MX

macromedia®
DIRECTOR®MX
2004

Getting Started with Director

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CHAPTER 1
Introduction

Welcome to Macromedia Director MX 2004. With Director, you can develop high-performance multimedia content and applications for CDs, DVDs, kiosks, and the Internet. This guide, *Getting Started with Director*, is designed to get you up and running as quickly as possible. It includes installation guidelines for both new and returning users as well as an orientation to Director and tutorials for new users.

In this chapter, you can get an overview of Director, learn about the features that are new in this release of Director, and find additional sources of information.

About Director

With Director, a proven multimedia authoring tool for professionals, you can develop high-performance content and deploy it anywhere: on CDs, DVDs, intranets, kiosks, or the Internet. Whether you are creating enhanced CD/DVD-ROM content, educational content, or entertainment applications, Director handles the widest variety of media, letting you unleash your creativity and build rich, interactive experiences that deliver measurable results. Director provides all the tools you need to maximize productivity, including a choice of scripting languages and cross-platform publishing.

With Director, you can now do all of the following:

- Embed most major media formats in your multimedia projects, including DVD-Video, Windows Media, RealMedia, QuickTime, and Macromedia Flash content, in addition to audio, bitmap, and 3D formats.

- Work seamlessly with other Macromedia MX products, including Macromedia Flash MX 2004.

- Extend the authoring environment and playback engine with the Xtra extension plug-in architecture in Director. Use third-party Xtra extensions or write your own to control external devices, such as joysticks and cameras, and perform sophisticated operating system-level tasks.

- Write scripts to add interactivity and automation to your projects, using the Lingo scripting language, JavaScript syntax, or a combination of the two.

- Publish content across platforms and to different formats, including Macintosh and Windows projectors.

Users view your completed Director movies in one of the following ways:

- In a projector, which plays on your user's computer as a stand-alone application.
- In the Macromedia Shockwave Player format, which plays in Shockwave-enabled web browsers. Millions of web users already have the Shockwave Player on their computers, browsers, or system software. Others have downloaded Shockwave Player, which is free, from the Macromedia website at www.macromedia.com/shockwave/download/.

Tip: To see some of the exciting and varied ways in which developers use Director, visit the Director showcase at www.macromedia.com/go/discreet_inspiration. You can also see great examples of Shockwave content at www.shockwave.com.

What's new in Director MX 2004

Director MX 2004 introduces many new features, designed to save time during authoring or to improve integration with other software, media types, and multimedia development processes.

Importing Macromedia Flash MX 2004 content   You can now access Macromedia Flash MX 2004 from within Director.

Scripting in JavaScript syntax   Director now supports scripting in JavaScript syntax, in addition to Lingo. You can use whichever language is more familiar to you or use both languages in the same movie to develop interactive features and functionality.

Using prebuilt components   Prebuilt Macromedia Flash MX 2004 components are now available to reduce your scripting time. You can drop components, such as calendars and user interface elements, into movies to cut the time that it takes to develop interactive features.

Adding DVD-Video   You can now embed, control, and play back the popular DVD-Video format inside Director movies. This feature makes DVD possible and affordable for a wide variety of developers—including entertainment studios, distance learning professionals, DVD authors, and corporate presentation specialists.

Publishing to Mac and Windows in one step   After you complete a movie, you can now publish across platforms in one step, creating either stand-alone applications or web-based Shockwave content that runs on Mac and Windows. The new projector publishing feature eliminates extraneous dialog boxes, saves projector settings on a per-project basis, and eliminates redundancies.

Naming sprites and channels   Sprites and channels can now have custom names, and absolute references to sprites are no longer necessary. This feature is an advantage when you make last-minute changes to your movie. With absolute references, your Lingo or JavaScript syntax scripts might break. But with sprite names, you can move sprites on the Score without worrying about broken scripts.

Customizing your workspace   You can arrange your workspace in multiple configurations and save each workspace for later use. As a new part of this feature, you can now create workspace settings that include Movie in a Window (MIAW) windows that are docked alongside your other windows. These docked MIAW windows can extend Director functionality.

Integrating with other Macromedia Studio MX 2004 products   If you already use other Macromedia Studio MX 2004 products, such as Macromedia Flash MX 2004 and Macromedia Fireworks MX 2004, then the Director interface is already familiar to you. In addition to a common interface, you can now start and edit other Macromedia Studio MX 2004 files from directly within Director.

Integrating with Macromedia server technologies You can now choose to integrate Director with Macromedia server technologies, such as Macromedia ColdFusion MX 6.1 and Macromedia Flash Communication Server MX. For multi-user games, distance learning content, and other server-controlled content, this link between your Director content and IT infrastructure extends your interactivity options.

Getting help from the reference panel A new reference panel is now available in Director to simplify getting help with using Director, behaviors, Xtra extensions, and application programming interfaces (APIs) for both Lingo and JavaScript syntax.

Guide to instructional media

Director contains a variety of information sources to help you learn the program quickly and become proficient in creating multimedia. This information includes several printable PDF files and online help. The Director workspace contains tooltips and context-sensitive help, and additional help is available on the Director website at www.macromedia.com/go/director_support.

Getting online help

As you use Director, you can get immediate online help by opening Director Help. You can also get help with the specific item in Director that you are currently using. This feature is called context-sensitive help.

To access Director Help:

1 Select Help > Director Help.

2 Browse for a topic on the Contents tab, or type a keyword on the Search tab.

To access context-sensitive help, do one of the following:

- If you are working in a window, display the Options menu for that window and select Help.
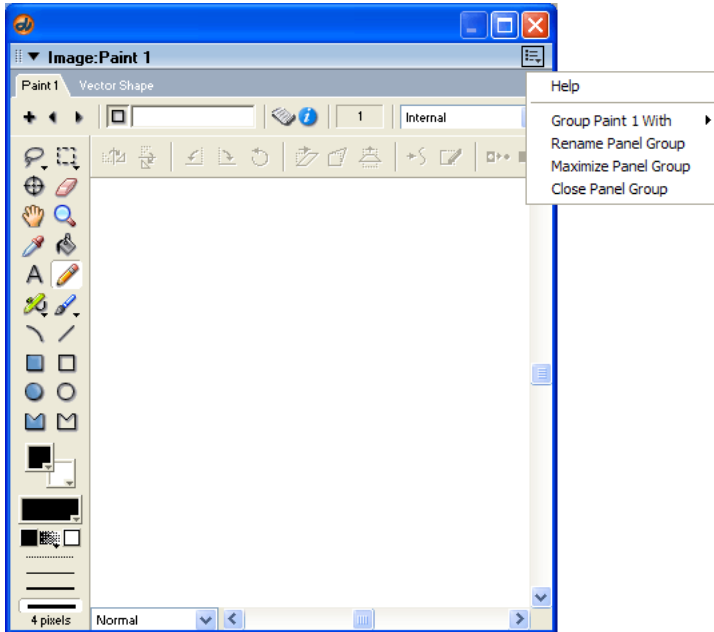
- If you are working in a dialog box, click the Help button.

  Director Help opens and displays a topic that relates to the window or dialog box that you are using.

Sources of information

Getting Started with Director   This printed manual contains the essential information that you need to get started, including information about installing the latest version of Director. This manual also guides you through the workspace and offers a tutorial, designed for those who are new to Director.

Director Help Panel   This online help system is the comprehensive information source for all Director features. It includes overviews of the features, examples, how-to procedures, descriptions of interface elements, and a reference of all scripting objects in both Lingo and JavaScript syntax. Topics are linked and indexed to make finding information and jumping to related topics quick and easy. To view the Director Help Panel, select Help > Director Help while you are working in Director.

Using Director   This manual is available in printable PDF format from the Director Documentation Center at www.macromedia.com/go/director_docs. It explains how to use all of the features and functionality offered in Director. Information in the manual is also available in the online Director Help.

Director Scripting Reference   This manual is available in printable PDF format from the Director Documentation Center at www.macromedia.com/go/director_docs. It provides a complete reference of the Director application programming interfaces (APIs), including both Lingo and JavaScript syntax. Information in the manual is also available in the online Director Help.

Creating Your First 3D Movie in Director   This tutorial is available in printable PDF format from the 3D tutorial page on the Macromedia website at www.macromedia.com/go/drmx2004_3d_tutorial_en. It takes you step by step through creating a simple 3D movie.

Tooltips   When you place your mouse pointer over a Director tool or another item in the Director workspace for a few seconds, a small tooltip appears that explains what you can do with the item.

Director Support Center   The Director Support Center website (www.macromedia.com/go/director_support) contains the latest information about Director, plus additional topics, examples, tips, and updates. Check the website often for the latest news and how to get the most out of Director.

Document conventions

Director Help and the Director product manuals all follow a few basic conventions:

- The term *Director* typically refers to the most recent version of Director.
- *Lingo* refers to a scripting language that is shipped with Director. *JavaScript syntax* refers to the Director implementation of JavaScript.
- How-to procedures are identified with bold headings that begin with "To..." and end with a colon. For example, if **To access Director Help:** appears in a heading, then the heading is followed by a set of steps.
- Examples of Lingo and JavaScript syntax are shown in a fixed-width font. For example, `answer = 2 + 2` is a sample Lingo statement.
- Variables used to represent parameters in Lingo and JavaScript syntax appear in italics. For example, `whichCastMember` is commonly used to indicate where you should insert the name of a cast member in Lingo or JavaScript syntax.
- Text that you should type in a window or dialog box is shown in a **bold** font.

CHAPTER 2
Installing and Configuring Director

Installing Macromedia Director MX 2004 takes only a few minutes. After installation, you may want to customize Macromedia Director MX 2004 to fit your authoring needs. You can install Xtra extensions to add functionality and set up an Internet connection for remote access to files. You can configure Director immediately after installation, or you can return to configuration at any time.

System requirements

The following hardware and software are the minimum required to author Director movies:

- For Microsoft Windows: An Intel Pentium III 600 MHz (or later processor running Windows 2000 or Windows XP; at least 128 MB of available RAM (256 recommended); and 200 MB of available disk space

- For Macintosh: A Power Macintosh G3 500 MHz (or later) running Mac OS X 10.2.6 or 10.3; at least 128 MB of available RAM (256 recommended); and 200 MB of available disk space

The following hardware and software are the minimum required to play back Director movies:

- For Microsoft Windows: An Intel Pentium II with 64 MB of available RAM running Windows 98, or an Intel Pentium III with 128 MB of available RAM running Windows 2000 or Windows XP; one of the following web browsers: Netscape 7.1, Microsoft Internet Explorer 5.01 Service Pack 2, Microsoft Internet Explorer 5.5 Service Pack 2, or Microsoft Internet Explorer 6 Service Pack 1

- For Macintosh OS X: A Power Macintosh G3 with 128 MB of available RAM running Mac OS X 10.1.5, 10.2.6, or 10.3; one of the following web browsers: Netscape 7.1, Microsoft Internet Explorer 5.2 or later, or Safari 1.1

- For Macintosh Classic: A Power Macintosh G3 with 64 MB of available RAM running System 9.2; Microsoft Internet Explorer 5.1

Note: Complete and updated system requirements are available on the Macromedia System Requirements page at www.macromedia.com/go/sysreqs.

Installing Director

Follow these steps to install Director on either a Windows or a Macintosh computer. On the Macintosh, you need administrator privileges and an administrator password to complete the installation.

To install Director on a Windows or a Macintosh computer:

1 Insert the Director CD into the computer's CD-ROM drive and do one of the following:

- In Windows, if the installation program does not start automatically, select Run from the Windows Start menu, type **d:\setup.exe** (where **d** is your CD-ROM drive letter), and click OK.
- On the Macintosh, double-click the Director Installer icon.

2 Follow the on-screen instructions. Before you can use Director, you must activate your license by phone or on the Internet. To learn how to activate your license, see the on-screen instructions.

3 Make sure that Director is properly installed and ready to start by doing one of the following:

- In Windows, if you chose the default program group when you installed, select Start > All Programs > Macromedia > Macromedia Director MX 2004.
- On the Macintosh, double-click the Director icon in the Macromedia Director MX 2004 folder.

If Director starts, then you are ready to begin using or configuring Director.

Installing Xtra extensions

Xtra extensions add features and functionality to Director. Some Xtra extensions are included with the standard installation of Director; others must be installed separately. You should follow the steps below only if you have an Xtra extension that requires separate installation.

If you are interested in finding and downloading Xtra extensions, visit the Macromedia Director Exchange at www.macromedia.com/cfusion/exchange/. Then, for more information about Xtra extensions, see "Working with Xtra extensions" on page 37.

To make a custom Xtra extension available to Director:

1 Close Director if it is open.

2 Place the custom Xtra extension in the Xtras folder. The Xtras folder is located as a subfolder in a Configuration folder in the same folder as the Director application.

- For example on a PC, the location of the Xtras folder might be c:\Program Files\ Macromedia\Director MX 2004\Configuration\Xtras.
- On a Macintosh, the location of the Xtras folder might be /Applications/Macromedia Director MX 2004/Configuration/Xtras.

An Xtra extension can be stored in a folder up to five folders below the Xtras folder.

3 Start Director.

Note: Copies of the same Xtra extension can have different filenames or have the same filename but reside in different folders. If duplicate Xtra extensions are available when Director starts, Director displays an alert. Delete any duplicate Xtra extensions.

Connecting to the Internet

Director can connect to the Internet to import media files and retrieve data. Follow the steps here before you try to connect to the Internet, if you plan to access files remotely while using Director. Use the settings in the Network Preferences dialog box to control how the connection works and to define a preferred browser.

To select Internet connection settings:

1   Select Edit > Preferences > Network.

   Note: On Macintosh OS X operating systems, select Director › Preferences › Network instead.

2   In the Preferred Browser text box, type the file path to your preferred web browser, or click the Browse button and navigate to the correct file path.

   By specifying this file path, you select which web browser should open on your system when you play a movie that is programmed to open a web browser.

3   Select or clear Launch When Needed. When this option is selected, web browser launching is enabled.

4   In the Disk Cache Size text box, type the maximum number of kilobytes that you want Director to use to cache data from the Internet on your hard disk.

   Tip: To immediately empty the cache, click Clear.

5   To specify how often cached data is compared with the same data on the server, select one of the following Check Documents options:

   Once Per Session checks for data revisions only once from the time you start to the time you quit Director. This option improves performance but might not always display the most current version of a page.

   Every Time checks for changes whenever you request a page. This option slows performance but ensures that you are always viewing the most current version of a page.

6   To specify the configuration of your system's proxy server, select one of the following Proxies options:

   No Proxies specifies that you have a direct connection to the Internet.

   Manual Configuration allows you to customize proxy settings for your system. Enter the HTTP or FTP location and port number of your proxy server.

   Browsers usually do not require proxy servers to interact with the network services of external sources, but in some network configurations where a firewall blocks the connection between the browser software and a remote server, interaction with a proxy might be required.

   A firewall protects information in internal computer networks from external access, and in doing so, it can limit the ability to exchange information. To overcome this limitation, browser software can interact with proxy software. A proxy server interacts with the firewall and acts as a conduit, providing a specific connection for each network service protocol. If you are running browser software on an internal network from behind a firewall, you need the name and associated port number for the server running proxy software for each network service.

CHAPTER 3
Getting to Know the Workspace

The Macromedia Director MX 2004 workspace is designed to make the most efficient use of the space on your screen. Windows, also called panels, can be organized into tabbed panel groups, and panel groups can be docked together. To make the most of the features in Director, you should take a few minutes to understand how to navigate and customize your workspace.

As you get to know the workspace, you will also learn about the features that Director has to offer. For example, learning about the Script window and the Message window can help those who are new to scripting in Director. If you have not scripted in Director before and would like to start, make sure to read about the Script window and the Message window.

Before you begin working in Director for the first time, you should also understand the movie metaphor upon which Director is based. By understanding this metaphor, you can more easily recognize components of your workspace, like the Stage and Cast window.

Understanding the Director metaphor

The Director user interface is designed around a movie metaphor. Each project you create can be thought of as a movie, with a cast of characters, a score, a stage where the action takes place, and a director (you, the author). Each media element that appears in your movie (sound, video, images, text, buttons, and so on) can be thought of as a member of the movie's cast. In Director, the Cast window is where you view the list of media elements that appear in your movie.

As with a real movie, each Director movie has a score. However, the score of a Director movie contains more than just music. The Score window in Director contains information about when and where each of the cast members appears on the Stage. The Score describes the action that happens in the movie.

The action in a Director movie takes place in a window called the Stage. To create a Director movie, you add cast members (media elements) to the Cast window by creating them in Director or importing them. Next, you place them on the Stage as sprites. A sprite is simply a copy of a cast member that appears on the Stage. Then you refine the actions of the sprites by editing them on the Stage or in the Score.
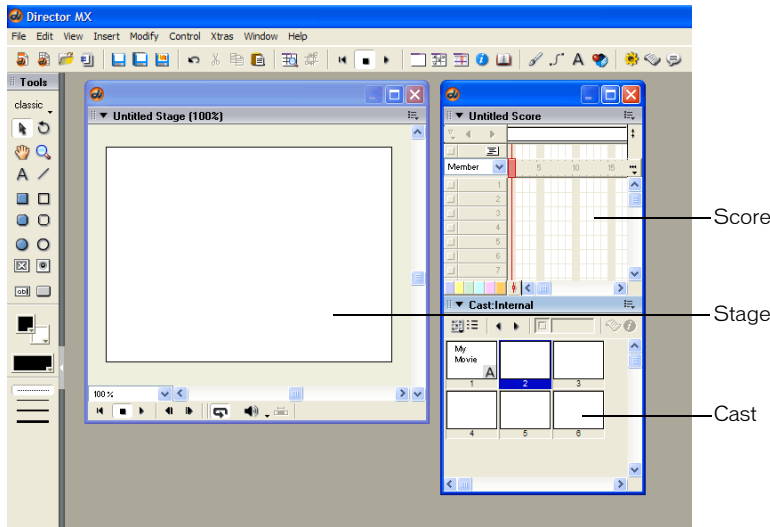
The Cast window, the Stage, and the Score in Director

Navigating the Director workspace

When you first start Director, several windows open in the default workspace. The Tool palette and the Stage are stand-alone windows. Other windows are docked together. For example, the Score and the Cast window are docked together by default. In the right docking channel, you can find the Property inspector, along with a group of windows called Design and another group of windows called Code.

Getting to know the default workspace

When creating and editing a basic movie, you typically work in four of the windows that appear in the default workspace: the Stage, the Score, the Cast window, and the Property inspector. From the Cast window, you import, create, and edit the cast members, or media elements, of your movie. In the Property inspector, you control the properties of the cast members. With the Score and the Stage, you control how, where, when, and for how long those media elements appear in your movie.
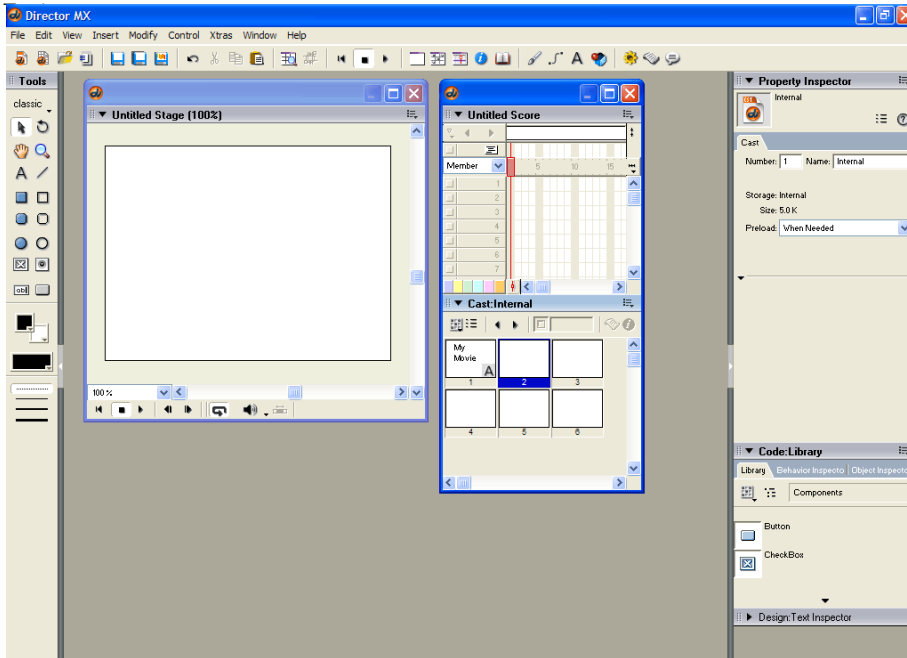
The default Director workspace (Windows platform)

Manipulating the default workspace

The default workspace is designed for most people who are new to using Director, but you can also manipulate this workspace to suit your needs. You can display additional windows as you need them and hide windows to keep your workspace clean and easy to work with. You can also control how windows display their contents by changing window preferences.

To display or hide a window:

1 Open the Window menu.

2 Select one of the window names that are listed on the menu. A check mark or bullet mark next to a window name indicates that the window is currently displayed.

For information on customizing your workspace further, see "Customizing your workspace" on page 32.

To change window preferences:

1 Select Edit > Preferences.

2 Select one of the following commands: General, Score, Sprite, Cast, Paint, Editors, or Script.

These commands all open dialog boxes that allow you to modify the behavior of windows. The General command controls windows in general, while the other commands control a specific window or set of windows. (The Network command is also available, but it does not control window preferences. Rather, it controls Internet connection settings.)

Getting to know window types

There are two types of windows in Director: document windows and tool windows. You typically use document windows to create or edit content; you use tool windows to view or modify properties of that content.

For example, the Paint window is a document window. It allows you to create and edit images. In contrast, the Property inspector is a tool window. It allows you to change the properties of an image that you created in the Paint window in addition to the properties of other content.

Both types of windows, document windows and tool windows, are available from the Window menu. A few examples of document windows include the following:

- Stage
- Score
- Cast
- Various media editors (for example, Text, QuickTime, and DVD)

A few examples of tool windows include the following:

- Property inspector
- Tool palette
- Text inspector
- Control panel

Using the Stage

The Stage is the part of a movie that your users will see. You use the Stage to determine where media elements, or cast members, should appear onscreen. When you determine where you want the cast member to appear, you place a copy of that cast member, called a sprite, on the Stage.

During authoring, you can define the properties of the Stage, such as its size and color. For example, as you work on your movie, you can make the Stage either larger or smaller than its original size. You can also scale the coordinates for the sprites on the Stage, so that they continue to fill the entire screen. Guides, grids, and Align and Tweak windows are available to align sprites on the Stage.

Moving around on the Stage

A large-sized Stage sometimes does not fit in your workspace. If you can see only part of your Stage at one time, you can move to a different part of the Stage whenever you need to.

To move around on the Stage:

1 If the Stage is not already displayed, select Window > Stage.

2 Do one of the following:

- From the Tool palette, select the Hand tool.
- Press and hold the Spacebar.

3 Place the hand on the Stage, and click and drag to move the Stage.

Increasing or decreasing your view of the Stage

You can author in Director on a zoomed Stage—one that is either larger or smaller than the normal size of the movie. The Stage's title bar indicates the Stage size expressed as a percentage of the normal Stage size.

When you change the size of the Stage, any guides or grids that you use to assist you with alignment also scale to the zoomed size, and you can manipulate sprites in the same way that you would on a Stage that is not zoomed.

To zoom in on the Stage:

1 From the Tool palette, select the Magnifying Glass tool.

2 Click the Stage until it reaches the desired size.

To zoom out from the Stage:

1 From the Tool palette, select the Magnifying Glass tool.

2 Press and hold the Alt key (Windows) or the Option key (Macintosh), and then click the Stage until it reaches the desired size.

Using the offstage canvas

The Stage includes an offstage canvas area within the Stage window but outside of the active movie area. This canvas area is useful for assembling your sprites either before or after they appear on the Stage.

The offstage canvas is also useful as a way to preload content. For example, you can place sprites on the offstage canvas so that they are loaded into memory and ready to play immediately when needed in a subsequent frame of the movie.
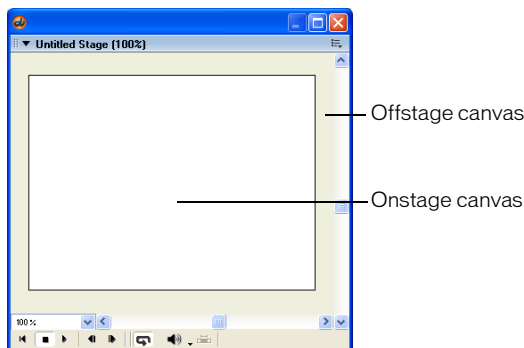
The offstage canvas and the onstage canvas

Using the Score

Like the Stage, the Score provides a view of your movie. The Stage provides a graphical view, while the Score provides a view of the movie's timeline. The Stage displays the point in time that is selected within the Score.

The Score organizes and controls a movie's content over time in rows called channels. The Score includes many Sprite channels for the movie's sprites. Sprite channels are numbered and control when sprites appear in the movie. Additionally, the Score includes effects channels that control the movie's tempo, sound, color palettes, transitions, and scripted behaviors.

The Score displays channels in the order shown in the following figure. Only the Sprite channels are displayed by default.
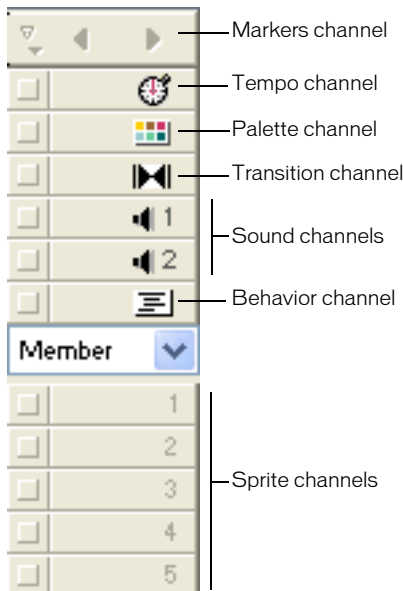
Effects and sprite channels in the Score

While the rows of the Score contain channels, the columns of the Score contain frames. A frame in a movie represents a single point in time, which is similar in theory to a frame in a celluloid film. Frame numbers are listed above the columns in the Score.

A red vertical line, called the playhead, moves across the frames in the Score to indicate which point in time is currently displayed on the Stage. You can also click any frame in the Score to move the playhead to that frame, and you can drag the playhead backward or forward through frames.

Navigating the Score

The first channel in the Score is the Marker channel. It contains markers that identify important points in time, such as the beginning of a new scene. Markers help you make quick jumps to specific frames in a movie. If you need to jump to a frame that is not marked with a marker, you can also move the playhead.

To create a new marker:

1 If the Score is not already displayed, select Window > Score.

2 Display the frame that you want to mark with a marker.

3 Directly above the frame that you want to mark, click the white bar in the Marker channel.

4 Select the New Marker text, and type a new name for the marker.
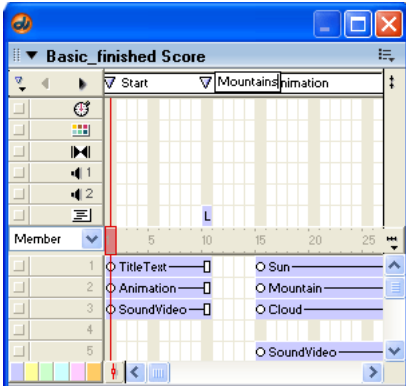
A new marker on a frame in the Score

To jump to a marker in the Score:

1 On the Marker channel, open the Markers menu.
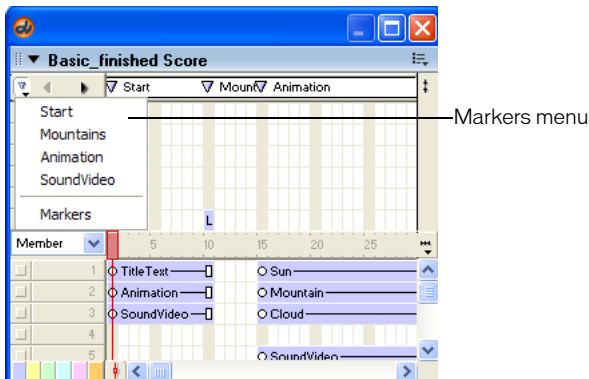
2 Select the name of the marker that you want to jump to.

To jump to a frame in the Score:

• Click the frame that you want to jump to.

Showing and hiding the effects channels

The effects channels—like Tempo, Transition, and Sound—can be either displayed or hidden. When you begin working with Director, you may want to have the effects channels shown at all times. As you become comfortable with Director, you can hide the effects channels until you need to use them. Settings on the effects channels remain in place even when the channels are hidden from view.

To show or hide the effects channels:

• Click the Hide/Show Effects Channels button in the upper right corner of the Score to change the display.

 Hide/Show Effects Channels button
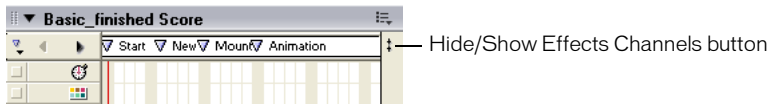
Setting the number of Sprite channels

Although the Score can include as many as 1000 Sprite channels, most movies use as few as possible to improve performance in the authoring environment and during playback. Sprites in higher channels appear on the Stage in front of sprites in lower channels. You use the Property inspector's Movie tab to control the number of channels in the Score for the current movie.

To set the number of Sprite channels:

1 Make sure that the Score is the active window.

2 In the Property inspector, select the Movie tab.

3 On the Movie tab, in the Channels text box, enter a number from **1** to **1000**.

The numbered Sprite channels in the Score increase or decrease, according to the number in the Channels text box.

Turning channels on and off

To hide the contents of any channel on the Stage, or to disable the contents if they are not visible sprites, you use the button to the left of the channel. When you turn off an effects channel, the channel's data has no effect on the movie. You should turn off Score channels when testing performance or working on complex overlapping animations.

To turn off a Score channel:

• Click the gray button to the left of the channel. A darkened button indicates that the channel is off.

This channel is on

This channel is off
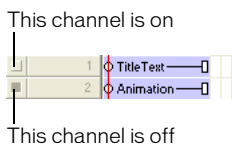
To turn multiple Score channels off and on:

1 Press and hold the Alt key (Windows) or the Option key (Macintosh).

2 Click a channel that is on to turn all of the other channels off, or click a channel that is off to turn the other channels on.

Changing your view of the Score

To narrow or widen the Score, you change the zoom percentage. Zooming in widens each frame, which lets you see more data in a frame. Zooming out shows more frames in less space and is useful when moving large blocks of Score data.

To change the zoom setting:

1 On the right side of the Score, click the Zoom Menu button.

Zoom Menu button
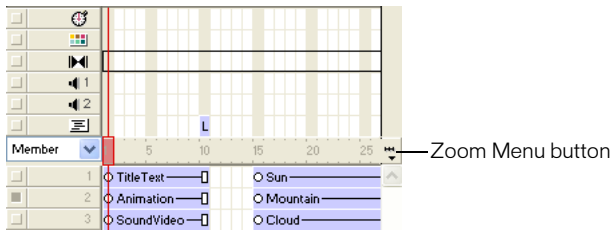
2 Select a size from the Zoom menu. Sizes are displayed as a percentage of full size.

Using the Control panel

The Control panel governs how movies play back in the authoring environment. You can jump to specific frames within the movie, control how many frames per second play on the Stage, and change the volume at which sounds play. You can also use the Control panel to start, stop, and rewind movies on the Stage.

Displaying the Control panel

Part of the Control panel, called the Control toolbar, is docked to the bottom of the Stage for easy access. To use all of the buttons on the Control panel, you can also display the full Control panel as a floating window.

To display or hide the Control panel:

• Select Window > Control Panel.

To display or hide the Control toolbar:

• Select View > Control Toolbar.

Controlling movie playback

As you build a movie, you may want to check your progress periodically by watching the movie on the Stage. You can use the Control panel for this purpose.

To start, stop, or rewind a movie:

1 If the Control panel is not already displayed, select Window > Control Panel.

2 On the Control panel, click the Rewind, Stop, or Play button. These three buttons appear on the far left side of the Control panel.

To change the volume at which sounds play:

• On the Control panel, click the Volume button, and then select a volume level from the menu.

Rewind, Stop, and Play buttons   Volume button
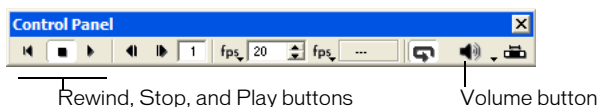
Movie playback options in the floating Control panel

Navigating frames in a movie

As you build a movie, you sometimes need to check individual frames or examine transitions from one frame to the next. The Control panel allows you to check these details.

To step through a movie one frame at a time:

• On the Control panel, click the Step Forward button.

To go to a specific frame in a movie:

• Enter a frame number in the frame counter, and press Enter (Windows) or Return (Macintosh).

Frame counter

Step Forward button
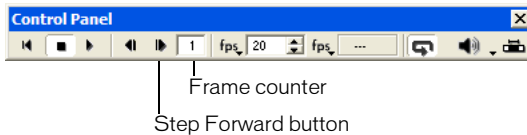
Frame navigation options in the floating Control panel

Using the Cast window

The Cast window contains the cast members of your movie. You can use the Cast window to create or import new cast members, to view existing cast members, and to control the properties of each cast member.

As you work in Director, you can expect to use two types of cast members:

• Cast members can be the media elements of your movie, such as sounds, text, graphics, animation, and video. These cast members are placed on the Stage as sprites.

• Some cast members may appear in the Score but not on the Stage. These cast members include scripts, palettes, fonts, and transitions, which you can use in the effects channels on the Score.

In the Cast window, you can create or import new cast members to appear as sprites on the Stage. Creating a Director movie consists largely of defining sprites' properties, where they appear, when they appear in the movie, and how they behave. Different sprites can be created from a single cast member. Each sprite can have its own values for different properties, and most changes to these properties do not affect the cast member. Most changes to a cast member, however, will change the sprites created from that cast member.
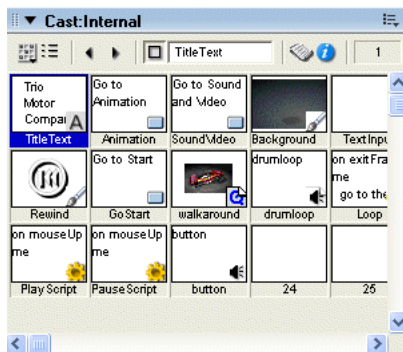
The Cast window filled with cast members

To create a new cast member:

1 If the Cast window is not already displayed, select Window > Cast.

2 On the Tool palette, select a text, drawing, or control button.

Text, drawing, and control buttons
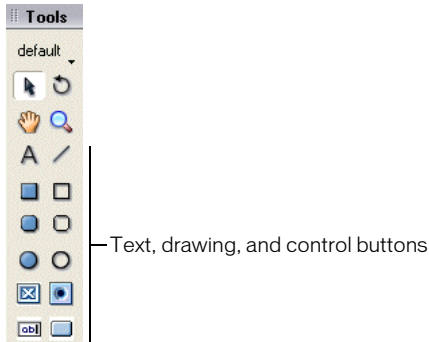
3 Click the Stage to place the new cast member.

The cast member now appears in the Cast window.

To import a cast member from an existing media file:

1 If the Cast window is not already in thumbnail view, click the Cast View Style button.

Cast View Style button
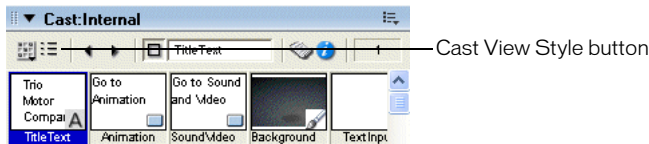
2 In thumbnail view in the Cast window, right-click an empty cast member, and select Import.

3 Navigate to a media file, select the file, and click the Import button.

The cast member now appears in the Cast window.

Using the Property inspector

Every cast member and sprite in a movie has properties. You can view and change these properties by using the Property inspector. In addition to cast members and sprites, the entire movie also has a set of properties. The Property inspector displays a Movie tab, where you can view and change these properties.

Controlling your view of the Property inspector

Like other windows in Director, the Property inspector allows you to control its appearance. You can choose between a list view and a graphical view. You can also save space by showing only the most frequently used options in the Property inspector, or you can show the full set of options.

To switch between a list view and a graphical view:

1 If the Property inspector is not already displayed, select Window > Property Inspector.

2 Near the top of the Property inspector, click the List View Mode button.

 — List View Mode button
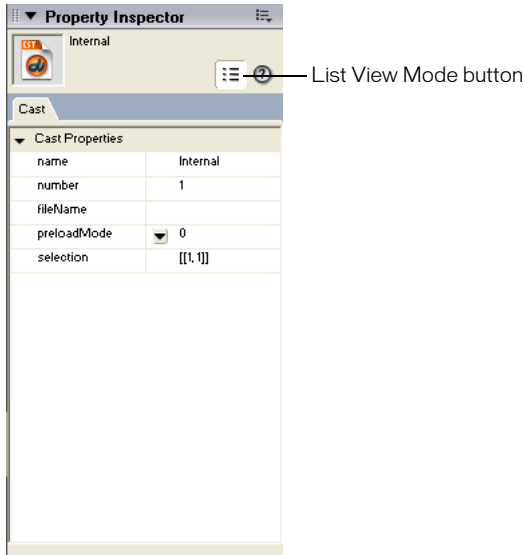
To show more or less information in the Property inspector:

• Click the expander arrow in the Property inspector.

 — Expander arrow
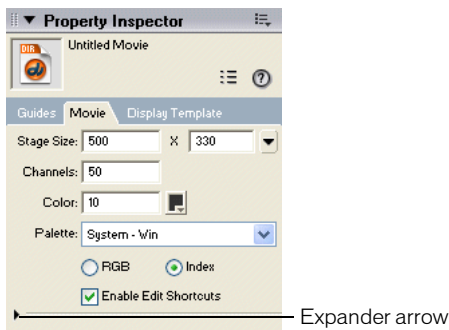
Setting cast member and sprite properties

Each time you select a sprite, cast member, or multiple sprites and cast members, your view of the Property inspector changes. New options and tabs appear, depending on what you have selected. If you select multiple sprites and cast members, the Property inspector displays only the properties that apply to all the selected items.

To set the properties of a sprite or cast member:

1 Do one of the following:

  ■ On the Stage or in the Score, select a sprite.

  ■ In the Cast window, select a cast member.

2 In the Property inspector, change one of the properties.

3 Click the Stage to enter your selection. Then look on the Stage to see the effect of the new property.

Setting movie properties

On the Movie tab, you can control how colors are defined, the size and location of the Stage, the number of channels in the Score, copyright information, and font mapping. The Movie tab is available whenever an item on the Stage or in the Score is selected. You do not have access to the Movie tab when a cast member is selected.
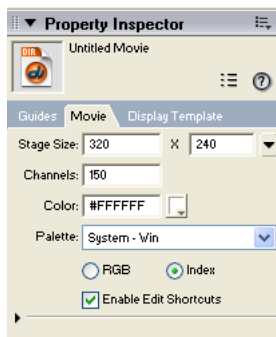
The Movie tab in the Property inspector

To set movie properties:

1 Make sure that the Property inspector is in graphical view, and select the Movie tab.

2 In the Stage Size row, select a preset value or enter values in the Width and Height text boxes to set the size of the Stage.

3 In the Channels text box, specify the number of channels in the Score.

4 In the Color text box, enter an RGB value for the color of the Stage, or double-click the color icon and select a color.

5 In the Palette box, select a color palette for the movie. This palette remains selected until Director encounters a different palette setting in the Palette channel.

6 To determine how the movie assigns colors, select either RGB or Index.

  RGB makes the movie assign all color values as absolute RGB values.

  Index makes the movie assign color according to its position in the current palette.

7 In the Preferred 3D Renderer box, select a default renderer used to draw 3D sprites within the movie, if that renderer is available on the client computer.

  OpenGL specifies the openGL drivers for hardware acceleration that work with Macintosh and Windows platforms.

  DirectX 7.0 specifies the DirectX 7 drivers for hardware acceleration that work only with Windows platforms.

DirectX 5.2 specifies the DirectX 5.2 drivers for hardware acceleration that work only with Windows platforms.

Software specifies the Director built-in software renderer that works with Macintosh and Windows platforms.

Auto specifies that the most suitable renderer should be selected. This option is the default value for this property.

Note: If the preferred renderer is not available on the client computer, the movie selects the most suitable available renderer.

8 In the About and Copyright boxes, enter copyright and other information about the movie.

This information is important if your movie will be downloaded from the Internet and saved on a user's system.

9 To save the current font map settings in a text file named Fontmap.txt, click Save. To load the font mapping assignments specified in the selected font map file, click Load.

Note: More advanced movie properties are available on the Display Template tab, next to the Movie tab in the Property inspector. For example, you can control the location of the stage on a user's screen by using the Display Template tab in the Property inspector.

Using the Script window

The Script window in Director allows you to add advanced, scripting-based interactivity to movies. In the Script window, you can code in either Lingo or JavaScript syntax. Lingo is the traditional scripting language of Director, while JavaScript syntax was recently introduced to support multimedia developers who prefer working with JavaScript.

By scripting in the Script window, you can accomplish many of the same tasks that you can in the graphical interface of Director—such as moving sprites on the Stage or playing sounds. But much of the usefulness of scripting is in the flexibility that it brings to a movie. Instead of playing a series of frames exactly as the Score dictates, a movie can have scripts that control frame play in response to specific conditions and events.
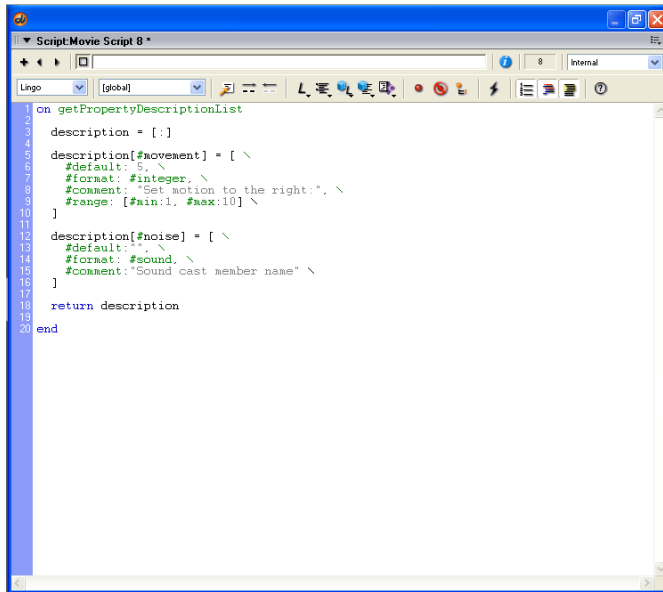
The Script window

Here are a few examples of what you can do with scripts:

- Control the movement of a sprite based on whether the user clicks a specific button.
- Control when a sound plays, based on how much of the sound has already streamed from the Internet.
- Create animation, stream movies from the web, perform navigation, format text, and respond to user actions with the keyboard and mouse.
- Create and manage data arrays, perform mathematical operations, and combine strings of text.

For more complete information on scripting in Director, see the Scripting Reference topics in the Director Help Panel. To view Help in Director, select Help > Director Help.

Note: In addition to the Script window, where you can create your own scripts, Director includes a set of prepackaged instructions, called behaviors, that you can simply drag to sprites and frames. Behaviors let you add script-based interactivity without writing scripts. For more information on behaviors, see the Behaviors topics in the Director Help Panel.

Using the Message window

The Message window supports testing and debugging in Director. These features are especially important as you add script-based interactivity to your movies. Like the Script window, the Message window offers both Lingo and JavaScript syntax. The Message window offers two modes—a standard mode and a trace mode:

- In standard mode, you can enter script into the Input pane to test the result before you add it to the movie. In this mode, the Message window helps you test scripting results immediately, instead of having to play the whole movie to check the results.

- In trace mode, you can play a movie and watch the Output pane to see script as it runs in the movie. In this mode, the Message window helps you find the source of bugs in your movie by showing you what script is running when an error occurs.

To switch between standard and trace modes:

1 If the Message window is not already displayed, select Window > Message.

2 In the Message window, click the Trace button.
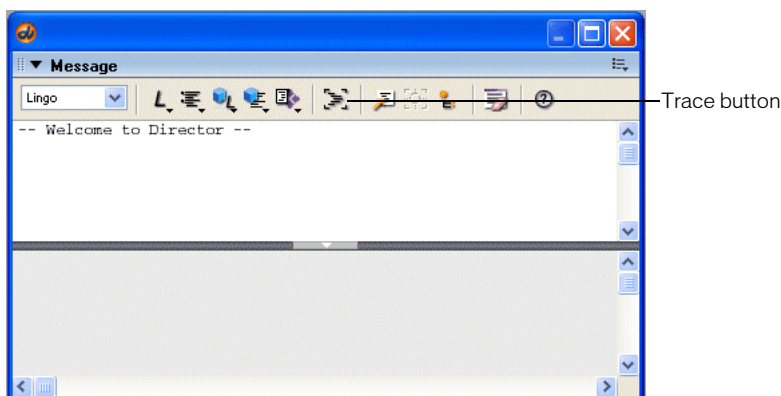
When the Trace button is indented, the Message window is in trace mode.

For more information on how to use the Message window for testing and debugging, see the Scripting Reference topics in the Director Help Panel. To view Help in Director, select Help > Director Help.

Customizing your workspace

In Director, some windows, or *panels*, can be grouped together into a tabbed set of panels called a *panel group*. Director comes preconfigured with several default panel groups. But you can also customize panel groups to maximize your productivity. Whether you use the defaults or create customized panel groups, you can display or hide panel groups, just as you do with standard windows.

To make the most efficient use of your workspace, Director also supports default and customized *docking* of panel groups. You can dock panel groups to each other or to one of the docking channels. (Docking channels are available only in Windows.) After you customize the panel groups, you can save the workspace layout as a *panel set*. With panel sets, you can switch between different layouts to suit different types of work.

Most panels or panel groups have a header bar that displays the name and includes the following features: an expander arrow to collapse and expand the panel or panel group, a gripper to dock and undock the panel or panel group, and an Options menu for managing the panel or panel group.

Gripper to dock and undock panels or panel groups

Expander arrow to collapse and expand panels or panel groups

Options menu button
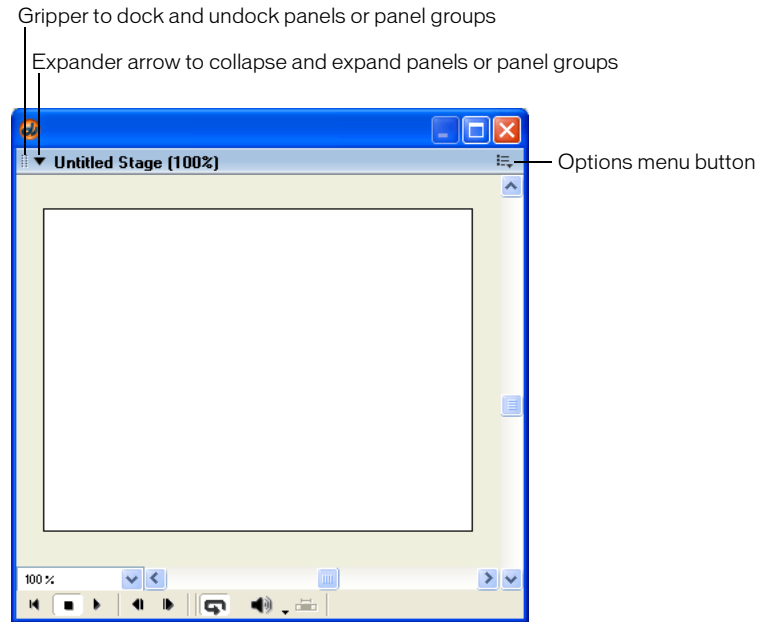
Features in the header bar

Customizing panel groups

Director comes preconfigured with several default panel groups. Some of these panel groups contain multiple panels on tabs. For example, the Design panel group has three tabs—Text Inspector, Align, and Tweak. Other panel groups contain only one panel. For example, the Property inspector is a stand-alone panel.

You can use the default panel groups or customize panel groups to fit your preferences. To customize, you can move a tab from one panel group to another, or you can separate a tab and create a new stand-alone panel.

Panels that you can combine in a tabbed panel group are restricted by window type and functionality. The following combinations are allowed:

- Casts with other casts
- Media editor windows with other media editors (for example, Vector Shape with Shockwave 3D)
- Script windows with media editors (for example, Script with Paint)
- Tool windows with other tool windows (for example, Text inspector with Memory inspector windows)

You cannot place the Property inspector, Tool palette, Stage, Score, or Message window in a tabbed panel group. They must remain stand-alone panels.

To move a panel to a different panel group:

1 Select a stand-alone panel or a panel within a panel group.

2 From the Options menu, select Group [panel name] With, where [panel name] is the name of the panel that you selected.
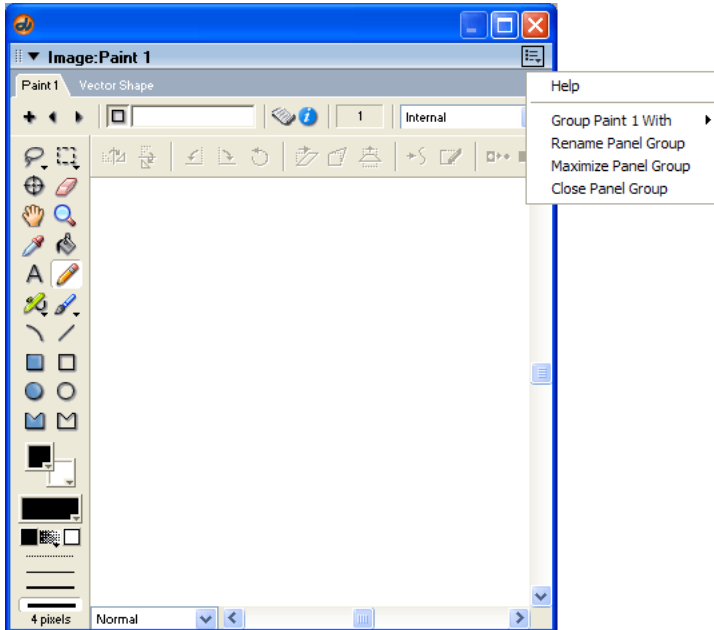
Note: If Group [panel name] With is not available on the Options menu, then the panel cannot be moved to a new panel group.

3 From the Group [panel name] With menu, do one of the following:

- To move the panel to an existing tabbed panel group, select a panel group name.
- To move the panel to a new standalone panel, select New Panel Group.

Note: The New Panel Group option is dimmed if the panel is already a stand-alone panel.

To rename a panel group:

1 From a panel group's Options menu, select Rename Panel Group.

2 In the Rename Panel Group dialog box, enter a new name for the panel group, and click OK.

To rearrange the order of tabs within a panel group:

1 Select a tab within a panel group.

2 From the panel group's Options menu, select Group [panel name] With, where [panel name] is the name of the tab that is selected.

3 From the Group [panel name] With menu, select the same panel group that already contains the tab.

The tab is moved to the last (rightmost) position in the panel group.

Tip: When you customize your panel groups, it is a good idea to save your new layout for later use. See "Docking panel groups" on page 35.

Docking panel groups

You can dock stand-alone panels and panel groups in two ways: to each other and to the docking channels. (Docking channels are available only in Windows and cannot be used for docking document windows.) In Windows, the docking channels run along the left and right sides of the application window. The area between these docking channels is called the View Port.

Docking is restricted by window type. In both Macintosh and Windows versions of Director, document windows can be docked together (for example, the Stage with the Cast window), and tool windows can be docked together (for example, the Property inspector with the Behavior inspector). A document window cannot be docked with a tool window.

Dockable panels and panel groups have a header bar just below their title bar. The following illustration shows what this header bar looks like. Panels and panel groups that do not have this header bar are not dockable.

Gripper is present in the header bar
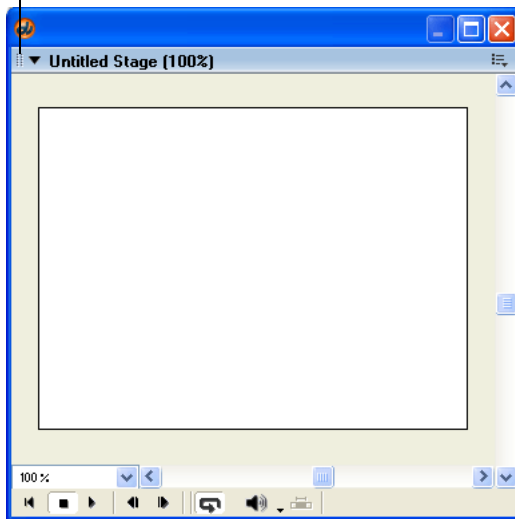
A header bar with a gripper, indicating that the panel is dockable

To dock a panel or panel group:

- On the header bar below the title bar, click and drag the gripper to another dockable panel group or to one of the docking channels. When you see a thick black line where you want to place the panel or panel group, release the gripper.

Note: The Tool palette cannot be docked with other windows. It can be docked only to a docking channel in Windows.

To undock a panel or panel group:

- On the header bar below the title bar, click and drag the gripper until the panel or panel group is separated from its docking location, and release the gripper.

Saving panel sets

You can save your current workspace layout as a panel set. Later, you can open that panel set to return to the workspace layout. You can manage your workspace by saving multiple panel sets, removing panel sets that you no longer use, and restoring the default panel set.

To save a panel set:

1 Select Window > Panel Sets > Save Panel Layout.

2 Name the panel layout, and click OK.

To open a saved panel set, do one of the following:

• To switch to a customized layout, select Window > Panel Sets, and select one of the saved panel sets.

• To return to the default layout, select Window > Panel Sets > Default.

To remove a panel set:

1 Select Window > Panel Sets > Remove Panel Set.

2 From the Panel Set list, select the panel set that you want to remove.

3 Click Remove.

Opening, closing, and collapsing panel groups

Panels groups can be open, closed, or collapsed. Open panel groups may be floating on the workspace or (only in Windows) docked to one of the docking channels. Collapsed panel groups are still available on the workspace with only the header bar displayed, while closed panel groups are removed entirely from the workspace.

To close a panel group:

• From the Options menu, select Close Panel Group.
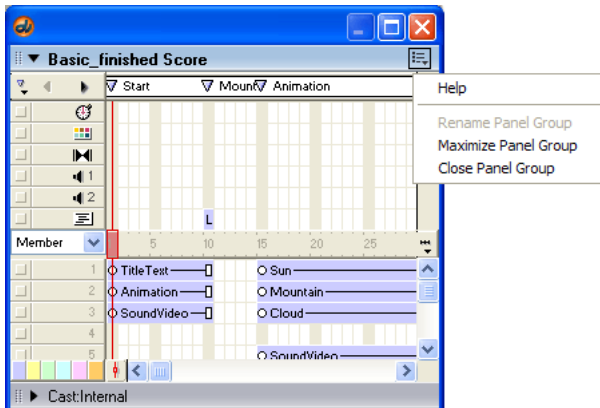
To open a panel group:

• From the Window menu, select one of the panels in the panel group.

When you display one of the panels in a panel group, the entire panel group is displayed.

To collapse or expand a panel group:

• Click the expander arrow or the panel group's title in the header bar.

Click to expand or collapse a panel
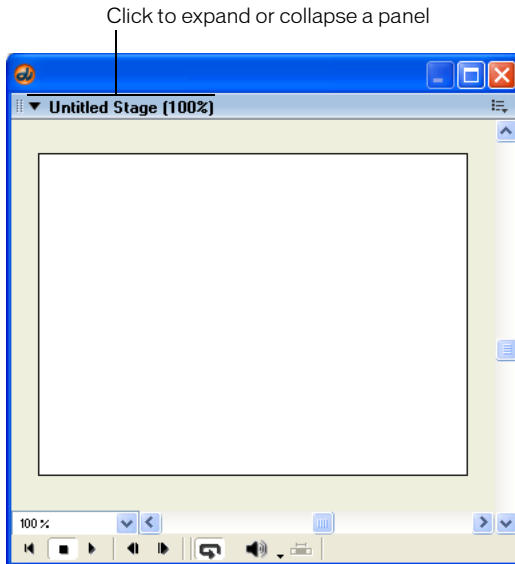
To close or collapse a docked collection of panel groups:

• If the panel groups are docked to each other, click the Close button in the title bar.

• If the panel groups are docked to the docking channel (Windows only), click the arrow in the center of the docking channel's separator bar.

To close all tool panels and docking channels:

• Select Window > Hide Panels.

Working with Xtra extensions

Xtra extensions are software components that extend Director functionality; some Xtra extensions are installed with Director and others are available separately for download and installation. Additionally, if you know the C programming language, you can create custom Xtra extensions. For information on creating custom Xtra extensions, see the Macromedia Xtras Developers Support page in the Director Support Center at www.macromedia.com/support/xtras/.

Xtra extensions provide several types of additional functionality. After they are installed, they are available for your use whenever you open Director. Xtra extensions can bring the following elements into Director:

Media   Introduce additional media types as cast members into your movie.

Scripting   Access additional Lingo or JavaScript syntax if you script in Director.

Transitions   Choose from additional transitions between movie scenes.

Tools   Use additional tools to make the authoring process easier.

Adding media

Xtra extensions can import media as cast members into Director. Some of these media Xtra extensions are built into Director, such as Macromedia Flash, Vector Shape, and Animated GIF. Other media Xtra extensions come from third-party developers; they can include databases, 3D graphics processors, special types of graphics, and so on.

To see which media Xtra extensions are available to add to your movie:

• Select Insert > Media Element.

The Media Element submenu displays all of the built-in media Xtra extensions. If a media element appears in this list, then you can import files of this type as cast members.

Note: Third-party media Xtra extensions might not appear here and might require implementation through scripting.

Adding script

Scripting Xtra extensions make additional objects, methods, and properties available in Director. The built-in NetLingo scripting Xtra extension, for example, allows you to control Internet functions.

To see which scripting Xtra extensions are available to add to your movie:

1 If the Script window is not already open, select Window > Script.

2 Click the Scripting Xtras button.
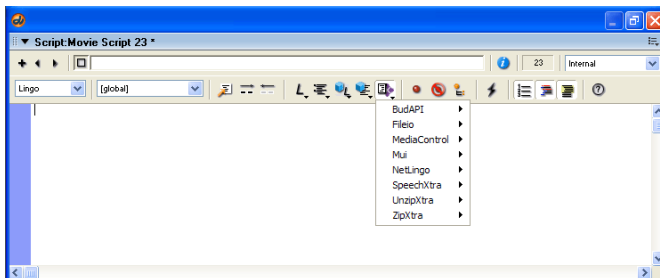
The Scripting Xtras menu displays all of the installed scripting Xtra extensions.

3 Click one of the scripting Xtra extensions to see all of the methods and properties that are included with that Xtra extension.

For more information on the objects, methods, and properties in standard Director scripting Xtra extensions, see the Scripting Reference topics in the Director Help Panel. To view Help in Director, select Help > Director Help.

Adding transitions

Transition Xtra extensions supply transitions in addition to the predefined transitions that are available in Director. You can access these additional transitions in the same place that you access the standard transitions.

To see which transition Xtra extensions are available to add to your movie:

1 Select a frame in the Score.
2 Select Modify > Frame > Transition.

The Frame Properties: Transition dialog box shows all of the transitions that you can use in your movie, including the transition Xtra extensions.

Distributing Xtra extensions

When you distribute a movie, you must package your media Xtra extensions, scripting Xtra extensions, and transition Xtra extensions along with the movie. If you do not package the Xtra extensions with the movie, your users will not be able to view all of the movie's content or use all of its features. Xtra extensions can be packaged with projectors, or your user can download your required Xtra extensions from the Internet.

If your user is missing an Xtra extension that Director requires, an alert appears when the movie opens. For missing transition Xtra extensions, the movie performs a simple cut transition instead. For missing media Xtra extensions, Director displays a red X as a placeholder for the cast member.

For more information on distributing Xtra extensions with your movie, see "Packaging Movies for Distribution" in the Director Help Panel. To view Help in Director, select Help > Director Help.

CHAPTER 4
Building Your First Basic Movie

This tutorial takes you through the steps of creating your first movie in Macromedia Director MX 2004. If you are new to using Director, follow this tutorial to learn hands-on how to create a simple interactive movie with animation, sound, and video. The movie is designed to suggest what is possible with Director rather than simulate a fully developed Director project.

Before stepping through this tutorial, you should first take a few moments to read Chapter 3, "Getting to Know the Workspace," on page 17. It introduces you to the Director user interface and provides an important foundation for this tutorial.

What you will learn

This tutorial introduces you to the basic skills needed to build a Director movie. These include the following:

- Setting movie properties
- Importing cast members into Director
- Placing cast members on the Stage and in the Score to create sprites, which are copies of cast members
- Animating sprites
- Creating buttons
- Scripting in Lingo to create user interactivity
- Controlling digital video and audio
- Publishing a movie on the Internet

Preparing to build the movie scenes

Before you begin to build scenes, you will get familiar with how the completed movie should look, and you will prepare the Stage.

View the completed movie

Start by viewing a completed version of the tutorial movie to become familiar with how your finished movie should look.

1   Start Director.

2   Select File > Open.

3   Within your Director MX 2004 application folder, browse to Tutorials/Basics/Finished and double-click the Basic_finished.dir file.

4   If windows obscure the Stage, drag them out of the way.

5   To play the movie, click the Play button at the bottom of the Stage.
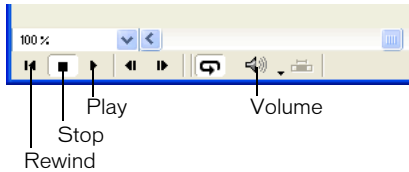
6   Use the buttons in the movie to navigate from one scene to another and control the playback of the video clip.

The movie consists of three scenes. The first is a title scene that contains buttons for navigating to the other two scenes. The second scene is an animation of a tire bouncing. The third scene contains a digital video and buttons that control it. Each of these scenes also contain navigation buttons.

7   When you finish viewing the movie, click the Stop button at the bottom of the Stage.

Open the movie

To begin the tutorial, open a partially completed Director file.

1   Select File > Open.

2   Within your Director MX 2004 application folder, browse to Tutorials/Basics/Start and double-click the Basic_start.dir file.

    Note: When you open this file, Director closes the Basic_finished.dir file. If you made any changes to that file, do not save them.

3   Select File > Save As.

4   Name the file **My_Basic_start**. Save the movie in the Start folder.

    By making a copy of the file, you or another user can complete this tutorial again with the Basic_start.dir file.

Set up the movie

You can now arrange your workspace and set properties for your movie, such as the Stage size and color and the number of channels in your Score. During the authoring process, you view Director movies on the Stage. You can set up the size and color of the Stage window.

1   Select Window > Panel Sets > Default to display the default workspace.

2   If the Property inspector is not already displayed, select Window > Property Inspector.

3   In the Property inspector, click the Movie tab.

If the Property inspector is not in graphical view, as shown in the following illustration, click the List View Mode button to switch to the graphical view.

Tip: To see the names of buttons (like the List View Mode button), place your mouse pointer over the button. The name of the button appears in a floating box next to the button until you move the mouse.

List View Mode button
Stage Size arrow
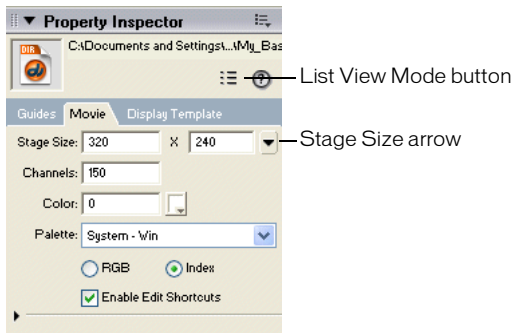
4 Click the Stage Size arrow, and select 500 x 330.

The size of the Stage increases.

5 If the Score is not open, select Window > Score.

6 In the Property inspector, type **50** in the Channels text box and press Enter (Windows) or Return (Macintosh), and then click OK in the dialog box that appears.

The number of channels in the Score decreases from 150 to 50, making the movie's file size smaller.

Note: In Windows, the Enter key on the numeric keypad plays the movie. Be sure to use Enter on the alphanumeric section of the keyboard when entering information in Director.

7 In the Property inspector, click the Color button, and select dark gray from the color picker.

Color button
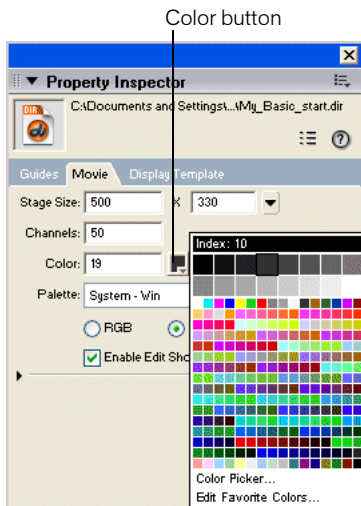
8 Select File > Save.

Note: As you complete the tutorial, remember to save your work frequently.

View your cast members

To create a Director movie, you need cast members. Cast members are the objects that appear on the Stage and in the Score. Some of these elements might be text, graphics, sound, video, or scripting behaviors.

The movie you create in this tutorial consists of three scenes. Some cast members appear in more than one scene, and some appear in one scene only. First, use the Cast window to view your current set of media. Next, you will begin adding new cast members. You add cast members to a Director movie by creating them in Director or by importing files made in other applications.

1 If the Cast window is not already open, select Window > Cast.

You can view the Cast window in two views: List and Thumbnail. In List view, you can sort cast members by name, number, date modified, type, and other criteria. Thumbnail view lets you see a thumbnail image of each cast member. In Thumbnail view, cast members are always shown in numerical order. For this tutorial, you will use the Thumbnail view. If your Cast window is in List view, you need to switch to Thumbnail view.

2 To toggle from List view to Thumbnail view, click the Cast View Style button in the upper left corner of the Cast window.
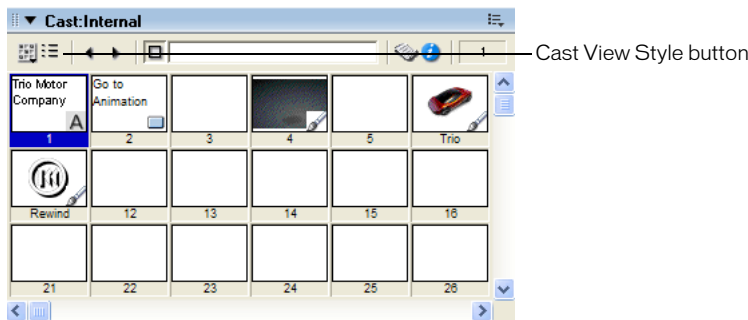
The Cast window contains cast members that you can use in your movie. The first is a text cast member. It contains the text "Trio Motor Company." The text cast member thumbnail image that appears in the Cast window contains a small *A* icon in the lower right corner. This is the cast member type icon, and the *A* indicates that it is a text cast member.

The second cast member is a button. Button cast members have special functionality built into them, such as changing color when clicked, so that they behave in the way most users expect buttons to behave. This button contains the text "Go to Animation." Its cast member type icon is a small square button shape.

The third cast slot is empty. You will add a cast member to that slot later. The fourth cast member is a bitmap image. Its cast member type icon is a paintbrush.

The ninth, tenth, and eleventh cast slots contain bitmaps that you will use as custom buttons. Using a bitmap image lets you control the appearance of the button, but it does not provide the built-in functions of the Director button cast member type. However, you can add these functions with script, using either the Director scripting language called Lingo or JavaScript syntax. In this tutorial, you will use Lingo to add these functions.

Building the first scene with text and an image

Building a scene in Director requires creating or importing the cast members for the scene and placing sprites on the Stage. As you learned in Chapter 3, "Getting to Know the Workspace," on page 17, sprites are objects that control when, where, and how cast members appear in a movie. You create sprites by placing cast members on the Stage or in the Score. To build the first scene of the movie, you will place sprites of the TitleText cast member and two buttons on the Stage. One of the buttons is already in the cast, and you will create the other button.

Edit a text cast member

The first cast member you will use in your movie is the text cast member containing the words "Trio Motor Company." You will edit the text to give it a more appealing graphic design.

1 In the Cast window, double-click the text cast member in cast slot 1.

The Text window opens.
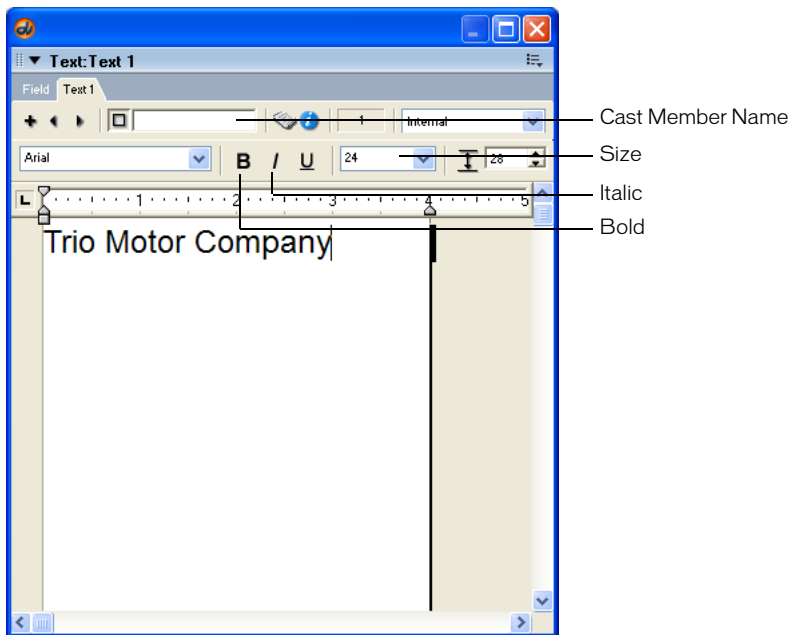
You use the Text window to edit text cast members. You will find that most Director cast member types have associated windows that you can use to view and edit the cast member.

Note: While completing the tutorial, you might find it useful to undo a change that you made. To undo, select Edit › Undo. Conversely, you can redo what you have undone by selecting Edit › Repeat.

2 Select Edit > Select All. The entire text block is selected.

3 Click the Bold button and the Italic button. The style of the selected text changes from plain to bold and italic.
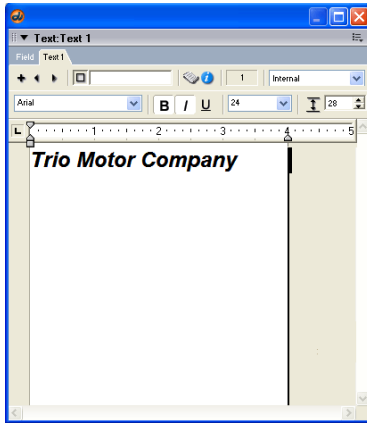
4 Give the text cast member a name. Click the Cast Member Name text box at the top of the window. Then type **TitleText**, and press Enter (Windows) or Return (Macintosh).

5 Close the Text window, and save your movie.

Add sprites to the Stage

To begin building the scene, you drag the TitleText cast member, button cast member, and bitmap cast member from the Cast window to the Stage or Score. Because the first scene should occur at the beginning of the movie, you put the cast members at the beginning of the Score. The Score is discussed in detail later in this tutorial.

1 Click the Rewind button at the bottom of the Stage. This ensures that the cast members you place on the Stage are in the first frame of the Score, the beginning of your movie.

2 In the Cast window, click the TitleText cast member and drag it anywhere on the Stage to create a sprite from the TitleText cast member.

The background of the new text sprite is white.

3 Click the new text sprite on the Stage to select it.

4 On the Sprite tab in the Property inspector, do the following:

a In the Ink box, select Background Transparent.

Inks control the way a sprite color appears on the Stage. Background Transparent ink makes the white background of the sprite appear transparent.

b   Click the Forecolor color picker, and select white.
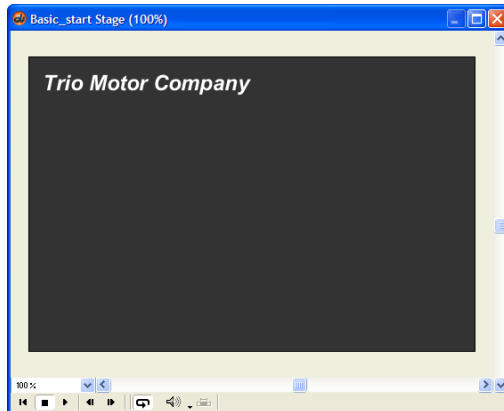
c   In the X text box, type **15**. In the Y text box, type **15**, and press Enter (Windows) or Return (Macintosh). The text is placed at precise coordinates on the Stage.
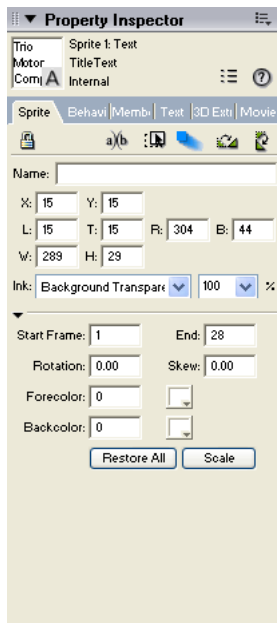
Add sprites to the Score

When you place a cast member on the Stage, the sprite is added to both the Stage and the Score. You can also place cast members on the Score. When you place a cast member on the Score, the sprite is added to the Stage as well.

1   Click the Trio cast member in cast slot 6.

2   Drag the Trio cast member to the Score window so that it fills channel 2, just below the TitleText sprite. Make sure that the sprite begins in frame 1 of the Score.

Dragging a cast member to the Score centers the sprite on the Stage.

Add an existing button to the Stage

In addition to the title text, the first scene of your movie will contain two buttons. You will add the first button to the Stage. Then you will create a new button on the Stage to complete the scene.

You begin by naming the button cast member in cast slot 2 of the Cast window. Earlier, you named the TitleText cast member by entering a name in the Text window. You can also give cast members names directly in the Cast window.

1   Click the button cast member in cast slot 2.

2   Click the Cast Member Name text box at the top of the Cast window, and type **Animation**. Press Enter (Windows) or Return (Macintosh).

Cast Member Name text box

3   Drag the Animation button cast member from the Cast window to the Stage. Place it on the lower right side of the Stage.

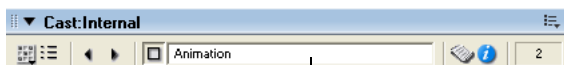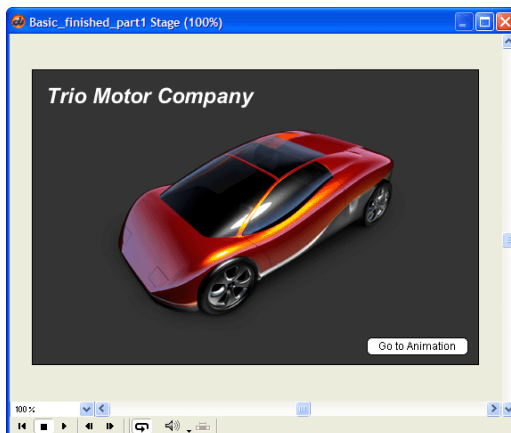4   Select the button sprite on the Stage.

5   On the Sprite tab of the Property inspector, do the following: In the X text box, type **375**. In the Y text box, type **300**, and then press Enter (Windows) or Return (Macintosh).

The button sprite is now placed at precise coordinates.

Create a new button cast member

Now you are ready to create the second button.

Remember that button cast members contain special functionality to automatically highlight when clicked. Creating button cast members in Director is different from creating most other cast members. Cast members are often created in separate windows and then dragged from the Cast window to the Stage. You create a button cast member directly on the Stage, using the Tool palette. You will use the Button tool to create a new button.

1 If the Tool palette is not displayed, select Window > Tool Palette.

2 Make sure that the Tool palette is in Classic view. At the top of the Tool palette, display the list of views and select Classic.
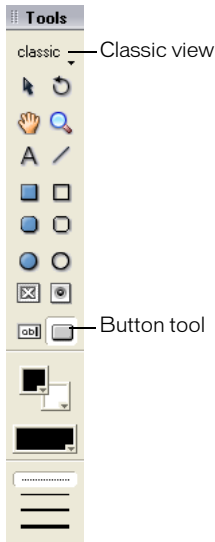
3 On the Tool palette, click the Button tool.

4 Drag a horizontal rectangle toward the right side of the Stage, as shown in the following illustration:
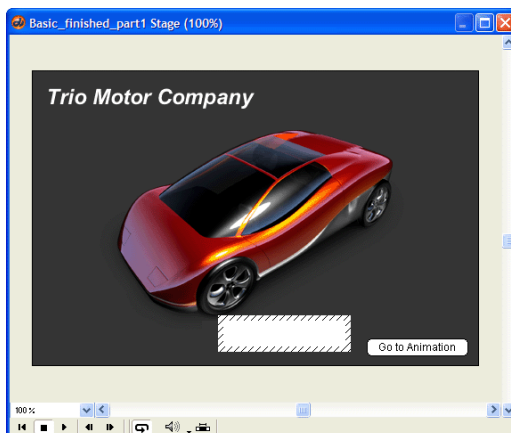
5   When you release the mouse button, the rectangle you created becomes an editable text box in which you enter the text that you want to appear on your button. Type **Go to Sound and Video** in the text box.

   Note: If the text is too long for your button, you can enlarge the button. Click the button with the Arrow tool selected, and then drag the sizing handle on the right edge of the button to the right.

6   On the Sprite tab of the Property inspector, do the following: In the X text box, type **200**. In the Y text box, type **300**, and press Enter (Windows) or Return (Macintosh).

7   Click the Stage outside the button.

   The editable text box changes to a completed button sprite. In the Cast window, the new button cast member takes the next available cast slot, appearing in cast slot 3.

8   Select the new button in the Cast window.

9   In the Cast Member Name text box at the top of the Cast window, type **SoundVideo** and press Enter (Windows) or Return (Macintosh).

You have now created a new button cast member and added all of the graphic sprites for the first scene of your movie.
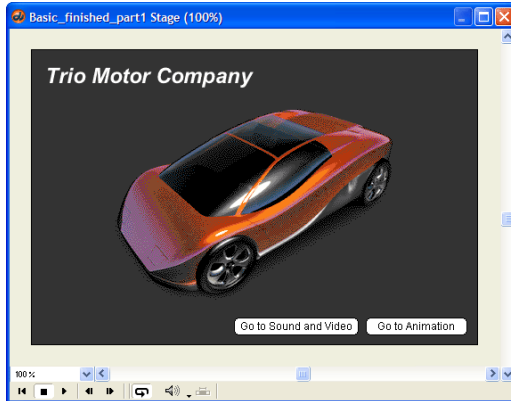
Observe the difference between sprites and cast members

As you learned earlier in this tutorial, when you drag cast members onto the Stage, you create sprites. Sprites are instances of cast members that appear on the Stage and in the Score window. The Score window displays all the frames in your movie and shows in which frames the sprites appear on the Stage. You can view information about sprites and edit them from both the Stage and the Score, while you view and edit cast members from the Cast window.

Several sprites can refer to the same cast member and can appear on the Stage simultaneously.

1   Drag the TitleText cast member from the Cast window to the Stage a second time.

   Two TitleText sprites appear on the Stage but only one TitleText cast member appears in the Cast window. Both TitleText sprites are instances of the TitleText cast member.

2   In the Score, click the extra TitleText sprite on channel 4.

3   Press the Backspace key or the Delete key.

   The TitleText cast member in the Cast window remains unaffected when you delete the extra sprite.

Edit sprites in the Score window

You can shorten or lengthen sprites as needed. To make the Score information for your entire movie easier to read on the screen without scrolling, you will shorten the sprites for scene 1.

1   In the Score window, click the end of the TitleText sprite, and drag it to the left to frame 10.
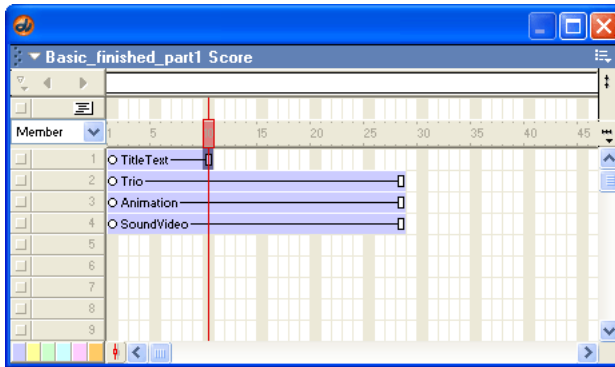
Note: You can also lengthen sprites by dragging their end frames to the right to higher-numbered frames, and you can edit more than one sprite at the same time by selecting multiple sprite end frames.

2   Click the Trio bitmap sprite in channel 2 of the Score.

3   Press and hold the Shift key, and click the Animation and SoundVideo sprites.

4   Click frame 10 in the frame number bar above channel 1. The playhead moves to frame 10.

5   Select Modify > Extend Sprite.

The sprites shorten in length so they occupy only frames 1 through 10. You can use the Extend Sprite command to either lengthen or shorten sprites.

Change the default length of sprites

You can change the default length of sprites that you drag to the Stage and Score by editing the Sprite Preferences. You will now change the default sprite length to 10 frames, which makes it easier to compose a movie that consists only of 10-frame scenes.

1 Select Edit > Preferences > Sprite to open the Sprite Preferences dialog box.

2 In the Span Duration text box, type **10** and click OK. This new default sprite duration applies to all of your movies in Director, not just the movie that you are building now.
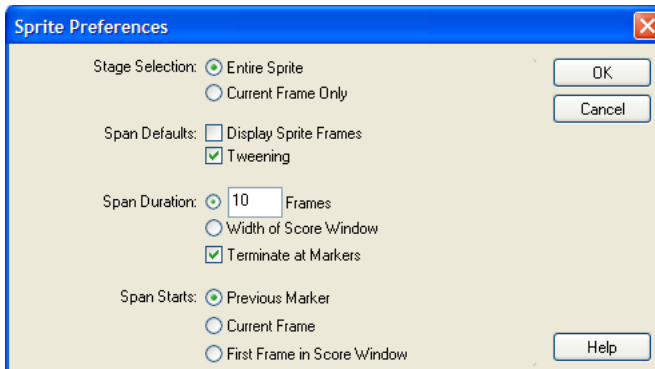
Scene 1 of your movie is almost complete. Later, you will return to this scene to add Lingo commands to the navigation buttons. Now you will start building scene 2.

Note: As you complete the tutorial, remember to save your work frequently.

Building the second scene with animation

The second scene of your movie will contain a simple animation of a tire bouncing. You will import an image cast member for this scene and animate it to travel up and down on the screen, creating a bouncing effect. This scene will also include a new button that returns users to the first scene.

Place the background bitmap on the Stage

A bitmap is comprised of colored pixels arranged to form a graphic. The fourth cast member in the cast is a bitmap that will serve as a background for your animation. Because the animated scene will start in frame 15, you will place a sprite of the background on the Stage in frame 15.

- From cast slot 4, drag the black background image to channel 1, frame 15 of the Score.

  When you place a sprite on the Score, Director automatically centers the sprite on the Stage.
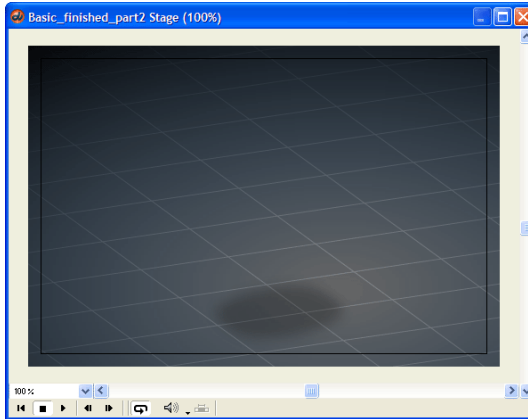
Name a cast member

The background cast member has not yet been named. Naming cast members makes it easier to identify the sprites in the Score.

1 In the Cast window, select the cast member in cast slot 4.

2 In the Cast Member Name text box at the top of the Cast window, type **Background**. Press Enter (Windows) or Return (Macintosh).
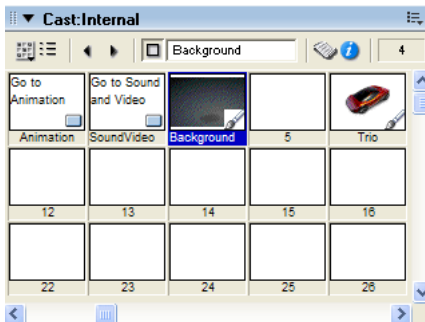
Import media into Director

The tire graphic for the animation is a Macromedia Fireworks PNG file, but you can import lots of other media formats as well. Once a file is imported as a cast member, you can use it just as you would use any other cast member.

1 Select File > Import.

2 In the Import Files dialog box, navigate within your Director MX folder to Tutorials/Basics/BasicsMedia.

3 Select the tire.png file, and click the Add button.

4   Click the Import button.

5   In the Image Options dialog box, click the OK button.

The tire has taken up the first available slot in the Cast window. The new cast member has adopted the file name from "tire.png" as the cast member name.

Animate the image to travel up

You are now ready to add the tire to the scene and create an animation of it bouncing. You can create the animation effect by placing a sprite of the tire cast member on the Stage and then moving the sprite to a new position in each frame. Later, you will use a technique called tweening to make the animation look more realistic.

1   From the Cast window, drag the tire cast member to channel 2, frame 15 of the Score.

2   On the Stage, move the tire sprite so that it sits just above the shadow near the bottom of the Stage.

3   With the tire sprite selected, press and hold the Shift key, click the center red dot, and drag it about one third of the distance toward the top of the Stage.

By holding the Shift key, you maintain a straight vertical line in your animation.
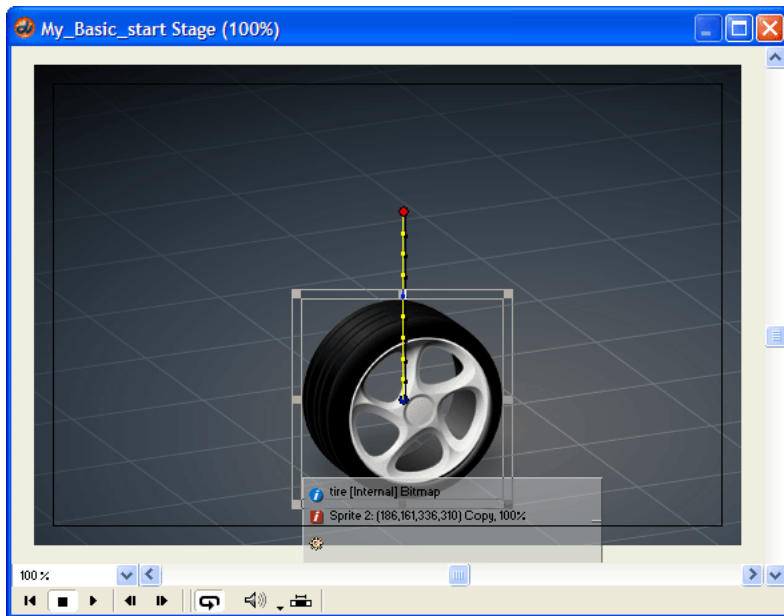
Scrub the playhead to view your animation

You can move the playhead to preview your animation. Scrubbing the playhead is useful when you want to make sure that an animation or other multimedia effect works like you want it to.

• In the Score, drag the playhead back and forth from frame 15 to frame 24. This is called "scrubbing the playhead."

The tire moves up along the path that you just created. Now you will animate the tire returning to the ground.

Animate the image to travel down

You now have an animation of a tire rising off the ground. To animate the tire returning to its starting point, you can use the same method that you used when animating the tire to travel up. But you can also use a shortcut to create a reversed copy of the tire sprite.

1 In the Score, click channel 2 anywhere between frames 16 and 23.

   The tire sprite that you created previously is selected.

2 Select Edit > Copy Sprites to copy the sprite.

3 In the Score, click channel 2, frame 25.

4 Select Edit > Paste Sprites.

   If you scrub the playhead at this point, you will see the tire animation repeated twice. Next, you will reverse the motion of the second tire animation.

5 In the Score, click channel 2 anywhere between frames 26 and 33.

   The new copy of the tire sprite is selected.
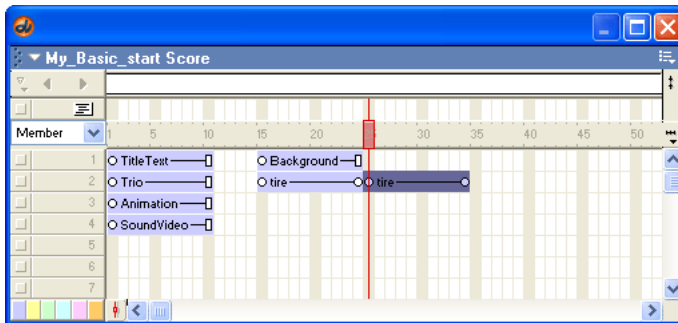

6 Select Modify > Reverse Sequence.

7 Scrub the playhead from frames 15 to 34 to see the tire rise and then fall.

Extend the background across additional frames

You may have noticed as you scrubbed the playhead that the background sprite disappears as the tire falls. The background sprite exists only between frames 15 and 24. You can extend it to additional frames.

1 In the Score, click channel 1, frame 24 and drag it to frame 34.

2 Scrub the playhead again. This time, the background sprite exists through the whole
   tire animation.
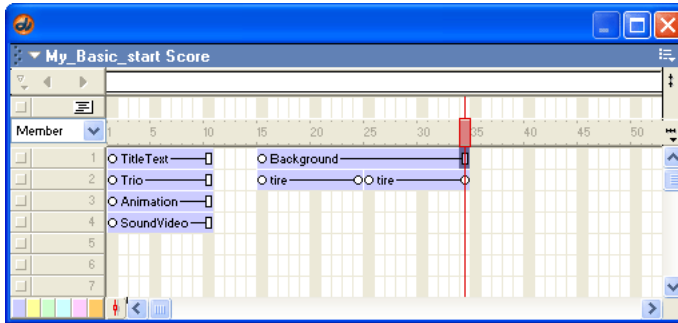
Change the tempo of an animation

For the tire animation to be more realistic, the tire should slow as it reaches the top and accelerate
as is returns to the ground. You can achieve this effect through a technique called *tweening*.

1 In the Score, move the playhead to the up phase of the animation (between frames 15 and 24).

2 On the Stage, select the tire sprite.

3 Select Modify > Sprite > Tweening.

4 Move the Ease-Out slider bar to 100% and click the OK button.
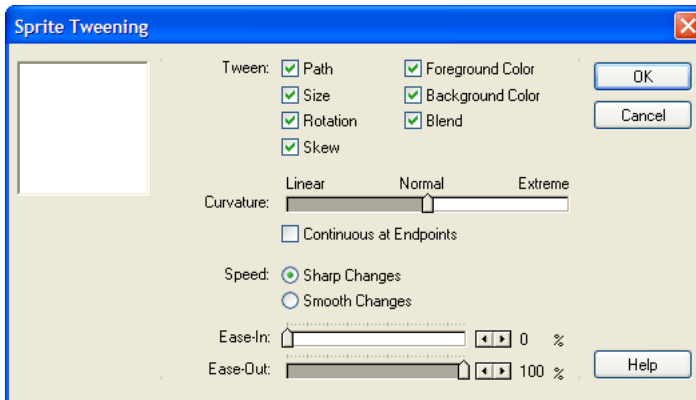
The yellow dots in the animation path have become bunched close together near the top of
the animation.

5 Scrub the playhead. The tire slows as it reaches the apex.

6 In the Score, move the playhead to the down phase of the animation (between frames 25
   and 34).

7 On the Stage, select the tire sprite.

8 Select Modify > Sprite > Tweening.

9 Move the Ease-In slider bar to 100% and click the OK button.

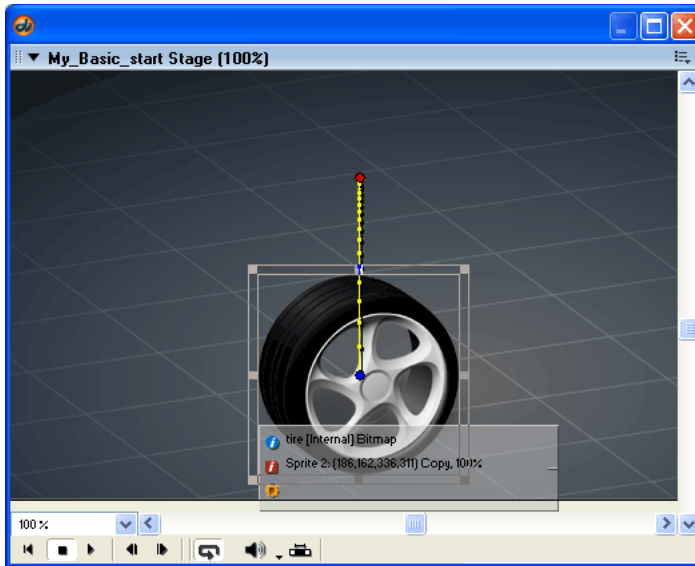10 Scrub the playhead. The tire accelerates as it reaches the bottom.

Change the span of an animation

It may seem that the tire is bouncing too rapidly. To make the animation run at a slower rate, you can add frames to the animation. You should also keep the separation between the up and down phases of the tire animation near the middle of the animation span.

1 In the Score, click the end frame of the Background sprite in frame 34, and drag it to frame 50.

2 In the Score, click the end frame of the down phase tire sprite in frame 34, and drag it to frame 50.

3 In the Score, click the beginning frame of the down phase tire sprite in frame 25, and drag it to frame 33.

4 In the Score, click the end frame of the up phase tire sprite in frame 24, and drag it to frame 32.
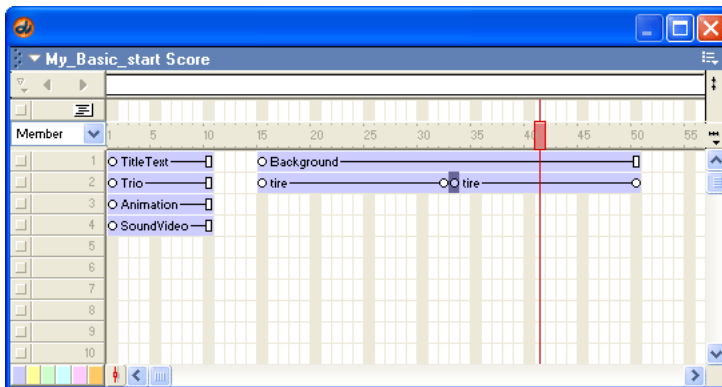
Later in this tutorial, you will add Lingo script to make the tire animation loop.

Add an existing navigation button to the Score

To complete the animation scene, you will add navigation buttons. First, you will use the Go to Sound and Video button that you created earlier for scene 1. Then you will create a new button that returns users to the first scene. Later, you will add Lingo to these buttons to make them function.

1 In the Score, click frame 15.

2 From the Cast window, drag the SoundVideo cast member to the lower side of the Stage. A new sprite appears in the Score beginning in frame 15.

3 In the Score, click and drag the end of the new SoundVideo sprite from frame 24 to frame 50.

4 On the Stage, click the SoundVideo button.

5 In the Property inspector, display the Sprite tab.

6 On the Sprite tab of the Property inspector, do the following:

  a In the X text box, type **350**.

  b In the Y text box, type **300**, and press Enter (Windows) or Return (Macintosh).

  Note: If the button is too wide to fit on the Stage, you can shrink the button. Click the button with the Arrow tool selected, and then drag the sizing handle on the right edge of the button to the left.

Add a new navigation button to the Score

Next, you will create a new button that returns users to the first scene.

1 In the Score, click frame 15.

2 On the Tool palette, click the Button tool.

3 On the lower left side of the Stage, drag a horizontal rectangle toward the right side of the Stage.

4 When you release the mouse button, the rectangle you created becomes an editable text box in which you enter the text that you want to appear on your button. Type **Go to Start** in the text box.

  Note: If the text is too long for your button, you can enlarge the button. Click the button with the Arrow tool selected, and then drag the sizing handle on the right edge of the button to the right.

5 In the Cast window, select the new button cast member.

6 In the Cast Member Name text box at the top of the Cast window, type **GoStart**, and press Enter (Windows) or Return (Macintosh).

7 In the Score, drag the end of the new button sprite in channel 4 from frame 24 to frame 50.

8 On the Sprite tab of the Property inspector, do the following: In the X text box, type **15**. In the Y text box, type **300**, and press Enter (Windows) or Return (Macintosh).

Arrange sprites in the Score

To make the Score easier to read, arrange the sprites of the animation scene in the Score so that there is an empty channel between the graphic sprites and the button sprites.

1 In the Score, select the SoundVideo sprite that begins in frame 15.

2 Press the Shift key, and select the GoStart sprite. Both sprites should be selected.

3 Drag the two sprites down one channel so that they occupy channels 4 and 5. Be sure not to move them left or right. The sprites should still occupy frames 15 through 50.

4   At the bottom of the Stage, click the Rewind button, and then click the Play button.

The movie plays from beginning to end, flashing scene 1 briefly on the Stage and playing the tire animation once before returning to frame 1 and playing again.

5   If your movie plays only once, turn on looping by selecting Control > Loop Playback.

6   When you finish viewing the movie, click the Stop button at the bottom of the Stage.

Later in this tutorial, you will add Lingo scripts to make the buttons function and prevent the playhead from moving from one scene to the next without navigation.

Note: As you complete the tutorial, remember to save your work frequently.

Building the third scene with sound and video

The sound and video scene will introduce you to using sound and video in your movies. You can include sound and video with or without Lingo, depending on the complexity of the effect you want to achieve. In this scene, you will add video to the Stage, add a sound effect, and add buttons that control the sound and video.

Import a digital video cast member

When you import a file into Director, you can import the entire file into your Director movie file or leave it as a separate file, creating only a reference to the external file in your Director movie. If you import a file by reference, it is crucial not to move it from the location where it's referenced. If you move it, Director will not be able to find it the next time you open your Director file, and the movie will not play as intended. Advantages of importing by reference include the following:

• The file size of your Director movie is smaller when you reference, rather than fully import, your media.

• Referencing media offers greater flexibility in terms of how you manage and where you locate your media assets.

When the referenced file is edited using the Launch and Edit feature of Director, there is no need to import the edited file again.

The first cast member in the sound and video scene will be a QuickTime digital video file. Digital video files are always imported by reference, leaving the digital video file separate from the Director file.

1   Select File > Import. In the Import Files dialog box, navigate within your Director MX folder to Tutorials/Basics/BasicsMedia and select the file named walkaround.mov.

2   Click the Add button.

3   In the Media pop-up menu, select Link to External File.

By selecting the Link to External File option, you specify importing by reference.

4 Click the Import button.

The new digital video cast member appears in the Cast window in the first available cast slot. It is named after the imported file.
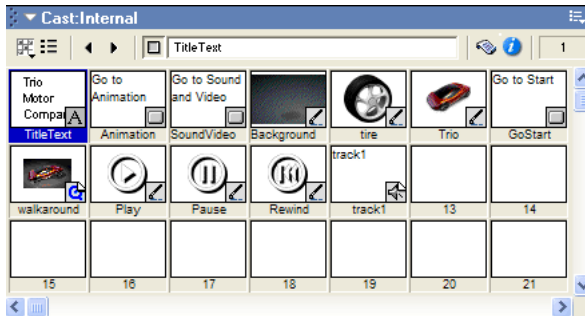

Play the digital video

You can view the QuickTime cast member by opening the QuickTime window. This window contains controls for playing the video file but not for editing the video; you cannot edit digital video files in Director.

1 In the Cast window, double-click the walkaround cast member.

The QuickTime window opens.

2 Play the video by using the controls at the bottom of the QuickTime window:
   - Click the Play button in the lower left corner of the window. The video begins playing, and the Play button changes to a Pause button.
   - To pause the video, click the Pause button in the lower left corner of the window. The video pauses, and the Pause button reverts to a Play button.

The QuickTime window has its own playhead that moves to the right as the video plays. You can use the playhead to jump to a specific point in the video or to scrub through the video.
   - To jump to a specific point in the video, click in the bar to the right or left of the playhead. The playhead moves to the point that you clicked in the bar, and the window displays the corresponding frame of video.
   - To scrub through the video, drag the playhead to the right to scrub forward and to the left to scrub in reverse.

3 When you finish playing the video, close the QuickTime window.
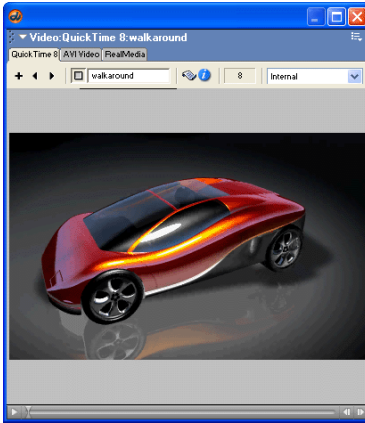
Create a QuickTime sprite

You are now ready to place the QuickTime sprite on the Stage. The sound and video scene should start in frame 55.

1 In the Score, click frame 55. The playhead moves to frame 55.

2 From the Cast window, drag the walkaround QuickTime cast member to near the top-center of the Stage.

The new sprite appears on the Stage and in the Score in channel 1, frames 55 through 64.
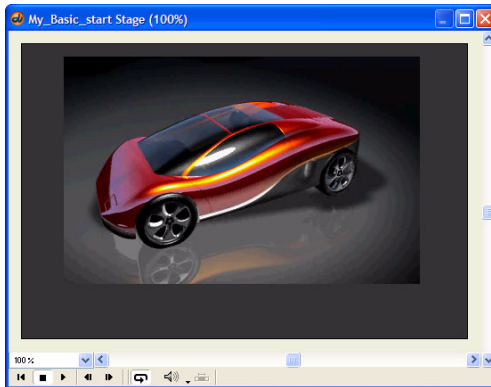
Specify direct-to-Stage playback for a QuickTime cast member

Director can play QuickTime video using direct-to-Stage playback, which lets the video play at the fastest possible speed. When direct-to-Stage playback is selected for digital video, the video appears in front of all other sprites, regardless of the channel that contains the sprite. To verify that direct-to-Stage playback is selected for the new QuickTime sprite, complete the following steps.

1 In the Cast window, select the walkaround cast member. (Make sure that you do not select the sprite on the Stage.)

2 In the Property inspector, select the QuickTime tab.

3 On the QuickTime tab, verify that the DTS checkbox is selected. DTS stands for direct-to-Stage.

   The Video, Audio, and Streaming check boxes should also be selected, by default.

Add custom buttons

Next, you will add buttons that control playback of the QuickTime sprite. These buttons are already included in the Cast window in cast slots 9, 10, and 11. Unlike the standard Director button cast members, these cast members are bitmap graphics that do not include automatic button functionality. Later, you will add Lingo to the buttons to make them control the QuickTime sprite.
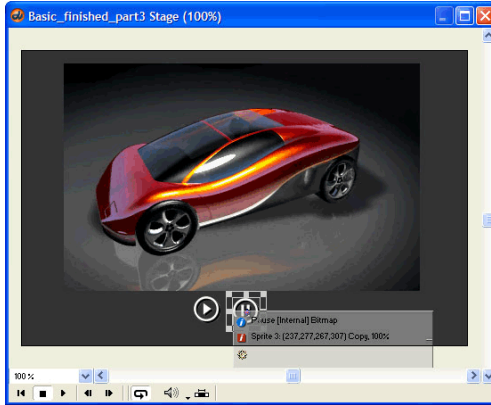
1 In the Score, click frame 55 if the frame is not already selected.

2 In the Cast window, find the Play cast member and drag it to the Stage. Place the Play button on the Stage underneath the QuickTime sprite. Because you will align all three buttons soon, do not worry about precise placement yet.

   The Play button's sprite appears on the Stage and in channel 2, frames 55 through 64, of the Score.
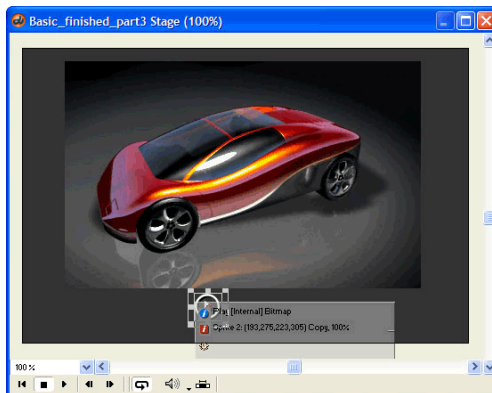
3 In the Cast window, find the Pause cast member and drag it to the Stage. Place the Pause button on the Stage underneath the QuickTime sprite, just to the right of the Play button. Again, precise placement is not necessary yet.

The Pause button's sprite appears on the Stage and in channel 3, frames 55 through 64, of the Score.

4   In the Cast window, find the Rewind cast member and drag it to the Stage. Place the Rewind button on the Stage underneath the QuickTime sprite, just to the right of the Pause button.

The Rewind button's sprite appears on the Stage and in channel 4, frames 55 through 64 of the Score.

5   In the Score or on the Stage, press the Shift key and click the three buttons.

All three buttons are selected, so you can now place all three of them precisely on the Stage.

6   Select Window > Align.

The Align tab on the Design panel is displayed on the lower right side of the screen.

7   On the Align tab, click the Align Vertical Center button. This option aligns the buttons along the X axis.

Align vertical center

Distribute horizontal center
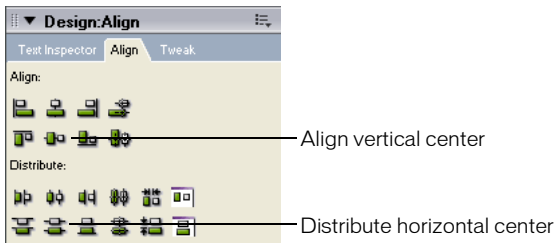
8   On the Align tab, click the Distribute Horizontal Center button. This option unifies the distances between the three buttons.

Later in this tutorial, you will add Lingo to these custom buttons to make them functional.

Import a sound

The QuickTime movie has no sound track. You can make the scene more interesting by adding sound to accompany the video. The easiest way to add sound to a Director movie is to import a sound cast member and place it in one of the sound channels in the Score. Whenever the playhead plays frames that include sound sprites, the sound plays. You can also play sounds by using Lingo instead of the sound channels, which you will learn later in this tutorial.

1   Select File > Import.

2   In the Import Files dialog box, navigate within your Director MX application folder to Tutorials/Basics/BasicsMedia folder, and open the Sounds folder.

3   Select the sound file named track1, and click the Add button.

4   In the Media box at the bottom of the dialog box, select the Link to External File option.

    This option tells Director to import only a reference to the file, leaving the sound file separate from the Director movie file.

5   Click the Import button. The track1 sound file is imported into the Cast window.

Add a sound to the Score

Now you can add the sound to the Score. Because sounds are heard and not seen, they do not appear on the Stage. You place sound sprites directly in the Score.

1   In the Score, click the Hide/Show Effects Channels button if the effects channels are not visible. The effects channels should appear above the frame number bar in the Score.
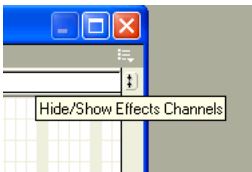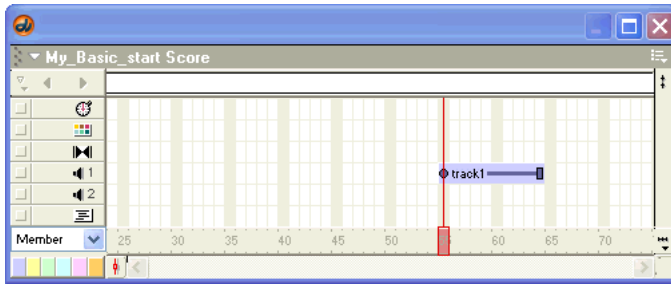

The Hide/Show Effects Channels button
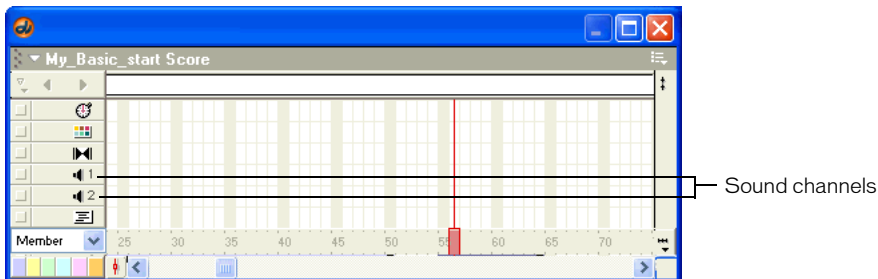
How the effects channels should look when they are visible

2   In the Score, click frame 55.

3 From the Cast window, drag the track1 cast member to frame 55 in sound channel 1 of the Score.

The sound is now ready to play when frames 55 to 64 of your movie play.

4 Rewind and play your movie.

The playhead moves through the frames of your movie quickly. There is not enough time for the QuickTime sprite or the track1 sound to play through before the playhead reaches frame 64. Later, you will add Lingo to solve this problem.

5 When you finish viewing the movie, click the Stop button at the bottom of the Stage.

Add navigation buttons

The last sprites that you will add to the sound and video scene are the navigation buttons. You will then be ready to add some simple Lingo script, the Director scripting language, to the buttons.

The sound and video scene needs a button that returns users to the start scene and a button that is linked to the animation scene. You already have each of these buttons in the Cast window and in the Score. You will use two slightly different techniques to place these buttons in the sound and video scene.

You used the GoStart button in the animation scene and placed it at the very bottom left corner of the Stage. Since it is appropriate for that button to be in the same location on the Stage in the sound and video scene, you can use the same sprite for both scenes. By simply lengthening the GoStart button sprite from the animation scene, you can extend it in the Score to the sound and video scene. When you do this, the button occupies the same space on the Stage in both scenes.

After lengthening the GoStart sprite, you will need to add the button that navigates to the animation scene. Because the button will occupy a different location on the Stage than it did in the start scene, you will make a new sprite for it in the sound and video scene.

1 On the Score, find the GoStart sprite in channel 5 and drag its end frame to frame 64.

The sprite lengthens in the Score and appears in the lower left corner of the Stage in the sound and video scene.

2 On the Score, select frame 55 in channel 6.

3 From the Cast window, drag the Animation cast member to the Stage, placing it in the lower right corner of the Stage.
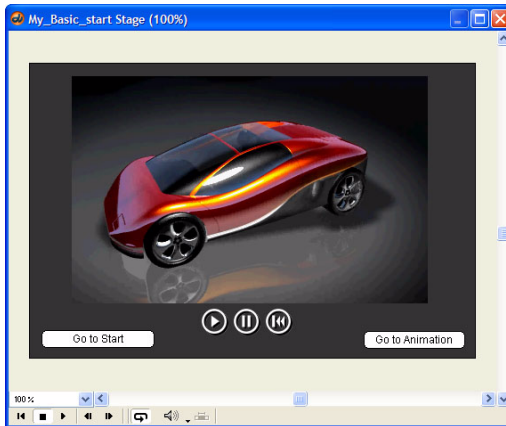
The new Animation button sprite appears on the Stage and in frames 55 through 64 in channel 6 of the Score. Because you already selected frame 55 in channel 6, the sprite appears in that location when you drag it to the Stage. If you do not preselect a channel in the Score, the sprite appears in the first available channel in the frame where the playhead is located.

4 On the Stage, click the Go to Animation button.

5 Use the Sprite tab in the Property inspector, as you did earlier, to give the button an *x* coordinate of **350** and a *y* coordinate of **300**.

Each scene of your movie is graphically complete. You are now ready to add Lingo to the buttons, to let users navigate through the movie.

Note: As you complete the tutorial, remember to save your work frequently.

Writing scripts to control the movie

By scripting, you can implement almost any kind of user interaction and multimedia effect that you can imagine. You can make simple buttons function, as you will soon do in this tutorial. You can also script more complex tasks, including controlling every aspect of a movie's content without using the Score.

Director supports scripting in two languages: Lingo and JavaScript syntax. In this tutorial, you will script in Lingo only, but if you are already familiar with JavaScript, you may want to try JavaScript syntax instead. Lingo is designed to be easy to learn, so don't be intimidated. After you know the basic concepts, you can use the extensive scripting vocabulary to control anything in your movie.

Looping the playhead with Lingo

The scenes of your movie are not much good as scenes if the playhead simply races through them without stopping to let the user absorb their content. In this movie, the playhead must stay in one scene until the user makes a decision to go to a different scene. In this tutorial, you will add Lingo to a special Script channel in the Score and to your button sprites.

To make the playhead stay in one scene, you loop it in a single frame or a series of frames. For the start scene and the sound and video scene, the playhead can loop in one frame. For the animation scene, where the animation occurs over a series of frames, the playhead should loop over the same series of frames.

To control the movement of the playhead without using buttons, you use the Script channel in the Score. As with the sound channels, the Script channel is one of the effects channels that appear above the frame number bar in the Score.

Script channel

Write a handler

The start scene is the first one that needs a script to loop the playhead. Each time the playhead leaves one frame to go to the next, an event, called an `exitFrame` event, occurs. In this case, the word *event* refers to an action executed in Director. Your first script will use the `exitFrame` event as its trigger.

Each script you write is composed of handlers. A handler is a set of Lingo commands that handle a specific event, such as the `exitFrame` event. Some scripts have only one handler and some have multiple handlers. Each handler begins with the name of the triggering event, such as `exitFrame`, and ends with the word `end`.

When you need to enter or edit scripts in Director, you use the Script window. Each script becomes a cast member. The Script window contains tools for editing scripts easily.

1   In the Script channel of the Score, double-click frame 10, the last frame of the start scene. The Script window opens, and it already includes a default handler:
    ```
    on exitFrame me

    end
    ```

2   In between these two lines of script, enter the following additional script:
    ```
    _movie.go(_movie.frame)
    ```
    The result is a handler that should look like this:
    ```
    on exitFrame me
      _movie.go(_movie.frame)
    end
    ```

3   Close the Script window. The new script cast member appears in the Cast window in the first available cast slot. A sprite for the script also appears in the Script channel in frame 10.

4   In the Cast window, select the new script.

5   In the Cast Member Name text box at the top of the Cast window, type **Loop**. Press Enter (Windows) or Return (Macintosh).

6   At the bottom of the Stage, below the movie, click the Rewind button. Then also at the bottom of the Stage, click the Play button to play your movie.

    The movie plays to frame 10 and stops. The movie continues to play, even though it loops at frame 10.

7   At the bottom of the Stage, click the Stop button to stop the movie.

The handler that you wrote has three parts:

- The first line, `on exitFrame me`, tells Director to run this script when the playhead leaves the frame where the script is located. This is frame 10.
- The second line, beginning with `_movie.go`, tells Director to send the playhead back to the current frame. The `.frame` in (`_movie.frame`) always refers to the frame number where the playhead is currently located. Again, this is frame 10.
- The last line of any handler contains the word `end`. It signals the end of the script.

The result of the new handler is that the playhead continually loops in frame 10 as it is sent back to frame 10 each time it tries to go to frame 11. Your Director movie plays to frame 10 and loops there until the user clicks a button to go to a different scene.

Reuse the handler

You can use the same script cast member in the last frame of your movie, frame 64. The script creates the same looping effect in frame 64 for the sound and video scene as you achieved in frame 10 for the start scene.

1   Make sure that the Cast window and Score are open.

2   In the Score, display frame 64.

3   From the Cast window, drag the Loop script cast member to frame 64 in the Script channel of the Score.

A new sprite for the script appears in frame 64. The default length of script sprites is one frame. Now the same looping effect from frame 10 also occurs in frame 64. So the movie keeps playing the sound and video scene until the user clicks a button.

Add a marker to the Score

In the animation scene, you constructed an animation that takes place from frame 15 to frame 50. If you loop the playhead only in frame 50, the animation does not play while the movie is waiting for the user to click a button. In this case, you should loop the playhead over the entire range of frames that contain the animation.

To do this, you can use a script that is similar to the one you just wrote and place it in the last frame of the animation scene. However, this new script will send the playhead to the first frame of the animation rather than to the frame where the script is located.

Because the first frame of the animation scene is frame 15, you could simply write a script that says:

```
_movie.go(15)
```

The problem with this script is that it is not flexible. If you decide to move the animation scene to a different range of frames in the Score, the script would be incorrect. To make the script more flexible, you can place markers in the Score and send the playhead to a marker rather than a specific frame number.

Markers are a way of giving a name to a specific frame in the Score. If you name the first frame of the animation scene and then decide to move the scene, you can simply move the marker in the Score along with the rest of the scene.

1 In the Score, display frame 15.

2 Click the Marker bar above frame 15.

Marker menu   Marker bar
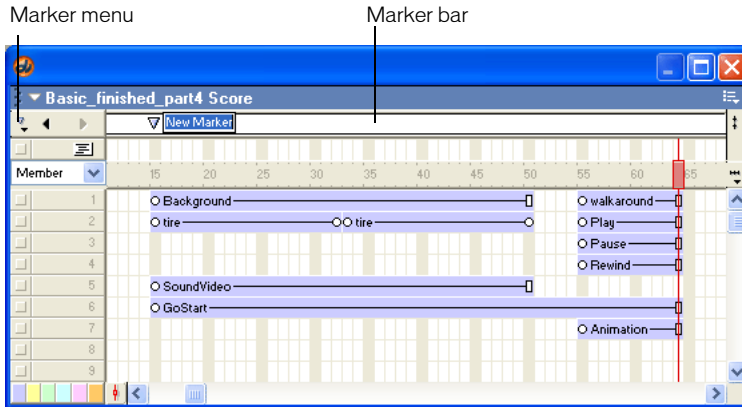
A new marker appears in the Marker bar in frame 15. The text box next to the new marker contains "New Marker" as placeholder text.

3 In the text box next to the new marker, type **Animation**, and press Enter (Windows) or Return (Macintosh) to name the marker.

Create navigation in Lingo using marker names

You can write a script that loops the playhead in frames 15 through 50 using the name of the marker.

1 Double-click the Script channel in frame 50, the last frame of the animation scene. The script window opens with the default on exitFrame script already entered.

2 Inside the default script, on line 2, type the following:

```
_movie.go("Animation")
```

3 In the Name text box at the top of the window, type **AnimLoop**, and close the Script window.

The new script cast member appears in the first available cast slot of the Cast window, and the new sprite appears in frame 50 of the Script channel in the Score.

4 Click frame 15 in the frame number bar in the Score, and click the Play button at the bottom of the Stage.

The animation scene plays, and the playhead loops back to frame 15 when it reaches frame 50. The animation of the tire bouncing repeats continuously.

5 Click the Stop button at the bottom of the Stage.

Each of the scenes in your movie has a script that prevents the playhead from moving to a different scene. Now you'll add scripts to the navigation buttons so the user can move from scene to scene.

Add Lingo to navigation buttons

To make the navigation buttons function, you need to add scripts to the buttons. These scripts should be attached to the button sprites, rather than to frames in the script channel. Your frame scripts respond to `exitFrame` events. After you write the button scripts, they will respond to mouse clicks.

You start by adding scripts to the button sprites in the start scene.

1 In the Score, display frames 1 through 10.

2 Right-click (Windows) or Control-click (Macintosh) the Animation button sprite in channel 3, frames 1 through 10.

3 In the context menu, select Script.

The Script window opens with a default handler entered:

```
on mouseUp me

end
```

4 On the second line, type the following script:

```
_movie.go("Animation")
```

You see the following result:

```
on mouseUp me
  _movie.go("Animation")
end
```

5 In the Name text box at the top of the Script window, type **GoAnim**.

6 Close the Script window, and save your movie.

This handler has three parts. The first line tells Director to trigger this handler when the user clicks on the button sprite to which the script is attached. Specifically, the `mouseUp` event refers to the action of releasing the mouse button after it has been pressed. This way the script does not run until the user releases the mouse button when clicking.

The second line of the handler contains the same code as the previous script that you wrote. It sends the playhead to the frame that contains the marker named Animation. The difference between these two scripts is that this one performs its action based on a mouse click, not on an `exitFrame` event.

Again, the word `end` on the last line tells Director that the script is finished.

Test your script

You are now ready to try out your new button script.

1 If necessary, bring the Stage window to the foreground by clicking its title bar.

2 Rewind and play your movie.

The movie plays, and the start scene remains on the screen. The playhead does not move to another scene until you click your newly scripted button.

3 Click the Go to Animation button on the Stage.

The button provides feedback by changing color when it is clicked. The playhead moves to the first frame of the animation scene, and the tire bounces.

4 Stop your movie.

Add markers to two additional scenes

Your first button is complete. To use similar scripts on the remaining navigation buttons, you can add markers to the start scene as well as the sound and video scene.

1   Display frame 1 of the Score.

2   In the Score, click the marker bar in frame 1, the first frame of the start scene.

   A new marker appears.

3   In the text box next to the new marker, type **Start**, and press Enter (Windows) or Return (Macintosh).
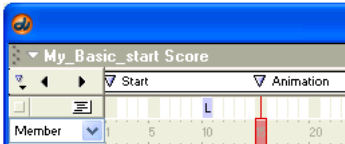
4   Display frame 55 of the Score.

5   Click the marker bar in frame 55, the first frame of the sound and video scene.

6   In the text box next to the new marker, type **SoundVideo**, and press Enter (Windows) or Return (Macintosh).
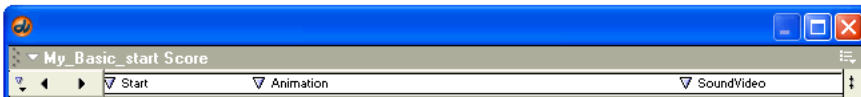
Write script that refers to scenes

You can write scripts that refer to any of the three scenes by name. You can now add a script to the Go to Sound and Video button in the start scene.

1   In the Score, display frames 1 through 10.

2   In frames 1 through 10, right-click (Windows) or Control-click (Macintosh) the SoundVideo sprite.

3   In the context menu, select Script.

   The Script window opens with the default `on mouseUp` handler.

4   On the second line of the handler, type:

   `_movie.go("SoundVideo")`

5   In the Name text box at the top of the Script window, type **GoSndVid**.

6   Close the Script window, and save your movie.

7   To test the script, rewind and play your movie, and then click the Go to Sound and Video button in the start scene.

   The movie jumps to the sound and video scene, and the QuickTime sprite plays.

Add scripts to the animation scene

The animation scene contains two buttons: the Go to Start button and the Go to Sound and Video button. Because you already have a script for the Go to Sound and Video button, you can reuse it. For the Go to Start button, you need to write another new script.

1 Make sure that the Cast window and the Score are both open.

2 Display frame 15 of the Score.

3 From the Cast window, drag the GoSndVid script cast member onto the SoundVideo button sprite that appears in frames 15 through 50 of the Score.

   The script is now attached to this sprite in the same way it is attached to the SoundVideo button sprite in scene 1.

4 To write a new script for the Go to Start button, right-click (Windows) or Control-click (Macintosh) the GoStart button sprite that starts on frame 15 of the Score.

5 Select Script from the context menu.

   The Script window opens with the default `on mouseUp` handler.

6 On the second line of the handler, type the following:

   `_movie.go("Start")`

7 In the Name text box at the top of the Script window, type **GoToStart**, and then press Enter (Windows) or Return (Macintosh).

8 Close the Script window and save your movie.

Because this Go to Start button sprite extends all the way into the sound and video scene, you do not need to do anything else to enable the button in that scene. The last step to enable all the of navigation buttons is to add the GoAnim script to the Go to Animation button in the sound and video scene.

Add one more script to the sound and video scene

You already added the navigation script to the Go to Start button in the sound and video scene. To complete the navigation buttons, you only need to add a script to the Go to Animation button.

1 Make sure that the Cast window and the Score are both open.

2 Display frames 55 through 64 of the Score.

3 From the Cast window, drag the GoAnim script onto the Animation button sprite in frames 55 through 64 of the Score.

   Your movie's navigation functionality is now complete. You can now move among all three scenes of your movie.

4 Rewind and play your movie.

5 Use each of the navigation buttons in all three scenes. Verify that each button sends the playhead to the correct scene.

Controlling digital video with script

Although Director movies and digital video movies share some similarities, differences also exist between the two types of movies. Both Director movies and digital videos comprise a sequence of frames that display on the screen. Director plays its movies by moving the playhead through the Score and displaying each frame the playhead comes to. If the computer on which the movie plays is slow and takes a long time to display each frame, then the Director movie plays slowly. The way that Director plays movies is called *frame-based* animation.

Digital video movies use a timeline instead of a Score. The timing of the video playback is tied closely to the sound track of the video. For example, if the video has a sound track, the timing of the video and sound must remain synchronized during the entire playback of the video. For this reason, digital videos will skip frames if necessary to keep up with the sound track. On slower computers, several frames might be skipped during video playback. This kind of animation is called *time-based*. These differences are the reason you navigate a Director movie by jumping to different frames in the movie, and you navigate a digital video by jumping to different times within the video.

Now you are ready to add scripts to the bitmap graphic buttons for controlling the digital video playback. The bitmap graphic buttons are a Play button, a Pause button, and a Rewind button. For these buttons, you use some new scripting terms, including the `movieRate` and `movieTime` properties of the QuickTime sprite. By changing the values of these properties with Lingo, you change the way the video plays on the Stage.

When the user navigates to the sound and video scene from a different scene, the digital video plays from start to finish once. To play the video again without first leaving the scene, you need to rewind it. You rewind the video by setting its `movieTime` property.

The `movieTime` property indicates the time, within the digital video, that currently appears on the screen. The `movieTime` is measured in ticks, or 60ths of a second. For example, when the movie displays the very first frame of video, the `movieTime` is 0. When 1 second of the video has played, the `movieTime` equals 60. When 3 seconds of the video have played, the `movieTime` equals 180. By setting the `movieTime` to a number that you select, you can make the video jump to a different frame.

Rewind the QuickTime sprite

You can rewind the QuickTime sprite by setting its `movieTime` to 0.

1 In the Score, display frames 55 through 64.

2 In frames 55 through 64, right-click (Windows) or Control-click (Macintosh) the Rewind button sprite.

3 Select Script from the context menu.

   The Script window opens with a default `on mouseUp` handler already entered.

4 On the second line of the handler, type the following Lingo to rewind the QuickTime sprite:

   ```
   sprite(1).movieTime = 0
   ```

5 Press Enter (Windows) or Return (Macintosh).

6 On the third line of the handler, type the following Lingo:

   ```
   sprite(1).movieRate = 0
   ```

   The `movieRate` property indicates the speed at which the QuickTime sprite is playing. When the video is stopped, the `movieRate` is 0.

   The result looks like this:

   ```
   On mouseUp me
      sprite(1).movieTime = 0
      sprite(1).movieRate = 0
   end
   ```

7 In the Name text box at the top of the Script window, type **RewindScript**.

8 Close the Script window, and save your movie.

9 Rewind and play your movie.

10 In the start scene, click the Go to Sound and Video button.

The movie jumps to the sound and video scene, and the QuickTime sprite begins to play.

11 When the QuickTime sprite finishes playing, click the Rewind button on the Stage. The QuickTime sprite rewinds to the beginning of the video.

Add a script that plays the QuickTime sprite

When the video is playing normally, the `movieRate` is 1. You can now add the `movieRate` property to the Play button. This time, scripting makes the QuickTime sprite play when the user clicks the Play button in the movie on the Stage.

1 In the Score, right-click (Windows) or Control-click (Macintosh) the Play button sprite in frames 55 through 64.

2 Select Script from the context menu.

3 In the Script window, on the second line of the handler, type the following Lingo:

```
sprite(1).movieRate = 1
```

This script starts the QuickTime sprite playing at normal speed.

4 In the Name text box at the top of the Script window, type **PlayScript**.

5 Close the Script window, and save your movie.

Add a script that pauses the QuickTime sprite

When the video is paused, the `movieRate` is 0. You can play a video at faster than normal speed by using numbers greater than 1 and at slow speed by using numbers less than 1.

1 In the Score, right-click (Windows) or Control-click (Macintosh) the Pause button sprite in frames 55 through 64.

2 Select Script from the context menu.

3 On the second line of the handler in the Script window, type the following Lingo:

```
sprite(1).movieRate = 0
```

This Lingo pauses the QuickTime sprite.

4 In the Name text box at the top of the Script window, type **PauseScript**.

5 Close the Script window, and save your movie.

6 Now all your video control buttons work. Rewind and play your movie to test the buttons.

Control sound with script

The sound and video scene plays the sound file that you placed in the Score, but only the first time you go to the scene. You can add script to make the music play each time you play the video. You can also add script to make a short sound effect play when the video control buttons are clicked.

To control sound with script, you use commands that are specifically intended for use with sounds. In this tutorial, the first step is to add Lingo to play the track1 sound when the video plays a second time. For this task, add a `play` function to the PlayScript cast member that you have already written in Lingo.

1 In the Cast window, select the PlayScript cast member.

2 Click the Cast Member Script button near the upper right corner of the window.

Cast Member Script button
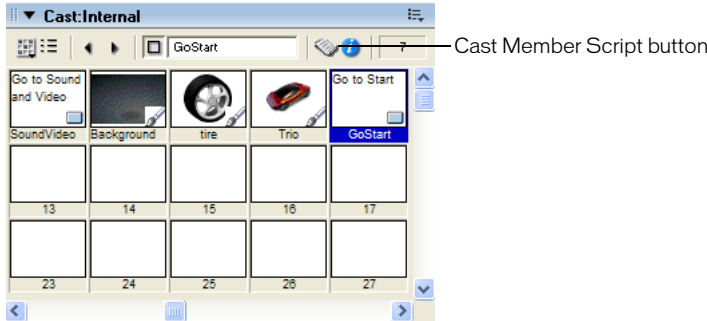
The Script window opens with the Lingo from the PlayScript cast member visible.

3 Place the insertion point at the end of the second line of the handler that reads as follows:

```
sprite(1).movieRate = 1
```

4 Press Enter (Windows) or Return (Macintosh), and type the following on the new line:

```
sound(1).play(member("track1"))
```

This Lingo tells Director to play the sound cast member named track1 in sound channel 1. In the Score, there are two sound channels. When you use Lingo, you can use as many as eight sound channels.

5 Close the Script window, and save your movie.

6 Rewind and play your movie. The track1 sound now plays each time you press the Play button in the sound and video scene of the movie.

Modify the script for the Pause button

Now you need to modify the PauseScript cast member so that the sound pauses when the user clicks the Pause button on the Stage to pause the video.

1 In the Cast window, select the PauseScript cast member.

2 Click the Cast Member Script button in the upper right corner of the Cast window. The Script window opens with the PauseScript Lingo displayed.

3 Place the insertion point at the end of the second line of the handler that reads as follows:

```
sprite(1).movieRate = 0
```

4 Press Enter (Windows) or Return (Macintosh). On the new line, type the following:

```
sound(1).pause()
```

This Lingo tells Director to pause the sound in sound channel 1.

5 Close the Script window and save your movie.

Now when you click the Pause button in the sound and video scene of the movie, the sound and video pause at the same time. When you click the Play button in the movie again, the video resumes and the sound plays again.

Modify the script for the Rewind button

You can modify the RewindScript cast member so that the sound stops when the user clicks the Rewind button.

1　In the Cast window, select the RewindScript cast member.

2　Click the Cast Member Script button in the upper right corner of the Cast window.

3　In the Script window, place the insertion point at the end of the third line of the handler that reads as follows:

```
sprite(1).movieRate = 0
```

4　Press Enter (Windows) or Return (Macintosh). On the new line, type the following:

```
sound(1).stop()
```

This Lingo tells Director to stop the sound in sound channel 1.

5　Close the Script window, and save your movie.

Now when you click the Rewind button in the sound and video scene of the movie, the video rewinds and the sound stops playing. When you click the Play button in the movie, the video restarts and the sound plays again.

Add sounds to buttons

The final effect to add is to make a short sound play when users click any of the video control buttons in the sound and video scene. This sound file is small; there is no compelling reason not to import the file directly into your Director file. Then you will add a `play` function to each of the scripts that are attached to the video control buttons. This command plays the new sound cast member in the second sound channel.

1　Select File > Import.

2　In the Import Files dialog box, navigate within your Director MX folder to Tutorials/Basics/BasicsMedia/Sounds.

3　Select the file named button.wav, and click the Add button.

4　In the Media pop-up menu, select Standard Import.

5　Click the Import button.

The new sound cast member appears in the Cast window in the next available cast slot.

6　In the Cast window, select the RewindScript cast member.

7　Click the Cast Member Script button in the upper right corner of the Script window.

8　In the Script window, create a new line after the first line of the handler.

9　On the new line, type the following Lingo:

```
sound(2).play(member("button"))
```

The `(2)` specifies the second sound channel.

10 Close the Script window, and save your movie.

11 Repeat steps 6 through 10 for the PlayScript and PauseScript cast members.

You have now completed authoring your Director movie. You can play the movie and move from scene to scene with the navigation buttons that you created. You can control the playback of the digital video with the bitmap graphic buttons that you added. Next, you will publish the movie to play on the web.

Publishing your movie

In general, you can publish your movie for the web by simply selecting File > Publish. Using default Publish settings, Director creates a Macromedia Shockwave version of your movie, with the Director movie (DCR) extension, in the same directory as your original movie. An HTML page includes the necessary tags to embed the movie. Your browser window opens, and your Shockwave content plays within the browser.

When you use QuickTime video, you must complete a few additional steps to ensure that your movie plays correctly. These steps involve specifying that a QuickTime Xtra extension downloads to your user's system, if necessary, and placing your files in a specific folder if you are publishing your movie on a local computer.

Use a QuickTime Xtra extension

Xtra extensions are software components that extend the functionality of Shockwave content and projectors. A QuickTime Xtra extension is necessary to ensure your QuickTime movie plays correctly when published. When you imported the QuickTime movie, Director automatically added the QT3 Asset Xtra to the Xtra extensions list for your movie. You now need to select the Xtra extension from the list to make it available to your users.

1 Select Modify > Movie > Xtras.

2 In the Movie Xtras dialog box, select the following Xtra extension, according to your operating system:

   ■ Windows users should select QT6Asset.x32.

   ■ Macintosh users should select QuickTime Asset.

   Note: Both versions of the QuickTime Xtra extension are cross-platform.

3 Select the Download if Needed check box.

4 Click the OK button.

5 Save your movie.

   The Xtra extension will now download transparently to the user's computer, from a Macromedia secure server, if the user does not have the Xtra extension.

Get linked media ready to play on your local computer

The Macromedia Shockwave Player plays DCRs in safe mode on your local computer to avoid security breeches, such as a movie accessing data on your hard drive. For the Shockwave Player to access the linked media in your tutorial (the QuickTime movie and track1 sound) in safe mode, the files must be in a folder named dswmedia. This is the only folder name that lets Shockwave Player access linked local files. The file naming convention applies only to DCR movies that you play on your local computer; if you upload your files to an Internet server, your linked media does not need to reside in a folder named dswmedia.

Complete the following steps to create a copy of your movie within a dswmedia folder.

1 Save your movie and exit Director (File > Exit).

2 On your desktop, create a new folder and name it dswmedia.

3 Within your Director MX 2004 application folder, browse to Tutorials/Basics.

4   From the Basics folder, copy the Start folder and all of its contents to the dswmedia folder on your desktop.

5   From the Basics folder, copy the BasicsMedia folder and all of its contents to the dswmedia folder on your desktop.

Note: The Start and BasicsMedia folders must be at the same level within the dswmedia folder for the linked media to play correctly.

Change Publish settings and publish your movie

When you use the Publish command, you can take advantage of the default Publish settings of Director, or you can modify them with the Publish Settings dialog box.

For the tutorial movie, you will publish the movie using the Detect Shockwave HTML page which, in addition to including `OBJECT` and `EMBED` tags that are necessary to display your movie correctly in a browser, includes JavaScript that detects if your user has the correct version of Shockwave Player. If necessary, a message appears that advises your user to update the Shockwave Player installation.

1   Open the version of the movie that resides in the dswmedia folder on your desktop.

2   In Director, select File > Publish Settings.

3   On the Formats tab of the Publish Settings dialog box, select both Shockwave File (DCR) and HTML. None of the other Publish options should be selected.

4   Verify that Preview after publishing is selected, and click OK.
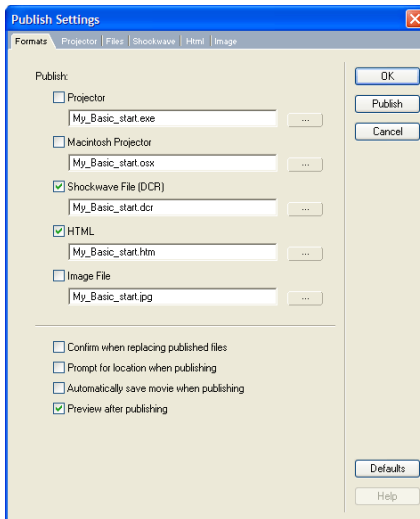
5   Save your movie.

6   Select File > Publish.

Your browser opens and plays your tutorial movie.

When you save your movie, Director also saves any changes you made in the Publish Settings dialog box. The next time that you want to publish your movie in the same way, you can simply select File > Publish without having to modify the Publish Settings dialog box again.

Summarizing what you learned

By completing this tutorial, you have become familiar with the basic tasks and procedures used to create Director movies. You now know how to do the following:

- Import cast members
- Edit movie properties
- Create sprites
- Use inks
- Animate sprites
- Create bitmap graphics
- Create vector shapes
- Create button cast members
- Edit the Score
- Use sounds
- Write simple Lingo scripts
- Publish your movie for web playback

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