction handle up to accelerate entering and leaving the keyframe, or drag it down to decelerate entering and leaving the keyframe.

By default, if you drag a handle beyond the top or bottom of the graph area, the graph line is automatically resized to fit within the graph area. However, if you deselect the icon  to the right of the property values, the graph line will not be resized. (See [“Adjusting the Speed or Velocity graph border” on page 160.](#))

To fine-tune speed separately for incoming and outgoing frames:

- 1 In the Timeline window, display the Speed or Velocity graph for the keyframe you want to adjust.
- 2 Using the selection tool, drag the direction handle you want to adjust. If the direction handles are joined, press Ctrl (Windows) or Command (Mac OS) and click the keyframe marker to separate them and then drag either direction handle up or down.

To rejoin split direction handles:

- 1 In the Timeline window, display the Speed or Velocity graph for the keyframe you want to adjust.
- 2 At the keyframe you want to adjust, press Ctrl (Windows) or Command (Mac OS) and click the handle again.

Adjusting the Speed or Velocity graph border


When you drag a direction handle beyond the top or bottom of the graph area, After Effects calculates a new minimum or maximum value based on how far you dragged outside the graph, and it redraws the graph so that all the values you specified for that layer property are visible in the graph by default. You can manually adjust the size of the Speed or Velocity graph border when you want to make greater changes to the speed.

To adjust the Speed or Velocity graph border:

Position the pointer tool on the graph border and, when the pointer becomes a double-arrow cursor, drag up or down.



Speed graph border at default location (left) and expanded for precision editing (right).

If you do not want the graph to be resized automatically when you drag a handle beyond the top or bottom of the graph area, deselect the icon  to the right of the property values. Deselecting this icon lets you zoom in on a portion of the graph resized beyond the graph area, but note that part of the graph may not be displayed.

To change the default graph area size:

- 1 Choose Edit > Preferences > Display (Windows) or After Effects > Preferences > Display (Mac OS).
- 2 For Default Height of Timeline Graphs, specify the number of cells. (One cell equals 14 pixels.)

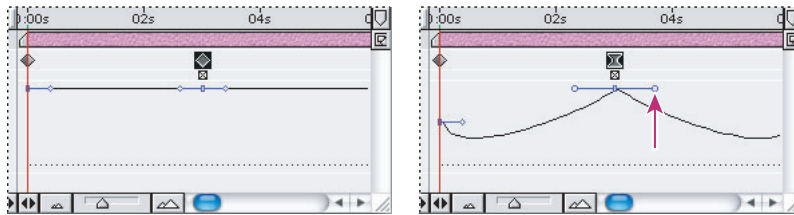
Creating a bounce or intense peak

Use direction handles to simulate the type of acceleration seen in a bouncing ball. When you create this type of effect, the Speed or Velocity graph appears to rise quickly and peak.

To create a bounce or peak:

- 1 In the Timeline window, expand the outline for the keyframe you want to adjust. Then click the triangle to the left of the property to display the Speed graph or the Velocity graph.
- 2 Make sure the interpolation method for the keyframe you want to peak is set to Continuous Bezier or Bezier. (See [“Changing the interpolation method” on page 151.](#))

3 At the desired keyframe, drag the direction handle up until it is near the top of the graph.



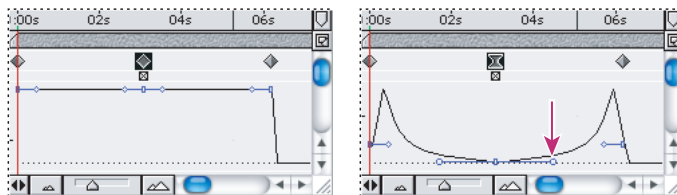
Dragging the direction handle to create a peak.

Starting or stopping change gradually

Direction handles can also create gradual starts and stops, such as a boat slowing to a stop and then starting again. When you use this technique, the Speed or Velocity graph resembles a smooth U shape.

To start or stop change gradually:

- 1 In the Timeline window, click the triangle to the left of the property you want to change to display the Speed graph or the Velocity graph.
- 2 Make sure the interpolation method for the keyframe you want to peak is set to Continuous Bezier or Bezier. (See [“Changing the interpolation method” on page 151.](#))
- 3 At the desired keyframe, drag the direction handle down until it is near the bottom of the graph.



Dragging the direction handle to make a gradual change

Extending the influence of a direction handle

Along with controlling the level of acceleration and deceleration, you can also extend the *influence* of a keyframe outward or inward in relation to an adjacent keyframe. Influence determines how quickly the Speed or Velocity graph reaches the value you set at the keyframe, giving you an additional degree of control over the shape of the graph. The incoming handle increases the influence of a keyframe value on the previous keyframe when you drag it to the left, and it decreases the influence on the previous keyframe when you drag it to the right.

To adjust the influence of a direction handle on the previous or next keyframe:

- 1 In the Timeline window, expand the outline for the keyframe you want to adjust. Then click the triangle to the left of the property to display the Speed graph or the Velocity graph.
- 2 Using the selection tool, click a keyframe and drag the direction handle left or right.

Changing speed numerically


You may want to specify speed more precisely than you can by dragging direction handles. In such cases, specify speed numerically in the Keyframe Velocity dialog box.

The exact options available in the dialog box vary depending on the layer property you are editing and may also vary for plug-ins. For each, speed is expressed as described in the following table:

Keyframe type	Measurement of speed
Anchor Point and Position	Pixels per second
Mask Shape	Units per second
Mask Feather	Pixels per second for both the x (horizontal) and y (vertical) dimensions
Scale	Percent per second for the x (horizontal), y (vertical), and z (depth) dimensions
Rotation	Degrees per second
Opacity	Percentage per second

To specify speed numerically:

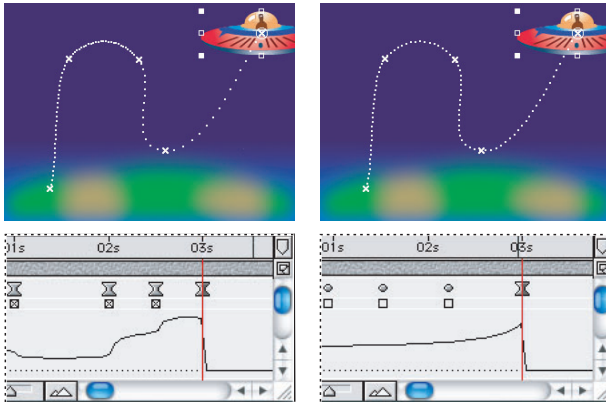
- 1 Display the Speed graph for the keyframe you want to adjust.
- 2 Select the keyframe you want to edit.
- 3 Choose Animation > Keyframe Velocity.
- 4 Type values for Incoming and Outgoing Velocity Speed.
- 5 Type values for the following options, and then click OK:
 - Influence specifies the amount of influence toward the previous keyframe (for incoming interpolation) or the next keyframe (for outgoing interpolation).
 - Continuous creates a smooth transition by maintaining equal incoming and outgoing velocities.

Note: By default, the proportions of the current Scale or Mask Feather values are preserved as you edit the values. If you don't want to preserve proportions, click the link icon  next to the property values in the Timeline window to remove the icon.

Creating smooth changes using roving keyframes

Using the *roving keyframe* option in After Effects, you can easily create smooth movement across several keyframes at once. Roving keyframes are keyframes that are not linked to a specific time; their speed and timing are determined by adjacent keyframes. When you change the position of a keyframe adjacent to a roving keyframe in a motion path, the timing of the roving keyframe may change.

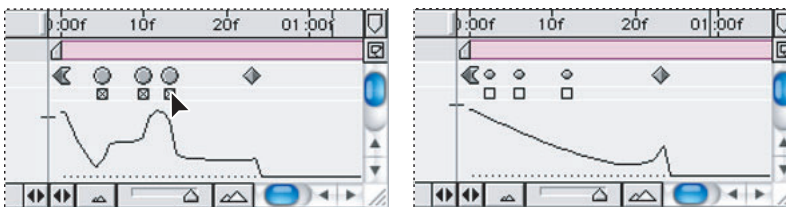
Roving keyframes are available only for spatial layer properties such as Position. In addition, a keyframe can rove only if it is not the first or last keyframe in a layer, because a roving keyframe must interpolate its speed from the previous and next keyframes.



The original motion path (left) indicates different velocities between keyframes. After the keyframes are set to rove (right), the motion path displays consistent speed over the range of keyframes.

To smooth motion over several keyframes:

- 1 In the Timeline window, set up the keyframes for the motion you will smooth.
- 2 Determine the beginning and ending keyframes for the range you want to smooth.
- 3 Do one of the following:
 - For every keyframe in the range (except the beginning and ending keyframes), deselect the roving-keyframe option directly below the keyframe to let the keyframes roam. The intermediate keyframes adjust their positions on the timeline to smooth the speed curve between the beginning and ending keyframes.



When you deselect the roving-keyframe option (left), the keyframe may shift to smooth the motion (right).

- Select the keyframes you want to rove and choose **Animation > Keyframe Interpolation**. Then choose **Rove Across Time** from the Roving pop-up menu.

For more information on setting up keyframes for a motion you want to smooth, see [“Setting layer position” on page 126](#).

To change a roving keyframe back to a nonroving keyframe:

Do one of the following:

- Select the roving keyframe option directly below the keyframe, or drag the roving keyframe left or right.

- Select the keyframes you want to change and choose Animation > Keyframe Interpolation. Then choose Lock To Time from the Roving pop-up menu.

Automatically easing speed using Easy Ease

Eliminate sudden changes in a property's speed by using the Easy Ease keyframe assistant. Although you can manually adjust the speed of a keyframe by dragging direction handles, using Easy Ease automates the work.

After you apply Easy Ease, each keyframe has a speed of 0 with an influence of 33.33% on either side. When you ease the speed of an object, for example, the object slows down as it approaches a keyframe, and gradually accelerates as it leaves. You can ease speed only when coming into or out of a keyframe, or both.

To ease speed through the Easy Ease keyframe assistant:

- 1 In the Timeline window, select a range of keyframes.
- 2 Choose Animation > Keyframe Assistant > Easy Ease (to ease speed coming both into and out of selected keyframes), Easy Ease In (to ease speed coming into selected keyframes), or Easy Ease Out (to ease speed coming out of selected keyframes).

Simulating a zoom lens using Exponential Scale (Pro only)

You can simulate a realistic acceleration of a zoom lens when working with 2D layers by using Exponential Scale, which converts linear scaling of a layer to exponential scaling. This is useful for creating a cosmic zoom, for example. Zooming optically with a lens is not linear—the rate of change of scaling accelerates as you zoom. To simulate this acceleration, Exponential Scale converts the velocity of the scaling to an exponential curve.

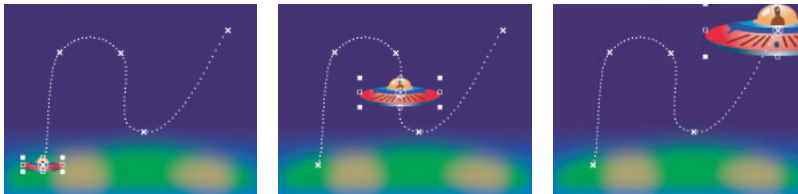
To apply Exponential Scale:

- 1 In the Timeline window, hold down the Shift key and select starting and ending keyframes for the scale property.
- 2 Choose Animation > Keyframe Assistant > Exponential Scale.

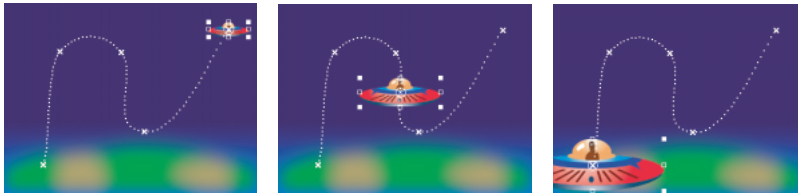
Note: *Exponential Scale replaces any existing keyframes between the selected starting and ending keyframes.*

Using the Time-Reverse Keyframes keyframe assistant

For any property in a layer, you can select a range of keyframes and reverse their order. For example, you can reverse keyframes in the Position property to reverse the motion of an object. You can select and reverse keyframes across multiple layers and properties, but each set of keyframes for a property is reversed only within its original time range and not that of any other selected property. Markers in the Timeline window are not reversed, so you may need to move markers after reversing keyframes.



Original property values.



Scale property values reversed using the Time-Reverse Keyframes keyframe assistant.

To reverse keyframes:

- 1 In the Timeline window, select a range of keyframes you want to reverse.
- 2 Choose Animation > Keyframe Assistant > Time-Reverse Keyframes.

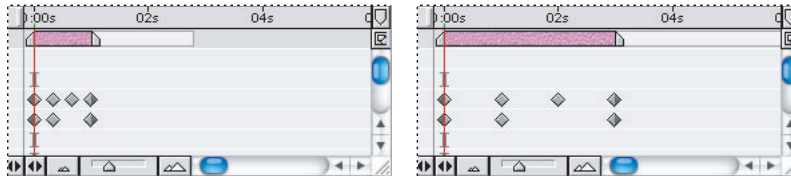
For information on reversing the direction in which a layer plays and changing the order of the keyframes, see [“Reversing the playback direction of a layer” on page 167](#). For information on reversing the direction in which a layer plays without changing the order of the keyframes, see [“About time-remapping” on page 168](#).

Time-stretching a layer

Using the Time Stretch command, you can easily change how fast or slow a layer containing either audio or video is played back. Speeding up or slowing down a layer is also known as *time-stretching*.

Time-stretching a layer to and from specific times

When you time-stretch a layer, the audio file or the original frames in the footage (and all keyframes that belong to the layer) are redistributed along the new duration. Use this command only when you want the layer and all layer keyframes to change to the new duration.



Time-stretching a layer redistributes keyframes along the new duration.

If you time-stretch a layer so that the resulting frame rate is significantly different from the original speed, the quality of motion within the layer may suffer. Turn on frame blending to improve slow-motion or fast-motion effects. (See [“Enhancing time-altered motion by blending frames” on page 110.](#))

To time-stretch a layer from a specific time:

- 1 In the Timeline or Composition window, select the layer.
- 2 Choose Layer > Time Stretch.
- 3 Type a new duration for the layer, or type a Stretch Factor.
- 4 Click one of the Hold In Place options to specify the point in time from which the layer will be time-stretched, and then click OK:
 - Layer In-point holds the layer’s current starting time, and time-stretches the layer by moving the Out point.
 - Current Frame holds the layer at the position of the current-time indicator (also the frame displayed in the Composition window), and time-stretches the layer by moving the In and Out points.
 - Layer Out-point holds the layer’s current ending time and time-stretches the layer by moving the In point.

To time-stretch a layer to a specific time:

- 1 In the Timeline window, move the current-time indicator to the frame where you want the layer to begin or end.
- 2 Display the In and Out columns in the Timeline window by choosing Columns > In and Columns > Out from the Timeline window menu.
- 3 Do one of the following:
 - To stretch the In point to the current time, press Ctrl (Windows) or Command (Mac OS) as you click the In time for the layer in the In column.
 - To stretch the Out point to the current time, press Ctrl (Windows) or Command (Mac OS) as you click the Out time for the layer in the Out column.

Keeping keyframes intact when time-stretching a layer

When you time-stretch a layer, the positions of its keyframes stretch with it by default. You can circumvent this behavior by cutting and pasting keyframes.

To time-stretch a layer but not its keyframes:

- 1 Make a note of the time at which the first keyframe appears.
- 2 In the layer outline, click the name of one or more layer properties containing the keyframes you want to keep at the same times.
- 3 Choose Edit > Cut.
- 4 Move or stretch the layer to its new In and Out points.
- 5 Move the current-time indicator to the time at which the first keyframe appeared before you cut the keyframes.
- 6 Choose Edit > Paste.

Reversing the playback direction of a layer

You can easily reverse a layer's playback direction. When you do, all keyframes for all properties on the selected layer also reverse position relative to the layer. The layer itself maintains its original In and Out points relative to the composition.

Note: For best results, replace the layer with a composition that has the same frame size as the layer, and reverse the layer inside the composition. This is the most accurate way to reverse footage. For more information on this process, called nesting, see [“Organizing a project using nesting” on page 313](#).

To reverse a layer's playback direction:

- 1 In a Timeline window, select the layer you want to reverse.
- 2 Press Ctrl + Alt + R (Windows) or Command + Option + R (Mac OS).

Note: You can also play a layer backward by typing a negative time-stretch value in the Time Stretch dialog box.

To reverse the order of keyframes without reversing the layer's playback direction, select keyframes and choose Animation > Keyframe Assistant > Time-Reverse Keyframes. (See [“Using the Time-Reverse Keyframes keyframe assistant” on page 165](#).)

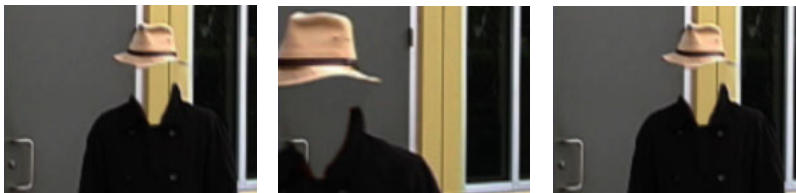
To reverse a layer's playback direction without reversing the order of its keyframes, use time-remapping to reverse the layer. (See [“About time-remapping” on page 168](#).)

About time-remapping

In After Effects you can easily expand, compress, play backward, or freeze a portion of a layer's duration using a process known as *time-remapping*. For example, if you are using footage of a person walking, you can play footage of the person moving forward, and then play a few frames backwards to make the person retreat, and then play forward again to have the person resume walking.



Footage is usually displayed at a constant speed in one direction.

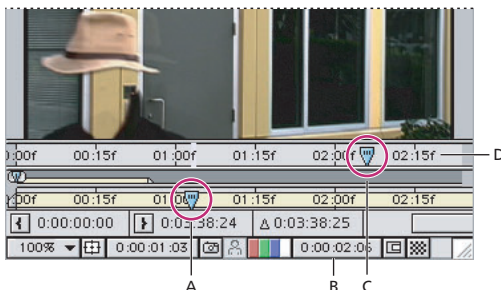


Time-remapping distorts time for a range of frames within a layer.

You can also time-remap layers containing audio or both audio and video. When you apply time-remap to a layer containing audio and video, the audio and video remain synchronized. You can remap audio files to gradually decrease or increase the pitch, play audio backwards, or create a warbled or scratchy sound.

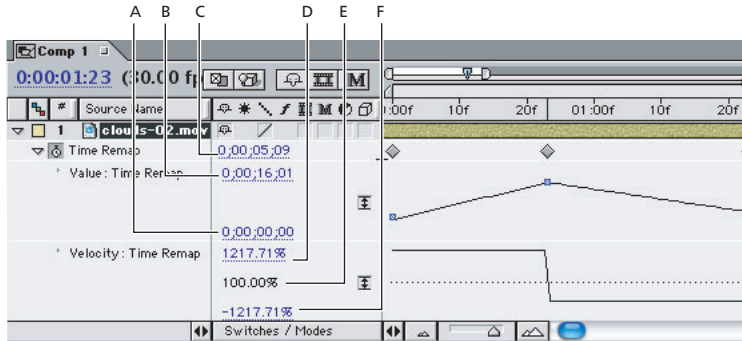
You can remap time in either the Layer window or the Timeline window. Remapping video in one window displays the results in both windows. Each window provides a different view of the layer duration:

- The Layer window provides a visual reference of the frames you change, as well as the frame number. The window displays the current-time indicator and a remap-time marker, which you move to select the frame you want to play at the current time.



Layer window for time remapping **A.** Current-time indicator **B.** Remap-time marker **C.** Time-remap value **D.** Navigator bar

- The Timeline window provides a precise view of the changes you specify over time by marking your changes with keyframes and a graph similar to the one displayed for other layer properties. You must be familiar with using keyframes to remap time in the Timeline window. (See [“Understanding keyframes” on page 117.](#))



Time remapping values **A.** First frame **B.** Last frame **C.** Active frame **D.** Top speed **E.** Current speed **F.** Lowest speed

Working with the Time Remap graph

When remapping time in the Timeline window, use the values represented in the Time Remap graph to determine and control which frame of the movie plays at which point in time:

Time Remap This value indicates which frame plays at the current time. As you drag a Value graph marker up or down, this value changes accordingly. You can click this value and type a new one. The Time Remap value also appears in the Layer window next to the Out point value.

Value: Time Remap The top value represents the last (highest) frame in the layer, and the bottom value represents the first (lowest) frame.

Velocity: Time Remap The top value indicates the layer's fastest speed. The bottom value is always a negative of the top value. The middle value indicates how fast the video is playing at the current time. Normal speed is 100%, slow-motion is less than 100%, and fast-motion is greater than 100%.

When you turn on Enable Time Remapping, After Effects adds a Time Remap keyframe at the start and end points of the layer in the Timeline window. By setting additional remap keyframes, you can create complex motion effects. Every time you add a Time Remap keyframe, a Value graph marker appears on the graph directly below the keyframe. As you move this marker up or down, the Time Remap value changes to the frame of the video set to play at the current time. After Effects then interpolates intermediate frames and plays the footage forward or backward from that point.

The speed at which remapped video plays depends on the number of frames you are remapping and the amount of time allocated in the timeline for the changes. For example, if you freeze a frame for one second and do not increase the duration of the layer by one second, the footage following the freeze frame must play faster than normal to play all frames in the limited time remaining.

The original duration of the source footage may no longer be valid when remapping time, because parts of the layer no longer play at the original rate. If necessary, set the new duration of the layer before you remap time. (See [“Understanding trimming” on page 102.](#))

If you remap time and the resulting frame rate is significantly different from the original, the quality of motion within the layer may suffer. Apply frame blending to improve slow- or fast-motion effects. (See [“Using frame blending” on page 110.](#))

Time-remapping parts of a motion footage or audio layer

There are limitless options for time-remapping in After Effects. For example, you can time-remap an entire layer, making it play backwards. You can time-remap a few frames at the beginning or end of the layer, creating a freeze-frame effect. Or you can time-remap frames in the middle of the layer, creating a slow-motion effect.

You can remap time for video footage only; still images cannot be remapped. For best results, do not remap video footage that has been time-stretched.

To freeze the first frame without changing the speed:

- 1 In a Composition window or Timeline window, select the layer you want to remap.
- 2 Choose Layer > Enable Time Remapping.
- 3 Click the triangle to the left of the Time Remap heading to display the time graph for time remapping.
- 4 Move the current-time indicator to where you want the movie to begin.
- 5 Shift-click the keyframes at the layer’s start and end, or click the Time Remap property name to select the start and end keyframes.
- 6 Drag the first keyframe to the current-time indicator, which moves the start and end keyframes.

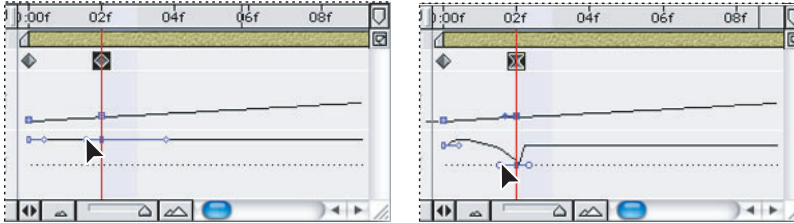
To freeze the last frame without changing the speed:

- 1 In a Composition window or Timeline window, select the layer you want to remap.
- 2 Choose Layer > Enable Time Remapping.
- 3 Click the triangle to the left of the Time Remap heading to display the time graph for time remapping.
- 4 Drag the triangle at the end of the layer duration bar to the time where you want the freeze frame to end.

To remap time in the Timeline window:

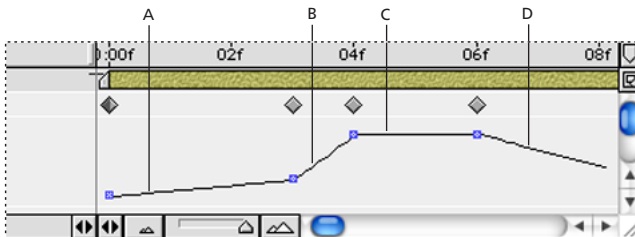
- 1 In a Composition window or Timeline window, select the layer you want to remap.
- 2 Choose Layer > Enable Time Remapping.
- 3 Click the triangle to the left of the Time Remap heading to display the time graph for time remapping.
- 4 Move the current-time indicator to the frame where you want change to begin, and then click the keyframe check box.

5 On the Time Remap graph below the keyframe, drag the Value graph marker, watching the Time Remap value as you drag. To prevent the graph from dropping below the dotted line, press Shift as you drag the graph marker:



Dragging the Value graph marker down slows down the layer.

- To slow down the layer, drag the Value graph marker down. (If the layer is playing in reverse, drag up.)
- To speed up the layer, drag the Value graph marker up. (If the layer is playing in reverse, drag down.)
- To play frames backward, drag the Value graph marker down to a value below the previous keyframe value.
- To play frames forward, drag the Value graph marker up to a value above the previous keyframe value.
- To freeze the previous keyframe, drag the Value graph marker up to a value equal to the previous keyframe value so that the graph line is flat. Another method is to select the keyframe and choose **Animation > Toggle Hold Keyframe**, and then add another keyframe where you want the motion to start again.

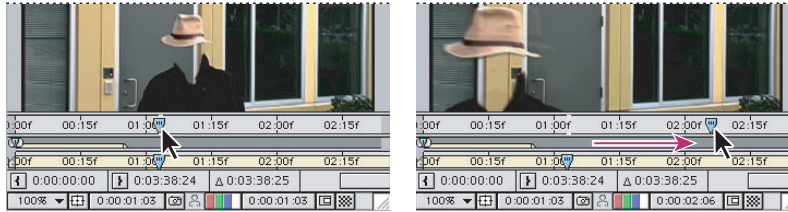


Time remap graph **A**. No change **B**. Fast motion **C**. Freeze frame **D**. Backward motion

To remap time in a Layer window:

- 1** Open the Layer window for the layer you want to remap.
- 2** Choose **Layer > Enable Time Remapping**. A second time ruler appears in the Layer window above the default time ruler and the navigator bar.
- 3** On the lower time ruler, move the current-time indicator to the first frame where you want the change to occur.

4 On the upper time ruler, the remap-time marker indicates the frame currently mapped to the time indicated on the lower time ruler. To display a different frame at the time indicated on the lower time ruler, move the remap-time marker accordingly.



Drag the remap-time marker to replace the frame at the current time marker.

5 Move the current-time indicator on the lower time ruler to the last frame where you want change to occur.

6 Move the remap-time marker on the upper time ruler to the frame you want to display at the time indicated on the lower time ruler:

- To move the preceding portion of the layer forward, set the remap-time marker to a later time than the current-time indicator.
- To move the preceding portion of the layer backward, set the remap-time marker to an earlier time than the current-time indicator.
- To freeze a frame, set the remap-time marker to the frame you want frozen. Then, move the current-time indicator (lower ruler) to the last point in time where the frame will appear frozen and move the remap-time marker again to the frame you want frozen.

Time-remapping audio pitch

The Velocity graph in the Time Remap property directly relates to the pitch of an audio file. By making subtle changes to the Velocity graph, you can create a variety of interesting effects. To avoid screeching audio, you may want to keep the Velocity value below 200%. When the velocity (speed) is too high, use the Levels controls, located under the Audio property, to control the volume.

You may hear clicks at the beginning and end of an audio (or an audio and video) layer after setting new In and Out points in the Time Remap graph. Use the Levels controls to remove these clicks. (See [“Using audio layers” on page 112.](#))

To change the pitch of an audio layer:

- 1** In a Composition window or Timeline window, select the layer you want to remap.
- 2** Choose Layer > Enable Time Remapping.
- 3** Click the triangle to the left of the Time Remap heading to display the time graph for time-remapping.
- 4** Move the current-time indicator to the frame where you want change to begin, and then click the keyframe navigator box.
- 5** On the Velocity graph below the keyframe, drag a marker, watching the Velocity value as you drag.
 - To lower the pitch, drag the Velocity graph marker down.
 - To increase the pitch, drag the Velocity graph marker up.

To remove clicks from new In and Out points in the Time Remap graph:

- 1 If necessary, choose Window > Audio.
- 2 In the Timeline window, select the audio (or audio and video) layer to which you applied time-remapping.
- 3 Expand the layer outline to display the Audio property and then the Levels property.
- 4 Move the current-time indicator to the new In point and click the stopwatch icon next to Levels to set a keyframe.
- 5 In the Audio palette, change the decibel value to 0.0.
- 6 Press the Page Up key on your keyboard to move the current-time indicator to the previous frame.
- 7 In the Audio palette, change the decibel level to -96.0.
- 8 Move the current time to the new Out point and set the decibel level to 0.
- 9 Press the Page Down key on your keyboard to move the current-time indicator to the next frame.
- 10 In the Audio palette, change the decibel level to -96.0.



You can change the decibel Slider Minimum value in the Audio Options dialog box, which is available from the Audio palette window menu. (See [“Previewing audio” on page 112.](#))

Adding randomness with The Wiggler (Pro only)

You can add randomness to any property as it varies over time by using The Wiggler. You can also use the wiggle expression to accomplish this. (See [“Property attributes and methods” on page 308.](#)) Depending on the property and the options you specify, The Wiggler adds a certain number of deviations to a property by adding keyframes and randomizing interpolations coming into or out of existing keyframes. You need at least two keyframes to use The Wiggler.

Using The Wiggler, you can more closely simulate natural movement within specified limits. For example, add randomness to an animated butterfly to produce fluttering. Add it to brightness or opacity to simulate the flicker of an old projector.

To add randomness to a property:

- 1 Select a range of keyframes for the property.
- 2 Choose Window > The Wiggler.
- 3 For Apply To, select the type of curve you want The Wiggler to change. If you selected keyframes for a property that varies spatially, you can select Spatial Path to add deviations to the motion, or Temporal Graph to add deviations to the velocity. If you selected keyframes for a property that does not vary spatially, you can select only Temporal Graph.
- 4 Select a Noise Type option to specify the type of deviation due to randomly distributed pixel values (noise):
 - Smooth Noise produces deviations that occur more gradually, without sudden changes.
 - Jagged Noise produces sudden changes.

5 Select the dimensions of the property you want to affect:

- One Dimension adds deviations to only one dimension of the selected property. Choose the dimension from the menu.
- All Dimensions Independently adds a different set of deviations to each dimension.
- All Dimensions the Same adds the same set of deviations to all dimensions.

6 Set a Frequency to specify how many deviations (keyframes) per second After Effects adds to the selected keyframes. A low value produces only occasional deviations, while a high value produces more erratic results. A value between 0 and 1 creates a keyframe at intervals of less than one per second. For example, a value of 0.5 creates one keyframe every 2 seconds.

7 Set a Magnitude to specify the maximum size of the deviations. After Effects sets the specified magnitude to the units of the selected property, so a value for one property may produce very different results in another property.

8 Click Apply and preview the results.

9 If necessary, choose Edit > Undo The Wiggler to reset the keyframes, adjust the values for Frequency and Magnitude, and then reapply The Wiggler.

Note: The Smoother is a non-Production Bundle feature that creates or modifies keyframes in order to smooth a motion path, value curve, or velocity curve. For more information, see [“Smoothing motion and velocity” on page 130](#).

Working with Masks and Transparency

Understanding transparency in After Effects

When part of a layer is transparent, that transparency information is stored in the layer's *alpha channel*. If the alpha channel of a layer doesn't meet your requirements, you can use any combination of *masks*, *mattes*, and *keying* to display or hide different parts of a layer. You can also combine layers to achieve visual effects, apply blending modes to control the intensity or transparency of colors or brightness values, and use a color channel in one layer to create an effect in another layer. With a combination of layers and layer masks, you can create an array of effects.

Transparency terminology in After Effects

To create effects by combining images, parts of each image must be transparent. The terminology of transparency varies by media and by software. After Effects refers to transparent areas using the following terms:

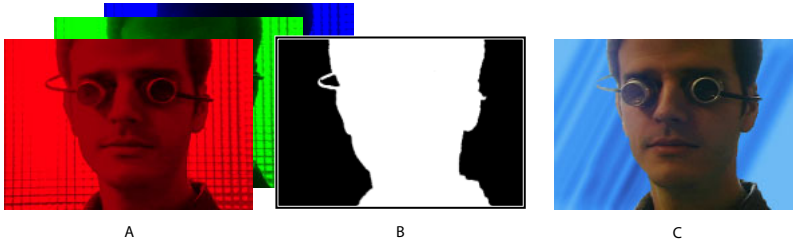
Alpha channel An invisible channel that defines transparent areas for the footage item or layer that contains the channel. With imported items, an alpha channel provides a way to store both the footage and its transparency information in a single file without disturbing the footage item's color channels. Each After Effects layer can accommodate an alpha channel included with a footage item. (See ["Importing footage containing an alpha channel" on page 46.](#))

Mask A path, or outline, that modifies a layer's alpha channel. Use a mask when you want to draw areas of transparency in After Effects. A mask belongs to a specific layer, but each After Effects layer can contain multiple masks.

Matte A layer (or any of its channels) that defines the transparent areas of that layer or another layer. Use a matte when you have a channel or layer that defines the desired area of transparency better than the alpha channel (or in cases where footage does not include an alpha channel).



Keying Defining transparency by a particular color (color key) or brightness value (luminance key) in an image. Pixels matching the key color become transparent. Use keying to remove a background with a uniform color, such as a blue screen.



Separated color channels (left), the alpha channel (center), and all channels viewed together (right).

Using a footage item with an alpha channel

An alpha channel is a fourth 8- or 16-bit channel included in addition to the three 8- or 16-bit red, green, and blue color channels of video footage or an RGB image. When a file contains an alpha channel, its image is defined as containing a total of 32 or 64 bits, or using “Millions of Colors +” or “Trillions of Colors +.” An alpha channel has the same function as a key in analog video compositing or a matte in optical film compositing—it describes the areas of an image that are transparent. (See [“Importing footage containing an alpha channel” on page 46](#) and [“Selecting 16-bpc color depth \(Pro only\)” on page 22](#).)

Working with masks

Each layer in a composition can contain an unlimited number of masks. Create and view masks in either the Composition or Layer window, and set interactions between mask properties in the Timeline window or in the Layer menu. (See [“Creating masks” on page 177](#).) You can also animate the shape of the mask by animating individual vertices on a mask path. (See [“Setting keyframes” on page 119](#).)

To view masks in the Composition window:

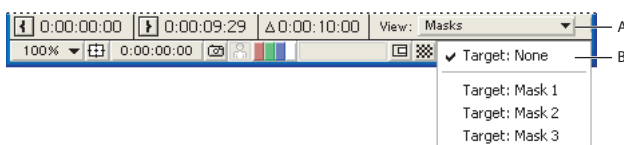
Choose View Options from the Composition Window menu, select Masks in the Layer section of the View Options dialog box, and then click OK.

To view masks in the Layer window:

Choose Masks or Anchor Point Path from the View pop-up menu.

To specify a mask in the Layer window as the target for all new mask shapes:

Choose the mask name from the Target pop-up menu. (See [“Specifying one mask as the target for animation” on page 190](#).)



Menu selections to specify a mask in the Layer window **A**. View pop-up menu **B**. Target pop-up menu

Creating masks

You can create one or more masks for each layer in a composition. Masks appear in the Timeline window in the order you create them.

You can create a mask using any of the following methods:

- Draw a path using the tools from the Tools palette.
- Specify the dimensions of the mask shape in the Mask Shape dialog box.
- Paste a path copied from another layer or from Adobe Illustrator or Adobe Photoshop. (See [“Importing masks from Adobe Illustrator and Adobe Photoshop” on page 194.](#))
- Convert an alpha channel using the Auto-trace command. (See [“Converting alpha channels to masks” on page 181.](#))
- Convert a text layer using the Create Outlines command. (See [“Creating masks from text characters” on page 226.](#))

Types of masks

You can draw four types of masks:

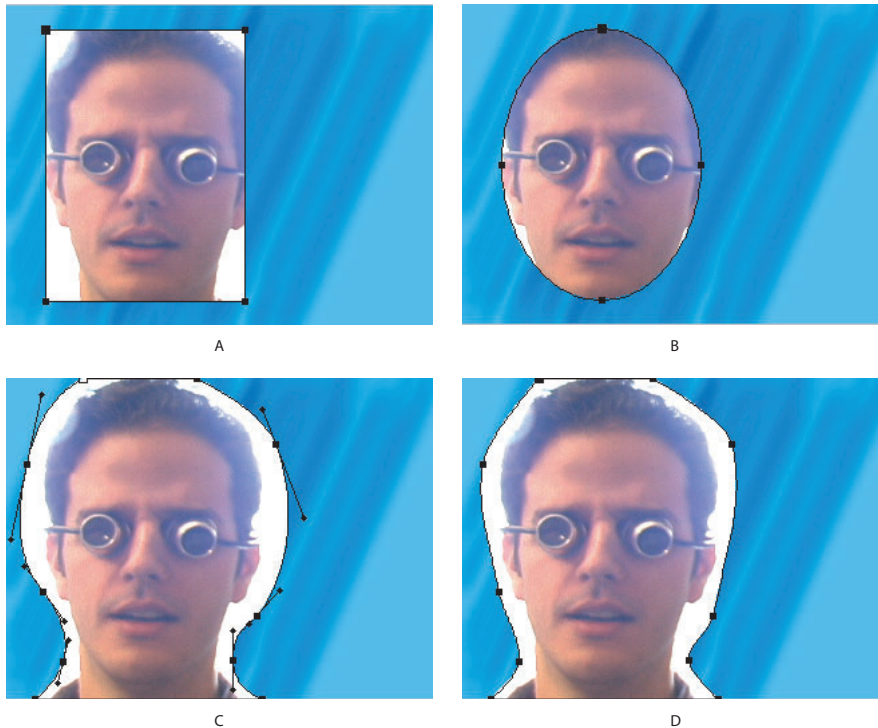
Rectangular A rectangular mask can also be square. This type of mask is previewed and rendered faster than any other kind of drawn mask.

Elliptical An elliptical mask can also be circular.

Bezier Use the pen tool to draw a freeform Bezier path as a mask. You can create any shape of Bezier mask by using the pen tool. (See [“Drawing a Bezier mask with the pen tool” on page 182.](#))

RotoBezier Select the RotoBezier option in the Tools palette after selecting the pen tool to draw a freeform RotoBezier path as a mask. The main difference between RotoBezier and Bezier is that the tangent handles are calculated automatically with RotoBezier masks.

After you first create a mask, you can resize it or rotate it as a whole or you can change parts of it. (See [“Scaling and rotating selected masks or vertices” on page 185](#) and [“Changing the shape of a mask” on page 186](#)).



Four types of masks **A.** Rectangular mask **B.** Elliptical mask **C.** Bezier mask **D.** RotoBezier mask

Working with multiple masks in one layer

When you create masks in a layer, the mask names appear in the order you create them in the Timeline window outline. To organize and keep track of your masks, rename them as you would rename layers. (See [“Renaming a layer” on page 100](#).) When creating additional masks for one layer in the Layer window, make sure that the Target pop-up menu in the Layer window is set to None; otherwise, you will replace the targeted mask instead of creating a new mask. (See [“Specifying one mask as the target for animation” on page 190](#).)

To make it easier to work with multiple masks in the Composition window, you can apply different colors to each mask outline.

To apply a new color to a mask outline:

- 1 Select the mask in the Timeline window.
- 2 If necessary, expand the Mask properties by pressing the M key.
- 3 Click the color swatch just to the left of the mask name, pick a new color, and click OK.

For more information about masks, see [“Selecting masks and vertices” on page 183](#).

Duplicating masks

If you create a mask on one area of a layer and want to put a copy of it on another area of the layer, use the Duplicate command.



To duplicate a mask:

- 1 Select the mask in either the Composition, Layer, or Timeline window, and then do either of the following:
 - Choose Edit > Duplicate.
 - Choose Edit > Copy, deselect the mask, and then choose Edit > Paste.
- 2 In the Composition or Layer window, drag the duplicated mask to another location on the layer.

Drawing rectangular and elliptical masks

Use the rectangle and ellipse tools to create mask shapes, or specify a mask shape numerically.

To create a rectangular or elliptical mask by dragging:

- 1 Select a layer in the Composition window or display a layer in the Layer window.
- 2 Select the rectangle tool  or the ellipse tool  in the Tools palette.
- 3 Position the cursor in the Composition or Layer window at one corner of the mask you want to draw and drag to the opposite corner.
- 4 Use either of the following techniques to alter the mask as you draw:
 - Hold down Shift as you drag to create a square with the rectangle tool or a circle with the ellipse tool.
 - Begin dragging, and then hold down Control (Windows) or Command (Mac OS) to create a mask that extends from its center.

For more information about moving, scaling, and rotating masks, see [“Scaling and rotating selected masks or vertices” on page 185](#).

To create a rectangular or elliptical mask the size of the layer:

- 1 Select a layer in the Composition window or display a layer in the Layer window.
- 2 In the Tools palette, double-click either the rectangle tool or the ellipse tool.

To create a rectangular or elliptical mask by specifying a mask shape numerically:

- 1 Select a layer in the Composition window or display a layer in the Layer window.
- 2 Choose Layer > Mask > New Mask. A new mask appears in the Composition or Layer window with its handles at the outer edges of the frame.
- 3 Choose Layer > Mask > Mask Shape.
- 4 Select Rectangle or Ellipse.
- 5 If you want, specify the size and location of the mask's bounding box.
- 6 Click OK.

To learn more about bounding boxes, see [“Using the Info palette” on page 36](#).

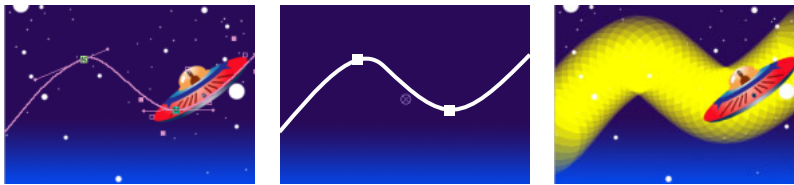
About mask paths

A mask in After Effects is a drawn path consisting of path segments and vertices. Segments are the lines or curves that connect two vertices. Vertices define where each segment of a path starts and ends.

In addition, the mask you create can be either an open or closed path. An open path has different beginning and ending points; for example, a straight line is an open path. A closed path is continuous and has no beginning or end; for example, a circle is a closed path. Closed-path masks can create transparent areas for a layer. Open paths cannot create transparent areas for a layer, but are useful when used as a parameter for an effect; for example, creating a visible line or shape from the mask using the Stroke effect. (See [“Applying effects to a mask” on page 195.](#))

Creating masks from motion paths

You can copy position, anchor point, or an effect’s point position keyframes and paste those keyframes on a selected mask. This is useful for creating animations that follow the edges of a mask. When you create masks from motion paths, make sure that you copy keyframes from a single position property only—do not copy the keyframes of any other property. (See [“Setting layer position” on page 126.](#))

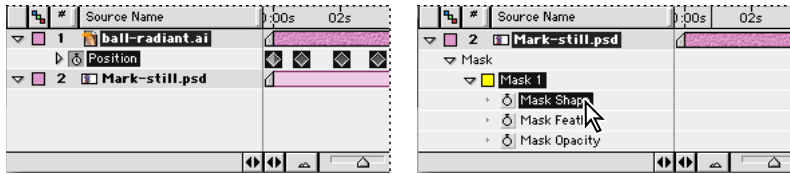


The motion path of the spaceship (left) is copied to the background layer (center) and used by the Vegas effect (right).

To create a mask from a motion path:

- 1 In the Composition window, display the motion path from which you want to create the mask.
- 2 In the Timeline window, select the successive keyframes along the motion path you want to use as a mask. Click the Position property name to select all the keyframes. Shift-click successive keyframes to select only a few keyframes.
- 3 Choose Edit > Copy.
- 4 In the Timeline window, select the layer you want to apply the mask to and expand its properties, or open the layer in its Layer window.
- 5 Do one of the following:
 - To use the motion path as a new mask, choose Layer > Mask > New Mask.
 - To use the motion path as a replacement for an existing mask, select the mask you want to replace.
- 6 In the Timeline window, expand the Mask property for the mask you want to create or replace, and select the Mask Shape value name.

7 Choose Edit > Paste.



Selecting and copying Position keyframes (left); then pasting them in the selected Mask Shape value (right)

Converting alpha channels to masks

You can convert the alpha channel of a layer to one or more masks by using the Auto-trace command. You can also create masks using the red, green, or blue channels of the layer. Auto-trace creates as many masks as necessary to outline the selected area while leaving the layer intact. When you apply Auto-trace, affected layers are automatically set to Best Quality to ensure accurate results.

- To create a mask with Auto-trace:**
- 1 In the Timeline window, adjust the work area to the range of frames for which you want to create mask shape keyframes.
 - 2 Select one or more layers in the Composition window.
 - 3 Choose Layer > Auto-trace.
 - 4 Select the appropriate options in the Auto-trace dialog box, and then click OK. One or more masks appear in the Composition window and in the Timeline window for that layer.



Apply a keying effect to the layer to isolate your subject and reduce the number of masks created by Auto-trace.

Auto-trace includes the following options:

Current Frame Creates masks on the selected frame only.

Work Area Creates mask shape keyframes throughout the specified work area.

Tolerance Specifies, in pixels, how tightly the mask stroke conforms to the shape of the alpha channel. Extremely high values create masks with sharp corners; extremely low values create masks that encompass noise in the specified channel's perimeter.

Threshold The specified percentage value determines where to draw the mask stroke. Values over the threshold are mapped to white and are opaque; values under the threshold are mapped to black and are transparent.

Channel Specifies the channel to convert to masks. Choices include alpha, red, green, blue, and luminance.

Invert Inverts the input layer prior to searching for edges. For example, if you apply Auto-trace to a square layer that contains a circular alpha channel, Invert creates a mask for the circle only, instead of creating masks of both the circle and square outline of the layer.

Blur Specifies the amount of blur in pixels to apply to the layer before the threshold is sampled. Set the value to zero to create masks that closely outline high-contrast images. Use higher values to reduce jagged mask edges.

Apply to New Layer Applies the mask to a new solid the same size as the selected layer. This control is automatically selected for layers that have Collapse Transformations enabled—it creates a new layer the same size as the composition that contains the layer.

Converting text to masks


You can create editable masks from an existing text layer. The Create Outline command creates one or more masks from the text outlines. (See [“Working with masks in text layers” on page 225.](#))

Drawing a Bezier mask with the pen tool

Using the pen tool, you can create a Bezier mask of any shape, including straight lines at any angle or smooth flowing curves. The pen tool provides the most precise control over straight lines and curves.

You can easily adjust the shape of the path by dragging the mask's vertices or the direction lines associated with a vertex. You can also quickly add points to or delete points from a segment, or change a vertex from one type to another. For information on changing vertices, see the related procedure in [“Changing the shape of a mask” on page 186.](#)

Drawing straight lines with the pen tool

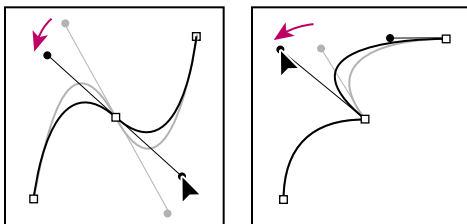
With the pen tool, draw straight lines by clicking the pen tool to create vertices. Each time you click the tool in a new location, After Effects draws a straight path segment from the previous point to the new point. To close the path, position the cursor directly over the first vertex and, when you see a closed circle icon  next to the cursor, click it.

Drawing curves with the pen tool

You can create curved masks by dragging the pen tool in the direction you want the curve to go. On curved mask segments for Bezier masks, each selected vertex displays one or two *direction lines*, ending in *direction handles*. The shape of a curved segment depends on the direction line at either end of the segment. As a path exits one vertex, that point's direction line shapes the curve. As the path approaches the next vertex, its shape is less influenced by the previous point and more influenced by the direction line at the next vertex. Moving these elements reshapes the curves in a path. The direction lines always touch the curve at the vertices. The angle and length of a direction line determine the shape of the curve as it exits that vertex.

Continuous curved paths—that is, paths along a continuous wave shape—are connected by vertices called *smooth points*. Noncontinuous curved paths are connected by *corner points*. You can change a vertex to either a smooth or corner point as you draw.





When you move a direction line on a smooth point, the curves on both sides of the point adjust simultaneously. By contrast, when you move a direction line on a corner point, only the curve on the same side of the point as the direction line is adjusted. Complete the shape by clicking the first vertex or by double-clicking the last point.



Adjusting the direction lines on a smooth point (left) and a corner point (right).

To change a vertex:

Do one of the following:

- Position the pen tool over the vertex you want to change and click the vertex when the pen tool icon  becomes the convert vertex tool icon .
- In the Tools palette, select the convert vertex tool . If the convert vertex tool is not visible, click and hold one of the visible pen tool icons  and choose the convert vertex tool from the menu.

Drawing a RotoBezier mask with the pen tool

Use the RotoBezier option in the Tools palette to create curved masks more quickly. The RotoBezier option automatically calculates the curved segments for you, thereby eliminating the need for direction lines.

You can convert any existing mask to a RotoBezier mask. However, Bezier masks that have adjusted direction lines change shape when converted to RotoBezier because After Effects calculates RotoBezier segments automatically. You can convert RotoBezier masks to Bezier without affecting the mask shape.

To create a RotoBezier mask:

- 1 In the Tools palette, select the pen tool, and then click the RotoBezier option.
- 2 In the Composition window, click to create a mask shape.

To convert a mask to a RotoBezier mask:

- 1 Select a mask in the Layer or Composition window.
- 2 Choose Layer > Mask > RotoBezier.

To change smooth corners to sharp corners using the RotoBezier mask option:


With the pen tool selected, Alt-click (Windows) or Option-click (Mac OS) an existing vertex.

Note: If you Alt-click (Windows) or Option-click (Mac OS) a sharp corner, all corners become smooth.

Selecting masks and vertices

Before you can modify or animate masks, you must know how to select them, especially when you've created more than one mask on a layer. Also, unlike layers, masks can have more than one level of selection. You can select a mask as a whole path, which is appropriate when you want to move or resize a mask. However, if you want to change the shape of a mask, select one or more points on a mask. Selected points appear solid, and unselected points appear hollow.

To select all or part of one or more masks in the Layer or Composition window:

- 1 Click the selection tool .
- 2 Do one of the following:
 - To select a vertex on a mask, click it.
 - To select a mask segment, click the edge of the mask.

- To select an entire mask by clicking, press Alt (Windows) or Option (Mac OS) as you click a mask. To select more masks, hold down Alt + Shift (Windows) or Option + Shift (Mac OS) as you click other masks.
- To select masks by dragging, hold down Shift, click inside the mask, and draw a marquee completely around the vertices or masks you want to select.



To use the selection tool when the pen tool is selected, hold down Ctrl (Windows) or Command (Mac OS).


To select masks in the Timeline window:

- 1 Click the right-facing arrow next to a layer name to expand it.
- 2 Click the right-facing arrow next to the Masks heading to expand it, revealing all masks on that layer.
- 3 Do any of the following:
 - To select one mask, click its name.
 - To select a contiguous range of masks, hold down Shift as you click the names of the first and last masks in the range.
 - To select several discontinuous masks together, hold down Ctrl (Windows) or Command (Mac OS) as you click the names of any masks you want to include.

Note: You can select only whole masks in the Timeline window. To select individual vertices on a mask, use the Composition or Layer window.

To add or remove masks or vertices to or from the selection:

Do one of the following:

- In the Composition window, use the selection tool  to drag a marquee to enclose all vertices on all desired masks.
- In the Layer window, hold down Shift as you drag a marquee over other unselected vertices.
- In either the Layer or Composition window, select a mask and hold down Shift as you click other unselected masks with the selection tool.

To select or deselect all vertices in a mask:

Press Command + A. To deselect all vertices, press Command + Shift + A.

To select all masks on a layer:

Choose Edit > Select All.

To select an adjacent mask on a layer:

Press the tilde (~) key to select the next mask, or Shift + ~ to select the previous mask.

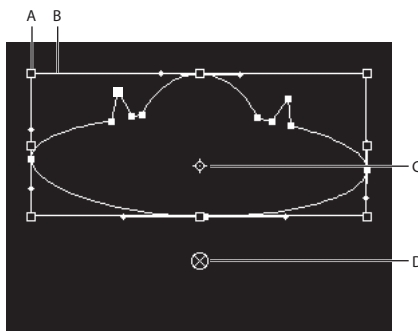
To deselect the mask:

Click anywhere other than on or inside a mask.

Scaling and rotating selected masks or vertices




In one step, you can scale and rotate an entire mask (or selected vertices in one or more masks) using the Free Transform Points command. When you use this command, a *bounding box* surrounds the selected vertices, and an anchor point displays in the center of the bounding box to mark the effect point for the current transformation. You can scale and rotate the selected vertices by dragging the bounding box or its handles. You can also change the point from which the mask rotates or scales by moving the bounding box anchor point. The Free Transform Points bounding box handles and anchor point exist independently of the handles and anchor point for the layer.

Note: When you animate rotation using Free Transform Points, the vertices of the mask are interpolated in a straight line from keyframe to keyframe. Because of this, the results may be different than you expect.



Free Transform points **A.** Bounding box handle **B.** Free Transform Points bounding box **C.** Bounding box anchor point **D.** Layer anchor point

To move, scale, or rotate a mask or mask vertices:

- 1 Display the layer containing the mask or masks you want to transform in the Composition or Layer window.
- 2 Using the selection tool, do one of the following:
 - To change a certain number of vertices, select the vertices you want to transform and choose Layer > Mask > Free Transform Points.
 - To transform the entire mask, select it in the Timeline window and choose Layer > Mask > Free Transform Points.
- 3 To move the bounding box's anchor point, position the selection tool over the bounding box anchor point  until the selection tool changes to a *move anchor point* icon . Drag to position the anchor point.
- 4 Do any combination of the following:
 - To move the mask or selected vertices, position the pointer inside the bounding box and drag.
 - To scale the mask or selected vertices, position the pointer on a bounding box handle and, when the pointer changes to a straight, double-sided arrow , drag to a new size. Hold down Shift as you drag to constrain the scale. Hold down Ctrl (Windows) or Command (Mac OS) as you drag to scale around the bounding box's anchor point.

- To rotate the mask or selected vertices, position the pointer just outside the Free Transform bounding box and, when the pointer changes to a curved double-sided arrow ↻, drag to rotate.
- 5 To close the Free Transform bounding box, double-click anywhere in the Composition or Layer window.

Changing the shape of a mask

In the Layer or Composition window, you can freely change the shape of a mask. You can move, delete, or add vertices to reshape a mask; create a flexible outline to accommodate any shape; and even change a mask shape over time.

Some changes require the use of tools grouped with the pen tool in the Tools palette. To reveal these tools, click and hold the pen tool in the Tools palette. When modifying a mask, make sure that you click only existing vertices or segments; otherwise, you may create a new mask instead.

To change a mask shape numerically:

- 1 Select the mask.
- 2 In the Timeline window, expand the Mask options.
- 3 Next to the Mask Shape property, click the underlined word “Shape,” and specify the changes.
- 4 Click OK.

To replace one mask shape with another:

- 1 In the Layer window, select the mask you want to replace from the Target pop-up menu.
- 2 Draw a new mask shape.

Note: After you create the new mask shape in the Layer window, select None from the Target pop-up menu; otherwise, all subsequent masks you create will replace the targeted mask. (See [“Specifying one mask as the target for animation” on page 190.](#))

To reset a mask to its default boundaries:

Select the mask in the Timeline window and choose Layer > Mask > Reset Mask.

To delete one mask:


Select the mask in the Timeline window and press Delete.

To delete all masks:

Select the layer containing the masks you want to remove and choose Layer > Masks > Remove All Masks.

To move a vertex:

Using the selection tool , drag the vertex.

 You can temporarily switch from the pen tool to the selection tool by pressing Ctrl (Windows) or Command (Mac OS).

To add a vertex to a mask:

Using the add vertex tool , click the line between two existing vertices.

To delete a vertex from a mask:

Using the delete vertex tool , click a vertex.

To adjust the shape of a curve segment:


Do one of the following with the selection tool:

- Drag a vertex.
- Drag the direction lines extending from an adjoining smooth vertex.
- Drag a curved segment.

Note: Dragging a curved segment on a RotoBezier mask also moves the vertices.

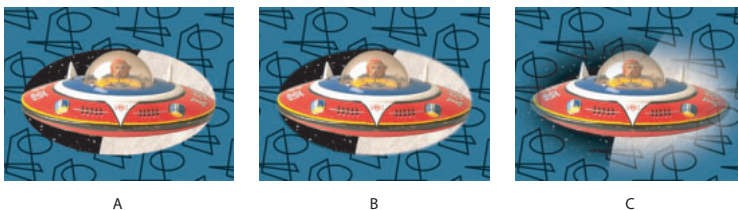
To change a vertex from a corner to a smooth vertex or vice versa:

Do one of the following:

- Using the convert vertex tool , click the vertex.
- Using the selection tool, hold down Ctrl (Windows) or Control (Mac OS) as you click the vertex.
- Using the pen tool, click the vertex.

Feathering mask edges

Using the Mask Feather property, you make mask edges hard-edged or soft-edged (feathered). By default, the feather width straddles the mask edge, half inside and half outside. For example, if you set the feather width to 25, the feathering extends 12.5 pixels inside the mask edge and 12.5 pixels outside it. You can also extend or contract the mask edges to control where the mask feathering appears. (See [“Adjusting the edges of a mask” on page 188.](#))




Setting the Mask Feather property **A.** No feather **B.** 2-pixel feather **C.** 40-pixel feather

Mask feathering takes place only within the dimensions of the layer frame area. Therefore, a feathered mask shape should always be slightly smaller than the layer area. If a mask feather extends beyond the layer area, the feathered edge ends abruptly.

You can adjust the feathering of a layer's mask by specifying precise values or by dragging in the Timeline window.

To adjust feathering in the Timeline window:

- 1 Expand the desired layer and its Mask properties.

2 Click the Constrain Proportions switch  next to the Mask Feather property so that the constrain proportions icon appears if you want to constrain the x and y values proportionally.

3 Drag the underlined value for Mask Feather.

To adjust feathering by specifying precise values:

1 Select the mask that you want to adjust.

2 Expand the desired layer and its Mask Properties in the Timeline window.

3 Right-click (Windows) or Control-click (Mac OS) the underlined value for Mask Feather, and select Edit Value.

Specify amounts for horizontal and vertical feathering (or type one value and select Constrain to make both values the same) and click OK.

Note: You can apply only uniform feathers, that is, feathers that expand the mask horizontally and vertically, on layers that have Continuously Rasterize enabled in the Timeline window.

Adjusting the edges of a mask

To finely expand or contract all the edges of a mask, use the Mask Expansion property. This property's value represents, in pixels, how far from the original mask edge you are expanding or contracting the adjusted edge.

To adjust the edges of the mask using Mask Expansion:

1 In the Timeline window, expand the Mask properties of the layer you want to adjust.

2 Drag the underlined value for Mask Expansion.

Adjusting the opacity of a mask

Masks have an opacity property that you can use to adjust the transparency of any mask, or even to turn masks on and off temporarily.

To adjust the opacity of a mask:

1 In the Timeline window, expand the mask properties of the mask you want to adjust.

2 Drag the underlined value for Mask Opacity.

Applying motion blur to a mask

Motion blur creates a blur based on a mask's movement in the composition. You can apply motion blur to any one of the individual masks on a layer. (See [“Applying motion blur to layers” on page 111.](#))

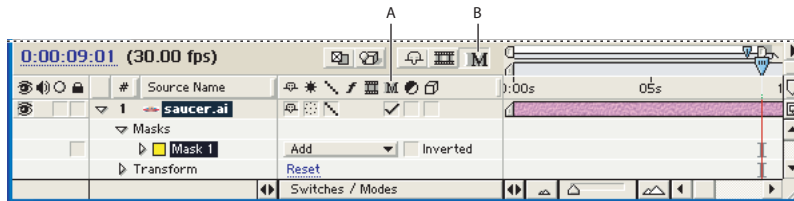
Note: The mask must contain Mask Shape keyframes that create enough movement to result in a realistic motion blur.

To apply motion blur to a mask:

1 Select one or more masks.

2 Choose Layer > Masks > Motion Blur and choose one of the following options:

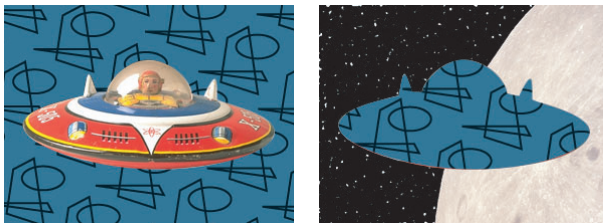
- Same as Layer, to control the mask's blur using the Motion Blur button.
 - On, to render the mask blur even if the Motion Blur button is not selected. (The Enable Motion Blur button must be selected for this option to work.)
 - Off, to apply no motion blur to the mask.
- 3 Click the Enable Motion Blur button in the Timeline window to view the blur.



Motion Blur settings for a layer and a composition **A.** Motion Blur switch **B.** Enable Motion Blur button

Specifying which parts of a mask are inside and outside

The image area inside the mask outline is fully opaque, and the area outside the mask outline is transparent. If you want to create the appearance of a hole in a video layer to reveal a layer underneath, switch the inside and outside areas by *inverting* the mask. You cannot change the mask state using keyframes; a mask is either inverted or not inverted for the entire duration of a composition.



Default behavior for a drawn mask (left); same mask inverted (right)

To invert a drawn mask:

- 1 Select the mask you want to invert.
- 2 In the Timeline window, select the Inverted option next to the mask name.

If you have multiple masks in one layer, you can apply mask modes to create complex transparent shapes or varying levels of transparency. (See [“Controlling how masks in the same layer interact” on page 195.](#))

Moving a mask and panning a layer behind a mask

You can adjust the area that displays through a mask by either moving the mask in the Layer or Composition window or panning (moving) the layer behind the mask in the Composition window. When you move a mask, the mask layer's Position values remain constant, and the mask moves in relation to other objects in the Composition window.

When you use the pan behind tool to pan a layer behind a mask, the mask's position remains constant in the Composition window, but changes in the Layer window. The masked layer's Position values change in relation to the composition. As you pan past the edges of the layer's frame, the layer's Mask Shape values also change. Using the pan behind tool saves steps; without it, you would have to change the masked layer's Position and Mask Shape properties manually. You can animate a layer panning behind another layer by setting keyframes for the masked layer's Position and Mask Shape properties. (See [“Setting keyframes” on page 119.](#))



When you use the pan behind tool in the Composition window, After Effects automatically makes two adjustments for you. In the Layer window, the mask is moved in relation to its layer (top), while in the Composition window, the layer is moved in relation to the composition (bottom).

To move a mask:

- 1 Select the mask or masks you want to move.
- 2 In the Composition window, drag the mask or masks to a new location. To constrain the movement of the mask or masks to horizontal or vertical, hold down Shift after you start dragging.

For more information on masks, see [“Selecting masks and vertices” on page 183.](#)

To pan a layer behind its mask:

- 1 Select the pan behind tool in the Tools palette .
- 2 Click inside the mask area in the Composition window and drag the layer to a new position.

Specifying one mask as the target for animation

As soon as you draw the first point on your first mask for a layer, the Layer window displays a Target pop-up menu, which you use to specify a mask as the target for all new mask shapes.

When you create a new mask shape while a mask is chosen in the Target pop-up menu, the targeted mask is replaced by the new shape. You can change this behavior by choosing None from the pop-up menu so that any new mask shape you create in the Layer window creates a new mask instead of replacing an existing mask. You can also lock a mask to prevent changes to it. (See [“Locking a mask” on page 197](#).)

To specify a mask as the target of all new shapes:

In the Layer window, choose the mask name from the Target pop-up menu.

To specify no mask as a target for changes:

In the Layer window, choose None from the Target pop-up menu.

Animating a mask

You can change all of a layer’s Mask property’s values—Mask Shape, Mask Feather, Mask Opacity, or Mask Expansion—over time by using keyframes. (See [“Understanding keyframes” on page 117](#).)

To animate a mask shape, After Effects designates the topmost vertex at the initial keyframe as the *first vertex* and “numbers” each successive vertex in ascending order from the first vertex. After Effects then assigns the same numbers to the corresponding vertices at all successive keyframes. After Effects interpolates the movement of each vertex from its initial position at one keyframe to the position of the correspondingly numbered vertex at the next keyframe. At any time during an animation, you can designate another vertex as the first vertex; this causes After Effects to renumber the vertices of the shape you assigned a new first vertex, and the mask animates differently as After Effects now maps the new vertex numbers to the corresponding “old” vertex numbers still saved at successive keyframes.

To animate a mask property:

- 1 In the Timeline or Composition window, select the mask that you want to animate.
- 2 Move the current-time indicator to the time where you want to begin the animation.
- 3 Expand the Mask properties and locate the property that you want to change.
- 4 Set a value for the mask property. For information on setting a mask value, see the corresponding section for the value you want to set.
- 5 Set an initial keyframe.
- 6 Move the current-time indicator to the time where you want to add the second keyframe.
- 7 Change the value for the mask property.

Repeat steps 7 and 8 as many times as you want to add more keyframes.

For further information, see [“Adjusting the opacity of a mask” on page 188](#) or [“Setting keyframes” on page 119](#).

Note: By default, when you add a vertex to a mask, the new vertex appears on the mask throughout the mask’s duration but reshapes the mask only at the time it was added. When you delete a vertex from a mask at a specific point in time, the vertex is deleted from the mask throughout the mask’s duration. Prevent After Effects from adding and deleting vertices throughout the mask’s duration by choosing *Edit > Preferences > General*

(Windows) or After Effects > Preferences > General (Mac OS), and deselecting Preserve Constant Vertex Count When Editing Masks.

To designate another vertex as the first vertex:

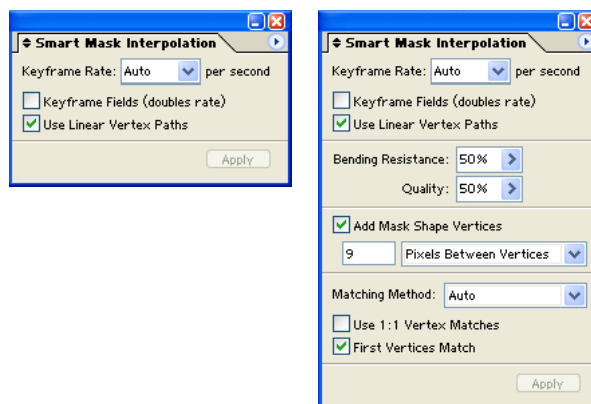
- 1 Create an animated mask shape, as described in the previous procedure.
- 2 In the Timeline window, move the current-time indicator to the point where you want to designate a new first vertex.
- 3 Select the vertex you want to designate as the first vertex.
- 4 Choose Layer > Mask > Set First Vertex.

For further information, see [“Selecting masks and vertices” on page 183](#).

Note: The vertex designated as the first vertex appears slightly larger than the other vertices in the Composition window.

Using Smart Mask Interpolation (Pro only)

Smart Mask Interpolation provides a high level of control for creating mask shape keyframes and smooth, realistic animation. Once you select the mask shape keyframes to interpolate, Smart Mask Interpolation creates intermediate keyframes based on settings you provide. The Info palette displays the progress of the interpolation and the number of keyframes created.



The Smart Mask Interpolation palette, showing the basic controls (left) and the optional controls (right)

To use Smart Mask Interpolation:

- 1 Choose Window > Smart Mask Interpolation.
- 2 Select at least two adjacent mask shape keyframes.
- 3 Set options in the Smart Mask Interpolation palette and click Apply.
- 4 If desired, click the arrows on the left corner of the palette tab or choose Show Options from the Smart Mask Interpolation palette menu, and set additional options.

Note: To interrupt the interpolation process, press Esc. The Info palette indicates that the process has been interrupted and reports the number of keyframes created.

Options in the Smart Mask Interpolation palette include the following:

Keyframe Rate Specifies the number of keyframes Smart Mask Interpolation creates per second between the selected keyframes. For example, a value of 10 creates a new keyframe every 1/10 of a second. Choose Auto to set the keyframe rate equal to the composition frame rate, which appears in parentheses.

Note: Regardless of the keyframe rate you choose, Smart Mask Interpolation always adds keyframes at the frame just after the first mask shape keyframe and at the frame just before the second mask shape keyframe. For example, if you interpolate between keyframes at 0 seconds and 1 second in a 30-fps composition with a keyframe rate of 10 per second, mask shape keyframes are added at frame numbers 1, 3, 6, 9, 12, 15, 18, 21, 24, 27, and 29.

Keyframe Fields Doubles the keyframe rate. When this option is selected, and Keyframe Rate is set to the composition frame rate, a keyframe is added at each field.

Use Linear Vertex Paths Specifies that vertices in the first keyframe move along a straight path to their corresponding vertices in the second keyframe. Leave this unselected if you want some vertices to interpolate along curved paths; for example, when the desired interpolation involves rotating parts. If this option is not selected, Smart Mask Interpolation creates a natural path for the mask.

Bending Resistance Specifies how susceptible the interpolated mask shape is to bending instead of stretching. A value of 0 specifies that, as the mask shape animates, it bends more than it stretches; a value of 100 specifies that the mask shape stretches more than it bends.

Quality Specifies how strictly Smart Mask Interpolation matches vertices from one keyframe to another. A value of 0 specifies that a particular vertex in the first keyframe matches only the same-numbered vertex in the second keyframe. For example, the 10th vertex in the first keyframe must match the 10th vertex in the second keyframe. A value of 100 means that a vertex in the first keyframe can potentially match any vertex in the second keyframe. Higher values usually yield better interpolations; however, the higher the value, the longer the processing time.

Add Mask Shape Vertices Specifies that Smart Mask Interpolation adds vertices to facilitate quality interpolations. In general, Smart Mask Interpolation works best when the mask shapes have dense sets of vertices. Also, a vertex on the first mask shape cannot match the middle of a curve or straight-line segment on the second mask shape, so adding vertices before matching is sometimes necessary to produce the desired result. Smart Mask Interpolation does not modify the original keyframes. Only the new mask shape keyframes computed by Smart Mask Interpolation have additional vertices.

The value you set specifies how finely the input mask shapes are subdivided. Pixels Between Vertices specifies the distance, in pixels, between vertices on the larger perimeter mask shape after subdivision. Total Vertices specifies the number of vertices on the interpolated mask shapes. Percentage of Outline specifies that a vertex is added at each indicated percent of the mask shape outline length. For example, a value of 5 means that a vertex is added at each successive segment of the outline that represents 5% of the total perimeter. To use only the vertices that were there at the first frame, do not select this option.

Note: Smart Mask Interpolation may add vertices at existing vertex locations even if Add Mask Shape Vertices is not selected. If two vertices on one mask shape match a single

vertex on the other, the single vertex is duplicated at the same location so that the segment between the two vertices shrinks to that location.

Matching Method Specifies the algorithm that Smart Mask Interpolation uses to match vertices on one mask shape to vertices on the other. Auto applies the matching algorithm for curves if either of the two selected keyframes has a curved segment; otherwise, it applies the polylines algorithm. Curve applies the algorithm for mask shapes that have curved segments. Polyline applies the algorithm for mask shapes that have only straight segments.

Note: The mask shape keyframes added by Smart Mask Interpolation are polylines when the Polyline Matching Method is selected, regardless of whether the input mask shapes contained curved segments.

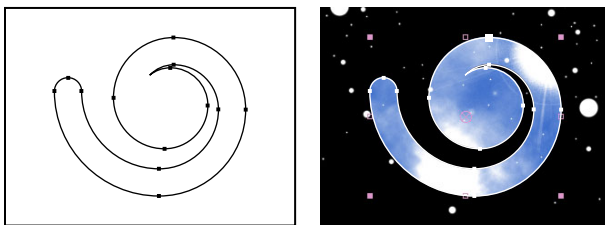
Use 1:1 Vertex Matches Specifies that Smart Mask Interpolation creates a vertex on one mask shape that matches the same-numbered vertex on the other mask shape. On each of the input mask shapes, Smart Mask Interpolation matches the first vertices, the second vertices, the third vertices, and so forth. If the two shapes have unequal numbers of vertices, then this action may produce undesirable results.

First Vertices Match Specifies that Smart Mask Interpolation matches the first vertices in the two mask shape keyframes. If not selected, Smart Mask Interpolation searches for the best first-vertex match between the two input mask shapes.

Note: To ensure good results, make sure that the first vertices of the input mask shapes match, and then select First Vertices Match.

Importing masks from Adobe Illustrator and Adobe Photoshop

You can import paths from Adobe Illustrator or Adobe Photoshop and use them in After Effects layers. Using the special path-editing tools available in these applications, you can create a wider variety of shapes for your After Effects masks.



Path in Adobe Illustrator (left), and that same path imported into an After Effects Layer window as a mask (right)

To import a path from Adobe Illustrator or Adobe Photoshop:

- 1 Open Adobe Illustrator or Adobe Photoshop and create a path. For more information about creating a path in Adobe Illustrator or Adobe Photoshop, see the user guide for the application.
- 2 Select all of the vertices on the path that you want to copy to After Effects.
- 3 Choose Edit > Copy.
- 4 Open After Effects.

5 Open the Layer or Composition window into which you want to paste the path, and choose Edit > Paste.

Note: Each path from Adobe Illustrator or Adobe Photoshop is imported into After Effects as one mask.

Applying effects to a mask

You can apply the following standard After Effects effects to a mask shape: Path Text, Audio Waveform, Audio Spectrum, Stroke, Fill (closed paths only), and Smear (closed paths only). You can apply the following After Effects Professional edition effects to a mask shape: Reshape (closed paths only), Vegas, and the Inner Outer Key (closed paths only). The Professional edition-only effect Particle Playground can also use a mask shape to define effect boundaries.



You may also be able to use masks with effects from other manufacturers. For more information on the effects listed, see the online Effects Help.

Creating visible lines and solid shapes from masks

To outline or fill a mask, apply the Stroke (outline) and/or the Fill effect. Each mask in a layer can have different fill and stroke settings. You can apply an outline to an open or closed mask path, but if you want to fill a mask, it must be a closed path. (See [“Working with effects” on page 248.](#))

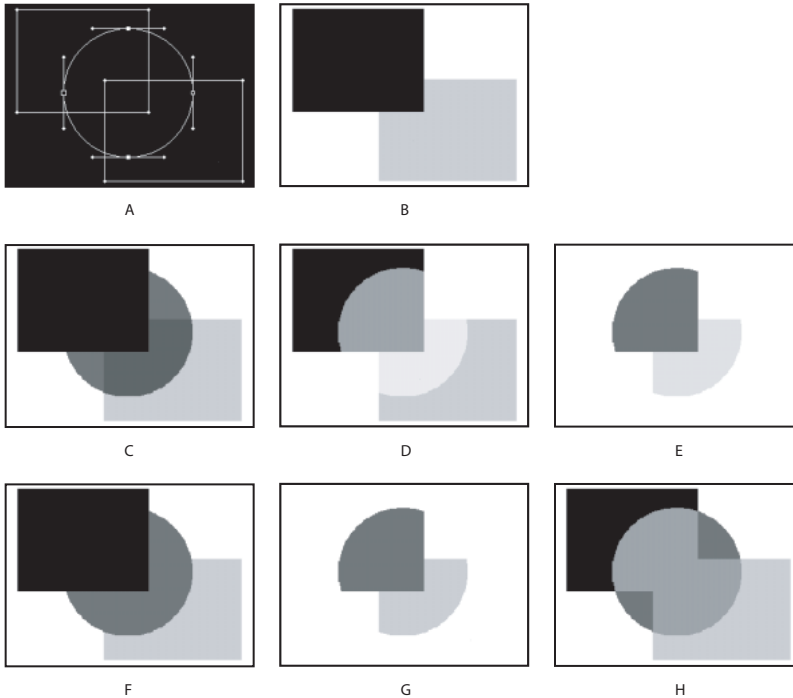
Controlling how masks in the same layer interact

Blending modes for masks control how different masks within a layer interact with one another. By default, all masks are set to Add, which combines the transparency values of any masks that overlap on the same layer. You can apply one mode to each mask, but you cannot change a mask's mode over time. (See [“Specifying a blending mode” on page 200.](#))

The first mask you create interacts with the layer's alpha channel. If that channel doesn't define the entire image as opaque, then the mask interacts with the layer frame. Each additional mask you create interacts with masks located above it in the Timeline window outline. The results of mask modes vary depending on the modes set for the masks higher up in the outline. You can use mask modes only between masks in the same layer. (See [“Using mask modes” on page 196.](#))

Using mask modes

Using mask modes, you can create complex mask shapes with multiple transparent areas. For example, you can set a mask mode that combines two masks and sets the opaque area to the areas where the two masks intersect.



Mask shapes that result when different modes are applied to circle mask **A**. Original masks **B**. None **C**. Add **D**. Subtract **E**. Intersect **F**. Lighten **G**. Darken **H**. Difference

To apply a mask mode:

- 1 In the Timeline window, select the layer containing the mask to which you want to apply a mode and press M.
- 2 Click the menu next to the mask name and choose a mask mode.

The following mask mode descriptions are based on interactions between two layer masks—the top set to Add, the other set to the mask mode described:

None After Effects treats the mask as if it does not exist. The mask has no impact on the layer or composition. This option is useful when you want to use the mask's path for an effect such as Stroke or Fill, but do not want it to create transparent areas in the layer. (See [“Applying effects to a mask” on page 195.](#))

Add Adds the selected mask area to the other masks for that layer, displaying all mask contents in the Composition window. Where multiple masks intersect, the opacity of all intersecting masks is added together.

Subtract Subtracts the mask from all masks located above it in the Timeline window. The contents of the subtracted mask area display as a hole in the Composition window. This option is useful when you want to create the appearance of a hole in the center of another mask.

Intersect Adds the mask to all masks above it, but displays in the Composition window only the area where the selected mask and any of the previous masks intersect. Where multiple masks intersect, the opacity of all intersecting masks is added together.

Lighten Adds the mask to all the masks above it, displaying contents of all masked areas in the Composition. Where multiple masks intersect, the highest opacity value is used, so opacity doesn't build up.

Darken Adds the mask to all masks above it, but displays in the Composition window only the area where the selected mask and any of the others intersect. Where multiple masks intersect, the highest transparency value is used, so transparency doesn't build up.

Difference Adds the selected mask to the masks above it, and displays in the Composition window the mask contents of all masked areas except those areas where the masks intersect.

Modifying multiple masks

If you have selected several masks, you can invert or change the modes of all of the selected masks at once. The choice you make for one mask is applied to all the masks.

To modify several masks at once:


- 1 Select the masks you want to modify.
- 2 Select a mask mode or invert one layer's mask.

For further information, see ["Selecting masks and vertices" on page 183](#).

Locking a mask

Locking a mask prevents you from selecting it in the Timeline, Composition, and Layer windows or setting it as a target in the Layer window. Use this feature to avoid unwanted changes to the mask.

To lock or unlock a mask:

- 1 In the Timeline window, expand the Mask property.
- 2 In the Switches column, click the box underneath the lock icon  next to the mask you want to lock or unlock. A mask is locked and cannot be selected when the lock icon appears in the box.

Note: To unlock multiple masks at one time, select the layer(s) and choose *Layer > Mask > Unlock All Masks*.

Reusing a mask

You can reuse masks in other layers and compositions. It is particularly useful to store Bezier masks you've spent a long time perfecting. You can even create a project with compositions that exist just to store complex layer masks. Mask shapes are stored inside a composition, not as an external file on your hard disk. When you want to use a mask from another project, import that project into your current project.

To save a mask:

- 1 In the Timeline window for the composition containing the layer and mask you want to save, expand the layer and its mask properties.
- 2 Do one of the following:
 - To save an animated mask, select the mask keyframes you want to save.
 - To save a nonanimated mask, select the mask.
- 3 Copy the mask or keyframes and paste to a new layer (this can be a simple solid).

For further information, see [“Setting keyframes” on page 119](#).

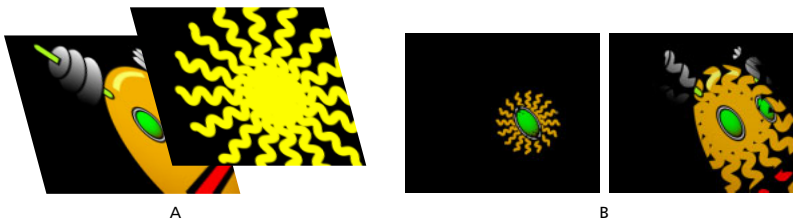
To reuse a mask:

- 1 Open the composition containing the mask you want to reuse. If you saved the mask in another project, import the project and then open the mask’s composition.
- 2 In the Timeline window, expand the saved mask’s layer and mask properties.
- 3 Select the mask path or keyframes.
- 4 Copy the mask or keyframes and paste to the new layer.

Creating track mattes and traveling mattes

When you want one layer to show through a hole in another layer, set up a track matte. You’ll need two layers—one to act as a matte, and another to fill the hole in the matte. You can animate either the track matte layer or the fill layer. When you animate the track matte layer, you create a *traveling matte*. If you want to animate the track matte and fill layers using identical settings, consider precomposing them. (See [“Understanding precomposing” on page 317](#).)

After Effects preserves the order of a layer and its track matte after you duplicate or split the layer. Within the duplicated or split layers, the track matte layer remains on top of the fill layer. For example, if your project contains layers A and B, where A is the track matte and B the fill layer, duplicating or splitting both of these layers results in the layer order ABAB. (See [“Duplicating a layer” on page 94](#) and [“Creating new layers by splitting a layer” on page 95](#).)



Traveling Matte **A.** Matte layer (top) and fill layer (below) **B.** Animation of the matte layer’s Scale property.

Using alpha channel or luminance values for a track matte

Define transparency in a track matte using values from either its alpha channel or the luminance of its pixels. Using luminance is useful when you want to create a track matte using a layer without an alpha channel or a layer imported from a program that can't create an alpha channel. In both alpha channel mattes and luminance mattes, pixels with higher values are more transparent. In most cases, you use a high-contrast matte so that areas are either completely transparent or completely opaque. Intermediate shades should appear only where you want partial or gradual transparency, such as along a soft edge.

To create a track matte:

- 1 Click the Switches/Modes button at the bottom of the Timeline window. The Modes column appears in place of the Switches column. You can also show the Modes column and the Switches column simultaneously.
- 2 Arrange two layers in the Timeline window. Make sure that the designated matte layer is directly above the designated fill layer.
- 3 From the TrkMat menu for the fill layer, define transparency in the next layer above by choosing one of the following:


No Track Matte No transparency created; next layer above acts as a normal layer.

Alpha Matte Opaque when alpha channel pixel value is 100%.

Alpha Inverted Matte Opaque when alpha channel pixel value is 0%.

Luma Matte Opaque when a pixel's luminance value is 100%.

Luma Inverted Matte Opaque when a pixel's luminance value is 0%.

After Effects converts the next layer above into a track matte, turns off the video of the track matte layer, and adds a track matte icon  next to the track matte layer's name in the Timeline window. The Composition window displays the fill layer viewed through the alpha channel of the matte layer. (See [“Optional columns” on page 86.](#))

Note: *Although the video is turned off for the matte layer, you can still select the layer to reposition, scale, or rotate it. Select the layer in the Timeline window, and then drag the center (indicated by a circle with an X) of the layer in the Composition window.*

Preserving underlying transparency during compositing

The Preserve Underlying Transparency option specifies that the opaque areas of a layer display only when positioned over opaque areas in underlying layers. With this option, you can make a layer display only when it is positioned over the layer below it. It's useful for creating effects such as glints or light reflecting off a polished surface.

To preserve underlying transparency:

Select the T option in the Layer Switches column for the appropriate layer.



A matte layer before applying Preserve Transparency (left) and after (right).

Using blending modes

Blending modes control how each layer blends with or reacts to layers beneath it. The stencil and silhouette blending modes affect the alpha channels of layers beneath them. Other blending modes affect how colors appear when blended with the colors from other layers. Blending modes in After Effects (formerly referred to as *layer modes*) are identical to blending modes in Adobe Photoshop.

Blending modes cannot be animated by using keyframes. If you want a blending mode to change at a certain time, split the layer at that time and apply the new blending mode to the part of the layer that continues. You can also use the Compound Arithmetic effects, which are similar to blending modes but can change over time. (See [“Creating new layers by splitting a layer” on page 95.](#))



For information on using the Compound Arithmetic effect, see Compound Arithmetic in the online Effects Help.

Specifying a blending mode

You apply a blending mode to the layer above the layers you want it to interact with. When specifying blending modes, it is helpful to think of the results in the following terms:

- The *underlying colors* are the colors of the layers located below the layer to which you want to apply the mode.
- The *layer colors* are the original colors in the layer where you set the blending mode.
- The *resulting colors* are the final colors displayed.

To apply a blending mode:

1 If the Mode menu is not visible in the Timeline window, click the Switches/Modes button at the bottom of the Timeline window or choose Columns > Modes from the Timeline window menu.

2 From the layer's Mode pop-up menu, choose a mode.

You can apply one of the following blending modes to a layer:

Add Combines the color values of the layer and underlying colors. The resulting color is lighter than the original. This is a good way to combine nonoverlapping images in two layers. Pure black in a layer does not change the underlying color. Pure white in the underlying color is never changed.

Alpha Add Composites layers normally, but adds complementary alpha channels together to create a seamless area of transparency. Useful for removing visible edges from two alpha channels that are inverted relative to each other or from the alpha channel edges of two touching layers that are being animated.

Classic Color Burn This is the Color Burn mode from After Effect 5.0 and earlier, renamed to Classic. Use it to preserve compatibility with older projects; otherwise, use Color Burn. Classic Color Burn darkens the resulting color based on the original layer color. The darker the original layer color, the darker the resulting color. Pure white in the original layer does not change the underlying color. Pure black in the original layer usually changes the underlying color to black.

Classic Color Dodge This is the Color Dodge mode from After Effect 5.0 and earlier, renamed to Classic. Use it to preserve compatibility with older projects; otherwise, use Color Dodge. Classic Color Dodge brightens the resulting color based on the original layer color. The lighter the original layer color, the brighter the resulting color. Pure black in the original layer does not change the underlying color. Pure white in the original layer usually changes the underlying color to white.

Classic Difference This is the Difference mode from After Effect 5.0 and earlier, renamed to Classic. Use it to preserve compatibility with older projects; otherwise, use Difference. Classic Difference subtracts the channel values of the layer and underlying colors and displays the absolute value of the result.

Color Creates resulting colors with the luminance of the underlying colors and the hue and saturation of the layer colors. This preserves the gray levels in the image.

Color Burn Looks at the color information in each layer and darkens the original layer color to reflect the underlying layer color by increasing the contrast. Pure white in the original layer does not change the underlying color. This mode is the same as the Color Burn blending mode used in Adobe Photoshop 7.0.

Color Dodge Looks at the color information in each layer and brightens the original layer color to reflect the underlying layer color by decreasing the contrast. Pure black in the original layer does not change the underlying color. This mode is the same as the Color Dodge blending mode used in Adobe Photoshop 7.0.

Dancing Dissolve Functions the same as the Dissolve option, except that the placement of random color changes varies over time.

Darken Compares the channel values of the underlying and layer colors and displays the darker of the two. Specifying this option can cause color shifts in layers with color.

Difference Looks at the color information in each layer and subtracts either the underlying color from the original layer color or the original layer color from the underlying color, depending on which has the greater brightness value. Pure white inverts the original layer color values; black produces no change. This mode is the same as the Difference blending mode used in Adobe Photoshop 7.0.

Dissolve Randomly replaces layer colors with colors from underlying layers, based on layer transparency.

Exclusion Creates a result similar to but lower in contrast than the Difference mode. Blending with white inverts the underlying color values. Blending with black produces no change.

Hard Light Multiplies or screens the resulting color depending on the original layer color. The result is similar to shining a harsh spotlight on the layer. If the underlying color is lighter than 50% gray, the layer lightens as if it were screened. If the underlying color is darker than 50% gray, the layer darkens as if it were multiplied. This option is useful for creating the appearance of shadows on a layer.

Hue Creates resulting colors with the luminance and saturation of the underlying colors and the hue of the layer colors.

Lighten Compares the channel values of the underlying and layer colors and displays the lighter of the two. Specifying this option can cause color shifts in layers with color.

Linear Burn Looks at the color information in each layer and darkens the original layer color to reflect the underlying color by decreasing the brightness. Pure white produces no change.

Linear Dodge Looks at the color information in each layer and brightens the original layer color to reflect the underlying color by increasing the brightness. Pure black produces no change.

Linear Light Burns or dodges the colors by decreasing or increasing the brightness, depending on the underlying color. If the underlying color is lighter than 50% gray, the layer is lightened by increasing the brightness. If the underlying color is darker than 50% gray, the layer is darkened by decreasing the brightness.

Luminescent Premul Prevents clipping of color values that exceed the alpha channel value after compositing by adding them to the composition. Useful for compositing rendered lens or light effects (such as lens flare) from footage with premultiplied alpha channels. May also improve results when compositing footage from other manufacturers' matting software. When applying this mode, you may get the best results by changing After Effects' interpretation of the premultiplied-alpha source footage to straight alpha. (See ["Interpreting alpha channels as straight or premultiplied" on page 47.](#))

Luminosity Creates resulting colors with the hue and saturation of the underlying colors and the luminance of the layer colors. This option is the inverse of the Color option.

Multiply Multiplies the color values in the layers and divides the result by the maximum pixel value of either 8-bit or 16-bit pixels, depending on which mode you are in. The resulting color is never brighter than the original.

Normal Composites the layer on top of underlying layers.

Overlay Mixes colors between layers, preserving highlights and shadows to reflect the light and dark areas of the layer colors.

Pin Light Replaces the colors, depending on the underlying color. If the underlying color is lighter than 50% gray, pixels darker than the underlying color are replaced and pixels lighter than the underlying color do not change. If the underlying color is darker than 50% gray, pixels lighter than the underlying color are replaced and pixels darker than the underlying color do not change.

Hard Mix Enhances the contrast of the underlying layer that is visible beneath a mask on the source layer. The mask size determines the contrasted area; the inverted source layer determines the center of the contrasted area.

Saturation Creates resulting colors with the luminance and hue of the underlying colors and the saturation of the layer colors. If you use this option with a layer having no saturation (gray), there is no change.

Screen Multiplies the inverse brightness values of the colors in all layers. The resulting color is never darker than the original. Using the Screen option is similar to the traditional technique of superimposing two different film negatives and printing the result.

Silhouette Alpha See [“Using stencil and silhouette blending modes” on page 203](#).

Silhouette Luma See [“Using stencil and silhouette blending modes” on page 203](#).

Soft Light Darkens or lightens resulting colors, depending on the layer color. The result is similar to shining a diffused spotlight on the layer. If the underlying color is lighter than 50% gray, the layer lightens. If the underlying color is darker than 50% gray, the layer darkens. A layer with pure black or white becomes markedly darker or lighter, but does not result in pure black or white.

Stencil Alpha See [“Using stencil and silhouette blending modes” on page 203](#).

Stencil Luma See [“Using stencil and silhouette blending modes” on page 203](#).

Vivid Light Burns or dodges the colors by increasing or decreasing the contrast, depending on the underlying color. If the underlying color is lighter than 50% gray, the layer is lightened by decreasing the contrast. If the underlying color is darker than 50% gray, the layer is darkened by increasing the contrast.

Using stencil and silhouette blending modes

The stencil and silhouette blending modes use either a layer’s alpha channel or its luminance (luma) values to affect the alpha channel of all layers beneath the layer. This differs from the track matte, which affects only one layer.

Stencil mode Cuts through all layers, so you can show multiple layers through the frame of the stencil layer’s alpha channel.

Silhouette mode Blocks out all layers below it, so you can cut a hole through several layers at once.

Note: The stencil and silhouette blending modes affect all layers below the layer to which they are applied. To keep the silhouette and stencil blending modes from cutting through or blocking all layers underneath, nest the layer in a composition. (See [“Creating animations by nesting compositions” on page 314](#).)

With Stencil Luma, the lighter pixels of the layer are more opaque than the darker pixels. With Silhouette Luma, the lighter pixels of the layer are more transparent than the darker pixels.



Stencil (left) shows all layers below through the frame of the stencil layer’s alpha channel. Silhouette (right) cuts a hole through all layers below.

To use the stencil or silhouette modes on a layer:

- 1 Click Switches/Modes at the bottom of the Timeline window.

2 Click Normal to open the Mode pop-up menu for the layer you want to use as a stencil or silhouette, and then choose one of the following:

- Stencil Alpha to create a stencil using the layer's alpha channel.
- Stencil Luma to create a stencil using the layer's luma values.
- Silhouette Alpha to create a silhouette using the layer's alpha channel.
- Silhouette Luma to create a silhouette using the layer's luma values.

Cycling through blending modes

You can quickly cycle through all the blending modes for a selected layer, making it easy to experiment with the results that each mode has on the layer.

To cycle through a layer's blending modes:

- 1 Select a layer in the Timeline window.
- 2 Do one of the following:
 - Hold down Shift and press the plus key (+) to cycle forward through each blending mode.
 - Hold down Shift and press the underscore key (_) to cycle backward through each blending mode.

Creating transparency using keying

You can make parts of a footage file transparent by *keying out* a color or luminance value. Keying makes it easy to key objects moving across a consistent background color or objects too complex to mask easily. When you key out a value, all pixels that have similar colors or luminance values become transparent. This technique is often called *bluescreening*, although you do not have to use blue; you can use any solid color for a background. (See ["Using keying effects" on page 256.](#))

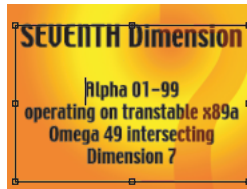


For information on specific keying effects, see the online Effects Help.

Creating and Animating Text

About text in After Effects

After Effects provides a wide range of text features accessible through the Tools palette, Character palette, and Paragraph palette. You can add horizontal or vertical text anywhere in a composition. Depending on how you use the type tools, you can enter *point text* or *paragraph text*. Point text is useful for entering a single word or a line of characters; paragraph text is useful for entering and formatting the text as one or more paragraphs.



Vertical and horizontal point text (left) and paragraph text in a bounding box (right)

In many ways, text layers are just like any other layer in After Effects. You can apply effects and expressions to them, animate them, designate them as 3D layers, and even edit the 3D text while viewing it in multiple views. As with layers imported from Adobe Illustrator, text layers are continuously rasterized, so when you scale the layer or resize the text, it retains crisp, resolution-independent edges. The main differences between text layers and other layers are (a) you cannot open a text layer in its own Layer window, and (b) you can animate the text in a text layer using special text animator properties and selectors. (See [“Animating text with text animator groups” on page 218](#)).

Creating a text layer

You can create text layers using one of two methods: by choosing the Layer > New > Text command, or by clicking the type tool in the Composition window. When you use the Text command, a new text layer is created and an insertion point for the horizontal type tool appears in the center of the Composition window. When you use the type tools, a new text layer is created as soon as you click inside the Composition window.



Entering point text

When you enter point text, each line of text is independent—the length of a line grows or shrinks as you edit it, but it doesn’t wrap to the next line. The text you enter appears in a new text layer.

The small line through the I-beam marks the position of the text *baseline*. For horizontal text, the baseline marks the line on which the text rests; for vertical text, the baseline marks the center axis of the text characters.



To enter point text:

- 1 Do one of the following:
 - Select the horizontal type tool  or the vertical type tool , and then click inside the Composition window to set an insertion point for the text.
 - Choose Layer > New > Text.
- 2 Select additional text options in the Character palette and Paragraph palette.
- 3 Enter the characters you want. Press Enter on the main keyboard (Windows) or Return (Mac OS) to begin a new line.
- 4 Press Enter on the numeric keypad, or click anywhere outside of the Composition window to end text editing mode.




For more information on formatting, see [“Formatting characters” on page 208](#) and [“Formatting paragraphs” on page 213](#).

Entering paragraph text

When you enter paragraph text, the lines of text wrap to fit the dimensions of the bounding box. You can enter multiple paragraphs and select a paragraph justification option.


You can resize the bounding box, which causes the text to reflow within the adjusted rectangle. You can adjust the bounding box while you're entering text or after you create the text layer. The text you enter appears in a new text layer.

To enter paragraph text:

- 1 Select the horizontal type tool  or the vertical type tool .
- 2 In the Composition window, do one of the following:
 - Drag diagonally to define a bounding box for the text.
 - Hold down Alt (Windows) or Option (Mac OS) as you click; then drag diagonally to define a bounding box around a center point.
- 3 Select additional text options in the Character palette or Paragraph palette.
- 4 Enter the characters you want. Press Enter on the main keyboard (Windows) or Return (Mac OS) to begin a new paragraph. If you enter more text than can fit in the bounding box, the overflow icon  appears on the bounding box.
- 5 Press Enter on the numeric keypad, or click anywhere outside of the Composition window to end text editing mode.

For more information on formatting, see [“Formatting characters” on page 208](#) and [“Formatting paragraphs” on page 213](#).

To resize a text bounding box:

- 1 With the type tool active, select the text layer in the Composition window to display the bounding box handles.
- 2 Position the pointer over a handle—the pointer turns into a double arrow —and do one of the following:
 - Drag to resize in one direction.
 - Shift-drag to maintain the proportion of the bounding box.

- Hold down Control (Windows) or Command (Mac OS) as you drag to scale from the center.

Copying and pasting text from other applications

You can copy text from other applications such as Adobe Photoshop, Adobe LiveMotion™, Adobe InDesign, or any text editor, and paste it into a text layer in After Effects. Because After Effects also supports unicode characters, you can copy and paste these characters between After Effects and any other application that also supports unicode (which includes all Adobe applications).

Text layers from Adobe Photoshop retain their style and remain editable in After Effects.

To copy and paste text from other applications:

- 1 Copy the text from the original application.
- 2 In After Effects, create a new text layer or, using a type tool, click inside an existing text layer and choose Edit > Paste.



To edit text imported from Adobe Photoshop:

- 1 Import the Adobe Photoshop text as a layer or a composition.
- 2 Open the Adobe Photoshop composition or add the layer to a composition.
- 3 Select the text layer and choose Layer > Convert to Editable Text.



Note: You cannot edit text on merged Adobe Photoshop layers.

Editing text in text layers


You can edit text in text layers at any time. If you set the text to follow a path, designate it as a 3D layer, transform it, or animate it, you can still continue to edit it.

The cursor for the type tool changes as you move it around the Composition window, depending on whether or not the cursor is directly over an existing text layer. When it is directly over a text layer, it appears as the edit text cursor ; click to edit the existing text. When the cursor is not directly over a text layer, it appears as a new text cursor ; click to create a new text layer. Shift-click always creates a new layer.

To edit text in a text layer:

- 1 Select the horizontal type tool  or the vertical type tool .
- 2 In the Timeline window, double-click the text layer to set type tool to editing mode and select the text.
- 3 Edit text as desired.

To move text in the Composition window without leaving editing mode:

With the text tool selected, move the cursor away from the text; when the cursor turns into a move icon , drag the text.

Showing and hiding layer controls

In editing mode, you may find it useful to hide the layer controls, such as highlights and vertices. For example, to change the color for selected characters only, hide the layer controls to keep the characters selected, but remove the highlight to see the color of the selected characters as they change.

To hide and show layer controls:

Choose View > Hide Layer Controls or View > Show Layer Controls.

Formatting characters

After Effects gives you precise control over individual characters in text layers, including font, size, color, leading, kerning, tracking, baseline shift, and alignment. You can set text attributes before you enter characters or you can change the appearance of selected characters in a text layer.

Selecting characters

Before you can format individual characters, you must select them. You can select one character, a range of characters, or all characters in a text layer.

To select characters:

- 1 Select the horizontal type tool **T** or the vertical type tool **IT**.
- 2 Select the text layer in the Timeline window, or click inside the text flow to automatically select a text layer.
- 3 Position the insertion point inside the text flow, and do one of the following:
 - Drag to select one or more characters.
 - Click and then Shift-click to select a range of characters.
 - Choose Edit > Select All to select all the characters in the layer.
 - Double-click a word to select it. Triple-click a line to select it. Click four times in a paragraph to select it. Click five times anywhere in the text flow to select all characters in a bounding box.
 - To use the arrow keys to select characters, hold down Shift and press the Right Arrow or Left Arrow key. To use the arrow keys to select words, hold down Shift+Ctrl (Windows) or Shift+Command (Mac OS) and press the Right Arrow or Left Arrow key.

Note: In After Effects, selecting and formatting characters in a text layer puts the type tool into edit mode.

Using the Character palette

The Character palette provides options for formatting characters. When using the Character palette, keep the following guidelines in mind:

- If text is highlighted, changes you make in the Character palette affect only the highlighted text.
- If no text is highlighted, changes you make in the Character palette affect the selected text layers and the text layer's selected Source Text keyframes, if any exist.
- If no text is highlighted and no text layers are selected, the changes you make in the Character palette become the new defaults for the next text entry.

To display the Character palette:

Do one of the following:

- Choose Window > Character, or click the Character palette tab if the palette is visible but not active.

- With a type tool selected, click the palette button  in the Tools palette.

Note: To make After Effects automatically open the Character and Paragraph palettes whenever you select a type tool, select any type tool from the Tools palette, and then select *Auto Open Palettes*.

To change values in the Character palette and update text in real time:

Drag an icon in the palette.

To reset Character palette values to the default values:

Choose Reset Character from the Character palette menu.

Choosing a font

A font is a complete set of characters—letters, numbers, and symbols—that share a common weight, width, and style. When you select a font, you can select the *font family* and its *font style* independently. The font family is a collection of fonts sharing an overall typeface design; for example, Times. A font style is a variant version of an individual font in the font family; for example, regular, bold, or italic. The range of available font styles varies with each font. If a font doesn't include the style you want, you can apply *faux* styles—simulated versions of bold, italic, superscript, subscript, all caps, and small caps styles.

In addition to the fonts installed on your system, After Effects uses font files in these local folders:


Windows Program Files/Common Files/Adobe/Fonts

Mac OS X Library/Application Support/Adobe/Fonts

If you install a Type 1, TrueType, OpenType, or CID font into the local Fonts folder, the font appears in Adobe applications only.

To choose a font family and style:


- 1 Choose a font family from the Font Family pop-up menu in the Character palette. If more than one copy of a font is installed on your computer, an abbreviation follows the font name: (T1) for Type 1 fonts, (TT) for TrueType fonts, or (OT) for OpenType fonts.
- 2 Do one of the following:
 - Choose a font style from the Font Style pop-up menu in the Character palette.
 - If the font family you chose does not include a bold or italic style, click the Faux Bold button **T** or the Faux Italic button **I** in the Character palette to apply a simulated style. Or you can choose Faux Bold or Faux Italic from the Character palette menu.

 In After Effects, you can choose a font family and style by typing the desired name in the text box. As you type, the name of the first font or style beginning with that letter appears. Continue typing until the correct font or style name appears. Be sure to deselect the font name before entering new type in the image.

Choosing a font size

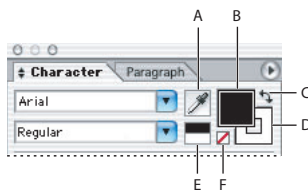
The *font size* determines how large the type appears in the image. In After Effects, the unit of measurement for fonts is *pixels*. When a text layer is at 100% scale value, the pixel values match composition pixels one-to-one. So if you scale the text layer to 200%, the font size will appear to double. For example, a font size of 10 pixels will look like 20 pixels. Because After Effects continuously rasterizes text, the resolution remains high when you increase the scale values.

To choose a font size:

In the Character palette, enter or select a new value for Size .

Changing the text color

The text you enter gets its color from the Fill and Stroke boxes in the Character palette. You can change the text color before or after you enter text. You can change the fill or stroke color of individual, selected characters; selected Source Text keyframes; all text in a layer; or all text across multiple selected layers.



Text color options **A.** Eyedropper **B.** Fill Color **C.** Swap Fill and Stroke Color **D.** Stroke Color **E.** Set to Black or White **F.** No Color

To change the text color:

In the Character palette, do one of the following:

- Click the Fill box to select a color in the Color dialog box.
- Click the Stroke box to select a color in the Color dialog box.
- Click the Swap Fill and Stroke button to swap colors for fill and stroke.
- Click the No Color button to remove the fill or stroke, depending on which box is in front. To bring a box to the front, click it.
- Click the Eyedropper and then click a color on screen to set the fill or stroke to that color.
- Click the Set to Black or Set to White icon to set the fill or stroke to that color.

Using smart quotes

Smart quotes, or “printer’s quotation marks” use a curved left or right quotation mark instead of the straight marks used by regular quotes.

To use smart quotes:

Choose Use Smart Quotes from the Character palette menu.

Specifying leading

The amount of space between lines of text is called *leading* (pronounced 'le-di[ng]'). For Roman type, leading is measured from the baseline of one line of text to the baseline of the next line. The *baseline* is the invisible line on which most text lies. You can apply more than one leading amount within the same paragraph; however, the largest leading value in any line of text determines the leading value for that entire line. For more information on leading, see [“Specifying how leading is measured” on page 216](#).

To change the leading:

In the Character palette, do one of the following:

- Choose the desired leading from the Leading menu ▲.
- Select the existing leading value, and enter a new value.

Specifying kerning and tracking

Kerning is the process of adding or subtracting space between specific letter pairs. You can control kerning manually, or you can use automatic kerning to turn on the kerning built into the font by the font designer. *Tracking* is the process of creating an equal amount of spacing across a range of letters.

Positive kerning or tracking values move characters apart (adding to the default spacing); negative values move characters closer together (reducing the default spacing).



Tracking set to default value of 0 (left), Tracking set to -50 (center), and Tracking set to 200 (right)

To use a font's built-in kerning information:

In the Character palette, choose Metrics from the Kerning menu ⌘.

To adjust kerning manually:

- 1 Click with a type tool to set an insertion point between two characters.
- 2 In the Character palette, enter or select a numeric value for Kerning ⌘.

Note: If a range of text is selected, you can't manually kern the characters. Instead, use tracking.

To specify tracking:

In the Character palette, enter or select a numeric value for Tracking ⌘.

Adjusting horizontal or vertical scale

Horizontal scale and *vertical scale* specify the proportion between the height and width of the text. Unscaled characters have a value of 100%. You can adjust scale to compress or expand selected characters in both width and height.

To adjust the horizontal or vertical scale of text:


In the Character palette, enter a new percentage for Horizontal Scale  or Vertical Scale .

Specifying baseline shift

Baseline shift controls the distance that text appears from its baseline, either raising or lowering the selected text to create superscripts or subscripts.

Note: For information on adjusting the baseline of Chinese, Japanese, and Korean fonts, see [“Adjusting tsume” on page 216](#).

To specify baseline shift:



In the Character palette, enter a value for Baseline Shift . A positive value moves horizontal text above and vertical text to the right of the baseline; a negative value moves text below or to the left of the baseline.

Changing case

You can enter or format text as uppercase characters, either all caps or small caps. When you format text as small caps, After Effects uses the small caps designed as part of the font, if they are available. If the font does not include small caps, After Effects generates faux small caps.

To change the case of text:

Do one of the following:

- Click the All Caps button  or the Small Caps button  in the Character palette.
- Choose All Caps or Small Caps from the Character palette menu. A checkmark indicates that the option is selected.



Note: Selecting *Small Caps* will not change characters that were originally typed in uppercase.

Making characters superscript or subscript

You can enter or format text as superscript or subscript characters. Superscript characters are reduced in size and shifted above the text baseline; subscript characters are reduced in size and shifted below the text baseline. If the font does not include superscript or subscript characters, After Effects generates faux superscript or subscript characters.

To specify superscript or subscript characters:

Do one of the following:

- Click the Superscript button  or the Subscript button  in the Character palette.
- Choose Superscript or Subscript from the Character palette menu. A checkmark indicates that the option is selected.

Rotating vertical text

When working with vertical text, you can rotate the direction of characters by 90°. Rotated characters appear upright; unrotated characters appear sideways (perpendicular to the text line).

To rotate characters in vertical text:

- 1 Select the text using the vertical text tool.

2 Choose Rotate Character from the Character palette menu. A checkmark indicates that the option is selected.

Note: You cannot rotate double-byte characters (full-width characters available only in Chinese, Japanese, and Korean fonts). Any double-byte characters in the selected range will not be rotated.

Formatting paragraphs

A paragraph is any range of text with a carriage return at the end. You use the Paragraph palette to set options that apply to entire paragraphs, such as the alignment, indentation, and leading. For point text, each line is a separate paragraph. For paragraph text, each paragraph can have multiple lines, depending on the dimensions of the bounding box.

Selecting paragraphs and showing the Paragraph palette

You can use the Paragraph palette to set formatting options for a single paragraph, multiple paragraphs, or all paragraphs in a text layer.

To select paragraphs for formatting:

Select the horizontal type tool **T** or the vertical type tool **IT** and do one of the following:

- Click inside a paragraph to apply formatting to a single paragraph.
- Make a selection within a range of paragraphs to apply formatting to multiple paragraphs.
- Select one or more text layers in the Timeline window to apply formatting to all paragraphs in the selected layers.
- Select one or more Source Text keyframes to apply formatting to layers only at those keyframes.

To show the Paragraph palette:

Choose Window > Paragraph, or click the Paragraph palette tab if the palette is visible but not active.

To scrub values in the Paragraph palette and update text in real time:

Drag an icon in the palette.

To reset values in the Paragraph to the default values:

Choose Reset Paragraph from the Paragraph palette menu.

Aligning and justifying text

You can *align* text to one edge of a paragraph (left, center, or right for horizontal text; top, center, or bottom for vertical text) and *justify* text to both edges of a paragraph. Alignment options are available for both point text and paragraph text; justification options are available only for paragraph text.

To specify alignment:

In the Paragraph palette, click an alignment option. The options for horizontal text are:

- ≡ Aligns text to the left, leaving the right edge of the paragraph ragged.
- ≡ Aligns text to the center, leaving both edges of the paragraph ragged.

☐ Aligns text to the right, leaving the left edge of the paragraph ragged.

The options for vertical text are:

☐ Aligns text to the top, leaving the bottom edge of the paragraph ragged.

☐ Aligns text to the center, leaving both the top and bottom edges of the paragraph ragged.

☐ Aligns text to the bottom, leaving the top edge of the paragraph ragged.

To specify justification for paragraph text:

In the Paragraph palette, click a justification option. The options for horizontal text are:

☐ Justifies all lines except the last, which is left-aligned.

☐ Justifies all lines except the last, which is center-aligned.

☐ Justifies all lines except the last, which is right-aligned.

☐ Justifies all lines including the last, which is force-justified.

The options for vertical text are:

☐ Justifies all lines except the last, which is top-aligned.

☐ Justifies all lines except the last, which is center-aligned.

☐ Justifies all lines except the last, which is bottom-aligned.

☐ Justifies all lines including the last, which is force-justified.

Indenting paragraphs

Indentation specifies the amount of space between text and the bounding box or line that contains the text. Indentation affects only the selected paragraph or paragraphs, so you can easily set different indentations for paragraphs.

To specify paragraph indentation:

In the Paragraph palette, enter a value for an indentation option:

- Indent Left Margin ☐ indents text from the left edge of the paragraph. For vertical text, this option controls the indentation from the top of the paragraph.
- Indent Right Margin ☐ indents text from the right edge of the paragraph. For vertical text, this option controls the indentation from the bottom of the paragraph.
- Indent First Line ☐ indents the first line of text in the paragraph. For horizontal text, the first line indent is relative to the left indent; for vertical text, the first line indent is relative to the top indent. To create a first line hanging indentation, enter a negative value.

Changing space above or below paragraphs

You can control the space above and below paragraphs using the paragraph spacing options.

To specify paragraph spacing:

In the Paragraph palette, enter a value for Space Before ☐ and Space After ☐.

Specifying hanging punctuation

Hanging punctuation controls whether punctuation marks fall inside or outside the margins. If hanging punctuation is turned on for Roman fonts, then periods, commas, single-quotation marks, double-quotation marks, apostrophes, hyphens, em dashes, en dashes, colons, and semicolons appear outside the margins.

To use hanging punctuation for Roman fonts:

Choose Roman Hanging Punctuation from the Paragraph palette menu. A checkmark indicates that the option is selected.

Note: When you use Roman Hanging Punctuation, any double-byte punctuation marks available in Chinese, Japanese, and Korean fonts in the selected range will not appear outside the margins. (See [“Adjusting tsume” on page 216.](#))

Composing text

The appearance of text on the page depends on a complex interaction of processes called *text composition*. Using the word spacing, letter spacing, and glyph spacing options you’ve selected, After Effects evaluates possible line breaks and chooses the one that best supports the specified parameters.

After Effects offers two composition methods: the Adobe Every-line Composer and the Adobe Single-line Composer. Both composition methods evaluate possible breaks and choose the one that best supports the justification options you’ve specified for a given paragraph.

The Every-line Composer Considers a network of break points for a range of lines and thus can optimize earlier lines in the paragraph in order to eliminate especially unattractive breaks later on. Working with multiple lines of text results in more even spacing and fewer hyphens.

The Every-line composer approaches composition by identifying possible breakpoints, evaluating them, and assigning a weighted penalty based on these principles:

- Highest importance is given to evenness of letter and word spacing. Possible breakpoints are evaluated and penalized according to how much they deviate from optimal spacing.
- After breakpoint penalty values are identified for a range of lines, they are squared, magnifying the bad breakpoints. The composer then uses the good breakpoints.

The Single-line Composer Offers a traditional approach to composing text one line at a time. This option is useful if you prefer to have manual control over how lines break. If spacing must be adjusted, the Single-line composer first tries to compress, rather than expand text.

To choose a composition method for a paragraph:

Choose Adobe Every-line Composer or Adobe Single-line Composer from the Paragraph palette menu. A checkmark indicates which option is selected.

Setting options for Chinese, Japanese, and Korean text

After Effects provides several options for working with Chinese, Japanese, and Korean (CJK) text. Characters in CJK fonts are often referred to as *double-byte characters* because they require more than one byte of information to express each character.

Displaying CJK font names

You can control how font names are displayed—in English or in the native language.


To display CJK font names in English:

Choose Show Font Names in English from the Paragraph palette menu.

Adjusting tsume

Tsume reduces the space around a character by a specified percentage value. The character itself is not stretched or squeezed as a result. When tsume is added to a character, spacing around both sides of the character is reduced by an equal percentage.

To reduce spacing between characters:

- 1 Select the characters you want to adjust.
- 2 In the Character palette, enter or select a percentage for Tsume . The greater the percentage, the tighter the compression between characters. At 100% (the maximum value), there is no space between the character's bounding box and its em box.

Specifying how leading is measured

Top-to-top leading measures the spacing between lines of text from the top of one line to the top of the next line. This is different from bottom-to-bottom leading, which measures the space between lines from the text baseline. If you use top-to-top leading, the first line of text in a paragraph is aligned flush with the top of the bounding box; if you use bottom-to-bottom leading, space appears between the first line of text and the bounding box.

The leading option you choose does not affect the amount of leading between lines, only how the leading is measured. (See [“Specifying leading” on page 211](#).)

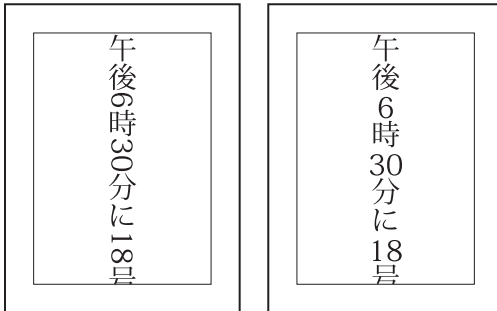
Note: *Top-to-top leading and bottom-to-bottom leading are not available for vertical text.*

To specify how leading is measured:

- 1 Select the paragraphs you want to adjust.
- 2 Choose Top-to-Top Leading or Bottom-to-Bottom Leading from the Paragraph palette menu. A checkmark indicates which option is selected.

Using tate-chuu-yoko

Tate-chuu-yoko (also called *kumimoji* and *renmoji*) is a block of horizontal text laid out within a vertical text line.



Original layer (left) and after tate-chuu-yoko is applied (right)

To turn on or turn off tate-chuu-yoko:

- 1 Select the characters that you want to rotate.
- 2 Choose Tate-Chuu-Yoko from the Character palette menu. A checkmark indicates that the option is turned on.

Note: Using *tate-chuu-yoko* does not prevent you from editing and formatting text; you can edit and apply formatting options to rotated characters as you do to other characters.

Animating text

As with other layers in After Effects, you can animate text layers. However, text layers offer additional animation options. You can animate text layers by using any of the following three methods:

- Animating the Transform properties, as you would any other layer.
- Animating the source text of the layer, so that the characters themselves change to different characters or use different character or paragraph formats over time.
- Using text animator properties and selectors to animate individual characters, the entire set of characters, or a range of characters.

Animating the source text

Use the Source Text property to change and animate the character and paragraph features of the text character themselves (for example, change a “b” to “c”). Because you can mix and match formatting within a text layer, you can easily create animations that transform the every detail of a word or phrase. For example, you can set keyframes for the Source Text property to change the letters in a word, text color, font family, style, or stroke width at different intervals.



Source text animated so it changes every 5 frames

After Effects uses Hold interpolation between source text keyframes, so character options you set at the first keyframe remain the same until the second keyframe with no smooth, gradual change between keyframes. For example, if you animate the font size for the source text and specify that the font size changes from 10 px to 50 px, After Effects does not interpolate the value changes and gradually change the font from 10 px to 50 px. Instead, it holds the value at 10 px until it reaches the next keyframe, where it abruptly changes to 50 px. To find out how to smoothly animate changes to text, see [“Animating text with text animator groups” on page 218](#).

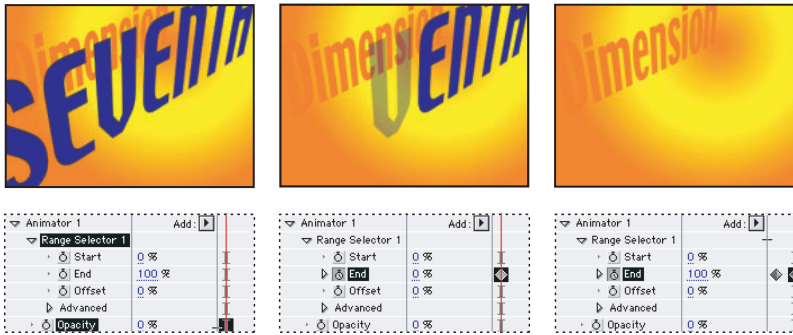
To animate source text:

- 1 In the Timeline window, expand the text layer you want to animate, and then expand the Text property.
- 2 Click the Source Text stopwatch to create an initial keyframe, then move the current-time indicator to the point in time where you want the first change to appear and change the text characters or any of the options in the Character or Paragraph palette.
- 3 Repeat step 2 as often as you want.

Animating text with text animator groups

Once you create and format your text layers, use text animator groups to quickly and easily create elaborate animations. A text *animator* group includes one or more selectors and one or more animator properties. A *selector* is like a mask—it specifies which characters or section of a text layer you want an animator property to affect. Using a selector, you can define a percentage of the text, specific characters in the text, or a specified range of text. You can animate any selection so that the text changes over time without you having to animate the property. (See [“Working with selectors” on page 222](#).)

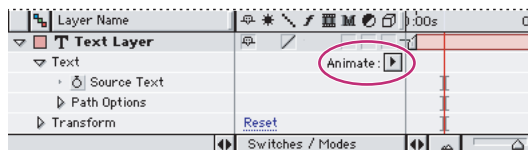
Using a combination of animator properties and selectors, you can create complex text animations that would otherwise require painstaking keyframing. Most text animations require you to animate only the selector values—not the property values. Consequently, text animators use a small number of keyframes even for complex animations. For example, to animate the Opacity gradually from the first character to the last, set the Opacity value (in the Animator group) to 0, and then set the End (Range Selector property) to 0% at 0 seconds and 100% at the end of the animation.



Animating the opacity of a text layer using the Opacity animator and the End Range Selector property

To use text animator groups:

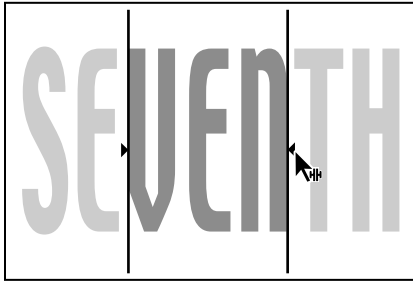
- 1 Select a text layer in the Timeline window, or select the specific characters you want to animate in the Composition window.
- 2 Do one of the following:
 - Choose Animation > Animate Text and then choose a property from the submenu.
 - Choose a property from the Animate pop-up menu, located in the Switches/Mode column of the Timeline window.



Animate pop-up menu


- 3 In the Timeline window, adjust the animator property values.
- 4 Expand the Range selector and set keyframes for Start or End by doing one of the following:
 - Drag or type the values in the Timeline window.

- Drag the selector bars in the Composition window.



Selector bars surrounding the three middle characters “VEN”

5 To refine the selection, expand Advanced and specify options and values as desired. For information about using selectors, see [“Working with selectors” on page 222](#).


 Because all of the animator groups that you add to a text layer appear as “Animator” in the Timeline window, you may want to rename them using more descriptive names. You can rename animator groups and selectors the same way you rename layers (see [“Renaming a layer” on page 100](#)).

To remove animators from a text layer:


- 1** In the Timeline window, select the text layer.
- 2** Choose Animation > Remove All Text Animators.

Understanding animator properties

Use animator properties to animate text in text layers.

 To learn how these properties work, see [“Examples of text animations” on page 227](#).

Most animator properties are identical to other layer properties, such as Position, Scale, and Opacity; however, the following properties are unique to text layers:

Position Specifies the position of the characters. You can specify values for this property in the Timeline window, or in the Composition window using the selection tool, which changes to a move tool  when positioned over text characters.

All Transform Specifies that all the Transform properties are added at once to the animator group.

Skew Specifies the slant of the characters. The Skew Axis specifies the axis along which the character is skewed.

Fill Color (RGB, Hue, Saturation, Brightness, Opacity) Specifies the color values of the characters, based on the type of color animator property you choose.

Stroke Color (RGB, Hue, Saturation, Brightness, Opacity) Specifies the color of the character’s stroke (outline).

Stroke Width Specifies the width of the character’s stroke (outline).

Tracking Specifies the space between each character in a word.

Line Anchor Specifies the alignment for the tracking in each line of text. A value of 0% specifies left align, 50% specifies center align, and 100% specifies right align.

Line Spacing Specifies the space between lines of text in a multiline text layer.

Character Offset Specifies the number of unicode values to offset selected characters. For example, a value of 5 moves the characters in the word forward five steps alphabetically, so the word “offset” becomes “tkkxjy.”

Character Value Specifies the new unicode value for selected characters, replacing each character with one character represented by the new value. For example, a value of 65 replaces all of the characters in a word with the 65th unicode character “A,” so the word “value” becomes “AAAAA.”

Character Range Specifies limits on the character. This property appears whenever you add the Character Offset or Character Value property to a layer. Choose Preserve Case & Digits to keep characters in their respective groups. Groups include uppercase Roman, lowercase Roman, digits, symbols, Japanese katakana, and so forth. Choose Full Unicode to allow for unlimited character changes.

Adding and using animator properties

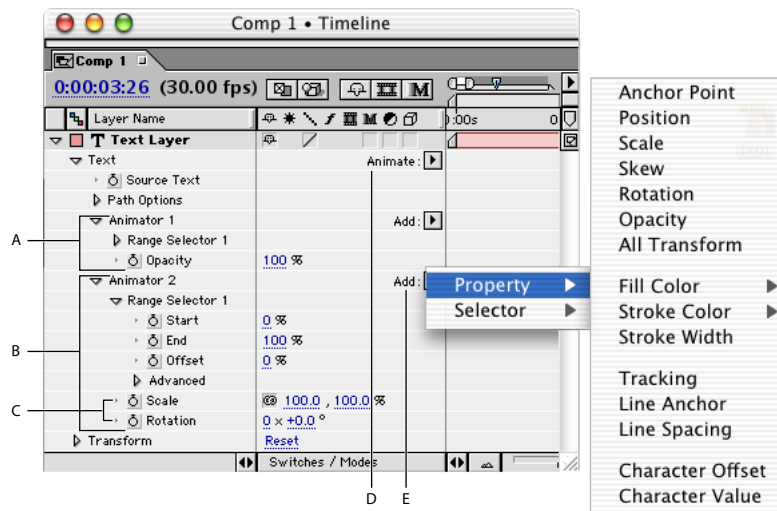
You can add as many animator properties to a layer as you want, and you can combine them in a variety of ways—adding more animator properties to an existing animator group (which contains a selector and an animator property), adding a new animator group, or adding a new selector to an existing animator group. (See [“Understanding the Range selector” on page 223](#)).

To add an animator group to a text layer:

In the Timeline window, select the text layer and choose a property from the Animate pop-up menu. A new animator group, along with a selector and the chosen animator property, appear in the Timeline window.

To add a new animator property to an existing animator group:

In the Timeline window, select the animator group to which you want to add and choose the property from the Add pop-up menu; then choose a property from the submenu. The new animator property appears within the same group as the existing animator property and shares the existing selector.



Animators in the Timeline window **A.** Animator group **B.** Animator group with Scale and Rotation animator properties **C.** Animator properties **D.** Animator pop-up menu **E.** Add Animator Property or Selector pop-up menu

Working with selectors

Each animator group includes a default Range selector. In addition to this Range selector, you can add another Range selector or a Wiggly selector.

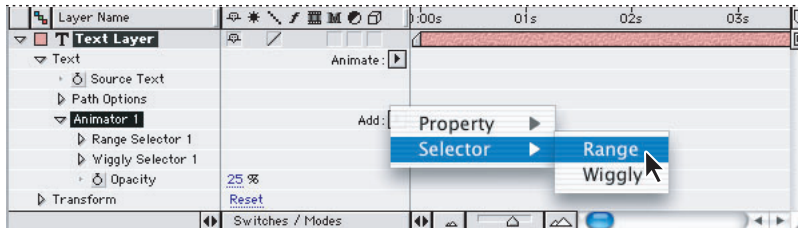
Using and adding selectors

When you add multiple selectors to an animator group, you can control the way they interact with each other by using each selector's Mode property. You can set values for the Start and End properties by changing the values in the Timeline window or by using the selector bars in the Composition window.

Note: Only add selectors to existing animator groups—you can't create an animation unless you have a property to animate.

To add a new selector to an animator group:

1 In the Timeline window, select an animator group and choose Selector from the Add pop-up menu; then choose either Range or Wiggly from the submenu.



Adding a new Range selector to an animator group

To specify ranges with the Range selector:

In the Timeline window, do one of the following:

- To specify an animated range that gradually applies the animator property to all of the characters, set an End keyframe of 0% at 0 seconds and 100% at the end of the animation.
- To specify a static range of individual characters in the Composition window, drag the left selector bar to the left edge of the first character you want in the range and drag the right selector bar to the right edge of the last character you want in the range.
- To specify an animated range of individual characters in the Composition window, drag both selector bars to the left side of the first character in the range and set a Start or End keyframe, move the time indicator to the end of the animation, and then drag the right selector bar to the right side of the last character in the range.
- To move both the Start and End values by an equal amount, set a value for Offset.

Understanding the Range selector

The Range selector is the default selector for all animator groups. You can add additional Range selectors to an animator group or add multiple animator properties that use the same Range selector.

The Range selector includes the following properties (including Advanced properties):

Start and End Specifies the beginning and end of the selection (relative to the number of characters, words, or lines as specified by the Units and Based On properties). For example, if you set Start to 0%, and set keyframes for End for 0% at 0 seconds and 100% at 4 seconds, the animator property will gradually take effect over those 4 seconds.

Offset Specifies how much you want to offset the Start and End of the selection. This property is useful for animating the selector “through” the text, because the value you specify moves the Start and End values equally, saving you the trouble of animating them both exactly the same way. To set the offset in the Composition window while you edit the Start or End values, Shift-click the Start or End selector bars.



To learn how Offset works, see [“Offsetting characters” on page 228](#).

Units and Based On Specifies the units for Start, End, and Offset. You can use either the percentage or index units and base the selection on the characters, characters excluding spaces, words, or lines. If you select characters, After Effects counts spaces and effectively pauses the animation between words as it animates the spaces between words.



Original (left) and with “VEN” selected by the range selectors, Based On set to Character, Shape set to Triangle, and Scale set to 40% (right)

Mode If you have only one selector, Mode specifies the interaction between the selector and the text. With one selector, you can use the Subtract mode to invert the selector; other modes do not have an effect on the layer. If you have multiple selectors, Mode specifies the way each selector combines with the selectors above it, similar to how multiple masks combine when you apply a Mask mode. For example, if your first Range selector includes characters 20-80 and is set to Add mode and your second Range selector includes characters 50-55 and is set to Subtract mode, the resulting selection includes only characters 20-49 and 56-80, subtracting 50-55 from the range.

Amount Specifies how much you want the range of characters to be affected by animator properties. At 0%, the animator properties do not affect the characters. At 50%, half of each property value affects the characters. This option is useful for animating the result of animator properties over time.

Shape Controls how characters are selected between the Start and End of the range. Each option modifies the selection by creating gradual transitions between selected characters using the chosen shape. For example, when animating the y Position values of text characters using Ramp Down, the characters gradually move at an angle from bottom left to upper right. You can specify Square, Ramp Up, Ramp Down, Triangle, Round, and Smooth.



Original (left) and after selecting entire word, setting Based On to Characters, animating the y Position value so word is at the bottom of the window, and setting Shape to Ramp Down (right)



To learn how these properties work, see [“Working with animator shapes” on page 231](#).

Smoothness Specifies the amount of time the animation takes to transition from one character to another when you use the Square shape.



To learn how Smoothness works, see [“Creating a write-on animation” on page 232](#).

Ease High and Ease Low Specifies the speed of change as selection values change from fully included (high) to fully excluded (low). For example, when Ease High is 100%, the character changes more gradually (eases into the change) while it is fully to partially selected. When Ease High is -100%, the character changes quickly while it is fully to partially selected. When Ease Low is 100%, the character changes more gradually (eases into the change) while it is partially selected to unselected. When Ease Low is -100%, the character changes quickly while it is partially selected to unselected.

💡 To learn how these properties work, see [“Working with animator shapes” on page 231](#).

Understanding the Wiggly selector

Use the Wiggly selector to create selections that “wiggle,” or vary by a specified amount, over time. You can add one or more Wiggly selectors to an animator group, and that animator group can contain one or more properties.

💡 To see how the Wiggly selector affects an animation, see [“Animating the position of individual characters and using the Wiggly selector” on page 228](#).

The Wiggly selector includes the following properties:

Mode Specifies the way each selector combines with the selectors above it, similar to how multiple masks combine when you apply a Mask mode. For example, if you want to wiggle only a specific word, use a Range selector on that word and then add a Wiggly selector and set it to Intersect mode.

Max and Min Amount Specifies the amount of variation from the selection.

Wiggles/Second Specifies how many variations from the set selection occur per minute.

Correlation Specifies to what percentage the variations are correlated to the characters in the text layer. At 100%, all characters wiggle by the same amount at the same time, and at 0%, all characters wiggle independently.

Temporal and Spatial Phase (revolutions + degrees) Specifies the variation of wiggle, based on the phase of your animation in time (temporal) or per character (spatial). You can use this to change the *Seed*, or starting time, for slightly different animations.

Lock Dimensions Scales the wiggled selection’s dimensions by the same value. This is useful when wiggling the Scale property.

Working with masks in text layers

You can apply masks to text layers as you would any other layer in After Effects. Once you create a mask in a text layer, you can make the text follow the mask as a path—you can then animate the text along that path, or animate the path itself. In addition, you can easily create masks from each text character by using the Create Outlines command.

💡 If you want to export text layers to Macromedia Flash (.swf) format, use the Create Outlines command on all text layers first.

Creating masks from text characters

For each character in a text layer, you can create a separate mask. The Create Outlines command extracts the outlines for each character, creates masks from the outlines, and puts the masks on a new solid layer. You can then use these masks as you would any other mask in After Effects; for example, you can apply effects such as Audio Waveform or Scribble Fill. By default, all masks created using the Create Outlines command use the Difference mask mode.

To create masks from characters:

- 1 Do one of the following:
 - To create masks for all the characters in a text layer, select the text layer in the Timeline window.
 - To create masks for specific characters, select the characters in the Composition window.
- 2 Choose Layer > Create Outlines.

Creating and animating text on a path

You can use open or closed masks to create paths for text. After you create the mask or path, you can modify it at any time. When using a closed mask as a text path, make sure to set the mask mode to None.

Use the Path Options property to specify a path and alter the way that individual characters appear on the path—perpendicular to the path, aligned to the left or right, reversed, and so on. Animating Path Options is an easy way to create text that travels along a path. You can also animate the First Margin property so that the margin moves from one end of the path to the other.

To position text along a mask's path:

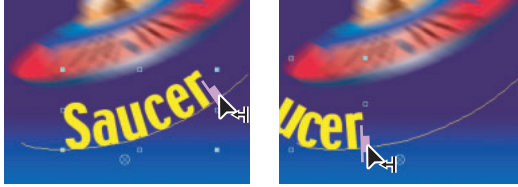
- 1 Create a text layer and type the desired text.
- 2 With the text layer selected, use the pen tool to draw a mask in the Composition window.
- 3 In the Timeline window, expand the Path Options property for the text layer and select the mask from the Path pop-up menu. The text automatically uses the alignment specified in the Paragraph palette.

Note: If the mask is closed (for example, if the mask is a circle), set the mask mode to None. For more information on masks, see [“Using mask modes” on page 196](#).

- 4 In the Composition window, do one of the following, if desired, to reposition the text on the path:
 - Drag the left margin control ¶ to move left-aligned text away from the left edge of the path.
 - Drag the center margin control ¶ to move center-aligned text away from the center of the path.
 - Drag the right margin control ¶ to move right-aligned text away from the right edge of the path.
 - Drag either the right or left margin control to move force-aligned text away from the edges of the path.

- Hold down Shift and drag any margin control to snap the control to the mask vertices.

Note: You can also change the text margins using the Right Margin and Left Margin property in the Timeline window.



Changing the Last Margin of path text in the Composition window

To change or animate text path properties:

- 1 In the Timeline window, expand the text layer you want to animate, expand the Text property, and then expand the Path Options property.
- 2 Change any of the Path Options properties that you want.
- 3 To animate a property, click the property's stopwatch icon to set the initial keyframe and then set the option as desired.

Path Options include the following additional properties:

Reverse Path Reverses the path. This option is useful for closed paths; however, to see the results, make sure the mask mode is set to None.

Perpendicular to Path Rotates each character so that it is perpendicular to the path.

Force Alignment Positions the first character at the beginning of the path (or at the specified First Margin location), positions the last character at the end of the path (or at the specified Last Margin location), and evenly spaces the remaining characters between the first and last characters.

First Margin Specifies the position of the first character in pixels, relative to the start of the path. The First Margin is not active when text is right-aligned and force alignment is not enabled.

Last Margin Specifies the position of the last character in pixels, relative to the end of the path. Last Margin is not active when text is left-aligned and force alignment is not enabled.

Examples of text animations

This section includes sample projects. By recreating these projects, you can get an idea of the extraordinary power of animator properties and selectors. As with many After Effects features, the best way to learn about animating text is to experiment.


Offsetting characters

This examples illustrates how you can easily animate random characters so that they gradually form a legible word or phrase. To do this, specify an Offset Character value and animate the Range selector.



Animating the offset values for the characters in the word "Galaxy"

To offset characters:

- 1 Create a new composition.
- 2 Create a new text layer with the word "Galaxy".
- 3 Position the cursor away from the text in the Composition window and when the type cursor changes to the move cursor , drag to move the text to the bottom and center of the window. Resize it if necessary so that it fits within the window.
- 4 Choose Animation > Animate Text > Character Offset.
- 5 In the Timeline window, set the Character Offset value to 5.
- 6 Expand Range Selector 1.
- 7 Click the Start stopwatch to set an initial keyframe at 0 seconds and set the value to 0%.
- 8 Move the current-time indicator to 5 seconds and set the Start value to 100%.
- 9 Preview the animation.

Animating the position of individual characters and using the Wiggly selector


This example demonstrates how easy it is to animate the position of individual characters. It also shows how the Wiggly selector can create a dramatic change to the animation simply by adding it to the layer. The effect is spectacular, but the keyframing is minimal.



Animating the color and position of the characters in the word "Galaxy"

To flash colors and drop characters:

- 1 Create a new composition.
- 2 Create a new text layer with the phrase "Galaxy" and set the color to blue.

3 Position the cursor away from the text in the Composition window and when the type cursor changes to the move cursor , drag to move the text to the center of the window. Resize it if necessary so that it fits within the window.

4 Choose Animation > Animate Text > Position.

5 In the Timeline window, drag the Position property's y value to the left until all the characters are off the screen.

6 Expand Range Selector 1.

7 Click the Start stopwatch and leave it at 0% at 0 seconds; then move the current-time indicator to 5 seconds and set Start to 100%.

8 Preview the animation.

9 Collapse the Animator 1 group.

10 Make sure nothing is selected except the text layer name in the Timeline window, and choose Fill Color > Hue from the Animate pop-up menu. A new animator group, Animator 2, appears in the Timeline window.

11 Set Fill Hue to 1 x +0.0.

12 Expand the Range Selector 1 for Animator 2.

13 Click the Start stopwatch and leave it at 0% at 0 seconds; then move the current-time indicator to 5 seconds and set Start to 100%.

14 Preview the animation. The colors change now as they drop from the top of the screen, but they all use the same color and end up the same, original color.

15 With the Fill Hue selected, choose Selector > Wiggly from the Add pop-up menu.

16 Expand the Wiggle Selector 1 property and choose Add from the Mode pop-up menu.

17 Preview the animation.

Note: If you add the Fill Hue property to Animator 1 and then add the Wiggly selector, both the position and the colors wiggle, instead of just the colors.

Animating the tracking at the beginning and end of a layer

This example illustrates how easy it is to isolate characters when tracking a line of text. Using the Tracking and Line Anchor animator properties, you can easily move all but one or a few characters.




Animating the tracking values for the characters "3579" (left and center) so that only the "7" in the middle remains (right)

To animate tracking and set Line Anchor:

1 Create a new composition.

2 Create a new text layer and type "3579".

- 3 Position the cursor away from the text in the Composition window and when the type cursor changes to the move cursor , drag to move the text to the center of the window. Resize it if necessary so that it fits within the window.
- 4 Choose View > Show Grid.
- 5 In the Timeline window, select the text layer and choose Animation > Animate Text > Tracking.
- 6 Make sure Before & After is specified in the Track Type menu.
- 7 Click the Tracking Amount stopwatch and leave the value at 0 at 0 seconds.
- 8 Move the current-time indicator to 5 seconds and drag the Tracking Amount value until all characters are off the screen.
- 9 Preview the animation.
- 10 With the current-time indicator at 0, take a snapshot of the Composition window. You will use this, and the grids, to determine the original location of the number “7” at the end of the animation.
- 11 Move the current-time indicator to 5 seconds.
- 12 Click the Show Snapshot button.
- 13 In the Timeline window, select Animator 1 and choose Line Anchor from the Add pop-up menu.
- 14 Drag the Line Anchor value until the “7” is positioned in approximately its original position in the center of the Composition window.
- 15 Click the Show Last Snapshot button in the Composition window to see the exact location of the “7” in its original location. Adjust the Line Anchor value to position the character in the original location.
- 16 Preview the animation.


Using selectors to animate only one word in a text layer

There are many ways to use selectors. This example shows how you can use them to limit an animation to a specific word.



Animating the skew values in the characters in the word “Speeding”

To animate words in a phrase at different times:

- 1 Create a new composition.
- 2 Create a new text layer with the words “Speeding Saucer”.
- 3 Position the cursor away from the text in the Composition window and when the type cursor changes to the move cursor , drag to move the text to the center of the window. Resize it if necessary so that it fits within the window.
- 4 Choose Animation > Animate Text > Skew.

- 5 In the Timeline window, set the Skew value to 35.
- 6 Expand Range Selector 1.
- 7 Make sure the current-time indicator is at 0 seconds and click the End stopwatch.
- 8 In the Composition window, drag both selector bars to the left side of the “S” in “Speeding”.
- 9 Move the current-time indicator to 2 seconds and drag the right selector bar to the right side of the “g” in “Speeding”.
- 10 Preview the animation.


Working with animator shapes

Using different Shape options, you can significantly change the appearance of an animation.



Setting the Shape to Triangle

Changing the transitions between characters in an animation:


- 1 Create a new composition.
- 2 Create a text layer with the characters “01234”.
- 3 Position the cursor away from the text in the Composition window and when the type cursor changes to the move cursor , drag to move the text to the top of the window. Resize it if necessary so that it fits within the window.
- 4 Choose Animation > Animate Text > Position.
- 5 Expand Range Selector 1.
- 6 Make sure the current-time indicator is at 0 seconds and click the End stopwatch and set End to 0.
- 7 Move the current-time indicator to 5 seconds and set End to 5.
- 8 Adjust the y Position value so that the text appears at the bottom of the Composition window.
- 9 Preview the animation.
- 10 Click Advanced and choose Triangle from the Shape pop-up menu; then preview the animation.
- 11 Choose Square from the Shape menu and preview the animation; then set Ease High to 100% and preview the animation.
- 12 Set Ease High to -100 and preview the animation again.
- 13 Set different options from the Shape menu and preview the resulting animations.

Creating a write-on animation

You can easily create the appearance of writing on the screen by using the Opacity animator property.



Writing on text using Opacity




- 1 Create a new composition.
- 2 Create a text layer with the characters "01234".
- 3 Position the cursor away from the text in the Composition window and when the type cursor changes to the move cursor , drag to move the text to the center of the window. Resize it if necessary so that it fits within the window.
- 4 Choose Animation > Animate Text > Opacity.
- 5 Set Opacity to 0%.
- 6 Expand the Range Selector 1 and click the stopwatch icon for Start.
- 7 In the Composition window, drag the start selector to the left edge of the text (the value will be at 0).
- 8 Move the current-time indicator to 5 seconds and drag the start selector in the Composition window to the right edge of the text (the value will be 5).
- 9 Preview the animation.
- 10 By default, the Smoothness property is set to 100%. To create a typewriter appearance, expand the Advanced property and set Smoothness to 0%.

Using Paint Tools


Using the brush tool

After Effects provides the brush tool to let you paint on a layer with the current foreground color. You can paint on individual frames or paint strokes that animate automatically over a range of frames. By default, the brush tool creates soft strokes of color. However, you can change these default characteristics by changing the tool's brush options. You can also modify how the brush stroke interacts with the background color of the layer and with other brush strokes by specifying a blending mode. You can animate brush stroke characteristics over several frames or have After Effects interpolate one brush stroke shape to another.

To use the brush tool:

- 1 Double-click the layer you want to paint on.
- 2 Select the brush tool  from the Tools palette.
-  Select the Auto Open Palettes option in the Tools palette to ensure that the Paint and Brush Tips palettes open each time you select the paint tools. You can also click the palette icon  in the Tools palette to open these palettes.
- 3 Do any of the following in the Paint palette:
 - Select a brush, and set brush tip options.
 - Select a color by clicking the Foreground Color icon and specifying a color in the Color Picker.
 - Specify opacity and flow, blending mode, channel, and duration.
- 4 Position the brush tool over the layer, and drag to paint. The brush tool changes to a brush tip cursor in the Layer window. Each resulting stroke appears in the Timeline window as a separate item with properties that can be animated.

For information on brush tip options, see [“Working with brushes” on page 236](#). For information on blending modes, channels, duration options, opacity, and flow, see [“Specifying options for painting” on page 240](#). For information on paint strokes, see [“Working with paint strokes in the Timeline window” on page 243](#).

 You can interleave paint strokes with other effects that are already applied to the layer: Click the View pop-up menu in the Layer window, and choose the view that you want to paint.


Rotoscoping with the brush tool

Rotoscoping involves painting on individual frames over a series of frames to create an animation or to remove unwanted details in your footage. While rotoscoping can be tedious work, After Effects makes the process somewhat easier.



To rotoscope with the brush tool:

- 1 Double-click the layer you want to paint.
- 2 Select the brush tool in the Tools palette.
- 3 In the Paint palette, choose Custom from the Duration pop-up menu, and specify the duration in frames. Select paint options as desired.
- 4 Paint in the layer.
- 5 Press Control + Page Down (Windows) or Command + Page Down (Mac OS) to advance the number of frames specified by the Custom duration setting. (To move back the same number of frames, press Control + Page Up (Windows) or Command + Page Up (Mac OS).

 If you use a graphics tablet, map the keyboard shortcuts to the buttons on your pen to work more efficiently. Refer to your tablet's documentation for instructions. For more information about using your tablet with the paint tools, see [“Working with Brush Dynamics” on page 239](#).

- 6 Repeat steps 4 and 5 as needed.

Using the clone stamp tool

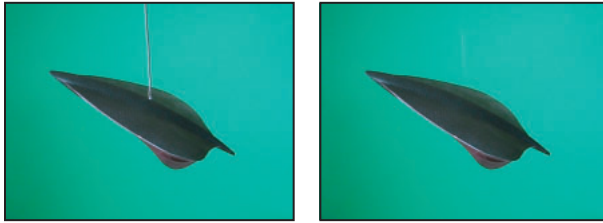
You can use the clone stamp tool to clone pixels and repair images in the Layer window. The clone stamp tool samples the pixels on a source layer (before effects are applied) and then applies the sample to the same layer or a different layer in the same composition as the source layer. You can clone a single frame or apply clone strokes continuously over several frames. Each clone stroke paints on more of the sample.

If you select Aligned in the Paint palette, you can release the mouse button without losing the current sampling point. As a result, the sampled pixels are applied continuously to reproduce the entire sampled area, no matter how many times you stop and resume painting. If you deselect Aligned, the sampled pixels are applied from the initial sampling point each time you stop and resume painting.

When selected, the Lock Source Time option applies samples from a single frame to all subsequent frames with applied strokes. When this option is deselected, the clone tool continuously samples and applies strokes over all subsequent frames with a fixed duration (measured in seconds) between the two, specified by the Clone Time Shift value in the Timeline window.

- To use the clone stamp tool:**
- 1 Select the clone stamp tool from the Tools palette.
 - 2 Select a brush in the Brush Tips palette, and set brush options.
 - 3 Do any of the following in the Paint palette:
 - Specify opacity and flow, a blending mode, or a channel.
 - Specify how you want to align the sampled pixels.

- Sample a single frame or a range of frames.



Removal of wire frame in moving footage with clone tool

4 Move the current-time indicator in the Layer window to the frame that you want to sample. Alt-click (Windows) or Option-click (Mac OS) in the layer to set the sampling point.

5 Move the current-time indicator in the Layer window to the frame to which you want to apply the sample. To apply the sample to a different layer in the composition, double-click the layer and move the current-time indicator in the Layer window to the desired frame.

6 Position the clone stamp tool over the layer in the Layer window, and then drag to apply the sample.

Each clone stroke includes properties that are unique to the clone stamp tool in addition to blending modes, stroke options, and transform properties. You can view these properties in the Stroke Options section in the Timeline window:

Clone Source Specifies the sampled layer.

Clone Position Specifies the x, y location of the sample within the source layer.

Clone Time Specifies the time (measured in seconds) in the Composition window when you sampled the source layer, as indicated by the current-time indicator. This property appears only when Lock to Source is selected.

Clone Time Shift Specifies the number of seconds between the sample and the clone stroke. This property appears only when Lock to Source is not selected.

For information on brush tip options, see [“Working with brushes” on page 236](#). For information on blending modes, channels, opacity, and flow, see [“Specifying options for painting” on page 240](#). For information on paint strokes, see [“Working with paint strokes in the Timeline window” on page 243](#).

Using the eraser tool

The eraser tool removes pixels from an image as you drag through it, thereby creating transparency in the layer. When you erase over paint strokes, you remove pixels from the stroke and the source layer to reveal transparency, depending on the opacity of your eraser.

To use the eraser tool:

- 1** Select the eraser tool from the Tools palette.
- 2** Select a brush in the Brush Tips palette and set brush options:
 - Specify an opacity to define the strength of the erasure. An opacity of 100% erases pixels completely. A lower opacity erases pixels partially.
 - Specify a flow rate.

- Specify a duration.

3 Drag through the area you want to erase.

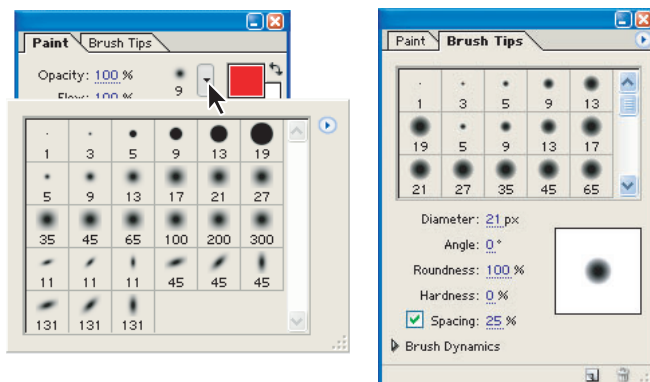
For information on brush options, see [“Working with brushes” on page 236](#). For information on flow, see [“Specifying opacity or flow” on page 243](#).

Working with brushes

Working with brushes is an important part of using the painting and editing tools. The brush you select determines many characteristics of the resulting brush stroke. After Effects provides a variety of preset brushes to fill a wide range of uses. You can also create custom brushes using the Brush Tips palette.

Selecting brushes

Once you’ve selected a paint tool, you can select brushes from the Brush Tips palette or the Paint palette. The Brush Tips palette lets you select preset brushes and design custom brushes, whereas the Paint palette simply provides preset brushes. Choose Window > Brush Tips to open the Brush Tips palette.



The Brush Tips pop-up menu in the Paint palette and the Brush Tips palette are two ways to select a brush.

To select a preset brush:

Do one of the following:

- In the Paint palette, drag the Brush Tips pop-up menu to select a brush tip.
- In the Brush Tips palette, scroll through the list of brushes, and select a brush. A preview of the brush appears in the preview area.

To change how the Brush Tips palette displays preset brushes:

Choose a display option from the Brush Tips palette menu:

- Text Only to view the brushes as a list.
- Small or Large Thumbnail to view the brushes as thumbnails. Small Thumbnail is the default.

- Small or Large List to view the brushes as a list with thumbnails.

💡 To dynamically view the name for a brush, position the pointer over a brush until the tool tip appears.

Customizing brush tips

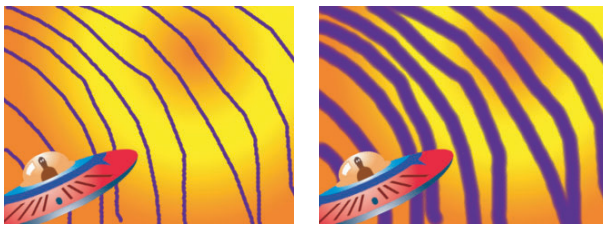
A brush stroke is made up of many individual brush tip marks. The brush tip you select determines the shape, diameter, and other characteristics of a brush mark. You can customize brush tips by changing the brush tip properties. Any changes you make to an existing brush tip can be saved as a new brush tip; the default set of brush tips remains unaltered.

To set brush tip shape options:

In the Brush Tips palette, select the brush tip you want to customize and change the value for one or more of the following options:

Diameter Controls the size of the brush. Enter a value in pixels or drag a new value.

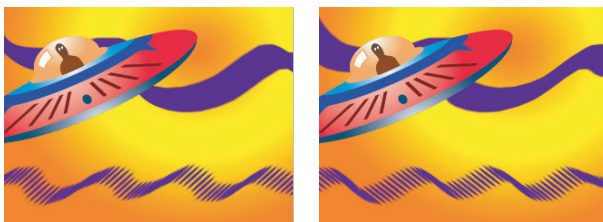
💡 Control-drag (Windows) or Command-drag (Mac OS) the brush in the Layer window to adjust diameter; release the key, and continue to drag to adjust hardness. Both the cursor and Brush Tips palette update dynamically.



Strokes with low diameter values (left) and high diameter values (right)

Angle Specifies the angle by which an elliptical brush's long axis is rotated from horizontal. Enter a value in degrees or drag a new value.

Note: Brush strokes can be expressed in both positive and negative values. For example, a brush stroke with a 45-degree angle is equivalent to a brush stroke with a -135-degree angle.



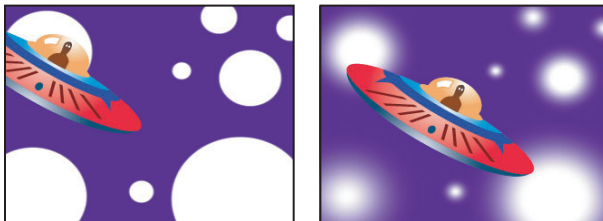
Angled brushes create chiseled strokes: 45-degree brush (left), and -45-degree brush (right).

Roundness Specifies the ratio between the brush's short and long axes. A value of 100% indicates a circular brush, a value of 0% indicates a linear brush, and intermediate values indicate elliptical brushes.



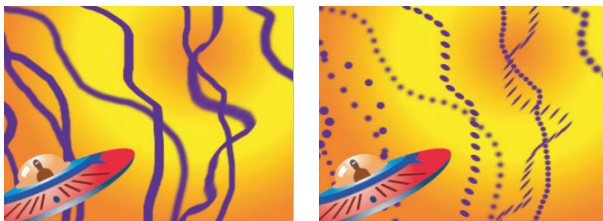
Brush strokes using 100-percent roundness (left) and varying percentages (right)

Hardness Controls the brush stroke's transition from 100% opaque at the center to 100% transparent at the edges. Even with high hardness settings, only the center is fully opaque. Enter a percentage value or drag a new value.



Hardness settings at 100-percent (left) and 0-percent hardness (right)

Spacing Controls the distance between the brush tip marks in a stroke. The value is a percentage of the brush diameter. When this option is deselected, the speed of the cursor determines the spacing.



Decrease spacing for continuous lines (left); increase spacing for skipped brush strokes (right).

Note: To change a value, you can either type a value and press *Enter* (Windows) or *Return* (Mac OS), or place the pointer over the value and drag a new value.

Working with Brush Dynamics

You can use a graphics tablet with each paint tool. You can adjust the brush tip by using the graphic tablet's pen pressure, pen tilt, or position of the pen thumbwheel. Specify Brush Dynamics options in the Brush Tips palette to add dynamic (or changing) elements to preset brush tips. For example, you can change the size of your brush tip dynamically by adding more or less pen pressure. Pressing the eraser side of the pen to the tablet always selects the eraser tool.

Note: *Brush Dynamics are available only when you're using a pressure-sensitive digitizing tablet such as the Wacom® tablet.*

Working with the Brush Tips palette

The Brush Tips palette lets you customize your brush tips in a variety of ways.

To set Brush Dynamics:

In the Brush Tips palette, select the brush tip you want to customize, and change the value for one or more of the following options:

Size Specifies how much the size of brush marks varies in a stroke. Options include Off, Pen Pressure, Pen Tilt, and Stylus Wheel.

Minimum Size Specifies a range between 1%-100%. This option is available only when Off is not chosen from the Size pop-up menu.

Angle Specifies how much the angle of brush marks varies in a stroke. Options include Pen Pressure, Pen Tilt, and Stylus Wheel.

Roundness Specifies how much the roundness of brush marks varies in a stroke. Options include Off, Pen Pressure, Pen Tilt, and Stylus Wheel.

Opacity Specifies how much the opacity of brush marks varies in a stroke. Options include Off, Pen Pressure, Pen Tilt, and Stylus Wheel.


Flow Specifies how much the flow of brush marks varies in a stroke. Options include Off, Pen Pressure, Pen Tilt, and Stylus Wheel.

Creating and managing preset brush tips

You can customize an existing brush tip and save it as a preset brush tip. You can create custom brush tips, rename preset brush tips, and delete preset brush tips.

Note: *New preset brushes are saved in a Preferences file so that they persist between editing sessions.*


To create a new preset brush tip:

- 1 In the Brush Tips palette, specify the desired settings.
- 2 Choose New Brush from the Brush Tips palette menu or click the New Brush Tip icon .
- 3 Type a name for the brush tip in the Choose Name window, and click OK.

To rename a preset brush tip:

- 1 In the Brush Tips palette, select the brush tip you want to rename.
- 2 Choose Rename Brush from the palette menu.
- 3 Type a name for the brush tip in the Choose Name window, and click OK.

To delete a preset brush tip:

- 1 In the Brush Tips palette, select the brush tip you want to delete.
- 2 Choose Delete Brush from the palette options menu, or click the Delete Brush icon .
- 3 Click Yes to delete the brush tip.

Note: You can also create, rename, and delete brush tips by right-clicking (Windows) or Ctrl-clicking (Mac OS) the brush tip.



To return to the default library of preset brush tips:

Choose Reset Brush Tips from the Brush Tips palette menu, and then click OK. To save the custom brushes you created, click Append when the dialog box prompts you to replace current brush tips with the default brush tips.

Specifying options for painting

You set options for painting in the Paint palette.

Selecting a brush color

The Paint palette provides a Foreground and Background color for you to use while painting. You can select from a range of colors or enter RGB values to create a new color. Switch the order of these colors by clicking the switch icon  or reset the colors to black and white by clicking the reset icon .

To select a brush color:

- 1 In the Paint palette, click the Foreground or Background color selection box.
- 2 Do one of the following:
 - Select a color from the Basic Color area (Windows) or color library in the Color Picker (Mac OS).
 - Create a custom color by entering or dragging values for the Red, Green, and Blue channels.

Selecting a blending mode

The blending mode specified in the Paint palette or in the Timeline window controls how pixels in the image are affected by the brush stroke. It is helpful to think in terms of the following colors when visualizing the result of a blending mode:

- The *underlying color* is the original color in the image.
- The *blend color* is the color being applied with the brush tool.
- The *result color* is the resulting combination of the underlying and blend colors.

To select a blending mode for the brush tool:

In the Paint palette, choose a blending mode from the Mode pop-up menu:

Normal Paints each pixel to make it the result color. This is the default mode.

Dissolve Paints each pixel to make it the result color. However, the result color is a random replacement of the pixels with the underlying color or the blend color, depending on the opacity at any pixel location.

Darken Specifies an underlying or blend color—whichever is darker—as the result color. Pixels lighter than the blend color are replaced, and pixels darker than the blend color don't change.

Multiply Multiplies the underlying color by the blend color. The result color is always a darker color. Multiplying any color with black produces black. Multiplying any color with white leaves the color unchanged. When you paint a color other than black or white, successive strokes produce progressively darker colors. The result is similar to drawing on the image with multiple markers.

Linear Burn Darkens the underlying color to reflect the blend color by decreasing the brightness. Painting with white produces no change.

Color Burn Darkens the underlying color to reflect the blend color by increasing the contrast. Painting with white produces no change.

Add Combines the color values of the underlying and blend colors to produce the result color. The result color is lighter than the original colors. Painting with black produces no change. Painting any color onto an underlying color of white also produces no change.

Lighten Selects the underlying or blend color—whichever is lighter—as the result color. Pixels darker than the blend color are replaced, and pixels lighter than the blend color do not change.

Screen Multiplies the inverse of the blend and underlying colors. The result color is always a lighter color. Painting with a black screen leaves the color unchanged. Painting with a white screen produces white. The result is similar to projecting multiple photographic slides on top of each other.

Linear Dodge Brightens the underlying color to reflect the blend color by increasing the brightness. Painting with black produces no change.

Color Dodge Brightens the underlying color to reflect the blend color by decreasing the contrast. Painting with black produces no change.

Overlay Multiplies or screens the colors, depending on the underlying color. Patterns or colors overlay the existing pixels while preserving the highlights and shadows of the underlying color. The underlying color is not replaced but is mixed with the blend color to reflect the lightness or darkness of the original color.

Soft Light Darkens or lightens the colors, depending on the blend color. The result is similar to shining a diffused spotlight on the image. If the blend color (light source) is lighter than 50% gray, the underlying color is lightened as if it were dodged. If the blend color is darker than 50% gray, the underlying color is darkened as if it were burned in. Painting with pure black or white produces a distinctly darker or lighter area but does not result in pure black or white.

Hard Light Multiplies or screens the colors, depending on the blend color. The result is similar to shining a harsh spotlight on the image. If the blend color (light source) is lighter than 50% gray, the underlying color is lightened, as if it were screened. This is useful for adding highlights to an image. If the blend color is darker than 50% gray, the underlying color is darkened, as if it were multiplied. This is useful for adding shadows to an image. Painting with pure black or white results in pure black or white.

Linear Light Burns or dodges the colors by decreasing or increasing the brightness, depending on the blend color. If the blend color (light source) is lighter than 50% gray, the underlying color is lightened by increasing the brightness. If the blend color is darker than 50% gray, the underlying color is darkened by decreasing the brightness.

Vivid Light Burns or dodges the colors by increasing or decreasing the contrast, depending on the blend color. If the blend color (light source) is lighter than 50% gray, the underlying color is lightened by decreasing the contrast. If the blend color is darker than 50% gray, the underlying color is darkened by increasing the contrast.

Pin Light Replaces the colors, depending on the blend color. If the blend color (light source) is lighter than 50% gray, pixels darker than the blend color are replaced, and pixels lighter than the blend color do not change. If the blend color is darker than 50% gray, pixels lighter than the blend color are replaced, and pixels darker than the blend color do not change. This is useful for adding special effects to an image.

Hard Mix Enhances the contrast of the underlying layer through the use of a mask on the source layer. The mask size determines the contrasted area; the inverted source layer determines the center of the contrasted area.

Difference Looks at the color information in each channel and subtracts either the blend color from the underlying color or the underlying color from the blend color, depending on which has the greater brightness value. Painting with white inverts the underlying color values; painting with black produces no change.

Exclusion Creates a result similar to but lower in contrast than the Difference mode. Painting with white inverts the underlying color values. Painting with black produces no change.

Hue Creates a result color with the luminance and saturation of the underlying color and the hue of the blend color.

Saturation Creates a result color with the luminance and hue of the underlying color and the saturation of the blend color. Painting with this mode in an area with no saturation (gray) causes no change.

Color Creates a result color with the luminance of the underlying color and the hue and saturation of the blend color. This preserves the gray levels in the image and is useful for coloring monochrome images and for tinting color images.

Luminosity Creates a result color with the hue and saturation of the underlying color and the luminance of the blend color. This mode creates an inverse result from that of the Color mode.

Silhouette Luma Creates transparency in painted areas of the layer, allowing you to see underlying layers or background. The luminance value of the blend color determines opacity in the result color. Painting with pure white creates 0% opacity. Painting with pure black produces no change.

Specifying a channel

You can apply the brush tool and the clone tool to the alpha channel of an image, the RGB channels, or both by choosing the channel in the Paint palette. When Alpha is selected, you can only add and remove opacity; swatches and Paint palettes display colors in monochromatic tones.



Painting the alpha channel with 100% black has the same result as using the eraser tool: It creates transparent paint strokes.

Specifying a duration option

You can choose a duration for each stroke in the Paint palette. The option you choose determines the length of the stroke's duration bar in the Timeline window.

- Single Frame to apply the paint stroke to the selected frame only.
- Constant (the default) to apply the paint stroke to the current frame and all subsequent frames of the layer.
- Write On to animate the paint stroke.
- Custom to apply the paint stroke to a specified number of frames.

Specifying opacity or flow

You can specify opacity and flow for the paint tools. *Opacity* specifies the maximum amount of paint coverage applied by the brush. *Flow* specifies how quickly paint is applied by the brush tool. Opacity and Flow settings can range from 0% to 100%. To simulate semi-transparent paint, specify a low percentage value; to simulate opaque paint, specify a high value.


Working with paint strokes in the Timeline window

Once you have applied a paint stroke to a layer, you can modify the way the stroke interacts with the layer and the composition by adjusting the blending mode, stroke properties, and transform properties in the Timeline window.

Each paint stroke is labeled numerically in the Effects section of the Timeline window and is named for the tool that created it. For example, brush strokes are named as Brush 1, Brush 2; clone stamp strokes are named as Clone 1, Clone 2.



To view paint strokes, select the layer in the Timeline window, and press the P key twice.

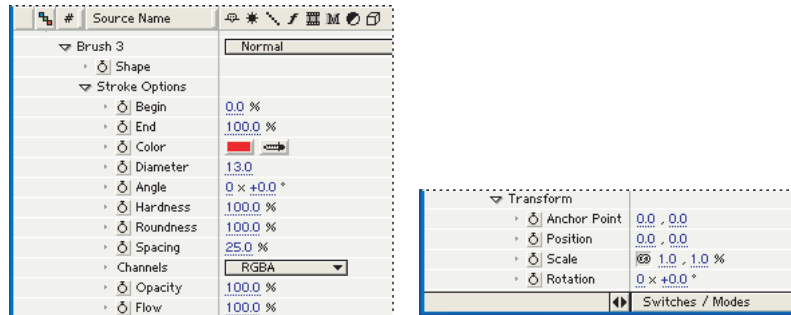
Each paint stroke has a separate duration bar in the Timeline window, similar to a layer's duration bar. The initial length of the duration bar is determined by the duration option you choose in the Paint palette. (See [“Specifying a duration option” on page 243.](#)) Paint strokes behave like layers: You can drag the In or Out point of the duration bar to change the stroke's duration and shift the stroke up or down to change its position relative to other strokes. You can hide a paint stroke from view by clicking the eye icon  next to the stroke.

Note: Select any keyframes for a paint stroke before you move or alter the paint stroke's duration bar.

You can move a paint stroke's location in the Timeline window by dragging its duration bar to another time in the Timeline window. To change the order of an overlapping stroke, drag the stroke up or down in the Timeline window.



While you can't edit a stroke's shape, you can change its shape by copying and pasting a mask to a selected brush stroke in the Timeline window.



Each brush stroke is numbered and includes individual Stroke Options and Transform properties in the Effects section of the Timeline window.

Selecting a paint stroke

Use the selection tool to select strokes in either the Timeline window or the Layer window. When you select a paint stroke, it appears in the Layer window with an anchor point at the start of the stroke and a black line running the length of the stroke.

To select a paint stroke, do either of the following:

- Click the paint stroke in the Layer window.
- Select the paint stroke in the Paint section of the Timeline window.

To select multiple paint strokes, do any of the following in the Timeline window or Layer window:

- Shift-click to select contiguous paint strokes.
- Drag a marquee to select contiguous paint strokes.
- Hold down the Control key (Windows) or Command key (Mac OS) to select non-contiguous paint strokes.

To deselect a paint stroke in the Timeline window or the Layer window:

Click anywhere but the paint stroke.



To move a paint stroke, change its Position property values.

Specifying transform properties

You can specify transform properties of a paint stroke in the Timeline window to set its position, scale, opacity, and angle of rotation. Transform properties alter the paint stroke using the paint stroke's anchor point as its center.

To specify transform options:

- 1 Click the triangle next to Effects and Paint to expand the effects section for the layer.

- 2 Click the triangle next to the paint stroke (for example, Brush 1) to expand the brush stroke properties.
- 3 Click the triangle next to Transform to expand the Transform properties.
- 4 Specify the Anchor Point, Position, Scale, Rotation, or Opacity property by dragging or entering values.

Painting on a transparent layer

You can hide or display the layer you paint on by enabling the Paint on Transparent option. You can enable the Paint on Transparent option in the Timeline window or the Effects Control window. When you enable this option, paint strokes appear on a transparent background instead of the source layer.

To enable the Paint on Transparent option:

- 1 Select the layer to which paint is applied in the Timeline window.
- 2 Choose Effect > Effect Controls.
- 3 Select Paint on Transparent to enable it.

Specifying a blending mode in the Timeline window

You can apply blending modes to a paint stroke after it has been applied to a layer.

To specify a blending mode: 1 In the Timeline window, click the triangle to the left of the layer to expand the Paint section.

- 2 Click Normal in the Switches column next to the paint stroke to open the Blending Modes pop-up menu, and then choose a blending mode.

For more information on blending modes, see [“Selecting a blending mode” on page 240](#).



You can specify all of the options listed in the Paint palette and the Brush Tips palette in the Timeline window. Paint on Transparent is also available through the Effect Controls palette. To set keyframes to animate paint strokes, see [“Animating a paint stroke in the Timeline window” on page 245](#).

Animating a paint stroke in the Timeline window

You can animate a paint stroke by setting keyframes for paint stroke properties. After Effects animates paint strokes automatically when you choose Write On from the Duration pop-up menu in the Paint palette or when you replace paint strokes (referred to as *stroke targeting*) in the Timeline window. The time you take to apply the stroke determines the stroke's duration; the speed of your movements determines velocity.

To animate a paint stroke automatically with Write On:

- 1 Open a layer and select a paint tool in the Tools palette.
- 2 In the Paint palette, choose Write On from the Duration pop-up menu.
- 3 Apply a paint stroke to the layer. As you paint, your movements are recorded in real time and determine the duration and velocity of the resulting stroke.
- 4 In the Timeline window, open the layer to view the paint stroke in the Stroke Options section. Two keyframes appear in the End parameter.

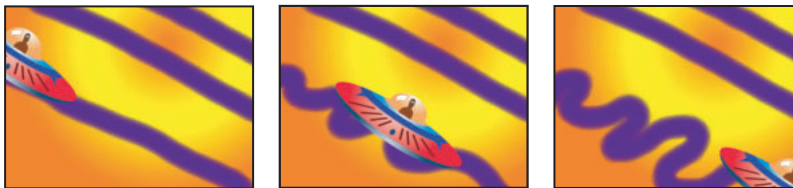
5 Drag the second keyframe to the frame where you want the complete stroke to appear. The stroke begins on the frame indicated by the first keyframe.

💡 You can reverse the order of the animation by cutting and pasting the first keyframe in the Timeline window to a later time than the ending keyframe.

To animate a paint stroke by using stroke targeting:

- 1 Open a layer and select a paint tool in the Tools palette.
- 2 In the Paint palette, choose Single Frame, Constant, or Custom from the Duration pop-up menu.
- 3 In the Layer window, drag in the layer to create a paint stroke.
- 4 In the Timeline window, click the triangles next to the layer in the Strokes section and in the Paint section to view the brush stroke.
- 5 Do one of the following:
 - Click the stopwatch for Shape to create a keyframe.
 - Click the stopwatch for any other Brush properties that you want to animate.
- 6 Drag the current-time indicator to a new location in the Timeline window.
- 7 While the brush stroke is still selected, drag in the layer to create a new paint stroke. A second keyframe appears in the Timeline window for each animated property.

When you render the work area, After Effects interpolates brush shape and other animated properties for all frames between the two keyframes.



After Effects interpolates a brush shape (center) between two different strokes created with the same brush.

Applying Effects

Learning about specific effects

All effects included in After Effects are listed and described in the online Effects Help. You can print any Help topic at any time. To get information on a specific effect, select an effect and click About in the Effect Controls window.

Standard edition effects

The standard edition of After Effects includes the following categories and effects:

Adjust Brightness & Contrast, Channel Mixer, Color Balance, Curves, Hue/Saturation, Levels, Levels (Individual Controls), Posterize, and Threshold

Audio Backwards, Bass & Treble, Delay, and Stereo Mixer

Blur & Sharpen Channel Blur, Compound Blur, Directional Blur, Fast Blur, Gaussian Blur, Radial Blur, Sharpen, and Unsharp Mask

Channel 3D Glasses, Arithmetic, Blend, Calculations, Channel Combiner, Cineon Converter, Compound Arithmetic, Invert, Minimax, Remove Color Matting, Set Channels, Set Matte, Shift Channels, and Solid Composite

Distort Liquify, Magnify, Mirror, Offset, Polar Coordinates, Ripple, Smear, Spherize, Transform, Turbulent Displace, Twirl, Warp, and Wave Warp.

Expression Controls Angle Control, Checkbox Control, Color Control, Layer Control, Point Control, and Slider Control

Image Control Change Color, Change to Color, Color Balance (HLS), Color Link, Colorama, Equalize, Gamma/Pedestal/Gain, Grow Bounds, PS Arbitrary Map, and Tint

Keying Color Key, Color Range, and Luma Key

Noise Dust & Scratches, Median, Noise, Noise Alpha, Noise HLS, Noise HLS Auto

Paint Paint

Perspective Basic 3D, Bevel Alpha, Bevel Edges, Drop Shadow, and Radial Shadow

Render 4-Color Gradient, Audio Spectrum, Audio Waveform, Beam, Cell Pattern, Checkerboard, Circle, Ellipse, Eyedropper Fill, Fill, Fractal, Grid, Paint Bucket, Lens Flare, Lightning, Radio Waves, Ramp, Scribble, Stroke, and Vegas

Simulation Card Dance, Caustics, Foam, Shatter, and Wave World

Stylize Brush Strokes, Color Emboss, Emboss, Find Edges, Leave Color, Mosaic, Motion Tile, Roughen Edges, Strobe Light, Texturize, and Write-on

Text Basic Text, Numbers, and Path Text

Time Echo, Posterize Time, and Time Difference

Transition Block Dissolve, Card Wipe, Gradient Wipe, Iris Wipe, Linear Wipe, Radial Wipe, and Venetian Blinds



Video Broadcast Colors, Reduce Interlace Flicker, and Timecode

Professional edition effects

The Professional edition of After Effects includes all of the effects available in the Standard edition, as well as the following effects:

Adjust Color Stabilizer

3D Channel 3D Channel Extract, Depth Matte, Depth of Field, Fog 3D, and ID Matte

Audio Flange & Chorus, High-Low Pass, Modulator, Parametric EQ, Reverb, and Tone

Channel Alpha Levels

Distort Bezier Warp, Bulge, Corner Pin, Displacement Map, Mesh Warp, Optics Compensation, and Reshape

Keying Color Difference Key, Difference Matte, Extract, Inner/Outer Key, Linear Color Key, and Spill Suppressor

Matte Tools Matte Choker and Simple Choker

Noise Fractal Noise

Paint Vector Paint

Render Advanced Lightning

Simulation Particle Playground

Stylize Glow and Scatter

Time Time Displacement

Working with effects

When you apply an effect to a layer, the Effect Controls window opens; the effect is listed there. Each layer to which you apply effects appears on its own tab in the Effect Controls window. The effect is also listed in the Effects section under the layer name in the Timeline window. If you apply additional effects to the layer, they are listed under the first effect in the Timeline window. Effects are rendered in order from top to bottom in this list. You change the order in which effects are rendered by dragging the effect name to a new position in the list.

The Effect Controls window contains a variety of controls that modify the properties of an effect, including sliders, options, color swatches, effect points, and angles.

Using the Effects palette

You can use the Effects palette to search for and apply effects to a layer. You can browse categories and folders of effects or type the full or partial name of an effect to locate it. You can also change the manner in which the effects are listed in the palette: by category folder, by operating system folders, or in alphabetical order.

To locate an effect in the Effects palette:

- 1 Choose Window > Effects.
- 2 Do one of the following:

- Scroll through the list of effects. If the effects are listed by category, expand the category to see the effect names.
- Type the effect name, or a part of the name in the Contains text box. The effects list displays the effects containing the characters you typed.

To specify how effects are listed in the Effects palette:

Choose one of the following views from the Effects palette menu:

Categories Lists effects by category.

Explorer Folders (Windows) or Finder Folders (Mac OS) Lists all effects in their respective folders, as they appear in Windows Explorer, or in the Finder.

Show Effects Shows all available effects.

Show Referring Favorites Shows all favorites that contain the selected effect.

Show Favorites Shows all effects saved as favorites.

Show Favorite Contents Shows the individual effects that comprise a favorite built from more than one effect. To see the individual effects, click the triangle to the left of a favorite name.

Note: Favorites appear in the Effects palette only if they are located in the After Effects application folder or a subfolder of the application folder. If you move them to a new folder, place a shortcut (Windows) or an alias (Mac OS) of that folder in the Favorites folder. (See [“Saving favorite effects for instant reuse” on page 251.](#))

Show 16 bpc Effects Only Shows only the effects that are designated as 16-bits-per-channel effects.

Reveal in Explorer (Windows) or Reveal in Finder (Mac OS) Opens the system folder that contains the effect selected in the palette.

Refresh List Updates the list of favorites to include changes in the list made during an After Effects session.

Applying and controlling effects

You can apply or remove an effect at any time. Once you’ve applied effects to a layer, you can temporarily turn off one or all the effects in the layer to concentrate on another aspect of your composition. Effects that are turned off do not appear in the Composition window and typically are not included when the layer is previewed or rendered. (However, in the Render Queue window, you can specify that the composition is rendered with all effects on, regardless of which effects you are displaying in the Composition window.) Turning off an effect does not delete the keyframes created for any of the effect properties; all keyframes remain until the effect is deleted from the layer.

By default, when you apply an effect to a layer, the effect is active for the duration of the layer. However, you can make an effect start and stop at specific times or make the effect more or less intense over time by using keyframes.



You apply and edit effects to an adjustment layer just as you do to any other layer. However, when you apply an effect to an adjustment layer, the effect is applied to all layers below it in the Timeline window. (See [“Creating an adjustment layer” on page 94.](#))

To apply an effect to a layer from the Effect menu:

- 1 In the Timeline or Composition window, select a layer.

- 2 Choose a category from the Effect menu, and then choose an effect from the submenu.



Using this procedure, you can apply multiple instances of a single effect to a layer.

To apply an effect to a layer from the Effects palette:

- 1 Locate and select the effect or effects you want to apply.
- 2 Do one of the following:
 - Double-click the selected effect or effects.
 - Drag the effect to the target layer on the Timeline window, either to the layer name, Effect list heading, or to any spot in the existing list of effects.
 - Drag the effect to the Composition window. The Info palette displays the name of the targeted layer as you drag over it.
 - Drag the effect to the Effect Controls window.

Note: Applying an effect to a layer makes it the active layer.

To open the Effect Controls window:

In the Timeline window, double-click an effect name, or choose Effect > Effect Controls.

To change the color of hot text in the Effect Controls window (or any window):

- 1 Choose Edit > Preferences > Display (Windows) or After Effects > Preferences > Display (Mac OS).
- 2 Click the Hot Text Color color swatch to select a color, or click the eyedropper to sample a color from anywhere on the screen. Then click OK.

To select a layer in the Effect Controls window:

Click the tab below the Effect Controls title bar for the layer you want to select.

To open the Options dialog box for an effect:

In the Effect Controls window, click Options to the right of the effect name.

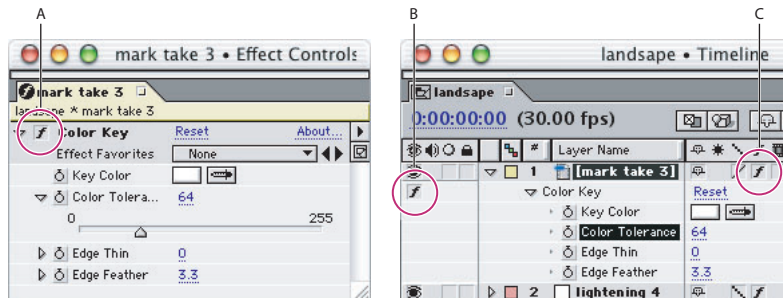
Note: Not all effects include an Options dialog box.

To copy effects in a layer and paste them into other layers:

- 1 In the Effect Controls window, select one or more effects, and then choose Edit > Copy.
- 2 In the Timeline window, select one or more layers, and then choose Edit > Paste.

To temporarily turn off an effect:

In the Effect Controls or Timeline window, select the layer, and then click the Effect option to the left of the effect name.



Effect option in the Effect Controls window and Effect switch in the Timeline window **A.** The Effect option in the Effect Controls window turns a specific effect on or off. **B.** The Effect option in the Timeline window also turns a specific effect on or off. **C.** The Effect switch in the Switches column of the Timeline window turns all effects in a layer on or off.

To temporarily turn off all effects in a layer:

In the Timeline window, click the Effect switch in the Switches column for the desired layer.

To remove an effect:

In the Effect Controls window, select an effect name and press Delete.

To apply multiple effects to one or more layers:

- 1 In the Timeline window, select a layer or group of layers.
- 2 Choose a category from the Effect menu, and then choose an effect from the submenu.
- 3 Repeat step 2.

To remove all effects applied to a layer:

- 1 In the Timeline or Composition window, select the layer or layers from which you want to remove all effects.
- 2 Choose Effect > Remove All.

Note: This command eliminates all keyframes for the deleted effects. If you choose Remove All accidentally, immediately choose Edit > Undo Delete Effect to restore the effects and keyframes.

Saving favorite effects for instant reuse

You can save settings of one or more effects as a *favorite* effect. Saving an effect as a favorite also saves any set keyframes, as well as expressions used in the effect. For example, if you created an explosion using several effects with complex parameter and animation settings within those effects, you can save all those settings as a single favorite. You can then apply that favorite to any other footage, or you can apply any single effect from that favorite to any footage. The 20 most recently saved or applied favorites appear under Recent Favorites in the Effect menu.

Favorites also appear in the Effect Favorites pop-up menu in the Effect Controls window and in the Effects palette. The Effect Favorites pop-up menu lists only those favorites that contain the current effect. For example, if the Mirror effect is selected, the pop-up menu will show only those favorites that include the Mirror effect. If the Effect Favorites pop-up menu or the Favorites category in the Effects palette do not appear, choose the Show Favorites option from the Effect Controls or the Effects palette menu.

Note: When you apply an effect from the Effect Favorites pop-up menu, only the current effect from the favorite is applied.

To save a favorite effect:

- 1 Select a layer in the Timeline or Composition window, and apply one or more effects to it. If you want, animate the effect using keyframes.
- 2 In the Effect Controls window for that layer, select one or more effects to include as a favorite.
- 3 Choose Effect > Save Favorite, or choose Save Selection as Favorite from the Effect Favorites pop-up menu. Specify a filename and location, and click Save.

Note: If the favorite does not appear in the Effects palette, choose Refresh List from the Effects palette menu.

To apply a favorite effect:

- 1 Select one or more layers.
- 2 Do one of the following:
 - Select the favorite in the Effects palette, and then drag the effect to the Timeline, Composition, or Effect Controls windows.
 - To apply a recently used or saved favorite, choose Effect > Recent Favorites, and then choose the favorite.
 - To apply selected effects from within a favorite, press Ctrl (Windows) or Command (Mac OS), select the desired effects in the Effects palette, and then drag them to the Timeline, Composition, or Effect Controls windows. If the individual effects within a favorite do not appear, choose Show Favorite Contents from the Effects palette menu.
 - To apply a favorite that isn't available on the Recent Favorites menu, choose Effect > Apply Favorite, locate the favorite effects (.FFX) file you want, and click Open.

Working with effects in 16 bits per channel (Pro only)

Many effects in After Effects support 16 bits per channel, or 16 bpc. If an effect supports only 8 bits, and your project is set to 16 bpc, After Effects displays a warning icon ⚠ next to the effect name in the Effect Controls palette. Using an 8-bit effect in a 16-bit project will result in a loss of detail. You can set the Effects palette to list only 16-bpc effects. (See [“Using the Effects palette” on page 248.](#))

Changing effect property values

The Effect Controls window shows all the controls used to change the property values for an effect. These controls can include underlined values, sliders, effect point icons, angle controls, menus, color swatches, eyedroppers, and graphs.

You can also change the property values for an effect in the Timeline window, although using the Effect Controls window is often quicker and easier.




Effect properties in the Effect Controls window **A.** Click to expand or collapse an effect's controls. **B.** Drag left to decrease or right to increase a value. **C.** Click to set or remove keyframes. **D.** Click to return to the default values. **E.** Click to view Favorites that contain the current effect **F.** Drag or type to set a new value. **G.** Drag the line in the angle control to set a new value.

To change the value of an effect property:

- 1 In the Effect Controls window, click the effect name to select it.
- 2 If the effect's controls are not visible, click the triangle to the left of the effect name.
- 3 Change the value using one of the following methods:
 - Drag the slider left or right, if available.
 - Drag the highlighted value or type a new value directly over the existing value.
 - Click Reset to select default values.

To set an angle:

Set the angle using one of the following methods:

- Click a point inside the angle control .
- Click and drag the angle control line.


Note: Once you have clicked inside the angle control, you can drag outside of it for more precision.

- Drag the highlighted value or type a new value directly over the existing value.

Note: You can set an angle of more than 360 degrees by turning the dial more than once or by typing a new angle value.

To set a color value for an effect:

Set the color value using one of the following methods:

- In the Effect Controls window, click the color swatch, select a color in the Color dialog box, and click OK.
- Click the eyedropper , position it on the desired color anywhere on the screen, and click to select the color.

Placing an effect using effect points

Some effects require that you identify specific positions on a layer to determine how the effect will be applied. Often, these effect points enable After Effects to properly position the effect on the layer. A given effect may require as few as one or as many as four or more effect points.

Note: The positions of these effect points are based on the coordinate system for the layer, not for the composition. The coordinates shown in the Info palette are layer coordinates when you're working in the Layer window.

To set an effect point:

Select the effect and then do one of the following:

- Click the effect control point \oplus in the Composition window and drag. The coordinates in the Effect Controls window change as you drag.
- Click the effect control point button \div in the Effect Controls window; then, in the Composition or Layer window, position the control point where you want the effect point, and click.
- In the Effect Controls palette, drag the x-axis, y-axis, and z-axis (if available) position coordinates (located to the right of the effect control point button) or type over the highlighted coordinates.

To view the effect point or path in the Layer window:

Choose the effect name from the Layer window's View menu.

To view the effect point in the Composition window:

Select the effect name in the Timeline window.

Changing effects over time

By default, when you apply an effect to a layer, the controls you specify do not change for the duration of a layer. However, you can change an effect over time by assigning a keyframe to one of the effect's properties at the time you want a change to happen and then changing the effect controls at that keyframe. (See ["Setting keyframes" on page 119](#).)

To set a keyframe for an effect:

In the Effect Controls window or the Timeline window, click the stopwatch next to the effect property for which you want to set a keyframe.

Positioning effects on layers

After Effects renders all effects using subpixel positioning, a highly accurate interpolation that calculates a layer's position to thousandths of a pixel. Effects are calculated to a level of precision higher than the resolution displayed on-screen, which results in smooth, high-quality effects and animations. Positioning with subpixel accuracy may soften pixels when used with blending or smoothing effects.

To position an effect exactly where you want it:

- 1 Choose View Options from the Composition window menu and then select Effect Controls to make the effect points visible.
- 2 Select the effect you want to position in the Effect Controls or the Timeline window.
- 3 Zoom in on the layer in the Composition window. The more you zoom in, the more accurate you can be. Effect points for effects are interpolated throughout the area of the image.

Note: A layer must be set to Best quality to take advantage of subpixel accuracy. However, for faster editing, you can keep layers at Draft quality until you render a finished movie.

Changing rendering order


When you apply more than one effect to a layer, the final result may depend on the order in which those effects are applied. To change the order in which effects are applied, drag the effect name to a new position in the Effect Controls window or the Timeline window.

The order in which After Effects renders masks, effects, and transform properties, called the *rendering order*, may affect the final result of an applied effect. To achieve certain effects, change the default rendering order so that a transform property is rendered before an effect in a layer instead of after the effect. (See [“Understanding default rendering order” on page 313.](#))

Using audio effects

Any audio effect can be customized to radically change the sound of the original audio. For more impact, you can duplicate a layer that contains audio effects, add additional audio effects to the duplicate layer, and then turn off the original layer’s effects to hear only the processed audio.

Many audio effects include Dry Out and Wet Out options. Use these to specify the mix of unprocessed (Dry) and processed (Wet) audio in the final output.

 For information on audio effects, see “Audio effects” in the online Effects Help.

Using cameras and lights with effects

Some of the After Effects effects, called Comp Camera effects, can use a composition’s camera and lights. These effects include Card Dance, Card Wipe, and Shatter. Some always use the composition camera, while others include light and camera options in the Effect Controls window. Comp Camera effects are characterized with a 3D cube beside their names in the Effect Controls window. When you apply a Comp Camera effect to a layer (2D only), it can track the composition’s camera and light positions and render a 3D image on the 2D layer to which it is applied. (See [“Understanding cameras” on page 268](#) and [“Understanding lights” on page 273.](#))

The effect’s results appear 3D; however, the layer with the Comp Camera effect applied remains a 2D layer and consequently has the following characteristics:

- 3D layers above and below it in the Timeline window cannot interact with one another.
- It can be relocated anywhere in the Timeline window’s stacking order.

- It cannot interact with other Comp Camera effects, 3D layers, or shadows.
- The image is rendered on the layer, not the composition. So, make sure you apply Comp Camera effects to layers that are the same size as the composition and are exactly centered in the composition.


Using Adobe Photoshop layer styles in After Effects

After Effects supports the following layer styles from Adobe Photoshop: Drop Shadow, Inner Shadow, Bevel/Emboss, Inner Glow, Outer Glow, and Solid Fill. If you apply layer styles in Adobe Photoshop and then import the file into After Effects, the styles are also imported; however, not all options in each style are transferred over. You can edit the styles in the Effect Controls window.


Using keying effects

After Effects includes several different effects that key out, or make transparent, parts of an image. Each effect is called a *key*, and the color specified for transparency is called the *key color*. A key locates pixels in an image that match the specified key color and makes them transparent or semitransparent, depending on the type of key. When you place a layer over another layer using transparency, the result forms a *composite*, in which the background is visible wherever the first layer is transparent, making the first layer appear to be part of the background.

After Effects creates an *alpha channel* for identifying areas in an image that are partially or completely transparent. The view of an image in its alpha channel is often called the *matte view*. The matte represents opaque, transparent, and partially transparent areas as white, black, and gray, respectively. (See [“Importing footage containing an alpha channel” on page 46.](#))

 For information on using the keys included with After Effects, see “Keying effects” in the online Effects Help.


You often see composites in movies, for example, when an actor appears to dangle from a helicopter or float in outer space. To create this effect, the actor is filmed in an appropriate position against a color screen. The color screen is then *keyed out* and the actor’s scene is composited over the background footage item.

 For satisfactory keying results, start with the highest-quality materials you can gather, such as film that you scan and digitize. If appropriate for your footage, strive for lighting that is constant for the duration of the color-screen scene. Use footage files with the least amount of compression. Files with *lossy* compression, especially DV and Motion JPEG files, discard subtle differences in blue. These differences may be necessary to create a good matte from a bluescreen.

Adjusting keying controls on a single frame

For evenly lit bluescreen footage, adjust keying controls on only one frame. Choose the most intricate frame of the scene, one involving fine detail such as hair and transparent or semitransparent objects, such as smoke or glass. If the lighting is constant, the same settings you apply to the first frame are applied to all subsequent frames.

If lighting changes, you may need to adjust keying controls for other frames. Place keyframes for the first set of keying properties at the start of the bluescreen scene. If you are setting keyframes for one property only, use Linear interpolation. For footage that requires keyframes for multiple interacting properties, use Hold interpolation. (See [“Hold interpolation” on page 150.](#))

 If you set keyframes for keying properties, you may want to check the results frame by frame. Intermediate keying values may appear, producing unexpected results.

Using a background color

To help you view transparency, temporarily change the background color of the composition, or include a background layer behind the layer you are keying out. As you apply the key to the layer in the foreground, the composition background (or a background layer) shows through, making it easy to view transparent areas.

Working with binary keys

The simplest type of key is the binary key, which creates pixels that are either transparent or opaque. Pixels that match the specified key color are made transparent; those that don't match remain opaque. Because binary keys do not create semitransparent pixels, they are best for solid objects with sharp, defined edges, such as titles or credits, or for footage items with a solid color background and no changes in background lighting.

Working with linear keys

Linear keys create a range of transparency across an image. A linear key compares each pixel in the image to the key color you specified. If the color of a pixel closely matches the key color, it becomes completely transparent. Pixels that don't match as well are made less transparent, and pixels that don't match at all remain opaque. The range of transparency values, therefore, forms a linear progression.

Working with matte tools

Once you have used a key to create transparency, use matte tools to remove traces of key color and create clean edges. The Professional edition includes the following matte tools: Simple Choker, Matte Choker, Alpha Levels, and Spill Suppressor.

Using a garbage matte

A garbage matte is merely a portion of a bluescreen scene that contains only the subject that you need. The remainder of the scene, which may contain undesired objects, is not important and is masked out. The keyed subject can be placed in another scene for still sequences or simple effects.

To create a garbage matte:

- 1 Use the Mask Tool to roughly outline a subject in bluescreen footage.
- 2 Apply one or more keys to mask out the remainder of the bluescreen scene.
- 3 Apply matte tools as necessary to fine-tune the matte.

Using a hold-out matte

A hold-out matte (also known as a hold-back matte) is a duplicate of the layer you have keyed. The hold-out matte, however, is masked to include only the area of the image containing the key color that you want to preserve as opaque. The hold-out matte is then placed directly on top of the keyed layer; when rendered, the hold-out matte prevents the area from becoming transparent.

Typically, you would create a hold-out matte for only one or two frames, when the subject is in a particular position that makes the color visible. Hold-out mattes are not recommended for preserving color for longer periods of time because the effect may become more obviously visible.



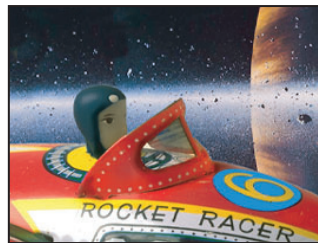
A



B



C



D

Example of using a hold-out matte **A.** Original bluescreen image. The number's background is also blue. **B.** After keying, the number's background is also transparent. **C.** Hold-out matte containing the part of the image you want to remain opaque **D.** When the hold-out matte is placed on top of the keyed image, the number's background is now opaque.

To create a hold-out matte:

- 1 Apply any Transform property keyframes to the original layer containing the color screen.
- 2 Duplicate the layer containing the color screen.
- 3 In the original, apply keys and matte tools to create transparency.
- 4 In the copy, find the frame that contains the area you want to preserve, and then use the Mask Tool to mask out everything in the image except the area you want to preserve.
- 5 Make sure that the copy (the hold-out matte) is positioned directly on top of the keyed layer and contains exactly the same keyframes with the same values. Then render the movie.

Sequencing and combining keys

When creating transparency in footage, you may need to try different keys before you are satisfied with the results. You can also combine two or more keys or matte tools. Because keys are treated as effects, you can easily turn them on or off by clicking the Effect option to the left of the effect name in the Effect Controls window or in the Timeline window. Use the following recommendations for combining keys for specific types of footage items:

- To create transparency in well-lit footage shot against a bluescreen or greenscreen, start with the Color Difference Key. Add the Spill Suppressor to remove traces of the key color, and then use one or more of the other matte refinement tools, if necessary. If you are not satisfied with the results, try starting again with the Linear Color Key.
- To create transparency in footage shot against multiple colors or to create transparency in unevenly lit footage shot against a bluescreen or greenscreen, start with the Color Range key. Add the Spill Suppressor and other tools to refine the matte. If you are not completely satisfied with the results, try starting with or adding the Linear Color Key.
- To create transparency in dark areas or shadows, use the Extract Key on the Luminance channel.
- To make a static background scene transparent, use the Difference Matte Key. Add the Simple Choker and other tools as needed to refine the matte.

3D Compositing

Understanding 3D

After Effects can display layers in two dimensions (x, y) or three dimensions (x, y, z). When you specify a layer as three-dimensional (3D), After Effects adds the z axis, which provides control over the layer's depth. As you increase the z value, the layer moves farther away in space; as you decrease it, the layer moves closer. Using three dimensions lets you create layers that more realistically reflect light, cast shadows, and move through space.



A conventional After Effects 2D image (left) and an image with 3D properties (right)

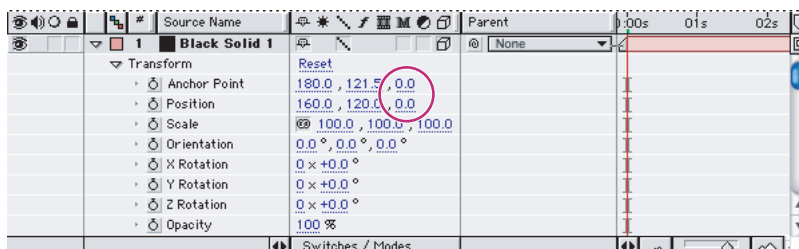
You can specify any layer, except an adjustment layer, as 3D. You can also create and animate camera and light layers to view or illuminate 3D layers from any angle. Though you can import composited files with 3D information into After Effects, you cannot manipulate the objects of those files nor can you create models within the program.

Working with 3D layers

After Effects 3D layers are two-dimensional rectangles that you can move in three dimensions. By default, they are at 0 on the z axis.

Designating a 3D layer

Designating a layer as 3D activates the additional layer properties: Position (z), Anchor Point (z), Orientation, X Rotation, Y Rotation, Z Rotation, and Material Options. Material Options specify how the layer interacts with light. (See [“Understanding 3D layer material options” on page 264.](#))



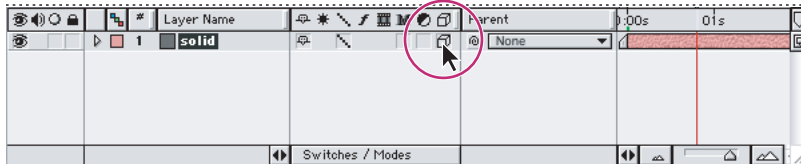
z-axis values highlighted



To designate a layer as 3D:

Do one of the following:

- In the Timeline window, click the 3D layer switch for the layer.

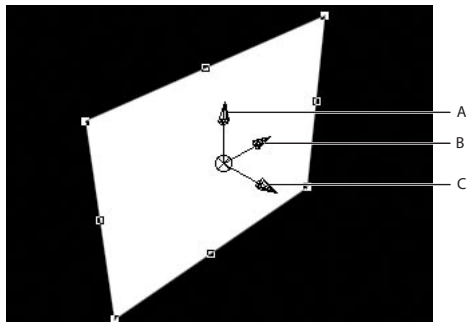


3D layer switch

- Select the layer, and choose Layer > 3D Layer.

Moving a 3D layer in the Composition window

In the Composition window, 3D layers appear with three axes. Axes are color coded: red arrows control the x axis, green arrows control the y axis, and blue arrows control the z axis. You can control the layer's location by dragging an axis with either the selection or rotation tool. Changing the position moves the layer along an axis; changing the angle (rotation) pivots the layer on its anchor point around the axis. The Info palette updates to show the coordinates of the layer you are adjusting.





3D layer axes in the Composition window **A.** y axis **B.** x axis **C.** z axis

You can also move 3D layers by dragging the layers in the Composition window. Dragging from the center of a layer using the selection tool moves the layer within the camera's plane of view. Dragging a layer handle using the rotation tool constrains the rotation to a particular axis.

Note: The axis along which you can drag a layer depends on the composition 3D view. (See ["Using 3D views" on page 265.](#))

To adjust the position, orientation, or rotation of a 3D layer in the Composition window:


- 1 Select the 3D layer you want to move.
- 2 In the Tools palette, do one of the following:
 - To adjust position, click the selection tool .
 - To adjust orientation or rotation, click the rotation tool , and choose either Orientation or Rotation from the Set pop-up menu.

3 In the Composition window, do one of the following:

- Using the selection or rotation tool, drag an axis or anywhere on the layer. You can drag the pointer outside the Composition window.
- Using the rotation tool, drag a layer handle. If you drag a corner handle, the layer rotates along the z axis; if you drag a left or right center handle, the layer rotates along the y axis; if you drag a top or bottom center handle, the layer rotates along the x axis.


Note: To quickly move a layer axis, or to rotate a layer in constrained, 45-degree increments, hold down Shift while dragging.

To move the anchor point in 3D space using the axes:

- 1 Select a 3D layer.
- 2 In the Tools palette, click the pan behind tool .
- 3 In the Composition window, position the pointer over the center of the axes, and drag.

Note: This procedure also adjusts the layer position relative to the composition so that the layer remains where it was before you moved the anchor point. To move the layer relative only to the anchor point, hold down Alt (Windows) or Option (Mac OS) while dragging the x, y, or z axis in the Composition window.

To show a wireframe representation of the layer movement:

In the Timeline window, click the Disable Dynamic Preview button . (See [“Using Dynamic Preview” on page 276.](#))

To show or hide the axes:

- 1 Activate the Composition window that contains the axes you want to show or hide.
- 2 In the Timeline window, select the layer whose axes you want to show or hide.
- 3 Choose View > Show Layer Controls or View > Hide Layer Controls.

Note: Hiding the axes also hides such layer controls as the camera and light wireframe icons, layer handles, and the point of interest.

Understanding Z scale

Usually, scaling a layer's z axis has no effect on the layer because the layer itself has no depth. To add depth, you can change the position of the layer's anchor point or establish a parenting relationship with other layers. Once you add depth, scaling the layer's z Scale value appears to change the layer's position.

Understanding 3D rotation

You can adjust 3D rotation two ways: by changing a layer's Orientation values or changing its X, Y, and Z Rotation values. You can use the rotation tool to change Orientation or X, Y, or Z Rotation values.

When you animate any of a 3D layer's Orientation values, the layer moves along the shortest possible rotational path in 3D space, creating natural and predictable rotations. You can smooth this path by changing the spatial keyframe interpolation to Auto Bezier. (See [“Changing the interpolation method” on page 151.](#))

When you animate any of a 3D layer's X, Y, or Z Rotation values, the layer rotates along each individual axis. You can adjust the number of rotations, as well as the angle of rotation. You can also add keyframes to the layer's rotation on each axis individually. Animating using these properties allows for more keyframing options than the Orientation property does, but also may result in motion that is less predictable. This property is useful for creating rotations with multiple revolutions along a single axis.

To specify what values the rotation tool affects:

In the Tools palette, select the rotation tool, and choose either Rotation or Orientation from the Set menu.

Understanding 3D layer order

When you move 3D layers behind or in front of each other in the Composition window, their Timeline window order does not change. You can use additional views, available from the 3D View menu, to determine the actual position of the 3D layers in the Composition window. (See [“Using 3D views” on page 265.](#))

The layers' order in the Composition window determines how After Effects applies blending modes. When you use the Standard 3D rendering plug-in, blending modes affect only the layers behind the layer to which you applied the blending mode. When you use the Advanced 3D rendering plug-in, the blending mode is applied pixel-by-pixel depending on which layer is in front. (See [“3D rendering” on page 276.](#))

Layer order in the Timeline window specifies how After Effects applies track mattes—they always affect layers that are adjacent in the Timeline window. When you apply a shadow to a 3D layer that has a track matte, the shadow may not appear as expected. To ensure that the shadow remains where expected, precompose (but don't collapse) the composition between applying the track matte and applying the shadow.

Combining 2D and 3D layers

Compositions can contain both 2D and 3D layers. However, lights and shadows cast by 3D layers do not affect 2D layers. The position of 2D and 3D layers may affect how After Effects renders the composition. (See [“3D rendering” on page 276.](#))

Using effects with 3D layers

Though all After Effects effects are 2D effects, you can apply them to any 3D layer except lights and cameras.

With some effects, called Comp Camera effects, you can use the active composition camera or lights to view or light an effect from various angles in order to simulate more sophisticated 3D effects. (See [“Using cameras and lights with effects” on page 255.](#))

Note: Because effects are 2D, effects that appear to cause protrusions in a layer, such as *Bulge* or *Wave Warp*, don't have z space values and don't let you view layers through a camera. So, when you rotate a layer with those effects applied and view it from the side, the effect does not protrude into 3D space.

Using masks with 3D layers

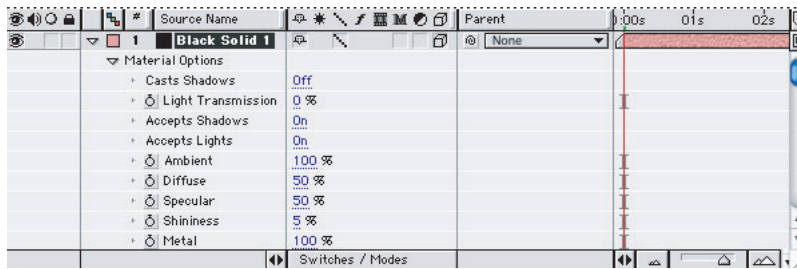
You can draw a mask on any 3D layer in After Effects. The mask coordinates correspond to the layer coordinates in 2D space. However, the mask itself has no 3D properties except those of the layer itself, so you cannot draw a mask along the z axis. However, once you've drawn the mask on the layer, the entire layer can be animated along the z axis.

Note: Applying masks or effects to a collapsed 3D composition may make it behave like a 2D layer. To avoid this, turn off the Collapse switch in the Timeline window.

Understanding 3D layer material options

In the Timeline window, 3D layers have an additional set of properties called Material Options. These determine how a 3D layer interacts with light and shadow, both of which are important components of realism and perspective in 3D animation.

Shadows cast by continuously rasterized 3D layers (including text layers) are not affected by effects applied to that layer. If you want the shadow to show the results of the effect, precompose the layer with the effect before adding the shadow.



3D layer material options

To specify material options properties:

- 1 In the Timeline window, expand a 3D layer, and then expand Material Options.
- 2 Select any of the following options:

Casts Shadows Casts a shadow on layers within the range of that shadow. The direction and angle of the shadows are determined by the direction and angle of the light sources. Set Casts Shadows to Only if you want the layer to be invisible but still cast a shadow. Use the Only setting along with Light Transmission to project the colors from the invisible layer onto a visible layer.

Note: To cast a shadow, select the Casts Shadows option for both the shadow-casting layer and the corresponding light.

Light Transmission Specifies the percentage of light that shines through a layer. Use this option to make layers act like transparencies and cast their color on another layer. You can also create the effect of light passing through stained glass by placing a light behind a 3D layer and adjusting the light transmission. A light transmission value of 0 casts a black shadow and specifies that no light passes through the layer. This setting renders faster; use it if you don't want to cast a colored shadow or if you want previews to render quickly. A value of 100 specifies that the full color value of the shadow-casting layer is projected on the layer accepting the shadow.

Accepts Shadows Shows the shadow cast on this layer by another layer.

Accepts Lights Specifies that the layer is shaded using the light that reaches it. Turn this off if you don't want the light to change the color of the layer. If you turn this off, the layer can still accept and cast shadows.

Ambient Specifies the level of ambient (nondirectional) reflectivity of the layer. A value of 100% creates the most reflectivity; a value of 0% creates no ambient reflectivity.

Diffuse Specifies the level of diffuse (omnidirectional) reflectivity of the layer. Applying diffuse reflectivity to a layer is like draping a dull, plastic sheet over it. Light that falls on this layer reflects equally in all directions. A value of 100% creates the most reflectivity; a value of 0% creates no diffuse reflectivity.

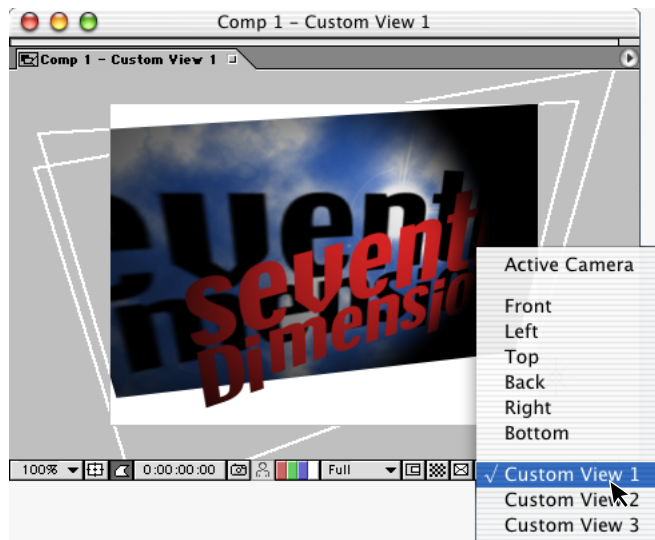
Specular Specifies the level of specular (directional) reflectivity of the layer. Specular light reflects from the layer as if from a mirror. A value of 100% creates the most reflectivity; a value of 0% creates no specular reflectivity.

Shininess Specifies the size of the specular highlight. This value is active only if the Specular setting is greater than zero. A value of 100% produces a reflection with a small specular highlight. A value of 0% produces a reflection with a large specular highlight.

Metal Specifies the color of the specular highlight. A value of 100% specifies that the color is the color of the layer. For example, with a Metal value of 100%, an image of a gold ring reflects golden light. A value of 0% specifies that the color of the specular light is the color of the light source. For example, a layer with a Metal value of 0% under a white light has a white highlight. (If you are using OpenGL, the Metal value is temporarily set to zero during an interactive preview.)

Using 3D views

You can view your 3D layers from several angles, using orthogonal views or custom views that employ perspective. The orthogonal views (Front, Back, Left, Top, Right, and Bottom) show a layer's position in the composition but do not show perspective.



3D views

The three custom views place you at a certain height and angle within the composition, depending on the view you choose. Adjust your angle and height within custom views with the camera tools. (See [“Using the camera tools” on page 271.](#))

Setting and adjusting views

You can change views as often as you want, to see the layers from different angles. You can also choose to look at selected layers or all layers. When you do this, After Effects repositions the camera and its point of interest to include the layers in its view.



To view the keyboard shortcuts for setting views and other After Effects features, see [“Keys for viewing windows” on page 382.](#)

To set a 3D view:

Do one of the following:

- Choose a view from the 3D View pop-up menu at the bottom right of the Composition window.
- Choose View > Switch 3D View, and choose a view from the menu.
- Choose View > Switch to Last 3D View.

To see layers that are not visible in the active view:

Choose View > Look at All Layers.

To see selected layers:

Choose View > Look at Selected Layers.

To set or replace 3D view shortcuts:

Choose View > Set 3D View Shortcut > Replace *n*, where *n* is a view you want to replace. After Effects replaces the view shown in the menu with the current-composition 3D view.

To toggle among 3D views:

Do one of the following:

- To toggle among the three 3D view shortcuts in the View > Set 3D View Shortcut menu, press F10, F11, or F12 to display the first, second and third view, respectively.
- To switch to the previous 3D view, press Esc.

Using multiple views

You can create multiple composition view windows for 3D and 2D layers. You can add views to any composition or use a built-in multiple-view workspace. Opening multiple views helps you to monitor how a change appears in other views (especially in 3D), more accurately place images, and more comprehensively visualize how your images animate.

You can open as many views of your composition as you want, and each view can have a different region of interest and a different magnification. You can also make the current multiple view conform to a saved workspace or save your views as a custom workspace. When you use 3D layers, each view is labeled according to the composition name and the 3D view chosen in the 3D View menu.

To set initial multiple views for current and future compositions:

Do one of the following:

- Choose Window > Workspace > Two Comp Views or Four Comp Views.
- Right-click (Windows) or Control-click (Mac OS) the Composition window, and choose Apply Workspace > Two Comp Views or Four Comp Views.

Note: You can change any view to Two Comp Views or Four Comp Views at any time.

To add a new view to a multiple-view layout:



- 1 Click a Composition window, and choose View > New View.
- 2 Do one of the following:
 - If you are working in 3D, choose a new 3D view from the 3D View pop-up menu at the bottom of the Composition window.
 - If you are working in 2D or 3D, choose a new magnification view or define a region of interest for the new view. (See [“Changing the region of interest” on page 85.](#))
- 3 Position the windows as desired by moving them around the desktop or dragging the tabs to one central Composition window and nesting them.

Note: Before After Effects creates new views, it opens closed views that were part of a saved workspace.

To return to a single composition view:

Choose Window > Workspace > One Comp View.

To change view properties for all open views:

- 1 Click a Composition window.
- 2 Do one of the following:
 - To display the magnification level, RGBA channels, safe zones, transparency grid, or Layer Wireframe mode in all open views, Ctrl-click (Windows) or Command-click (Mac OS) the corresponding button or menu in the Composition window.
 - To display the grids, Shift+Ctrl-click (Windows) or Shift+Command-click (Mac OS) the Title-Action Safe button .
 - To switch all views to Transparency Grid, Ctrl-click (Windows) or Command-click (Mac OS) the View Transparency Grid button  at the bottom of the Composition window.

To set view preferences so all views close at once:

- 1 Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS).
- 2 Select Close Multiple Views Simultaneously, and click OK.

Note: To override this preference, hold down Alt (Windows) or Option (Mac OS) as you close a composition.

Conforming multiple views to workspaces

When you conform a view to a saved workspace, After Effects converts all 3D views to views available in the saved workspace. Views from the current workspace that don't exist in the saved workspace are renamed "Active Camera." For example, if the current workspace contains Camera 2, Top, and Left views, and you conform it to a saved workspace that lacks a Camera 2 view, After Effects names the new views Active Camera, Top, and Left. If no 3D elements are in a composition, the standard 2D view is applied upon conversion. (See ["Customizing the workspace" on page 23.](#))

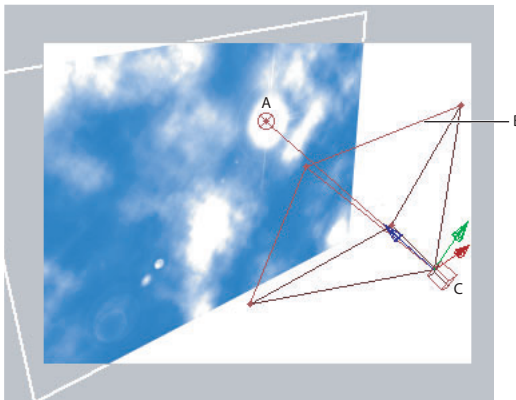
To conform all windows to a saved workspace:

Choose Window > Workspace, and then choose the name of the workspace.

Understanding cameras

You can view After Effects 3D layers from any number of angles and distances using layers called cameras. When you set a particular camera view for your composition, you look at the layers as though you were looking through that camera. You can choose between viewing a composition through the Active Camera or through a named custom camera. The Active Camera is the topmost camera in the Timeline window at the current time. After Effects uses the Active Camera view when creating final output and when nesting compositions. If you have not created a custom camera, then the Active Camera is the same as the default composition view.

Though you can add multiple cameras to any composition, the camera's views affect only 3D layers, or 2D layers to which you've applied a Comp Camera effect. (See ["Using cameras and lights with effects" on page 255.](#)) Cameras can be both a parent and child to 2D and 3D layers.



Example of a camera **A.** Point of interest **B.** Frame **C.** Camera

Note: If you import or open an After Effects 5.x project containing a 3D composition that used a default camera, After Effects 6.0 adds an AE 5.x Default Camera to the composition.

Creating and using cameras

You can animate cameras along the *x*, *y*, and *z* axes. Each custom camera has its own set of properties, which include varying focal lengths, apertures, and focus distances. Using these properties, you can create custom cameras that simulate a large range of real cameras. For information on using a camera's point of interest, see [“Understanding point of interest” on page 275](#).

All of the cameras that you create are listed in the View list, located at the bottom of the Composition window, where you can access them at any time.

To create a camera:

- 1 Select either the Timeline or Composition window.
- 2 Choose Layer > New > Camera.
- 3 Adjust settings. (See [“Understanding camera settings” on page 269](#).)

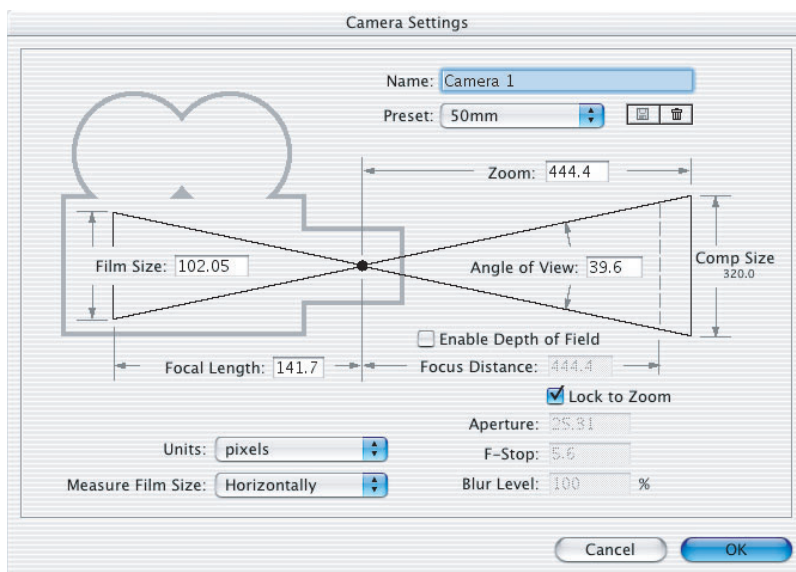
To change the camera used in the view:

Choose a camera from the 3D View pop-up menu at the bottom right of the Composition window.

Note: You can include specific layers in a camera view by using the View commands. (See [“Setting and adjusting views” on page 266](#).) The Look At Selected Layers command changes the position of the camera view but does not change the angle or direction of view.

Understanding camera settings

You can set up cameras in After Effects to simulate the capabilities of real-world cameras. Use camera settings to configure the camera view to match the settings you use to record video footage or to look at the footage from a new perspective. You can change camera settings at any time.



Specify camera settings in the Camera Settings window.

To change a camera's settings:

- 1 Select the camera, and choose Layer > Camera Settings.
- 2 Specify any of the following settings:

Name Specifies the name of the camera. By default, After Effects assigns the name Camera 1 to the first camera you create in a composition, and all subsequent cameras are numbered in ascending order. If you delete a camera, and are still using the After Effects default naming convention, After Effects names the next camera you create with the lowest available number. You should choose distinctive names for multiple cameras to make it easier to distinguish them.

Preset Specifies the type of camera settings you want to use. Cameras come with several presets. The presets are named according to focal lengths. Each preset is meant to represent the behavior of a 35mm camera with a lens of a certain focal length. Therefore, the preset also sets the Angle of View, Zoom, Focus Distance, Focal Length, and Aperture values. The default preset is 50mm. You can also create a custom camera by specifying new values for any of the settings.

Zoom Specifies the distance from the position of the camera to the image plane.

Angle of View Specifies the width of the scene captured in the image. The Focal Length, Film Size, and Zoom values determine the angle of view. A wider angle of view creates the same effect as a wide-angle lens.

Enable Depth of Field Applies custom variables to the Focus Distance, Aperture, F-Stop, and Blur Level settings. Using these variables, you can manipulate the depth of field to create more realistic camera-focusing effects. (The depth of field is the distance range within which the image is in focus. Images outside the distance range are blurred.)

Focus Distance Specifies the distance from the camera's position to the plane that is in perfect focus.

Aperture Specifies the size of the lens opening. The Aperture setting also affects the depth of field—increasing the aperture increases the depth of field blur. When you specify new values for Aperture, the values for F-Stop change dynamically to match it.

F-Stop Represents the ratio of the focal length to aperture. Most cameras specify aperture size using the f-stop measurement; thus, many photographers prefer to set the aperture size in f-stop units. When you specify new values for F-Stop, the values for Aperture change dynamically to match it.

Blur Level Controls the amount of depth-of-field blur in an image. A setting of 100% creates a natural blur as dictated by the camera settings. Lower values reduce the blur.

Film Size Specifies the size of the exposed area of film, which is directly related to the composition size. When you specify new values for Film Size, the Zoom value changes to match the perspective of a real camera.




Focal Length Specifies the distance from the film plane to the camera lens. In After Effects, the camera's position represents the center of the lens. When you specify new values for Focal Length, the Zoom value changes to match the perspective of a real camera. In addition, the Preset, Angle of View, and Aperture values change accordingly.

Units Specifies the units of measurement in which the camera setting values are expressed.

Measure Film Size Specifies the dimensions used to depict the film size.

Note: When you change camera settings, you may lose the lock between Focus Distance and Zoom. To ensure that Focus Distance and Zoom remain locked, add an expression to the Focus Distance property in the Timeline window: Select the Focus Distance property, and choose Animation > Add Expression; then drag the expression pick whip to the Zoom property.

Using the camera tools

Use the camera tools to adjust the camera view. Use the orbit camera tool  to rotate the current 3D view around the point of interest. Use the track xy camera tool  to adjust the 3D view horizontally or vertically. Use the track z camera tool  to adjust the 3D view along the line leading to and from the point of interest or, if you are using an orthogonal view, to adjust the scale of the view. These tools are specifically for manipulating the 3D views and do not become active until you create a 3D layer, a camera, or a light.

To adjust a view using the camera tools:

- 1 In the Tools palette, select the camera tool you want to use. (Hold down the mouse button on a camera tool to see all the available tools.)
- 2 In the 3D View pop-up menu, choose the view you want to adjust.
- 3 Drag in the Composition window. You can drag outside the window once you've begun dragging within it.

Using axes modes

Axes modes specify on which set of axes the layer, light, or camera is transformed. You can transform a layer on any of the following modes:




Local Axis mode Aligns the axes to the surface of a 3D layer.

World Axis mode Aligns the axes to the absolute coordinates of the composition. Regardless of the rotations you perform on a layer, the axes always represent 3D space relative to the 3D world.

View Axis mode Aligns the axes to the view you have selected. For example, suppose that a layer has been rotated and the view changed to a custom view. Any subsequent transformation made to that layer while in View Axis mode happens along the axes corresponding to the direction from which you are looking at the layer.

Note: The camera tools always adjust along the view's local axes, so their action will not be affected by the axes modes.

To change axes modes:

In the Tools palette, click the icon for one of the following modes: Local Axis mode , World Axis mode , or the View Axis mode .

Importing camera data from Maya files

You can import camera data from Maya project files (.ma) and work with the data as a single composition or two compositions. Ensuring that the camera data is *baked* makes keyframing easier down the line.

By default, After Effects treats linear units specified in the Maya file as pixels.

Working with Maya camera data

For each Maya file you import, After Effects creates either one or two compositions, as follows:

- If the Maya project has a square pixel aspect ratio, After Effects creates a single, square-pixel composition containing the camera data and transformations.
- If the Maya project has a nonsquare pixel aspect ratio, After Effects creates two compositions. The first composition, which has a filename prefixed by *Square*, is a square-pixel composition containing the camera data. The second, or *parent*, composition is a nonsquare-pixel composition that retains the dimensions of the original file and contains the square-pixel composition.

When you import a Maya file with a 1-node camera, After Effects creates a camera in the square-pixel composition that carries the camera's focal length, film size, and transformation data. When you import a Maya file with a 2-node or targeted camera, After Effects creates a camera and an additional parent node in the square-pixel composition. The parent node contains only the camera's transformation data.

When working with imported camera data, use 3D layers and square-pixel footage in the square-pixel composition, and use all nonsquare footage in the parent composition.

Note: *After Effects reads only the rendering cameras in Maya files and ignores the orthographic and perspective cameras. Therefore, always generate a rendering camera from Maya, even if it's the same as the perspective camera.*

Baking Maya camera data

Before importing Maya camera information, you need to *bake* it. Baking places a keyframe at each frame of the animation. You can have 0, 1, or a fixed number of keyframes for each camera or transform property. For example, if a property is not animated in Maya, either no keyframes are set for this property or one keyframe is set at the start of the animation. If a property has more than one keyframe, it must have the same number as all of the other animation properties with more than one keyframe.

Reduce import time by creating or saving the simplest Maya file possible. In Maya, reduce keyframes by deleting static channels before baking, and save a version of the Maya project that contains the camera animation only.

Note: *The following transformation flags are not supported: query, relative, euler, objectSpace, worldSpace, worldSpaceDistance, preserve, shear, scaleTranslation, rotatePivot, rotateOrder, rotateTranslation, matrix, boundingBox, boundingBoxInvisible, pivots, CenterPivots, and zeroTransformPivots. After Effects skips these unsupported flags, and no warnings or error messages appear.*

Importing camera data from RLA or RPF files

After Effects imports camera data saved with RLA or RPF sequence files. That data is incorporated into a camera layer that After Effects creates in the Timeline window. You can access the camera data of an imported RLA or RPF sequence and create a camera layer containing that data.

To create a camera layer using RLA or RPF data:

- 1 Place the imported sequence in the Timeline window, and then select the sequence.

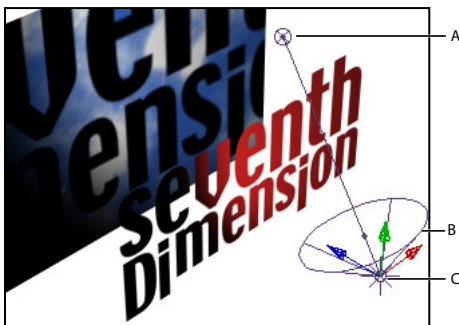
2 Choose Animation > Keyframe Assistant > RPF Camera Import.

Note: To create an RLA or RPF file with the camera data in 3D Studio Max, save your rendering in RPF format with Coverage, Z Depth, and Alpha Channels enabled.

Understanding lights

Lights are layers that shine light on other layers. You can choose among four different types of lights and modify them with varying settings. Lights, by default, point to the point of interest. For information on the point of interest, see [“Understanding point of interest” on page 275](#).

You can specify which 3D layers a light affects by designating the light as an adjustment layer—place the light in the Timeline window above the layers on which you want it to shine. Layers that are above a light adjustment layer in the Timeline window do not receive the light, regardless of the light's position. 3D adjustment layers have a subtle effect. You can rotate them and work with them in 3D, but they do not allow 3D layers lower in the Timeline window to intersect. (For information on adjustment layers, see [“Creating an adjustment layer” on page 94](#).)



Parts of a light A. Point of interest B. Spotlight cone C. Light

Creating and setting up lights

You can create Parallel, Spot, Point, and Ambient lights. You can animate all of a light's settings, except for Casts Shadows.

Note: To make a layer display a shadow, select the *Accepts Shadows* layer material option. (See [“Understanding 3D layer material options” on page 264](#).)

To create a new light:

1 From the Timeline or Composition window, choose Layer > New > Light.

2 In the Light Settings dialog box, specify any of the following settings:

Light Type Parallel light rays emanate directional, unconstrained light from an infinitely distant source. A Spot light emits light from a source that is constrained by a cone, like the spotlight used in stage productions. A Point light emits unconstrained omnidirectional light, like the rays emitted from a bare light bulb. Ambient light has no source but rather contributes to the overall brightness of a scene and casts no shadows.

Intensity Sets the brightness of the light. Negative values create *nonlight*. Nonlight subtracts color from a layer. For example, if a layer is already lit, creating a directional light also pointing at that layer and employing negative values creates an area of negative light, or a dark area, on the layer.

Cone Angle Sets the width of the Spot light by adjusting the angle of the cone surrounding the source. This option is active only if Spot is the Light Type.

Cone Feather Adjusts the edge softness of the Spot light. This option is active only if Spot is the Light Type.

Color Sets the color of the light.

Casts Shadows Indicates whether the light source causes a layer to cast a shadow.

Shadow Darkness Sets the darkness level of the shadow. This option is active only if Casts Shadows is selected.

Shadow Diffusion Sets the softness of a shadow based on its apparent distance from the shadowing layer. Larger values create softer shadows. This option is active only if Casts Shadows is selected.

Understanding 3D auto-orientation

3D layers include auto-orientation options, which you apply to individual layers. When using footage layers, you can use the Orient Toward Camera option to specify that the layer always faces the active camera. (See [“Rotating a layer along a motion path” on page 134.](#))

When using light and camera layers, you can specify any of the following Auto-Orient options:

Off Specifies that the camera or light rotates freely, independent of the motion path or the point of interest.

Orient Along Path Specifies that the camera or light points only in the direction of the motion path. For example, use this option to depict a driver’s perspective while looking at the road ahead as he drives.

Orient Towards Point of Interest Specifies that the camera or light continues to point at the point of interest as you change the camera’s Position values. When you adjust a camera’s or light’s position by dragging the axes in the Composition window, the point of interest moves as well.

To change the Auto-Orientation settings for a camera or light:

- 1 In the Timeline window, select the camera or light, and then choose Layer > Transform > Auto-Orient.

- 2 Select an option from the Auto-Orientation dialog box, and click OK.

Note: If you specify Orient Towards Point of Interest and then change a camera’s Orientation or X, Y, or Z Rotation properties, the camera will be offset by the new values. For example, you could set a camera up this way to depict a passenger’s perspective while looking out the side window of a car as it moves.

To reset a camera's or light's transform properties to default values:

In the Timeline or Composition window, select a camera or light, and choose Layer > Transform > Reset.

Understanding point of interest



Cameras and lights include a *Point of Interest* property that specifies the point in the composition at which the camera or light points. By default, the point of interest is set at the center of the composition, and the camera or light's view is automatically oriented toward it. You can move the point of interest at any time.

For more information about cameras, see [“Understanding cameras” on page 268](#). For information about using lights, see [“Understanding lights” on page 273](#).



Before moving a camera, choose a view other than Active Camera so that you can see the point of interest icon and the boundaries defining its angle.

To move a camera, a light, or the point of interest in the Composition window:

- 1 In the Timeline or Composition window, select a camera or light (to select a light, move the current-time indicator to the point in time where the light is active).
- 2 Using the selection or rotation tool, do one of the following:
 - To move the camera, light, or the point of interest, position the pointer over the axis you want to adjust, and drag.
 - To move the camera or light along a single axis without moving the point of interest, drag the axis while holding down Ctrl (Windows) or Command (Mac OS).
 - To move the camera or light freely without moving the point of interest, drag the camera icon .
 - To move the point of interest, drag the point of interest icon .

Using third-party files with depth information

Though After Effects can import third-party files with depth information such as ElectricImage (.eiz) files and .rla file formats, and interpret the z-space channel in those files, it cannot animate individual objects within those files. After Effects treats composited third-party 3D files as a single layer. That layer, as a whole, can be given 3D attributes and treated like any After Effects 3D layer, but the objects contained within that 3D file cannot be manipulated individually. To access the 3D depth information in these files, use the 3D Channel effects (see the online Effects Help).

Previewing 3D

You can speed up preview time by disabling Dynamic Preview Wireframe or using Draft 3D mode. These preview modes reduce the amount of data displayed in a 3D layer so the screen redraws faster. You can also use OpenGL for fast interactive previews (scrubbing) of 3D layers. (See [“Previewing animation” on page 139](#).)

For information on another way of speeding up 3D compositions, see [“Using Wireframe view in the Composition window” on page 30](#).

Using Dynamic Preview

When you disable Dynamic Preview, After Effects displays wireframe representations instead of the actual layer while you move the layer in the Composition window. The layer appears again after you stop moving it.

To enable or disable Dynamic Preview mode:

Click the Disable Dynamic Preview button  in the Timeline window.

To temporarily disable or enable Dynamic Preview mode:

Hold down Alt (Windows) or Option (Mac OS) as you move a layer.

To specify the Dynamic Preview preferences:

Choose Edit > Preferences > Previews (Windows) or After Effects > Preferences > Previews (Mac OS), and select Enable Dynamic Preview.

Working in Draft 3D mode

Draft 3D mode disables all lights and shadows that fall on 3D layers. It also disables the camera's depth-of-field blur.

To enable or disable Draft 3D mode:

Click the Draft 3D mode button  in the Timeline window.

3D rendering

After Effects provides two 3D rendering plug-ins: Advanced 3D and Standard 3D. These plug-ins compute the motion blur, lighting, shadow, and depth-of-field information unique to 3D. By default, After Effects uses the Advanced 3D rendering plug-in to create both RAM previews and output files. The 3D rendering plug-in you specify becomes the default for future compositions.

Rendering order for compositions containing 3D layers is different than for compositions containing only 2D layers. With 2D compositions, After Effects renders layers according to their Timeline window order, from the bottom layer to the top layer. In contrast, After Effects renders 3D layers according to their spatial order in the Composition window, from the most distant layer, or the one with the highest z Position value, to the closest layer, or the one with the lowest z Position value. After Effects renders the X Rotation, Y Rotation, and Z Rotation properties in their descending Timeline window order. When rendering a composition that includes cameras, After Effects renders only the topmost, active camera in the Timeline window.

Rendering compositions containing both 2D and 3D layers

If a composition contains both 2D and 3D layers, After Effects renders the 3D layers in independent, noninteractive groups that are separated by the 2D layers. For example, if the Timeline window contains (from top to bottom) two 3D layers, two 2D layers, and two 3D layers, After Effects renders the composition in the following order:

First The bottom two 3D layers as a set, according to their spatial order in the Composition window.

Second The 2D layers according to their Timeline window order, from bottom to top.

Third The top two 3D layers as a set. These are rendered in a geometric space independent of the 3D layers at the bottom of the Timeline window.

Essentially, the 2D layers split the 3D space into separate universes. The result is that shadows cast by either set of 3D layers do not fall on the other set, and the two sets of 3D layers do not interact geometrically. The two sets of 3D layers do share cameras and lights because these two elements are global to the composition.

Using the Advanced 3D rendering plug-in

By default, After Effects uses the Advanced 3D rendering plug-in. Use this rendering plug-in to render compositions containing intersecting 3D layers. The Advanced 3D rendering plug-in accurately calculates intersecting layers so that they appear to slide through each other naturally instead of to pop from one side to the other. This rendering plug-in also accurately calculates anti-aliasing, motion blur, and blending modes for intersecting layers.

To render shadows, the Advanced 3D rendering plug-in uses shadow maps, which are images rendered from the point of view of each light source. Normally, a shadow's resolution is computed automatically based on the composition resolution and the quality settings (switches). If the normal resolution does not create the quality you want or renders too slowly, you can adjust the shadow map resolution. For example, if shadows are blurry and the Shadow Diffusion material option is set to 0, increase the shadow map resolution. Or, if shadows render too slowly, decrease the shadow map resolution.

Note: If your animation does not include intersections and you do not want to set the shadow map resolution, use the Standard 3D rendering plug-in, which renders more quickly.



Example of a 3D file with intersecting layers rendered with the Standard renderer (left) and the 3D renderer (right)

To use the Advanced 3D rendering plug-in:

- 1 Choose Composition > Composition Settings.
- 2 Click the Advanced tab.
- 3 Choose Advanced 3D from the Rendering Plug-in menu.
- 4 To specify the shadow map resolution, click the Options button and choose an option from the Shadow Map Resolution menu. (These options represent the resolution in pixels. Choose Comp Size or a resolution larger than the composition size for best results.)

Using the Standard 3D rendering plug-in

Use the Standard 3D rendering plug-in if your composition does not include intersecting layers—it may be faster for some compositions, and it creates output of the same quality as the Advanced 3D rendering plug-in.

When rotated layers in animations are angled toward the screen, they can appear with ragged edges if they are not accurately anti-aliased. To smooth out the edges, choose the More Accurate anti-aliasing option in the Standard 3D rendering plug-in.

To use the Standard 3D rendering plug-in:

- 1 Choose Composition > Composition Settings.
- 2 Click the Advanced tab.
- 3 Choose Standard 3D from the Rendering Plug-in pop-up menu.
- 4 To specify anti-aliasing, click Options, and choose one of the following options from the Anti-aliasing menu:

Faster Renders the animation without employing any advanced anti-aliasing, which results in a faster render, but with possibly ragged edges on edge-on animations.

More Accurate Employs advanced anti-aliasing when rendering the animation, which may slow the render time, but will create edge-on animations with smoother edges.

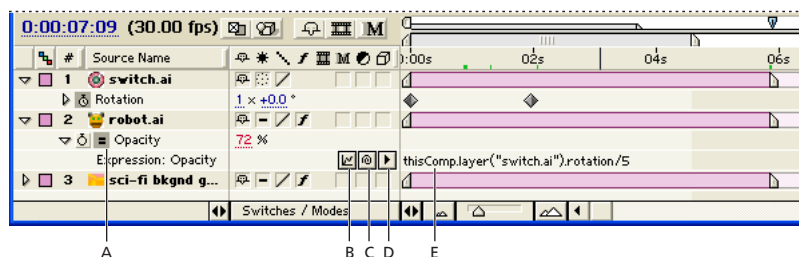
Creating Expressions

Understanding expressions

When you want to create a complex animation, such as car wheels spinning, but would like to avoid creating tens or hundreds of keyframes by hand, try using *expressions* instead. With expressions, you can create relationships between layer properties and use one property's keyframes to dynamically animate another layer. For example, if you set rotation keyframes for a layer and then apply the Drop Shadow effect, you can use an expression to link the Rotation property's values with the Drop Shadow's Direction values; that way, the drop shadow changes accordingly as the layer rotates.

You can use the pick whip to create expressions as well as create them manually.

Important: The parameters for some After Effects effects have changed since After Effects 5.5 was released. If you have existing expressions that use parameter index references rather than parameter names, you may need to make adjustments to the expressions so that the correct parameter is accessed.



Expression options in the Timeline window **A.** On/Off switch **B.** Graph overlay icon **C.** Pick whip **D.** Language elements menu **E.** Expression field

Creating expressions by using the pick whip

Expressions can seem intimidating for those who aren't familiar with scripting or JavaScript. Fortunately, After Effects makes expressions easy to use and easy to learn through the expression pick whip. The pick whip is a tool in the Timeline window that you can drag to connect any two properties. Once you drag the pick whip to a particular property, the expression automatically appears in the expression field in the Timeline window. You can easily learn the syntax and format for expressions by looking at the expressions that the pick whip creates. (See [“Working with the expression pick whip” on page 289.](#))



Creating expressions manually

Expressions are based on the standard JavaScript language; but you do not need to know JavaScript to use expressions. You can create expressions by using simple examples and modifying them to suit your needs or by chaining objects and methods together using the expression elements guide or language menu. So, even if you have no previous experience with JavaScript, you can use expressions to create complex animations that would otherwise require you to generate numerous keyframes. And if you have a basic understanding of JavaScript, you can write expressions that create sophisticated relationships between layer properties.

For information on writing your own expressions, see [“Using the Expression language menu” on page 295](#) and [“After Effects expression elements guide” on page 299](#).




To learn about shortcuts for creating expressions, see the Shortcuts Appendix.

To create an expression:


- 1 Select a property in the Timeline window and choose Animation > Add Expression.

Note: After Effects automatically fills the expression field with a default expression that copies the fixed value of the property or the value of the keyframes (if any).



- 2 Do one of the following:

- Drag the pick whip  to a property in the Timeline window, or to an effect property in the Effect Controls window. If you want, modify the pick whip results.
- Type an expression directly over the existing text. If you want, use the Expression language menu or the elements guide for help with entering properties, functions, and constants.

- 3 Click outside of the expression field or press Enter on the numeric keypad to activate the expression.

Note: If an expression cannot be processed, After Effects displays a message explaining the error and automatically disables the expression. A yellow warning icon  appears next to the expression; click the warning icon to view the error message again.

To temporarily turn an expression off:

- 1 Click the On/Off switch  next to the layer property name on which the expression is written. When an expression is off, a slash appears through the switch .
- 2 Click the switch again to turn the expression back on.

To view all of the expressions on selected layers:

Press EE on the keyboard.

Modifying default expressions

All of your work adding, editing, and writing expressions occurs in the Timeline window. When you add an expression to a layer property, a default expression appears in a text field under the property. Use this field to type new expressions or edit expression variables. Some expressions rely on the names of layers or properties in your project; if you change the name of a layer property that is involved in an expression, the expression may produce an error message.

Working with global objects

All expressions start with a *global object*. Only an attribute or method of the global object can appear in an expression with nothing to the left of it.

The default global object for any expression is the layer on which the expression is written. For example, if you add an expression to the Scale property of a layer named "Layer A" and you want the expression to return Layer A's Position property's values, you can use any of the following expressions, as they are equivalent:

```
thisComp.layer("Layer A").position
```

```
thisLayer.position
```

```
position
```


To retrieve values from an object other than the layer containing the expression, insert the object in the expression. For example, if you write an expression on a layer named "Layer A" and you want to retrieve position values from a layer named "Layer B", use the following expression:

```
thisComp.layer("Layer B").position
```

Resizing the expression field

Expressions can use multiple lines. If you need to increase (or decrease) the size of the expression field, position the cursor on the bottom edge of the expression field; when the cursor turns into a double-pointing arrow ⇅, drag up or down.

Viewing the expression graph

To see how an expression changes the value or velocity graph, click the graph overlay icon . The black graph displays the value or velocity before the expression, and the red graph displays value or velocity after the expression.

Turning on the graph overlay for the Position property also changes the motion path display in the Composition window so that you can see the expression-affected path.

Converting expressions to keyframes

In some situations, it may be useful to convert an expression to keyframes. For example, if you want to freeze the values in an expression for a period of time, you can convert the expression to keyframes and then adjust the keyframes accordingly; or, if an expression takes a long time to evaluate, you can convert it to keyframes so that it renders more quickly. When you convert an expression to keyframes, After Effects evaluates the expression, creating a keyframe at every frame, and then disables the expression.

To convert an expression to keyframes:

In the Timeline window, select the property in which the expression is written and choose Animation > Keyframe Assistant > Convert Expression to Keyframes.

Modifying the values of properties using Expression Controls effects

Use Expression Controls effects to manipulate one or many properties' values in your expressions. These effects provide controls that you can refer to in any expression. A single control can affect several properties at once. You can apply Expression Controls effects to any layer; however, it is useful to apply them to a null layer, which you can simply use as a control layer. You then add expressions to other layers to access that control—you can simply copy and paste the same expression on different layer properties. For example, you can add the Slider effect to a null layer (Null 1), and then copy and paste an expression such as the following to a series of layers in the composition:

```
position+[0,10*(index-1)*thisComp.layer("Null 1").effect("Slider Control")("Slider")]
```

Each of the layers with this expression will animate by a 10-pixel difference ($10 * (\text{index} - 1)$ returns the layer number - 1, times 10, as the starting position value) and uses that as you drag the slider. All you need to do is set keyframes for the slider on the null layer and all the other layers animate accordingly. (For information on applying effects, see [“Applying and controlling effects” on page 249.](#))

To apply Expression Controls

In the Timeline window, select the layer to which you want to add the expression control and choose Effect > Expression Controls > [effect name].

After Effects includes the following Expression Control effects for which you can set keyframes:

Angle Control This control contains a dial that rotates from 0 to 360 and adds rotations. You can adjust the angle control by dragging the dial or dragging the underlined values.

Checkbox Control This control contains a single checkbox that you can click. You can animate this control to start and stop animation at specific intervals.

Color Control This control contains a color swatch and an eyedropper. You can use this effect to control the gradual or sporadic change of colors on one layer or among several layers.

Layer Control This control contains a layer menu that lists all of the layers in the active composition. You cannot add keyframes to this effect.

Point Control This control contains an effect point control. You can use this to perform as a master control for animation in a series of layers.

Slider Control This control contains a slider with a default value range of 0 to 100. To use values that exceed this limit, drag the underlined value above the slider instead. To change the slider range, right-click (Windows) or Control-click (Mac OS) the underlined slider value and choose Edit Value from the menu that appears. Type the new values in the Slider Range text box.

Writing expressions

You can write an expression directly in the expression field in the Timeline window or in any text editor. If you write an expression in a text editor, you can simply copy it and paste it into the expression field.

When writing expressions, keep the following guidelines in mind:

- JavaScript is case-sensitive.
- Semicolons are required to separate statements or lines.
- Spaces between words are ignored.

Note: To write your own expressions, it may help to have some basic knowledge of JavaScript syntax and mathematics. However, once you learn the basic logic behind creating an expression, you can write fairly sophisticated expressions without ever looking at a JavaScript reference guide.

Writing expressions to access values

You use the expression language to access properties in After Effects that have numeric values. To access a value, use a chain of object references separated by the period (.) operator. To chain object references past the layer level (for example, to chain effect properties, masks, or text animators), you can use parentheses. For example, to link the Opacity property in Layer A to the Gaussian Blur's Blurriness property in Layer B, type the following expression in the expression field for Layer A's Opacity property:

```
thisComp.layer("Layer B").effect("Gaussian Blur")("Blurriness")
```

The default object for an expression is the property on which the expression is written, followed by the layer containing the expression; therefore, you do not need to specify the property. For example, a wiggle expression written on a layer's Position property can be either of the following:

```
wiggle (5, 10)
```

```
position.wiggle (5, 10)
```

You do need to include the layer and property when retrieving them from outside the layer and property on which the expression is written. For example, an expression written on Layer B's Opacity property, linking it to Layer A's Position property would read:

```
thisComp.layer(Layer A).position[0].wiggle(5, 10).
```



To visualize how this works, use the pick whip to link one property to another.

Writing an expression using the expression elements guide

To understand the order in which you can add elements to an expression and to learn what the element returns, see the [“After Effects expression elements guide” on page 299](#).

To construct a simple expression that copies position values from one layer to another:

- 1 Create two solid layers: Solid 1 and Solid 2.
- 2 Animate the Position property values for Solid 1.
- 3 Select the Position property for Solid 2 and choose Animation > Add Expression. The following expression appears by default:

```
position
```

- 4 Type the following directly over the word “position”:

```
thisComp
```

5 The element `thisComp` is a global attribute whose value is a Comp object representing the current composition. To determine what can follow `thisComp` in your expression, look up the return value for `thisComp` under [“Global objects” on page 300](#).

6 Note that `thisComp` returns a Comp. Next, look at the [“Comp attributes and methods” on page 303](#) to see which attributes and methods you can use with a Comp. One option is `layer(index)`. The index, or number, inside the parentheses specifies the layer that you want to use. To retrieve values from the second layer in the active composition, type the following:

```
thisComp.layer(2)
```

7 Again, look at the expression elements guide to see that `layer(index)` returns a Layer. Look at [“Layer general attributes and methods” on page 305](#), and find the element you want to use. For example, if you want to access the Position property’s values for the layer, type the following:

```
thisComp.layer(2).position
```

8 From [“Layer general attributes and methods” on page 305](#), you can see that the position attribute returns a property. Look up [“Property attributes and methods” on page 308](#) and notice that you can add a time factor to the expression. To add a specific time, such as current time minus 2 seconds, type the following:

```
thisComp.layer(2).position.valueAtTime(time-2)
```

9 From [“Property attributes and methods” on page 308](#), notice that the `valueAtTime(time)` method returns a Number or Array. When an expression returns a Number, Array, or Boolean (such as true or false), you cannot add further attributes or methods to the expression (if you want, however, you can add operators such as +, -, *, or /).

Saving an expression

Once you have written an expression, you can save it for future use by copying and pasting it into a text-editing application, such as Notepad, Simple Text, or even Stickies. However, because expressions are written in relation to other layers in a project and may use specific layer names, it doesn’t always work to simply save and load expressions into a project. If you want to save an expression for use in another project, you may want to add comments to the expression or save the entire project file so that you can use it as a reference when you reuse the expression.

Note: You can save a favorite effect that includes an expression and use it in other projects, as long as the expression does not refer to properties that don’t exist in the other projects. See [“Saving favorite effects for instant reuse” on page 251](#).

To add comments to an expression:

Do either of the following:

- Type `//` at the beginning of the comment. Any text between `//` and the end of a line is ignored. For example:

```
// This is a comment.
```

- Type `/*` at the beginning of the comment and `*/` at the end of the comment. Any text between `/*` and `*/` is ignored. For example:

```
/* This is a  
multiline  
comment */
```

Editing or adding keyframes on a property containing an expression

After you add an expression to a property, you can continue to add or edit keyframes to the property. The value of a keyframe at the time you create it or edit it is the value it would be without the expression applied. When an expression exists, you can create keyframes by using any of the following methods and the expression will remain valid:

- Click the keyframe box.
- Choose Animation > Add Keyframe.
- Position the cursor between keyframes and choose Edit Keyframe from the menu that appears.

Understanding the expression language

The After Effects expression language is based on JavaScript 1.2, with an extended set of built-in objects. After Effects uses only the core standard JavaScript 1.2 language, not the Web browser-specific extensions. Instead of Web browser extensions, After Effects contains its own set of extension objects such as Layer, Comp, Footage, and Camera that you can use to access most of the values in an After Effects project. (For more information about JavaScript, see a JavaScript reference manual, such as *JavaScript: The Definitive Guide*, by David Flanagan.)

In JavaScript, an array is a type of object that stores several numbers. You can create your own arrays by surrounding a list of numbers with brackets, and separating them with commas, such as the following example:

```
[10, 23]
```

You can assign arrays to a variable, thus making it easy to cross-reference array values in other areas of the expression. Below, the variable `myArray` has been assigned to the previous example:

```
myArray = [10, 23]
```

The number of elements in an array defines its dimension. (See [“Dimensions of arrays” on page 287](#).) Because `myArray` has two elements, it is of dimension 2. You can access the individual elements of an array by using brackets and an index to indicate which element you want. (See [“Indexing vectors and arrays” on page 287](#).) The elements in an array are numbered, starting from 0. Using the previous example, you can access the individual elements as follows:

```
myArray[0] is 10
myArray[1] is 23
```

You can use `[2]` to access the third element of a three-dimensional array; however, if you use `[2]` in a two-dimensional array, After Effects will return an error.

You can combine both types of syntax, using the individual values as well as retrieving specific values using brackets and an index. For example, to use the x value from the previous example as the x value for a new expression, you can use either of the following expressions, as they are the same:

```
[myArray[0], 5]
[10, 5]
```

Many of the properties and methods in the After Effects expression language take arrays as arguments or return them as values. For example, `thisLayer.position` is an array that is either two or three dimensional depending on whether your layer is 2D or 3D. So following the previous example, if you want to write an expression that keeps the y value of an object's animation but fixes the x value at 9, you would write:

```
y = position[1];
[9, y]
```

or even more succinctly:

```
[9, position[1]]
```

This is an important point, so let's look at one more example. If you want to combine the x position value from Layer A with the y position value from Layer B, you would write:

```
x = thisComp.layer("Layer A").position[0];
y = thisComp.layer("Layer B").position[1];
[x, y]
```

You may notice that in After Effects many properties and methods take or return vectors, not arrays. As far as JavaScript is concerned, these are exactly the same thing. From a mathematical point of view, After Effects refers to an array as a vector if it represents either a point or direction in space. For example, After Effects describes `position` as returning a vector.

However, while a function like `audioLevels` does return a two-dimensional value (the left and right channel levels), it is not called a vector because it does not represent a point or direction. Some functions in After Effects accept vector arguments, but they are generally only useful when the values passed represent a direction. For example, `cross(vec1, vec2)` computes a third vector that is at right angles to the input vectors. This is useful when `vec1` and `vec2` are two vectors representing directions in space, but not if they just represent two arbitrary collections of numbers.

Note: In JavaScript, a value stored in an object is called a *property*. However, After Effects uses the term “property” to refer to layer attributes as defined in the Timeline window. Consequently, for clarity, After Effects documentation refers to a JavaScript property as a “method” when the property takes arguments, or an “attribute” when it does not.

Dimensions of arrays

Different properties in After Effects have different value dimensions (1D, 2D, 3D, or 4D) depending on the number of value parameters they have. In the expression language, properties’ values are either single values (numbers) or arrays. Arrays, such as position values, are always enclosed in square brackets and separated by commas; a single value, such as an opacity value, does not use brackets. The following table provides examples of different value dimensions for properties:

Value type	Value dimensions
1D	Rotation ° Opacity %
2D	Scale [x=width,y=height] Position [x, y] Anchor Point [x, y]
3D	Scale [width, height, depth] Position [x, y, z] Anchor Point [x, y, z]
4D	Color [red, green, blue, alpha]

Colors are represented as 4D arrays [r, g, b, a]. Each value in a color array ranges from 0 (black) to 1 (white). For example, red can range from 0 (no color) to 1 (red). So, [0, 0, 0, 0] is black and transparent, and [1, 1, 1, 1] is white and completely solid.

To learn how to select a specific value in a vector or array, such as Position’s y value, see [“Accessing specific values in a vector or array” on page 288](#).

Indexing vectors and arrays

Indexing is a way of retrieving values in vectors and arrays. Vector and array indexing starts from 0—for example, the Position property arrays are indexed as follows:

- `Position[0]` is the x coordinate of position.
- `Position[1]` is the y coordinate of position.
- `Position[2]` is the z coordinate of position.

The Layer, Effect, and Mask elements in After Effects use an indexing process that starts from 1. For example, the first layer in the Timeline window is as follows:

```
layer(1)
```

Generally, it is best to use the name of a layer, effect, or a mask instead of a number to avoid confusion and errors if the layer, effect, or mask is moved, or if the parameters are changed during product updates and upgrades. When you use a name, always enclose it in straight quotes. For example, the first expression below is easier to understand than the second expression, and it will continue to work even if you change the order of effects:

```
effect("Colorama").param("Get Phase From")
```

```
effect(1).param(2)
```

Accessing specific values in a vector or array

You can create an expression that references just one value within the array of a 2D or 3D property. By default, the first value is used, unless you specify otherwise. For example, if you drag the pick whip from layer 1's Rotation property to layer 2's Scale property, the following expression appears:

```
thisComp.layer(2).scale[0]
```

By default, the above expression uses the first value of the Scale property, which is width. If you prefer to use the height value instead, drag the pick whip directly to the second value instead of the property name, or change the expression as follows:

```
thisComp.layer(2).scale[1]
```

Conversely, if you drag the pick whip from layer 2's Scale property to layer 1's Rotation property, After Effects automatically duplicates the expression so that two values are available for the scale. The following expression appears:

```
[thisComp.layer(1).rotation, thisComp.layer(1).rotation]
```

To use a different value as one of the value parameters instead of doubling the one rotation value, remove the duplicate expression and insert a value. For example, to use the rotation value for the scale's height and 10 for the width, you would create the following expression:

```
[thisComp.layer(1).rotation, 10]
```

The value of an expression is the value of the last statement evaluated. For example, in the following expressions, the results are the same:

```
x = rotation * 10; [x, 20]
```

```
[rotation * 10, 20]
```


Understanding expression time

Time within an expression is always measured in seconds. The default time for any expression is the current composition time at which the expression is being evaluated. The following expressions both use the default composition time and return the same values:

```
thisComp.layer(1).position
```

```
thisComp.layer(1).position.valueAtTime(time)
```

To use a relative time, add a time value to the `(time)` argument. For example, to get a value at a time 5 seconds before the current time, use the following expression:

```
thisComp.layer(1).position.valueAtTime(time-5)
```

Understanding expression time in nested comps

Default time references to properties in nested compositions use the original default composition time, not remapped time. However, if you use the `source` function to retrieve a property, the remapped time is used.

For example, if the source of a layer in the parent composition is a nested composition, and in the parent composition you have remapped time, when you access the position values of a layer in the nested composition with the following expression, the position values use the composition's default time:


```
comp("nested comp").layer(1).position
```

However, if you access layer 1 using the `source` function, the position values use the remapped time:

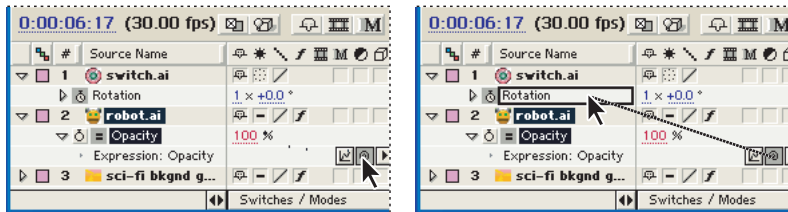
```
thisComp.layer("nested comp").source.layer(1).position
```

Note: If you use a specific time in an expression, After Effects ignores the remapped time.

Working with the expression pick whip


If you are not familiar with JavaScript or the After Effects expressions language, you can still take advantage of the power of expressions by using the pick whip. The pick whip  is a tool that automatically copies values from one layer to another. With the pick whip, there's no need to create keyframes, which can take hours; you simply drag the pick whip from one layer to another, and the animation that you set in the first layer is copied into the second layer.

Use the pick whip to create expressions that link the values of one property or effect to another. For example, link the Rotation property of Layer A to the Rotation property of Layer B to make Layer A's rotation values the same as Layer B's; or link a camera's Point of Interest property to the Position property of another 3D layer to make the camera follow the layer as it moves through space.



Drag the pick whip to a property to create a live link to the values.

To create an expression by using the pick whip:

- 1 Select a property in the Timeline window and choose Animation > Add Expression.
- 2 Drag the pick whip  to another property in the Timeline or Effect Controls window.
- 3 If you want, modify the pick-whip results.

For more information on modifying pick-whip results, see [“Modifying and enhancing pick-whip expressions” on page 291](#).



For information on shortcuts for expressions, see the Shortcuts Appendix.

Selecting values with the pick whip

When you use the pick whip, you can drag it to a property's name or to its values. If you drag to the property's name, the resulting expression displays all the values as one. For example, if you drag the pick whip to the Position property's name, the following expression appears:

```
position
```

If you drag the pick whip to one of the Position property's values (such as the y value), the following expression appears, providing access to the specific arrays:

```
[position[1], position[1]]
```

Once you select a property's name or value, After Effects automatically inserts the appropriate expression in the expression field at the location of the cursor. If text is already selected in the expression field, that text is replaced by the new expression text. If the cursor is not in the expression field, all text in the field is replaced by the new text.

If the layer, mask, or effect name that you drag the pick whip to is not unique, After Effects renames it. For example, if you have two or more masks named "Mask" and you drag the pick whip to one of them, After Effects renames it "Mask 2."

Modifying and enhancing pick-whip expressions

Once you use the pick whip to create an expression, you can perform simple edits to alter the expression's effect. For example, you can add a scale factor to the expression to increase or decrease the effect. To edit a pick-whip expression, type directly in the expression field, and then press Enter on the numeric keypad or click outside of the field to activate it.

You can modify a pick-whip expression by using simple math operations, such as those listed in the following table:

Symbol	Function
+	add
-	subtract
/	divide
*	multiply
*_1	perform opposite of original, such as counterclockwise instead of clockwise

Using increasingly complex math functions provides an increasingly higher degree of flexibility. For example, you could use the math function `/360*100` to change an expression's range from 0-360 to 0-100. This would be useful if you wanted to convert the values of a 360-degree dial to a slider that is measured in percentages.

Using the compact English language preference

You can specify the way the pick whip formats expressions. By default, the pick whip creates compact English expressions, which use the Timeline window's name for the properties within an expression. Because these names are coded into the product and never change, the expression does not break when opened on a computer that uses a language other than English. Any property names that you can change are enclosed in straight quotes and remain the same in any language. If you don't plan on sharing your projects across a language barrier, you can deselect this preference and line up properties in an expression hierarchically, using parentheses.

To see the difference between the two expression formats, create the same pick-whip expression with the preference selected and unselected. For example, create an expression from any property in Layer A to the Mask Opacity property in Layer B, and you get the following expression with the preference selected:

```
thisComp.layer("Layer B").mask("Mask 1").maskOpacity
```

You get the following expression with the preference unselected:

```
thisComp.layer("Layer B")("Masks")("Mask 1")("MaskOpacity")
```

Note: Because the default is set to use compact English, this chapter uses compact English in all examples and illustrations.

To specify the format for pick whip expressions:

- 1 Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS).
- 2 Select or deselect "Expression Pick Whip Writes Compact English."

Pick-whip expression examples

The following are examples of pick-whip expressions, some of which have been altered with simple functions. These expressions are easy to create and result in sophisticated effects that would otherwise require dozens of keyframes.

Turning a dial and illuminating a lamp (linking opacity and rotation values)

The following example shows how to use the pick whip to simulate dimming a light bulb while rotating a dial. This expression links the opacity values to the rotation values so that as the rotation changes, the opacity changes too.

Note: To learn what the text in an expression means, see ["Understanding the expression language" on page 285](#).

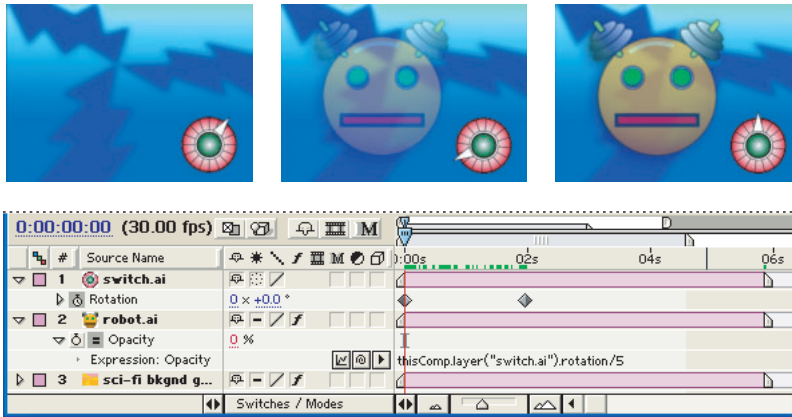
To link opacity values to rotation values:

- 1 Start with a composition containing two layers: one to be used as the switch that you'll rotate, and one to be used as the object that changes in opacity as you rotate the switch. (We used two Adobe Illustrator files and named one "robot" and the other "switch.")
- 2 Create keyframes to animate the rotation of the switch layer.
- 3 Select the Opacity property for the robot layer and choose Animation > Add Expression. A default expression appears under the property.
- 4 Click the pick whip next to the Opacity expression and drag it to the Rotation property for the switch layer. After Effects automatically fills in the following expression:

```
thisComp.layer("switch.ai").rotation
```

5 Preview the animation. Notice that the Opacity property of the robot layer is animated, yet there are no opacity keyframes.

Note: Make sure to use rotation values that are compatible with the Opacity property. For example, opacity values range from 0 to 100, so rotating the switch layer backward using a negative value results in an opacity value of 0.



Expression linking opacity and rotation. The “/5” modifier makes the change more gradual.

Rotating the hands of a clock (linking rotation values between layers)

Use the pick whip to quickly animate the hands on a clock so that as the hour hand moves from hour to hour, the minute hand rotates the full circumference of the clock face. This type of animation would take a long time to create if you had to set each keyframe for both hand layers, but with the pick whip, you can do it in a matter of minutes.

To link rotation values between two layers:

- 1 Import or create two layers: an hour hand and a minute hand.
- 2 Position them as if they were hands on a clock, and then set the anchor points for the hands at the center of the clock. (See [“Setting and animating an anchor point” on page 135.](#))
- 3 Set Rotation keyframes for the hour hand.
- 4 Select the Rotation property for the minute hand and choose Animation > Add Expression.
- 5 Drag the pick whip to the hour hand’s Rotation property. The following expression appears:

```
thisComp.layer("hour hand").rotation
```

- 6 To make the minute hand rotate 12 times faster than the hour hand, type “*12” at the end of the expression as follows:

```
thisComp.layer("hour hand").rotation*12
```

Increasing a layer's blur as it travels farther away in z-space (linking Fast Blur effect to position values)

You can use the pick whip to control blur by a layer's horizontal position in the Composition or by its position in z-space. This expression is useful for making an object, such as a balloon or airplane, blurrier as it travels farther away in space or from one side of the Composition window to the other.

To link effect values to position values:

- 1 Import or create a layer in the shape of a star.
- 2 Click the 3D switch for the layer and set Position keyframes so that it moves farther away in z-space.
- 3 Apply the Fast Blur effect.
- 4 Select the Fast Blur's Blurriness property in the Timeline window and choose Animation > Add Expression.
- 5 Drag the pick whip to the Position property. The following expression appears:

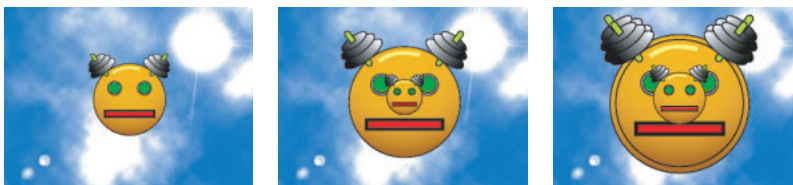
```
position[2]
```

- 6 If the blur is too intense, cut the blur amount by one-fifth by adding `/5` to the end of the expression as follows:

```
position[2]/5
```

Scaling layers successively (linking scale values between layers)

Use expressions to scale objects successively and at precisely the same interval. This expression is useful for creating a concussion appearance, in which objects appear at a set interval and successively scale up and replace each other.



Linking scale values with a two-second delay between layers

To link scale values between three layers:

- 1 Position three layers in the center of the Composition window, from where they will stream in.
- 2 Create Scale keyframes for layer 3: set Scale to 0 at 0 seconds and 100 at 6 seconds.
- 3 Select the Scale property for layer 2 and choose Animation > Add Expression.
- 4 Drag the pick whip to the Scale property name of layer 3. The following expression appears:

```
thisComp.layer("layer name").scale
```

- 5 Add the `valueAtTime` function to the end of the expression to make layer 2 scale 2 seconds later than layer 3:

```
thisComp.layer("layer name").scale.valueAtTime(time-2)
```

6 Repeat steps 3 through 5 for layer 3, and add a `valueAtTime (time-4)` function:

```
thisComp.layer("layer name").scale.valueAtTime(time-4)
```

7 Preview the layer.

Writing expressions for source text

All expressions produce a result that is a number or an array of numbers—with one exception: expressions written for the Source Text property of a text layer. The result of an expression that links to the Source Text property is interpreted as a JavaScript string. The expression replaces the existing text for the layer, using the style of the first character. You can use the pick whip to retrieve the source text from another text layer; however, only the style of the first character of the destination layer is used.

For example, to copy the original text from one layer and add it to another layer in all upper case characters, type the following expression:

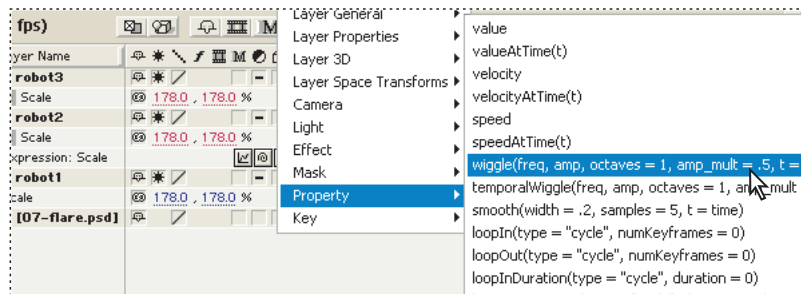
```
text.sourceText + "\r" + text.sourceText.toUpperCase()
```

Note: You can use `"\r"` in a String expression to start a new line of text. For more information on the String object, consult a JavaScript guide.

Using the Expression language menu


The Expression language menu in the Timeline window contains all the After Effects–specific language elements that you can use in an expression. This menu is helpful for determining valid elements and their correct syntax; use it as a reference for available elements. Select any object, attribute, or method, and After Effects automatically inserts it in the expression field at the location of the cursor. Then, you can edit and add to it as needed.

The Expression language menu lists arguments and default values. This makes it easy to remember which elements you can control when you write an expression. For example, in the language menu, the Property function for wiggle lists: `wiggle(freq, amp, octaves = 1, ampMult = .5, t = time)`. There are five arguments listed in the parentheses following `wiggle`. The `=` in the last three arguments indicates that using those parameters is optional. If you specify no values for them, they default, respectively, to 1, .5, and the current time.



Add expression elements to the expression field by choosing them from the Expression language menu.

To build an expression using the Expression language menu:

- 1 Select a layer property and choose Animation > Add Expression.
- 2 Click the Expression language menu icon  and choose Global > thisComp. The element appears in the expression field at the location of the cursor:

```
thisComp
```

- 3 To continue the expression, add a period (.) to the end, click the Expression language menu icon, and then choose an attribute from the Comp menu, such as `layer(index)`:

```
thisComp.layer(index)
```

- 4 Insert the specific layer information you want. For example, if you want to use the keyframe information from Layer 1, change `index` to 1 as follows:

```
thisComp.layer(1)
```

- 5 Next, choose an attribute or method from any of the Layer, Light, or Camera menus. For example, if Layer 1 has Position keyframes that you want to use in your expression, choose `position` from the Layer Properties menu, and so on.

```
thisComp.layer(1).position
```

Expression examples

You can use the following expressions in your own projects. Each example provides setup instructions along with the expression; you can add the expression exactly as it appears or modify it to create your own unique results.

Averaging one layer between two others

This expression positions and maintains one layer at a balanced distance between two other layers. To achieve this effect, you need three layers in your composition.

To average one layer between two others:

- 1 Start with three layers.
- 2 Create motion paths for the first two layers in the Timeline.
- 3 Select the Position property for the third layer and choose Animation > Add Expression.
- 4 Select the default expression text and type the following:

```
(thisComp.layer(1).position + thisComp.layer(2).position)*.5
```

Creating a trail of images

This expression instructs a layer to be at the same position as the next higher layer in the Timeline window, but delayed by a specified amount of time (in this case, .5 seconds). You can set similar expressions for the other geometric properties. This expression requires two or more layers.

To create a trail of images:

- 1 Start with two solids that are scaled to approximately 30%.
- 2 Create a motion path for the first layer.
- 3 Select the Position property for the second layer and choose Animation > Add Expression.
- 4 Select the default expression text and type:

```
thisComp.layer(thisLayer, -1).position.valueAtTime(time - .5)
```

- 5 Duplicate the last layer five times. All layers follow the same path, and each is delayed .5 seconds from the previous.

Creating a bulge between two layers

Use an expression to synchronize the Bulge Center parameter of the Bulge effect in one layer with the position of another layer. For example, you can create an effect that looks like a magnifying glass moving over a layer, with the contents under the magnifying glass bulging as the lens (that is, the overlying layer) moves. This expression uses the `fromWorld` element, which makes the expression work correctly regardless of whether you move the magnifying glass layer or the underlying layer. You can rotate or scale the underlying layer and the expression stays intact.

You can also use other effects, such as Ripple, with this expression.

To create a bulge between two layers:

- 1 Start with two layers. Make one layer a magnifying glass or similar object with a hole in the middle and name it Magnifier.
- 2 Create a motion path for the magnifying glass layer.
- 3 Apply the Bulge effect to the other layer.
- 4 Select the Bulge effect's Bulge Center property in the Timeline window and choose Animation > Add Expression.

5 Select the default expression text and type the following:

```
fromWorld(thisComp.layer("Magnifier").position)
```

Moving a layer in a perfect circle

You can create an expression without using properties from other layers. For example, you can make a layer revolve in a perfect circle or move back and forth diagonally.

To create a circular movement in one layer:

- 1 Start with one layer.
- 2 Select the Position property for the layer and choose Animation > Add Expression.
- 3 Select the default expression text and type:

```
[(thisComp.width/2), (thisComp.height/2)] +  
[Math.sin(time)*50, -Math.cos(time)*50]
```

Commonly used methods and attributes

Some of the methods and attributes available for expressions perform operations specific to After Effects. For example, you can use the `hasParent` layer attribute to determine if a layer in your After Effects project has a parent layer attached to it, or you can use the keyframe-looping methods to cycle through specified keyframes in your project.

Using the “hasParent()” attribute

Use the `hasParent()` attribute to determine if a layer has a parent. You can use this attribute even if there isn't a parent layer at present. For example, the following expression indicates that the layer to which you apply it will wiggle based on the position of the layer's parent. If the layer has no parent, then it will wiggle based on its own position. If the layer is parented later, then its behavior will change accordingly:

```
idx = index;  
if (hasParent) {  
    idx = parent.index;  
}  
thisComp.layer(idx).position.wiggle(5, 20)
```

Using the “name” attribute

Use the `name` attribute with Comp, Footage, Layer, Mask, and Effect objects when you want to apply the same expression to several layers and vary the results based on the name of an object. For example, the following expression wiggles the position of a layer differently if the layer is named “hero”:

```
amp = 20;  
if (name == "hero") {  
    amp = 40;  
}  
wiggle(5, amp)
```

Using layer space transform methods

Use layer space transform methods to transform values from one space to another, such as from layer space to world space. The “from” methods transform values from the layer’s space to the named space (comp or world). The “to” methods transform values from the named space (comp or world) to the layer space. Each transform method takes an optional parameter to determine the time at which the layer’s transform is computed; however, you can almost always use the current (default) time.

Use Vec transform methods when transforming a direction vector, such as the difference between two position values. Use the plain (non-Vec) transform methods when transforming a point, such as position. Comp and world space are the same for 2D layers. For 3D layers, however, comp space is relative to the active camera, and world space is independent of the camera. (See [“Layer space transform methods” on page 306.](#))

Using keyframe-looping methods

You can use keyframe-looping methods to repeat a series of keyframes. You can use these methods on any property except marker. Keyframes or duration values that are too large are clipped to the maximum allowable value. Values that are too small result in a constant loop. (See [“Property attributes and methods” on page 308.](#))

The default argument for keyframe-looping methods is `cycle`, which repeats the specified segment. However, you can substitute `cycle` with any of the following arguments:

- `Pingpong` repeats the specified segment, but alternates between repeating forward and backward in the segment.
- `Offset` repeats the specified segment, but offsets each cycle by the difference in the value of the property at the start and end of the segment, multiplied by the number of times the segment has looped.
- `Continue` does not repeat the specified segment, but continues to animate a property based on the velocity at the first or last keyframe. For example, if the last keyframe of a layer’s Scale property is 100%, the layer continues to scale from 100% to the Out point, instead of looping directly back to the Out point. This type does not accept a “keyframes” or “duration” argument.

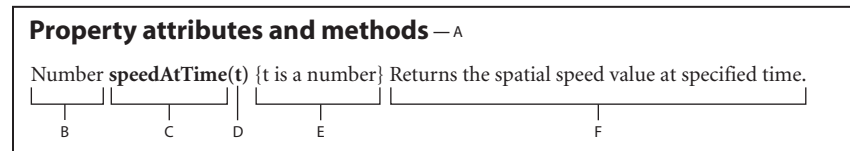
After Effects expression elements guide

Use the elements in the following sections along with standard JavaScript elements to write your expressions. Remember that you can also use the Expression language menu at any time to insert functions into an expression. (See [“Using the Expression language menu” on page 295.](#))

See [“Writing expressions” on page 282](#) for procedures on using this guide.

Expression elements guide key

Use the following key when referencing the expression elements guide:



Key for using the expression elements guide

- **A.** Headings represent expression objects. All elements listed below a heading are attributes (that you can retrieve from the object) or methods (that you can call on the object). Many of the attributes and methods return other objects—look up those object types in this guide to determine how to continue your expression.
- **B.** Initial cap Roman text at the beginning of a description represents the return value type. Some return values include a number in square brackets—this number specifies the dimension of the returned property or array. If a specific dimension is not included, the dimension of the returned array depends on the dimension of the input.
- **C.** Bold text represents the expression language element to type in your expression.
- **D.** Bold text inside parentheses represents the type of argument(s) that you need to add. If an argument contains an equal sign (=) and a value (such as `t=time` or `width=.2`), the argument uses the included default value if you don't specify a different value.
- **E.** Text inside curly brackets represents the argument description. Some argument descriptions include a number in square brackets—this number indicates the dimension of the expected property or array. If a specific dimension is not included, any dimension will work.
- **F.** Text following the curly brackets is a description and possibly an example of the element.

Global objects

Comp **comp**(name) Retrieves another composition by name.

Footage **footage**(name) Retrieves a footage item by name.

Comp **thisComp** Represents the composition containing the expression. For example, you can start an expression with `thisComp.layer(2)`.

Layer, Light, or Camera **thisLayer** Represents the Layer itself. Because `thisLayer` is the default object, its use is optional. For example, you can start an expression with `thisLayer.width` or `width` and get the same result.

Property **thisProperty** Represents the property containing the expression. For example, if you write an expression on the Rotation property, you can start an expression with `thisProperty` to refer to the Rotation property value.

Number **time** Represents the composition time, in seconds, at which the expression is being evaluated.

Number **colorDepth** Returns the project's color depth value of either 8 or 16 bits. For example, `colorDepth` returns 16 when the project's color depth is 16 bits-per-channel.

Number **posterizeTime(framesPerSecond)** {framesPerSecond is a number} Returns a value that becomes the frame rate from which the rest of the expression operates. This allows you to set the expression to a frame rate lower than the composition.

Number or Array **value** Represents the value at the current time for the property containing the expression. For example, you can include `value + 5` in an expression.

Vector math methods

Array **add(vec1, vec2)** {vec1 and vec2 are arrays} Adds two vectors.

Array **sub(vec1, vec2)** {vec1 and vec2 are arrays} Subtracts two vectors.

Array **mul(vec1, amount)** {vec1 is an array, amount is a number} Multiplies every element of the vector by the amount.

Array **div(vec1, amount)** {vec1 is an array, amount is a number} Divides every element of the vector by the amount.

Number or Array **Clamp(value, limit1, limit2)** Limits each element between the corresponding values of limit1 and limit2.

Number **dot(vec1, vec2)** {vec1 and vec2 are arrays} Returns a dot product, which is the result of multiplying the two vectors together.

Array [2 or 3] **cross(vec1, vec2)** {vec1 and vec2 are arrays [2 or 3]} Returns a vector cross-product. Refer to a math reference guide or JavaScript guide for more information.

Array **normalize(vec)** {vec is an array} Normalizes the vector so that its length is 1.0. This is a short way of writing `div(vec, length(vec))`.

Number **length(vec)** {vec is an array} Returns the length of vector vec.

Number **length(point1, point2)** {point1 and point2 are arrays} Returns the distance between two points. Point2 is optional. For example, `length(point1, point2)` is the same as `length(sub(point1, point2))`.

Array [3] **lookAt(fromPt, atPt)** {fromPt and atPt are arrays [3]} The argument fromPt is the location in world space of the layer you want to orient. The argument atPt is the point in world space you want to point the layer at. The return value can be used as an expression for the Orientation property, making the layer's z-axis point at atPt. It is especially useful for cameras and lights. For example, `lookAt(position, thisComp.layer(1).position)`. If you use this on a camera, turn off auto-orientation.

Note: Vector math functions are global methods that perform operations on arrays, treating them as mathematical vectors. Unlike built-in JavaScript methods, such as `Math.sin()`, you do not use the `Math` prefix with these methods. Unless otherwise specified, vector math methods are lenient about dimensions and return a value that is the dimension of the largest array, filling in missing elements with zeros. For example, the expression `[10, 20]+[1, 2, 3]` returns `[11, 22, 3]`.

Random number methods

Nothing **seedRandom(seed, timeless=false)** {seed is a number, the default timeless is false} Takes the existing seed and increments it by a random value that depends on the layer's index (number) and the stream (property), but not the time. For example, `seedRandom(n, true)` passes true as the second parameter to the `seedRandom()` function to get a random number between 0 and 1, which depends on the layer and property number, but not the time.

Number **random()** Returns a random number between 0 and 1.

Number or Array **random(maxValOrArray)** {maxValOrArray is a number or Array} Returns a number between 0 and maxVal, and is the same dimension as maxVal; or returns an array with the same dimension as maxArray, with each component ranging between 0 and maxArray.

Number or Array **random(minValOrArray, maxValOrArray)** {minValOrArray and maxValOrArray are numbers or Arrays} Returns a number between minVal and maxVal, or returns an array with the same dimension as minArray and maxArray, with each component ranging between minArray and maxArray. For example, the expression `random([100, 200], [300, 400])` returns an array whose first value is between 100 and 300, and whose second value is between 200 and 400. If the two input dimensions don't match, the shorter one is filled out with zeros

Number **gaussRandom()** Returns a random number between 0 and 1. The results have a bell-shaped distribution. Approximately 90% of the results are between 0 and 1, and the remaining 10% are beyond the edges.

Number or Array **gaussRandom(maxValOrArray)** {maxValOrArray is a number or Array} When using maxVal, it returns a random number between 0 and maxVal. The results have a bell-shaped distribution. Approximately 90% of the results are in the 0 to maxVal range, and the remaining 10% are beyond the edges. When using maxArray, it returns an array with the same dimension as maxArray, with 90% of the results ranging between 0 and maxArray and the remaining 10% beyond the edges. The results have a bell-shaped distribution.

Number **gaussRandom(minValOrArray, maxValOrArray)** {minValOrArray and maxValOrArray are numbers or Arrays} When using minVal or maxVal, it returns a random number between minVal and maxVal. The results have a bell-shaped distribution. Approximately 90% of the results are in the minVal to maxVal range, and the remaining 10% are beyond the edges. When using minArray or maxArray, it returns an array with the same dimension as maxArray, with each component ranging between minArray and maxArray. The results have a bell-shaped distribution. Approximately 90% of the results are in the minArray to maxArray range, and the remaining 10% are beyond the edges.

Number **noise(valOrArray)** {valOrArray is a number or an array [2 or 3]} Returns a number between 0 and 1. Noise is not actually random, but is used when you want a seemingly random number with some correlation between nearby samples. It is based on Perlin Noise. (See a computer graphics reference book for more information.) For example, `add(position, noise(position)*50)`.

Interpolation methods

Number or Array **linear(t, value1, value2)** {t is a number, and value1 and value2 are numbers or arrays} Returns a value that linearly interpolates from value1 to value2 as t ranges from 0 to 1. Returns the value of value1 when t is 1 <= 0. Returns the value of value2 when t is >= 1.

Number or Array **linear(t, tMin, tMax, value1, value2)** {t, tMin, and tMax are numbers, and value1 and value2 are numbers or arrays} Returns the value of value1 when t <= tmin1. Returns the value of value2 when t >= tMax. Returns a value that is a linear combination of value1 and value2 when tMin < t < tMax.

Number or Array **ease(t, value1, value2)** {t is a number, and value1 and value2 are numbers or arrays} Returns a value that is similar to linear, except that the interpolation eases in and out so that the velocity is 0 at the start and end points. This method results in a very smooth animation.

Number or Array **ease(t, tMin, tMax, value1, value2)** {t, tMin, and tMax are numbers, and value1 and value2 are numbers or arrays} Returns a value that is similar to linear, except that the interpolation eases in and out so that the velocity is 0 at the start and end points. This method results in a very smooth animation.

Number or Array **easeIn(t, value1, value2)** {t is a number, and value1 and value2 are numbers or arrays} Returns a value that is similar to ease, except that the tangent is 0 only on the value1 side and is linear on the value2 side.

Number or Array **easeIn(t, tMin, tMax, value1, value2)** {t, tMin, and tMax are numbers, and value1 and value2 are numbers or arrays} Returns a value that is similar to ease, except that the tangent is 0 only on the tMin side and is linear on the tMax side.

Number or Array **easeOut(t, value1, value2)** {t is a number, and value1 and value2 are numbers or arrays} Returns a value that is similar to ease, except that the tangent is 0 only on the value2 side and is linear on the value1 side.

Number or Array **easeOut(t, tMin, tMax, value1, value2)** {t, tMin, and tMax are numbers, and value1 and value2 are numbers or arrays} Returns a value that is similar to ease, except that the tangent is 0 only on the tMax side and is linear on the tMin side.

Color conversion methods

Array [4] **rgbToHsl(rgbArray)** {rgbArray is an array [4]} Converts a color in RGBA space to HSLA space. The input is an array specifying red, green, blue, and alpha, all in the range of 0.0 to 1.0. The resulting value is an array specifying hue, saturation, lightness, and alpha, also in the range of 0.0 to 1.0. For example, `rgbToHsl.effect("Change Color")("Color To Change")`.

Array [4] **hslToRgb(hslaArray)** {hslaArray is an array [4]} Converts a color in HSLA space to RGBA space. This is the opposite of `rgbToHsl`.

Other math methods

Number **degreesToRadians(degrees)** Converts degrees to radians.

Number **radiansToDegrees(radians)** Converts radians to degrees.

Comp attributes and methods

Layer, Light, or Camera **layer(index)** {index is a number} Retrieves the layer by number (order in the Timeline window). For example, `thisComp.layer(3)`.

Layer, Light, or Camera **layer("name")** {name is a string} Retrieves the layer by name. Names are matched by layer name, or source name if there is no layer name. If duplicate names exist, After Effects uses the first one in the Timeline window. For example, `thisComp.layer("Solid 1")`.

Layer, Light, or Camera **layer(otherLayer, relIndex)** {otherLayer is a layer object, and relIndex is a number} Retrieves the layer that is the relIndex (number) of layers above or below the otherLayer (name). For example, `layer(thisLayer, -2)` returns the layer that is two layers higher in the Timeline window than the layer on which the expression is written.

Number **marker(markerNum)** {markerNum is a number} Retrieves the time of a composition marker. You can use this to fade out a layer's opacity at the time where the marker resides. For example, `markTime = thisComp.marker(1);linear(time, markTime - .5, markTime, 100, 0).`

Number **numLayers** Returns the number of layers in the composition.

Camera **activeCamera** Retrieves a value from the camera through which the composition is rendered at the current frame. This is not necessarily the camera through which you are looking in the Composition window.

Number **width** Returns the composition's width value in pixels.

Number **height** Returns the composition's height value in pixels.

Number **duration** Returns the composition's duration value in seconds.

Number **frameDuration** Returns the frame duration in seconds.

Number **shutterAngle** Returns the shutter-angle value of the composition in degrees.

Number **shutterPhase** Returns the shutter-phase of the composition in degrees.

Array [4] **bgColor** Returns the background color of the composition.

Number **pixelAspect** Returns the pixel aspect ratio of the composition expressed as width/height.

String **name** Returns the name of the composition.

Footage attributes and methods

Number **width** Returns the width of the footage in pixels.

Number **height** Returns the height of the footage in pixels.

Number **duration** Returns the duration of the footage in seconds.

Number **frameDuration** Returns the duration of a frame in seconds.

Number **pixelAspect** Returns the pixel aspect ratio of the footage, expressed as width/height.

String **name** Returns the name of the footage.

Note: To use footage from the Project window as an object in an expression, use the global `footage()` method, as in `footage("filename")` and then use any of the attributes above. You can also access a footage object using the source attribute on a layer whose source is a footage item.

Layer sub-objects attributes and methods

Comp or Footage **source** Returns the source Comp or source Footage object for the layer. Default time is adjusted to the time in the source. For example, `source.layer(1).position.`

Effect **effect(name)** {name is a string} Returns an Effect object. After Effects finds the effect by its name in the Effect Controls window. The name can be the default name or a user-defined name. If there is more than one effect with the same name, the effect closest to the top of the Effect Controls window is used.

Effect **effect(index)** {index is a number} Returns an Effect object. After Effects finds the effect by its index in the Effect Controls window, starting at 1 and counting down from the top.

Mask **mask(name)** {*name* is a string} Returns a layer Mask object. The name can be the default name or a user-defined name.

Mask **mask(index)** {*index* is a number} Returns a layer Mask object. After Effects finds the mask by its index in the Timeline window, starting at 1 and counting down from the top.

Layer general attributes and methods

Number **width** Returns the width of the layer in pixels. It is the same as `source.width`.

Number **height** Returns the height of the layer in pixels. It is the same as `source.height`.

Number **index** Returns the Number of the layer in the composition.

Layer, Light, or Camera **parent** Returns the parent Layer object of the layer, if there is one. For example, `position[0] + parent.width`.

Boolean **hasParent** Returns a true value if the layer has a parent, or a false if it doesn't.

Number **inPoint** Returns the In point of the layer in seconds.


Number **outPoint** Returns the Out point of the layer in seconds.

Number **startTime** Returns the start time of the layer in seconds.

Boolean **hasVideo** Returns a true value if the layer has video, or a false if it doesn't.

Boolean **hasAudio** Returns a true value if the layer has audio, or a false if it doesn't.

Boolean **active** Returns a true value if the layer's video switch  is on, or a false if it isn't.

Boolean **audioActive** Returns a true value if the layer's audio switch  is on, or a false if it isn't.

Layer property attributes and methods

Property [2 or 3] **anchorPoint** Returns the anchor point value of the layer in the layer's space.

Property [2 or 3] **position** Returns the position value of the layer, in world space if the layer has no parent, or in the parent's layer space if there is a parent.

Property [2 or 3] **scale** Returns the scale value of the layer, expressed as a percentage.

Property **rotation** Returns the rotation value of the layer in degrees. For a 3D layer, it returns the z rotation value in degrees.

Property [1] **opacity** Returns the opacity value for the layer, expressed as a percentage.

Property [2] **audioLevels** Returns the value of the Audio Levels property of the layer, in decibels. This is a 2D value; the first value represents the left audio channel, and the second value represents the right. The value is not the amplitude of the source material's audio track; instead, it is the value of the keyframed Audio Levels property.

Property **timeRemap** Returns the value of the Time Remap property in seconds, if Time Remap is enabled.

Marker Number **marker.key(index)** {*index* is a number} Returns the value of the Marker Number property for a layer. The only methods and attributes available from marker are `key()`, `nearestKey`, and `numKeys`.

Marker Number **marker.key("name")** {name is a string} Returns the name of the Marker Number property for a layer. The name is the name of the marker, as typed in the comment field in the marker dialog box, for example, `marker.key("ch1")`. The value for marker keys is a string, not a number. For example, `m1 = marker.key("Start").time; m2 = marker.key("End").time; linear(time, m1, m2, 0, 100);`

Marker Number **marker.nearestKey** Returns the value for the marker which is nearest to the current time.

Number **marker.numKeys** Returns the total number of layer markers.

String **name** Returns the name of the layer.

Note: When you add masks, effects, paint, or text, or apply motion tracker to a layer, After Effects adds new properties to the Timeline window. There are too many of these properties to list here, so use the pick whip to learn the syntax for referring to them in your expressions. For any of the levels that represent groups of properties, you can use the `.name` and `.numEntries` properties to return the user-specified name and the number of entries in the group. For example, `text("Animators").numEntries` returns the number of animators on your text layer.

Layer 3D attributes and methods

Property [3] **orientation** Returns the 3D orientation value in degrees for a 3D layer.

Property [1] **rotationX** Returns the x rotation value in degrees for a 3D layer.

Property [1] **rotationY** Returns the y rotation value in degrees for a 3D layer.

Property [1] **rotationZ** Returns the z rotation value in degrees for a 3D layer.

Property [1] **lightTransmission** Returns the value of the Light Transmission property for a 3D layer.

Property **castsShadows** Returns a value of 1.0 if the layer casts shadows.

Property **acceptsShadows** Returns a value of 1.0 if the layer accepts shadows.

Property **acceptsLights** Returns a value of 1.0 if the layer accepts lights.

Property **ambient** Returns the ambient component value as a percentage.

Property **diffuse** Returns the diffuse component value as a percentage.

Property **specular** Returns the specular component value as a percentage.

Property **shininess** Returns the shininess component value as a percentage.

Property **metal** Returns the metal component value as a percentage.

Layer space transform methods

Array [2 or 3] **toComp(point, t = time)** {point is an array [2 or 3], and t is a number} Transforms a point from layer space to comp space. For example, `toComp(anchorPoint)`.

Array [2 or 3] **fromComp(point, t=time)** {point is an array [2 or 3], and t is a number} Transforms a point from comp space to layer space. The resulting point in a 3D layer may have a nonzero value even though it is in layer space. For example (2D layer), `fromComp(thisComp.layer(2).position)`.

Array [2 or 3] **toWorld(point, t=time)** {point is an array [2 or 3], and t is a number} Transforms a point from layer space to view-independent world space. For example, `toWorld.effect("Bulge")("Bulge Center")`.

Array [2 or 3] **fromWorld(point, t=time)** {*point* is an array [2 or 3], and *t* is a number} Transforms a point from world space to layer space. For example,
`fromWorld(thisComp.layer(2).position).`

Array [2 or 3] **toCompVec(vec, t=time)** {*vec* is an array[2 or 3], and *t* is a number} Transforms a vector from layer space to comp space. For example, `toCompVec([1, 0]).`

Array [2 or 3] **fromCompVec(vec, t=time)** {*vec* is an array[2 or 3], and *t* is a number} Transforms a vector from comp space to layer space. For example (2D layer),
`dir=sub(position, thisComp.layer(2).position); fromCompVec(dir).`

Array [2 or 3] **toWorldVec(vec, t=time)** {*vec* is an array[2 or 3], and *t* is a number} Transforms a vector from layer space to world space. For example, `p1 = effect("Eye Bulge 1")("Bulge Center"); p2 = effect("Eye Bulge 2")("Bulge Center"); toWorld(sub(p1, p2)).`

Array [2 or 3] **fromWorldVec(vec, t=time)** {*vec* is an array [2 or 3], and *t* is a number} Transforms a vector from world space to layer space. For example,
`fromWorld(thisComp.layer(2).position).`

Array [2] **fromCompToSurface(point, t=time)** {*point* is an array [2 or 3], and *t* is a number} Projects a point located in comp space to a point on the surface of the layer (zero z-value) at the location where it appears when viewed from the active camera. This is useful for setting effect control points. Use with 3D layers only.

Camera attributes and methods

Property [3] **pointOfInterest** Returns the camera's point of interest values in world space.


Property **zoom** Returns the camera's zoom values in pixels.

Property **depthOfField** Returns a 1 if the camera's Depth of Field property is on, or returns a 0 if it is off.

Property **focusDistance** Returns the camera's focus distance values in pixels.

Property **aperture** Returns the camera's aperture value in pixels.

Property **blurLevel** Returns the camera's blur level value as a percentage.

Boolean **active** Returns a true value if (a) the camera's video switch  is on, (b) the current time is between the camera's In and Out points, and (c) it is the first such camera listed in the Timeline window. Returns a false value if the above conditions are not met.

Note: Camera objects have all of the same attributes and methods as Layer objects, except for *source*, *effect*, *mask*, *width*, *height*, *anchorPoint*, *scale*, *opacity*, *audioLevels*, *timeRemap*, and all of the material properties.

Light attributes and methods

Property [3] **pointOfInterest** Returns the light's point of interest values in work space.

Property **intensity** Returns the light's intensity values as a percentage.

Property [4] **color** Returns the light's color value.

Property **coneAngle** Returns the light's cone angle value in degrees.

Property **coneFeather** Returns the light's cone feather value as a percentage.

Property **shadowDarkness** Returns the light's shadow darkness value as a percentage.

Property **shadowDiffusion** Returns the light's shadow diffusion value in pixels.

Note: *Light objects have all of the same attributes and methods as Layer objects, except for source, effect, mask, width, height, anchorPoint, scale, opacity, audioLevels, timeRemap, and all of the material properties.*

Effect attributes and methods

Boolean **active** Returns a true value if the effect is turned on in both the Timeline window and the Effect Controls window, or a false value if it is turned off in either window.

Property **param(name)** {name is a string} Returns a property within an effect. For example, `.effect("Bulge")("Bulge Height")`. Effect point controls are always in layer space.

Property **param(index)** {index is a number} Returns a property within an effect. For example, `.effect("Bulge")(4)` returns the Bulge Height property. Effect point controls are always in layer space.

String **name** Returns the name of the effect.

Mask attributes and methods

Property **MaskOpacity** Returns the mask's opacity value as a percentage.

Property **MaskFeather** Returns the mask's feather value in pixels.

Boolean **invert** Returns a true value if the mask is inverted, or a false if it is not.

Property **MaskExpansion** Returns the mask's expansion value in pixels.

String **name** Returns the name of the mask.

Note: *You cannot access the mask shape when using expressions.*

Property attributes and methods

Number or Array **value** Returns the property's value at the current time.

Number or Array **valueAtTime(t)** {t is a number} Returns the property's value at the specified time in seconds.

Number or Array **velocity** Returns the temporal velocity value at the current time. For spatial properties, such as Position, it returns the tangent vector value. The result is the same dimension as the property.

Number or Array **velocityAtTime(t)** {t is a number} Returns the temporal velocity value at the specified time.

Number **speed** Returns a 1D, positive speed value equal to the speed at which the property is changing at the default time. This element can be used only for spatial properties.

Number **speedAtTime(t)** {t is a number} Returns the spatial speed value at the specified time.

Number or Array **wiggle(freq, amp, octaves=1, ampMult=.5, t=time)** {freq, amp, octaves, ampMult, and t are numbers} Randomly shakes (wiggles) the value of the property. **freq** is calculated in wiggles per second, **amp** is calculated in units of the property to which it is applied, **octaves** is the number of octaves of noise to add together, **ampMult** is the amount that **amp** is multiplied by for each octave, and **t** is the base start time. For example, `position.wiggle(7, 30, 3)`.

Number or Array **temporalWiggle(freq, amp, octaves=1, ampMult=.5, t=time)** {freq, amp, octaves, ampMult, and t are numbers} Samples the property at a wiggled time. The **freq** argument is calculated in wiggles per second; **amp** is calculated in units of the property to which it is applied; **octaves** is the number of octaves of noise to add together; **ampMult** is the amount that **amp** is multiplied by for each octave; and **t** is the base start time. For this function to be meaningful, the property it samples must be animated, because the function alters only the time of sampling, not the value. For example, `scale.temporalWiggle(5, .2)`.

Number or Array **smooth(width=.2, samples=5, t=time)** {width, samples, and t are numbers} Applies a box filter to the value of the property at the specified time, and smooths the result over time. **width** (in seconds) is the range of time over which the filter is averaged. **samples** equals the number of discrete samples evenly spaced over time. Generally, you'll want samples to be an odd number so that the value at the current time is included in the average. For example, `position.smooth(.1, 5)`.

Number or Array **loopIn(type = "cycle", numKeyframes = 0)** Loops a segment of time that is measured from the first keyframe on the layer forward toward the layer's Out point. The loop occurs from the layer's In point to the first keyframe on the layer. The segment to loop is delineated by the specified number of keyframes. **Keyframe** sets the number of keyframe segments to loop; the specified range is measured from the first keyframe. For example, `loopIn("cycle", 1)` loops the segment bounded by the first and second keyframes. The default value of 0 means that all keyframes will loop.

Number or Array **loopOut(type = "cycle", numKeyframes = 0)** Loops a segment of time that is measured from the last keyframe on the layer back toward the layer's In point. The loop occurs from the last keyframe on the layer to the layer's Out point. The segment to loop is delineated by the specified number of keyframes. **Keyframe** sets the number of keyframe segments to loop; the specified range is measured backward from the last keyframe. For example, `loopOut("cycle", 1)` loops the segment bounded by the last keyframe and second-to-last keyframe. The default value of 0 means that all keyframes will loop.

Number or Array **loopInDuration(type = "cycle", duration = 0)** Loops a segment of time that is measured from the first keyframe on the layer forward toward the layer's Out point. The loop occurs from the layer's In point to the first keyframe on the layer. The segment to loop is delineated by the specified duration. **Duration** sets the number of composition seconds in a segment to loop; the specified range is measured from the first keyframe. For example, `loopInDuration("cycle", 1)` loops the first second of the entire animation. The default of 0 means that the segment to loop begins at the layer Out point.

Number or Array **loopOutDuration(type = "cycle", duration = 0)** Loops a segment of time that is measured from the last keyframe on the layer back toward the layer's In point. The loop occurs from the last keyframe on the layer to the layer's Out point. The segment to loop is delineated by the specified duration. **Duration** sets the number of composition seconds in a segment to loop; the specified range is measured backward from the last keyframe. For example, `loopOutDuration("cycle", 1)` loops the last second of the entire animation. The default of 0 means that the segment to loop begins at the layer In point.

Key **key(index)** Returns the key object by number. For example, `key(1)` returns the first key. When you access a key object, you can get Time, Index, and Value properties from it. For example, the following expression gives you the value of the third position key, `position.key(3).value`. The following expression, when written on a layer's animated Opacity property, ignores the keyframe values and only uses the keyframes' placement in time to determine where a flash should occur, `d = Math.abs(time - nearestKey(time).time); easeOut(d, 0, .1, 100, 0)`.

Key **key(markerName)** Returns the key object for the marker key with this name. Use only on marker properties.

Key **nearestKey(time)** Returns the keyframe object nearest to a designated time.

Number **numKeys** Returns the number of keyframes in a property.

Key attributes and methods

Number or Array **value** Returns the value of the keyframe.

Number **time** Returns the time of the keyframe.

Number **index** Returns the index of the keyframe.

Managing Projects Effectively

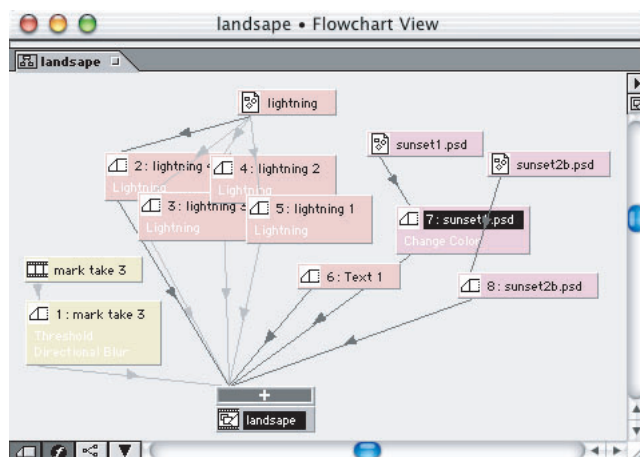
Visualizing organization with Flowchart View

After Effects provides a separate Flowchart View for each composition and for the overall project to help you keep a “big picture” perspective on complex projects. In Flowchart View, individual boxes (or *tiles*) represent each composition, layer, and footage item, including any applied effects. Directional arrows represent the relationships between components.

Note: Flowchart View only shows you the existing relationships. You cannot use this view to change relationships between project elements.

Opening Flowchart View

The elements included in Flowchart View depend on what is selected and on whether the compositions are *nested compositions* (used inside another composition as a layer) or *root compositions* (not nested). The Flowchart View of a project displays only root compositions. Nested compositions and other elements that make up the composition appear when you expand a composition tile.



The expansion button [+] for a composition in Flowchart View reveals any nested compositions, source footage, and applied effects.

To open Flowchart View:

Do one of the following:

- To open Flowchart View for a *project*, choose Window > Project Flowchart View.
- To open Flowchart View for a *composition*, select the composition in the Project window, and choose Composition > Comp Flowchart View.




When you click a tile in Flowchart View, that element becomes active (selected) in the Project window. If the tile represents a layer, that layer also becomes active in the Timeline window.

Note: Gray lines between tiles in Flowchart View indicate that the Video or Audio switch for those items is turned off in the Timeline window. Black lines indicate the switch is turned on.

Customizing Flowchart View

You can customize Flowchart View using the Flowchart View menu. Specify the type of lines between elements (angled or straight), justification, whether tiles appear with effects, and flow direction. The menu also includes a Cleanup command to reorganize elements in aligned flowcharts.

You can also use the four buttons along the bottom of the Flowchart View window, which are shortcuts for many of these menu commands. The Show Effects button  is unique because it also serves as a slider for the justification commands. Use the slider by holding down Alt (Windows) or Option (Mac OS) as you drag the slider.



For tool tips identifying the buttons in the Flowchart View window, let your pointer hover over a button until the tool tip appears.

Changing label colors in Flowchart View




You can change the label colors in the Flowchart View window using a context menu. Changing label colors in the Flowchart View changes them in the Timeline window also.

To change the label colors in Flowchart View:

- 1 Select a tile whose label you want to change to a different color.
- 2 Right-click (Windows) or Control-click (Mac OS) the tile, and do one of the following:
 - To change the color of one tile, choose a color.
 - To change the color of all tiles in a label group, choose Select Label Group from the menu that appears; then right-click (Windows) or Control-click (Mac OS) a tile, and choose a color.

Using Flowchart View to make changes

You can make some changes to your project from within Flowchart View. You can delete elements by selecting them and pressing Delete. If the selected element is a footage item or composition, it is deleted from the project and no longer appears in the Timeline and Project windows. If the selected element is a layer, it is deleted from the composition in which it appears.

You can also change the layer properties for a selected element by right-clicking (Windows) or Control-clicking (Mac OS) the icon to the left of the name in the element tile. The icons have various appearances, depending on the element type, such as layers , compositions , audio footage , and so forth. For example, you can use the icon context menu to work with masks and effects or to change switches, apply transformations, and adjust quality.

Note: When you change element properties in Flowchart View, be careful to click the icon in the tile, not the name of the element. The context menu associated with the element icon is different from the one that opens from the element name.

Organizing a project using nesting

When you nest compositions, you organize your project into a hierarchy. In its simplest form, nesting means that you combine two or more compositions into one main composition from which you render the final movie. A composition inside another composition becomes a layer within the parent composition.

Use composition nesting to save time working and rendering. With composition nesting, you can do the following:

Apply complex changes to an entire composition You can create a composition containing multiple still images, nest the composition within the overall composition, and animate the nested composition so that all the still images change in the same ways over the same time period.

Reuse anything you build You can build an animation in its own composition and then drag that composition into other compositions as many times as you want. This can save large amounts of space, especially for complicated effects, such as 3D layers.

Update in one step Update many composition copies in one step by editing the original animated composition.

Alter the default rendering order of a layer You can specify that After Effects render a transform change (such as rotation) before rendering effects, so the effect applies to the rotated footage.

Note: Parenting is another way to apply complex changes to an entire composition. For information, see [“Understanding parent layers” on page 137](#).

Understanding default rendering order

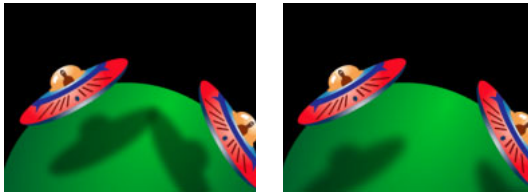
The order in which After Effects renders the various parts of a composition can affect the look of some visual effects in a rendered movie. An understanding of how After Effects renders a composition will help you get the results you want.

In rendering a composition, After Effects processes 2D layers in the order in which they are listed in the Timeline window, starting at the bottom of the list. However, After Effects processes 3D layers in Z order within their 3D bins. (See [“3D rendering” on page 276](#).) In processing each layer, After Effects processes changes from the top down, as these three categories appear in the Timeline window: first the masks, then effects, and finally the transformations. The blending modes and track mattes are processed after that. For elements with multiple effects, After Effects processes these in the order in which they are listed in the Effect Controls and the Timeline windows.

Changing the rendering order

Sometimes, projects require a visual effect that cannot be achieved by using the default rendering order. For example, you may be constructing an animation in which you want a rotated object to have a drop-shadow effect. By default, After Effects renders an effect before rotation, which creates shadows that all have different light-source orientations.

To render the animation so that the shadows appear as if created by a single light source, you need to apply rotation before you apply the drop-shadow effect.




Rotation applied at transform stage results in the shadow rotating with the layer (left). Drop shadow applied at the effect stage results in a properly oriented shadow (right).

Although you can't instruct After Effects to change the order of processing within a layer, there are three ways to get the rendering order you want: applying the Transform effect, including an adjustment layer above the layer, or using nesting or precomposing.

Note: You could also achieve this result using 3D lights and shadows. (See [“Understanding lights” on page 273.](#))

Transform effect Apply Transform effects (choose Effect > Perspective > Transform) when you want a transform property to render before another effect. These transform changes will be rendered before subsequent effects. Other transform properties, set in the Timeline window, will be rendered last.

 For more information, see “Transform” in the online Effects Help.

Adjustment layer Use an adjustment layer in your composition when you want to change rendering order and apply transform properties or effects to more than one layer at a time. When you apply an effect to an adjustment layer, After Effects renders the effect after rendering all properties in the other layers. (See [“Creating an adjustment layer” on page 94.](#))

To apply an adjustment layer to some (but not all) of the layers below it, you must either nest or precompose the adjustment layer with those layers.

Nesting or precomposing Use either nesting or precomposing to change the rendering order while also applying an effect to continuously rasterized or collapsed layers. Precomposing is a form of nesting and changes the rendering order in the same way. To make an effect render after a transform property, apply the effect to the nested composition instead of to the layer inside that composition. (See [“Organizing a project using nesting” on page 313](#) and [“Understanding precomposing” on page 317.](#))

Creating animations by nesting compositions

Nesting is useful when you want to apply a single transform property to a layer in more than one way. It adds another opportunity to apply masks, effects, or transform changes.

To nest a composition:

Drag a composition icon from the Project window into another composition in the Timeline window.

Note: If the target composition is currently active in the Composition window, you can also drag the composition icon you want to nest directly into the Composition window.

For example, you could use nesting to make a planet both rotate and revolve (moving like the Earth, which spins on its own axis and also travels around the sun). By nesting, you can apply rotation to the planet in one composition and then move that composition into another composition containing the background. The planet composition becomes a new layer in the composition containing the background. You can then apply rotation to this new layer to make it revolve.

Another way to configure this example would be to use parenting. (See [“Understanding parent layers” on page 137.](#))

Synchronizing time displays of nested compositions

When you open windows associated with a composition, such as the Timeline window, the Layer window, and the Effect Controls windows, changing the current time in one window updates the other windows associated with that composition. However, changing the current time in one composition does not change the current time in windows belonging to other compositions, unless you are working with nested compositions.

You can synchronize the current-time indicators in open windows belonging to a nested composition. After Effects provides a preference that updates all windows of nested compositions when you move the current-time indicator in any nested composition.

To synchronize time displays in windows of nested compositions:

Choose Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS), click the Synchronize Time of All Related Items option to add a checkmark, and click OK.

Collapsing transformations to maintain image quality

There are two methods of calculating changes to transform properties (such as rotation or scale) while rendering a nested composition. The default method is to apply transform properties and rasterize at every level of nested compositions. The alternative method is to collapse transformations, which postpones the calculation of transform properties and the rasterization of nested compositions until the rendering process reaches a layer you select. You can increase image quality and significantly reduce rendering time by collapsing transformations.

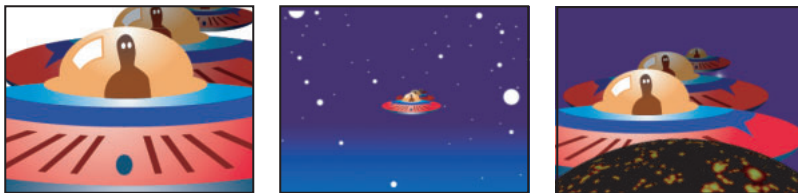
To collapse transformations of a nested composition:

In the Layer Feature column of the Timeline window, click the Collapse Transformations switch icon ✱ next to the layer containing the nested composition.

Collapsing transformations can preserve resolution when a nested composition is scaled down and then scaled back up in successive compositions. Without collapsed transformations, a nested composition that is scaled down loses the resolution of its original larger size. When you collapse transformations, the original resolution of a nested composition is preserved; its final resolution is determined by its size within the composition that uses collapsed transformations.



Default method When a nested composition is scaled down and then up again in successive compositions, it retains the lower resolution of the scaled-down version.



Collapsed transformation When a nested composition is scaled down and then up again in successive compositions, it retains the resolution of the original layer.

When you collapse the transform properties of a layer, all compositions nested inside it combine their opacity setting with the opacity setting of the layer that uses collapsed transform properties.

When a layer contains an Adobe Illustrator file instead of a nested composition, the Collapse Transformations switch for that layer becomes the Continuously Rasterize switch, which you can use to improve the image quality of footage. (See [“Importing an Adobe Illustrator, PDF, or EPS file” on page 51](#) and [“Collapsing transformation properties” on page 108](#).)

Collapsing transformations also adds some flexibility when you work with 3D layers in nested compositions. If you have a subordinate composition that has 3D objects within it without turning on Collapse Transformations, After Effects renders the composition as a 2D image of the 3D arrangement in the next higher composition. However, if you turn on Collapse Transformations, After Effects renders the 3D layers into the next higher composition so that they retain their 3D relationships among themselves and with other 3D layers there. You can continue to manipulate the relative positions of the 3D layers as a group from the lower composition.

Saving time by prerendering nested compositions

A complex nested composition can take a long time to preview and render. If you have a nested composition that you do not expect to work on any further, render the nested composition into a movie and use it as a proxy for the actual nested composition. As a rendered movie, it will require less calculation and will take less time to display and render in the larger project. You can still make changes to the prerendered composition, because the original nested composition remains in the project list. If you make a significant change to the original nested composition, simply render it again. Prerendering a nested composition is particularly beneficial when you use a nested composition multiple times in a project.

Using a prerendered movie in place of a nested composition also saves time and memory when you render the final version of the main composition. Just be sure to apply your final output settings when you prerender the nested composition. (See [“Changing render settings” on page 330.](#))

There are three phases to prerendering a composition: Creating a composition, rendering the composition you created, and then creating a proxy from the rendered composition. Use the Pre-render command to automate the last two phases.


Using the Pre-render command

The Pre-render command provides an easy way to flatten nested compositions, greatly shortening preview times. The command opens the render queue and creates a render item for the selected composition with Import and Replace Usage selected as the Post-Render Action option.

To prerender a composition:

- 1 Select the composition in the Project or Composition window.
- 2 Choose Composition > Pre-render. Adjust the settings as necessary, and render the footage.

To edit a prerendered composition:

- 1 In the Project window, click the proxy indicator  for the prerendered composition until it displays an empty box. This turns off the proxy so that After Effects uses the actual composition in the project.
- 2 In the Project window, double-click the composition from which the proxy movie was rendered.
- 3 Edit the composition.
- 4 Save the project.
- 5 Render the composition into a movie again, using the same filename as the previous version of the movie.
- 6 After rendering is complete, set up the movie as a proxy for the composition. The next time you view the composition containing the movie, the new movie is displayed.

Understanding precomposing

Sometimes it's necessary to nest compositions after you have already created a complex project hierarchy. It can be tedious or difficult to use nesting in an existing composition.

Precomposing is an easier way to nest layers within an existing composition. Precomposing moves the layers to a new composition. When you want to change the order in which layer components are rendered, precomposing is a quick way to create intermediate levels of nesting in an existing hierarchy. (See [“Understanding default rendering order” on page 313.](#))

When you precompose, one or more layers that you select move into a new composition. This new composition takes the place of the selected layers—something that does not occur in ordinary nesting. Precomposing also places the new composition in the Project window, available for use in any composition.

After Effects offers two options for working with layer properties and keyframes during precomposing:

Leave All Attributes In (selected composition) Leaves the selected layer properties and keyframes in the original composition. The frame size of the new composition is the same as that of the selected layer. Select this option when you do not need to change the rendering order, such as when you precompose layers only to simplify or reuse a composition, not to change the rendering order of layer properties. This option is not available when you select more than one layer or a text layer. When you use this option, changes you applied to the properties of the original layer are still applied to that layer in the original composition.

Move All Attributes into the New Composition Moves the properties and keyframes of one or more selected layers one level further from the main composition in the composition hierarchy. The frame size of the new composition is the same as that of the original composition. Choose this option when you want to change the rendering order in the selected layers, such as when you want to rotate a layer but not its drop shadow. (See [“Creating animations by nesting compositions” on page 314.](#))

To precompose one or more layers:

- 1 In the Timeline window containing the layers you want to precompose, select the layers.
- 2 Choose Layer > Pre-compose.
- 3 Select Leave All Attributes In or Move All Attributes into the New Composition, and then click OK.

Reducing the project

Use the Reduce Project command to automatically delete any items that are not used, either directly or indirectly, in selected compositions. For example, this command removes both unused footage items and all other compositions that are not included within a selected composition as nested (subordinate) compositions.



It's useful to refer to Flowchart View when you select the compositions you want to keep. (See [“Visualizing organization with Flowchart View” on page 311.](#))

Be aware of two special cases when you use Reduce Project:

- If the selected composition includes elements that are turned off (that is, the Video or Audio switch is deselected in the Timeline window), the Reduce Project command does not remove that switched-off item.

- If an expression in a selected composition refers to an element in a nonsubordinate composition, Reduce Project removes the nonsubordinate composition and the applied expression. The message that appears after you choose Reduce Project reminds you of this possibility, so you can undo the command if needed.



To avoid removing the expressions from a nonsubordinate composition, drag the nonsubordinate composition into the composition that refers to it. Then turn off the Audio and Video switches for the composition you added.

To delete unused project elements:

- 1 In the Project window, select all the compositions you want to keep in the project.
- 2 Choose File > Reduce Project.

Note: The Reduce Project command is available only when the Project window is active.

Using scripts to facilitate tasks

You can use scripts to automate many tasks in After Effects. For example, you can direct After Effects to import multiple footage files. A script is a series of commands that tells your computer to perform a sequence of operations. These operations may involve only After Effects, or they may involve other applications, such as spreadsheet or database management programs.

After Effects provides prerecorded scripts to assist you in performing common tasks. Prerecorded scripts appear in the File > Run Scripts pop-up menu. You can also create your own scripts for use in After Effects. After Effects recognizes JavaScript files (.jsx).



For a complete description of After Effects scripting capabilities, see the Scripting online Help or the After Effects Scripting PDF file on the After Effects CD.

To execute a script:

Do one of the following:

- Choose File > Run Script > <script name>.
- Choose File > Run Script > Choose File, locate and select a script, and click Open.

To install a script:

Copy the script to your computer's hard disk. If you want the script to appear in the Run Scripts pop-up menu, place the script in the Scripts folder inside the After Effects folder.

Note: If you edit a script while After Effects is open, you must save your changes for the changes to be applied. If you place a script in the Scripts folder while After Effects is open, you must restart After Effects for the script to appear in the Run Scripts menu.


Techniques for working efficiently

Projects you create using high resolution or many layers can take longer to work with because of long previewing times or complex navigation. After Effects provides many options and techniques for working faster and more efficiently.

In many cases you can work more quickly by displaying an appropriate level of detail for the layers you are working on. For example, imagine you are animating a frame containing a small moving layer in front of a larger layer. If you're adjusting the motion of the small layer in relation to the large layer, you may need to see both layers. If you're adjusting only the effect applied to the smaller layer, you can speed previewing by preventing a detailed display of the larger layer, displaying the layer at a lower resolution or as a wireframe, or turning off the display of the layer. As you work on other parts of the project, use the following techniques to speed screen updates on the area in which you are currently working.

Utilize OpenGL support OpenGL accelerates interactive previews (such as dragging layers in the Composition window or scrubbing values) by using the Open GL features of your video display card. OpenGL improves preview speed for many After Effects features such as shadows, 2D and 3D transformations, effects, and cameras. (See [“Using OpenGL interactive previewing” on page 141.](#))

Lower the composition's resolution Displaying a composition at a lower resolution than is set in its Composition Settings dialog box speeds previewing, especially when you adjust the window size accordingly. (See [“Setting resolution” on page 77.](#))

Use folders in the Project window To make it easier to locate and move items, organize items by creating and using folders in the Project window. (See [“Working with the Project window” on page 26.](#)) Use the Find button  at the bottom of the Project window to locate files and compositions by name.

Close unneeded windows and tabs Keep open only those windows and tabs that you need to see as you work. After Effects must spend time updating all Layer or Composition windows that are open, which takes time from the one or two windows that are most important. Tabs consume memory that could otherwise be used to speed up other operations.

Substitute a proxy for a source item When working at full resolution, substitute a low-resolution or still-image proxy for a layer to speed previewing and working. (See [“Substituting a low-resolution proxy for footage” on page 71.](#))

Lower a layer's display quality Selecting Draft for a layer while working with it is often a good compromise in quality that will speed previewing. (See [“Changing the layer image quality” on page 109.](#))

Hide layers When you don't need to see one or more layers in the Timeline window, hide them or mark them as shy, which simplifies navigation. (See [“Showing and hiding layers in the Timeline window” on page 101.](#))

Lock layers To avoid wasting time undoing accidental modifications, lock a layer when you want to see it but do not want to modify it. (See [“Locking and unlocking a layer” on page 102.](#))

Prerender nested compositions Render a completed composition as a movie so that After Effects doesn't use the time and memory required to calculate its changes every time it displays. (See [“Saving time by prerendering nested compositions” on page 317.](#))

Collapse transformations of nested compositions In some cases, you can improve preview speed, rendering speed, and image quality by collapsing transformations of a layer containing nested compositions. (See [“Collapsing transformation properties” on page 108.](#))

Deselect Continuously Rasterize for Illustrator files Deselect the Continuously Rasterize switch for an Adobe Illustrator file until you need to view or render it in detail. This prevents After Effects from rasterizing the entire file after each change, thus saving you time. (See [“Importing an Adobe Illustrator, PDF, or EPS file” on page 51](#), and [“Collapsing transformation properties” on page 108](#).)

Stop window updates Press the Caps Lock key to prevent After Effects from updating Footage, Layer, or Composition windows. This is useful for a Layer or Composition window that takes a long time to update. When Caps Lock is active, all open Footage, Layer, or Composition windows display the last update you made before pressing Caps Lock, regardless of the changes you make. As soon as you make a change that would appear in a window, After Effects adds a red outline to any affected windows, and the windows are not updated. After Effects continues to update window controls such as motion paths, anchor points, and mask outlines as you move them. To resume window updates and display all changes made while Caps Lock was active, press Caps Lock again to deactivate it.

Deselect Show Cache Indicators Showing the cache indicators may slow down After Effects processing. To turn off the indicators, deselect Show Cache Indicators in the Timeline window menu.

Isolate the layer you’re working on Isolate the layer by using the Solo switch. (See [“Soloing a layer” on page 102](#).)

Use Draft 3D Use this option to prevent highlight and shadow calculations. (See [“Understanding 3D” on page 260](#).)

Disable Dynamic Preview Use the Enable Dynamic Preview option to turn off updating for faster interaction. To turn off updating, choose Edit > Preferences > Preview and deselect Enable Dynamic Preview. You can also toggle this setting using the Disable Dynamic Preview button at the top of the Timeline window.

Using RAM effectively

Occasionally, After Effects may display an alert message indicating that it requires more memory to display or render a composition. To render more efficiently, it’s helpful to understand how After Effects uses memory and what parts of a composition may be increasing the memory load. Many variables, such as memory management controlled by QuickTime or other system software, make it impossible to predict the exact amount of memory required for displaying or rendering a particular layer. However, you can usually identify memory-intensive layers with enough certainty to get a composition to render.

When rendering a composition, the following factors determine memory requirements:

- The resolution of the composition frame. A higher resolution frame requires more memory.
- The memory requirement of the most memory-intensive layer in the composition.
- The size of the project file.

If you have no problems displaying every frame of a full-resolution, best-quality preview of a composition, then you have enough memory to render the composition. Rendering a composition into a movie takes somewhat less memory than displaying it on-screen.

Setting image caching preferences

As you work on a composition, After Effects temporarily stores rendered composition and source images in RAM, so that previewing and editing can occur more quickly. For example, once you view a specific frame in a composition, that frame is stored in RAM until you run out of memory or until you edit the composition in some way that affects that frame. You can control how After Effects stores images in RAM by setting different image-caching preferences.

To specify image caching:

- 1 Choose Edit > Preferences > Cache (Windows) or After Effects > Preferences > Cache (Mac OS).
- 2 For Image Cache Size, type a value to set the maximum amount of installed RAM to use for cached frames. The default value is 60%. Values over 90% are not recommended.
- 3 For Maximum Memory Usage, type a value to set the maximum amount of memory to use for any purpose. You can specify values over 100% (where 100% equals the amount of physical RAM you have installed) because virtual memory uses hard-disk space. However, values over 200% are not recommended.
- 4 Click OK.

Note: The Image Cache Size setting directly affects the number of frames that you can play back in RAM preview. Increase the value to play back more frames. Decrease it if you notice that your RAM previews jerk and halt during playback. This jerky playback often occurs because of virtual memory paging activity, which is affected by the memory usage of the other applications you have running.

Identifying memory-intensive layers in a composition

After Effects renders each frame of a composition one layer at a time. This means that the memory requirement of each individual layer is more important than the duration of the composition or the number of layers in the composition. The memory requirement for a composition is equivalent to the memory requirement for the most memory-intensive single layer in the composition. For example, it generally takes less memory to render 30 layers at NTSC resolution than two layers at motion-picture film resolution.

The memory requirements of a layer increase in the following situations:

- When you use larger image sizes.
- When you add a mask in After Effects.
- When the source of a layer is a composition. When a layer contains a composition, everything in that composition must be rendered before the next layer, so look for memory-intensive layers within that composition.
- When you apply certain plug-in effects or transfer options, especially those that combine the layer with other layers. For example, After Effects must set aside an additional memory buffer for the Set Channels effect.
- When you apply certain output options, such as 3:2 pulldown, cropping, and stretching.
- When you add shadows or depth of field.
- When you use 16 bpc (approximately doubles memory requirement).

Reducing a composition's memory requirements

Once you identify the layers that use memory-intensive features, you can employ several strategies to reduce the memory load:

- Collapse transformations of nested compositions where possible. Collapsing transformations calculates the transform property changes once for all nested compositions instead of calculating at every level in the composition hierarchy. This saves memory and improves performance. This technique cannot be used if the nested composition uses a mask or effect. (See [“Collapsing transformation properties” on page 108](#) and [“Collapsing transformations to maintain image quality” on page 315](#).)
- Prerender nested compositions. When you render nested compositions into movies, After Effects saves the time and memory required to calculate the changes in them. (See [“Saving time by prerendering nested compositions” on page 317](#).)
- Render compositions in draft mode. Although draft quality is not sufficient for final output, it produces a movie that is good enough for previewing your project.
- Reduce the number of changes you can undo with the Undo command by choosing Edit > Preferences > General (Windows) or After Effects > Preferences > General (Mac OS) and typing a lower number for Levels of Undo.
- Free up RAM currently used to cache images by choosing Edit > Purge > Image Caches. You can also free up RAM currently used to store undo changes by choosing Edit > Purge > Undo.

If insufficient-memory problems persist, try the following:

- Add additional RAM to your computer.
- When a memory error message appears, temporarily turn off effects from the project in order to finish rendering.

Running After Effects on multiprocessor systems

When running on a multiprocessor system, After Effects employs an MP plug-in to make use of the added processing power available. With this plug-in, a multiprocessing system previews and renders certain operations much faster than single processor systems. The MP plug-in accelerates movement, rotation, motion blur, blending modes, and other computation-intensive operations, including plug-in effects such as Compound Arithmetic and Bevel Alpha.

The degree to which the MP plug-in improves performance depends on the type of operation being performed. Memory-intensive operations are accelerated only minimally. Performance improvement also depends on system variables, such as the operating system, the type and number of processors, hard drive type, and compression. To determine the impact on rendering speed, render a project using the plug-in, move the plug-in out of the Plug-ins folder, render the project again, and compare the rendering times.

Using the Windows MP plug-in (Windows only)

The MThread.aex plug-in enhances After Effects performance on multiprocessor systems under Windows XP Pro. The Adobe MP Accelerator plug-in is installed automatically during the After Effects installation process.

Using the Multiprocessor Support plug-in (Mac OS)

The Adobe Multiprocessor Support plug-in enhances After Effects performance on Mac OS multiprocessor systems, such as Apple G4. The Adobe Multiprocessor Support plug-in is installed automatically during the After Effects installation process.

Operations that take advantage of multiprocessors

The multiprocessor plug-ins accelerate many of After Effects operations, including the following:

Effects Alpha Levels, Arithmetic, Brightness/Contrast, Basic 3D, Bevel Alpha, Bevel Edges, Blend, Block Dissolve, Change Color, Channel Blur, Color Emboss, Color Balance, Color Difference Key, Compound Arithmetic, Compound Blur, Displacement Map, Difference Matte, Drop Shadow, Echo, Emboss, Equalize, Fast Blur, Fractal Noise, Glow, Gamma/Pedestal/Gain, Gradient Wipe, Color Balance (HLS), Invert, Inner/Outer Key, Luma Key, Color Key, Leave Color, Lightning, Linear Color Key, Linear Wipe, Matte Choker, Mirror, Noise, Offset, Optics Compensation, PS Arb Map, Radial Wipe, Ramp, Ripple, Scatter, Set Channels, Shift Channels, Simple Choker, Spill Suppressor, Strobe Light, Texturize, Tint, Twirl, Unsharp Mask, Vector Paint (when using Better Preview and a Stylus), Venetian Blinds, Write-on

Third-party effects Ultimatte, MetaCreations Studio Effects

Rendering Operations Anti-aliasing, Geometric Transformations, Subpixel-Positioning, Motion Blur, Scaling, Rotation, Transparency, Blending, Compositing, Frame Blending, Corner Pin, Masks, Blending Modes, 3D rendering, 16-bit per channel rendering

Rendering a Movie

About rendering

When you create output, the layers of a composition and each layer's masks, effects, and properties are rendered frame by frame into one or more output files or, in the case of a sequence, into a series of consecutive files.

After Effects provides a variety of formats and compression types for rendering output; the format you choose depends on the medium from which you'll play your final output or on the requirements of your hardware, such as a video-editing system.

You can render movies to use in a wide variety of ways, including the following:

- To play on systems that have a movie player application (such as Apple QuickTime Player).
- To record on videotape for playback on NTSC and PAL broadcast television equipment.
- To record to 35mm film for editing into a cinema release.
- To play from DVD, from CD-ROM, or as streaming video on the World Wide Web.
- To import into nonlinear editing systems, such as Avid or Media 100, for final output.
- To broadcast on HDTV.

To render to film or video, you must have the proper hardware for film or video transfer, or have access to a service bureau that can provide transfer services.

After Effects includes a Render Queue window, in which you can specify items to be rendered, each with its own rendering settings. The Render Queue window allows you to render any number of compositions unattended and in any order. You can also render each composition into multiple output formats at one time.



You can print the Render Queue window by choosing File > Print.

File formats supported for export by After Effects

You can export the file formats listed in the following table from After Effects 6.0. The Professional edition supports file formats at 16 bits per channel. The standard edition exports these files at 8 bits per channel. Unless otherwise noted, all file formats are exported at 8 bits per channel.



Format	Windows	Mac OS
Adobe Motion Exchange (.amx)	Yes	Yes
Adobe Photoshop (.psd)	16 bpc	16 bpc
Animated GIF (.gif)	Yes	Yes
Bitmap (.bmp, .rle)	Yes	Yes
Cineon (.cin)	16 bpc converted to 10 bpc	16 bpc converted to 10 bpc
CompuServe GIF (.gif)	Yes	Yes
ElectricImage (.img, .eiz)	Yes	Yes
Filmstrip (.flm)	Yes	Yes
FLC (.flc)	Yes	Yes
FLI (.fli)	Yes	Yes
Maya IFF (.iff)	16 bpc	16 bpc
JPEG (.jpg, .jpe)	Yes	Yes
MP3 (.mp3)	Yes	Yes
PCX (.pcx)	Yes	Yes
Pict (.pct, .pic)	Yes	Yes
Pixar (.pxr)	Yes	Yes
PNG (.png)	16 bpc	16 bpc
QuickTime (.mov)	Requires QuickTime 5.0 for 8 bpc and codec support for 16 bpc	Requires QuickTime 5.0 for 8 bpc and codec support for 16 bpc
RealMedia (.ram, .rm)	Yes	No
RLE (.rle)	Yes	Yes
SGI (.sgi, .bw, .rgb)	16 bpc	16 bpc
SWF (.swf)	Yes	Yes
Targa (.tga, .vda, .icb, .vst)	Yes	Yes
TIFF (.tif)	Yes	Yes
Video for Windows (.avi)	Yes	Yes
Windows Media	Yes	Yes

Note: File formats that use Adobe Photoshop plug-ins include Bitmap, PCX, Pixar, and PNG.

Rendering and exporting 16-bits-per-channel files (Pro only)

After Effects can read and render QuickTime files in 16-bits-per-channel color depth. When you select a QuickTime codec that supports 16-bits-per-channel color depth in the Output Module dialog box, Trillions of Colors is available. (See [“File formats supported for import by After Effects” on page 38.](#)) To find out whether your video codec supports 16-bits-per-channel color depth, contact the manufacturer directly.

Making (rendering) a movie

Rendering is a series of operations performed on your composition. First, each layer or nested composition is translated into a usable format with its masks, effects, and layer transformations. Next, any included blending modes are applied and translated. Finally, the composited frame is sent to each output module to create the final movie.

Making a movie from your final composition can take a few minutes or many hours, depending on the composition's frame size, quality, complexity, and compression method. When you place your composition in the Render Queue window, it becomes a render item that uses the render settings assigned to it. As After Effects renders the item, you are unable to work in the program. An audio alert indicates when rendering is complete.

To make a movie from a composition:

- 1 Save the project, and then do one of the following:
 - Select the composition in the Project window, choose Composition > Make Movie, specify the name and location of the output file, and then click Save.
 - Choose Window > Render Queue, and then drag the composition you want to render from the Project window to the Render Queue window. Default render settings and output module templates are assigned automatically. (See [“Using the Render Queue window” on page 328.](#))
 - 2 Click the underlined setting to the right of Render Settings to change the default render settings template, or to choose a render settings template from the pop-up menu. (See [“Changing render settings” on page 330.](#))
 - 3 Choose a Log type from the Log menu.
 - 4 Click the triangle to the left of the Output Module heading to view the default output module settings template, or choose a template from the Output Module pop-up menu. (See [“Changing output module settings” on page 333.](#))
 - 5 Click the underlined text after Output To to specify the name and location of the output file.
- Note:** You can locate a previously rendered item or check the destination of a queued render item by expanding the Output Module and clicking the underlined filepath listed below it, or by right-clicking (Windows) or Control-clicking (Mac OS) the Output Module.
- 6 Select the Render option under the Render column heading. The status of the item changes to Queued.
 - 7 Click the Render button.

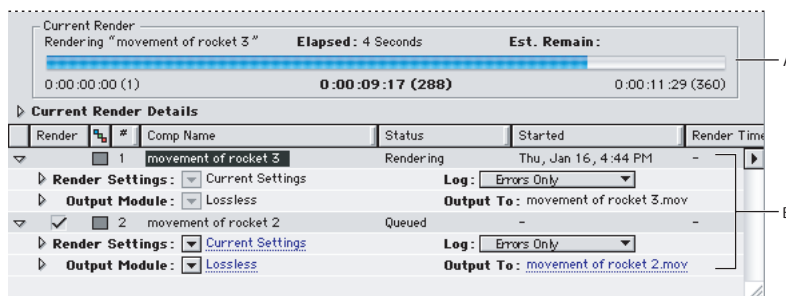
Note: To view more information about the composition as it renders, click the triangle to the left of Current Render Details. To view details of a completed rendering, review the log file.

Using the Render Queue window

Use the Render Queue window to render compositions, apply rendering and output module options, and obtain information on the rendering process. You can queue items to be rendered in any order.

All the settings for rendering a movie or sequence are included in the Render Queue window. When you drag or place a composition into the Render Queue window, it becomes a render item. You can then queue, or line up, a number of items for rendering, so that After Effects can render multiple items unattended. The settings you change in the Render Queue window affect only rendering and do not change the original compositions.

The top section of the Render Queue window monitors an item that After Effects is rendering. In the bottom section, you can arrange a queue of items to be rendered and specify render settings and output modules for each one.



A. Information on an item that is rendering **B.** Information on items queued for rendering, including settings you can change

Working in the Render Queue window

You can place multiple items in the Render Queue window. When rendering is complete, each item remains in the queue with its status changed to Done until you remove it. You cannot render a completed item again, but you can duplicate it to create a new item in the queue with the same settings or with new settings you specify.

To add compositions to the queue:

Drag the composition from the Project window to the Render Queue window, or make sure that the composition is selected and choose **Composition > Make Movie** or **Composition > Add to Render Queue**.

To remove render items from the Render Queue window:

Select the composition in the Render Queue window and press **Delete** or choose **Edit > Clear**.

To rearrange render items in the Render Queue window:

Drag the composition up or down the queue. A heavy black line appears between compositions, indicating where the composition will be placed.

To pause rendering:

Click the Pause button.

Note: While the rendering process is paused, you will not be able to change settings or otherwise use After Effects in any other way, but you can use other applications.

To stop rendering:

Click the Stop button.

Note: If you stop the rendering process, the item you stopped is assigned the status *User Stopped*, and a new item with the status of *Unqueued* is added to the Render Queue window and set to resume rendering at the first unrendered frame.

To rerender a render item with the same or different settings:

- 1 In the Render Queue window, select the render item.
- 2 Do one of the following:
 - To render with the same filename, choose Edit > Duplicate with Filename.
 - To render with a new filename, choose Edit > Duplicate, click the underlined Output to filename, type a new filename, and then click Save.
- 3 Click Render.

To change the hard disk destination for multiple queued items:

- 1 In the Render Queue window, press the Shift key to select multiple queued items.
- 2 Click the underlined Output to filename of any item.
- 3 Choose the hard disk to which you want to render the files. The filepaths for all selected items change to the new destination.



Close the Composition window to increase rendering speed.

Dragging footage to the Render Queue window

You can simultaneously create a composition from source footage and prepare it for rendering. This process is useful when you want to change some aspect of the source footage, such as frame rate or compression method, and have that rendered version available in your project.

To create a composition and render source footage simultaneously:

- 1 Choose Window > Render Queue.
- 2 Drag one or more footage items from the Project window to the Render Queue window, or make sure the footage is selected and press Control + Shift + / (Windows) or Command + Shift + / (Mac OS). After Effects creates both a new item in the Render Queue and a new composition in the Project window for each footage item.
- 3 Adjust the render settings as desired, and click Render.

Monitoring the rendering process

The Render Queue window displays both elapsed time and estimated time remaining for the composition being rendered. The Render Queue window also displays the render and output settings for all render items. You can view these settings by clicking the triangle to the left of the queued item's name and to the left of Output Module. Click the underlined filepath to locate the output destination in Windows Explorer (Windows) or the Finder (Mac OS). In addition, the Render Queue window displays the following information for all queued items:


Message Contains a status message.

RAM Shows the memory available for the rendering process.

Renderers Started Lists which items in the queue have started rendering.

Total Time Elapsed Shows the time elapsed for all items that have been rendered or are currently being rendered.

Log File Shows the name and location of the file to which rendering status messages are written. After Effects creates a log file, *AE Log (date/time).txt*. The path of the log file is displayed in the Render Queue window during rendering. Use the Log menu in the Render Queue window to select which information is written to the log file.

 Press the Caps Lock key before you start rendering to prevent the Composition window from displaying frames while it renders. By not updating the Composition window, After Effects requires less time to process simple render items with a lot of frames.

Checking rendering status

The status line in the Render Queue window provides important information on the results of the rendering process. Render queue status options include the following:

Unqueued The render item is listed in the Render Queue window but is not ready to render. Confirm that you have selected the desired render and output module settings, and then select the Render option to queue the composition.

Queued The composition is ready to render.

Needs Output An output filename has not been specified for one of the output modules.

Failed After Effects was unsuccessful in rendering the movie. Use a text editor to view the log file for specific information on why the rendering was unsuccessful.

User Stopped The rendering process was stopped.

Done The rendering process for the item is complete.

Changing render settings

The Render Queue window displays the current render settings—either default settings or settings you made when you created the composition. You can change these settings or override the settings for all layers or compositions.

When you set the quality and resolution of a composition while editing, it does not necessarily change the quality or resolution of compositions nested within it. When rendering, you can have After Effects automatically adjust the settings of all layers and compositions in your final rendered item.

You can change render settings in the Render Queue window by clicking the underlined render settings template name or by selecting a render settings template from the Render Settings pop-up menu. Several basic templates are provided. Use the Draft Settings template for reviewing motion or for testing. The Best Settings template works well for final rendering. To use the composition's current settings, use the Current Settings template.

To change render settings, click the underlined settings name. These settings affect the composition and all nested compositions.

The Render Settings dialog box has the following options:

Quality Determines the quality setting for all layers.

Resolution Determines the size and clarity of the rendered composition, relative to the original composition dimensions.

Note: *When rendering at reduced resolution, set the Quality option to Draft. Rendering at Best quality, while reducing resolution, does not produce a clear image and takes longer to render than rendering at Draft quality.*

Proxy Use Determines whether proxies will be used when rendering. Current Settings uses the settings for each item.

Effects Determines which effects are enabled for the rendered composition. You can choose to use current settings or to turn all effects on or off. If you choose All On, all applied effects are used in a composition or a layer. If you choose All Off, all effects for the composition are disabled.

Frame Blending Determines the frame blending settings for all layers. Use On for Checked Layers to render frame blending only for layers with frame blending enabled in the Switches column in the Timeline window, regardless of the composition's Enable Frame Blending setting. (See ["Using frame blending" on page 110.](#))

Field Render Determines the field-rendering technique used for the rendered composition. Choose Off if you are rendering for film or for display on a computer screen. (See ["Field-rendering considerations" on page 332](#) and ["Testing the field-rendering order" on page 360.](#))

3:2 Pulldown Determines the phase of 3:2 pulldown introduction. (See ["Introducing 3:2 pulldown" on page 337.](#))

Motion Blur Determines when motion blur is applied. Use On for Checked Layers to render motion blur only for layers with motion blur enabled in the Switches column in the Timeline window, regardless of the composition's Enable Motion Blur setting. Shutter angle affects the amount of Motion Blur. Select Override Shutter Angle if you don't want After Effects to use the shutter angle selected in the Composition Settings dialog box, and specify a different shutter angle. (See ["Adjusting the shutter angle for motion blur" on page 112.](#))

For more information, see ["About motion blur" on page 111.](#)

Use Storage Overflow Determines whether rendering continues when the first assigned storage volume overflows. If this option isn't selected, rendering stops when the first assigned volume reaches capacity. (See ["Working with overflow volumes" on page 357.](#))

Time Span Indicates how much of the composition is being rendered. To render the entire composition, choose Length of Comp. To render only the part of your composition indicated by the work-area markers, choose Work Area Only. To render a custom time span, choose Custom or simply click Set, type timecodes in Start, End, and Duration, and then click OK.

Frame Rate Determines the sampling frame rate used to render the composition. Select Use Comp's Frame Rate to use the frame rate specified in the Composition Settings dialog box, or select Use this Frame Rate to type in a different frame rate. The actual frame rate of the composition is unchanged.

Skip Existing Files When this option is selected, you can rerender part of a sequence of files without wasting time on previously rendered frames. When rendering a sequence of files, After Effects locates files that are part of the current sequence, identifies the missing frames, and then renders only those frames, inserting them where they belong in the sequence. You can also use this option to render single-frame sequences on multiple systems.

Note: *The current sequence must have the same name as the existing sequence, and the starting frame number, frame rate, and time span must be the same.*

Field-rendering considerations

If vertical scaling, translation, rotation, or effects are applied to the image, the two fields of a video frame should be separated so that rendering can occur separately. If the field settings in the Interpret Footage dialog box are correct for the input footage and the field settings in the Render Settings dialog box are correct for the output device, you can mix footage items of different field orders in a composition. If either of these settings is incorrect, however, the frames will be in the correct order, but the field order may be reversed, resulting in jerky, unacceptable images. The Upper Field First option corresponds to Even Field First in an ElectricImage file. (See [“Testing the field-rendering order” on page 360.](#))

Creating and using render settings templates

You can create templates that save commonly used render settings. These templates appear in the Render Settings pop-up menu in the Render Queue window. You can specify a default render settings template for movie rendering as well as another for creating a single frame. You can also save all render settings templates to a file to use on another computer.

To set the default render settings templates:

- 1 Choose Edit > Templates > Render Settings.
- 2 To specify a default template to be used when rendering movies, choose a template from the Movie Default pop-up menu. To specify a default template to be used when rendering a single frame, choose a template from the Frame Default pop-up menu.

To create a new render settings template:

- 1 Choose Edit > Templates > Render Settings.
- 2 Click New.
- 3 Specify the render settings you want, and click OK.

- 4 Type a name for the new template and click OK.

To edit an existing render settings template:

- 1 Choose Edit > Templates > Render Settings.
- 2 Choose a template from the Settings Name pop-up menu.
- 3 Click Edit.
- 4 Specify the render settings you want and click OK.
- 5 Click OK to close the Render Settings Templates dialog box.

Note: Changes to an existing template do not affect render items that are already in the Render Queue.

To save all currently loaded templates to a file:

- 1 Choose Edit > Templates > Render Settings.
- 2 Click Save.
- 3 Select a location for the file, type a filename, and then click OK.
- 4 Click OK to close the Render Settings Templates dialog box.

To load a saved template file:

- 1 Choose Edit > Templates > Render Settings.
- 2 Click Load.
- 3 Select the template file, and then click Open.
- 4 Click OK to close the Render Settings Templates dialog box.

Changing output module settings

An output module includes options for the specific video and audio output format to which you are rendering the movie, as well as video compression options. The Render Queue window shows the current settings for an output module.

Change output module settings from the Render Queue window by clicking the underlined output module template name or by choosing a template from the Output Module pop-up menu. Several templates are provided, including the Lossless template for creating movies for transfer to video or film.

Note: Before rendering, check the Audio Output settings in the Output Module Settings dialog box to ensure that they are correct. If your project includes audio, be sure that Audio Output is selected. If your project does not include audio, do not select Audio Output so that the size of the rendered file will not increase needlessly.

You can specify the following settings in the Output Module Settings dialog box:

Format Specifies the format for the output file or sequence of files. File formats include QuickTime, Video for Windows, and file types available from plug-in file format modules.

Embed Specifies whether to include information in the output file that links to the source project in After Effects. When you open the output file in another application such as Adobe Premiere, you can use the Edit Original command to edit the source project in After Effects. Selecting Project Link creates a link between the output file and the source project. Selecting Project Link and Copy creates a link and adds an embedded copy of the linked project to the output file; if the project is missing or updated when you choose Edit Original in another application, you can choose whether to open the source project or the saved copy of the project.

Post-Render Action Specifies an action for After Effects to perform after the composition is rendered. See [“About Post-Render Action options” on page 335](#).

Format Options Opens a dialog box with format-specific information. For example, if QuickTime is your format, Format Options opens a QuickTime Compression dialog box. (See [“Choosing compression options” on page 347](#).)

Starting # Specifies the number for the starting frame of a sequence. For example, if this option is set to 38, After Effects names the first frame filename_00038.tga. The Use Comp Frame Number option adds the starting frame number in the work area to the starting frame of the sequence.

Channels Specifies the output channels contained in the rendered movie. After Effects creates a movie with an alpha channel if you choose RGB+Alpha, implying a depth of Millions of Colors+.

Note: All files created with a color depth of Millions of Colors+ or Trillions of Colors+ have labeled alpha channels; information describing the alpha channel is stored in the file. Therefore, you do not have to specify an alpha interpretation each time you import an item created in After Effects.

Depth Specifies the color depth of the rendered movie. Choose from color or grayscale options, and note that certain formats may limit depth and color settings.

Color Specifies how colors are created with the alpha channel. Choose from either Premultiplied (Matted) or Straight (Unmatted). (See [“Importing footage containing an alpha channel” on page 46](#).)

Stretch Specifies the size of your rendered movie. Select Lock Aspect To if you want to retain the existing frame aspect ratio when stretching the frame size. Select Low Stretch Quality when rendering tests, and select High Stretch Quality when rendering a final movie.

Crop Used to select or add pixels to the edges of the rendered movie. You can specify the number of pixels to be added or subtracted from the top, left, bottom, and right sides of the movie. Type positive values to crop, and type negative values to add pixels. Select Region of Interest to render only the region of interest selected in the composition or layer window.

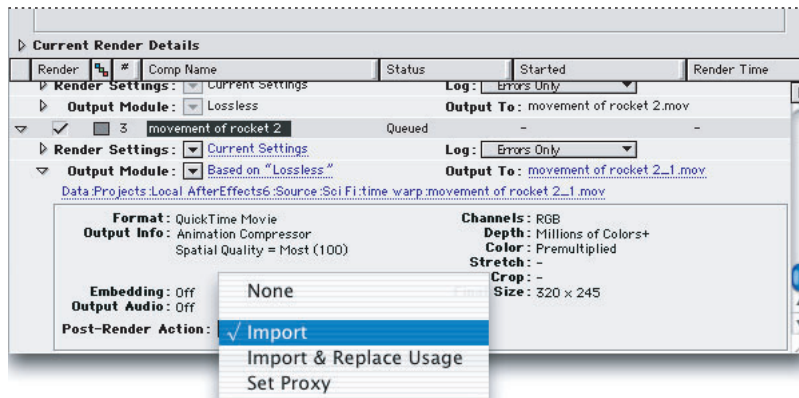
Note: By adding one pixel to the top of a rendered movie with field rendering, you can change the field-rendering order. (See [“Making a movie smaller than the rendered composition” on page 358](#).)

Audio Output Specifies the sample rate, sample depth (8 Bit or 16 Bit), and playback format (Mono or Stereo). Choose a sample rate that corresponds to the capability of the output format. Choose an 8-bit sample depth for playback on the computer, and a 16-bit sample depth for compact disc and digital audio playback or for hardware that supports 16-bit playback.

About Post-Render Action options

After a composition is rendered, After Effects can automate simple tasks through options available in the Post-Render Action menu. Post-Render Action options are useful for setting up multiple render items that don't continuously return to the Render Queue. These options allow you to prerender footage items and then replace existing footage or set proxies.

Note: You can choose a Post-Render Action option in an Output Module template, so be aware that changing the Output Module template could also change the Post-Render Action option. (See [“Creating and using output module templates” on page 337.](#))



The Post-Render Action menu

Using the Post-Render Action menu

The Post-Render Action menu specifies the action you want After Effects to perform after it renders the item. You can choose Post-Render Action options in the Render Queue window.

Note: Choosing *Pre-render* from the *Composition* menu adds a selected composition to the Render Queue and sets the Post-Render Action option to *Import & Replace Usage*.

To specify Post-Render Action options:

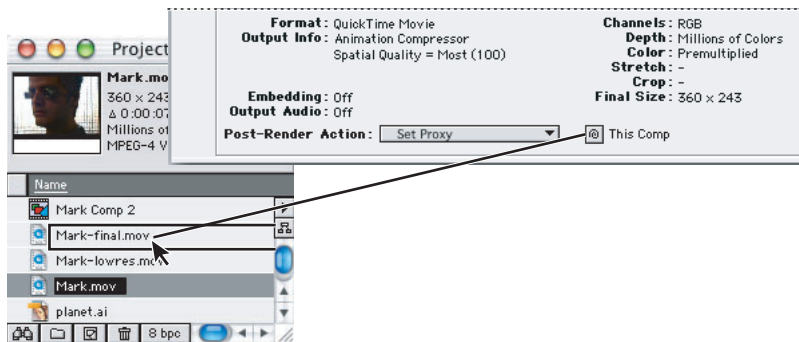
- 1 Place the item you want to render in the Render Queue window. (See [“Working in the Render Queue window” on page 328.](#))
- 2 Expand Output Module, and choose one of the following from the Post-Render Action menu:

None Performs no post-render action. This option is the default.

Import Imports the rendered file to the project when the rendering is complete.

Import & Replace Usage Imports the rendered file and substitutes it for each use of the specified Project window item. Drag the pick whip to the Project window item to specify it.

Set Proxy Sets the rendered file as a proxy for the specified project item. Drag the pick whip to the Project window item to specify it.



Setting a render item (right) as a proxy for a project item (left) using the Post-Render Action pick-whip.

Creating output chains

Use output chains to create files that can be used in different compositions. For example, you can create a placeholder for the rendered version of a 24-fps movie and then drag that placeholder into a 30-fps composition. Then, when you render the 30-fps composition, After Effects first renders the placeholder at 24 fps and uses this rendered version as it renders the 30-fps composition.

To create an output chain:

Drag the output module for a queued item from the Render Queue window to the Project window. After Effects creates a placeholder for output in the Project window and sets the Post-Render Action option for the item to Import & Replace Usage.

Creating default output filenames

The Use Default File Name and Folder preference ensures that all compositions added to the Render Queue window are automatically assigned a unique output filename (except for files created by saving RAM previews, which still use the composition name). When selected, each composition is assigned the same folder name as the previous composition until you change the path.

Note: Avoid using high-ASCII or other extended characters in filenames for projects to be used on different platforms or rendered using a watch folder.

To specify default output filenames:

- 1 Choose Edit > Preferences > Output (Windows) or After Effects > Preferences > Output (Mac OS).
- 2 Select Use Default File Name and Folder.

Introducing 3:2 pulldown

If you are creating output for film that's been transferred to video or if you want to simulate a film look for animation, use 3:2 pulldown. Footage items that were originally film transferred to video and had 3:2 pulldown removed when imported into After Effects can be rendered back to video with 3:2 pulldown reintroduced. You can introduce 3:2 pulldown by choosing one of five different phases. (See ["Removing 3:2 or 24Pa pulldown from video transferred from film or DV cameras" on page 62.](#))

Note: *It is important to match the phase of a segment that had 3:2 pulldown removed if it will be edited back into the video footage it came from.*

To introduce 3:2 pulldown:

- 1 In the Render Queue window, select the render item and then click the underlined Render Settings name.
- 2 For Field Render, choose a field order.
- 3 For 3:2 Pulldown, choose a phase.
- 4 Select other settings as appropriate, and then render.

Creating and using output module templates

You can create templates that save commonly used output module settings. These templates appear in the Output Module pop-up menu in the Render Queue window. You can specify a default output module template for movie rendering and another for creating a single frame. After Effects provides several templates that include commonly used formats, such as Microsoft DV NTSC. You can also save all output module settings templates to a single file to use on another computer.

Note: *After Effects includes templates that specify the use of the Pre-render and Create Proxy commands. (See ["Using the Pre-render command" on page 317](#) and ["Creating a proxy" on page 338.](#))*

To set the default output module template:

- 1 Choose Edit > Templates > Output Module.
- 2 In the Output Module Templates dialog box, do the following:
 - To set a default template to be used when creating movies, choose a template from the Movie Default pop-up menu.
 - To set a default template to be used when creating a single frame, choose a template from the Frame Default pop-up menu.

To create a new output module template:

- 1 In the Output Module Templates dialog box, click New.
- 2 Type the output module settings you want, and then click OK.
- 3 Type a name for the new template, and then click OK.

To edit an existing output module template:

- 1 In the Output Module Templates dialog box, choose a template from the Settings Name pop-up menu.

- 2 Click Edit.
- 3 Change the settings you want, and then click OK.

Note: Changes to an existing template do not affect render items that are already in the Render Queue.

To save all currently loaded output module templates to a file:

- 1 In the Output Module Templates dialog box, click Save.
- 2 Select a location for the file, type a filename, and then click OK.

To load a saved output module template file:

- 1 In the Output Module Templates dialog box, click Load.
- 2 Select the template file, click Open, and then click OK.

Creating a proxy

Use the Create Proxy command to create a proxy from footage or compositions selected in the Project window or the Timeline window. This command adds the selected footage to the Render Queue window and sets the Post-Render Action option to Set Proxy. (See [“About Post-Render Action options” on page 335](#), and [“About placeholders and proxies” on page 70](#).)

To create a proxy:

- 1 Select a footage item or composition in the Project or Timeline window.
- 2 Choose one of the following commands:
 - File > Create Proxy > Still to create a still image proxy.
 - File > Create Proxy > Movie to create a moving image proxy.
- 3 Specify a name and output designation for the proxy.
- 4 Specify Render settings, and click Render.

Note: To create a still image proxy from a movie or sequence file, open the footage in the Footage window and set as the poster frame the frame you want to use as the proxy. (See [“Displaying After Effects viewing and editing controls in the Footage window” on page 29](#).)

Exporting projects for use in LiveMotion

You can easily integrate After Effects projects with Adobe LiveMotion—simply create your complex animations in After Effects, and then export your project as an Adobe Motion Exchange format file (AMX). You can then import this file into LiveMotion.

Exporting to AMX format

During export, After Effects maintains vectors as much as possible. However, raster images and certain features cannot be represented as vectors in the AMX file. (See [“Supported features for AMX export” on page 339](#).) You can exclude these unsupported items, or you can let After Effects render them as a sequence of PNG files, which you can add to the AMX file. All audio is encoded in MP3 format and added to the AMX file as an audio stream.

After you export, a report (*AMX filenameR.htm*) is created in the same folder as the AMX file. Open the report in a browser to see which items are not supported in the AMX file.

To export to AMX format:

- 1 In the Project window, select the composition you want to export, and then choose File > Export > Adobe Motion Exchange (.amx) for LM2.
- 2 Specify a filename and location, and click Save.
- 3 In the AMX Settings dialog box, specify one or more of the following options, and then click OK:

Include Layers with Video Turned Off Specifies whether layers with the video turned off in the Timeline window are included in the AMX file. Excluding hidden layers can reduce the size of your AMX file and increase the export speed.

Put Images in Folder Specifies the folder to which After Effects exports images that contain unsupported items. During each export, After Effects saves these images in PNG format and adds a number to the folder name, if necessary, to make it unique.

Nested Compositions Specifies how After Effects exports nested compositions. Choose Rasterize to export them as a sequence. Choose Collapse Transformations to export them as vectors. If you have multiple nested compositions, choosing Collapse Transformations may increase export time.

Note: For the Collapse Transformations option to work, you must first turn on Collapse Transformations for the layer. (See [“Collapsing transformation properties” on page 108.](#))

Unsupported Features Specifies whether or not to render After Effects layers containing items not supported in LiveMotion. Choose Ignore to skip all unsupported features. Choose Rasterize to render all frames that contain unsupported features as a PNG sequence. Choosing Rasterize increases the file size and may significantly reduce the streaming quality.

Audio Activates the audio menus.

Sample Rate Specifies the sample rate of the audio.

Channels Specifies whether the audio tracks are mono or stereo.

Bit Rate Specifies the bit rate of the exported audio. Choose Auto to obtain the lowest bit rate available for the specified Sample Rate and Channel. Higher bit rates increase file size.

Note: After Effects rasterizes each layer to the size of the composition. To save space, you can create another composition with smaller dimensions and place the layer in that composition. This forces the resulting object in LiveMotion to be smaller and greatly reduces the size of the SWF file exported from LiveMotion.

Supported features for AMX export

When creating compositions intended for the AMX format, note the following:

Blending modes Only Normal mode is supported.

Layers and switches Layers beneath an adjustment layer or beneath a layer using a blending mode other than Normal are combined and rendered as a single layer. 3D layers are also combined and rendered as a single layer. All layer switches except the following are supported: Adjustment Layer, 3D Layer, Preserve Transparency, and Motion Blur.

Rectangular pixels Rectangular pixels, such as those used in DV and D1 video formats, are converted to square pixels upon export.

Keyframes All Hold and Linear keyframes are retained, but all Auto Bezier keyframes are interpreted as smooth. All other keyframe types, such as keyframes to which you have adjusted the velocity, cause the exporter to sample the range between the adjusted and unadjusted keyframes and then to create a linear keyframe for each frame of the animation. Roving keyframes are not supported.

Masks Only masks that use the Add mask mode are supported. Mask Feather and Mask Expansion are not supported.

Mattes All mattes except traveling mattes are supported.

Effects Path Text is the only supported effect (however, its Fill Over Stroke and Difference options are unsupported). Only one effect per layer is supported.

Exporting to Windows Media or RealMedia format (Windows only)

You can create movies in After Effects that can be embedded in Web pages for streaming and downloading. The Render Queue window provides options for rendering Windows Media files and RealMedia files.

Exporting to Windows Media format (Windows only)

Windows Media format supports embedded Web links and chapters. To include them in the exported file, create layer markers in your composition. (See [“Using markers” on page 104](#).) When you add a Web link to a layer marker, After Effects adds the link with a Get URL command to the Window Media file. If you add chapter information as well, After Effects translates the chapter information as a script command for the Web link.

Exporting to RealMedia format (Windows only)

By using the RealMedia format, you can export RealVideo® files with or without audio, and RealAudio® files.

To export a Windows Media or a RealMedia file:

- 1 Select the file or composition in the Project window, and choose Composition > Add to Render Queue.
- 2 In the Render Queue window, click the underlined Output Module setting to open the Output Module Settings dialog box.
- 3 Choose either Windows Media or RealMedia from the Format menu.
- 4 Click Format Options.
- 5 Do one of the following:
 - Choose a Preset from the Preset pop-up menu.
 - Load a preset by clicking the Import preset icon.
 - Choose Custom from the Preset pop-up menu to select your own settings.
- 6 Select Video from the list on the left, and then do one of the following:
 - For Windows Media, choose a codec from the pop-up menu, and select a bitrate mode.



- For RealMedia, choose a video codec from the pop-up menu, and a video content type that best suits the amount of motion in the video.
- 7** Select Audio from the list on the left, and then do one of the following:
- For Windows Media, choose an audio codec from the Codec pop-up menu if you're creating movies with audio, and select a bitrate mode. If you choose Windows Media Audio 9 Voice from the Codec pop-up menu, choose an appropriate Mode setting.
 - For RealMedia, select an audio content type (Voice or Music).
- 8** Click OK, set render options, and then click Render.

Specifying Windows Media and RealMedia options

When you export Windows Media or RealMedia files, choose from the following options:

Note: *You cannot save custom settings as a preset or in file format.*

Preset Specifies predetermined settings that match content with appropriate audio and video codecs.

Preset buttons The import preset button  allows you to import custom settings from applications, such as Adobe Premiere. The delete preset button  allows you to delete the selected preset.

Comment Provides a text box for you to describe the preset using a maximum of 256 characters. Comments are saved with the preset.

Summary Lists all the settings in the chosen preset.

General For Windows Media only, specifies whether your output is compressed or uncompressed. Indicates the average kilobytes per second for combined audio and video settings.

Allow Recording For RealMedia only, allows you to record a clip.

Video Specifies a list of video codecs for various Windows Media or RealMedia playback devices. Each option enables different selections for Audience Settings. For Windows Media only, Bitrate Mode Specifying Constant or Variable Quality may create a bitrate that exceeds the capabilities of some playback devices. When Windows Media Video 9 is selected, the Allow Interlaced Processing option is available.

Video Content For RealMedia only, specifies encoding options that correlate to the amount of motion in the video footage. For example, high motion may include fast pans or action scenes. Normal is suitable for clips with a wide range of motion. Sharpest Image mode provides the greatest amount of image for clips with high motion. Smoothest Motion provides the best continuity and smoothness between high-motion scenes. Slide Show mode produces high image quality and is most suitable for video with little or no motion.

Audio For Windows Media only, specifies the audio codec and bitrate type used for audio information. When Windows Media Video 9 is selected, the Mode pop-up menu is available with options for Music, Speech, and Mixed.

Audio Content For RealMedia only, include Music or Voice options. The Music option lets you optimize monophonic music-only clips.

Metadata Specifies 48 parameters you can add to the File Info section of the exported file. The Add/Remove Fields option allows you to add or remove metadata parameters; the Clear Fields option allows you to clear parameter values. Windows Media allows you to add new metadata fields.

Audiences Specifies audience profiles based on the type of Internet connection (such as dial-up or cable modem) and bandwidth. Profiles include Audio Format, Frame Rate, Bit Rate, Image Quality, and Buffer Size properties. Add/Remove Audiences lists the selected audiences in the Select Target dialog box. Selecting multiple audiences activates a feature called SureStream, which allows the playback device to choose the most appropriate stream for the user's available bandwidth. Windows Media allows ten audiences per preset. RealMedia allows unlimited audiences unless you specify VBR, which allows one audience only.

Exporting to Macromedia Flash (SWF) format

You can export compositions as Macromedia Flash (.swf) files. Web browsers with the Flash Player plug-in can play the SWF format.

Exporting compositions to SWF format

During export, After Effects maintains vectors as much as possible. However, raster images and certain features such as pixel effects, blending modes, and motion blur cannot be represented as vectors in the SWF file. (See [“Supported features for SWF export” on page 343.](#))

You can choose to ignore these unsupported items so that the SWF file includes only those After Effects features that can be converted into native SWF elements, or you can choose to rasterize frames that contain unsupported features and add them to the SWF file as JPEG-compressed bitmap images, which may reduce the efficiency of the SWF file.

Audio is encoded in MP3 format and added to the SWF file as an audio stream.

To export a composition to Macromedia Flash (SWF) format:

- 1 Select the composition you want to export, and then choose File > Export > Macromedia Flash (SWF).
- 2 Type a filename (making sure to include the .swf extension) and location, and then click Save (Windows) or OK (Mac OS).
- 3 Specify the following options as appropriate, and then click OK:

JPEG Quality Specifies the image quality. The higher the quality, the larger the file. (If Rasterize is selected for Unsupported Features, the JPEG Quality setting is used for all JPEG-compressed bitmap images exported to the SWF file, including bitmap images generated from composition frames or Adobe Illustrator files.)

Unsupported Features Specifies whether to rasterize features that SWF format doesn't support. Choose Ignore to exclude unsupported features, or choose Rasterize to render all frames that contain unsupported features as JPEG-compressed bitmap images and include them in the SWF file. If you choose Rasterize, the SWF Exporter rasterizes the following: source files for each layer in the composition (except layers that use Illustrator files or solids as the source footage), and nested compositions with Collapse Transformations enabled. Only the layer that contains the unsupported features is rasterized, not the entire composition frame.

Audio Sample Rate Specifies the sample rate of the audio.

Audio Channels Specifies whether the audio tracks are mono or stereo.

Audio Bit Rate Specifies the bit rate of the exported audio. Choose Auto to get the lowest bit rate available for the specified Sample Rate and Channel. Higher bit rates increase file size. (See [“Changing output module settings” on page 333.](#))

Loop Continuously Specifies that the exported SWF file loops continuously during playback. If you plan to specify looping by writing HTML code to control the Flash Player, select Loop Continuously.

Prevent Import Creates a SWF file that digital image or video-editing programs can't import.

Include Object Names Includes layer, mask, and effect names in the file. Selecting this option increases file size. (See [“Including object names in a SWF file” on page 345.](#))

Include Layer Marker Web Links Specifies layer markers to behave as Web links. (See [“Including Web links in a SWF file” on page 345.](#))

The SWF Exporter saves a report (*SWF filenameR.htm*) to the same folder as the SWF file. Open the report in a browser to see which items are unsupported in the SWF file.

Supported features for SWF export

When creating compositions intended for the SWF format, note the following information about each feature:

Layers Only Normal blending mode is supported. The following layer types and layer switches aren't supported: Track Mattes, 3D Layers, 3D Cameras, 3D Lights; Adjustment Layers, Preserve Transparency, Collapse Transformations, and Motion Blur.

Masks Only masks with Add mask mode or Difference mask mode are supported; multiple masks in a layer must use the same mask mode. If Add mode is specified, Partial Opacity and the mask Inverted option are also supported. Mask feathers are not supported.

Note: *The SWF Exporter renders overlapping Add mode masks that include alpha channels or partial opacity differently from After Effects.*

Effects Path Text is the only supported effect, limited to one layer per effect. All Path Text options are supported except the following: Composite on Original, Fill and Stroke/Options/Fill Over Stroke, and Advanced/Mode/Difference.

Resolution The SWF Exporter always creates files at full resolution (size of composition) and renders JPEG-compressed bitmap images at full resolution.

Adobe Illustrator files Only stroked paths and filled paths in CMYK or RGB color spaces are supported. Illustrator layers that contain masks or have Collapse Transformations enabled are rasterized.

Using references in the SWF file

The SWF Exporter uses each item in the SWF file once and then references it for any further use, provided the content doesn't change and regardless of whether the frames are consecutive. For example, the SWF Exporter adds a layer that contains still source footage and a non-animated mask to the SWF file and then references the layer on all subsequent frames, even if you've animated the layer's transformation properties. However, if you animate the mask, or if the layer's source file is video or a composition that changes over time, the SWF Exporter adds a new object to the SWF file on each frame where the layer is visible. Objects added this way include JPEG-compressed bitmap images, SWF movie clips created in Adobe Illustrator, and text characters applied with the Path Text effect.

Referencing also works across layers, so if multiple layers in the composition share the same source, the source is added once to the SWF file and is then referenced for every additional layer that shares the source. If the source is an Illustrator file or layer, a SWF movie clip is created and referenced. If the Path Text effect is applied, the text characters are added as vectors once and then referenced on all subsequent frames, unless you choose Fill Over Stroke from the Fill and Stroke options pop-up menu; in that case, the characters are added as vectors on every frame.

Exporting Audio Spectrum and Audio Waveform to SWF

The SWF Exporter converts lines drawn by the Audio Spectrum and Audio Waveform effects to vectors and ignores unsupported features: Outside Color (only the Inside Color is used), Softness, and Composite on Original. In addition, only uniformly thick lines are included in the SWF file. For example, if you select the Use Polar Path option in Audio Spectrum, lines become thicker farther from the center in After Effects, but in the SWF file the lines remain at the same thickness.

The waveforms may increase the SWF file size, so decrease the Displayed Samples value in the Audio Waveform effect or the Frequency Bands value in the Audio Spectrum effect, or decrease the frame rate to make the SWF file smaller.

Exporting Adobe Illustrator files to SWF

The SWF Exporter converts layers that have Illustrator source files to corresponding SWF items, provided the layer does not contain masks or have Collapse Transformations enabled. Illustrator crop marks are honored in the SWF file. Artwork outside the crop marks is included in the SWF file even though it's not visible, thereby increasing the file size.

The SWF export report lists information for unsupported features in Illustrator files for the first frame in which the Illustrator file is visible. Unsupported features are ignored or rasterized (depending on whether you've selected Ignore or Rasterize Unsupported Features) on all frames in which the footage is visible.

Flattening of Adobe Illustrator artwork The Flatten Adobe Illustrator Artwork option splits all overlapping objects into non-overlapping pieces. When you select this option, you don't need to convert Illustrator text to outlines before exporting. (This option supports source files from Illustrator 9.0 or later.

There are advantages and disadvantages to flattening Illustrator artwork. When you flatten Illustrator artwork, text exports to SWF properly, so you don't need to convert text to outlines. Overlapping objects are removed, so composited layers appear the same in both After Effects and the SWF file. End caps, joins, and transparency groups export properly, and artwork outside crop marks, which is not visible in the SWF file, is not included. However, SWF files don't necessarily become smaller. In addition, the flattening process may introduce unsupported objects that are then ignored or rasterized, and white fringes may appear around some objects. The process can be slow, memory-intensive, and possibly ineffective for complex Illustrator artwork.

Including object names in a SWF file

The Include Object Names option in the SWF Settings dialog box retains the name of each layer, mask, and effect. However, rasterized objects are not named.

Each mask exports as a separate SWF object whose name is the Layer name followed by the Mask name. If all masks use Difference mode, all masks export as one SWF object, and the name is the Layer name. Each Path Text character exports as a separate SWF object whose name is the Layer name, followed by the Effect name and the character index (starting at 0).

Including Web links in a SWF file

The Include Layer Marker Web Links option adds Web links and a Get URL action to the SWF file by using information from layer markers that you add in the Timeline window. (To create layer markers, see [“Creating Web links from markers” on page 106.](#)) This option also adds a frame label to each SWF frame that has a layer marker. You can specify how the browser opens the Web link with standard target commands (for example, “_blank”).

_blank Loads the Web link into a new browser window.

_parent Loads the Web link into the parent frame of the frame in which the current file is playing.

_self Loads the Web link into the current frame.

_top Loads the Web link into the top frame in the current window.

_level0 Loads another SWF file into level 0. The current file typically plays at level 0; another file loaded into level 0 usually replaces the current file. Note that the URL must refer to another SWF file.

_level1 Loads another SWF file into level 1 if the URL refers to another SWF file.

Saving a RAM preview as a rendered movie

Use RAM preview to preview frames, including audio, at the frame rate of your composition or as quickly as your system allows. To simplify the rendering process, save RAM preview frames as a movie. When saving a RAM preview, keep in mind the following:

- After Effects uses the composition frame size and resolution setting to determine the final dimension in pixels of a saved RAM preview. It does not consider the zoom level.
- RAM preview does not generate interlaced fields, so a saved RAM preview never contains fields. If you require interlaced fields, render the movie normally.

To save a RAM preview:

- 1 Choose Composition > Save RAM Preview.
- 2 Type a name, specify a location, and click Save.

Note: The 3D View of the active composition window must be set to Active Camera for Save Ram Preview to work, even if the composition doesn't contain 3D files.

Exporting footage using QuickTime components

If you have QuickTime 6.0 or later installed on your system, you can export items using components provided by QuickTime. This rendering process exports the movie directly without using the Render Queue window in After Effects. The specific file formats you can export to depend on how you've configured QuickTime. If you install new export modules as they become available from Apple or other third parties, those modules will appear on the File > Export submenu in After Effects. With this QuickTime support, you can export AVI files on both platforms or prepare streaming video and audio for Web distribution. If you want to apply QuickTime effects, you can do so during export.

For more information about effects and file formats supported by QuickTime, start the QuickTime Player program included with QuickTime 6.0, and choose Help > Online QuickTime Player Help.

Note: The composition is exported using the Composition window's current quality and resolution settings. Only the work area in the Timeline is exported.

To export files using QuickTime export formats:

- 1 Select an item in the Project window.
- 2 Choose File > Export, select the export module you want to use, specify options as necessary, and click Save.

Note: After Effects does not record pixel aspect ratios in exported or rendered output; consequently, QuickTime DV movies with 16:9 aspect ratios may not automatically switch your recording hardware to Widescreen.

Rendering an item to multiple formats

You can apply more than one output module to each render item in the queue. This is useful when you want to make more than one version of a movie. For example, you can automate the creation of a movie and its alpha matte, or you can create high-resolution and low-resolution versions of a movie.

When you apply more than one output module to a render item, After Effects renders to the various output formats simultaneously, saving you time.

To apply an additional output module:

- 1 In the Render Queue window, select an item.
- 2 Choose Composition > Add Output Module.

Choosing compression options

Compression is essential to reduce the data size of movies that would otherwise be so large as to prohibit effective playback. When compressing a movie file, you can fine-tune it for the best-quality playback on a computer, on a video playback device, on the Web, or from a CD-ROM drive.

QuickTime and Video for Windows have several built-in, software-based compression algorithms. Most video playback devices require either the QuickTime or Video for Windows format and a specific hardware or software codec. For example, AVID video editing systems use the AVID hardware codec when capturing footage and a software codec for compressing video footage on other systems. To maintain a high level of image and playback quality for your footage, use the same compression settings in After Effects that you use in the AVID editing system. If your codec supports it, you may choose a 32-bit color depth setting when exporting a movie in After Effects to include an alpha channel that can be composited later in your video editing system. For more information, see the documentation included with your video playback device.



For information about QuickTime compressors, go to the After Effects support page on the Adobe Web site at www.adobe.com/support/products/aftereffects.html.

Setting QuickTime compression options

Choices you make in the Compression Settings dialog box require trade-offs between file size and movie quality. The higher the visual quality of your movie, the larger the file size.

Quality The Quality control specifies the spatial compression of the movie, which compresses the data in each frame of a composition. Higher quality produces better image quality, but results in a bigger movie file. Lower quality results in a blocky and slightly blurred image (although it is still recognizable) and a smaller, more compressed movie file. Note that this quality is unrelated to each layer's quality setting in After Effects.

Key Frame Every In QuickTime terminology, the term *key frames* is different from the change-over-time keyframes placed in the After Effects Timeline window. In QuickTime, key frames are frames that occur at regular intervals in the movie. During compression they are stored as complete frames. Each intermediate frame that separates them is compared to the previous frame, and only changed data is stored. This greatly reduces movie size. Shorter intervals between key frames enable faster seeking and reverse playback, but can significantly increase the size of the file.

To specify QuickTime compression settings:

- 1 In the Render Queue window, click the underlined name of the output module.
- 2 For Format, choose QuickTime.
- 3 Click Format Options in the Video Output section.
- 4 In the Compression Settings dialog box, choose a compressor from the first menu in the Compressor section.

Note: Set the color depth in the Compression Settings dialog box instead of in the Output Module Settings dialog box. This ensures that non-Adobe plug-ins receive color depth information from After Effects. See step 8.

5 Select a Quality level from Least to Best.

Note (Mac OS only): If you intend to use key frames in the movie, hold down Option and adjust the Quality slider to control the temporal compression of the movie. Temporal compression compresses a movie by comparing successive frames and keeping only changed data. High temporal quality maintains smoothness of motion. Low temporal quality tends to produce jerkiness of motion because a pixel doesn't change unless the difference between frames is great.

6 If you want the smallest possible files, and your compressor choice allows for a key frame rate, select the box and type a number in the Key Frame Every box. Generally, you should type a number equal to the frame rate. For example, if you set a frame rate of 30 fps, type 30 in the Key Frame box. This sets one key frame every 30 frames of your movie.

Note: If you are going to use the resulting movie in another After Effects composition, type a small value (less than 5) in the Key Frame Every box or deselect the Key Frame Every option. The presence of key frames greatly increases the memory required to edit and render a movie.

7 Click OK.

8 If your compressor choice supports different image color depths, choose the appropriate color depth in the Output Module Settings dialog box:

- Choose Millions of Colors+ if you want 24-bit color quality and you want your composition background to be transparent (to include an alpha channel). The composition's background color is disregarded. Only Animation and None can support the Millions of Colors+ color depth.
- Choose Millions of Colors if you want 24-bit color quality but want to include your composition background color (no alpha channel).

Note: Color depth settings of Thousands of Colors or lower may cause banding and dithered images.

9 Select other options in the Output Module Settings dialog box, as described in ["Changing output module settings" on page 333](#). Then click OK.

Setting Video for Windows compression options

When setting Video for Windows compression options, you can specify the compressor and compression quality. Compressors available for Video for Windows include Microsoft Video 1, Cinepak, Microsoft RLE, Microsoft DV, and Intel Video. Choose a compressor based on the type of original images you have and the purpose of the rendered movie:

Cinepak Use when compressing 16-bit and 24-bit video for playback from CD or for desktop presentations. For best results, use the Cinepak compressor on raw source data that has not been previously compressed with a highly lossy compressor. Note that this is a slow compression method. With Cinepak, decompression is much faster than compression, and the data rate for playback can be defined by the user. However, you cannot save an alpha channel using the Cinepak compressor.

Microsoft RLE Use for lossless compression limited to 256 colors.

Microsoft DV Use for digital video camcorders.

Intel Indeo/Microsoft Video Use when compressing video for playback from CD.

Full Frames (Uncompressed) Use for a depth setting of Millions of Colors+ when an alpha channel is required.

To specify Video for Windows compression settings:

- 1 In the Render Queue window, click the underlined name of the output module.
- 2 Choose Video for Windows from the Format menu.
- 3 Click Format Options in the Video Output section.
- 4 In the Video Compression dialog box, choose a compressor from the first menu in the Compressor section.
- 5 Select a Compression Quality level.
- 6 If you selected either Cinepak or Microsoft Video in step 4, click the Configure button to set other options:
 - For Cinepak, choose whether the movie is compressed to color or to black and white.
 - For Microsoft Video, choose a level for the temporal compression quality of the movie. Temporal compression compresses a movie by comparing successive frames and keeping only changed data. High temporal quality maintains smoothness of motion. Lower temporal quality tends to produce jerkiness of motion because a pixel doesn't change unless the difference between frames is great.
- 7 If you want the smallest possible files, and your compressor choice allows for a key frame rate, select the Key Frame Every option and type a number of frames. Generally, you should type a number equal to the frame rate. For example, if you set a frame rate of 30 fps, type 30 in the Key Frame box. This sets one key frame every 30 frames of your movie.

Note: If you are going to use the resulting movie in another After Effects composition, type a small value (less than 5) in the Key Frame Every field or deselect the Key Frame Every option. The presence of key frames greatly increases the memory required to edit and render a movie.
- 8 Click OK.
- 9 If your compressor choice supports different image color depths, choose the appropriate color depth in the Output Module Settings dialog box. (See [“Setting QuickTime compression options” on page 347.](#))
- 10 Choose other options in the Output Module Settings dialog box. (See [“Changing output module settings” on page 333.](#)) Then click OK.

Exporting a single frame of a composition

You can save a single frame from a composition to any output format or as an Adobe Photoshop file with layers intact. One frame of the composition is rendered at the current time as set in the Composition window. This is useful for editing files in Adobe Photoshop or creating a proxy.

You can preserve the individual layers of a composition and save a frame of the composition as an Adobe Photoshop file. This makes it possible to use footage imported into After Effects as images in Adobe Photoshop. Preserving layers is also useful if you want to use a composition frame as a source for both print and dynamic media.

To export one frame of a composition:

- 1 In the Composition window, display the frame you want to export.
- 2 Choose Composition > Save Frame As > File.

- 3 Type a filename and click OK.
- 4 The Render Queue window is displayed. Adjust settings if necessary, and then click Render.

To export a single composition frame as an Adobe Photoshop file with layers:

- 1 In the Composition window, display the frame you want to export.
- 2 Choose Composition > Save Frame As > Photoshop Layers.
- 3 Type a filename and click OK.

Creating a filmstrip file for editing in Adobe Photoshop

Use the Filmstrip format to paint directly on video frames, a process known as *rotoscoping*. You can also rotoscope with paint tools in After Effects. (See [“Rotoscoping with the brush tool” on page 233](#).) You can render part or all of a composition as a *filmstrip*, a single file that contains all the frames of a composition or portion of a composition. Because video compression is not used in creating a filmstrip file, these files can be large. You can break the filmstrip file into any number of smaller files by setting the work area to a different portion of the composition before rendering each portion.

A filmstrip opens in Adobe Photoshop as a series of frames in a column, with each frame labeled by number, reel name, and timecode. If the column created by the filmstrip frames is more than 30,000 pixels tall, the frames continue in a second column. The number of frames displayed depends on the duration of the footage and the frame rate selected when you render the filmstrip.

When editing a filmstrip in Adobe Photoshop, use the following guidelines for best results:

- You can paint on the gray lines dividing the frames of the filmstrip without damaging the file. After Effects will display only the part of each frame that lies within the frame border.
- You can edit the red, green, blue, and alpha channels in the filmstrip file. Use only channel #4 as the alpha channel.
- Do not resize or crop the filmstrip.
- Flatten any layers you add in Adobe Photoshop.

Note: If you simply want to export a single frame, you don't need to use the Filmstrip format. (See [“Exporting a single frame of a composition” on page 349](#).)

To render a composition as a filmstrip:

- 1 Be sure that the composition you want to render is active. If you want to render only part of the composition, set the work-area markers to define the part you want to render.
- 2 Choose Composition > Make Movie.
- 3 Type a filename.
- 4 In the Render Queue window, click the underlined Output Module template name.
- 5 Choose Filmstrip from the Format pop-up menu. Specify the rest of the settings you want and click OK.
- 6 In the Render Queue window, click Render.

Rendering frames as a sequence of still images

Movies are the type of output most useful for easy previewing. However, a sequence of still images from a composition can be used for movie-making and desktop presentations. You can use a sequence of stills in the following ways:

- Transfer frames to film using a film recorder.
- Create still images for high-end video systems.
- Create still images and use them in a presentation.
- Select images for publishing or creating storyboards.
- Export source images for a graphics program in which the images can be edited or retouched and imported back into After Effects as footage items.

To export a range of frames as a sequence of stills:

- 1 Choose Composition > Make Movie.
- 2 Type a filename.

Note: When rendering frames on a Mac OS system for use on a Windows system, the filename must be in this format: filename[###].tga. As each frame is rendered and a filename created for it, After Effects replaces the [###] portion of the name with a number indicating the order of the frame in the sequence

- 3 In the Render Queue window, click the underlined Output Module template name.
- 4 Choose one of the sequence formats from the Format pop-up menu. Specify the rest of the settings you want and click OK.
- 5 In the Render Queue window, click Render.

Collecting files in one location

The Collect Files command gathers copies of all of the files in a project or composition into a single location for rendering or archiving. When you use this command, After Effects creates a new folder in which it saves a new copy of the project, copies of the specified footage files, proxy files as specified, and a report describing the files, effects, and fonts necessary to render the project.

After you collect files, you can continue making changes to a project, but be aware that those changes are stored with the original project and not with the newly collected version.

When you collect files, options include the following.

Generate Report Only Selecting this option does not copy the files and proxies.

Obey Proxy Settings Use this option with compositions that include proxies to specify whether you want the copy to include the current proxy settings. If this is selected, only the files used in the composition are copied. If this is not selected, the copy contains both proxies and source files, so you can later change proxy settings in the collected version.

Note: If you choose *For Queued Comps in the Collect Source Files*, After Effects uses the proxy settings from the render settings, not the composition.

Reduce Project Removes all unused footage items and compositions from the collected files when the following options are chosen in the Collect Source Files pop-up menu: For All Comps, For Selected Comps, and For Queued Comps.

Change Render Output To Use to redirect the output modules to render files to a named folder in the collected files folder. This option ensures that you have access to your rendered files when you're rendering the project from another system. Note that the rendering status must be valid (Queued, Unqueued, or Will Continue) for the output modules to render files to this folder.

Enable 'Watch Folder' render (Pro only) You can use the Collect Files command to save projects to a specified watch folder and then initiate watch-folder rendering over a network. After Effects also includes a render control file called *project name*_RCF.txt, which signals to watching systems that the project is available for rendering. After Effects and any installed render engines can then render the project together across a network. (See ["Rendering on a network using a watch folder \(Pro only\)" on page 353.](#))

Maximum Number of Machines (Pro only) Use to specify the number of render engines or licensed copies of After Effects that you want to allocate to render the collected project. Below this option, After Effects reports how many items in the project will be rendered using more than one machine.

Note: *If rendering time is unusually slow, you may have set the Maximum Number of Machines too high, and the network overhead required to track rendering progress among all machines is out of proportion to the time spent actually rendering frames. The optimal number depends on many variables related to the network configuration and the machines on it; experiment to determine the optimal number for your network.*

To gather files for rendering or archiving:

- 1 Choose File > Collect Files.
- 2 In the Collect Files dialog box, choose an appropriate option for Collect Source Files.
- 3 Select appropriate options, as needed. (For descriptions of each option, see the preceding paragraphs in this topic.)
- 4 To add your own information to the report that will be generated, click Comments, type your notes, and click OK. The comments appear at the end of the report.
- 5 Click OK. Name the folder and specify a location for your collected files.

The options for Collect Source Files include:

All Collects all footage files, including unused footage and proxies.

For All Comps Collects all footage files and proxies used in any project compositions.

For Selected Comps Collects all footage files and proxies used in currently selected compositions (in the Project window).

For Queued Comps Collects all footage files and proxies used directly or indirectly in any of the compositions with a valid rendering status in the Render Queues.

None Copies the project to a new location without collecting any source footage.

Once you start the file collection, After Effects creates the folder and copies the specified files to it. The folder hierarchy is the same as the hierarchy of folders and footage in your project. The new folder includes a (Footage) folder and may include an output folder (if you selected Change Render Output To).

The names of these folders appear in parentheses to signal any attending render engines not to search these folders for projects (Professional edition only).

Rendering on a network using a watch folder (Pro only)

The Professional edition provides the Watch Folder feature, which speeds up the rendering process on a network. If you have a full licensed copy of the Professional edition, you can set it up to work with render-only versions of After Effects. Your license entitles you to install as many copies of the render engine as you want on your network, as long as one licensed copy of the Professional edition is installed on that network.

Setting up watch-folder rendering

When you have multiple render engines on multiple systems monitoring a watch folder, they cooperate to achieve optimal efficiency. If your queued rendering items are set to Skip Existing Files (a Render Settings option), the render engines all work on a single render item at once. If this option is not selected, each render engine handles a render item itself.

Note: You cannot use multiple machines to render a single movie file. However, you can use multiple machines to render a sequence of individual still-image files.

To set up a watch-folder rendering process:

1 Install the After Effects render engine on as many machines as you want to involve in network rendering.

Note: If rendering time is unusually slow, you may be rendering to too many machines, and the network overhead required to track rendering progress among all machines is out of proportion to the time spent actually rendering frames. The optimal number depends on many variables related to the network configuration and the machines on it; experiment to determine the optimal number for your network.

2 Create a watch folder on a system that's accessible to all of the After Effects render engines on your network. In this case, create a folder called AE Watch Folder.

3 In each render engine, choose File > Watch Folder, and select the watch folder that you've created.

4 Create your projects and compositions, and set them up in the Render Queue with the render settings and output modules you want to use.

5 Choose File > Collect Files to copy completed projects (which are set up to use the Render Queue) to your specified watch folder.

6 Monitor the progress of the render engines by using a Web browser to navigate to HTML pages saved in the watch folder. After Effects generates these pages automatically when the rendering begins. Click the Reload button in your Web browser to see the updated status. If errors occur, these HTML pages will describe the errors.

Working with watch folders

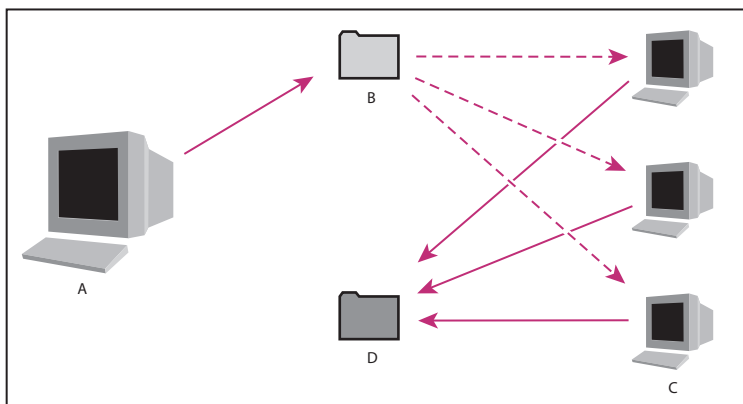
All Windows machines monitoring the watch folder as a mapped network drive must map that drive using the same drive letter. If this is a problem, make sure that the machine creating or collecting the project does not access the volume being watched as a mapped drive letter. For example, connect to the volume as \\network\watch instead of X:\watch.

Do not use the same computer to serve as both a watch folder to several other computers and to run After Effects in Watch Folder mode. Use a dedicated server that's accessible to all render engines to serve your watch folder. Make sure that all servers and clients have hard disks with unique names. Do not render to or initiate Watch Folder mode on the root of a volume or a shared folder that appears as the root when viewed from another computer. Specify a subfolder instead. Also, avoid using high-ASCII or other extended characters and slashes in filenames. For multiple-machine rendering, After Effects includes a "Multi-machine" sample template that you can use as a starting point.

You must perform the collect-files process using the full licensed copy of the Professional edition. In the Collect Files dialog box, be sure to select **Enable Watch Folder Render**. (All render queue items in the project must have output names or this option won't be available.) In addition, you may want to select **Change Render Output To**, so that the output directories for each project are stored in the watch folder. All of the render engines need access to these output directories to complete their rendering tasks. Once you choose **Collect Files**, After Effects copies the project or composition and all source files to the watch folder. Source files that are larger than 2 GB are not copied by the Collect Files command and must be copied manually to the (Footage) folder in the Collect Files folder. (See ["Collecting files in one location" on page 351.](#))

💡 Once the collected files appear in the watch folder, all monitoring render engines start rendering automatically. If you prefer, you can use the Collect Files command to store compositions and their source footage to a specified location and then initiate the watch-folder rendering process later. Doing so renders the projects in alphabetical order, rather than the order in which they were saved to the location.

After Effects renders the item to the specified destination folder and, if necessary, to the overflow volumes you have specified in the Output preferences. When After Effects finishes rendering all of the queued items in a given project, it closes that project without saving it and then scans the watch folder for new projects to render. Because it doesn't save the project, After Effects ignores any Post-Render Actions in the Output Module settings dialog box that specify to import the item when it is rendered.



Computer with full version of After Effects Professional edition (A) saves a project and all source files to a folder (B) on a server. Computers with the render engine installed (C) open the project and render a still-frame sequence to a designated output folder (D) on the server.

💡 When rendering across a network that includes volumes using different network or operating systems, such as Windows, Mac OS, Novell, and UNIX, make sure that you

specify output files using a file-naming convention that's compatible with all rendering or destination volumes.

Tracking dependencies when rendering over a network

You can track render dependencies when you render over a network by setting Post-Render Action options. When you set these options, After Effects confirms that all of the items that it needs to render are ready and available. For example, if one item depends on another to render and the first has not finished rendering or has received an error, the second does not render.

You can use this process to render a single QuickTime or AVI movie from a watch-folder render. The movie is actually created on only one computer.

To track the dependencies of a watch-folder render:

Note: This procedure assumes that you have already created a multiple-system watch-folder. (See [“Rendering on a network using a watch folder \(Pro only\)” on page 353.](#))

- 1 In the Render Queue window, drag the output module to the Project window. After Effects creates a placeholder for that item's output.
- 2 Drag the placeholder back to the Render Queue window.
- 3 Set the render settings and output module settings for the placeholder, and click Render.

Rendering single-frame sequences on multiple systems

Although the preferred method of rendering for multiple systems is using the Watch Folder feature, you can also use multiple systems and multiple copies of After Effects to render a project across a network. Rendering in each copy of After Effects starts at approximately the same time. By specifying that each copy skip existing frames or frames in progress, multiple systems can render the project simultaneously, writing the single-frame sequence to a single folder.

You can use multiple systems to render only single-frame sequences; you cannot use multiple systems to render movies. You can use combinations of Windows or Mac OS systems, with the following exceptions: When serving the watch folder from a Mac OS X server, you must use only Mac OS clients or only Windows clients; and when serving the watch folder from a Windows XP or Windows 2000 server running Services for Macintosh, do not use clients running Mac OS X.

Watch folder rendering with multiple instances does not work if you run two or more instances of After Effects on the same machine running Mac OS X.

Note: If you are rendering a project using Professional edition effects on multiple systems, each system must be running After Effects Professional edition.

To render a single-frame sequence with multiple systems:

- 1 Install After Effects on each system that will be rendering the project. Make sure that you have the same fonts installed on each system.

Note: Do not share plug-ins across a network. Make sure that you have a copy of the plug-ins folder on each system that is running After Effects. When using third-party plug-ins, also be sure that the same plug-ins are available on all systems and that you have sufficient licenses for the plug-ins.

- 2 Open the project on one system, and then choose Composition > Add to Render Queue.
- 3 In the Render Queue window, specify the Skip Existing Files option in the Render Settings section so that multiple systems do not render the same frames. Make sure that the Use Storage Overflow option is deselected.
- 4 In the Render Queue window, specify a single-frame sequence in the Output Module section and specify a folder in the Output To section. This folder must be available for all the systems that are rendering.
- 5 Save the project on the system where you opened it in step 2.
- 6 On each system that will be rendering, open and save the project. This ensures that After Effects records the new relative paths to each system in the following step.
- 7 Unless the network can handle large file transfers rapidly, copy the project file and all its source footage to each system that will be rendering.
- 8 Open the Render Queue window on each system and click Render. You do not need to start rendering on each system simultaneously, but to ensure equal workloads, start them at approximately the same time. As each system finishes rendering a frame, After Effects searches the Output folder for the next unrendered frame and starts rendering again.
- 9 You can stop and start any system at any time. However, if you stop a system without starting it again, the frame that it was rendering may not be finished. If one or more systems stop during rendering, starting any one system will ensure that all frames in the sequence get rendered.

Network performance

There is no limit to the number of systems you can use for rendering; in general, the more systems, the faster the rendering. However, if too many systems are used across a busy network, network traffic may be significant enough to slow down the entire process. You can detect network slowdown by observing the time spent in the Compressing & Writing stage in the Show Details section of the Render Queue window.

Note: Adobe does not provide technical support for general network configuration; consult your network administrator.

Starting After Effects in watch-folder mode (Pro only)

You can start After Effects in watch-folder mode automatically. Simply save a project called Watch This Folder.aep. After Effects will watch the folder containing the project if you open that project. To start After Effects in watch-folder mode when you start your Windows or Mac OS computer, create a shortcut (Windows) or alias (Mac OS) to the Watch This Folder.aep project and move it to your Startup folder (Windows) or your Startup Items folder (Mac OS).

If you're running a Windows system, you can also launch After Effects in watch-folder mode using a command-line option. Choose Start > Run, type "C:\Program Files\Adobe\After Effects\afterfx.exe" -wf C:\temp. (adjust the application path as needed to reflect the exact folder name where you installed After Effects, and replace C:\temp with the path to your watch folder), and press Enter. You can also use this command line in batch files.

Using multiple machines to render plug-in effects (Pro only)

When a composition contains layers that use a plug-in effect, the plug-in that created the effect must be present on all of the machines that will render the composition.

When you install an After Effects render engine on a machine, it contains all the plug-ins included with the After Effects Professional edition. If a composition uses a plug-in from another manufacturer, that plug-in must be present on all machines that will render the composition. However, support for network rendering varies among plug-in manufacturers. Before you set up a network to render effects created by third-party plug-ins, see your plug-in's documentation or contact the plug-in manufacturer and get answers to the following questions:

- Does the plug-in's license agreement allow installing multiple copies on a network for the purposes of rendering?
- Are there any other limitations or tips that apply to using that plug-in for network rendering?

Working with overflow volumes

A situation in which After Effects reaches a disk space limit while rendering a composition is called an overflow. Specify this limit for Minimum Diskspace Before Overflowing in the Output Preferences dialog box. When After Effects overflows a volume, the resulting files go into a folder on the root of the next volume in the After Effects Overflows list. You can specify multiple volumes to which rendered compositions can be directed. By doing so, each time a drive fills up, After Effects tries the next drive on the Preferences list.

Note: It is important to look at the log file after rendering; the log file reports when a render overflows.

To specify overflow settings:

- 1 Choose Edit > Preferences > Output (Windows) or After Effects > Preferences > Output (Mac OS).
- 2 To set overflow volumes, choose the volumes you want from the Volume menus under Overflow Volumes.
- 3 To set a maximum number of files, select the Segment Sequences At option, and type a maximum number of files.
- 4 To set a maximum movie file size before creating an overflow, select the Segment Movie Files At option, and then type a maximum file size.
- 5 Specify the minimum number of megabytes left on your volume before overflowing to the next volume, and then click OK.

Segmenting movies and sequences

You can also specify a size for your output so that After Effects renders files in segments even when overflow isn't necessary. You may want to segment files if you work with applications that restrict the size of imported files. In addition, if After Effects reaches a disk space limit and overflows across volumes, your output is distributed to files of a predetermined size.

To specify segment settings:

- 1 Choose Edit > Preferences > Output (Windows) or After Effects > Preferences > Output (Mac OS).
- 2 Specify a segment size for your output by doing one of the following:
 - Select Segment Sequence, enter a number for the maximum number of files each folder should contain, and then click OK.
 - Select Segment Movie, enter a number for the maximum size in kilobytes for each movie segment, and then click OK.

Rendering movies at different sizes

You can create output in sizes other than the size of your rendered composition. For example, you can create a full-sized movie for recording to videotape and a smaller movie for use on CD-ROM or in an on-screen presentation.

Making a movie smaller than the rendered composition

There are several methods for producing a reduced-size movie from your composition, each with trade-offs between speed and quality.

Nest the composition Create a new composition at the smaller dimensions, and nest the large composition inside it. For example, if you create a 640 x 480 composition, place it in a 320 x 240 composition. Use the Shrink to Fit command to scale the composition to fit the new smaller composition size: Press Ctrl + Alt + F (Windows) or Command + Option + Fit (Mac OS), and then collapse transformations by choosing Layer > Switches > Collapse. The resulting composition rendered at full resolution and best quality will have excellent image quality, better than if you had rendered using a reduced resolution.

Stretch the composition This method produces the highest quality reduced-size movie but is slower than nesting. For example, if you create a 640 x 480 composition and render it at full resolution, you can set the stretch value in the Output Module Settings dialog box to 50% to create a 320 x 240 movie. For a composition rendered at full resolution, the image quality is excellent when the Stretch Quality is set to High.

Note: Do not use stretching to change the vertical dimensions of a movie when field rendering is on. Stretching vertically mixes the field order, which distorts motion. Use either cropping or composition nesting if you need to vertically resize a field-rendered movie.

Crop the composition This method is ideal for reducing the size of a movie by a few pixels. Use the Crop options in the Output Module Settings dialog box. Remember that cropping cuts off part of the movie, so objects centered in the composition may not appear centered unless the movie is cropped evenly on opposite edges.

Crop to a region of interest To render just a portion of the composition frame, select a region of interest in the Composition window. Then, select the Region of Interest option in the Output Module Settings dialog box before rendering. (See [“Changing the region of interest” on page 85.](#))

Note: Cropping an odd number of pixels from the top of a field-rendered movie reverses the field order. For example, if you crop one row of pixels from the top of a movie with Upper Field First field rendering, the field-rendering order then becomes Lower Field First. Remember that if you crop pixels from the top of the movie, you need to add to the bottom

row of the movie to maintain the original size. If you are willing to lose one scan line, this gives you a way to output two movies from one render, each with a different field order. (See [“Using interlaced video in After Effects” on page 59](#) and [“Field-rendering considerations” on page 332](#).)

Render the composition at a reduced resolution This is the fastest method to create reduced-size movies. For example, if you create a 640 x 480 composition, you can set the composition resolution to one half, reducing the size of the rendered composition to 320 x 240. You can then create movies or images at this size. Note that the reduced resolution reduces the sharpness of the image and is best used for creating preview or draft movies.

Note: When rendering at reduced resolution, set the quality of the composition to Draft. Rendering at Best quality while reducing resolution does not produce a clean image and takes longer to render than rendering at Draft quality.

Making a movie larger than the rendered composition

Increasing the size of the output from a rendered composition reduces the image quality of a movie and is not recommended. If you must enlarge a movie, to maintain highest image quality, enlarge a composition that was rendered at full resolution and highest quality using one of the following methods:

Nest the composition Create a new composition at the larger dimensions and nest the smaller composition inside it. For example, if you create a 320 x 240 composition, you can place it in a 640 x 480 composition. Stretch the composition to fit the new larger composition size, and then collapse transformations by choosing Layers > Switches > Collapse. The resulting composition rendered at full resolution and best quality will have better image quality than if you had stretched the movie. However, this method also renders slower than if you created a composition and stretched it.

Note: To create a draft movie with specific dimensions, use both the Stretch option and reduced resolution in the rendered composition.

Stretch the composition For example, if you create a 320 x 240 composition and render it at full resolution, you can set the stretch value in the Output Module Settings dialog box to 200% to create a 640 x 480 movie. For a composition rendered at full resolution, the image quality will usually be acceptable.

Note: Do not use stretching to change the vertical dimensions of a movie with field rendering. Stretching vertically mixes the field order, which distorts any motion. Use either cropping or composition nesting if you need to vertically resize a field-rendered movie.

Crop the composition To enlarge a movie by a few pixels, increase the size using negative values for the Crop options in the Output Module Settings dialog box. For example, to increase the size of a movie by 2 pixels, type -2 in the Cropping section of the Output Module Settings dialog box. Remember that negative cropping adds to one side of a movie, so objects originally centered in the composition may not appear centered when the movie is cropped.

Note: Adding an odd number of pixels to the top of a field-rendered movie reverses the field order. For example, if you add one row of pixels to the top of a movie with Upper Field First field rendering, the field-rendering order then becomes Lower Field First. Remember that if you add pixels to the top of the movie, you need to crop from the bottom row of the movie to maintain the original size. (See [“Using interlaced video in After Effects” on page 59](#) and [“Field-rendering considerations” on page 332](#).)

Creating low-resolution movies for testing motion

You can test the motion of a high-quality composition by quickly creating a low-resolution, or thumbnail, movie. Do this by making a movie at a resolution less than full (using the Resolution pop-up menu in the Render Settings dialog box). After Effects creates a movie with dimensions proportional to the resolution.

For example, if your composition is 640 x 480 pixels and you make a movie at quarter resolution, the resulting movie will be 160 x 120 pixels (one-sixteenth the size of the composition). This thumbnail renders almost 16 times faster than at full resolution. You can then play the thumbnail on your system to get a good idea of what motion will be like in your final, full-sized movie. You can also enlarge the thumbnail in a movie-playing application to see playback at full size. In addition, you can use RAM preview for testing purposes.

Testing the field-rendering order

A simple test can determine the order in which your video equipment requires fields. When you make a movie, the rendering order (Upper Field First or Lower Field First) should be synchronized with the method used by your equipment, or your movie will appear distorted.

Note: *The field order with which you record to video equipment can be altered by changes in the hardware or software of your production setup. For example, changing your video board, device control software, or VCR after setting the field order can reverse your fields. Therefore, any time you make a change to your setup, run this test for field-rendering order.*

The test takes about 15 to 20 minutes and involves creating two movie versions of the same composition (one rendered with Upper Field First and one with Lower Field First), and then taping and playing the movies to see which choice looks right.

To test field-rendering order:

- 1 Create a simple composition with the correct frame size and frame rate. Choose an NTSC or PAL preset in the Composition Settings dialog box, and make the composition at least 3 seconds long.
- 2 Within the composition, make a layer that is a small rectangular solid. The layer can be any color as long as it contrasts sharply with the composition background. You may wish to add a title such as "Upper Field First" to the solid, to make identification of the movie easier.
- 3 Apply some fast movement to the solid using keyframes in its Position property. Set keyframes from the upper left of the Composition window to the lower right, for 1 second.
- 4 Save the project, and then drag the composition to the Render Queue window.
- 5 Click the underlined Render Settings name, and then choose Upper Field First.
- 6 Click OK, and then click Render to make the movie.
- 7 In the composition, change the color of the solid in the Composition window, and add a new title such as "Lower Field First" to identify it.
- 8 Render the composition again, choosing Lower Field First.
- 9 Record both movies to videotape with the same device.

10 Play both movies.

One movie will look distorted and have jumpy horizontal motion or shape distortion during vertical motion. The other movie will play back smoothly, with sharply defined edges. Use the field order that you used to create the smooth playing movie whenever you render movies with that particular hardware configuration.

Tracking Motion (Pro only)

About tracking motion (Pro only)

Using traditional editing techniques, it is difficult and time-consuming to synchronize visual effects or other images with moving footage. After Effects' motion tracking feature lets you easily create composites and dynamic visual effects regardless of whether the subjects or the camera (or both) are moving. After Effects can follow or *track* the movement of a specified area in a shot and then apply that movement to an effect, image, or other footage. The resulting visual effect precisely matches the original moving footage.

Uses of motion tracking (Pro only)

Motion tracking has multiple uses:

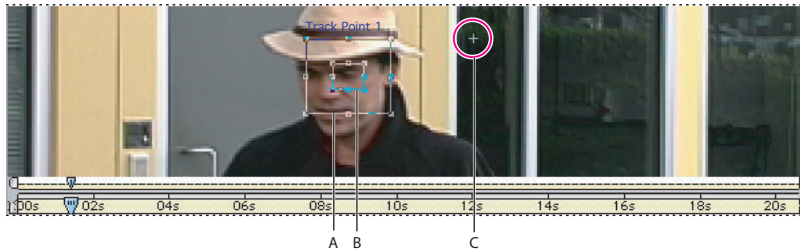
- Combining elements filmed separately, such as adding video footage to the side of a city bus or a star to the end of a sweeping wand.
- Animating a still image to match the motion of action footage, such as making a cartoon bumblebee pursue a swaying flower.
- Adding effects that follow a moving element, such as applying a lens flare to a scene where the camera pans or making a ball glow.
- Stabilizing footage, such as smoothing the wobble of footage shot with a handheld camera.
- Applying effects or transform properties to a layer using tracking data in expressions, such as stretching a wire coil between two objects. (For more information about using expressions, see ["Understanding expressions" on page 279.](#))

Note: If you're familiar with the principles of motion tracking, see ["Working with the Tracker Controls palette \(Pro only\)" on page 367.](#) If you're familiar with motion tracking in After Effects, see ["Tracking motion to apply to other footage or images \(Pro only\)" on page 370.](#)



How After Effects tracks motion (Pro only)

After Effects tracks motion by matching pixels (actually subpixels) from a selected area in a frame to pixels in each succeeding frame. You specify the area to track by using the *track point*. The track point contains a *feature region*, a *search region*, and an *attach point*. After Effects displays the track point during tracking in the Layer window.



Layer Window with Track Point A. Search Region B. Feature Region C. Attach Point

Feature region The feature region defines the area in the moving footage to be tracked. It should surround a distinct feature. After Effects must be able to clearly identify the feature throughout the footage, despite changes in light, background, and angle.

Search region The search region limits the area that After Effects must search to locate the feature. The feature needs to stand out only within the boundary of the search region, not within the entire frame. Confining the search to a small region saves search time and makes the search process easier.

Attach point The attach point designates the place of attachment for the *target* footage—the layer, image, or effect that you want to synchronize with the motion footage.

Preparing to track (Pro only)

The key to good tracking is finding a good feature to track, as well as sizing the search region adequately so that After Effects can easily locate the feature.

Setting up the shot (Pro only)

For best results, first prepare the object or region you are tracking *before* you begin filming. Because After Effects compares pixels from one frame to the next to produce an accurate track, attaching high-contrast markers to the object or region lets After Effects more easily follow the motion from frame to frame. Lightweight, brightly colored balls, such as ping-pong balls, placed on the feature work particularly well to preserve the shape of the track point. The number of markers you use corresponds to the number of points you are tracking. For example, if you're tracking four points using the Perspective Corner Pinning option, you need at least four features to correspond with the four corners of the layer you want to attach to your filmed footage. The more markers you add to your subject before shooting, the more features you'll have for tracking later.

Searching your footage (Pro only)

Before you begin tracking, it is important to view the entire shot to determine the best feature to track. What is clearly identifiable in the first frame may later blend into the background because the angle, lighting, or surrounding elements have changed. A feature may disappear offscreen or be obscured by another element at some point in the scene. While After Effects can extrapolate the motion of disappearing items, your chances for a successful track are higher if you step through the entire shot and select the best candidates for tracking.

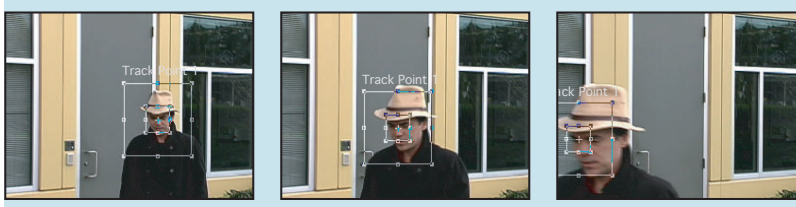
Selecting a good feature region (Pro only)

You need to locate and size the feature region carefully. For the smoothest tracking, the feature you select should be:

- Visible for the entire shot
- A contrasting color from the surrounding area
- A distinct shape (at least within the search region)
- A consistent shape and color throughout the shot

Adjusting the search region (Pro only)

The size and position of the search region depends on the movement of the feature you want to track. The search region must accommodate the movement of the feature, but only the frame-to-frame movement, not its movement throughout the shot. As After Effects locates the feature in a frame, both the feature and search regions move to the new location. Therefore, if the frame-to-frame movement is gradual, the search region needs to be only slightly larger than the feature region. If the feature changes position and direction quickly, the search region needs to be big enough to encompass the largest position and direction change in any pair of frames.

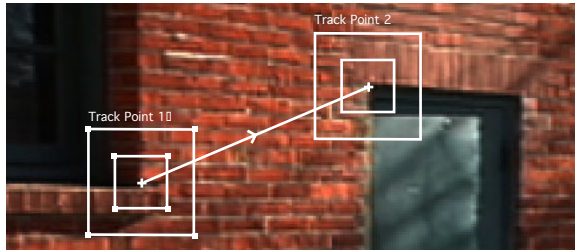


Layer window showing the feature and search regions moving through footage

Using rotation track points (Pro only)

In addition to tracking the position of a feature, you can also track its rotation. You can apply rotation values to another layer or to stabilize the same layer. When you select the Rotation option, After Effects displays two feature and search regions. A line connects the two attach points that lie at the center of each feature region. An arrow points from the first attach point to the second.

If possible, both feature regions should be on the same object, or at least they should both be on objects that are the same distance from the camera. The first feature region (on the left by default) represents the base of the tracking. The farther apart the regions, the more accurate the calculations and the better the result.



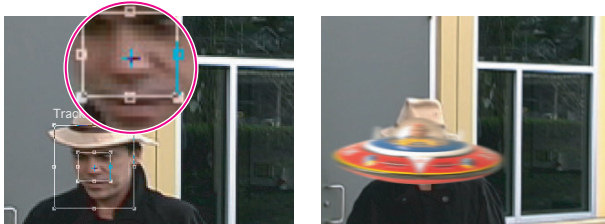
Layer window showing the feature and search regions for tracking Rotation

After Effects calculates rotation by measuring the change of angle between the first and second feature region from one frame to the next. Although the angle of rotation between the attach points may be quite different (indicated by the line between them), the angle between the feature regions determines the actual rotation values that are applied to the target layer when you click Apply. When you apply the tracking data to the target, After Effects creates rotation keyframes.

Positioning the attach point (Pro only)

The placement of the attach point determines the placement of your target footage, image, or effect control point. The default position is in the center of the feature region. You can move the attach point as necessary. While most times you'll want your target to be centered exactly on the feature region, there may be times when you need to offset the target from the source of the movement or times when the point of attachment is not the best feature to track.

For example, if you wanted to animate a flying saucer hovering over an undercover spy, you would position the feature region on a small, distinct area on the spy. If you left the attach point centered in the feature region, the saucer would be attached to that point (and would appear to have already landed on the spy). However, if you wanted the saucer to appear to be in pursuit, you would move the attach point out of the feature region to be somewhat above and behind the spy.



Attach point centered in feature region



Attach point offset from feature region

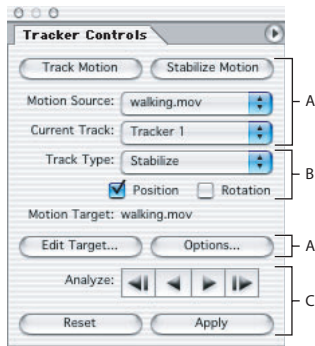
Perfecting your tracking (Pro only)

Because of the changing nature of an image in motion, digital tracking is rarely perfect. In moving footage, the shape of an image inevitably changes, along with the lighting and surrounding objects. Even with careful preparation, a feature generally evolves during a shot and at some point no longer matches the original feature. If the change is too great, After Effects may not be able to track the feature, and the track point will appear to wander or drift.

It can take time to develop an eye for good features to track. However, because of the many variables interacting in moving footage, regardless of your experience, you often need to make adjustments and track again. After Effects includes several options to help improve your success in tracking. For example, you can track using different aspects of color (RGB, luminance, or saturation), change the adaptiveness of the feature (allowing the feature region to change along with the footage), or have After Effects extrapolate or estimate motion if necessary. You can track the layer as many times as needed and then apply the best tracking results. (See [“Correcting a drifting feature region \(Pro only\)” on page 376.](#))

Working with the Tracker Controls palette (Pro only)

You use the Tracker Controls palette to control all types of tracking from motion stabilization to corner pinning. In this palette, you specify your motion source layer and motion target layer, choose the type of tracking you want, and access special tracking options. Once you have set all your parameters, you initiate tracking with the Analyze buttons and apply the tracking data with the Apply button.



Tracker Control palette **A.** Controls to create a new track, set the motion source and target **B.** Controls to set the type of tracking **C.** Controls to initiate, apply, and delete tracks

Understanding the Source, Current Track, and Target options (Pro only)

In the Tracker Controls palette, you control which layer you want to track, which tracking data you want to use, and the layer or effect to which you want to apply tracking.

Motion Source Specifies the layer that contains the motion you want to track. The menu lists all the moving footage layers in the current composition. If you selected a motion source or an effect point control of a layer before you opened the Tracker Controls palette, After Effects displays that layer for Motion Source.

Note: If you select a motion source from within the palette, you need to click either the *Track Motion* button or the *Stabilize Motion* button to create a new track.

Current Track Displays the track for the source layer that contains the tracking data. Every layer can have multiple tracks associated with it, allowing you to track more than one feature in a layer or to track the same layer using different settings. (See [“Tracking motion to apply to other footage or images \(Pro only\)” on page 370.](#))

Motion Target Specifies the footage, still image, or effect that you want to animate. When selected, the tracker applies position keyframes to the specified motion target layer to either animate or stabilize it. Change the target by clicking *Edit Target* and choosing a new target from the Layer pop-up menu in the Motion Target dialog box. The *Edit Target* button is not available if *Raw* is selected for Track Type.

Options Opens the Motion Tracker Options dialog box, through which you can improve the accuracy of tracking and select third-party tracker plug-ins. (See [“Defining tracker options \(Pro only\)” on page 369.](#))

Understanding types of tracking

The Track Type menu on the Tracker Controls palette provides several different tracking options. The menu defaults to Stabilize when you choose Stabilize Motion. When you choose Track Motion, the menu defaults to either Transform if the composition contains multiple layers or to Raw if the composition contains a single layer. You can choose the following options from the Track Type menu:

Transform Tracks position and/or rotation to apply to another layer. When tracking position, this option creates one track point and generates position keyframes. When tracking rotation, this option creates two track points and produces rotation keyframes.

Stabilize Tracks position and/or rotation to stabilize jerky camera movement or to fix drift of the subject from its mark. When tracking position, this option creates one track point and generates anchor point keyframes. When tracking rotation, this option creates two track points and produces rotation keyframes.

Parallel Corner Pin Tracks skew and rotation, but not perspective, using three corner points. Parallel lines remain parallel, and relative distances are preserved. This option creates three track points (calculating the position of the fourth) and generates corner point keyframes. The three attach points mark the placement of the three corner points.

Perspective Corner Pin Tracks perspective changes in source footage using four corner points. This option creates four track points and generates corner-point keyframes. The four attach points mark the placement of the corner points. For information on corner pinning, see [“Using corner pinning options \(Pro only\)” on page 371](#).

Raw Tracks position and/or rotation. Use this option if the motion target is not available or if you want to apply the tracking data to it at a later time. All tracking data is stored on the motion source layer within the project. The Edit Target button and the Apply button are not available with this tracking option. You can also use this option to create tracking data to use with expressions. (For more information about using expressions, see [“Understanding expressions” on page 279](#).) This option displays one track point, but you can add others by using the New Track Point option from the palette options menu. (See [“Adding new track points” on page 368](#).)

Adding new track points

To use tracking data with expressions, you may want to track additional features. You can add track points by choosing New Track Point from the palette options menu. Each new point tracks position only. You cannot apply the additional tracking data directly to a target layer, but you can refer to the data in expressions. As with any tracking data, it is stored with the motion source in a track and appears as keyframes in the timeline. You generally select the Raw track type if you plan to add track points and later use the data in expressions. (For information about the Raw tracking option, see [“Understanding types of tracking” on page 368](#); for information about tracking data, see [“Working with tracking data in the Timeline window \(Pro only\)” on page 379](#).)

Understanding the Analyze, Reset, and Apply controls (Pro only)

You use the Analyze, Reset, and Apply controls only when you are ready to begin tracking. The Analyze controls initiate tracking, while the Reset and Apply controls either delete the tracking data or apply it to the target layer.

Analyze Begins the frame-to-frame analysis of the position or angle of rotation of the track point (or points). Use the following controls for Analyze:

- Step Back ◀ to analyze the current frame by stepping back to the previous frame.
- Analyze Backward ◀ to analyze from the current-time indicator backward to the beginning of the work area or footage.
- Analyze Forward ▶ to analyze from the current-time indicator to the end of the work area or footage.
- Step Forward ▶ to analyze the current frame by advancing to the next frame.

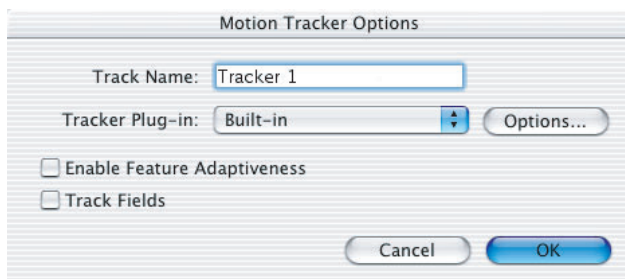
Reset Restores the feature region, search region, and attach point to their default positions and deletes the tracking data from the currently selected track. Tracker Control settings and keyframes already applied to the target layer remain unchanged.

Note: The Analyze Backward and Analyze Forward buttons change to a Stop button ■ while analysis is in progress.

Apply Sends the tracking data (in the form of keyframes) to the target layer or effect control point.

Defining tracker options (Pro only)

After Effects includes several options to help improve the accuracy of tracking as well as select a third-party tracker plug-in and adjust its settings. You access these options by clicking the Options button in the Tracker Controls palette.



Motion Tracker Options dialog box

Track Name Indicates the track selected in the Current Track pop-up menu in the Tracker Controls Palette.

Tracker Plug-in Sets the tracking plug-in used to calculate the tracking data for this track. By default, this option displays Built-in, the only tracker included with After Effects.

Options Displays the Tracker Plug-in Options dialog box, which includes tracker-specific options. The options for the built-in tracker plug-in help you fine-tune tracking. (See [“Understanding the tracker plug-in options \(Pro only\)” on page 377.](#))

Enable Feature Adaptiveness Causes After Effects to adapt the feature region during tracking to better assist in tracking the feature in subsequent frames.

Track Fields Tracks the motion in both video fields of interlaced video and doubles the frame rate to ensure that both video fields are tracked.

Note: When you begin tracking, After Effects sets the quality of the motion source layer to Best and the resolution to 100% to improve the image quality and make the selected feature region easier to find.

Moving and resizing the track point (Pro only)

Use one of the following techniques to move or resize the track point. (Make sure to select the selection tool and set the current-time indicator on the first frame you want to track.)

Note: Before you move or resize the regions, or move the attach point, always make sure that your work area defines the frames you want to track and that the current-time indicator is at the first frame.

Moving or resizing option	Action
Move the feature region, search region, and attach point together	Drag inside the region.
Move the feature and search regions together without moving the attach point of either region	Alt-drag (Windows) or Option-drag (Mac OS) the inside of either region, or drag the edge of the feature region.
Move the search region independently of the feature region	Drag the edge of the region.
Resize from the center of a region	Drag a handle.
Resize from the corner of a region	Ctrl-drag (Windows) or Command-drag (Mac OS) a corner handle.
Resize so that all sides have equal lengths	Shift-drag a handle.
Resize from the corner of a region and force all sides to be of equal length	Shift + Ctrl-drag (Windows) or Shift + Command-drag (Mac OS) a handle.

Tracking motion to apply to other footage or images (Pro only)

One of the most common uses of motion tracking is to create composites with other footage or images. Motion tracking lets you combine elements filmed separately or animate still images so that they appear to have been shot together.

To track motion and apply it to another layer:

1 Select the layer you want to track in the Timeline window.

Note: The selected layer must include motion or changing frames, such as video source footage, for Track Motion to be available in the Animation menu. If you want to track motion in still images or a sequence, first pre-compose the layer by choosing Layer > Pre-compose.

2 Choose Animation > Track Motion or click Track Motion in the Tracker Controls palette. After Effects then performs the following actions:

- Displays the Tracker Controls palette with the selected layer listed for Motion Source.
- Creates a new track and displays its name in the Tracker Controls palette for the Current Track.
- Displays Transform for Track Type (or Raw, if you haven't added the target footage to the composition yet).

- Adds a track point for the motion source in the Layer window.
- Adds the new track to the Motion Trackers section of the motion source layer in the Timeline.
- 3** Click Edit Target in the Tracker Controls palette, and choose the Motion Target layer from the Layer pop-up menu.
- 4** Select Position or Rotation as appropriate.
- 5** If you want to track a range of frames, define the work area you want to track in the Layer window for the source footage.
- 6** In the Layer window, move the current-time indicator to the frame from which tracking should begin.
- 7** Using the selection tool, position and resize the feature and search regions over the feature you want to track. (See [“Moving and resizing the track point \(Pro only\)” on page 370.](#))
- Note:** *The search region needs to be only big enough to accommodate the frame-to-frame position change of the feature.*
- 8** Drag the attach point where you want After Effects to position the footage.
- 9** In the Tracker Controls palette, click either the Forward Analyze or Backward Analyze button to begin tracking. Watch the tracking to make sure it is accurate. If not, click the button again to stop tracking, and then correct the problem as described in [“Correcting a drifting feature region \(Pro only\)” on page 376.](#)
- 10** When you are satisfied with the position of the feature region and attach point throughout the footage, click the Apply button to apply the motion to the specified target layer. After Effects creates keyframes for the target layer.

Using corner pinning options (Pro only)

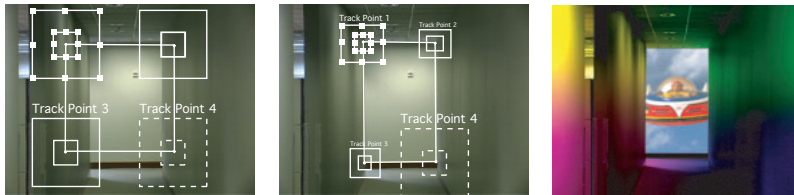
Most tracking options track a single feature in a motion layer. This single feature determines the position keyframes that are used to animate the anchor point (or center) of the target layer. Unlike standard tracking, the corner pinning options track points that are used to animate the *corners* of a typically rectangular target layer. Corner pinning is useful for adapting the target layer within a specified area of the motion layer. For example, you can track four corners on the side of a moving bus to attach a billboard. Corner pinning options allow you to either skew the target layer or simulate a change in perspective. The attach points, not the feature regions, determine the placement of the target layer's corners. By default, the attach points are centered within the feature regions.

After Effects gives you two corner-pinning options when tracking: Parallel Corner Pinning and Perspective Corner Pinning. These options create multiple tracking points and apply them to the target layer using the Corner Pin effect.

Understanding the Parallel Corner Pinning option

When you track using the Parallel Corner Pinning option, you simultaneously track three points in the source footage. After Effects calculates the position of a fourth point to keep the lines between the points parallel. When the movement of the points is applied to the target layer, the Corner Pin effect distorts the layer to simulate skew, scale, and rotation, but not perspective. Parallel lines remain parallel, and relative distances are preserved.

For example, suppose that you have footage of a door shot by a handheld camera that zoomed in or out during shooting but remained perpendicular to the door. You want to replace the door with a landing space ship. Using the Parallel Corner Pinning option, After Effects calculates the relative movement between the feature regions to correctly scale the space ship footage.

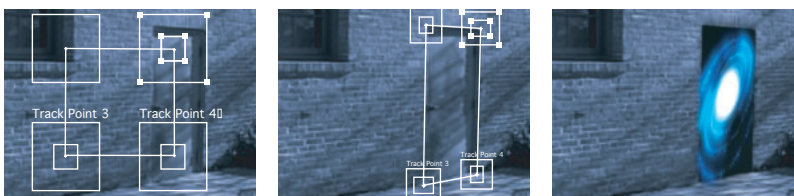


When you choose parallel corner pinning, the default positions of the attach points form a rectangle in the center of the motion footage layer (left). Moving the upper left tracking region moves the lower right (inactive) tracking region in tandem (center). You can place the attach points anywhere in the motion footage layer (right).

Understanding the Perspective Corner Pinning option

When you track using the Perspective Corner Pinning option, you simultaneously track four points in the source footage. When applied to the target footage, the Corner Pin Effect uses the movement of the four points to distort the layer, simulating changes in perspective.

For example, if you are replacing a sign on the side of a moving bus, the edges of the sign may be partially obscured because of shadows or objects; but a window on the bus may be visible throughout the footage. You can first define four feature regions that are distinct and easy to track, and then move the attach points to the four corners of the sign. When the new image appears in the sign, After Effects calculates the relative movement between the feature regions to create the correct perspective.



When you choose perspective corner pinning, the default positions of the attach points form a rectangle in the center of the motion footage layer (left). Moving each feature region extends the rectangle in the direction of motion (center). You can place the attach points anywhere in the motion footage layer (right).

Tracking motion to animate the Corner Pin effect (Pro only)

To track motion using either parallel or perspective corner pinning, you select the layer and adjust settings in the Tracker Controls palette. When you track motion using either parallel or perspective corner pinning, After Effects scales and skews the target layer as necessary to fit the dimensions defined by the feature regions.

To track motion using either parallel or perspective corner pinning:

1 Select the layer you want to track in the Timeline window.

Note: The selected layer must include motion or changing frames, such as video source footage, for Track Motion to be available in the Animation menu. If you want to track motion in still images or a sequence, first pre-compose the layer by choosing Layer > Pre-compose.

2 Choose Animation > Track Motion or click Track Motion in the Tracker Controls palette. After Effects then performs the following actions:

- Displays the Tracker Controls palette with the selected layer listed for Motion Source.
- Adds a track point for the motion source in the Layer window.
- Adds the new track to the Motion Trackers section of the motion source layer in the Timeline.

3 Click Edit Target in the Tracker Controls palette and choose the Motion Target layer from the Layer pop-up menu.

4 Choose either Parallel Corner Pinning or Perspective Corner Pinning from the Track Type pop-up menu. Four track points appear in the Layer window. (For Parallel Corner Pinning, one point is inactive.)

5 If you want to track a range of frames, define the work area you want to track in the Layer window for the source footage.

6 In the Layer window, move the current-time indicator to the frame from which tracking should begin. Go to step 7 if you are using perspective corner pinning.

7 For parallel corner pinning only: To change which point is inactive, Alt-click (Windows) or Option-click (Mac OS) the feature region of the point you want inactive. (One point must remain inactive to keep the lines parallel.)

8 Using the selection tool, place and resize the feature and search regions over the areas you want to track. The feature regions should lie in a single plane in the real world—for example, on the side of a bus, on the same wall, or on the floor. (See [“Moving and resizing the track point \(Pro only\)” on page 370.](#))

Note: The search region needs to be only big enough to accommodate the frame-to-frame position change of the feature.

9 Place the attach points at the locations where you want to attach the corners of the target layer. The attach points should also all lie in a single plane, but not necessarily the same plane as the feature regions.

10 In the Tracker Controls palette, click either the Forward Analyze or Backward Analyze button to begin tracking. Watch the tracking to make sure it is accurate. If not, click the button again to stop tracking, and then correct the problem as described in [“Correcting a drifting feature region \(Pro only\)” on page 376.](#)

11 When you are satisfied with the position of the feature regions throughout the footage, click the Apply button to apply the corner pinning track to the specified target. After Effects creates Corner Pin effect keyframes for each corner and copies them to the target layer.

Tracking motion to animate effects (Pro only)

You can animate effects applied to the motion source so that they follow a specific feature precisely throughout a shot. After Effects repositions the effect point using the position data it gathered when tracking. For example, you can track the sun as it moves across the sky to animate a lens flare. When applying tracking data to an effect point, the motion target must be an effect control point on the same layer as the motion source.

To animate effects:

1 In the Timeline, select the effect point control you want to animate.

Note: The selected effect must be applied to the motion source layer, and the layer must include motion or changing frames, such as video source footage.

2 Choose Animation > Track Effect Point Control. After Effects then performs the following actions:

- Displays the Tracker Controls palette with the current layer (the layer containing the effect) listed for Motion Source and the effect point control you selected in step 1 for Motion Target.
- Creates a new track and displays its name for Current Track in the Tracker Controls palette.
- Displays Transform for Track Type.
- Adds the new track to the Motion Trackers section of the motion source layer in the Timeline.
- Creates a track point in the Layer window for the motion source.

3 If you want to track a range of frames, define the work area you want to track in the Layer window for the source footage.

4 In the Layer window for the motion source, move the current-time indicator to the frame from which tracking should begin.

5 Using the selection tool, position and size the feature region so that it surrounds the feature you want to track. (See [“Moving and resizing the track point \(Pro only\)” on page 370.](#))

Note: The search region needs to be only big enough to accommodate the frame-to-frame position change of the feature.

6 In the Tracker Controls palette, click either the Forward Analyze or Backward Analyze button to begin tracking. Watch the tracking to make sure it is accurate. If not, click the button again to stop tracking, and then correct the problem as described in [“Correcting a drifting feature region \(Pro only\)” on page 376.](#)

7 When you are satisfied with the position of the feature region(s) throughout the footage, click the Apply button to apply the motion to the effect. After Effects creates keyframes and copies them to the effect point control.

Tracking to stabilize footage (Pro only)

If you shoot with a handheld or airborne camera or bump a camera during shooting, you may want to *stabilize* footage. Stabilizing smooths unwanted camera movement or unwanted drift (when a subject has drifted out of position). To stabilize footage, After Effects first tracks the motion in the shot. It then shifts the position and rotation of each frame as necessary to remove the movement. When played back, the motion appears smooth because the layer itself moves incrementally to offset the unwanted motion.

As with tracking motion, you need to define a feature and search region. However, for stabilization, you want to select a feature that is stationary within the context of the frame rather than select a feature that is moving. Tracking a stationary object ensures that you are stabilizing only unwanted motion. The rules for selecting a good feature are the same for stabilizing and tracking: The feature should be visible the entire shot, a contrasting color from the surrounding area, a distinct shape (at least within the search region), and a fairly consistent shape and color throughout the shot.

After Effects gives you two options for stabilizing: Position and Rotation. Together these options can compensate for undesired camera movement in all directions. You generally want to stabilize footage with these options on. However, in some circumstances you may need to turn one of them off. For example, if you are panning, you would turn off the Position option but leave the Rotation option. Because footage typically jitters or weaves in one direction only (horizontal or vertical), turning off the Position option prevents the Stabilizer from generating keyframes in both directions.

To stabilize a layer:

1 In the Timeline window, select the layer containing footage you want to stabilize.

Note: The selected layer must include motion or changing frames, such as video source footage, for Stabilize Motion to be available in the Animation menu. If you want to track motion in still images or a sequence, first pre-compose the layer by choosing Layer > Pre-compose.

2 Choose Animation > Stabilize Motion or click Stabilize Motion in the Tracker Controls palette. After Effects then performs the following actions:

- Displays the Tracker Controls palette with the selected layer listed for Motion Source as well as Motion Target.
- Creates a new track and displays its name in the Tracker Controls palette for the Current Track.
- Displays Stabilize for Track Type.
- Adds the new track to the Motion Trackers section of the motion source layer in the Timeline.
- Creates a track point for the motion source in the Layer window for the motion source.

3 In the Tracker Controls palette, select Position or Rotation as appropriate. If you select Rotation, After Effects adds an additional track point, connected by a line, in the Layer window. (See [“Using rotation track points \(Pro only\)” on page 364.](#))

4 In the Layer window, specify the work area you want to track. The position and rotation in subsequent frames are adjusted relative to the first frame.


5 Using the selection tool, position and size the feature and search regions.

Note: The search region needs to be only big enough to accommodate the frame-to-frame position change of the feature.

6 In the Tracker Controls palette, click the Forward Analyze button to begin tracking.

7 If the feature region (or regions) drifts away from the feature you want to track, adjust the size and position of the feature and search regions as described in [“Correcting a drifting feature region \(Pro only\)” on page 376](#).

8 When you are satisfied with the location of the feature region(s) throughout the footage, click Apply. After Effects creates anchor point keyframes for the footage.

 If the image creeps in from the margins of the action-safe zone, increase the scale just enough to extend past the margins. Find the frame that creeps in the most, and then nudge the scale (in the Composition window) using the Alt + [plus sign] and Alt + [minus sign] keys on the numeric keypad (Windows), or the Option + [plus sign] and Option + [minus sign] keys on the numeric keypad (Mac OS). This technique adjusts the scale for the duration of the footage.

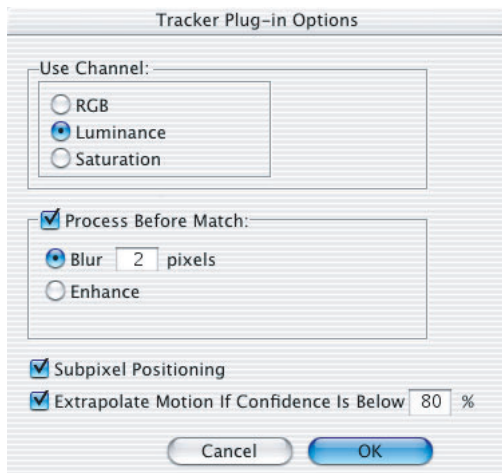
Correcting a drifting feature region (Pro only)

As an image moves in a shot, the lighting, surrounding objects, and angle of the object can all change, making the once distinct feature no longer identifiable at the subpixel level. It takes time to develop an eye for choosing a trackable feature. Even with careful planning and practice, you will often find that the feature region drifts away from the desired feature. Re-adjusting the feature and search regions, changing the tracking options, and trying again is a standard part of digital tracking. When drifting occurs, you may need to perform any combination of the following adjustments:

- Resize the feature and search regions and track again.
- Track the shot in sections, redefining the feature region in places where the feature changes and the region drifts.
- Track a different area with movement that closely matches that of the feature. If you are applying an effect or adding something to a specific point, you usually want to track close to the original feature. For example, you may want to add a glow effect to the end of a sword, but the lighting in the shot creates so much glare on the tip of the sword that tracking it is impossible. Tracking the opposite end of the sword would generate a much different motion path than tracking the tip. (This is where planning ahead before you shoot can really pay off.)
- Add a high-contrast object to the scene either attached to the object or in an area that matches the movement of the feature *before* you shoot.
- Adjust the tracking options to change the comparison method or precision of the frame-to-frame tracking.

Understanding the tracker plug-in options (Pro only)

After Effects includes several options to help improve your success in tracking. These options are available using the built-in tracker plug-in. You access these options by clicking the Options button in the Motion Tracker Options dialog box. This opens the Tracker Plug-in Options dialog box. (See [“Defining tracker options \(Pro only\)” on page 369.](#))



Tracker Plug-in Options dialog box

Use Channel Specifies the comparison method to use for tracking:

- *RGB* compares the RGB values in the feature region. Select if the feature is a distinct color.
- *Luminance* compares the brightness value in the feature region. Select if the feature has high contrast, or brightness, compared to the surrounding objects and background (such as a burning candle carried through a room).
- *Saturation* compares the density of color in the tracking region. Select if the feature has a high concentration of color, surrounded by variations of the same color (such as a bright red scarf against a brick wall).

Process Before Match Temporarily blurs or sharpens an image to improve tracking. Select *Blur* to reduce noise in the footage. Usually a value of 2 to 3 pixels is enough to produce better tracks in grainy or noisy footage. Select *Enhance* to exaggerate or refine the edges of an image and make them easier to track.

Note: *After Effects blurs or enhances the footage only for tracking, restoring it to its original state after tracking.*

Subpixel Positioning Specifies fractional position keyframes to match the specified feature region. When deselected, the tracker rounds off position keyframes to the nearest pixel.

Extrapolate Motion if Confidence is Below _% Specifies a tolerance level for matching the feature, after which After Effects extrapolates the motion. In other words, if the accuracy of the frame-to-frame match falls below the specified percentage, After Effects estimates the position of the Feature region. Use this option if the feature is obscured by another object or temporarily blends into the background. For example, if you are tracking a dog that walks behind a tree, the tracker can calculate the position of the dog in those frames where it is blocked by the tree.

Drift correction methods (Pro only)

You can correct drift by moving the feature region or modifying the tracking settings.

To correct drifting by moving the feature region:

- 1 Drag the current-time indicator to the last well-tracked frame.
- 2 Do one of the following actions:
 - To correct a single frame, drag the feature and search regions to new locations. Alt-drag (Windows) or Option-drag (Mac OS) the feature region to move it without moving the attach point. Monitor the feature region position in the Timeline window. After Effects automatically updates the previous tracking data to this new feature region/attach point position.
 - To correct several contiguous frames, drag the feature and search regions to new locations, resize if necessary, and click Analyze. Watch the tracking to make sure it is accurate. If not, click the button again to stop tracking, adjust the feature region, and begin again.
- 3 To preview tracking, press the Spacebar.
- 4 When you are satisfied with the track, click Apply to copy keyframes to the selected layer, or effect.

To correct drifting by modifying tracking settings:

- 1 Drag the current-time indicator to the last well-tracked frame.
- 2 In the Tracker Controls palette, click Options.
- 3 In the Motion Tracker Options dialog box, select Enable Feature Adaptiveness if colors change in the feature region or its shape evolves, and then click Options. After Effects displays the Tracker Plug-in Options dialog box.
- 4 Change the following settings as needed:
 - If the feature has high contrast, select Luminance.
 - If the feature has a high concentration of color, select Saturation.
 - If the footage is noisy or grainy, select Process Before Match, and click Blur. Type a value of 2 to 3 pixels.
 - If the edges of the feature are fuzzy, select Process Before Match, and click Enhance.
 - If the area is partially obscured during tracking, set a tolerance value for Extrapolate Motion if Confidence Is Below _%. You can determine the proper value by creating a trial track and then examining the confidence value displayed in the Timeline window for any frames with an obscured feature region. Type a value that is slightly larger than the largest confidence value for the problem frames.

- 5 Click OK in the Tracker Plug-in Options dialog box, and then click OK again in the Track Options dialog box.
- 6 In the Tracker Controls palette, click the Analyze Forward or the Analyze Backward button.
- 7 Watch the tracking to make sure it is accurate. If not, click the button again to stop tracking, adjust the settings, and begin again.
- 8 To preview tracking, press the Spacebar.
- 9 When you are satisfied with the track, click Apply to copy keyframes to the selected layer or effect.

Working with tracking data in the Timeline window (Pro only)

Once you have tracked a feature, After Effects stores the tracking data with the layer in a *track*. You can display this information by selecting Reveal Current Track in Timeline from the options menu in the Tracker Controls palette or by expanding the layer to view the Motion Trackers section in the Timeline. You can apply the same tracking data to different footage or effects. You can also track multiple features in the same footage. After Effects automatically creates a new track each time you choose a tracking option from the Animation menu. Tracks are named Tracker 1, Tracker 2, and so on. You can rename tracks to help identify them. You can also select tracks and track points and modify their numeric values.

Understanding the properties added to timeline

When you track motion, After Effects adds the following properties to the motion source in the Timeline:

▼ Motion Trackers		
▼ Tracker 1		
▼ Track Point 1		
• Feature Center	69.0 , 39.0	
• Feature Size	20.0 , 20.0	
• Search Offset	0.0 , 0.0	
• Search Size	40.0 , 40.0	
• Confidence	100.0 %	
• Attach Point Offset	0.0 , 0.0	
• Attach Point	69.0 , 39.0	
	Switches / Modes	

Motion Trackers properties in the Timeline window

Tracker [number] Specifies a track and all track points associated with the track. For example, Perspective Corner pinning tracks would list four track points.

Track Point [number] Specifies a feature region, search region, and attach point used in the track.

Feature Center Specifies Position properties for the center of the feature region.

Feature Size Specifies the area of the feature region in pixels.

Search Offset Specifies the distance between the feature region and the search region.

Search Size Specifies the area of the search region in pixels.

Confidence Specifies the accuracy with which the analyzed pixels match those specified by the search parameters.

Attach Point Offset Specifies the distance between the center of the feature region and the attach point.

Attach Point Specifies the position at which a target layer or effect is animated or attached to the motion source layer.

Using stored tracking data

Once you've tracked a motion source layer, you can apply that layer's stored tracking data to other target layers. For example, you can apply the track to a light bulb's position and to the Lens Flare effect's control point.

To apply an existing track to a new target:

- 1 In the Tracker Controls palette, choose the tracked layer from the Motion Source pop-up menu.
- 2 Choose the track containing the tracking data you want from the Current Track pop-up menu.
- 3 Click Edit Target to open the Motion Target dialog box, which lists all the layers in the composition (except the motion source layer) as well as any point controls in effects applied to the motion source layer.
- 4 Select the layer or effect point control you want to animate, and click OK.
- 5 In the Tracker Controls palette, click the Apply button to apply the tracking data to the specified target. After Effects creates keyframes for the target layer or effect.

Renaming tracks

After Effects names tracks sequentially as you create them. When you track more than one feature, it is helpful to give each track a descriptive name so that it is easier to identify.

To rename a track:

- 1 In the Tracker Controls palette, choose the tracked layer from the Motion Source pop-up menu.
- 2 Choose the track you want to rename from the Current Track pop-up menu.
- 3 Click Options.
- 4 Type the name for the track, and click OK.

Keyboard Shortcuts

Keys for selecting tools

(Tools palette)

Result	Windows	Macintosh
Selection tool	V	V
Rotation tool	W	W
Camera tools (Orbit, Track XY, and Track Z)	C, or Shift + C to cycle through tools	C, or Shift + C to cycle through tools
Brush, Clone Stamp, and Eraser tool	Ctrl + B to select tool, Ctrl + B to cycle through tools	Command + B to select tool, Command + B to cycle through tools
Hand tool	H, or hold down spacebar	H, or hold down spacebar
Zoom tool	Z, or Z + Alt to zoom out	Z, or Z + Option to zoom out
Pan Behind tool	Y	Y
Mask tools (Rectangular and Oval)	Q, or Shift + Q to cycle through tools	Q, or Shift + Q to cycle through tools
Type tools (Horizontal and Vertical)	Ctrl + T, or Ctrl + T to cycle through tools	Command + T, or Command + T to cycle through tools
Pen tools (Add Vertex, Delete Vertex, and Convert Vertex)	G, or Shift + G to cycle through tools	G, or Shift + G to cycle through tools
Corner tool	Alt + Pen tool, or Ctrl + Alt + Arrow tool	Option + Pen tool, or Command + Option + Arrow tool
Pen tool	Ctrl	Command
Text tool	Ctrl + T	Command + T
Momentarily switch tools	Hold down keyboard shortcut for tool	Hold down keyboard shortcut for tool
Switch tools	Press keyboard shortcut for tool	Press keyboard shortcut for tool

Keys for using projects

(Project window)



Result	Windows	Macintosh
Open last project	Ctrl + Alt + Shift + P	Command + Option + Shift + P
Open Project Settings dialog box	Ctrl + Alt + Shift + K	Command + Option + Shift + K
When opening a project, suppress opening of all windows (except the Project window)	Hold down Shift	Hold down Shift
Resize Project Window	Ctrl + \	Command + \

Keys for using footage items

(Project window)

Result	Windows	Macintosh
Open selected footage item or composition	Double-click or Enter on numeric keypad	Double-click or Enter on numeric keypad
Open movie in an After Effects footage window	Alt + double-click	Option + double-click
Activate most recent composition	\	\
Add selected item to most recently activated composition	Ctrl + /	Command + /
Replace a selected layer's source footage in Composition window with selected footage	Ctrl + Alt + /	Command + Option + /
Replace a selected layer's source footage item or composition	Alt-drag footage item from Project window into composition	Option-drag footage item from Project window into composition
Scan for changed footage	Ctrl + Alt + Shift + Q	Ctrl + Command + Option + Shift + Q
Delete a footage item without a warning dialog box appearing	Ctrl + Backspace	Command + Delete

Keys for viewing windows

Result	Windows	Macintosh
Cycle through open windows	Ctrl + Tab	

Result	Windows	Macintosh
Display/hide Title-Action Safe zones	' (apostrophe)	' (apostrophe)
Display/hide proportional grid	Alt + ' (apostrophe)	Option + ' (apostrophe)
Center active window	Ctrl + Alt + \	Command + Option + \
Suspend window updates	Caps Lock	Caps Lock
Cycle through tabs in the foremost window	Shift + , (comma) and Shift + . (period) Add Alt to zoom window to fit	Shift + , (comma) and Shift + . (period) Add Option to zoom window to fit
Take multiple (up to 4) snapshots	Shift + F5, F6, F7, and F8	Shift + F5, F6, F7, and F8
Display snapshot in active window	F5, F6, F7, and F8	F5, F6, F7, and F8
Display channel (RGBA)	Alt + 1, 2, 3, or 4	Option + 1, 2, 3, or 4
Display channel (RGBA) in color	Alt + Shift + 1, 2, 3, or 4	Option + Shift + 1, 2, 3, or 4
Display channel in color	Shift + click channel icon	Shift + click channel icon
Display unmatted color channels	Shift + click alpha channel icon	Shift + click alpha channel icon
Display/hide all palettes	Tab	Tab
Close active tab or window	Ctrl + W	Command + W
Close active window (all tabs)	Ctrl + Shift + W	Command + Shift + W
Close all windows except Project window	Ctrl + Alt + W	Command + Option + W

Keys for moving around

(Timeline window)

Result	Windows	Macintosh
Go to beginning of work area	Shift + Home	Shift + Home
Go to end of work area	Shift + End	Shift + End
Go to previous visible keyframe or layer marker	J	J
Go to next visible keyframe or layer marker	K	K

Result	Windows	Macintosh
Go to a composition time marker	0 - 9 on main keyboard	0 - 9 on main keyboard
Scroll selected layer to top of the Timeline window	X	X
Scroll current time to center of window	D	D

Keys for moving around windows

(Composition, Timeline, Footage, and Layer windows)

Result	Windows	Macintosh
Go to beginning	Home or Ctrl + Alt + Left Arrow key	Home or Command + Option + Left Arrow key
Go to end	End or Ctrl + Alt + Right Arrow key	End or Command + Option + Right Arrow key
Step forward 1 frame	Page Down or Ctrl + Right Arrow key	Page Down or Command + Right Arrow key
Step forward 10 frames	Shift + Page Down or Shift + Ctrl + Right Arrow key	Shift + Command + Right Arrow key or Shift + Page Down
Step backward 1 frame	Page Up or Ctrl + Left Arrow key	Page Up or Command + Right Arrow key
Step backward 10 frames	Shift + Page Up or Shift + Ctrl + Left Arrow key	Shift + Page Up or Command + Shift + Left Arrow key
Go to layer In point	i	i
Go to layer Out point	o	o
Snap items such as keyframes, time markers, and In and Out points to each other on a time ruler	Shift-drag item	Shift-drag item

Keys for previewing

(Timeline window)

Result	Windows	Macintosh
Start/pause playback	Spacebar	Spacebar
RAM preview every other frame	Shift + 0 on numeric keypad	Shift + 0 on numeric keypad

Result	Windows	Macintosh
Scrub video	Drag or Alt-drag current time marker, depending on Preview preferences setting	Drag or Option-drag current time marker, depending on Preview preferences setting
Scrub audio	Ctrl-drag current time marker	Command-drag current time marker
Display rectangle instead of alpha outline during wireframe preview	Ctrl + Alt + 0 on numeric keypad	Command + Option + 0 on numeric keypad
Leave window contents during wireframe preview	Shift + Alt + 0 on numeric keypad	Shift + Option + 0 on numeric keypad
Leave window contents during rectangle preview	Ctrl + Shift + Alt + 0 on numeric keypad	Command + Shift + Option + 0 on numeric keypad

Keys for using layers

(Composition and Timeline windows)

Result	Windows	Macintosh
Rename layer, composition, folder, or effect	Enter key on main keyboard	Return
Select next layer back	Ctrl + Down Arrow key	Command + Down Arrow key
Select next layer forward	Ctrl + Up Arrow key	Command + Up Arrow key
Select a layer by its layer-outline number	1 - 9 on numeric keyboard	1 - 9 on numeric keypad
Select non-contiguous layers	Ctrl-click layers	Command-click layers
Deselect all layers	F2	F2
Solo selected layer	SS	SS
Activate Composition window with layer	\	\
Display selected layer in Layer window	Enter on numeric keypad	Enter on numeric keypad
Display or close Effect Controls window for selected layers	Ctrl + Shift + T	Command + Shift + T
Switch between Composition and Timeline windows	\	\
Open source of a layer	Alt-double-click a layer	Option-double-click a layer

Result	Windows	Macintosh
Scale layer without dragging a handle in Composition window	Alt-drag layer	Option-drag layer
Snap layer to edges or center of frame in Composition window	Ctrl + Shift-drag layer (begin dragging before pressing keys)	Command + Shift-drag layer (begin dragging before pressing keys)
Constrain layer movement along x axis or y axis	Shift-drag layer (begin dragging before pressing keys)	Shift-drag layer (begin dragging before pressing keys)
Stretch layer to fit Composition window	Ctrl + Alt + F	Command + Option + F
Stretch layer to fit horizontally, preserving frame aspect ratio	Ctrl + Alt + Shift + H	Command + Option + Shift + H
Stretch layer to fit vertically, preserving frame aspect ratio	Ctrl + Alt + Shift + G	Command + Option + Shift + G
Reverse a layer's playback	Ctrl + Alt + R	Command + Option + R
Set In point	[(left bracket)	[(left bracket)
Set Out point] (right bracket)] (right bracket)
Trim In point of a layer	Alt + [(left bracket)	Option + [(left bracket)
Trim Out point of a layer	Alt +] (right bracket)	Option +] (right bracket)
Add/remove expression	Alt-click a property stopwatch in the Effect Controls window	Option-click a property stopwatch in the Effect Controls window
Add an effect (or multiple selected effects) to selected layers	Double-click an effect in the Effects palette	Double-click an effect in the Effects palette
Set In point by time-stretching	Ctrl + Shift + , (comma)	Command + Shift + , (comma)
Set Out point by time-stretching	Ctrl + Alt + , (comma)	Command + Option + , (comma)
Move In point to beginning of composition	Alt + Home	Option + Home
Move Out point to end of composition	Alt + End	Option + End
Constrain rotation to 45-degree increments	Shift-drag rotation tool	Shift-drag rotation tool
Constrain scaling to footage frame aspect ratio	Shift-drag layer handle	Shift-drag layer handle
Constrain movement along x or y axis	Shift-drag layer	Shift-drag layer

Result	Windows	Macintosh
Reset rotation angle to 0 degrees	Double-click rotation tool	Double-click rotation tool
Reset scale to 100%	Double-click selection tool	Double-click selection tool
Change property value x 10	Shift-drag underlined values in Switches/Modes column	Shift-drag underlined values in Switches/Modes column
Change property value .10	Ctrl-drag underlined values in Switches/Modes column	Command-drag underlined values in Switches/Modes column
Set all dimensions to same value for Scale and Mask Feather properties	Deselect Constrain Proportions option, and Alt-click to reselect option	Deselect Constrain Proportions option, and Option-click to reselect option
Re-lock two values for Scale and Mask Feather properties	Alt-click restraining checkbox if it has been deselected	Option-click restraining checkbox if it has been deselected

Keys for zooming

(Composition, Layer, and Footage windows)

Result	Windows	Macintosh
Zoom in	.(period)	.(period)
Zoom out	,(comma)	,(comma)
Zoom in and resize window	Alt + .(period) or Ctrl + = on main keyboard	Option + .(period) or Command + = on main keyboard
Zoom out and resize window	Alt + ,(comma) or Ctrl + - (hyphen) on main keyboard	Option + ,(comma) or Command + - (hyphen) on main keyboard
Zoom to 100%	/ (on main keyboard) or double-click zoom tool	/ (on main keyboard) or double-click zoom tool
Zoom to 100% and resize window	Alt + / (on main keyboard)	Option + / (on main keyboard)
Zoom window	Ctrl + \	Command + \
Zoom window to fill monitor	Ctrl + Shift + \	Command + Shift + \

Keys for viewing layer properties

(Timeline window)

Result	Windows	Macintosh
Anchor Point	A	A

Result	Windows	Macintosh
Audio Levels	L	L
Audio Waveform	LL	LL
Effects	E	E
Expressions	EE	EE
Mask Feather	F	F
Mask Shape	M	M
Mask Opacity	TT	TT
Mask Properties	MM	MM
Material options (3D)	AA	AA
Opacity	T	T
Position	P	P
Paint Effects	PP	PP
Reveal modified properties	UU	UU
Rotation	R	R
Time Remapping	RR	RR
Scale	S	S
Set layer property value in dialog box (works with P, S, R, F, and M)	Ctrl + Shift + property shortcut	Command + Shift + property shortcut
Show all animating values	U	U
Show selection in Timeline window	SS	SS
Hide property or category	Alt + Shift-click property or category name	Option + Shift-click property or category name
Display/hide Parent column	Shift + F4	Shift + F4
Add/remove property	Shift + property shortcut	Shift + property shortcut
Toggle switches/modes	F4	F4
Turn off all other solo switches	Alt-click solo switch	Option-click solo switch
Zoom to or from frame view	; (semicolon)	; (semicolon)
Zoom in time	= on main keyboard	= on main keyboard
Zoom out time	- (hyphen) on main keyboard	- (hyphen) on main keyboard

Keys for using compositions

(Composition window)

Result	Windows	Macintosh
Set composition resolution to custom	Ctrl + Alt + J	Command + Option + J
Reset view in the Composition window to 100% and center composition in the window	Double-click the hand tool	Double-click the hand tool
Toggle window display options in palette menu	Ctrl + Shift + H	Command + Shift + H

Keys for modifying keyframes

(Timeline window)

Result	Windows	Macintosh
Add or remove keyframe (if stopwatch is on) or turn on time-vary stopwatch	Alt + Shift + property display shortcut	Option + Shift + property display shortcut
Select all keyframes for a property	Click property name	Click property name
Deselect all keyframes	Shift + F2	Shift + F2
Snap keyframe to significant times	Shift-drag keyframe	Shift-drag keyframe
Nudge keyframe 1 frame forward	Alt + Right Arrow	Option + Right Arrow
Nudge keyframe 1 frame backward	Alt + Left Arrow	Option + Left Arrow
Select all visible keyframes	Ctrl + Alt + A	Command + Option + A
Go to previous visible keyframe	J	J
Go to next visible keyframe	K	K
Switch interpolation between Linear and Auto Bezier	Ctrl-click keyframe	Command-click keyframe
Change Auto Bezier interpolation to Continuous Bezier	Drag keyframe handle	Drag keyframe handle
Toggle between Continuous Bezier and Bezier interpolation	Ctrl-drag keyframe handle	Command-drag keyframe handle

Result	Windows	Macintosh
Easy ease	F9	F9
Easy ease in	Shift + F9	Shift + F9
Easy ease out	Ctrl + Shift + F9	Command + Shift + F9

Keys for nudging layers

(Composition and Timeline windows)

Result	Windows	Macintosh
Nudge layer 1 pixel in specific direction	Arrow key (nudges in direction of Arrow)	Arrow key (nudges in direction of Arrow)
Nudge layer 1 frame earlier	Alt + Page Up	Option + Page Up
Nudge layer 1 frame later	Alt + Page Down	Option + Page Down
Nudge layer rotation + 1 degree	+ (plus) on numeric keypad	+ (plus) on numeric keypad
Nudge layer rotation - 1 degree	- (minus) on numeric keypad	- (minus) on numeric keypad
Nudge layer scaling + 1%	Ctrl + + (plus) on numeric keypad	Option + + (plus) on numeric keypad
Nudge layer scaling - 1%	Ctrl + - (minus) on numeric keypad	Option + - (minus) on numeric keypad

Keys for setting the work area

(Timeline window)

Result	Windows	Macintosh
Set beginning of work area to current time	B	B
Set end of work area to current time	N	N
Set work area to selected layers	Ctrl + Alt + B	Command + Option + B
Set work area to composition duration when no layers are selected	Ctrl + Alt + B	Command + Option + B

Keys for using masks

(Composition and Layer windows)

Result	Windows	Macintosh
Reset oval or rectangle mask to fill window	Double-click rectangular or oval mask tool	Double-click rectangular or oval mask tool
Scale around center point in Free Transform mode	Ctrl-drag	Command-drag
Select all points in a mask	Alt-click mask	Option-click mask
Free transform mask	Ctrl + T, or double-click mask	Command + T, or double-click mask
Exit free transform mask	Enter	Return
Set an initial keyframe on a selected mask	Shift + Alt + M	Shift + Option + M

Keys for using effects

(Effect Controls window)

Result	Windows	Macintosh
Expand/collapse effect controls	` (grave accent)	` (grave accent)
Add keyframe for effect control	Alt-click effect property name	Option-click effect property name
Activate Composition window containing layer	\	\
Add an expression in the Timeline window	Alt-click a property stopwatch in the Effect Controls window	Option-click a property stopwatch in the Effect Controls window

Keys for using 3D animation

(Composition and Timeline windows)

Result	Windows	Macintosh
Remember Custom View 1	Shift + F10	Shift + F10
View Custom View 1 (defaults to front)	F10	F10
Remember Custom View 2	Shift + F11	Shift + F11
View Custom View 2 (defaults to custom view 1)	F11	F11
Remember Custom View 3	Shift + F12	Shift + F12

Result	Windows	Macintosh
View Custom View 3 (defaults to active camera)	F12	F12
Return to previous view	Esc	Esc
Look at Selected Layers	Shift + Alt + Ctrl + \	Option + Command + Shift + \
Toggle Casts Shadows property	Alt + Shift + C	Option + Shift + C
Move the camera and its point of interest to look at selected objects	Shift + Alt + Ctrl + \	Option + Command + Shift + \

Keys for using markers

(Composition and Timeline windows)

Result	Windows	Macintosh
Remove layer-time marker	Ctrl-click marker	Command-click marker
Go to previous visible layer-time marker or keyframe	J	J
Go to next visible layer-time marker or keyframe	K	K
Set keyframe	Alt + SS	Option + SS
Go to a composition-time marker	0-9 on main keyboard	0-9 on main keyboard
Set and number a composition-time marker at the current time	Shift + 0-9 on main keyboard	Shift + 0-9 on main keyboard
See the duration between two layer markers or keyframes in the Info palette	Alt-click the markers or keyframes	Option-click the markers or keyframes

Keys for using other palettes

Result	Windows	Macintosh
Switch between selection tool and pen tool	Hold down Ctrl	Hold down Command
Display filename in Info palette	Ctrl + Alt + E	Command + Option + E

Keys for using text

Result	Windows	Macintosh
Aligns text left, center, or right	Horizontal Type tool + Shift + Ctrl + L, C, or R	Horizontal Type tool + Shift + Command + L, C, or R
Aligns text top, center, or bottom	Vertical Type tool + Shift + Ctrl + L, C, or R	Vertical Type tool + Shift + Command + L, C, or R
Selects 1 character left/right, or 1 line down/up, or 1 word left/right	Shift + Left Arrow/Right Arrow, Shift + Down Arrow/Up Arrow, Shift + Ctrl + Left Arrow/Right Arrow	Shift + Left Arrow/Right Arrow, Shift + Down Arrow/Up Arrow, Shift + Command + Left Arrow/Right Arrow
Selects characters from insertion point to mouse click point	Shift + click	Shift + click
Moves insertion point 1 character left/right, 1 line down/up, or 1 word left/right	Left Arrow/Right Arrow, Down Arrow/Up Arrow, Ctrl + Left Arrow/Right Arrow	Left Arrow/Right Arrow, Down Arrow/Up Arrow, Command + Left Arrow/Right Arrow
Selects word, line, paragraph, or story	Double-click, triple-click, quadruple-click, or quintuple-click	Double-click, triple-click, quadruple-click, or quintuple-click
Toggles All Uppercase on/off	Shift + Ctrl + K	Shift + Command + K
Toggles Small Caps on/off	Shift + Ctrl + Alt + K	Shift + Command + Option + K
Toggles Superscript on/off	Shift + Ctrl + +	Shift + Command + +
Toggles Subscript on/off	Shift + Alt + Ctrl + +	Shift + Option + Command + +
Chooses 100% horizontal scale	Shift + Ctrl + X	Shift + Command + X
Chooses 100% vertical scale	Shift + Alt + Ctrl + X	Shift + Option + Command + X
Chooses Auto leading	Shift + Alt + Ctrl + A	Shift + Option + Command + A
Chooses 0 for tracking	Shift + Ctrl + Q	Shift + Command + Q
Reset text tracking	Shift + Alt + Q	Shift + Ctrl + Command + Q
Justifies paragraph; left aligns last line	Shift + Ctrl + J	Shift + Command + J
Justifies paragraph; forces last line	Shift + Ctrl + F	Shift + Command + F
Decreases/increases type size of selected text 2 pts/px	Shift + Ctrl + < or >	Shift + Command + < or >

Result	Windows	Macintosh
Decreases/increases leading 2 pts/px	Alt + Down Arrow/Up Arrow	Option + Down Arrow/Up Arrow
Decreases/increases baseline shift 2 pts/px	Shift + Alt + Down Arrow/Up Arrow	Shift + Option + Down Arrow/Up Arrow
Decreases/increases kerning/tracking 20/1000 ems	Alt + Left Arrow/Right Arrow	Option + Left Arrow/Right Arrow

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