M MACROMEDIA®

Using
Director®

Director®

For Macintosh®   Version 4

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Introduction

Welcome to Macromedia Director—the world's foremost authoring tool for multimedia productions.

If you're a multimedia artist or producer, an educator, engineer, or multimedia consultant, you'll find Director is the ideal tool for creating kiosks, entertainment and educational CD-ROM titles, simulations and visualizations, interactive presentations, and demo disks.

This introduction contains a list of what's in the package, a description of how the rest of this guide is organized, and information about the hardware and system software that you need to run Director. It provides instructions for installing Director and using Director's on-line help system. It also contains a summary of the features that are new in this version of Director and provides a quick overview of the basic steps involved in creating a Director movie.

What's in this package

The Director package contains the application software and five guides. In addition to this guide, *Using Director,* the package includes:

◆ *Learning Director,* a collection of step-by-step examples that lead you through the process of creating animations, working with sounds, creating special effects, adding interactivity to a movie, and creating hypertext. If you're new to Director, *Learning Director* is the ideal place to start. If you're an experienced user, you may want to try out some techniques you haven't used before.

◆ *Using Lingo,* an introduction to Director's scripting language, that provides hands-on experience using Lingo to control a movie in ways not possible in the score. Find out about interactivity: learn how to evaluate and respond to user input and how to give users the freedom to travel through and explore a movie. Many of the examples are based on the sample movies included in the package.

◆ *Lingo Dictionary,* a listing of every Lingo command. The dictionary contains the syntax for each command, a description of how it works, and examples of how the command might be used in a real script.

◆ *Tips & Tricks,* a short guide that includes tips on performance, synchronization, debugging strategies, and cross-platform development.

What's in this guide

This guide has six chapters, one appendix, a glossary, and an index.

Chapter 1, "Working with Cast Members," covers the basic procedures you'll find most useful when you're working with cast members—the procedures you'll find yourself using most of the time. It contains techniques for creating and making changes to cast members, ways to work with and organize cast members in the cast window, and procedures for handling cast members once you've placed them on the stage.

Chapter 2, "Creating Animations," demonstrates all the techniques for creating animation: in-betweening, frame-by-frame animation, auto animation, and real-time recording. It also describes techniques for handling film loops and QuickTime movies.

Chapter 3, "Working Behind the Scenes," shows how to add sound effects and music to a movie, how to set up visual transitions, and how to control the playback speed of a movie. It also explains how color palettes work, how to create and edit them, and how to create palette effects.

Chapter 4, "Making a Movie Interactive," shows how to put control of a movie into the hands of the users. It provides procedures you can follow to create buttons, hypertext links, and simple Lingo scripts.

Chapter 5, "Window Reference," details how every window in Director works. It includes information on the cast window, the score, the control panel, and the paint window.

Chapter 6, "Menu Reference," describes all the menu commands—and their associated dialog boxes—in Director in the order in which they appear.

Appendix A, "Director Shortcuts," lists the keyboard and mouse shortcuts available in Director.

Terms that look like *this* appear in the glossary at the end of the guide.

Hardware and software requirements

To create movies with Director, you need a 68030 Macintosh computer with a 640 x 480 (13-inch) monitor. You can run Director on a less powerful computer, but you probably won't find its performance acceptable. If you plan things right, you can create movies that will run on a less powerful computer without any problems.

A color monitor isn't absolutely essential, but you'll find yourself greatly limited without one. (The sample movies that come with Director require a color monitor.) A second large monitor makes developing movies infinitely easier.

To play digital video movies, you need the latest QuickTime extension.

Installing Director

The CD–ROM version of Director does not require an installer. Simply drag any folders you want plus all the files in the Director folder to the desired location on your hard drive. The Director application will not run off a CD–ROM. Help files, the EHelp engine, and projector resources files must be located in the same folder as the Director application.

The disk–based version of Director, available from Macromedia, requires an installer. Default installation includes all files, which decompress to approximately 30 megabytes.

The files provided include:

◆ **Program.** Installs the Director application, resources file, on–line help, and help settings.

◆ **Sample Movies.** Installs *Guided Tour* and *Lingo Expo. Guided Tour: Behind the Scenes* is a quick introduction to Director's features and interface. *Lingo Expo* showcases three Director movies that were designed to show what you can do with Lingo: *Noh Tale to Tell,* a storybook, demonstrates basic Lingo; *Furniture + Philanthropy,* a kiosk, covers intermediate Lingo; and *MECH,* a simulation, focuses on advanced Lingo.

◆ **Tutorial Movies.** Installs the sample files you need for the step–by-step examples in *Learning Director* and *Using Lingo*.

◆ **Extras.** Installs Clipmedia, utilities from Apple and Macromedia, and a variety of XObjects.

You don't have to install everything all at once. If you're not sure you are going to use a set of files, you can skip them, and then install the files later if you decide you need them.

Using the installer

To install Director:

1. **Put the Director Program diskette in the disk drive.**

2. **Double-click the icon that appears on the screen to open it.**

3. **Double-click the installer icon.**

4. **Follow the instructions that appear on the screen.**

Starting Director

To start Director:

1. **Go to the Macromedia Director 4.0 folder, and double-click the Macromedia Director 4.0 icon.**
    After a moment, Director prompts you to enter your name, organization, and serial number. The serial number is located on the user registration card.

2. **Fill in the information, and click Done.**

Getting help

Director has an extensive on–line help system:

◆ **To display the help window's table of contents,** choose Help from the Apple menu.

◆ **To get help about something that's on the screen,** choose Help Pointer from the Apple menu (or press Command–?), and then click the item you want information about.

◆ **To get information about a dialog box,** click the Help button that appears in the dialog box.

What's new in Director

The development of Director 4.0 included both major enhancements to provide new functionality and small changes to make the software easier to learn and use.

Some of the changes are obvious, such as the color buttons in the cast and score windows. Other changes are less apparent, such as the new keyboard shortcuts, which are detailed in Appendix A, "Director Shortcuts."

Here's an overview of everything that's new in Director:

Opening existing movies

You can open and use movies created with previous versions of Director. The first time you save a movie created with a previous version of Director, Director converts the movie to Director's new format. The new format provides compatibility with Director 4.0 for Windows.

The Update Movies command on the File menu converts an entire folder of movies into Director's new format. You can also use it to "protect" a movie: to modify the movie so someone can play it in a projector but not reopen it in Director.

Compatibility with Windows

You don't have to convert a movie you've created on the Macintosh with Director 4.0 before you open it with Director 4.0 for Windows. Any movie you create with Director 4.0 for Macintosh is completely compatible with Director 4.0 for Windows—and vice versa. (You can't, however, use earlier versions of Director—including Director 3.1 or Director 3.1 Player for Windows—to play Director 4.0 movies.)

Shared casts

To make shared casts compatible on Macintosh and Windows computers, a movie containing a shared cast must now be named SHARED.DIR.

Adding sounds to the score

Adding sounds to the score is much more straightforward than it was before. The Sounds utility, Sound menu, and Sounds file have been removed. To add a sound to the score, import it into the cast, and then either drag it to the score or use the Set Sound command on the Score menu.

User interface improvements

◆ Previous versions of Director had 13 menus, 4 of which were always present. Director now has ten menus, six of which are always present.

◆ The keyboard shortcuts are more convenient and are more consistent with the keyboard shortcuts commonly used in other Macintosh applications.

◆ A standard button bar appears at the top of the cast, paint, text, script, and digital video windows. The buttons provide convenient access to common operations.

◆ The layout and organization of both the score and the control panel have been improved.

- The layout and wording of the dialog boxes have been improved.

- You can add a cast member to a movie by dragging it from the cast window to the stage or the score. You can move a cast member within the cast window by dragging it from one slot to another. You can move information in the score by selecting it and dragging it.

- You can select a color for a range of cells in the score to make the information in the cells stand out. To display the cell color selector in the score, choose Score Window Options from the Score menu and select Colored Cells in the dialog box.

Cast window improvements

- You can identify three applications you want to use to edit cast members—one for bitmaps, one for sounds, and one for digital video—and launch the applications from the cast window.

- You can create up to 32,000 cast members—instead of just 512—for each movie.

- Cast window scrolling is much faster, especially for linked cast members.

- You can select cast members in the cast window by type.

- You can assign names to cast members and search for them by type, name, or a variety of other options.

- Cast members are numbered in decimal rather than octal format.

General enhancements

◆ The score provides 48 channels, twice as many as earlier versions of Director.

◆ There's no longer a 16-megabyte limit on the size of a Director movie.

◆ The way that Director organizes the information that makes up a movie has been improved. The change makes it possible to play movies back at the best possible rate and to reduce hard disk and CD-ROM access times.

◆ Overall memory management has been improved. You can assign levels of priority to cast members that determine which cast members are removed from memory first when memory is low.

◆ Sound channel management has been improved so that playback performance is better and causes fewer pauses in animation.

◆ The way Director looks for linked cast members has been improved. Director is more likely to be able to find a linked cast member that has been moved to another drive or folder.

◆ You can use Director to create projectors (play–only versions of movies). Unlike movies, projectors created with Director 4.0 for Macintosh can be played only on Macintosh computers, and projectors created with Director 4.0 for Windows can be played only on Windows computers.

◆ The Save and Compact command organizes the information in a movie in the best possible way for playing it back from a CD-ROM.

◆ The digital video features for QuickTime cast members have been enhanced.

General Lingo enhancements

◆ You can play one movie inside of a window within another movie. All of the Lingo scripts within the movie in the window remain in effect.

◆ Director compiles Lingo scripts automatically. You can check to see if a script's syntax is correct before you play the movie it's part of, and you can protect a movie's scripts when you create a projector.

◆ Creating many related objects from the same script is simpler.

◆ There's an improved, more consistent approach to handling messages and defining event handlers

◆ Scripts are easier to create, edit, and find. Movie, frame, and sprite scripts are cast members and appear in the cast window. A script in the cast info dialog box lets you display a script attached to a cast member.

◆ Lingo has additional cast and file management tools. You can use the new tools to find or change a cast member's type, color depth, palette, or other attributes, to copy and paste cast members to and from the Clipboard, and to move cast members within the cast window.

◆ Searching in script windows has been improved. A new `Find Handler` command locates handlers in either the current script or in all scripts in the movie.

◆ Handlers no longer appear on the Lingo menu. They're now listed in the Find Handler dialog box.

New Lingo language elements

◆ Lingo has new elements you can use to test and set a variety of cast member properties such as type, registration points, and color depth.

◆ Elements have been added that you can use to control the size, location, and appearance of windows and to identify the movie you want to play in the window.

◆ New elements make it possible to manage and check files and frames.

◆ A number of mathematical functions (such as sine, cosine, and arc tangent) are now available.

Outdated features that have been removed

◆ **Overview** has been removed from Director. The Auto Animate command has been retained; it now appears on the Score menu.

◆ **Macromedia Accelerator** is no longer necessary. To accelerate a movie, you export it as a QuickTime movie, and then import the QuickTime movie into Director to play it back. The Digital Video Cast Info dialog box provides enhanced support for controlling QuickTime movies in a Director movie.

◆ **The Gaffer and MacroMind Player** have been replaced by the Create Projector command.

Commands whose names have changed

Name in Director 3.1	Name in Director 4.0	Notes
Auto Transform	Auto Distort	
Burn Scene	removed	Instead, make the score active, choose Select All (Command–A) from the Edit menu, and then press Delete
Clean Up Selection	Sort Cast Members	
Clone	Duplicate Cast Members, Duplicate Palette	
Color Depth	*removed*	Moved to Transform Bitmap dialog box
Comment window	Marker window	
Delete Unused Cast	*removed*	Instead, choose Find Cast Members from the Cast menu, select the unused cast members in the cast window, and then press Delete
Easy Select	*removed*	Replaced by Playback Head Follows Selection in the Score Window Options dialog box (choose Score Window Options from the Score menu)
Extended Display Options	Score Window Options	
Magnify	*removed*	Replaced by Magnified Cells in the Score Window Options dialog box (choose Score Window Options from the Score menu)
Normal Size	*removed*	Replaced by restore to size of cast member in Sprite Info dialog box (choose Sprite Info from the Score menu)
Obey Scripts	Disable Lingo	Disable Lingo does the opposite of what Obey Scripts did
Place on Stage	*removed*	Instead, drag a cast member to stage or press Command-Shift-L

Commands whose names have changed

Name in Director 3.1	Name in Director 4.0	Notes
QuickTime window	digital video window	Director is compatible with Windows and can run both AVI and QuickTime movies
real-time indicator in score	actual tempo in control panel	
Repeat Selection	Selected Frames Only	
Select Cast	Find Cast Members	
Set Blend Value	Set Sprite Blend	
Shuffle Backward	*removed*	Replaced by this button at the bottom of the score window:
Shuffle Forward	*removed*	Replaced by this button at the bottom of the score window:
Transform Sprite	Sprite Info	

Creating a movie

For a quick introduction to Director, run the guided tour: Go to the Macromedia Director 4.0 folder, open the Sample Movies folder, and then the Guided Tour folder. Double-click the Behind the Scenes icon.

When you use Director to create a movie, the essential elements you work with are the stage, the score, the cast window, and cast members:

Cast window   Cast member   Stage
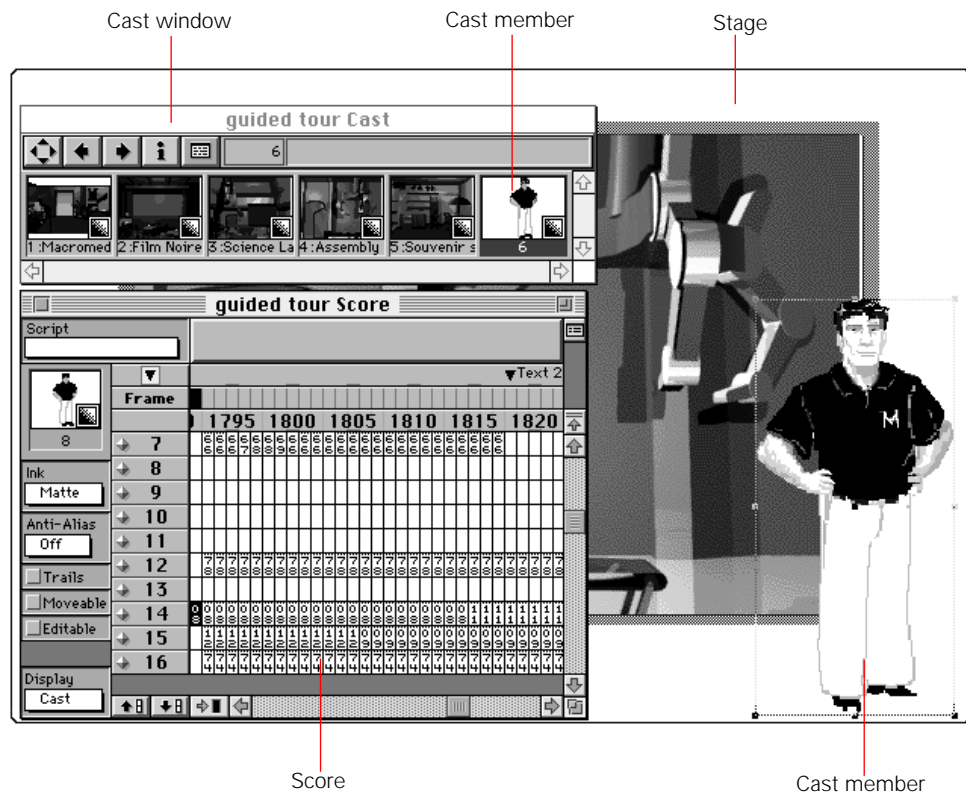
Score   Cast member

To create a movie:

1. Import or create the cast members you want to use in the movie.

Cast members include not just the graphics you want to display and animate on the screen, but text, sound effects and music, color palettes, buttons, digital movies (such as QuickTime movies), and the Lingo scripts that provide interactivity and control of a Director movie.

Every cast member you import or create appears in the cast window.
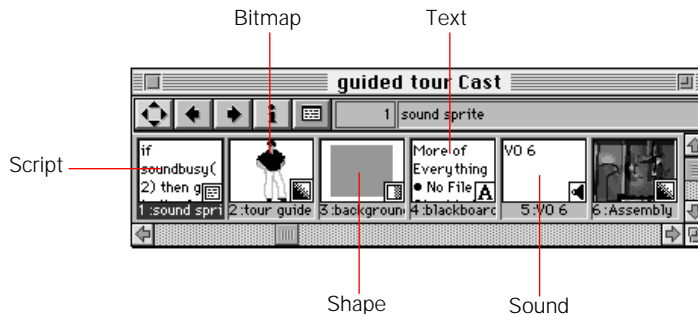
The cast window

2. Make changes to the cast members.

For example, you might colorize black-and-white images you've imported. Or you might create several different versions of a cast member in slightly different positions to create the illusion of realistic movement when you animate it.

You can make changes to bitmapped graphics and text in the paint window and to QuickDraw objects and text with the tools in the tools window.

The paint and tools windows

You can also make changes to bitmapped graphics and text in applications such as Photoshop and Canvas. To make changes to other types of cast members, such as sound files and QuickTime movies, use an appropriate application such as SoundEdit Pro or Adobe Premiere. For cast members you've linked rather than imported into a movie, you can launch the application you used to create the original file directly from Director using the Launch External Editor command.

3.   Place cast members either on the stage or in the score.

Moving a cast member to the stage not only displays the cast member on the stage but automatically inserts information about it into the score. Likewise, moving a text or graphic cast member to the score automatically places it on the stage.

Positioning a cast member on the stage determines *where* it appears on the screen. Positioning it in the score determines *when* it appears on the screen.

This cast member appears…

…before this one.
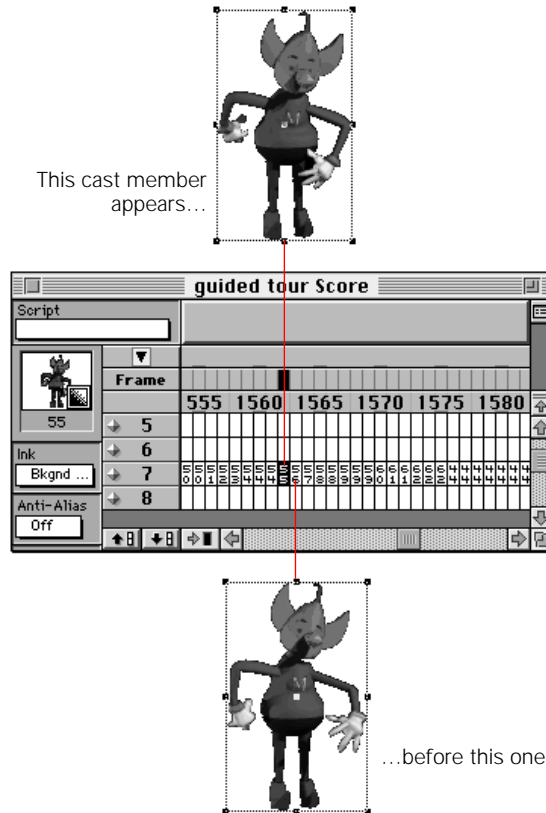
4. Create animation.

Director offers many ways to create animation:

◆ **Auto Animate.** For text and graphs. Provides predefined routines for creating common effects such as a text crawl or animated bars in a bar graph.

◆ **Auto Distort.** Automatically creates cast members in the intermediate positions in an animated sequence that starts with the cast member as it originally looks and ends as it looks after you've reshaped or rotated it.

- ◆ **Real-Time Recording.** Records a cast member's position as you move it around the stage.

- ◆ **Step Recording.** Records the position of the cast members on the stage one frame at a time.

- ◆ **In-Betweening.** Automatically creates the intermediate stages between starting and ending points when you're moving a cast member, changing its size, blending it with the background, or changing a foreground or background color.

- ◆ **Color Cycling.** Cycles through a range of colors selected in the color palette. Use to create effects such as a setting sun, a spinning ball, or a waterfall.

- ◆ **Palette Transition.** Gradually switches from the colors in one palette to those in another. Use to create effects such as the change from night to dawn to daylight.

5. Add transitions.

Transitions are preset options you can use to change from one image to another on the screen. For example, you can wipe text onto a background or dissolve from one screen to the next.

6. Add sound effects and music.

7. Make the movie interactive.

You can add buttons and hypertext links to a movie to make it interactive. Basic interactivity, such as branching from one part of a movie to another, is easy to accomplish with simple statements in *Lingo*, Director's scripting language. With more sophisticated Lingo scripts, you can create just about any kind of interactivity you can imagine.

Chapter 1

Working with Cast Members

A ***cast member*** is any element you can make part of a movie. Cast members include not just the images you move around the stage, but text, sound effects and music, buttons, color palettes, digital video (such as QuickTime movies), and the Lingo scripts that provide interactivity and control of a Director movie.

This chapter covers the basic procedures you'll find most useful when you're working with cast members—the procedures you'll find yourself using most of the time. It contains techniques for creating and making changes to cast members, ways to work with and organize cast members in the cast window, and procedures for handling cast members once you've placed them on the stage.

You'll find many other useful techniques in the last two chapters of this guide, Chapter 5, "Window Reference," and Chapter 6, "Menu Reference," and in two of the other guides that come packaged with Director, *Learning Director* and *Tips & Tricks*.

Creating cast members

Once you've planned a movie, assembling the cast is the first major task in creating it. You can create cast members either by using the tools that Director provides or by importing the cast members into Director from other applications.

Director provides a good, solid set of tools you can use to produce excellent, high-quality cast members of every type. You'll no doubt want to augment Director's tools with other applications such as Canvas, Photoshop, MacDraw Pro, Premiere, and SoundEdit Pro. Because these applications are dedicated to creating specific media types, they provide refinements and power that only dedicated applications can accommodate. Director doesn't duplicate all the features of dedicated applications; instead, it provides an efficient way to import cast members you create in other applications. Once you've imported those cast members, Director gives you the means to turn them into the best movies you can imagine: movies that are graphically appealing, filled with movement and sound, and rich in interactivity.

The following table provides a brief overview of how you go about creating cast members both inside and outside Director.

Ways to create cast members

Cast member	Outside Director	Inside Director
bitmap	Create the image in an application such as Photoshop, save it in PICT format, and then import it. (Director automatically converts PICT images to bitmaps when it imports them unless you use Paste as PICT.)	Use any of the paint tools in the paint window. (See "The paint window" in Chapter 5.)
button	Create the button in an application such as Photoshop, save it in PICT format, and then import it. (In Director, you can assign any bitmap, PICT, or shape cast member a script, making it a button.)	Use the button tool in the tools window. (See "Creating buttons" in Chapter 4.)

Ways to create cast members

Cast member	Outside Director	Inside Director
digital video	Use an application such as Premiere.	Create an animation, export it as a QuickTime movie, and then import the QuickTime movie. (See "QuickTime Movies" in Chapter 2.)
film loop	None.	Create an animation, copy the animation from the score, and paste it in the cast window; or create a movie and then import it into another movie. (See "Film loops" in Chapter 2.)
PICT	Create a QuickDraw object in another application, copy it to the Clipboard, and then use the Paste as PICT command on the Cast menu to paste it in the cast window. (See "Cast menu" in Chapter 6.)	None. (You can export an image from Director in PICT format or paste an image you've created outside Director into the cast window in PICT format, but you can't create an image inside Director in PICT format.)
shape	None. (A shape cast member is a single QuickDraw object you create with the shape tools in the tools window. A QuickDraw object you create outside Director becomes a bitmap or PICT cast member.)	Use any of the shape tools in the tools window. (See "The tools window" in Chapter 5.)
script	Use a word processor to create the script, copy it to the Clipboard, and then paste the script into a script window; or copy and paste a set of scripts to the Scrapbook, and then import the Scrapbook.	Use a script window. (See "The script window" in Chapter 5.)
sound	Digitize the sound using an application such as SoundEdit Pro, and then save the sound in AIFF format.	Use the Record Sound command on the Cast menu. (See Chapter 6.)
text	If the content of the text is your concern, use a word processor, and then copy and paste the text to a text window; or copy and paste blocks of text to the Scrapbook, and then import the Scrapbook. If the look of the text is your concern, use the text tool in an application such as Photoshop, save the image of the text in PICT format, then import it.	Use the text tool in the paint window to create bitmapped text; use a text window or the text tool in the tools window to create QuickDraw text. (See "Creating text," later in this chapter.)

Creating cast members in the paint window

The paint window offers not just a drawing area and a set of standard paint tools, but also a set of commands you can use to change how the tools work and a menu of ink effects.

Paint tools —

Ink effects —

Paint menu

Drawing area
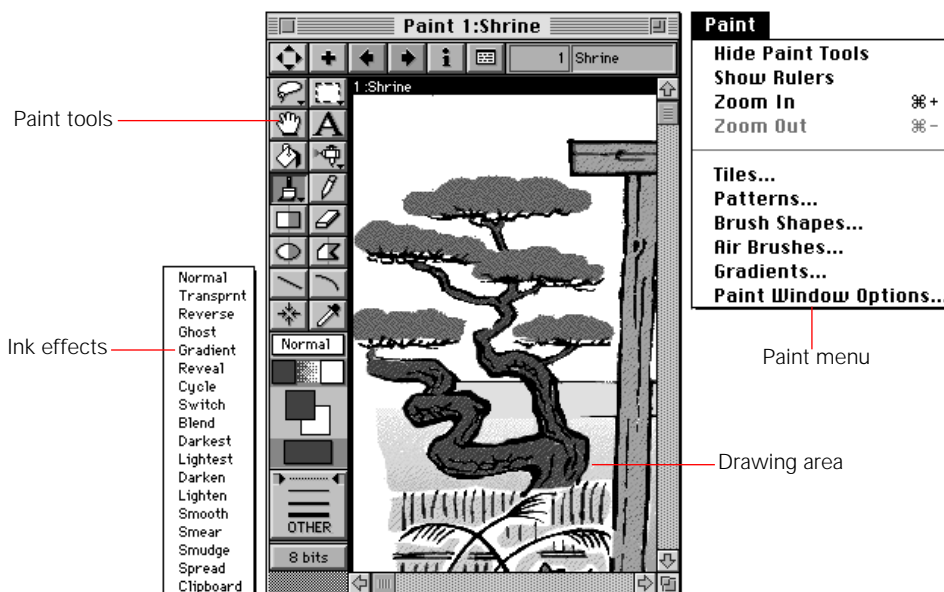
Director's paint tools work the same as paint tools in applications such as Photoshop. If you're familiar with paint tools from another application, you can use them without any further introduction. If you're unfamiliar with how paint tools work, see "The paint window" in Chapter 5, "Window Reference." Procedures for creating text with the paint window's text tool are covered in "Creating text," later in this chapter. You can also practice using the paint tools in the examples in *Learning Director*.

Before you create a cast member in the paint window, make sure you have the color depth set to the appropriate setting. For more information, see "Changing color depth," later in this chapter.

Other things you can do in the paint window

What you can do	Where to find out how
Change the size and shape of the paintbrush	"Brush Shapes" in the Paint menu section in Chapter 6
Select the paintbrush sizes and shapes you want to appear on the paintbrush pop-up menu	"Paintbrush" in the paint window section in Chapter 5
Change the size and density of the air brush	"Air brush" in the Paint menu section in Chapter 6
Select the air brush sizes and densities you want to appear on the air brush pop-up menu	"Air brush" in the paint window section in Chapter 5
Paint with two-color patterns	"Pattern selector" in the paint window section in Chapter 5
Create new two-color patterns	"Patterns" in the Paint menu section in Chapter 6
Paint with multicolor patterns	"Pattern selector" in the paint window section in Chapter 5
Create new multicolor patterns	"Tiles" in the Paint menu section in Chapter 6

Ink effects

Ink effects extend the results you can achieve with the paint tools. They modify either how a tool behaves, how colors are displayed, or—in the case of the Reveal ink effect—how two cast members interact graphically.

The best way to find out what you can do with ink effects is to experiment with them.

Things you can do with ink effects

What you can do	Where to find out how
Make the background color transparent	**Transparent** under "Ink pop-up menu" in the paint window section in Chapter 5
Make overlapping colors reverse	**Reverse** under "Ink pop-up menu" in the paint window section in Chapter 5
Create an image that can be seen only over a black background (when you're working in black and white)	**Ghost** under "Ink pop-up menu" in the paint window section in Chapter 5
Paint with the background color	**Ghost** under "Ink pop-up menu" in the paint window section in Chapter 5
Cycle through the colors in the palette automatically as you paint	**Cycle** under "Ink pop-up menu" in the paint window section in Chapter 5
Paint with translucent colors	**Blend** under "Ink pop-up menu" in the paint window section in Chapter 5
Paint over colors that are darker or lighter than the color you've selected	**Darkest** and **Lightest** under "Ink pop-up menu" in the paint window section in Chapter 5
Darken or lighten colors	**Darken** and **Lighten** under "Ink pop-up menu" in the paint window section in Chapter 5
Smooth edges	**Smooth** under "Ink pop-up menu" in the paint window section in Chapter 5
Smear a color into an adjacent area	**Smear** and **Smudge** under "Ink pop-up menu" in the paint window section in Chapter 5
Spread a color already on the screen into an adjacent area	**Spread** under "Ink pop-up menu" in the paint window section in Chapter 5

Things you can do with ink effects

What you can do	Where to find out how
Replace one color with another	"Switching colors using the Switch ink effect" later in this chapter
Paint with the contents of the Clipboard	**Clipboard** under "Ink pop-up menu" in the paint window section in Chapter 5

Choosing ink effects

The ink effects available in the paint window affect art only when you're in the process of creating it. Another set of ink effects is available in the score. You can use the score's ink effects to change the way cast members appear on the stage. (For more information about the score's ink effects, see "Ink pop–up menu" under "The score window" in Chapter 5, "Window Reference.")

Many ink effects are available only when the color depth of both the monitor and the movie are set to 8-bit (256 colors). For information about which ink effects the limitation applies to, see the lists of ink effects in the paint window and score sections of Chapter 5.

One of the options in the Paint Window Options dialog box has an important effect on ink effects and how they work with the tools in the paint window. If Ink Effect Sticks to Tool is selected (which it is by default), when you select a tool, Director automatically selects the ink effect you were using the last time you used the tool. If you don't want Director to automatically select the ink effect you used last time, choose Paint Window Options from the Paint menu and deselect the option.

To choose an ink effect:

1. **Select the tool you want to use.**

2. **Choose an effect from the Ink pop-up menu.**

Ink pop-up menu
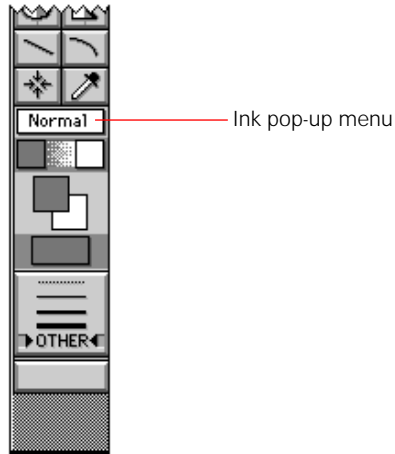
3. **Use the tool you've selected to create a cast member.**
    Director applies the ink effect to whatever you create with the
    tool.

Creating a gradient

A gradient is a blend of colors that varies gradually from the current
foreground color at one extreme to the gradient destination color at
the other.
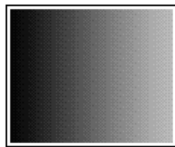
A gradient

You can use the Gradient ink effect with the filled–shape tools, the paint bucket, and the paintbrush.

To create a gradient:

1. **Select a filled shape tool, the paintbrush, or the paint bucket.**

2. **Choose a foreground color.**

Foreground color chip ——— Ink pop-up menu

Foreground color chip ——— Destination color chip

Foreground color chip
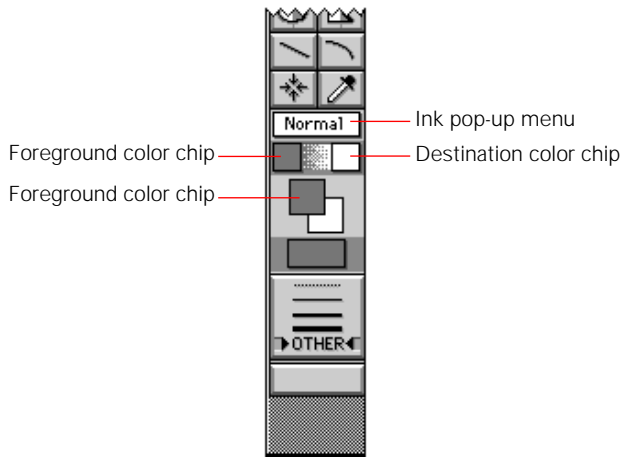
3. **Choose a destination color for the gradient from the destination color chip.**

4. **Choose Gradient from the ink effects pop-up menu.**

5. Choose Gradients from the Paint menu.

The Gradients dialog box appears.
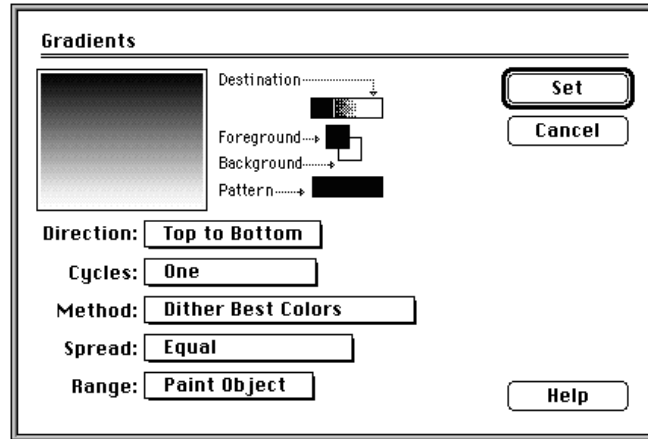
6. Select the options you want to use, and then click OK.

The options in the Gradients dialog box are described in "Gradients" in "Paint menu" in Chapter 6, "Menu Reference."

7. Use the tool you've selected.

The color that appears on the screen as you paint is not a single color, but the gradient you've selected.

Using the Reveal ink effect

You can use the Reveal ink effect to create a cast member through which you can see another.

Cast member in front

Cast member that's covered

Area painted with Reveal ink
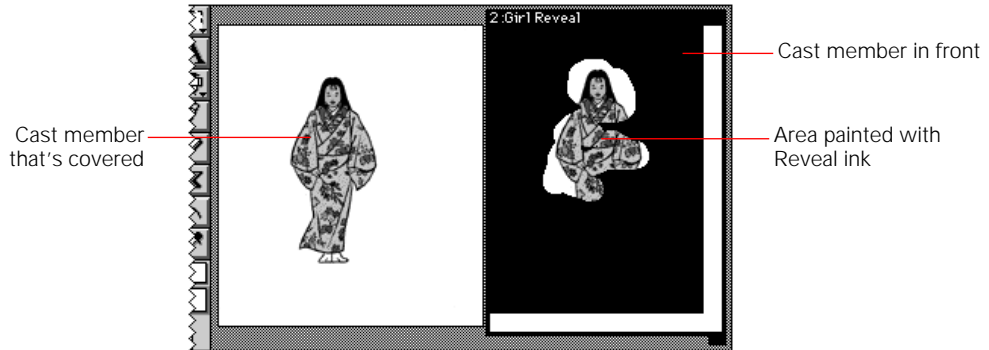
Imagine a cast member and the background behind it painted on a pane of glass covering another cast member. As you use the Reveal ink to paint over the cast member in front, you remove part of the cast member, revealing the other cast member underneath.

To use the Reveal ink effect:

1. **Create both the cast members.**
   You can also reveal a cast member through a blank background.

2. **Make sure that the two cast members are next to each other in the cast window.**
   Put the cast member you want to reveal before the cast member you want it to show through.

Cast member you want to reveal

Cast member where you're using the Reveal ink
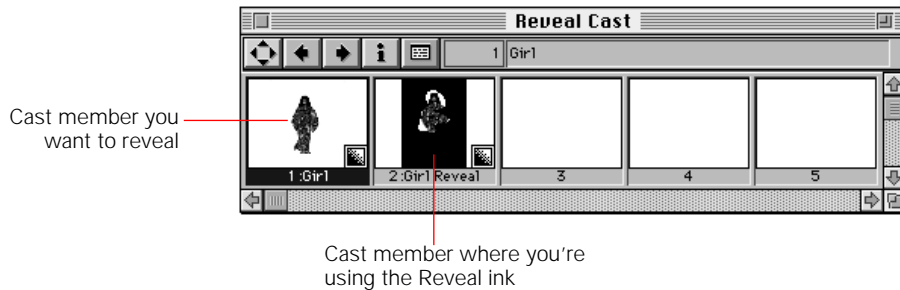
If you want to reveal a cast member through a blank background, make sure the cast member position after the cast member you want to reveal is empty. (For information about rearranging cast members in the cast window, see "Moving cast members within the cast window" under "The cast window" in Chapter 5, "Window Reference.")

3. **In the cast window, double-click the cast member that you want the revealed cast member to show through.**
   The cast member appears in the paint window.

Cast member you want to reveal

Double-click this cast member
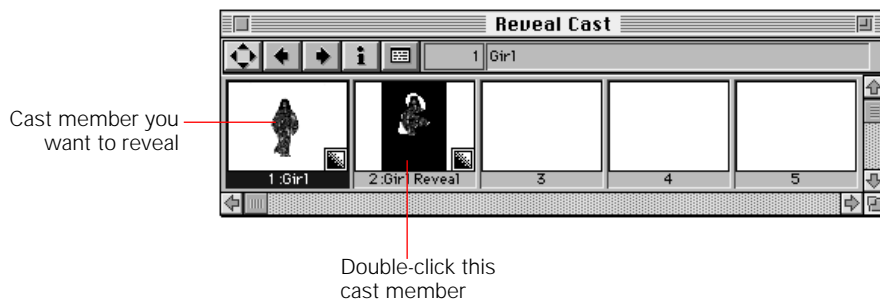
4. **Select the tool you want to use.**
   The Reveal ink effect works with the paintbrush, the paint bucket, the air brush, and the filled–shape tools.

5. **Choose Reveal from the ink effects pop-up menu.**

6. **Use the tool you've selected to paint the area where you want the other cast member to show through.**

Creating text

Director has two text tools: one in the paint window and one in the tools window. You can use either to create text, or you can create text by typing it in a text window.

Text tool

Text tool
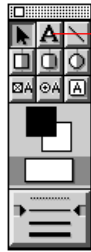
Paint window tools

Tools window
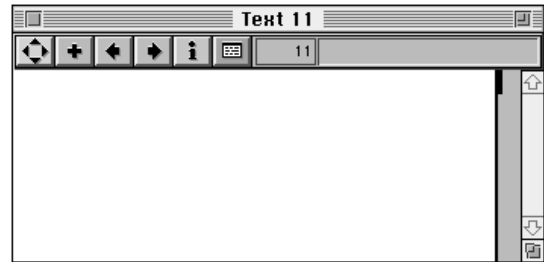
Text window

Text you create in the paint window is bitmapped (**bitmapped text** is stored as a graphic image of the text). Text you create with the tools window or in a text window is QuickDraw text (**QuickDraw text** is stored as the information that defines the text—the letters you've typed, the font, size, and style you've chosen, and so on).

Paint window text

Because the text you create in the paint window is bitmapped, Director can animate it faster than text you create in a text window or with the text tool in the tools window. You can also use the paint window's ink effects on bitmapped text, and you don't have to worry about whether users have the fonts you're using installed on their systems. The disadvantage of bitmapped text is that once you've created it, you can't edit it: if you want to change what you've typed, you have to erase it and type it again.

Tools window and text window text

Any text that you create with the text tool in the tools window, you can also display in a text window. And any text that you create in a text window, you can edit with the tool window's text tool once you've placed the text on the stage. The link between the two is the cast window: text created with either the tools window or in a text window becomes a text cast member in the cast window.

QuickDraw text takes less space than bitmapped text because Director saves only the information that defines the text, not every pixel that makes up the image of the text. QuickDraw text also looks much better when it's printed (so it's the better choice when you plan to print frames of a movie, say, for handouts). Perhaps most important, you can edit QuickDraw text after you've created it.

If you prefer working with QuickDraw text but you want to take advantage of Director's ability to animate bitmapped text faster, you can create and edit the text with the tools window or in a text window, and then use the Convert to Bitmap command on the Cast menu to change the text into bitmapped text. (See Chapter 6, "Menu Reference," for more information.)

▶ **Tip** *If you want to kern text, create it in an application such as Photoshop, adjust the spacing between letters there, and then import the text into Director. If you use Photoshop, you can also take advantage of its anti-aliasing capabilities.*

Creating text in the paint window

When you create text in the paint window, the text appears in the cast window as a bitmap cast member, not a text cast member.

To create text with the paint window's text tool:

1. **Select the text tool.**
   The pointer changes to an I-beam.

2. **Click at the spot in the paint window where you want to start typing.**
   A cursor appears inside a box that marks the text block.

3. **Choose the font, size, style, and alignment you want from the Text menu.**
   You can choose an ink effect or change the foreground color, background color, and pattern. You can also add a drop shadow to the text by choosing one of the options from the Text Shadow submenu on the Text menu.

4. **Type the text.**
   Before you set another insertion point, you can edit the text or drag the text box around the paint window. You can't choose a new font, size, or style for bitmapped text once you've typed it as you can with QuickDraw text. If you want to change any of those attributes, you have to erase the text, choose the new attributes from the Text menu, and then type the text again. Once you set another insertion point, you can't make any further changes to the text.

Creating text with the tools window

When you use the text tool in the tools window to create text on the stage, the text also appears as a text cast member in the cast window. You can edit the text directly on the stage or in the text window.

To create text with the tools window's text tool:

1. **Choose Tools from the Window menu.**
   The tools window appears.
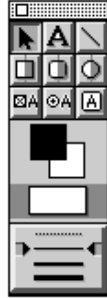
2. **Select the text tool.**
   The pointer changes to a crosshair with an A attached to it.

3. **Position the pointer at the place on the stage where you want the text to start, and then drag the text tool to draw a box.**
   The text you type appears inside the box. If you want to make the box wider, drag the handle on the right edge of the box. If you want to move the box, drag it by one of its edges.

4. **Type the text.**
   QuickDraw text always appears in the default font, size, and style (Geneva, 12 point, plain). You can apply the font, size, and style you want after you've typed the text. As you type, the text automatically wraps to the next line and the text box expands vertically to accommodate the new line.

5. **Select the text, and then choose a font, size, and style from the Text menu.**

Choosing a font is an important decision if you plan to distribute a movie. Remember that a computer can display only the fonts that are installed on it, and someone running the movie you're creating may not have the same fonts you have. If the font you choose isn't available, the system will replace it with a different font—and the results may not be what you want. If you can't be sure which fonts will be available when someone else runs your movie, either use the System fonts (Chicago, Geneva, and Monaco) or convert the text to a bitmap.

You can change the color of the text and its background with the foreground and background color chips in the tools window. You can use the options on the Text menu to set the alignment of the text and to place a border, gutter, box shadow, and text shadow around it.

There are a number of other aspects of a block of QuickDraw text that you can control using the options in the Cast Member Info dialog box. For information about the other options, see "Cast Member Info" under "Cast menu" in Chapter 6, "Menu Reference."

Note   *Although you can't use paint window ink effects with QuickDraw text, you can use the score window ink effects. For information about the score window ink effects, see "Ink pop-up menu" under "The score" in Chapter 5, "Window Reference."*

Creating QuickDraw text in the text window

You can type text directly in the text window rather than using the text tool on the stage.

To create text in the text window:

1. Choose Text from the Window menu.
A text window appears.

Drag to resize the text block
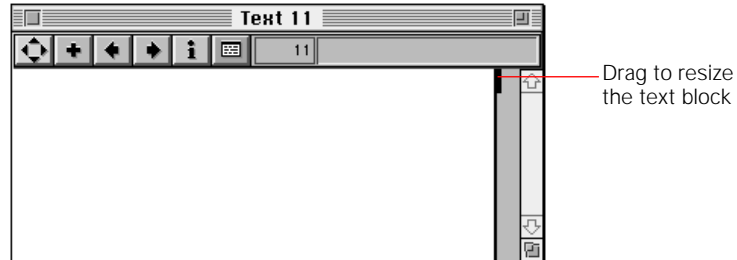
You can change the size of the text block by dragging the handle at the right edge of the text area.

2. Choose a font, size, and style from the Text menu.
You can change the color of the text and its background with the foreground and background color chips in the tools window. You can also choose to place a border, gutter, box shadow, or text shadow around the text you type. The border, gutter, box shadow, and text shadow you set appears only on the stage, not in the text window.

3. Type the text.
The text you type becomes a cast member in the cast window. You can enter up to 32,000 characters, including spaces.

If you want to change the text attributes, select the text in the text window and choose new attributes from the Text menu.

Editing QuickDraw text

You can edit QuickDraw text either on the stage or in the text window.

To edit QuickDraw text:

1. **Select the text if it's on the stage, or double-click the cast member that corresponds to the text to open the text window.**
   If the text is on the stage, a box appears around it.

2. **Select the part of the text you want to change.**
   You can double-click a word to select the entire word, or triple-click anywhere in the text to select the entire block.

3. **Make whatever changes you want.**
   Changes to the font, size, style, and text color affect only the text that's selected. Changes to the alignment, margins, border, box or text shadow, and background color affect the entire block of text. (To change the color of the text and background behind it, use the foreground and background color chips in the tools window.)

Making changes to cast members

Once you've assembled the cast of a movie, you may find that you need to make changes to some of the cast members. Three of the most common reasons for making changes to cast members are to produce animation, to change a cast member's color depth, and to change a cast member's color.

◆ **Producing animation**. A quick way to animate a cast member is first to duplicate it to produce a series of identical cast members, and then to make the appropriate change to each cast member in the series to create each stage in an animated sequence. You can also change the position, orientation, or shape of a cast member, and then have Director automatically generate a cast member for each intermediate stage between the cast member's original appearance and its appearance after the change.

◆ **Changing a cast member's color depth**. A good way to save memory and to improve a movie's performance is to reduce cast members to the lowest color depth they need to accommodate the number of colors they use. For example, if you've created a block of text that's all the same color against a one-color background, you can change it from an 8-bit cast member to a 1-bit cast member and save eight times the memory you were using before.

◆ **Changing a cast member's color**. If you import a black-and-white cast member into a color movie, the cast member doesn't have to stay black and white: you can increase the color depth of the cast member and then colorize it. If you import a color cast member that doesn't match the color scheme of the screen where you want to use it, you can replace its current colors with colors that look better.

The procedures in this section show how to create a sequence of cast members, how to change the color depth of a cast member and a movie, how to colorize a black–and–white cast member, how to use the Switch Colors command and Switch ink effect to replace one color with another, and how to combine several separate cast members into a single background.

Other things you can do with cast members

What you can do	Where to find out how
Scale the size of a cast member	"Transform Bitmap" in the Cast menu section in Chapter 6
Scale the size of a sprite	"Sprite Info" in the Score menu section in Chapter 6
Change the size, pattern, and color of a QuickDraw shape	"The tools window" in Chapter 5
Invert the colors in a cast member	"Invert Colors" in the Effects menu section in Chapter 6
Flip a cast member horizontally or vertically	"Flip Horizontal" and "Flip Vertical" in the Effects menu section in Chapter 6
Rotate a cast member	"Rotate Left," "Rotate Right," and "Free Rotate" in the Effects menu section in Chapter 6
Create an outline of a cast member	"Trace Edges" in the Effects menu section in Chapter 6
Darken or lighten a cast member	"Darken" and "Lighten" in the Effects menu section in Chapter 6
Smooth the edges of a cast member	"Smooth" in the Effects menu section in Chapter 6
Give a cast member the illusion of linear perspective	"Perspective" in the Effects menu section in Chapter 6
Slant a cast member as if it were bounded by a parallelogram rather than a rectangle	"Slant" in the Effects menu section in Chapter 6
Distort the shape of a cast member	"Distort" in the Effects menu section in Chapter 6

Other things you can do with cast members

What you can do	Where to find out how
Convert a QuickDraw text cast member to a bitmapped cast member	"Convert to Bitmap" in the Cast menu section in Chapter 6
Change the type of field Director displays a text cast member in	"Cast Member Info" in the Cast menu section in Chapter 6
Change the style of a button cast member	"Cast Member Info" in the Cast menu section in Chapter 6
Change the shape of a shape cast member	"Cast Member Info" in the Cast menu section in Chapter 6
Crop a film loop, linked Director movie, or digital video movie	"Cast Member Info" in the Cast menu section in Chapter 6
Open the application you used to create a cast member outside Director and edit the cast member	"Launch Editor" in the Cast menu section in Chapter 6

Creating a sequence of cast members

There are times when you'll need to make minor changes to a single cast member to create a sequence of cast members for frame-by-frame animation. For example, if you want to create an animation of a bird flying, you don't have to redraw the entire bird for each stage of the sequence. You can duplicate the bird's body, and then add a different set of wings to each copy to create each stage in the sequence.

To create a sequence of artwork:

1. **Go to the cast window and select the cast member you want to base the sequence on.**

2. **Choose Duplicate Cast Member from the Cast menu (or press Command-D).**
    A copy of the cast member is placed in the next available cast member position.

Note   *It's a good idea to give a duplicate cast member a new name. To rename a cast member, select it in the cast window, and then choose Cast Member Info from the Cast menu. When the Cast Member Info dialog box appears, type a name for the cast member, and then click OK.*

3. **Double-click the new cast member to display it in the paint window.**

4. **Use the paint tools to change the cast member.**

5. **Choose Duplicate Cast Member from the Cast menu again.**
    A copy of the cast member you just modified appears in the paint window (the copy is also added to the cast window). By starting with a copy of the cast member you just changed, rather than the first cast member in the sequence, you can pick up exactly where the last frame left off.

6. Repeat the process until you've completed the sequence.

For information about adding a sequence of cast members to a movie, see "Recording with Cast to Time" in Chapter 2, "Creating Animations." For information about turning a sequence of cast members into a film loop, see "Film loops," also in Chapter 2.

Automatically creating in-between cast members

You can use the Rotate Left, Rotate Right, Free Rotate, Perspective, Slant, and Distort commands on the Effects menu to change a cast member's shape or orientation.

Original cast member

After using Rotate Right

After using Rotate Left

After using Free Rotate

After using Perspective

After using Distort

After using Slant
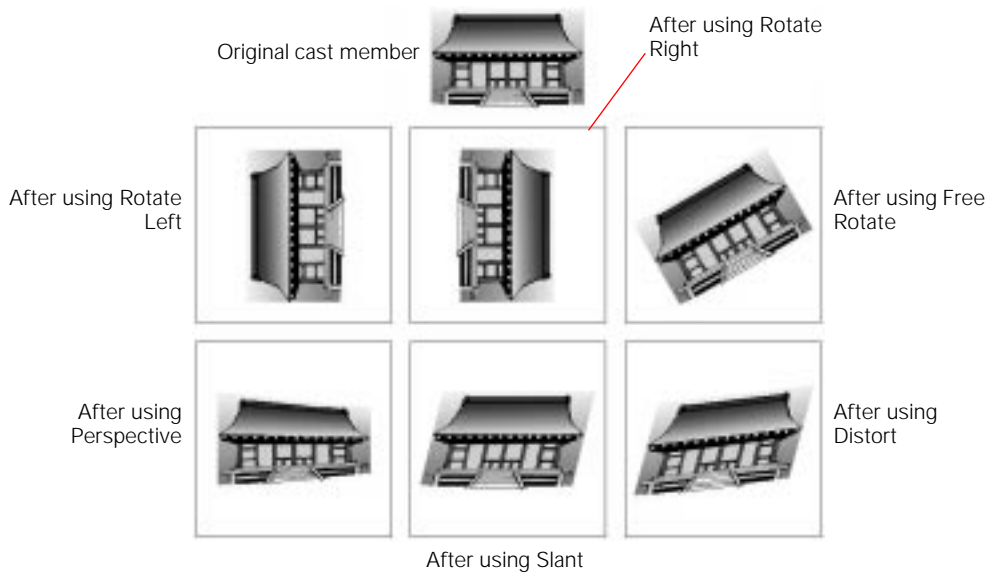
You can also stretch or squeeze a cast member in the paint window by selecting it and then holding down the Command key as you drag it.

Original cast member
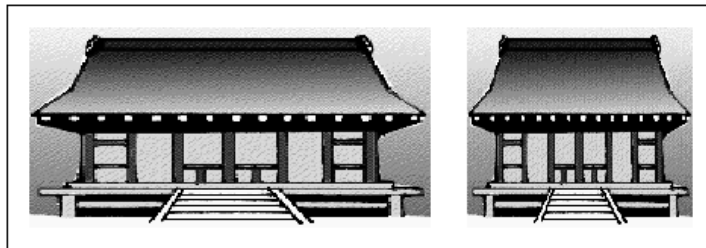
After stretching   After squeezing

After you've changed a cast member in any of those ways, you can use the Auto Distort command on the Effects menu. Auto Distort automatically generates the in-between positions in an animated sequence that starts with the cast member as it originally looks and ends as it looks after you've changed it. For example, you can use Auto Distort to create all the cast members you need to animate a wheel rotating.
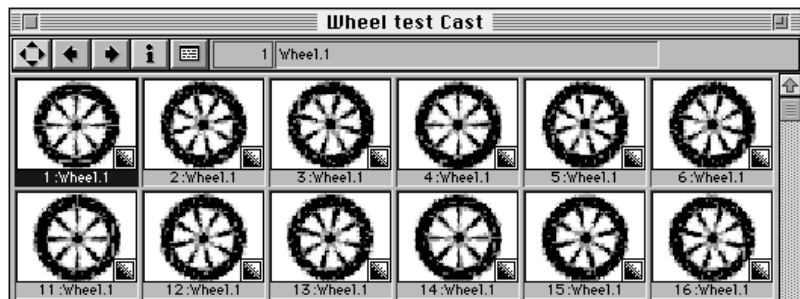
You can also use Auto Distort to generate the cast members that show a picture postcard fluttering to the bottom of the stage.
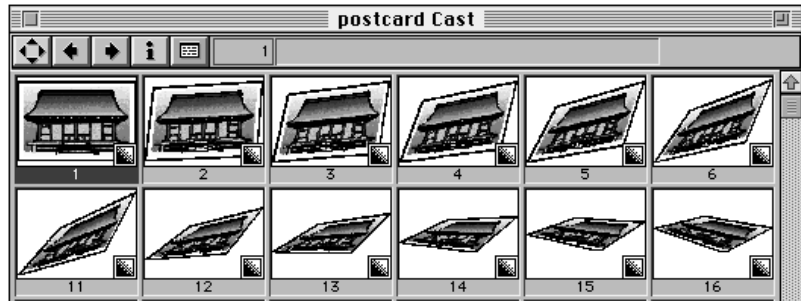
To create in-between cast members automatically:

1. **Use the selection rectangle tool to select the cast member you want to start with.**

2. **Change the cast member's orientation or shape.**

   ◇ If you choose the Rotate Left or Rotate Right commands, Director rotates the cast member 90 degrees in the corresponding direction. You can drag any of the handles that appear at the four corners of the selection rectangle to adjust its orientation further.

   ◇ If you choose Free Rotate, Perspective, Slant, or Distort, drag any of the handles that appear at the four corners of the selection rectangle to adjust the cast member's orientation.

   ◇ If you want to stretch or squeeze the cast member, hold down the Command key and then drag the cast member in the appropriate direction.

3. While the selection rectangle is still visible, choose Auto Distort from the Effects menu.

The Auto Distort dialog box appears.
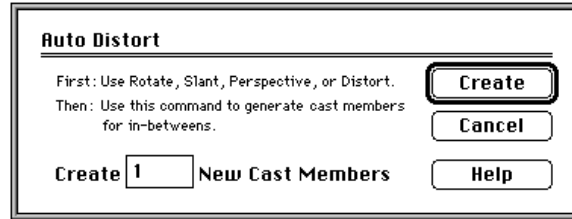
4. Type the number of in-between cast members you want, and click Create.

Director creates the new cast members and displays them in the cast window.

▶ *Tip*   *To add the entire sequence to the score in a single step, use the Cast to Time command. For information, see "Recording with Cast to Time" in Chapter 2, "Creating Animations."*

Changing color depth

The most important thing to remember when you're dealing with cast members and their color depth is this: The monitor you're using, the movie you're working on, and every cast member in the movie has its own color depth setting.

Changing a cast member's color depth has an irreversible effect on the cast member, so it's not a change you should make without advance planning. But it's a valuable—and in some cases, an invaluable—tool: Changing a cast member's color depth can save memory and improve performance, it can be one step in the process of creating cast members that look good on both Macintosh and Windows computers, and it's essential when you want to colorize a black-and-white cast member.

Choosing color depth

Color depth is, most simply, the number of colors you can use at any one time. The color depth of the monitor you're using, the movie you're working on, and every cast member in the movie can range from black and white to millions of colors.

A cast member's color depth setting determines both the number of colors you can choose from when you're creating a cast member and the colors that are displayed when the cast member appears on the screen. But it isn't the only determining factor. Three interrelated factors are at work:

◆   The color depth of the cast member you're working on

◆   The graphics display card and monitor you're using

◆   The monitor settings that are in effect.

For example, if your graphics display card can't display millions of colors, it doesn't matter if you set the color depth of a cast member to allow you to use millions of colors. And it doesn't matter if your graphics display card can display millions of colors and you've set the color depth of a cast member to allow you to use millions of colors if your monitor is set to display only black and white.

A monitor—depending on its type and the graphics display card that's installed—can display 1-bit color (black and white), 2-bit color (4 colors), 4-bit color (16 colors), 8-bit color (256 colors), 16-bit color (32,768 colors), 24-bit color (16.7 million colors), and 32-bit color (16.7 million colors and 8 bits of special effects). When you create a new movie or a new cast member, Director gives it the same color depth that the monitor is currently using. For example, if you have the monitor set to black and white, any new movie or cast member you create has a color depth of 1 bit. If you have the monitor set to millions of colors, any new movie or cast member you create has a color depth of 32 bits.

Changing a movie's color depth

A movie's color depth is important only if you select Switch Monitor's Color Depth to Match Movie's (in the Preferences dialog box) before you save the movie. When that option is selected, Director automatically changes the monitor's color depth setting to the color depth of the movie whenever you open the movie.

To select the option:

1. **Choose Preferences from the File menu.**
   The Preferences dialog box appears.
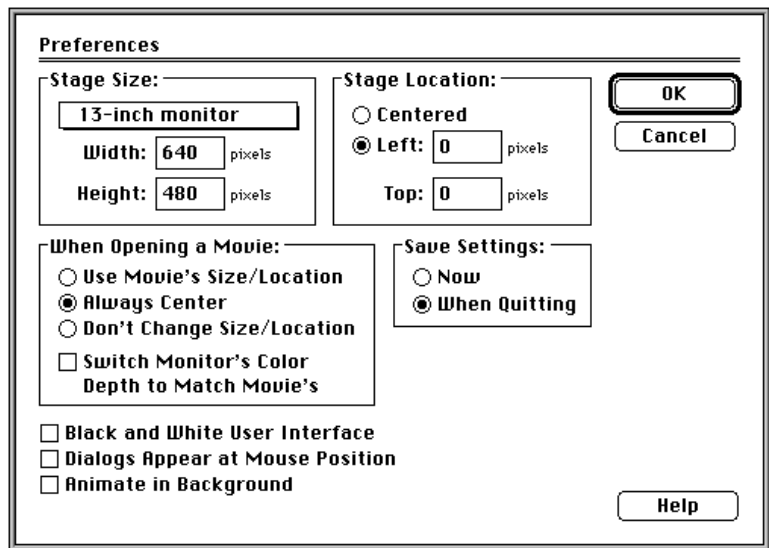
2. **Click the checkbox next to Switch Monitor's Color Depth to Match Movie's.**

3. **Click OK.**
   The new setting is saved when you save the movie.

To change the color depth of a movie:

1. **Go to the System's Control Panel folder, and open the Monitor control panel.**
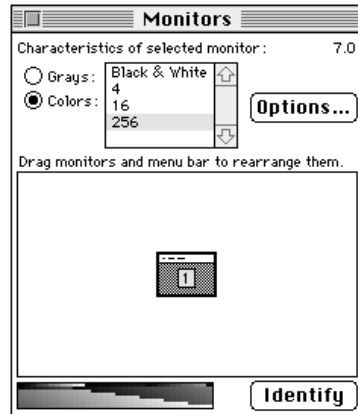
2. **Choose the color setting you want.**
   The colors displayed on the screen change as soon as you choose a new setting.

3. **Go back to Director, and save the movie.**
   From now on, whenever you open the movie, the monitor will change to the current settings.

Changing a cast member's color depth

A cast member's current color depth is displayed in the Cast Member Info dialog box. You can display the dialog box by selecting the cast member in the cast window and then choosing Cast Member Info from the Cast menu.

Color depth

Bitmap Cast Member Info

Cast Member: 1   Girl   **OK**

Palette: System   **Cancel**

Purge Priority: 2 - Normal   **Script...**

Colors: 8 bits
Size: 30.1 Kilobytes

☐ Auto Hilite   **Help**
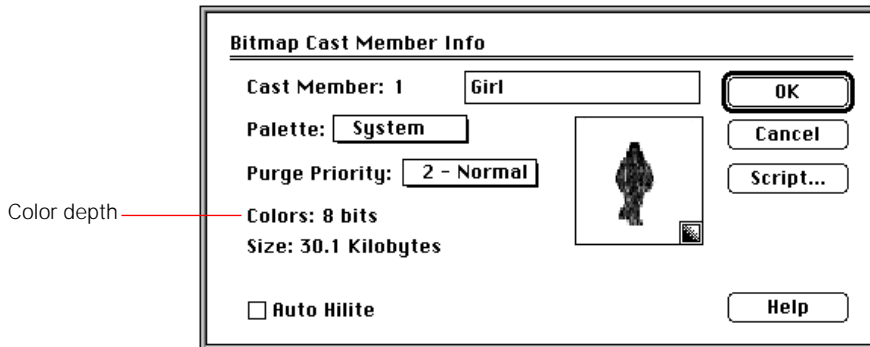
A bitmapped cast member's color depth is also displayed in the paint window.

▶OTHER◀
8 bits — Color depth
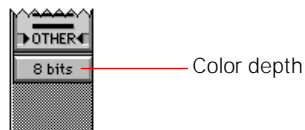
Changing a cast member's color depth can save memory and improve performance. For example, it takes eight times as much memory to define the color of an 8-bit cast member as it does to define a 1-bit cast member, and it takes longer to animate an 8-bit cast member as well. Surprisingly, that's true of an 8-bit cast member even when the only colors it uses are black and white. So, you can change the color depth of an 8-bit cast member that's black and white to 1 bit without changing its appearance—and both save space and improve performance.

► **_Tip_**   _A 1-bit cast member doesn't have to be black and white. You can select a foreground and a background color for a 1-bit cast member when it's on the stage (when the cast member is on the stage, it's called a sprite). To select a foreground and a background color for a sprite, first select the cells in the score connected with the sprite (don't select the cast member in the cast window). Then choose a foreground and a background color from the foreground and background color pop-up palettes in the tools window (don't use the palettes in the paint window)._

You can also improve performance by reducing the color depth of a cast member to the color depth of the monitor. For example, if you're running a movie with 32-bit cast members on a monitor set to 256 colors, change the color depth of the cast members to 8 bits. Performance slows down when the color depth of the cast members is higher than that of the monitor because every time Director displays a cast member, it needs to remap the colors from a 32-bit scheme to a 256-color palette.

You may also want to increase the color depth of a cast member. For example, if you import a black-and-white cast member into a color movie, you can change its color depth and then colorize it.

To change a cast member's color depth:

1. **Go to the cast window, and select the cast member.**
   If you want to change the color depth of more than one cast member, select them all. Use Shift-click to select a range or Command-click to select cast members that aren't next to each other.

2. **Choose Transform Bitmap from the Cast menu.**
   The Transform Bitmap dialog box appears.
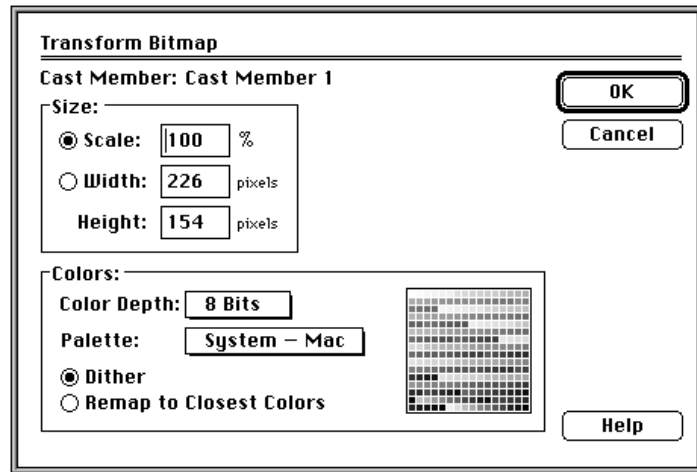
3. **Choose the color depth setting you want from the Color Depth pop-up menu in the lower half of the dialog box.**
   For information about the other settings, see "Transform Bitmap" under "Cast menu" in Chapter 6, "Menu Reference."

4. If you're changing the cast member to a lower color depth, select either Dither or Remap to Closest Colors.

The appearance of a cast member doesn't change when you switch from a lower color depth to a higher one. A black-and-white image remains black and white; changing its color depth just gives you the opportunity to add color to it. The appearance of a cast member may change when you switch from a higher color depth to a lower one. If you change the color depth of a black-and-white cast member from 8 bit to 1 bit, it won't look any different. But if you change the color depth of a cast member with colors other than black and white from 8 bit to 1 bit, Director changes all the colors to either black or white. The Dither and Remap to Closest Colors options let you decide how you want Director to handle the change.

Dither tries to match the cast member's original colors or shading by creating a blend of the colors available in the new color depth.
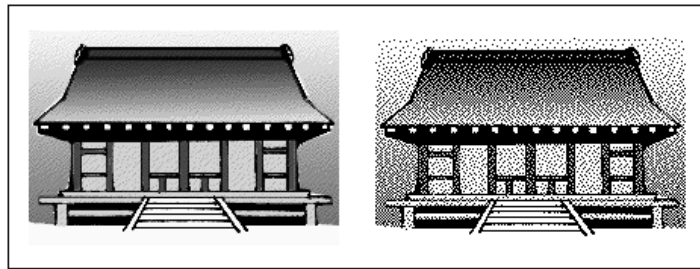
256 grays   Dithered in black and white

Remap to Closest Colors selects the colors available in the new color depth that are the closest to the cast member's original colors or shading.
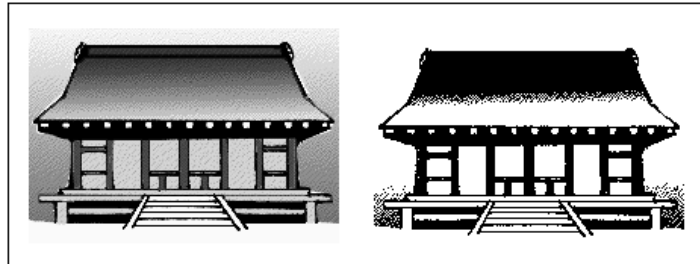
256 grays

Remapped to closest colors in black and white

5. Click OK.
An alert appears, warning you that you can't undo a change to a cast member's color depth.

6. Click OK.
Director changes the cast member's color depth.

Colorizing black-and-white bitmaps

You can colorize 1-bit cast members by increasing their color depth and then using the paint tools and ink effects to add color to them.

To colorize a 1-bit cast member:

1. Select the cast member in the cast window.

2. Choose Transform Bitmap from the Cast menu.
The Transform Bitmap dialog box appears.

3. Choose the color depth setting you want from the Color Depth pop-up menu in the lower half of the dialog box.
For information about each of the settings, see "Transform Bitmap" under "Cast menu" in Chapter 6, "Menu Reference."

4. Click OK.
An alert appears warning you that you can't undo a change to a cast member's color depth.

5. **Click OK.**
    Director changes the cast member's color depth.

6. **Display the cast member in the paint window, and use any of the following techniques to colorize it:**

    ◇   Use the paint bucket to fill solid areas with color.

    ◇   Use the Switch Colors command on the Effects menu to replace the foreground or background color with another color. For more information, see the next heading, "Switching colors in a cast member."

    ◇   Use the Switch ink effect to paint over the foreground or background color with another color.

    ◇   Use the Lightest ink effect to paint over any color that's darker than the color you've selected.

    ◇   Use the Darkest ink effect to paint over any color that's lighter than the color you've selected.

    ◇   Use the Blend ink effect to create a translucent object superimposed over the object you're colorizing. The color of the translucent object (which is the current foreground color) is blended with the foreground and background color of the object you're colorizing.

Switching colors in a cast member

Switching colors in a cast member is a quick way to colorize a black–and–white image. It's also an invaluable technique for changing a color that's scattered through an image to a different color.

The two methods for switching colors—the Switch Colors command on the Effects menu and the Switch ink effect—work essentially the same way. They change any pixel that matches the color you've selected in the paint window's foreground color chip to the color you've selected in the destination color chip.

When you switch colors, you change any pixel that is the current foreground color to the destination color.

Before the color has been switched — — After the color has been switched
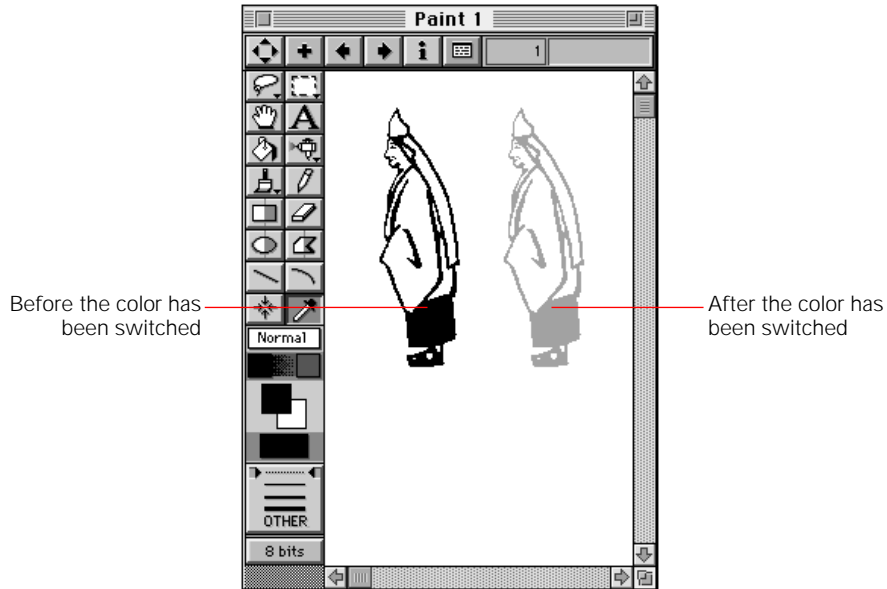
You can use the Switch Colors command to switch colors throughout an entire cast member or in just an area you've selected. You can use the Switch ink effect to paint over an existing color with a new one.

Switching colors using the Switch Colors command

To switch colors with the Switch Colors command:

1. **Display the cast member in the paint window.**

2. **Select the eyedropper.**

3. **Use the eyedropper to click the part of the cast member that contains the color you want to change.**
   The color in the foreground color chip changes to the color you click.

Eyedropper

Foreground color chip —

Destination color chip

Foreground color chip —
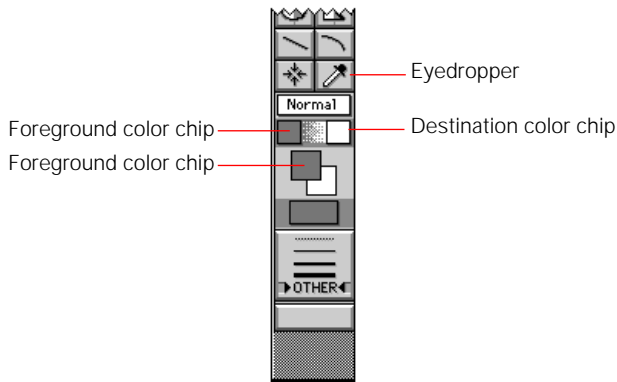
4. **Use the destination color chip to select the color that you want to change the current color to.**

5. **Use the selection rectangle or lasso to select the entire cast member or the area where you want the change to take effect.**

6. **Choose Switch Colors from the Effects menu.**
   The parts of the selected area that match the current foreground color change to the destination color.

Switching colors using the Switch ink effect

To switch colors with the Switch ink effect:

1. **Display the cast member in the paint window.**

2. **Select the eyedropper.**

3. **Use the eyedropper to click the part of the cast member that contains the color you want to change.**
   The color in the foreground color chip changes to the color you click.

Ink pop-up menu ———— Eyedropper

Foreground color chip ———— Destination color chip

Foreground color chip
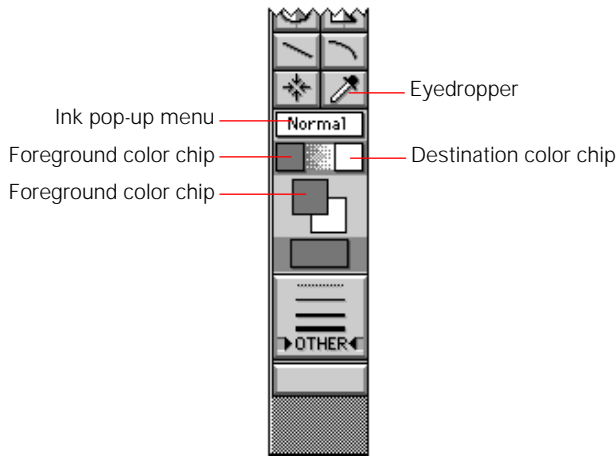
4. **Use the destination color chip to select the color that you want to change the current color to.**

5. **Select the paintbrush, and then choose Switch from the ink effects pop-up menu.**

6. **Paint the area you want to change.**
   The parts of the area that match the current foreground color change to the destination color.

Combining several pieces of art into one full-screen background

On occasion you may find that you're using several cast members to create a static background for animation. You can save space, improve performance, and use fewer channels in the score if you arrange the cast members on the stage, export the frame that contains them as a PICT file, and then import the PICT file and use it as the background.

To create a full-screen background from several cast members:

1. **Arrange the cast members on the stage as you want them to appear.**

2. **Choose Export from the File menu.**
    The Export dialog box appears.
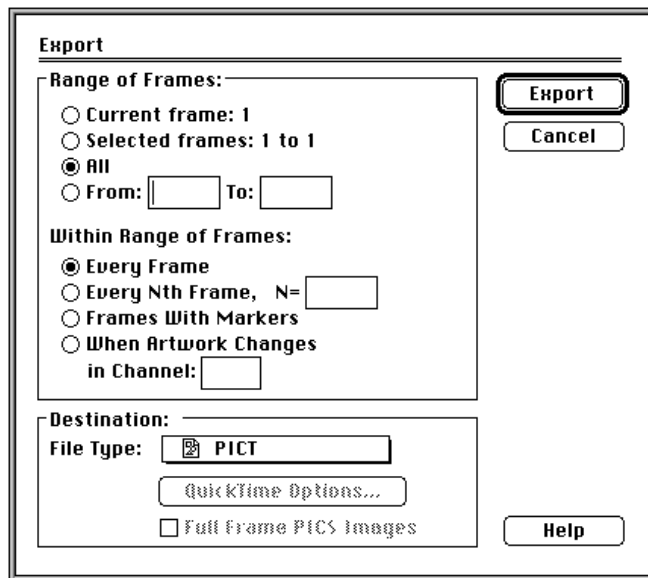
3. **Choose PICT from the File Type pop-up menu (near the bottom of the dialog box).**

4. **Under Range of Frames, select Current Frame, and then click the Export button.**
   The Save dialog box appears.

5. **Type a name for the file, and then click Save.**
   Director saves the frame as a PICT image.

6. **Choose Import from the File menu, and import the file you've just saved.**
   Director imports the full–screen image as a cast member. You can drag it to the stage to use as a background in channel 1.

Working with cast members in the cast window

The main function of the cast window is to provide a place where you keep the cast members you plan to use in a movie. But it's more than just that. You can also use the cast window to organize and arrange the cast—to name cast members, for example, to find and group them, and to delete those you aren't using.

Organizing and arranging the cast members not only makes them easier and more efficient to use, it also puts at your disposal capabilities that wouldn't be available otherwise. For example, once you've arranged a sequence of cast members next to each other in the cast window, you can align them and then flip through them in the paint window to see how they will look when you animate them.

You can also use the cast window to make movies load more efficiently and perform better. If you have two or more movies that use some of the same cast members, you can create a separate movie that contains nothing more than the cast window filled with the cast members the movies share.

The procedures in this section show how to name cast members, how to find cast members by name or by the palette they use, how to find and delete unused cast members, how to sort the cast, and how to create a shared cast.

Other things you can do in the cast window

What you can do	Where to find out how
Drag cast members from one position to another	"Moving cast members within the cast window" in the Cast window section in Chapter 5
Cut, copy, and paste cast members in the cast window	"Cut," Copy," and "Paste" in the Edit menu section in Chapter 6
Duplicate a cast member	"Copy" under "Edit menu" and "Duplicate Cast Member" in the Cast menu section in Chapter 6
Get information about a cast member	"Cast Member Info" in the Cast menu section in Chapter 6
Set when a cast member may be removed from memory if it's not being used and memory is low	"Cast Member Info" in the Cast menu section in Chapter 6
Find cast members in the cast window by type	"Find Cast Members" in the Cast menu section in Chapter 6
Arrange bitmap cast members so they appear aligned in the cast window	"Align Bitmaps" in the Cast menu section in Chapter 6
Play a sound file	"Cast Member Info" in the Cast menu section in Chapter 6
Mute the sound in a film loop, linked Director movie, or digital video movie	"Cast Member Info" in the Cast menu section in Chapter 6
Set a linked Director movie so Director follows the instructions in its Lingo scripts	"Cast Member Info" in the Cast menu section in Chapter 6
Set the way Director handles a digital video movie	"Cast Member Info" in the Cast menu section in Chapter 6
Change the size of the thumbnails in the cast window	"Cast Window Options" in the Cast menu section in Chapter 6
Change the number of cast members displayed in a row in the cast window	"Cast Window Options" in the Cast menu section in Chapter 6
Change the number of cast members that can be displayed in the cast window	"Cast Window Options" in the Cast menu section in Chapter 6

Naming a cast member

Giving a cast member a name is a much better way of identifying it than using the number of the position in the cast window that it occupies. The name you give a cast member remains the same no matter where it appears in the cast window. The position that a cast member occupies may change if you rearrange cast members in the cast window or reorganize them with the Sort Cast Members command. Naming cast members also makes it easier to find and select cast members with the Find Cast Members command.

Naming cast members can also save you a great deal of work if you've created Lingo scripts that refer to cast members. If you've referred to cast members by number and you then rearrange them in the cast window, you have to change each script by hand so it refers to the number of the cast member's new position. If you've referred to the cast members by name in the scripts, you don't need to make any change to the scripts: a cast member's name isn't affected by changing its position in the cast window.

To name a cast member:

1. **Open the cast window and select the cast member you want to name.**

2. **Choose Cast Info from the Cast menu.**
    The Cast Info dialog box appears.
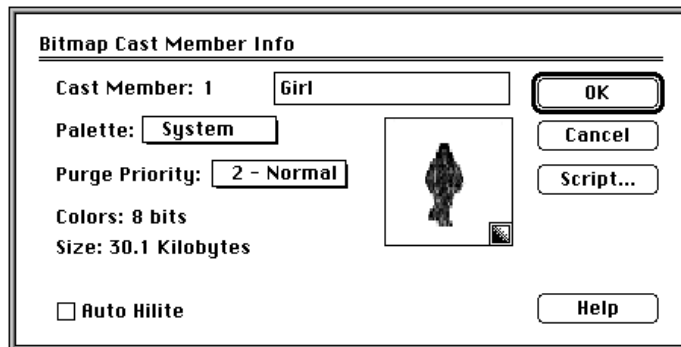
3. Enter a name in the Name entry box.

The name can be 31 characters long.

▶ *Tip*   *You can also use the cast member name field in any window where it appears to name or rename a cast member. (The cast member name field appears at the top of the cast window, the paint window, the text window, and so on.)*

4. Click OK.

Director assigns the name to the cast member.

Note   *Director allows you to give two cast members the same name. If a Lingo script refers to a name you've given to more than one cast member, the script uses the cast member that appears first in the cast window.*

Finding a cast member by name

If you've given a name to a cast member, you can use the name to find the cast member in the cast window using the Find Cast Members command. If a group of related cast members have a common element in their names (such as *Bird 1, Bird 2,* and so on), you can use the common element to find all of them at the same time.

To find a cast member by name:

1. **Make the cast window active.**

2. **Choose Find Cast Members from the Cast menu.**
   The Find Cast Members dialog box appears.

Select this option ——————

Find Cast Members

◉ whose type is: [All]   [**Select All**]

○ whose name begins with: [|]   [Select] ——————— Type the cast member's name here

○ that use the [**System**] palette   [**Done**]

○ that are not used in the score

1:

View ◉ by Number ○ by Name   [**Help**]
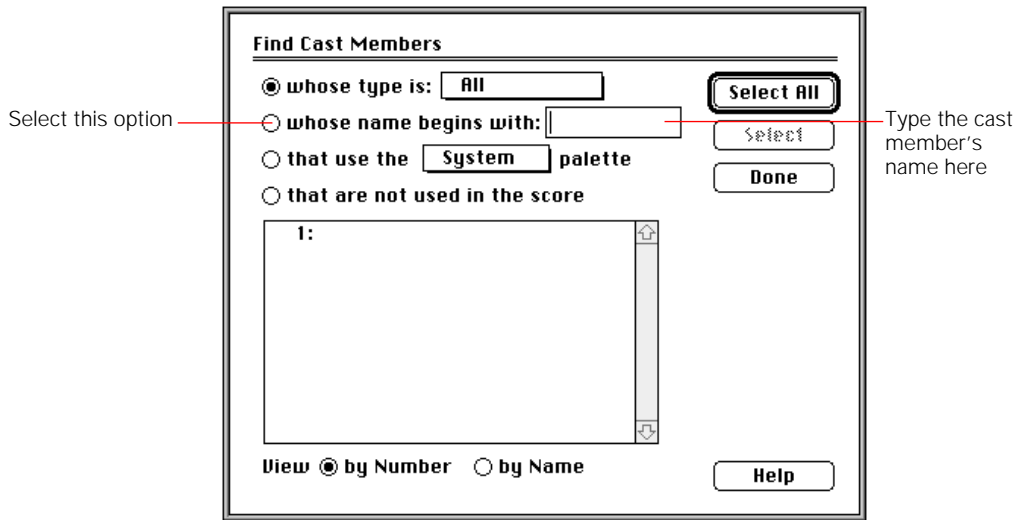
3. **Select the second option, Whose Name Begins with.**

4. **Enter the name of the cast member you want to find.**
   You don't have to type the entire name, just enough to distinguish it from other similar names.

5. **Click Select.**
   Director finds the first cast member whose name matches the text you've entered and selects it in the cast window.

   If you want to find and select all the cast members whose names match the text, click the Select All button.

Finding cast members by their palettes

Although different cast members in the same movie can use different color palettes, only one palette can be active at a time. That means there may be times when you need to find a group of cast members created with one palette and map them to the palette used by a different group of cast members so that you can use the two groups on the stage at the same time.

You can use the Find Cast Member command to identify which cast members use a particular palette. Once you've found the cast members that use a particular palette, you can then use the Transform Bitmap command to map them to a different palette.

To find the cast members that use a specific palette:

1. **Make the cast window active.**

2. **Choose Find Cast Members from the Cast menu.**
    The Find Cast Members dialog box appears.

Select this option ——
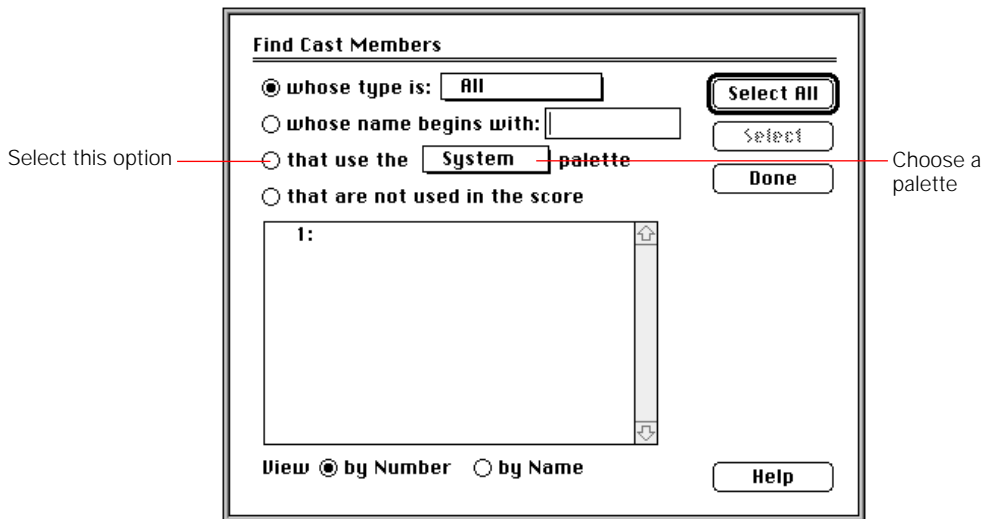
Choose a palette

The third option has a pop-up menu that lists all the palettes currently available.

3. **Choose the palette used by the cast members you want to find.**

4. **Make sure the button next to the third option is selected.**

5. **Click Select All.**
   The cast members that use the palette you chose appear highlighted in the cast window.

Note   *For information about mapping cast members to a different palette, see "Working with color palettes" in Chapter 3, "Working Behind the Scenes."*

Deleting unused cast members

When you finish a movie, you may find that you've created or imported cast members you've decided not to use in the movie. Deleting the unused cast members reduces both the space it takes to save the movie and the amount of memory the movie needs to run.

Note   *Use the Save and Compact command on the File menu to get rid of the unused space a cast member occupied before you deleted it. If you use the Save command, Director records that you've deleted the cast member, but it doesn't reuse the space the cast member occupied.*

You can identify the cast members that aren't used in the score with the Find Cast Members command, and then use the Clear Cast Members command on the Edit menu to delete them.

To delete unused cast members:

1. Make the cast window active.

2. Choose Find Cast Members from the Cast menu.
The Find Cast Members dialog box appears.

Select this option ——

Find Cast Members

● whose type is: | All |　　　　　| Select All |
○ whose name begins with: | |　　| Select |
○ that use the | System | palette　| Done |
○ that are not used in the score

1:

View ● by Number　○ by Name　　　| Help |
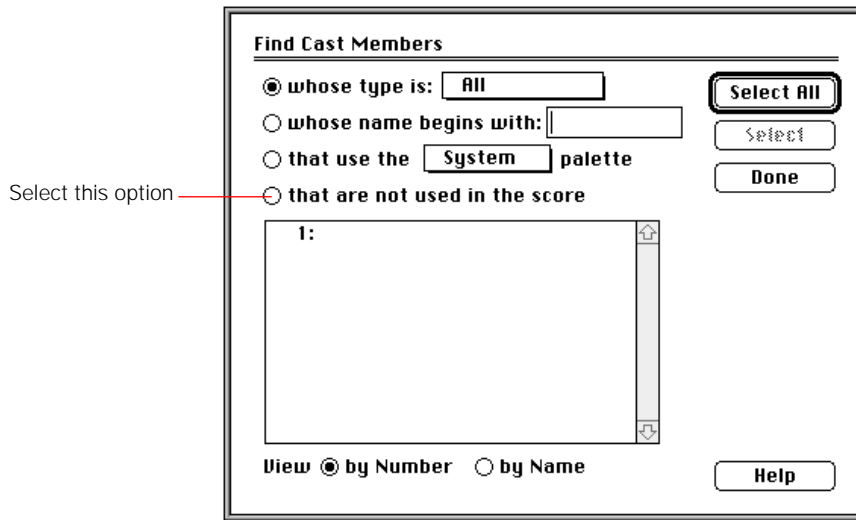
3. Select the fourth option, That Are Not Used in the Score.

4. Click Select All.
The thumbnails of the cast members that aren't used in the
current movie are highlighted.

Note　*The Unused in Score option selects all the cast members that aren't used in the
score. Just because a cast member isn't used in the score, however, doesn't
mean it isn't used in the movie. It may be a script that's attached to a button
or a graphic or sound that's referred to only in a script. Before you delete all
the cast members that are selected, make sure none of them is used in the
movie somewhere outside the score.*

5. Choose Clear Cast Members from the Edit menu.
Director deletes the unused cast members.

Cleaning up the cast

If you're working with a large cast, after a while you may find gaps in the cast window where you've cut or cleared cast members. You can eliminate the gaps by sorting the cast.
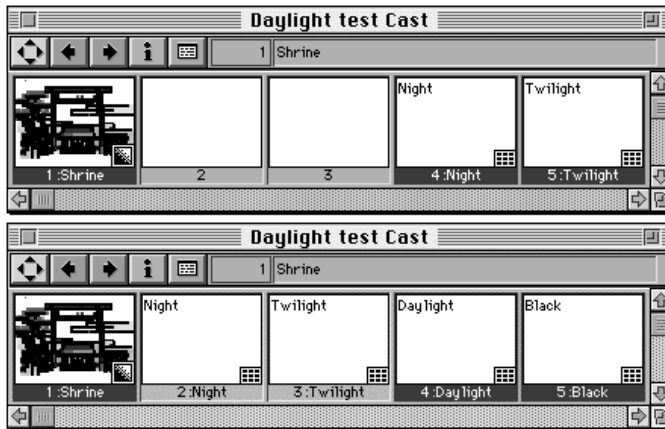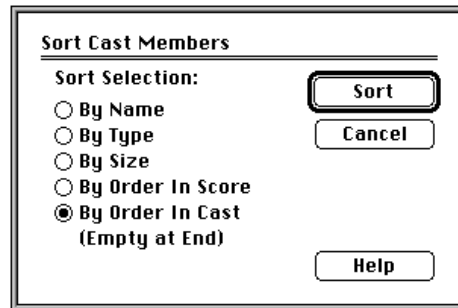

The cast before and after cleaning up

Note   *When you clean up the cast, the positions many of the cast members occupy in the cast window will change—and so will the numbers currently associated with them. If you've written Lingo scripts that refer to cast members by number, it's best to name those cast members and then change the references in the scripts to the cast members' names. Otherwise, you'll need to update the reference numbers one by one every time you clean up the cast.*

To clean up the cast:

1. **Make the cast window active.**

2. **Choose Select All from the Edit menu (or press Command-A) to select the entire cast.**
   If you're working with a movie that includes a shared cast, sorting the cast won't affect the cast members that are part of the shared cast. To clean up the shared cast, you need to open the shared cast movie.

3. Choose Sort Cast Members from the Cast menu.

The Sort Cast Members dialog box appears.

```
┌─────────────────────────────────────────┐
│                                         │
│  Sort Cast Members                      │
│  ─────────────────────────────────────  │
│  Sort Selection:         ┌──────────┐   │
│  ○ By Name               │   Sort   │   │
│  ○ By Type               └──────────┘   │
│  ○ By Size               ┌──────────┐   │
│  ○ By Order In Score     │  Cancel  │   │
│  ● By Order In Cast      └──────────┘   │
│     (Empty at End)                      │
│                          ┌──────────┐   │
│                          │   Help   │   │
│                          └──────────┘   │
│                                         │
└─────────────────────────────────────────┘
```

4. Choose the final option, By Order in Cast.

5. Click Sort.

Director reorders the cast members and moves all the empty cast member positions to the end.

The score automatically adjusts to the new cast member positions so the movie doesn't change.

Creating a shared cast

If you find that you're working on two or more related movies that share many of the same cast members, you can create a special movie that contains just the cast members the movies share. What makes the movie special is its name—SHARED.DIR. When you open any movie that's in the same directory as a movie named SHARED.DIR, the cast members in SHARED.DIR automatically appear in the movie's cast window. A shared cast is especially useful for storing the background graphics, scripts, buttons, sounds, cursors, and fonts that several movies all make use of.

Sharing cast members saves disk space because you don't have to save the same cast members in several different movies. Sharing cast members can also save time when you're opening a movie: Once a movie has opened the shared cast and loaded it into memory, the shared cast remains in memory. If you then open another movie, it doesn't have to load the shared cast into memory a second time. (However, if the new movie needs the memory the shared cast is using, it will replace the shared cast.)

For more information about shared casts, see "Frequently Asked Questions" in *Tips & Tricks*.

To create a shared cast:

1. **Choose New from the File menu (or press Command-N) to create a new movie.**

2. **Select a slot in the cast window that's far enough from the top that it will appear below any cast members that belong to the movies that will use the shared cast.**
   You need to leave enough room at the top of the cast window to accommodate the entire cast of any single movie that uses the shared cast.

   For example, suppose three movies use the shared cast. One has its own cast of 50 cast members (excluding the shared cast), another has its own cast of 75 cast members, and a third has its own cast of 100 cast members. To accommodate all 3 movies, you need to leave room for at least 100 cast members at the top of the cast window because that's the amount of space the largest cast occupies.
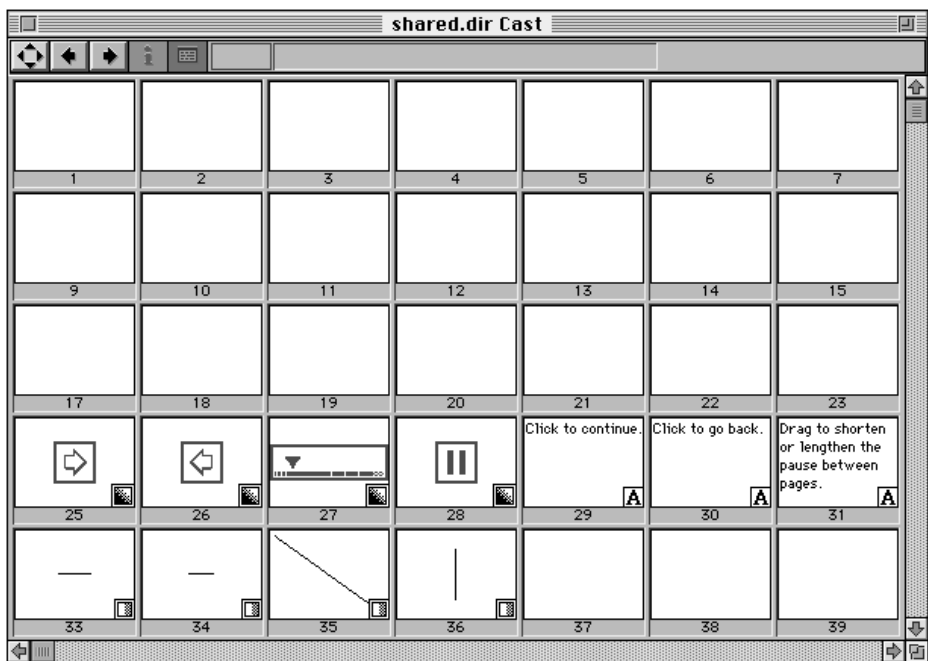
A shared cast as it appears in the cast window in SHARED.DIR
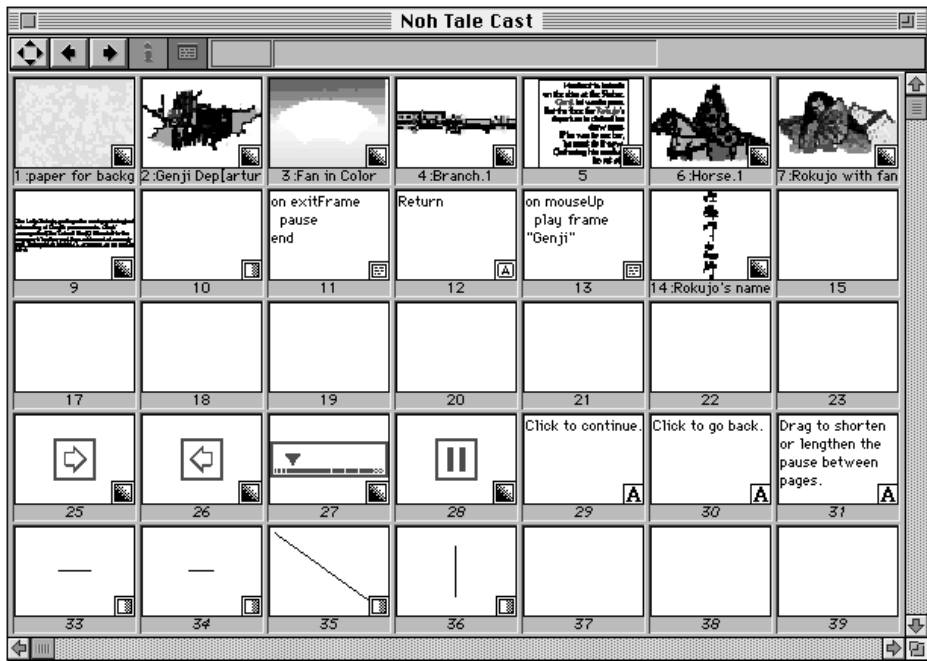
The same shared cast as it appears in the cast window of one of the movies that shares it

3. Import the cast members that you want the movies to share.

4. Save the movie. Name it SHARED.DIR.
Make sure SHARED.DIR is in the same directory as the movies that you want to share its contents.

When you open any movie that's in the same directory as SHARED.DIR, the cast members in SHARED.DIR automatically appear in the movie's cast window. The labels of shared cast members appear in *italics*. You can use shared cast members just as you would any other cast members in the movie's cast window. You can also edit shared cast members just as you would any other cast member in the movie's cast. When you save the movie, Director saves changes to the movie's own cast as part of the movie and changes to the shared cast as part of SHARED.DIR.

If you open a movie that's in a directory that has no shared cast, the shared cast that's currently in memory is removed from memory. If you open a movie that's in a directory that has its own shared cast movie, the new shared cast is loaded into memory, and the old shared cast is removed.

Note   *If you've created a shared cast movie with an old version of Director, before you can use it with a movie created with the current version of Director you need to open the movie in the current version of Director, rename it SHARED.DIR, and save it as a new movie.*

Working with cast members in the score and on the stage

You can make a cast member part of a movie by dragging it either to the stage or to a cell in the score. That's because the score is another view of whatever appears on the stage. But remember that cast members include not just the images you move around the stage, but sound effects and music, color palettes, and the Lingo scripts that provide interactivity and control of a Director movie. There's a place for every type of cast member in the score, and as a result, the score contains much more than what appears on the stage—it includes everything that's part of a movie.
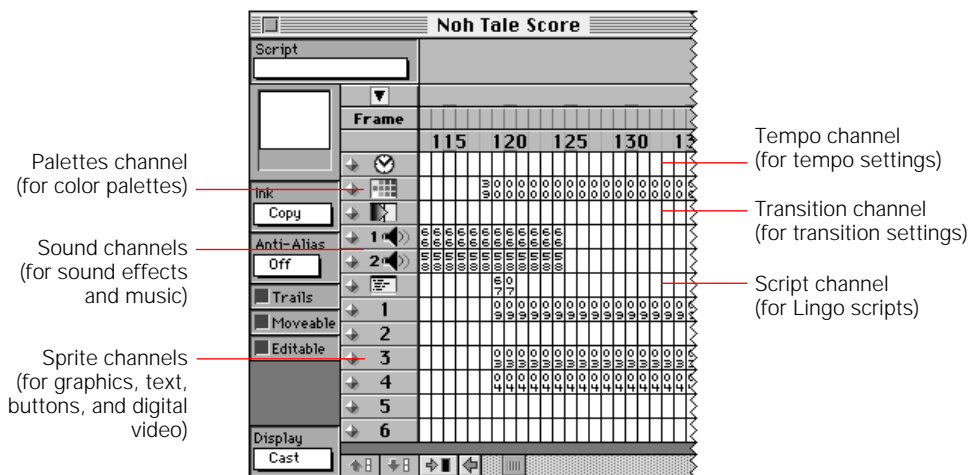
Some types of changes to a movie—such as adding or deleting a sound effect—appear only in the score. Changes that affect the appearance of the stage, on the other hand, are always reflected both on the stage and in the score. For example, if you make a change directly on the stage—say, move a block of text—Director records the change in the score automatically. If you make a change in the score—say, apply an ink effect to a graphic—Director immediately redraws the graphic on the stage to show the new information recorded in the score.

The procedures in this section show how to place a cast member on the stage, how to stretch and squeeze a sprite, how to use the score's ink effects, and how to clear a sequence of frames.

Other things you can do in the score and on the stage

What you can do	Where to find out how
Select cells	"Selecting cells" in the score window section in Chapter 5
Select an entire channel	"Selecting cells" in the score window section in Chapter 5
Extend a selection	"Selecting cells" in the score window section in Chapter 5
Select all the cells in a frame	"Selecting cells" in the score window section in Chapter 5
Position an insertion point down an entire frame	"Selecting cells" in the score window section in Chapter 5
Select discontinuous ranges of cells	"Selecting cells" in the score window section in Chapter 5
Drag a cast member from the paint window to the score or the stage	"Place button" in the paint window section in Chapter 5
Clear cast members on the stage	"Delete Sprites" in the Score menu section in Chapter 6
Cut, copy, paste, and clear cells in the score	"Cut," "Copy," "Paste," and "Clear" in the Edit menu section in Chapter 6
Reposition a cast member with the Tweak window	"The tweak window" in Chapter 5
Specify the exact location of a cast member on the stage	"Sprite Info" under "Score menu" in Chapter 6
Apply ink effects to cast members on the stage	"Ink pop-up menu" under "The Score window" in Chapter 5

Placing cast members on the stage

Once you've imported or created a cast member, you need to place the cast member on the stage or in the score to make it part of the movie.

When you place a cast member on the stage, you don't move the cast member bodily from the cast window to the stage as you put a chessman on a chessboard. Placing a cast member on the stage creates a new element: a **sprite**. The cast member remains in the cast window, and the sprite—an image of the cast member—appears on the stage in its stead.

A cast member and a sprite aren't identical. A cast member is a template for a sprite. When you drag a cast member to the stage, it's like making a copy of a form letter: the master letter remains unchanged, but the copy gets filled in with specific information. The specific information the sprite gets "filled in with" includes such things as its location on the stage, any ink you apply to it, any change you make to its size, and so on. You can have more than one sprite based on the same cast member, each a separate image of the cast member with a different location on the stage, a different ink applied to it, a different size, and so on.

To place a cast member on the stage:

▶ **Drag the cast member from the cast window to the stage.**
A sprite representing the cast member appears on the stage in the current frame of the animation.

▶ *Tip*   *To drag a sequence of cast members to the stage and place them in consecutive cells in a channel, hold down the Option key as you drag.*

When Director creates the sprite that represents a cast member, it simultaneously records information about the sprite in a cell in one of the channels of the score. The information that appears in the score depends on the display option selected on the Display pop–up menu.

Information about a sprite

Display pop-up menu
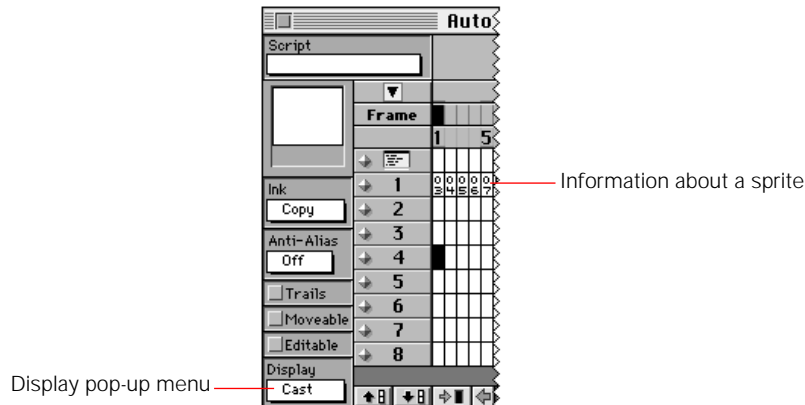
The default display option is *Cast*. When it's selected, the number of the cast member that the sprite represents appears in the cell.

The cell where Director has recorded the information about the sprite corresponds to the single frame of the movie where the sprite currently appears. Remember that every frame in the score represents a moment in time. For a sprite to appear on the stage during a given period of time, information about the sprite has to appear in every frame of the score that covers that period. You don't have to drag the cast member to the stage every time you want it to appear in a frame—Director has many techniques you can use to fill the frames of a movie with the cast members you want to appear on the stage. The techniques are covered in Chapter 2, "Creating Animations."

The channel where Director has recorded the information about the sprite has its own importance. A sprite recorded in a channel closer to the top of the score than the channel where another sprite is recorded appears behind the other sprite. The relative position of one sprite's channel to another sprite's is called the sprite's foreground priority. For more information, see "Changing layering" in Chapter 2, "Creating Animations."

When the score is active, press the Backspace or Delete key to remove a sprite that's selected from both the stage and the score. The cast member that corresponds to the sprite isn't affected.

To place a cast member in the score:

▶ **Drag the cast member from the cast window to the channel and frame where you want it to appear.**
Director places the cast member's sprite in the center of the stage.

You can also place a cast member on the stage or in the score by dragging it from the paint window. Just point to the Place button at the top of the paint window, hold down the mouse button, and drag to the spot on the stage where you want the cast member to appear.

Stretching and squeezing a sprite

You can squeeze or stretch a sprite to change its shape. The change you make to the sprite has no effect on the cast member the sprite represents or on any other sprites based on the same cast member.

Original cast member
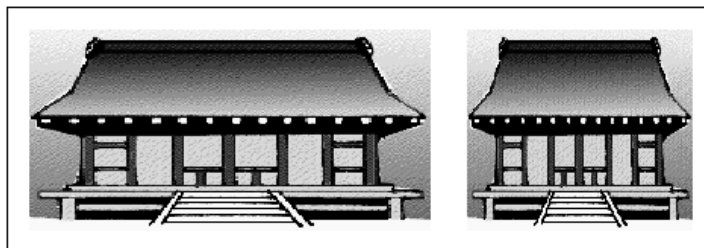
After stretching   After squeezing

To stretch or squeeze a sprite:

1. **Select the sprite or the cell in the score that corresponds to the sprite.**
    A selection rectangle with handles at the edges and corners appears around the sprite.

2. **Drag any of the handles.**
    When you drag the handle, the cast member stretches or squeezes in the direction you drag.

◆   **Stretching or squeezing a sequence of sprites.** The preceding technique works only for a single sprite. If you've already created a sequence of sprites and you want to stretch or squeeze them all in the same way, you need to select the entire sequence in the score, not just a single sprite on the stage. For more information, see "Changing a sequence of sprites."

◆   **Animating a stretch or a squeeze.** If you want to animate a sprite as it stretches or squeezes, see "Stretching and squeezing a sprite with in-betweening" in Chapter 2, "Creating Animations."

◆   **Speeding up animation.** When you use a cast member that's stretched, your animation may slow down. Try using the Auto Distort command to generate a series of stretched cast members.

Changing a sequence of sprites

Occasionally you'll find that after you created a sequence of sprites in a channel, you want to change something about the sequence. If it's a series of different sprites—perhaps a figure walking—you may want to change the position of the sprites on the stage; if it's a single sprite, you may want to change its shape or size. You can make the same change simultaneously to every sprite in the sequence by treating the series of cells in the score as a group.

To change a sequence of sprites:

1. **Select all the cells that are part of the sequence.**
   If the sequence is made up of sprites all based on a single cast member, you can double-click any cell in the sequence to select the entire sequence. You can also double-click the channel number at the left edge of the score to select the entire channel.

   When you look at the stage, you'll see one cast member selected on the stage.

2. **Make whatever change it is you want to make to the sprite.**
   Although it appears that you're changing only the sprite in the current frame, you're making the change to the information about the sprite in every cell you've selected.

You can select more than one channel if the change you want to make—for example, repositioning a group of sprites—applies to the sprite in each channel.

▶ *Tip*   *When you need to move the sprites precisely, use the Tweak window to move them a specific number of pixels. You can also use the arrow keys to move the sprites one pixel at a time.*

Using inks in the score

The score's ink effects are similar to the ink effects in the paint window but they serve a different purpose. You can apply the paint window ink effects to cast members only as you create them in the paint window. Once applied, those effects are permanent.

The score's ink effects determine how a sprite looks when it's on the stage. As a result, the score's ink effects don't change the appearance of a cast member permanently. For example, you can apply ink effects that make a sprite's background color transparent or that changes any black pixels in it to white. But those changes affect the sprite only in the specific cells where you've applied the ink effect. If you drag the same cast member to the stage to create a second sprite and apply a different ink effect to the new sprite, it may look completely different from the first.

Whenever you select cells in the score, the Ink pop-up menu changes to show the ink currently in effect. If more than one ink is in effect in the selection, the menu is blank.

For a quick overview of the effect each ink creates, take a look at the sample movie *Ink_FX*. To play it, go to the Macromedia Director 4.0 folder, open the Tutorials folder, and then the Learning Director folder. When you're finished watching the movie, press Command–period to stop it

To apply ink effects to a sprite:

1. **Make the score window active.**

2. **Select the cells that contain the sprite you want to apply the ink effect to.**
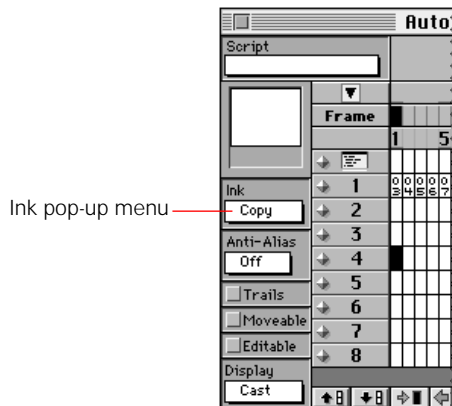
Ink pop-up menu

3. **Choose an ink effect from the Ink pop-up menu.**
   Director applies the ink effect to the sprite you've selected.

▶ *Tip* *You can apply an ink effect to a sprite on the stage without opening the score. Select the sprite on the stage, position the pointer on it, hold down the Command key, and then press the mouse button. The Ink pop-up menu appears. Choose an ink effect and release the mouse button. If more than one sprite is selected, Director applies the ink effect to all of them.*

Clearing a sequence of frames

To clear a sequence of sprites that occupies more than one frame:

1. **Make the score active.**

2. **Select the cells you want to clear.**

▶ *Tip*   *If you want to clear an entire channel, select it by double-clicking the channel number at the left of the channel.*

3. **Choose Clear Cells from the Edit menu (or press Backspace or Delete).**
    The entire sequence of sprites is cleared. In the cast window, the cast members that correspond to the sprites are unaffected.

Chapter 2

Creating Animations

The animation that appears in a Director movie can take many forms. No matter how varied the forms seem, however, almost all animation can be reduced to a few basic types:

◆ Changing a sprite's position on the stage (for example, making the moon appear to rise)

◆ Alternating a sequence of sprites (for example, making a flower appear to open)

◆ Cycling through a sequence of colors (for example, creating the illusion of a sunrise by making gradual changes to the color of the sky).

You can also combine the basic types of animation to create other animation effects. For example, you can create the appearance of a bird flying by alternating a sequence of sprites as you change the position of each sprite slightly in relation to the one before it.

Director provides you with four basic techniques for creating animation:

- **In-betweening**. In-betweening—also called key-frame animation—is an ideal technique for moving a single sprite along a straight, curved, or circular path. You position the sprite on the stage at the key points that define the path you want it to follow, and then have Director fill in all the in-between positions. You can also use in-betweening to gradually change a sprite's size, shape, or color, or to gradually blend it with the background.

- **Frame-by-frame animation**. Frame-by-frame animation is the most time-consuming way to go about creating animation, but it's also the way to get the most refined, precise results. Frame-by-frame animation is best for animation that involves alternating a sequence of sprites as they move across the stage. It's also ideal when you're animating several sprites at once and you want to keep their movements coordinated.

- **Auto animation**. Auto animation is a quick way of creating such things as animated bulleted lists and bar charts or "text crawls" (text that scrolls up from the bottom of the screen, such as the credits at the end of a movie). The effects you can achieve with auto animation are limited, but you can customize them—which makes them a quick starting point for more elaborate animation effects.

- **Real-time recording**. Real-time animation is the quick and dirty approach to animation. The process is simple: as you drag a sprite around the stage, Director records its motion. When you play the animation back, the sprite follows the path you traced for it on the stage. Real-time recording doesn't provide much precision or flexibility, but it's a quick way to get results.

Director's animation techniques aren't exclusive. In fact, when you use them in conjunction with each other, you can take advantage of the strengths each one has and create animation that's far more sophisticated than anything you could produce with any of them alone.

Basic techniques

This section covers the basics of auto animation, real-time recording, frame-by-frame animation, and in-betweening.

The section shows how to create animation with the Space to Time and Cast to Time commands and how to link one animated sequence with another using the Paste Relative command. The section demonstrates how to use in-betweening to add a static background to animation, to move a sprite across the stage, to accelerate or decelerate a sprite, to change two or more aspects of a sprite simultaneously, and to move a sprite in a curved line or a circle. The section also shows how to add and cut time from a movie, how to shift animation in time, and how to change a sprite's foreground priority.

Other things you can do with animation

What you can do	Where to find out how
Align cast members in the paint window to test animation	"Align Bitmaps" in the Cast menu section in Chapter 6
Reverse an animation sequence	"Reverse Sequence" in the Score menu section in Chapter 6
Move the playback head to any frame in the movie	"Moving around the score" in the score window section of Chapter 5
Play a portion of a movie repeatedly to check the animation	"Selected Frames Only" in the section on the control panel in Chapter 5
Display the part of the score where the playback head is currently located	"Moving around the score" in the score window section of Chapter 5
Change the way the score notation is displayed	"The Display pop-up menu" in the score window section in Chapter 5
Select various elements in the score in various ways	"Selecting cells" in the score window section in Chapter 5

Other things you can do with animation

What you can do	Where to find out how
Insert and delete frames in a movie	"Insert Frame" and "Delete Frame" in the Score menu section in Chapter 6
Change the stage background color	"Stage background" in the section on the control panel in Chapter 5
Create transitions between frames	"Working with transitions" in Chapter 3

Selecting where you want to record animation

Before you create animation, you need to select the place in the score where you want Director to record the information about the animation. You can select the spot in any of the following ways:

◆ Click a frame number at the top of the score to set an insertion point. Director records the animation in the first channel that's available, starting at the insertion point.

◆ Select a single cell. Director records the animation in the channel where the cell is located, starting at the cell. If any of the cells it needs to record the animation already contain information, Director replaces the existing information with the animation.

◆ Select a range of cells, Director records only as much animation as will fill the number of cells you've selected. If any of the cells already contain information, Director replaces the existing information with the animation.

If you don't make a selection or set an insertion point, Director records the animation in the first channel that's available, starting with the frame where the playback head is located.

Using auto animate

You use auto animate to create special animated effects for charts and text. You can automatically create effects such as animated bar charts, bullet charts, and text that zooms in or out. You can use auto animate effects alone or in combination with background images. For information about how each of the auto animate effects works, see "Auto Animate" under "Score menu" in Chapter 6, "Menu Reference."

Customizing an auto animate effect

Since auto animate provides a quick way to generate a path for a block of text or a bullet to follow, you can use it as a short cut for creating paths for other sprites. For example, you can use the Banner effect to create a path across the screen and then replace the text in the banner with a different sprite. The new sprite then follows the path you created for the text.

To customize an auto animate effect:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Create the effect with the Auto Animate command.**
    For details about the Auto Animate command, see "Auto Animate" under "Score menu" in Chapter 6, "Menu Reference."

3. **Go to the cast window and select the cast member you want to use to replace the cast member that's currently part of the animation.**

4. **Go to the score and select the cells that contain the animation.**

5. **Choose Switch Cast Members from the Score menu (or press Command-E).**

   Director replaces the original cast member with the one you've selected in the cast window.

When you run the animation, the new cast member follows the path you created with auto animate.

Real-time recording

You can create animation by recording the movement of a sprite as you drag it across the stage. The real-time recording technique is especially good for simulating the movement of a cursor. If you select Trails in the score, you can also use real-time recording to simulate handwriting. (For more information, see "Trails check box" in the score window in Chapter 5, "Window Reference.")
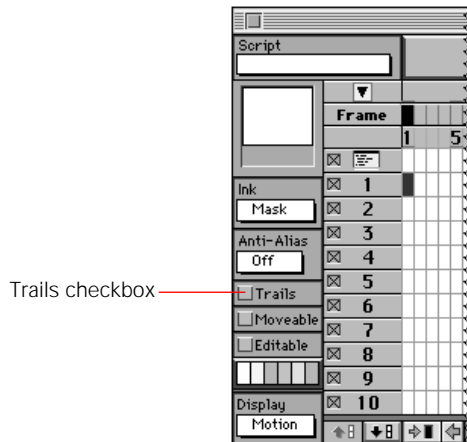
Trails checkbox ————

For better control when you're recording in real time, use the tempo control in the control panel to record at a speed that's slower than normal. (For more information, see "The Control Panel" in Chapter 5, "Window Reference.") You can adjust the speed with a different tempo setting to make the animation look normal when you play the movie back. (See "Adding a tempo setting" in Chapter 3, "Working Behind the Scenes.")

Tempo control

To record in real time:

1. Select the place in the score where you want Director to record the animation.
See "Selecting where you want to record animation" earlier in this chapter.

2. In the cast window, select the cast member you want to animate.
Make sure you select a cast member in the cast window—don't select a sprite on the stage. And don't drag the cast member from the cast window to the stage—just select it.

To record in a specific range of frames, select the frames, and then click the Selected Frames Only button on the control panel.

3. **Hold down the Control key and the spacebar.**
   The real-time record indicator appears next to the channel where you're recording.

Real-time record indicator
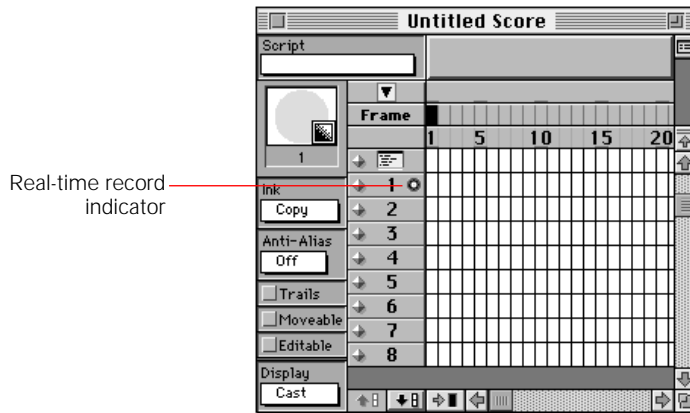
> ▶ *Tip*   *If you want to record in a different channel, hold down the Control key and the spacebar and click another channel indicator.*

The recording begins as soon as you click the mouse button in the next step, so be prepared to move the mouse.

4. **Point to the spot on the stage where you want the animation to start, press the mouse button to begin recording, and drag the pointer across the stage.**
   Director records the path you move the pointer along.

   If there are sprites in any of the other channels in the first frame of the animation, Director records their positions in each frame where it records the position of the sprite you're moving.

5. **Release the mouse button to stop recording.**

If you don't like the animation, you can choose Undo Score from the Edit menu (or press Command–Z) and try again. Or you can record different "takes" in different channels, and then use the one you like best.

Step recording

Step recording is the process of animating by taking snapshots of the position of a sprite in successive frames of a movie. You record the position of a sprite in a frame, step forward to the next frame, move the sprite to its new position, record the position, step forward to the next frame, and so on until you've completed the animation.

It's important as you create the animation to keep track of which sprites Director is recording in each new frame. The easiest way to do that is to select every sprite you want to record. When you select a sprite under normal conditions, Director displays a thin selection rectangle around the sprite. When Director is recording a sprite in step-recording mode, it changes the thin selection rectangle around the sprite to a thick selection rectangle so you can see what's being recorded and what isn't.

It's important to remember, however, that what determines whether a sprite is being recorded is not a thick selection rectangle around it, but a step record indicator next to the channel the sprite occupies.

Step record indicator
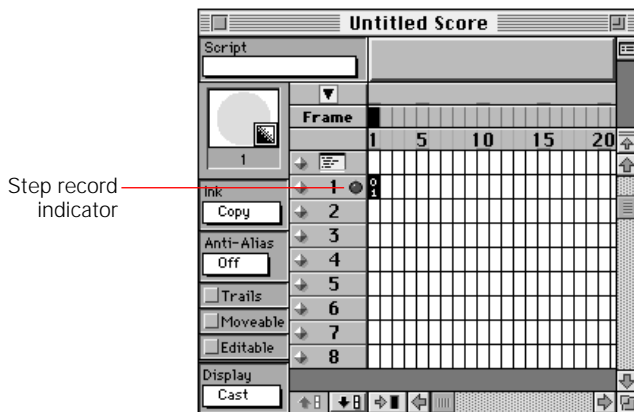
A thick selection rectangle appears around a sprite that Director is recording only if the sprite happens to be selected. The step record indicator, on the other hand, always appears next to the channel the sprite occupies when Director is recording it.

To step–record animation:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag a cast member from the cast window to the stage.**
   A sprite corresponding to the cast member appears on the stage. The thick selection rectangle around the sprite indicates that Director is recording the sprite's position.
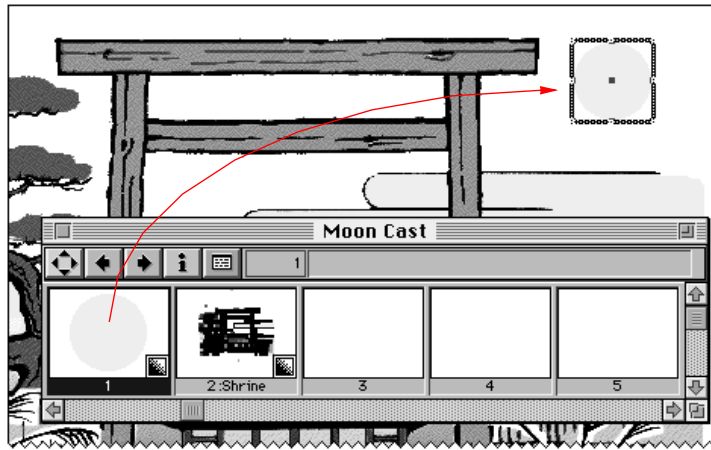
The step record indicator appears next to the channel where Director is recording information about the sprite.

Step record indicator
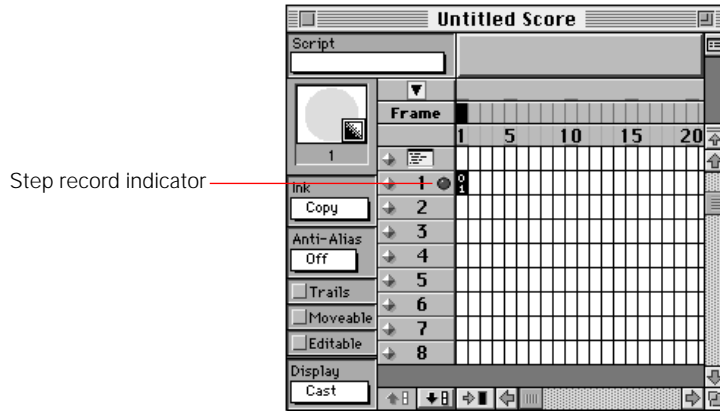
If you want to record a sprite that's already on the stage, click it to select it, and then press the Option key and click the sprite again to start recording. If you want to record other sprites already on the stage, Shift–click each of them to select them, then Option–click each of them to start recording them. Each sprite you select is highlighted with a thick selection rectangle and the step record indicator appears next to the channel each of the sprites occupies.

You can also record a sprite by Option–clicking the number to the left of the channel that the sprite occupies. (A thick selection rectangle won't appear around the sprite, however, unless you've selected the sprite.)

If you want to stop recording a sprite, Option–click it on the stage if it's selected, or Option–click the number to the left of the channel the sprite occupies.

3. Choose Step Forward from the Edit menu or click the Step Forward button on the control panel.

The movie advances to the next frame. The position of any sprite highlighted with a thick selection rectangle is recorded in the new frame.

If a sprite you're recording is already present in the next cell of the channel where you're recording its position, Director replaces the sprite's old position with its current position.

Note *As soon as you move the animation in any way other than stepping (for example, by using Rewind, Play, or Back, or by dragging the playback head), recording stops.*

4. Drag the sprite to reposition it.

You can also stretch the sprite or switch it with a sprite that corresponds to a different cast member.

5. Choose Step Forward from the Edit menu or click the Step Forward button in the control panel again.

The movie advances to the next frame, and any sprite highlighted with a thick selection rectangle is recorded again there.

6. Repeat steps 3 and 4 until you've completed the sequence you want to record.

7. Choose Rewind or Step Forward from the Edit menu (or click the Rewind or the Step Forward button in the control panel) to stop recording.

Move the playback head to the beginning of the animation and run the movie to see how it looks.

Switching cast members when step recording

You can switch cast members while step recording when you have a sequence of cast members—such as a bird flying—that appears in successive frames.

A sequence of cast members

Before you start recording the animation, make sure you have the sequence of cast members assembled in the cast window.

To switch cast members while step-recording:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Make the cast window active, and drag the first cast member in the sequence to the stage.**

3. **Choose Step Forward from the Edit menu or click the Step Forward button in the control panel.**
   Step Forward copies the sprite you just placed on the stage (and the information about its position on the stage) to the next frame. There are now two frames of animation, and both frames contain the first cast member in the sequence.

   The sprite in the second frame is still selected. The next step in the process is to switch cast members—to replace the sprite that corresponds to the first cast member in the sequence with a sprite that corresponds to the second cast member in the sequence.

4. **Select the second cast member in the sequence in the cast window, and then choose Switch Cast Members from the Score menu (or press Command-E).**
   Director replaces one sprite with the other.

5. **Drag the second sprite to reposition it.**
   For example, if you're working with a sequence of cast members that shows a bird flying, you'd move the second sprite in the direction the bird is flying to create the illusion of flight.

6. **Repeat steps 3, 4, and 5 for the remaining cast members in the sequence.**

▶ *Tip*   *Option–double-clicking a cast member in the cast window switches it with the cast member that's in the cell or cells currently selected in the score.*

Recording with Space to Time

When you have an animated sequence that's made up of a series of cast members, you'll probably find yourself arranging the corresponding sprites on the stage in a single frame so you can see their positions in relation to one another. Once you've finished arranging the sprites, you'll find the Space to Time command comes in handy. You can use the command to move the sprites from several channels in one frame to consecutive cells in a single channel.
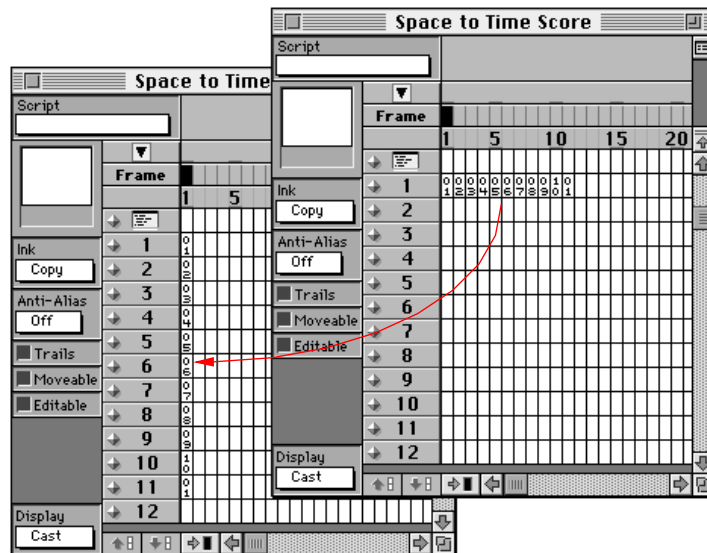
Space to Time shifts cast members from one frame to one channel

To use the Space to Time command:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag the cast members from the cast window one by one, in the order they appear in the sequence, and place each one on the stage at the spot where you want it to appear in the animation.**
    For example, if the animation involves an object moving from left to right, place the sprite corresponding to the first cast member in the left-most position, the sprite corresponding to the next cast member a bit to the right, the sprite corresponding to the next cast member farther to the right, and so on.

    As you position the sprites on the stage, Director places each one in a separate channel in the score.

3. **In the score, select all the sprites that are part of the sequence.**

4. **Choose Space to Time from the Score menu.**
    The Space to Time dialog box appears. It lets you set the number of frames you want between each sprite and the one following it.
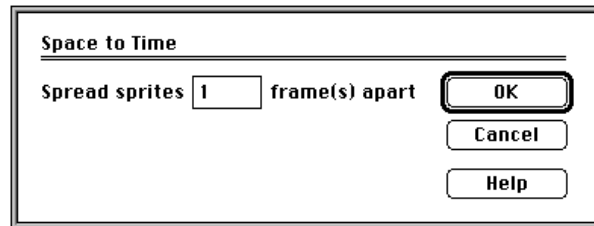
5. **Type the interval you want, and then click OK.**
    Director rearranges the sprites so that instead of being arranged from top to bottom in a single frame, they're arranged in sequence from left to right in a single channel.

If you've spaced the cells so that there are blank cells between them, you need to use one of the In-Between commands to fill in the blank cells. For information, see "In-Between Linear" and "In-Between Special" under "Score menu" in Chapter 6, "Menu Reference."

Space to Time is a fast way to set up the points you need for a curved in-between. Arrange the cast members in one frame, choose Space to Time from the Score menu, and add 10 to 20 cells between each cast member to produce a smooth curve.

Recording with Cast to Time

When you have a series of cast members that are all part of an animated sequence—such as a series of cast members that shows a bird in flight—you can use the Cast to Time command to move them to the score in a single step and have Director automatically arrange them in subsequent frames in a single channel.
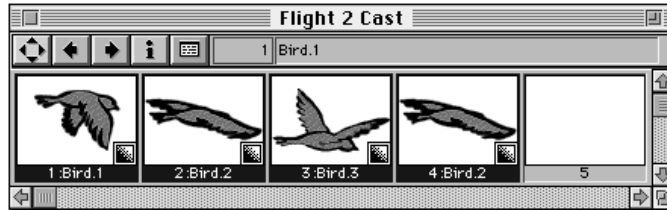
A series of cast members selected in the cast window

To add a sequence of cast members to the score:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Make the cast window active.**

3. **Select the series of cast members to be added to the score.**

4. **Choose Cast to Time from the Cast menu (or hold down Option and drag the cast members to the stage).**
   The selected series of cast members is added to the score.

▶ **Tip** *Sometimes the series of cast members that's placed in the score jumps about the stage when you play the movie. That's because the registration points of the cast members aren't set properly. For information about aligning registration points, see "Registration tool" under "The paint window" in Chapter 5, "Window Reference."*

Linking a sequence with Paste Relative

You'll often find that a long animated sequence consists of just one short animated sequence repeated several times. You can use the Paste Relative command to link a series of short sequences together into one continuous motion across the stage. The benefit of Paste Relative is that it automatically positions the beginning of one sequence precisely where the preceding sequence ended.
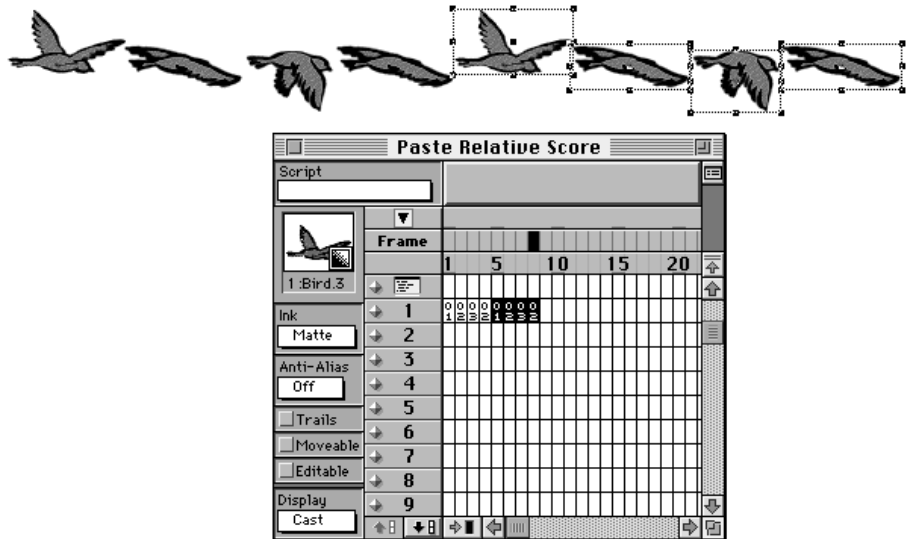
Use Paste Relative to make a sequence move all the way across the stage

To paste one sequence relative to another:

1. **Make the score active.**

2. **Select the cells that make up the sequence.**

3. **Choose Copy Cells from the Edit menu (or press Command-C).**

4. **Select the cell immediately after the last cell in the sequence.**

5. **Choose Paste Relative from the Score menu (or press Command-Shift-V).**
   Director positions the beginning of the copy precisely where the existing sequence ends.

You can repeat the process as many times as you need to create one continuous animation across the stage.

▶ *Tip*   *If you want to eliminate the pause that sometimes happens between copies of a sequence that are pasted together, end the original sequence with the same cast member it begins with. Then, copy the sequence, select the last cell of the sequence in the score, and choose Paste Relative. The first cast member at the beginning of the copy replaces the cast member at the end of the original sequence, linking the two together seamlessly.*

In-betweening

Director has two commands for in-betweening: In-Between Linear and In-Between Special.

◆ **In-Between Linear**. Once you've set the beginning and ending positions of a sprite that you want to move in a straight line, use the In-Between Linear command to fill in the intermediate positions. You can also use In-Between Linear to fill a channel with the stationary background for an animation or to fill a sound channel with a sound effect or music.

◆ **In-Between Special**. Use the In-Between Special command to create animation that follows a zig-zagging, curved, or circular path—or that speeds up at the beginning or slows down at the end. You can also use In-Between Special to animate a sprite as its size, shape, orientation, color, or blend value changes. If you want to change two aspects of a sprite in a single animated sequence—for example, its location and its size—use In-Between Special to create the intermediate stages that combine both changes.

Both commands appear on the Score menu.

Adding stationary cast members to a movie

Even though the important part of most Director movies is the animation they contain, most movies also contain backgrounds, text, and other cast members that remain static. Use the In-Between Linear command to fill a series of frames in a movie with stationary cast members.

To set a stationary cast member with In–Between Linear:

1. **Select the place in the score where you want Director to start recording the position of the cast member.**
   For example, if you're creating a background, select a cell in channel 1. (For more information, see "Selecting where you want to record animation" earlier in this chapter.)

2. **Drag the cast member from the cast window to the stage.**
   A sprite corresponding to the cast member appears on the stage.

3. **In the score, select the range of cells where you want the cast member to appear.**
   Make sure the first cell in the range is the one where the sprite currently appears. The rest of the cells should be empty.
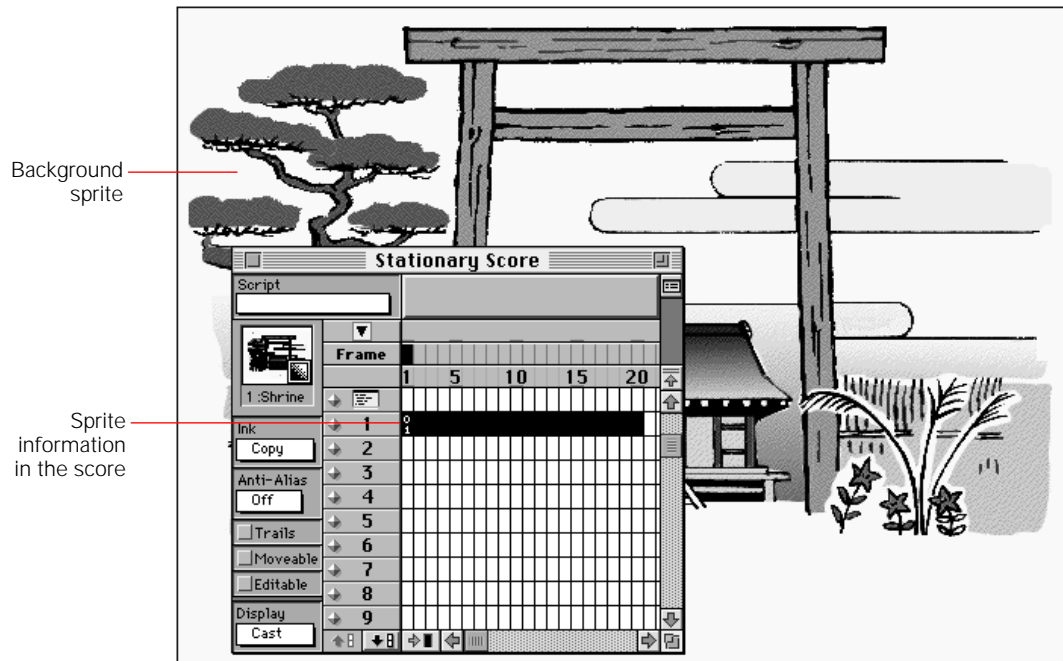
Creating a stationary background with in-betweening

4. **Choose In-Between Linear from the Score menu.**
   Director fills the cells you've selected with copies of the sprite in the first cell of the range.

The channel that a sprite occupies in the score determines whether it appears in front of or behind other sprites on the stage. If you add a background to a movie and it ends up in front of other sprites, the background is in the wrong channel. For more information, see "Changing layering" later in this chapter.

Moving sprites with in-betweening

You can use In-Between Linear not only to fill a series of frames with a stationary image, but to make an object move smoothly across the stage in any direction from one point to the next. All you have to do is set the starting and ending points of the animation. In–Between Linear does the rest. The frames that contain the beginning and ending points of the animation are called **key frames**.

Note   *Make sure that Playback Head Follows Selection is selected in the Score Window Options dialog box before you start the following procedure.*

To move a sprite with In–Between Linear:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag a cast member from the cast window to the stage, and place it at the point where you want the cast member's movement to start.**
   A sprite corresponding to the cast member appears on the stage.

3. Click the score to make it active.

The cell that's selected in the score contains information about the sprite's position on the stage.

The easiest way to set the end point of the animation is to copy the cell containing the sprite's starting point, paste it in the cell that marks the end of the animation, and then move the copy of the sprite to its final position.

In-Between Linear creates the intermediate positions in these cells
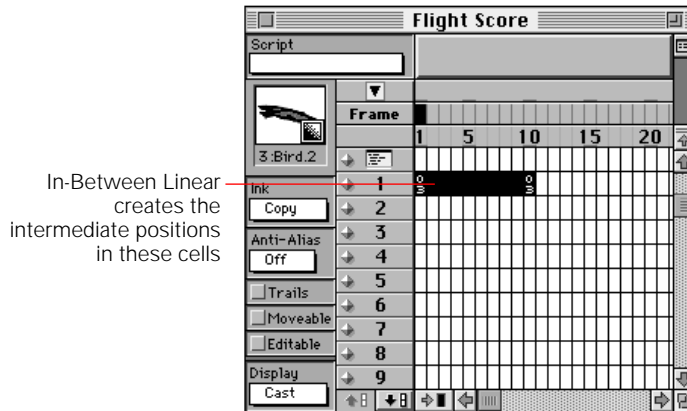
To set the end point:

1. Select the cell in the score that contains the sprite at the beginning of the animation.

2. Choose Copy Cells from the Edit menu (or press Command-C).

3. Select the cell where you want the animation to end.
Make sure the cell is in the same channel as the cell where the animation begins. The stage changes to reflect the way it's set up in the frame where the cell is located.

4. Choose Paste Cells from the Edit menu (or press Command-V).
The sprite appears on the stage.

5. Drag the sprite across the stage to the point where you want the animation to end.

To in-between the animation:

1. **Select the cell where the animation begins.**

2. **Shift-click the cell that marks the end of the animation sequence to select the entire range.**

3. **Choose In-Between Linear from the Score menu (or press Command-B).**
    The cells fill with the in-between positions of the animation.

When you play the movie, the sprite moves smoothly in a straight line between the starting and ending points you set. See "Adjusting the path of an in-betweened sprite" later in this chapter for an easy way to change the sprite's path.

In-betweening with acceleration and deceleration

You may find that an animated sequence looks more realistic if it gradually comes up to full speed at the beginning or gradually slows down at the end. You can use the In-Between Special command to ease into or ease out of an animated sequence by accelerating the motion at the beginning of the sequence or decelerating the motion at the end.

To create an animation that accelerates or decelerates:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag the cast member you want to animate from the cast window to the stage.**
    A sprite corresponding to the cast member appears on the stage.

3. **Position the sprite on the stage at the point where you want the animation to start.**

4. **In the score, select the cell where you want the animation to end.**
    Make sure the cell is in the same channel that contains the sprite you just placed on the stage.

5. **Drag the same cast member from the cast window to the stage and position it on the stage where you want the animation to end.**

6. **Select the cell that contains the sprite that marks the beginning of the animation.**

7. **Shift-click the cell that contains the sprite that marks the end of the animation to select the range between them.**

To in–between the animation:

1. **Choose In-Between Special from the Score menu.**
   The In–Between Special dialog box appears.
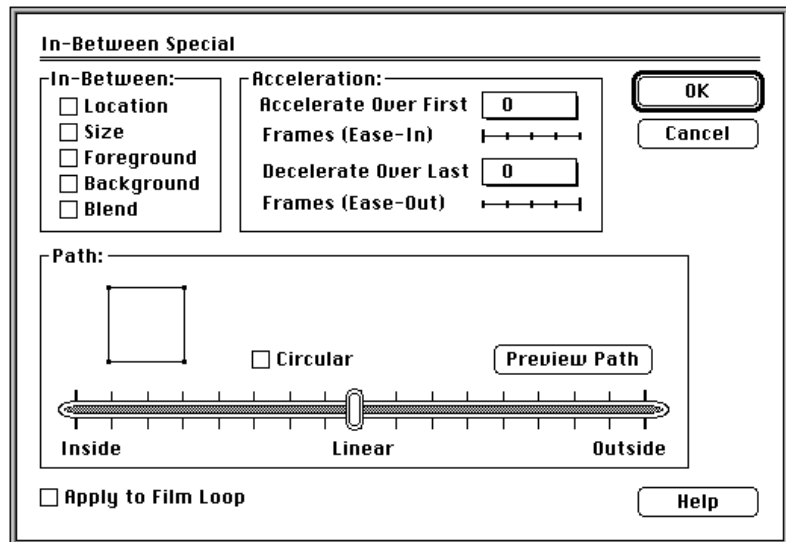
2. **Make sure Location is the only In-Between option selected.**
   You can also ease into and out of any of the other types of animation: a change of size, foreground or background color, or blend value.

3. **Type the number of frames over which you want the acceleration and the deceleration to take place.**

4. **Click OK.**

When you play the movie, the sprite gradually speeds up at the beginning of the animation and gradually slows down at the end.

▶ Tip *You can apply acceleration or deceleration to an animated sequence even if it's already in the score. Just select the sequence, choose In-Between Special from the Score menu, and choose the number of frames to accelerate or decelerate.*

Stretching and squeezing a sprite with in-betweening

If you want to animate a sprite stretching or squeezing, you can use In–Between Special to generate the in–between positions in the animation.

To animate a sprite stretching or squeezing:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag the cast member from the cast window to the stage.**
   A sprite corresponding to the cast member appears on the stage.

3. **Select the cell in the score that contains the sprite, and choose Copy Cells from the Edit menu (or press Command-C).**

4. **Select the cell where you want the animation to end.**
   Make sure the cell is in the same channel as the cell you copied.

5. **Choose Paste Cells from the Edit menu (or press Command-V).**

6. **Drag the handles on the selection rectangle surrounding the sprite to stretch or squeeze it.**

To in–between the change in the sprite:

1. **Select the series of cells beginning with the cell where the original sprite is located and ending with the cell where you pasted the copy.**

2. **Choose In-Between Special from the Score menu.**
   The In–Between Special dialog box appears.

3. **Make sure Size is the only In-Between option selected.**
   Set acceleration and deceleration settings if you want to use them.

4. **Click OK.**

When you play the movie the sprite stretches or squeezes.

▶ *Tip*   *Stretching or squeezing large cast members can make the animation choppy and slow. If that happens, use the Auto Distort command to generate separate cast members for each in-between position, and then use the sequence of cast members to create the animation. See "Auto Distort" under "Effects Menu" in Chapter 6, "Menu Reference."*

In-betweening two or more aspects at the same time

There may be times when you want to create animation using two or more of the In-Between options—location, size, foreground color, background color, and blend—at the same time. For example, you may want to move an object across the stage and make it grow smaller at the same time to create the illusion that the object is moving into the distance. When you use the In-Between Special command, you can select the In-Between options in any combination or all at the same time.

To in-between two or more aspects at a time:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag a cast member from the cast window to the stage.**
   A sprite corresponding to the cast member appears on the stage.

   The sprite in its current form defines the starting point of whatever change you want to make to it in the animation sequence: its starting location, starting size, starting foreground and background colors, and its starting blend value.

   You may need to make changes to the sprite to get to the right starting point. For example, if you want the sprite to start out invisible and fade in as it moves across the screen, you'll need to change its blend value. (For information about setting a sprite's blend value, see "Set Sprite Blend" under "The Score menu" in Chapter 6, "Menu Reference.")

3. **Copy the cell where the information about the sprite appears, move a number of frames to the right in the same channel, and paste the sprite information there.**

   You may also want to drag several cast members to the stage, and then use Space to Time to transfer them to a single channel.

4. **Make the changes to the sprite that define the way you want it to be at the end of the animation sequence.**

   For example, if you want the sprite's foreground color to change, select the color you want the sprite to be at the end of the sequence. If you want the sprite to change transparency, set the blend value you want it to have at the end of the sequence.

5. **Select the series of cells beginning with the cell where the original sprite is located and ending with the cell where you pasted the copy.**

6. **Choose In-Between Special from the Score menu.**

   The In-Between Special dialog box appears.
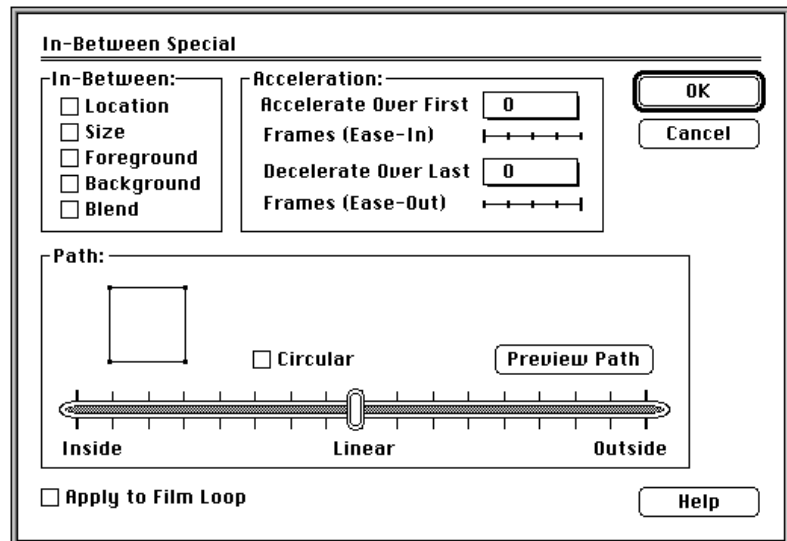
7. **Select the appropriate In-Between options, and then click OK.**

   Director in-betweens all the aspects that match the In-Between options you've chosen.

In-betweening a sprite in a curved line

Objects in the real world usually follow curved or circular paths instead of straight lines. The In–Between Special command makes it much easier for you to plot curved or circular paths for sprites than would be the case if you had to do it by hand. The process is similar to in-betweening a sprite in a straight line except that rather than setting two points to in-between, you set several key positions to define the sprite's path.

To set the key positions for the path:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag a cast member from the cast window to the point on the stage where you want the animation to begin.**
    A sprite corresponding to the cast member appears on the stage.

    You can set any number of positions to define a curved in–between. This example uses four key positions. You first set the four positions in one frame so you can see them in relation to one another. Then, you use the Space to Time command to transfer the key positions to subsequent frames in the same channel.

3. **Drag the same cast member from the cast window and position it on the stage to set the second key position.**

4. Repeat step 3 two more times to set the third and fourth key positions of the path.

Position 4

Position 3

Position 2
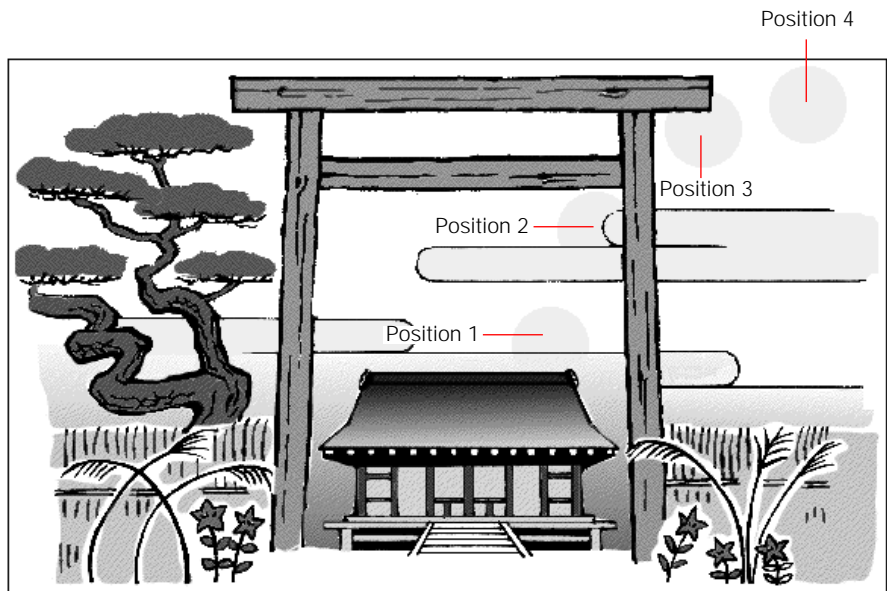
Position 1

Setting four key positions for a curved in-between

5. Click the score to make it active.

The four sprites you positioned on the stage appear in the score in a single frame. The Space to Time command transfers the sprites from separate channels in a single frame to consecutive frames in a single channel.

To transfer the sequence of sprites to a single channel:

1. **Select the sprites in the score.**

2. **Choose Space to Time from the Score menu.**
   The Space to Time dialog box appears. It lets you set the number
   of frames you want between each sprite and the one following it.

```
Space to Time
─────────────────────────────────────────

Spread sprites [1      ] frame(s) apart    (   OK   )

                                           ( Cancel )

                                           (  Help  )
```
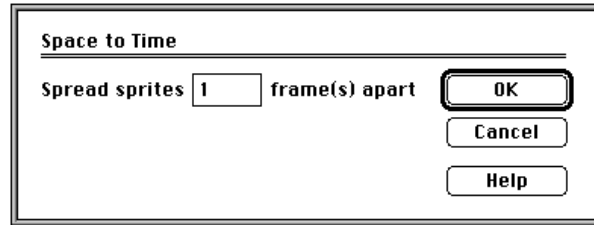
3. **Type an appropriate number of frames in the box.**
   The higher the number, the greater the space between the sprites,
   and the smoother the animation appears.

4. **Click OK.**

Once the four sprites are in the same channel, you can use In–
Between Special to generate the intermediate positions between
them.

To in–between the sprites:

1. Choose In-Between Special from the Score menu.
   The In–Between Special dialog box appears.
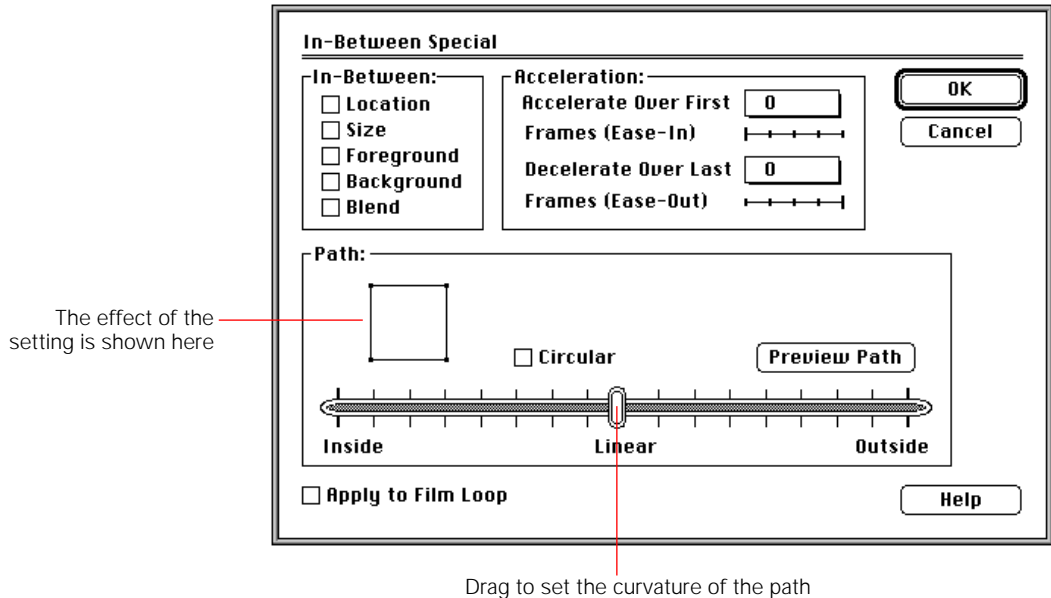
The effect of the setting is shown here ———

Drag to set the curvature of the path

Dragging the slider changes the curvature of the path. The effect of the setting you choose is shown by the way the square above the slider changes.

2. Set the slider to the curvature you want.

▶ **Tip** *Click the Preview Path button to preview the path.*

3. Click OK.
   The selected cells in the score fill with the in–between positions along the path. Play the movie to see the results.

▶ **Tip** *Director remembers and applies the settings you last set in the In-Between Special dialog box if you hold down the Shift key when you choose In-Between Special from the Score menu.*

In-betweening a sprite in a circle

Using the In–Between Special command to make a sprite move in a circle is much like using the command to animate a sprite along a curved path: you set a series of key positions on the stage to define the path of the sprite. The main difference is that to create a circular path, you make the last sprite position the same as the first position.

To set the key positions for the path:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag a cast member from the cast window to the point on the stage where you want the animation to begin.**
    A sprite corresponding to the cast member appears on the stage.

    You can set any number of positions to define a circular in–between, although the roundest circle is made with five key positions (the first and last positions are exactly the same). This procedure shows how to set five key positions in one frame so you can see them in relation to one another.
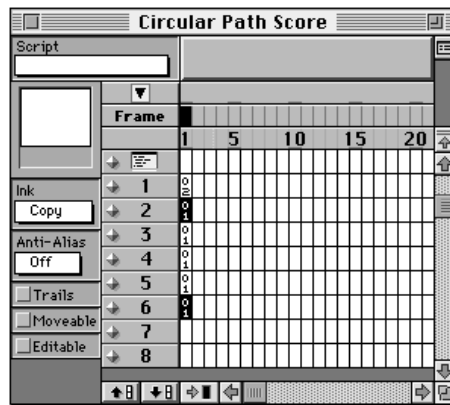
The first and last key frames are in exactly the same location
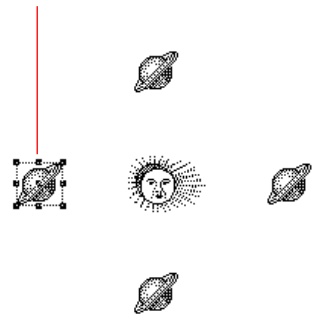
Setting five key frames for a circular in-between

3. **Drag the same cast member from the cast window, and position it on the stage to set the second key position of the path.**

4. **Repeat step 3 two more times to set the third and fourth key position.**

5. **Copy the cell that contains the first sprite, and paste it in the channel below the last sprite.**
Copying the cell that contains the first sprite guarantees that the first and last key positions are exactly the same.

6. **Click the score to make it active.**

The five sprites you positioned on the stage appear in the score in a single frame. The Space to Time command transfers the sprites from separate channels in a single frame to consecutive cells in the same channel.

To transfer the sequence of cast members to a single channel:

1. **Select the sprites in the score.**

2. **Choose Space to Time from the Score menu.**
The Space to Time dialog box appears. It lets you set the number of frames you want between each sprite and the one following it.

```
Space to Time

Spread sprites [ 1 ]    frame(s) apart      [    OK    ]

                                            [  Cancel  ]

                                            [   Help   ]
```
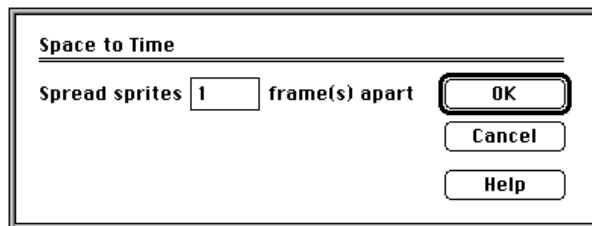
3. **Type an appropriate number of frames in the box.**
The higher the number, the greater the space between the sprites, and the smoother the animation appears.

4. **Click OK.**
Director transfers the sprites to consecutive cells in the same channel.

To in-between the sprites in a circle:

1. **Select the cells to be in-betweened.**

2. **Choose In-Between Special from the Score menu.**
    The In-Between Special dialog box appears.
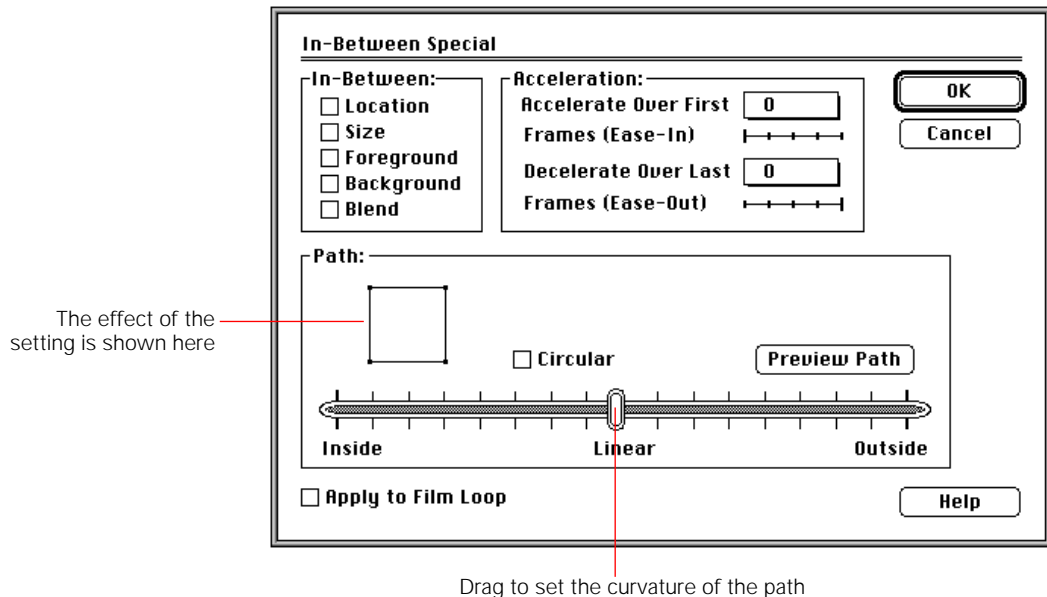
The effect of the setting is shown here ————

Drag to set the curvature of the path

Dragging the slider changes the curvature of the path. The effect of the setting you choose is shown by the way the square above the slider changes.

3. **Set the slider to the curvature you want.**

4. **Select the checkbox next to Circular.**

5. **Click OK.**
    The selected cells in the score fill with the in-between positions along the path. Play the movie to see the results.

Adjusting the path of an in-betweened sprite

After you in-between a sprite along a path and then play the animation that's the result, you may find that you want to adjust the path of the animation. All you need to do is change the position of one or more of the key frames and then choose In-Between Linear or In-Between Special again. If the animation is a straight line, for example, you can move the sprite in the first or last cell of the sequence to reset the beginning or end point of the sprite's movement.

Locating key frames in the score isn't difficult. If you look at the score with the Extended, Cast, or Motion display option selected, you can see dotted lines at the top of certain cells.

Dotted lines indicate in-betweened positions

Key frames are cells without dotted lines
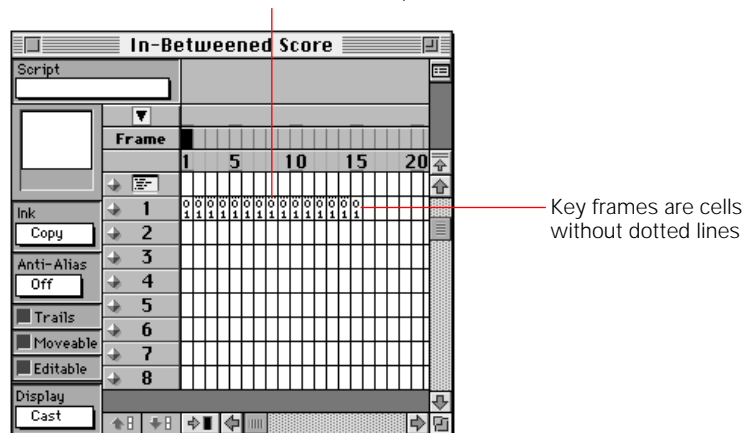
The dotted lines indicate that the information in the cells was generated by either the In-Between Linear or the In-Between Special command. Cells without dotted lines at the beginning and end of such sequences are key frames.

To adjust the path of a sprite animated with In–Between Linear:

1. **In the score, select the cell that represents the key frame you want to adjust.**
   There's no need to erase the previously in–betweened cells.

2. **On the stage, drag the sprite that corresponds to the key frame to reposition it.**

3. **Shift-click the key frame at the other end of the sequence of in-betweened cells to select the entire range.**

4. **Choose In-Between Linear from the Score menu.**
   Director recalculates the position of the sprite in all the cells between the two key frames. When you run the animation, the sprite moves in a new path defined by the new beginning or end point you set.

To adjust the path of a cast member animated with In–Between Special:

1. **In the score, select the cell that represents the key frame you want to adjust.**
   You can adjust any key frame in the sequence.

2. **On the stage, drag the sprite that corresponds to the key frame to reposition it.**
   If you want to adjust another key frame, repeat steps 1 and 2.

3. **Select all the cells in the original sequence you in-betweened, including the key frames at the beginning and end.**

4. **Choose In-Between Special from the Score menu.**
   Director recalculates the position of the sprite in all the cells in the sequence. When you run the animation, the sprite moves in a new path defined by the new key frames you set.

Cutting frames from a movie

Occasionally you may want to do more than just delete the information from a range of cells in the score—you may want to remove a range of frames from the score entirely. Deleting entire frames from the score has a different effect than just removing information from a range of cells. Removing information from a range of cells leaves blank space in the score; deleting entire frames removes not only the information in the frames, but the blank space as well. Since each frame represents a moment in time, the result is that the movie is shorter—just as if you'd cut frames from a film.

Drag here to select entire frames
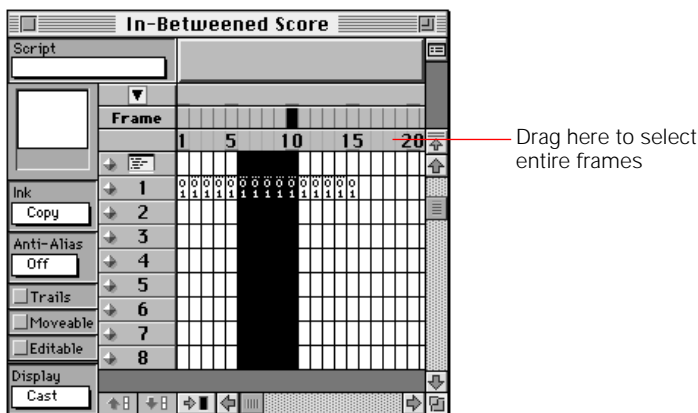
To delete frames from a movie:

1. **Select a number of frames by dragging across the frame numbers at the top of the score window.**
    The frames you've selected are highlighted.

2. **Choose Cut Cells from the Edit menu (or press Command-X).**
    Director removes the frames—not just the information they contain—from the movie.

▶ **Tip**   *If you want to delete just a single frame, you can use the Delete Frame command on the Score menu.*

Adding frames to a movie

You may sometimes need to add information to a movie in a spot where no empty cells are available. If you select just a cell to mark the spot where you want Director to insert the information, Director will replace the information that's already there with the new information you're pasting. But if you set an insertion point at the spot where you want to insert the new information, Director will add enough new frames to accommodate it.

Insertion point

Click here to set an insertion point
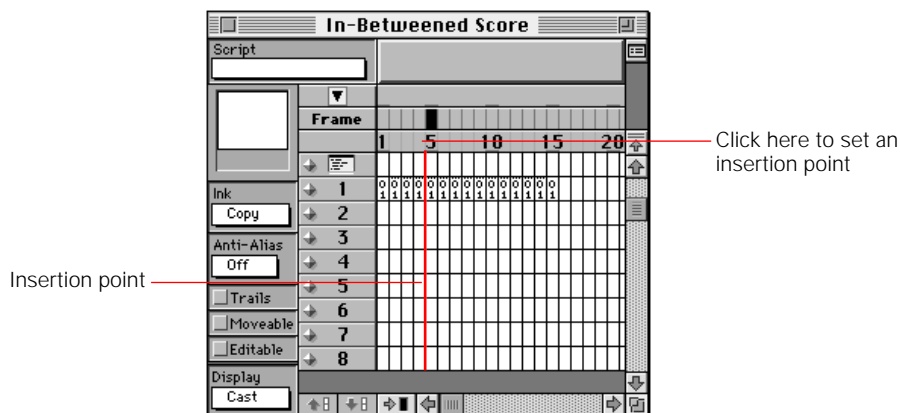
To add frames to a movie:

1. **Cut or copy the cells you want to add to the movie.**
   You can cut or copy the frames from the same movie or from a different one. If you want to add blank frames, copy any range of cells that's long enough; you can delete the information in the cells after you've used them to add new frames to the movie.

2. **Click the frame number where you want to insert the information.**
   An insertion point appears in the frame you click. Any information you paste into the score appears in new frames to the right of the insertion point.

3. **Choose Paste Cells from the Edit menu (or press Command-V).**
   Director inserts enough frames in the movie to accommodate the new information you're adding.

Note   *For information about the effects of copying and pasting information in a cell or a range of cells, see "Edit menu" in Chapter 6, "Menu Reference."*

Shifting a sequence of cells in time

You can reposition an animated sequence in time without necessarily adding or subtracting time in a movie by cutting a group of cells in one or more channels, and then pasting them in a different location in the score. You can also shift an animated sequence in time by selecting and dragging it to a different location in the score. The technique depends on how far you're shifting the sequence: if you're shifting it within a section of the score you can display in the score window all at one time, you can just select and drag it. If you're shifting the sequence from one part of the score to another part that's rather far away, it's easier to cut the sequence from its current location, go to the new location, and paste the sequence there.

To shift a sequence of cells by dragging the sequence:

1. **Select the cells that contain the sequence.**
   Select just the cells, not the entire frames where they're located.

2. **Drag the cells toward their new location.**
   As you start to drag the cells, an outline of the selection appears.

3. **Position the outline over the cells where you want to move the sequence.**
   After a moment, Director removes the information from the cells in the old location and displays it in the new location.

To shift a sequence of cells by cutting and pasting the sequence:

1. **Select the cells that contain the sequence.**
   Select just the cells, not the entire frames where they're located.

2. **Choose Cut Cells from the Edit menu (or press Command-C).**
   Director removes the information from the cells and stores it on the Clipboard. The frames that Director removed the information from remain in the score.

3. **Select a single cell in the new frame where you want the sequence to start.**

4. **Choose Paste Cells from the Edit menu (or press Command-V).**
   The sequence is pasted into the new location in the score.

▶ *Tip*   *If you select one cell, Director pastes all the information you cut back in the score. If you select more than one cell, Director pastes only as much information as will fit in the selected cells.*

Changing layering

Director's 48 sprite channels mean that you can have as many as 48 sprites on the stage at one time.

The sprite channels are assigned a foreground priority so that a sprite in a channel closer to the top of the score always appears behind a sprite in a channel closer to the bottom. Another way to think about foreground priority is to think of each channel in the score as a layer:
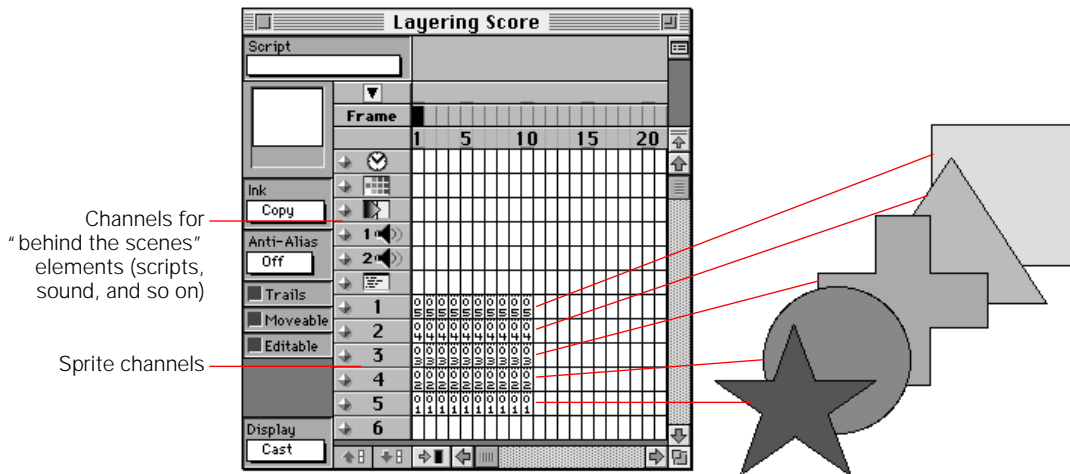
The order of the sprites in the channels determines foreground priority, as if each channel were a layer

When you add a sprite to a channel that's closer to the bottom of the score than another channel already occupied by a sprite, it's like placing a new layer on top of the last one. Sprites in channels closer to the bottom of the score appear in front of, or take priority over, those in channels closer to the top.

You'll undoubtedly come across situations where you want to switch the priority of two sprites. For example, if you wanted to animate a moon rising over a Japanese shrine, the best approach would be to set up the animation of the moon in front of the shrine scene, and then switch the channels the moon and shrine scene occupy so the moon appeared to rise behind the shrine.
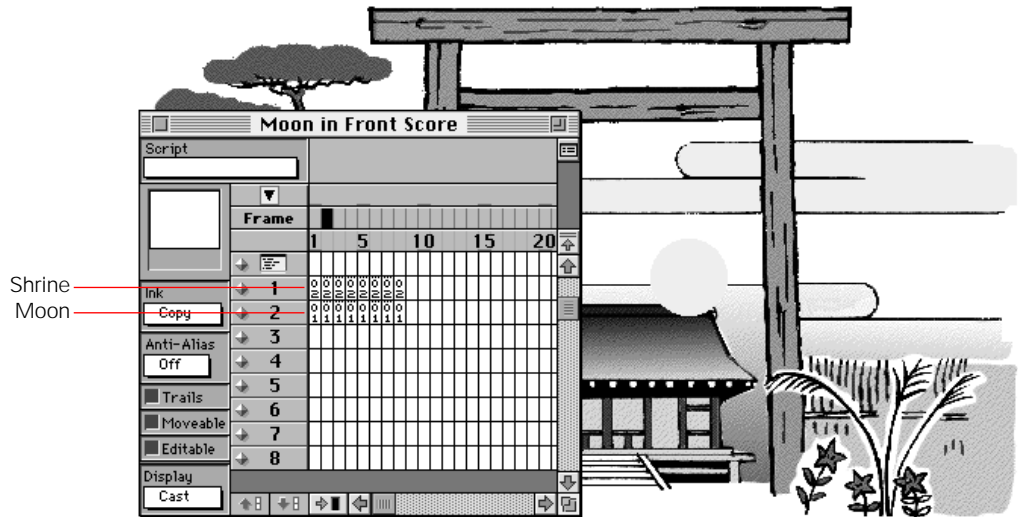
Before: The moon, in channel 2, appears in front of the shrine scene, which is in channel 1
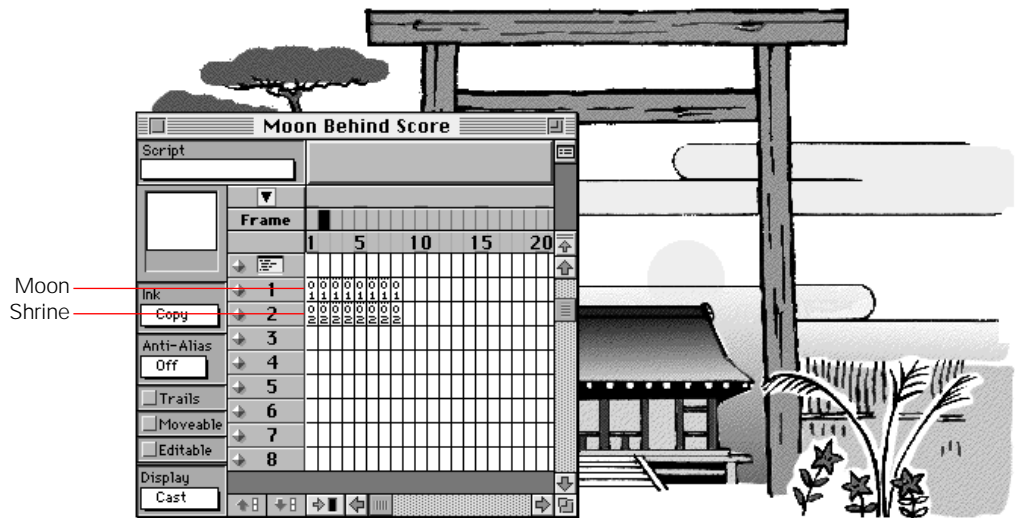
Moon

Shrine

After: The moon, now in channel 1, appears behind the shrine scene, which is now in channel 2

To switch the channels two sprites occupy, use the Shuffle Forward and Shuffle Backward buttons at the bottom of the score.

The Shuffle Forward button switches a range of cells you've selected in a channel with the cells in the channel below it. The sprite associated with the cells you've selected moves in front of the sprite in the other channel.
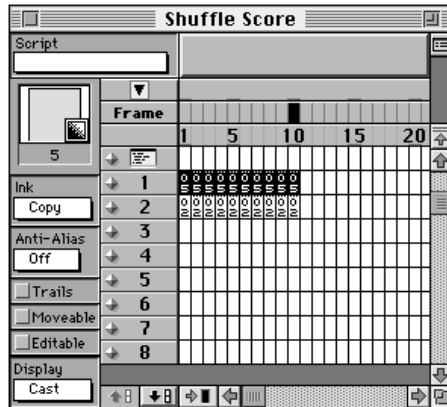
Shuffle Forward button
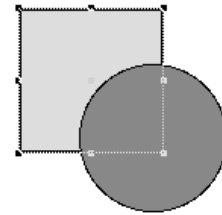
The Shuffle Backward button switches a range of cells you've selected in a channel with the cells in the channel above it. The sprite associated with the cells you've selected moves behind the sprite in the other channel.
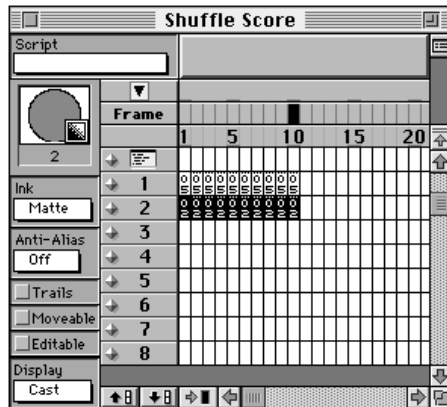
Shuffle Backward button
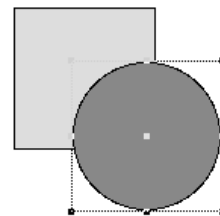
To move a sprite from the background to the foreground:

1. **In the score, select the cells that contain the sprite.**

2. **Click the Shuffle Forward button at the bottom of the score.**
    Director switches the cells you've selected with the cells in the channel immediately below them.

To move a sprite from the foreground to the background:

1. **In the score, select the cells that contain the sprite.**

2. **Click the Shuffle Backward button at the bottom of the score.**
    Director switches the cells you've selected with the cells in the channel immediately above them.

Moving animations between movies

Copying animation from one movie to another is as easy as cutting and pasting graphics. When you copy information from cells in the score, Director places the information on the Clipboard. You can then paste the information into the score of a different movie. You can also paste animation in the Scrapbook if you want to save it for future use.

The cells in the score contain information about the cast members, but they don't contain the cast members themselves. When you paste information from one movie into another, Director searches for the movie the information came from and imports the cast members. If you've changed the name of the movie or moved it since you copied the information, Director asks you to find the movie.

To move animation from one movie to another:

1. **Select the cells (or frames) you want to copy from the score.**
   Selecting a frame will copy all the information in all the cells in the frame, including scripts in the script channel, sounds, transitions, and so on.

2. **Choose Copy Cells from the Edit menu (or press Command-C).**
   Director copies the information to the Clipboard.

3. **Choose Open from the File menu (or press Command-O).**
   The Open dialog box appears. (If a dialog box appears first that asks if you want to save the movie, click Save.)

4. **Select the movie that you want to paste the information into, and then click Open.**
   After a moment, the movie's score appears in the score window.

5. **Select where you want to paste the information you've copied:**

   ◇ If you click a frame number at the top of the score, an insertion point appears. When Director pastes the information you've copied, it will add enough new frames to the movie to provide room for the information.

   ◇ If you select a single cell, Director will paste all the information you've copied into the movie. If any of the cells it needs for the information already contain information, it will replace the current information with the information it's pasting into the movie.

   ◇ If you select a range of cells, Director will paste only as much information as will fill the number of cells you've selected. If any of the cells already contains information, Director will replace it with the information it's pasting into the movie.

6. **Choose Paste Cells from the Edit menu (or press Command-V).**
   The information you've copied appears in the score. Director imports any cast members associated with the information from the original movie and displays them in the cast window.

Film loops

A *film loop* is an animated sequence that you can treat as if it were a single cast member. For example, if you wanted to create an animation of a bird flying across the stage, you could create a film loop of the sequence of sprites that shows the bird flapping its wings. Then, instead of using the frame-by-frame technique where you position each sprite in the sequence on the stage one by one, you can set the first and last positions of the film loop as if it were a single sprite and then use In-Between Linear to create the intermediate positions. When you run the animation, the bird flaps its wings and at the same time moves across the stage.

A film loop behaves just like any other sprite that's part of an animation, with three exceptions:

◆ When you step through an animation that contains a film loop (either by using Step Forward or Step Backward or by dragging the playback head in the score), the film loop doesn't animate. Animation occurs only when the movie is running.

◆ You can't apply ink effects to a film loop. If you want to use ink effects with a film loop, you need to apply them to the sprites that make up the animation before you turn the animation into a film loop.

◆ You can't attach a cast member or sprite script to a film loop. (For a description of cast member and sprite scripts, see "Types of scripts" in Chapter 4, "Making a Movie Interactive.")

A film loop—because of its limitations—may not be the best approach to what you're trying to achieve in a movie. Director provides three other ways of incorporating a completed chunk of animation into a movie as a discrete element: you can turn it into a QuickTime movie, import it as a linked Director movie, or play it in a window in another Director movie. For a comparison of all four methods, see "Movies within Director movies" at the end of this chapter.

Creating a film loop

Before you can create a film loop, you need to create the animation you want the film loop to contain. After you've created the film loop, you can delete the animation and use the film loop in its place.

To create a film loop:

1. **In the score, select the cells that contain the animation you want to turn into a film loop.**

2. **Drag the selection to an empty cast member position in the cast window (or copy the selection and paste it into the cast window).**
    A dialog box appears asking you to name the film loop.
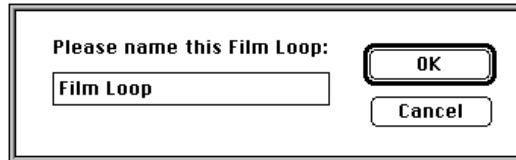
3. **Type a name for the film loop, and then click OK.**
    Director creates the film loop and displays the thumbnail that corresponds to it in the cast window.

Film loop cast member

4. **Delete the animation you used to create the film loop.**
    You can't extract the animation information in the film loop and return it to the score. If you want to keep a copy of the animation as it appears in the score, save it in the Scrapbook.

For information about using the film loop in a movie, see "Real-time recording with a film loop" and "In-betweening a film loop" later in this chapter.

Note   *If you delete any cast member used in the film loop from the cast window, Director can't run the film loop. You can reposition the cast members in the cast window or remove them from the score, but the cast members in the film loop have to remain in the cast window for the film loop to work.*

Creating a multi-channel film loop

A film loop isn't limited to the information in a single channel in the score. For example, if you have a sound effect that's part of an animated sequence, you can make the sound effect part of the film loop.

To create a multi-channel film loop:

1. **In the score, select the cells that contain all the sequences you want to be part of the film loop.**

▶ *Tip*   *Use Command-click to select sequences that aren't in adjacent channels.*

2. **Drag the selection to an empty cast member position in the cast window (or copy the selection and paste it into the cast window).**
   A dialog box appears asking you to name the film loop.

3. **Type a name for the film loop, and then click OK.**
   Director creates the film loop and displays the thumbnail that corresponds to it in the cast window.

4. **Delete the sequences you used to create the film loop.**
   You can't extract the animation information in the film loop and return it to the score. If you want to keep a copy of the animation as it appears in the score, save it in the Scrapbook.

Real-time recording with a film loop

Animating a normal sprite in real time involves dragging the pointer across the stage to record the path you want it to follow and the rate at which you want it to move. You can use the same animation technique with a film loop. The difference is that you're setting the path and rate not for a simple object, but for one that changes as it moves across the stage. For example, if you create a film loop of a bird flapping its wings, after you record the path of the film loop and rate at which it moves, the bird will appear to flap its wings as it moves across the stage.

For better control when you're recording in real time, use the tempo control in the control panel to record at a speed that's slower than normal. (For more information, see "The control panel" in Chapter 5, "Window Reference.") You can adjust the speed with a different tempo setting to make the animation look normal when you play the movie back. (See "Adding a tempo setting" in Chapter 3, "Working Behind the Scenes.")

Tempo control

To real time record a film loop:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Select the film loop in the cast window.**
    Don't drag the film loop from the cast window to the stage—just select it.

    To record in a specific range of frames, select the frames, and then click the Selected Frames Only button on the control panel.

3. **Hold down the Control key and the spacebar.**
   The record indicator appears next to the channel where you're recording.

   The recording begins as soon as you click the mouse button in the next step, so be prepared to move the mouse.

4. **Point to the spot on the stage where you want the animation to start, press the mouse button to begin recording, and drag the pointer across the stage.**
   Director records the path you move the pointer along.

   If there are sprites in any of the other channels in the first frame of the animation, Director records their positions in each frame where it records the position of the film loop.

5. **Release the mouse button to stop recording.**

In-betweening a film loop

The power of using a film loop is evident when you use either of the In–Between commands to animate the film loop. For example, one way to create an animation of a bird flying is to set the position of each cast member in the sequence frame by frame across the stage. A much easier approach is to create a film loop of a bird flapping its wings and then to in-between the film loop along the path you want the bird to follow.

Note *Make sure that Playback Head Follows Selection is selected in the Score Window Options dialog box before you start the following procedure.*

To define the path of a film loop:

1. **Select the place in the score where you want Director to record the animation.**
   See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag the film loop to the spot on the stage where you want the animation to begin.**
   A sprite corresponding to the first cast member in the film loop appears on the stage.

   When one of the sprites that's part of a film loop is selected, Director displays a selection rectangle that's big enough to encompass all the sprites that make up the film loop.

3. **Go to the score, copy the cell that contains the information about the film loop's sprite.**

4. **Paste the information in the cell where you want the animation to end.**

5. **Drag the sprite across the stage to the point where you want the animation to end.**

To in-between the animation:

1. **Select the cell where the animation begins.**

2. **Shift-click the cell that marks the end of the animation sequence to select the entire range.**

3. **Choose In-Between Linear from the Score menu (or press Command-B).**
   The cells fill with the in-between positions of the animation. Play the movie to see the results.

You can also use the options in the In–Between Special dialog box to accelerate or decelerate a film loop at the beginning or end of its movement or to in-between the film loop along a curved or circular path. Follow the instructions in "In-betweening with acceleration and deceleration," "In-betweening a sprite in a curved line," or "In-betweening a sprite in a circle" earlier in this chapter.

Switching film loops

Just as you can replace one sprite with another in an animated sequence, you can replace one film loop with another (or a film loop with a sprite or a sprite with a film loop). For example, if you wanted a bird, a bee, and a bat to follow exactly the same path, you could create the path with the film loop of the bird, make two copies of it, and replace the film loop of the bird with the film loop of the bee in one of the copies and with the film loop of the bat in the other copy.

To replace one film loop with another in an animated sequence:

1. **In the score, select the cells that contain the animation.**

2. **In the cast window, select the film loop you want to replace the film loop currently used in the animation.**

3. **Choose Switch Cast Members from the Score menu (or press Command-E).**
    The film loop you selected in the cast window replaces the film loop you used when you created the animation.

QuickTime movies

QuickTime movies and film loops have many things in common. They're both elements that you can manipulate as individual cast members, and yet they're both movies themselves. You can convert animation in Director's score into either a QuickTime movie or a film loop, and you can move both QuickTime movies and film loops around the stage the same way you move any other graphic cast member.

There are, of course, differences. QuickTime movies offer the added dimension of digital video—they provide a way to incorporate live action into a Director movie. You can also edit a QuickTime movie—unlike a film loop—either in Director or in an application such as Premiere. When you turn animation in a Director movie into a QuickTime movie, you can include transitions, tempo settings, and other effects, something that's not possible when you create a film loop.

As mentioned in the section on film loops, Director provides several ways of incorporating a completed chunk of animation into a movie as a discrete element. In addition to turning an animated sequence into a film loop or a QuickTime movie, you can import it as a linked Director movie or play it in a window that's part of another Director movie. For a comparison of all four methods, see "Movies within Director movies" at the end of the chapter.

This section shows how to turn animation in Director into a QuickTime movie, how to import a Quicktime movie into a Director movie, and how to edit the QuickTime movie and add it to the score.

QuickTime and digital video

You'll come across both the term QuickTime and the term digital video in Director. For example, when you import a QuickTime movie, the file type you choose is "QuickTime," but you then display the QuickTime movie you've imported in a digital video window. Director is a cross-platform development tool and tries to use general terms whenever possible. The digital video window is so named because it accommodates QuickTime movies on the Macintosh and both Video for Windows (.AVI) and QuickTime for Windows movies on Windows computers. On the other hand, since you can import only QuickTime movies into a Macintosh application, the option on the Type pop-up menu in the Import dialog box is appropriately named QuickTime.

Exporting a Director movie as a QuickTime movie

Turning animation you've created in Director into a QuickTime movie is one way to distribute the animation or use it in other applications. For example, many applications, such as Microsoft Word, let you attach QuickTime movies to documents.

You can also export animation as a QuickTime movie and then import the QuickTime movie into a Director movie. The entire animation then becomes a single cast member—which you can then move around the stage as the movie plays. Exporting animation as a QuickTime movie captures not just the movement of the sprites on the stage, but any tempos, palette effects, or transitions you've set.

How exporting a QuickTime movie works

When Director exports animation as a QuickTime movie, it plays the animation, takes snapshots of the stage moment by moment, and turns each snapshot into a frame in the QuickTime movie. When you play the QuickTime movie, the result looks much the same as the Director movie, even though the way the QuickTime movie produces the effect might be quite different. For example, if you use a palette setting to fade to black in a Director movie, Director actually darkens the entire screen little by little. When you export the animation as a QuickTime movie, Director takes snapshots of a stage that's progressively darker. When you play the QuickTime movie, you see a series of images, each of which is slightly darker than the one before it—but the screen as a whole doesn't change at all.

Getting the stage ready

When Director exports animation as a QuickTime movie, it always takes a snapshot of the entire stage. If you're using only part of the stage for the animation you're exporting—and the rest of the background is empty—you need to move the animation to the upper left corner of the stage and reduce the size of the stage to fit the area where the animation takes place.

To move the animation:

1. Select the animation in the score, and then choose Sprite Info from the Score menu (or press Command-K).
The Sprite Info dialog box appears.

```
┌─────────────────────────────────────────────────────┐
│  Sprite Info                                         │
│ ┌─ Size ──────────────────────────┐  ┌──────────┐   │
│ │  ◉ Scale:  [100]  %             │  │    OK    │   │
│ │                                 │  └──────────┘   │
│ │  ○ Width:  [138]   pixels       │  ┌──────────┐   │
│ │                                 │  │  Cancel  │   │
│ │    Height: [222]   pixels       │  └──────────┘   │
│ │                                 │                 │
│ │  ○ Restore to Size of Cast Member              │   │
│ └─────────────────────────────────┘               │
│ ┌─ Location ──────────────────────┐               │
│ │  From Left Edge of Stage: [0]  pixels           │
│ │                                 │               │
│ │  From Top Edge of Stage:  [0]  pixels  ┌──────┐ │
│ │                                        │ Help │ │
│ └────────────────────────────────────────┴──────┘ │
└─────────────────────────────────────────────────────┘
```
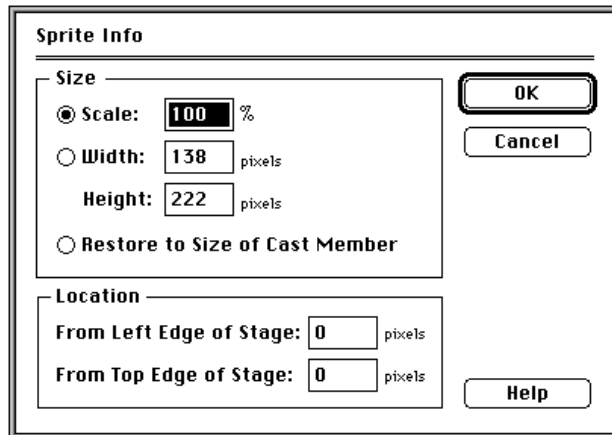
When you have more than one sprite selected, the size and location displayed in the Sprite Info dialog box apply to an imaginary rectangle that surrounds all the sprites.
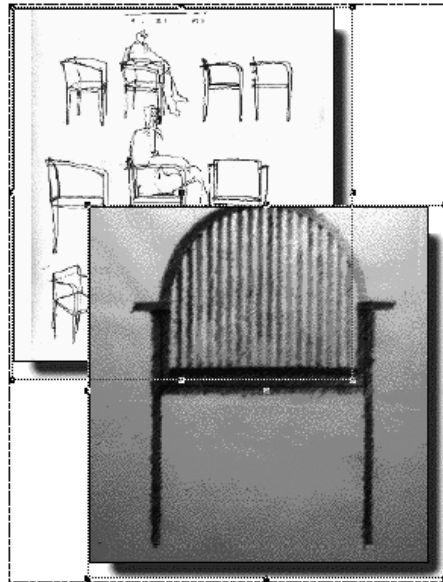
Imaginary rectangle surrounding the sprites.

2. **Write down the width and height displayed in the dialog box.**
   The width and height tell you how big the stage needs to be to accommodate the animation.

3. **Change the distance from both the top and left edges of the stage to zero, and then click OK.**
   Director moves the animation to the upper left corner of the stage.

To set up the stage:

1. **Choose Preferences from the File menu.**
   The Preferences dialog box appears.
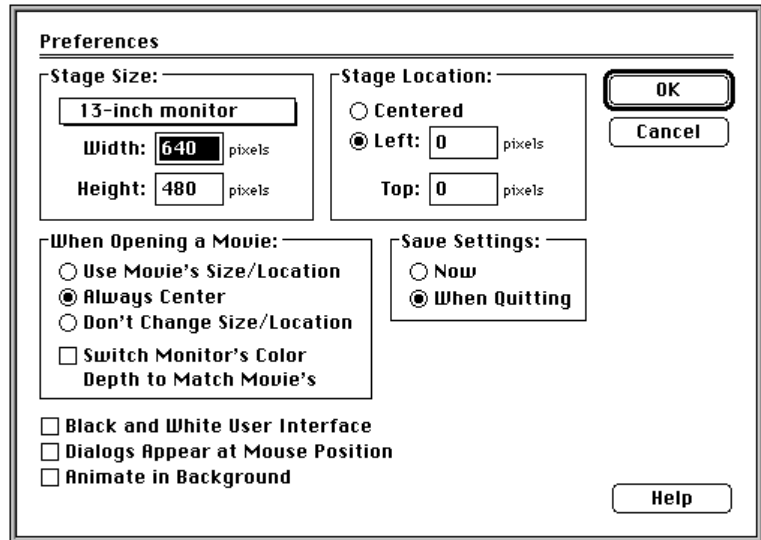
The size of the stage needs to be as close as possible to the size of the area the animation occupies. But both the width and height of the stage must be divisible by 16.

2. **Set the stage size:**

   ◇ If the area the animation occupies is smaller than 160 pixels wide by 120 pixels high, choose QuickTime 160 x 120 from the Stage Size pop-up menu.

   ◇ If the area the animation occupies is larger than 160 pixels wide by 120 pixels high, round the width and height up to the nearest number divisible by 16 and type the numbers in the Width and Height fields. (For example, if the area the animation occupies is 138 pixels wide by 222 pixels, enter 144 as the width and 224 as the height.)

3. **Click OK.**
   Director changes the size of the stage.

Exporting the animation

To turn the animation into a QuickTime movie:

1. **Choose Export from the File menu.**
   The Export dialog box appears.
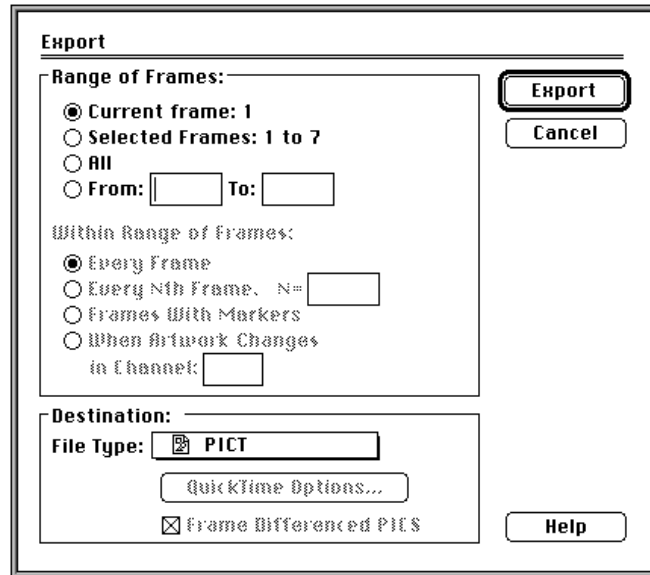
2. **Select the option you want from the Range of Frames options at the top of the dialog box.**
   For specific information about the options, see "Export" in "File menu" in Chapter 6, "Menu Reference."

3. **From the File Type pop-up menu in the Destination section at the bottom of the dialog box, choose QuickTime Movie.**

4. **Click the QuickTime Options button.**
   The QuickTime Export Options dialog box appears.
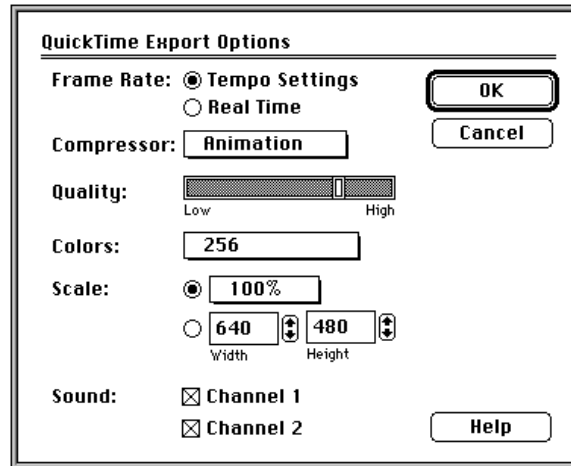
5. **Select the options you want to use and then click OK.**
   For specific information about the options, see "Export" in "File menu" in Chapter 6, "Menu Reference."

   The Export dialog box reappears when you click OK.

6. **Click Export.**
   The Save dialog box appears.

7. **Name the file and then click Save.**
   An alert appears that tells you to turn off any screen saver you have installed. Creating a QuickTime movie can sometimes be time consuming, and if your screen saver comes on, Director will save it as part of the QuickTime movie.

8. **Click OK.**
   Director saves the animation as a QuickTime movie.

Note *If you turn an animated sequence that includes a transition into a QuickTime movie, but the transition doesn't appear when you play the QuickTime movie, try increasing the Duration and Chunk Size settings in the Set Transition dialog box.*

Importing a QuickTime movie

You import a QuickTime movie the same way you import any other type of cast member.

To import a QuickTime movie:

1. Choose Import from the File menu (or press Command-J).
The Import dialog box appears.
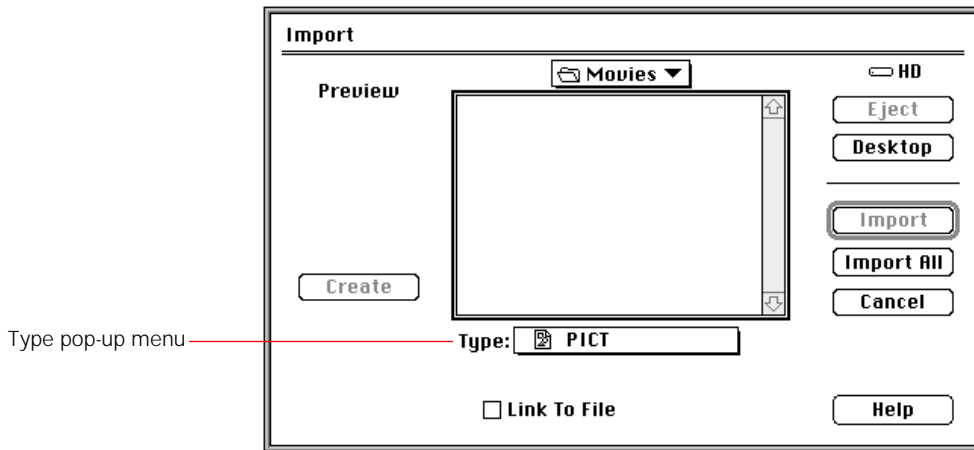
Type pop-up menu

2. Choose QuickTime Movie from the Type pop-up menu.
The Link to File checkbox disappears from the dialog box when you select QuickTime Movie as the type because the QuickTime movies you import always remain linked with the original file on the disk.

3. Select the file you want to import, and then click Import.
A thumbnail with the name of the file and identified by the digital video cast member icon appears in the cast window.

Editing a digital video cast member

Once you've imported a QuickTime movie into Director, it's called a digital video cast member or a digital video movie.

Editing a digital video movie in Director is limited to cutting, copying, and pasting frames. Remember that the QuickTime movies you import always remain linked with the original file on the disk. As a result, any changes you make to a digital video movie in Director become a permanent part of the original QuickTime movie file.

If you want to make changes other than cutting, copying, and pasting frames, use an application such as Premiere. Any changes you make to a QuickTime movie outside of Director are automatically reflected in Director as well.

Opening a digital video window

Just as you make changes to bitmap cast members in the paint window and to text cast members in a text window, you make changes to a digital video movie in a digital video window.

To display a digital video movie in a digital video window:

▶ **Select the digital video cast member in the cast window, and then choose Digital Video from the Window menu (or press Command-9).**
The digital video window appears.

Volume control — Step forward
Play/pause — Step backward
Drag to go to a frame
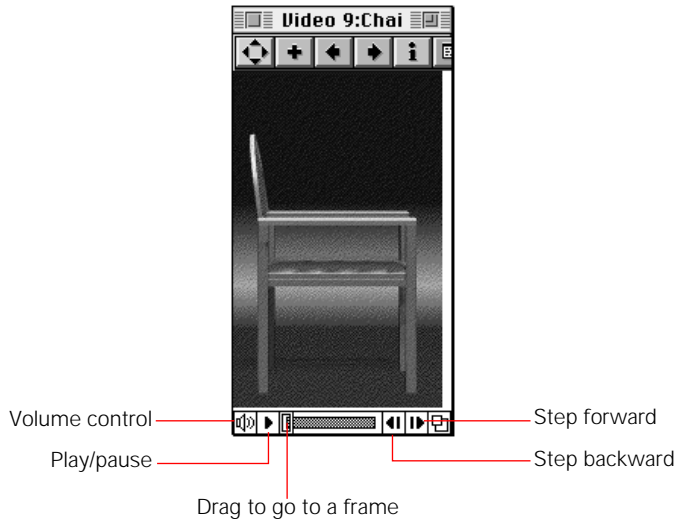
To display a second digital video window:

1. **Make sure the digital video window is still selected.**

2. **Choose Duplicate Window from the Window menu (or press Command-Option-Shift-9).**
A second digital video window appears.

When you open a second digital video window, it displays the same movie that's in the first window. The movie in the second window isn't a copy of the one in the first window, it's just a second view of the same movie. You can display different parts of the movie at the same time in the two different windows, but if you make a change to the movie, the change is reflected in both windows.

To display a different movie in the second window:

▶ **Click the next or previous arrows at the top of the window until the movie you want appears.**
The next and previous arrows display the next or previous digital video movie that's in the cast window. Director skips over other types of cast members.

Cutting, copying, and pasting

You can cut, copy, or paste either individual frames or ranges of frames.

To select a single frame in a digital video movie:

▶ **Use the Play button, the slider, or the Step Forward or Step Backward buttons to display the frame in the digital video window.**

To select a range of frames in a digital video movie:

1. **Display the first frame in the range in the digital video window.**

2. **Hold down Shift and drag the slider until the last frame in the range appears.**
The section of the slider that corresponds to the frames you've selected turns black.

To cut or copy part of a digital video movie:

1. **Select the frame or range of frames you want to cut or copy.**

2. **Choose Cut (or press Command-X) or Copy (or press Command-C) from the Edit menu.**

To paste a frame or range of frames into a digital video movie:

1. **Display the frame after the spot where you want the new frame or frames to appear.**
    You can paste the new frames either into the same movie that you cut or copied them from or into a different movie in a different digital video window.

    You can also paste the frames in the Scrapbook. Or you can paste a single frame into the paint window, where Director converts it into a bitmapped graphic (but you can't paste it back into a digital video movie after it's converted).

2. **Choose Paste from the Edit menu (or press Command-V).**
    Nothing changes in the digital video window because the image there occupies the frame just after the spot in the movie where you've pasted the new segment. To see the new frame or frames, click the Step Backward button.

Adding a digital video movie to a Director movie

You add a digital video movie to a Director movie the same way you add any other cast member:

▶   **Drag the digital video cast member from the cast window to the place on the stage or the frame in the score where you want it to appear.**
    Information identifying the digital video movie appears in the score, and the first frame of the movie appears on the stage.

▶ *Tip*   *If there's a white bounding box around the digital video movie, use the Background Transparent ink to get rid of it. (The Matte ink doesn't work with QuickTime movies.)*

A digital video movie is, like a sound, a time-based cast member. Remember that a single frame in a Director movie represents just a moment in time. As a result, when you place a digital video movie in just a single frame of the score you get just a snippet of the digital video movie. The playback head moves to the next frame before Director has time to play more than a little of the digital video movie.

There are two ways to make sure that Director plays a digital video movie until the movie is finished:

◆ Add a tempo setting that keeps the playback head from moving to the next frame until the entire digital video movie has finished playing. (See "Playing a digital video movie before continuing" later in this chapter.)

◆ In-between the digital video movie over enough frames to give it time to play all the way through. (See "In-betweening a digital video movie" later in this chapter.)

Cropping a digital video movie

Cropping a movie means trimming slices off the top or sides of the movie image.

Cropping trims a slice from a movie image
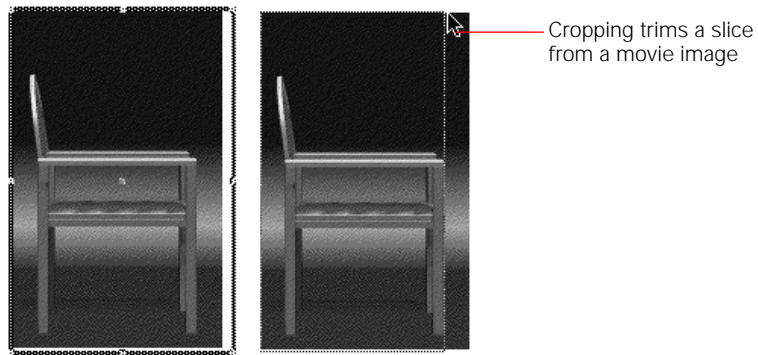
Cropping doesn't remove the slices you trim permanently, it just hides them. It's like adjusting shutters until just the part of the image you want to show is visible.

To crop a digital video movie:

1. **Select the digital video movie's cast member in the cast window.**

2. **Choose Cast Member Info from the Cast menu (or click the Info button at the top of the Cast window).**
    The Cast Member Info dialog box appears.
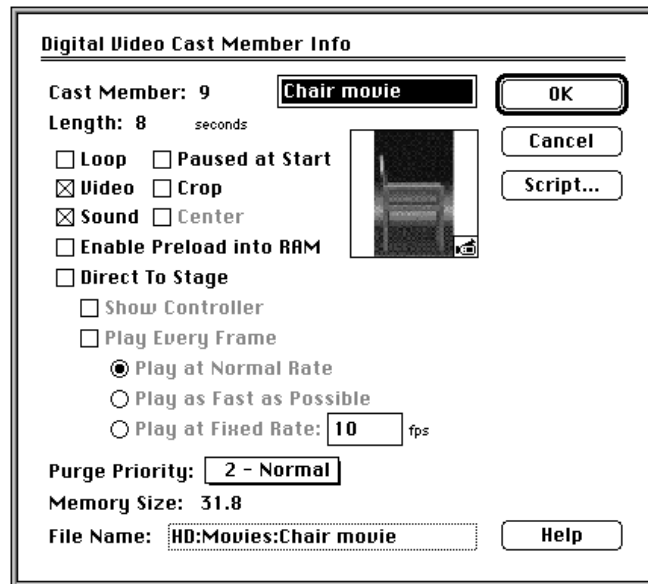
3. **Select Crop.**
    If you select Center (the option below Crop) as well as Crop, Director automatically centers the digital video movie inside the rectangular area you set as the size of the movie's image.

4. **Click OK.**

5. **Select the digital video movie in the score.**

6. **Go to the stage, and drag any of the handles that appear on the selection rectangle that surrounds the digital video image.**
    Director displays only as much of the movie image as will fit in the area defined by the selection rectangle.

Playing a digital video movie before continuing

Tempo settings control how fast the playback head moves from one frame to the next. You can use a tempo setting to prevent the playback head from moving to the next frame before the digital video movie in the current frame has finished.

Tempo settings have a special channel reserved for them in the score.
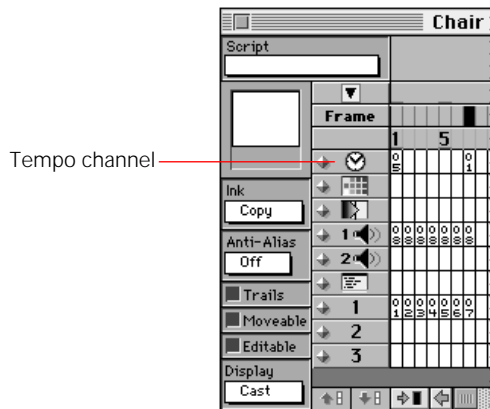
Tempo channel ———

To add a tempo setting that prevents the playback head from moving on until a digital video movie has finished:

1. **In the score, select the cell in the Tempo channel where you want the playback head to wait.**

2. **Choose Set Tempo from the Score menu.**
   The Set Tempo dialog box appears.
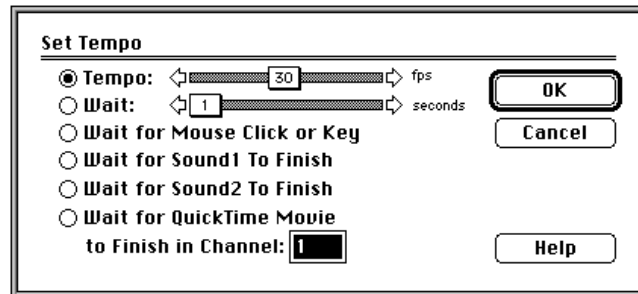
Tip   *You can also display the Set Tempo dialog box by double-clicking the cell in the Tempo channel where you want to set the tempo.*

3. **Select Wait for QuickTime Movie to Finish in Channel 1.**

4. **Change Channel 1 to the number of the channel where the digital video movie appears.**

5. **Click OK.**
   Director adds the tempo setting to the score.

In-betweening a digital video movie

There are two reasons to in-between a digital video movie:

◆ To fill enough frames with the movie so that it has time to play through to the end

◆ To move the movie across the stage as it plays.

If you want to fill enough frames with the movie so it has time to play through to the end, the process is essentially the same as adding a background to a movie. If you need help, see "Adding stationary cast members to a movie" earlier in this chapter. The steps that follow show how to move a digital video movie across the stage as it plays.

Note *Make sure that Playback Head Follows Selection is selected in the Score Window Options dialog box before you start the following procedure.*

To define the path of a digital video movie:

1. **Select the place in the score where you want Director to record the animation.**
    See "Selecting where you want to record animation" earlier in this chapter.

2. **Drag the digital video movie to the spot on the stage where you want the animation to begin.**

3. **Copy the cell in the score where the movie's location on the stage is stored.**

4. **Paste the information in the cell where you want the animation to end.**

5. **Drag the movie across the stage to the point where you want the animation to end.**

To in–between the animation:

1. **Select the cell where the animation begins.**

2. **Shift-click the cell that marks the end of the animation sequence to select the entire range.**

3. **Choose In-Between Linear from the Score menu (or press Command-B).**
   The cells fill with the in–between positions of the animation. Play the movie to see the results.

Movies within Director movies

Film loops and QuickTime movies provide two ways to incorporate a completed piece of animation in a Director movie as a discrete unit. Director provides two other ways of accomplishing the same thing:

◆ Importing one Director movie into another as a linked cast member

◆ Playing one Director movie in a window that's inside another Director movie.

Importing a linked movie. One of the advantages of importing one Director movie into another as a linked cast member is that the movie you're importing retains any interactivity you've built into it—something that's not true of film loops or QuickTime movies. Unlike a QuickTime movie, however, the linked Director movie doesn't retain any of the tempo settings, palette settings, or transitions it has when you open it and play it as a stand-alone Director movie.

To import a Director movie as a linked cast member, make sure the Linked checkbox is checked in the Import dialog box. The entire movie appears as a single cast member in the cast window. You can animate the cast member just as you would any graphic cast member, film loop, or digital video movie. If you want to retain the interactivity that's in the stand-alone version of the movie, select Enable Scripts in the Cast Member Info dialog box.

Playing a movie in a window. Playing a Director movie in a window has none of the limitations of using a film loop, a QuickTime movie, or a linked Director movie. Like a linked Director movie, it retains any interactivity you've built into it; like a QuickTime movie, it retains tempo settings, palette settings, and transitions. The movie that's in a window is, in fact, a complete, self-contained Director movie that plays inside another Director movie just as it does when it stands alone.

Navigator, one of the sample movies that came packaged with Director, shows how a movie within a movie works. To take a look at *Navigator*, go to the Macromedia Director 4.0 folder, open the Sample Movies folder, then the Lingo Expo folder, and double-click *Navigator* to start it.

A Director movie playing in a window within *Navigator*
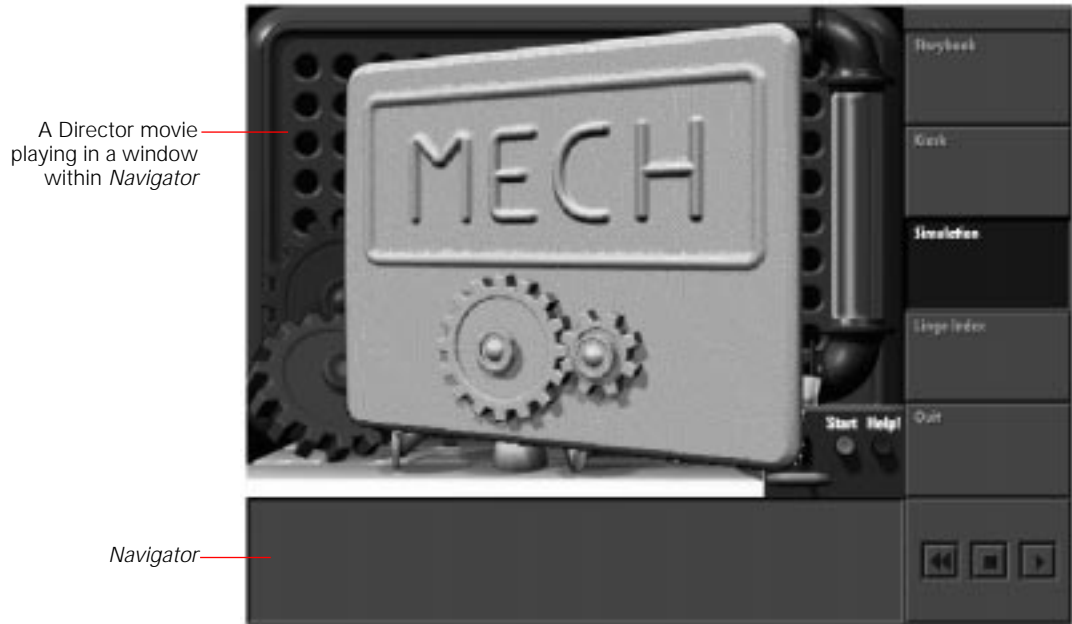
Navigator

The three movies that play in *Navigator*'s window—the kiosk, the simulation, and the storybook—are complete, self-contained Director movies. You can play any of them on their own without *Navigator,* and they play exactly the same way they do within *Navigator*.

To play a movie in a window, you need to write a short Lingo script to set up the window and to identify the movie you want to play. For information, see Chapter 9, "Movies in a Window," in *Using Lingo*.

The following table shows what you can and can't do with a film loop, a QuickTime movie, a linked Director movie, and a movie in a window. This information will help you decide which approach you want to use when you need to include a completed piece of animation in a Director movie.

Choosing an approach

If you want to	Use			
	Film loop	**QuickTime movie**	**Linked Director movie**	**Movie in a window**
Include tempo settings	no	yes	no	yes
Include palette settings	no	yes	no	yes
Include transitions	no	yes	no	yes
Include sounds	yes	yes	yes	yes
Include interactivity	no	no	yes*	yes
Attach a cast member script to the movie's cast member	no	yes	no	no
Attach a sprite script to the movie's sprite	no	yes	yes	no
Include sprite channel information from the original animation	yes	yes	yes	yes
Move the movie across the stage	yes	yes	yes	yes (using LIngo)
Edit the movie	no	partially†	yes‡	yes

*   Select Enable Scripts in the Cast Member Info dialog box.

†   You can cut, copy, and paste individual frames in Director; to do full editing, you need to use an application such as Premiere (changes are reflected in Director automatically).

‡   Close the current movie and open the linked movie in Director.

Chapter 3

Working Behind the Scenes

Anyone who's ever seen a big-budget action film knows that much of its impact comes from things other than the actors on the screen. The same is true of a Director movie. Animation is without doubt the heart of any movie, but without music, sound effects, transitions, and all the other effects you can create behind the scenes, any movie is bound to be a pretty bland experience.

The elements you can work with behind the scenes fall into these categories:

◆ **Sound effects and music**. You can make any sound or any piece of music that's been digitized and saved in AIFF format part of a Director movie.

◆ **Transitions**. Films use many techniques to shift from one scene to another—jump cuts, fades, dissolves, and so on. Director has over 50 transitions you can choose from, and you can use many of them not just to shift from one scene to the next, but to add or remove an element from the stage.

◆ **Palette effects**. Palette effects let you change the way images look by directly manipulating the colors in the palettes. There are two types of palette effect; palette transitions and color cycling. A palette transition shifts every color in a palette gradually through a range of intermediate colors to a corresponding color in a new palette. Color cycling affects a range of colors you've selected from the palette: Director shifts each color in the range to every other color in the range in succession.

◆ **Tempos**. Tempo settings give you control over the speed of animation (speed can have a major impact on the realism and effectiveness of an animated sequence). You can also use tempo settings to control the flow of a movie—for example, by waiting until a sound effect is finished or until a user has pressed a key before going to the next frame.

While most of the things you do behind the scenes have a direct impact on the content of the movies you create, one of the most important—creating projectors—affects how you distribute the movies after you've created them. A projector creates a play-only version of a movie. It's the ideal form for distributing a movie because anyone can run a projector—even people who don't own a copy of Director.

The procedures in this chapter show how to set tempos, control the playback speed of a movie, and add sound effects, music, and transitions to a movie. The chapter explains how color palettes work, how to create and edit them, how to set up palette transitions, and how to use color cycling. Finally, it describes how to turn a movie into a projector.

Working with tempo settings

Tempo settings control the speed of animation. You can use them to vary the pace within a movie. For example, you might want a title to move onto the stage slowly and then exit quickly. You can use one tempo setting to control the speed at which the title moves onto the stage and a different setting to control the speed at which it exits.

Tempo settings don't affect the duration of any transitions you've set in the transition channel, and they don't control the speed at which a sound plays. They control only the speed at which the playback head moves from frame to frame.

In the real world, the tempo setting in the tempo channel is the speed Director tries to achieve. Other factors may—and often do—affect the speed of animation. If you're animating several sprites at the same time, the animation runs more slowly than if you're animating just one. If you're animating a sprite you've applied a blend value to, the animation runs more slowly than it otherwise would. If you're animating an 8-bit sprite across an 8-bit background, the animation runs more slowly than if you're animating a 1-bit sprite across a 1-bit background. The computer you're using also affects the speed Director can achieve: some computers run more slowly than others. You can always slow animation down with a tempo setting, but you can't speed it up faster than the computer that's running the animation can manipulate the information it needs to display the animation on the screen.

The procedures in this section show how to set tempos, how to compare the speed at which a movie is actually running with the tempo you've set, and how to lock the speed at which a movie plays.

Other things you can do

What you can do	Where to find out how
Pause a movie for a given number of seconds	"Set Tempo" in the Score menu section of Chapter 6
Pause a movie until a user clicks the mouse or presses a key	"Set Tempo" in the Score menu section of Chapter 6
Wait for a sound to stop playing before the movie continues	"Set Tempo" in the Score menu section of Chapter 6

Adding a tempo setting

A movie usually begins with a tempo setting in the first cell of the tempo channel.
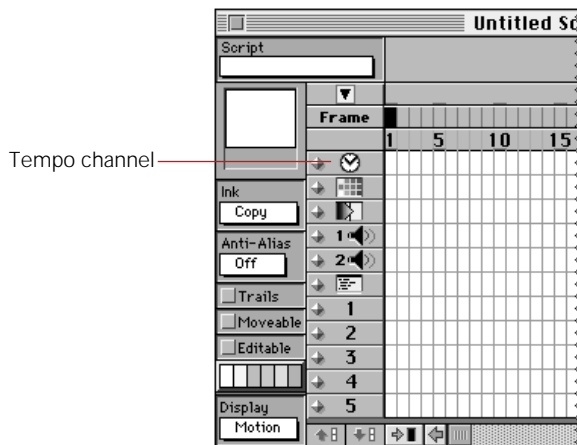
Tempo channel

If you don't set a tempo until later in the movie, the beginning tempo is determined by the setting in the control panel.
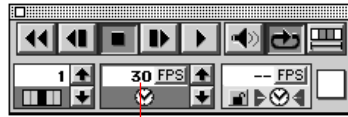
Tempo setting

Director plays a movie at the tempo you've set until it encounters a new tempo setting in the tempo channel.

Note   *It's a good idea to avoid setting a tempo, a transition, and a palette change all in the same frame. It's also a good idea to avoid using tempo settings that make a movie wait for the user to click the mouse or a key or for a sound or QuickTime movie to finish in the same frame where you have an interactive button. For ways to work around such situations, see* Tips & Tricks.

To add a tempo setting:

1. **In the score, select the cell in the tempo channel where you want the new tempo setting to appear.**

2. **Choose Set Tempo from the Score menu.**
   The Set Tempo dialog box appears.
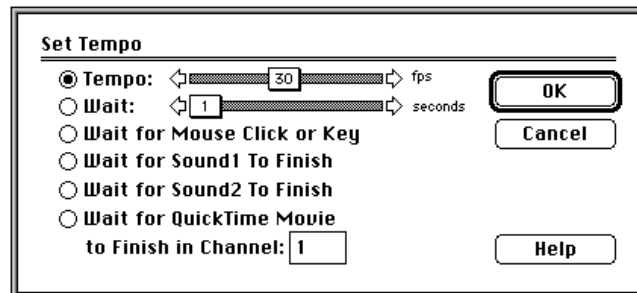
▶   *Tip*   *You can also open the Set Tempo dialog box by double-clicking a cell in the tempo channel.*

3. **Select the option you want to use.**

   For information about the options in the dialog box, see "Set Tempo" under "Score menu" in Chapter 6, "Menu Reference."

4. **Click OK.**

   A number that matches the setting you've chosen appears in the tempo channel.

Comparing actual speed with tempos you've set

As mentioned earlier, the tempo setting in the tempo channel is the speed Director tries to achieve. Not all computers, however, are equally fast, and one of the major reasons Director may fail to keep up with the tempo you've set is that the computer it's running on just isn't fast enough.

It's always a good idea while you're in the process of creating a movie to run the movie on a computer that's slower than the computer you're using to create it. You can step through the movie frame by frame and compare the tempo you've set with the actual speed of the movie. If the difference is too great and performance on the slower computer too poor, you can make changes to the movie to make it perform better.

The tempo you've set and the actual speed of a movie both appear in the control panel.

Actual speed
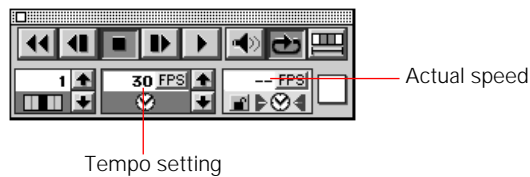
Tempo setting

To compare the actual speed of a movie with the tempos you've set:

1. **Use the Step Forward button to step through the movie frame by frame.**

2. **In each frame, compare the tempo setting shown in the control panel with the actual speed shown there.**
   If you haven't recorded the actual speed of a movie in a particular frame, the control panel displays two dashes (--).

Locking playback speed

Once you have a movie running at the speed you want, you can record the duration of each frame and then lock the movie's speed so it can't play back any faster. For example, you can adjust a movie so it runs well on a slow computer and then lock its playback speed so it runs the same on all computers regardless of their speed. It's important to remember that even though the movie can't play back any faster after you've locked the playback speed, it can still play more slowly.

To lock a movie's playback speed, either choose Lock Frame Durations from the Edit menu or click the Lock button on the control panel.
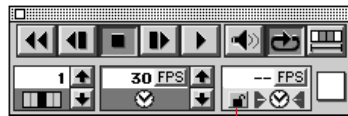
Lock button

To unlock the playback speed, choose Lock Frame Durations or click the Lock button again.

To lock an entire movie:

1. **Rewind the movie and play it all the way through.**
   Playing the movie records the actual duration of each frame. If you're working with a movie that has a great deal of interactivity, make sure you play through each segment of the movie.

2. **Choose Lock Frame Durations from the Edit menu or click the Lock button on the control panel.**
   When you click the Lock button, its appearance changes to show that frame durations are now locked.

   Once you lock the frame durations, the movie won't run any faster than the durations you've set even if the computer it's running on is capable of playing it faster.

To unlock a movie:

▶ **Click the Lock button.**
   The appearance of the Lock button changes to show that the movie is no longer locked.

Clearing previously recorded frame durations

You may occasionally want to lock the playback speed of only part of the movie. To do that, you first need to clear all the frame durations you've previously recorded for the movie, and then record the actual durations in just the parts of the movie where you want to lock the playback speed.

To lock part of a movie:

1. **Hold down the Option key and choose Lock Frame Durations from the Edit menu (or Option-click the Lock button on the control panel) to clear any frame durations that are set.**
   The value in the Actual display is replaced with two dashes (--).

2. **Select the frames you want to lock and click the Selected Frames Only button on the control panel.**

3. **Click the Play button to play the frames you've selected.**
   Playing the selection sets the actual duration of each frame that's part of it.

4. **Choose Lock Frame Durations from the Edit menu or click the Lock button on the control panel.**
   When you click the Lock button, its appearance changes to show that frame durations are now locked.

   Once you lock the frame durations, the frames you've selected won't run any faster than the durations you've set even if the computer it's running on is capable of playing them faster.

To unlock the part of a movie that's locked:

1. **Select the frames that are locked.**

2. **Click the Lock button.**
   The appearance of the Lock button changes to show that the frames are no longer locked.

Adding sounds

Of all the effects you can create in Director, sounds are among the most versatile. You can add voice-overs to provide information, music to create a mood, atmospheric sounds to set a scene, realistic sounds such as footsteps to reinforce animation, fantastic sounds to enhance special effects—just about anything you can imagine.

The sound channels in the score and tempo settings you can add to the tempo channel provide basic control of sound effects. You can create more sophisticated effects using the Lingo commands `sound fadeIn`, `sound fadeOut`, and `the volume of sound`. For more information, see *Using Lingo*.

The procedures in this section show how to add a sound to the sound channel and how to retrigger a short sound (such as a footstep) that you want to use over and over.

Other things you can do

What you can do	Where to find out how
Record a sound	"Record Sound" in the Cast menu section in Chapter 6
Play a sound in the cast window	"Cast Member Info" in the Cast menu section in Chapter 6
Cut, copy, paste, and clear sounds in the sound channels of the score	Edit menu section in Chapter 6
In-between sounds in the sound channels of the score	"In-Between Linear" in the Score menu section in Chapter 6
Replace one sound in the sound channel with another	"Switch Cast Members" in the Score menu section in Chapter 6

Adding sound to a movie

Most sounds require more than one cell for you to hear the whole sound. So, when you add a sound to the score, you usually select a range of cells rather than just a single cell.

The score has two channels set aside for sounds:
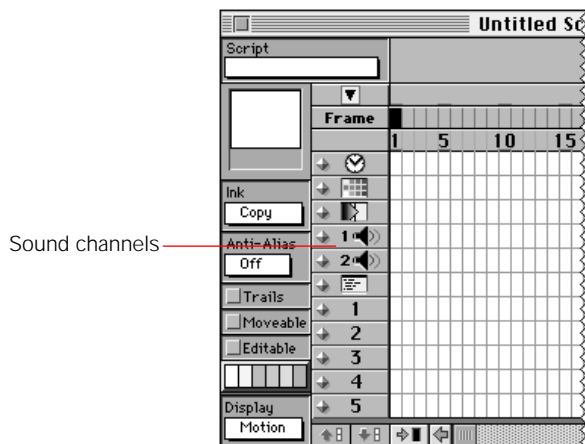
Sound channels

A sound in sound channel 2 overrides a sound in sound channel 1. A sound that's already playing in either sound channel overrides the sound in a digital video movie, and it also prevents the digital video movie's sound from playing even after the sound in the sound channel has stopped. Once the sound in a digital video movie has started, however, it overrides a sound in either sound channel.

If you're adding a looped sound—one that plays over and over as long as the playback head is in a frame where the sound is set—make sure the Looped checkbox in the Cast Member Info dialog box is selected for the sound. Otherwise, the sound won't repeat. (The ability to loop is something that's set when a sound file is created; you can't make a sound repeat by selecting the Looped checkbox if the ability to loop hasn't been built into the sound.)

To add a sound to a movie:

1. **Import the sound.**

2. **In the score, select the range of cells in the sound channel where you want to set the sound.**

3. **Choose Set Sound from the Score menu.**
    The Set Sound dialog box appears.
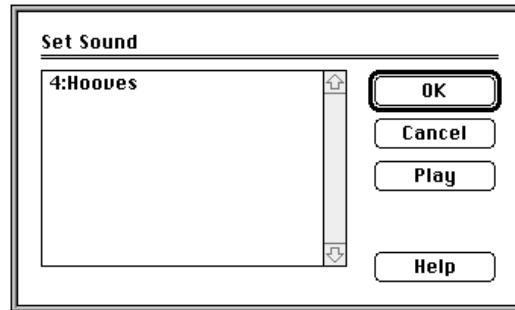
▶ **Tip** *If you want to hear a sound before you add it to the movie, select it and click the Play button.*

4. **Select the sound you want to use, and click OK.**
    The number that appears in the sound channel corresponds to the sound's number in the cast window.

    If the sound cuts off before it's finished playing when you run the movie, use In–Between Linear to fill more cells with the sound. Or add a tempo setting to the frame where the sound ends: select the option in the Tempo dialog box that makes the movie wait for the sound to finish.

▶ **Tip** *Sounds take up considerable disk space. If you know you're going to use the same sounds in several movies, put the sounds in a shared cast. You can then use the same sounds in several movies and use much less memory. For information about creating a shared cast, see "Creating a shared cast" in Chapter 1, "Working with Cast Members."*

Repeating a sound

You may find that you want to repeat a sound such as a footstep over and over to create one continuous sound effect—for example, the sound of a person walking.

One way to do that is to use a looped sound. But remember that the ability to loop is something that's set in an AIFF sound file when the file is created; you can't you can't make an AIFF sound repeat by selecting the Looped checkbox in the Cast Member Info dialog box if the ability to loop hasn't been built into the sound.

To repeat a sound that doesn't have looping built into it, you have to retrigger the sound—which means you have to separate each new occurrence of the sound in the sound channel with at least one blank cell. (Simply filling a continuous range of cells with the sound won't work: Director interprets the entire range as a single instruction to play the sound through just once.)
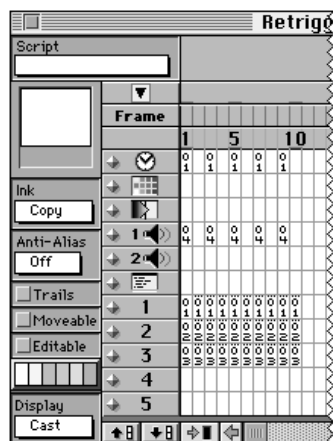
Using a blank cell to retrigger a sound

To repeat a sound:

1. **In the score, go to the sound channel you want to use and select the entire range of cells during which you want the sound to play.**

2. **Choose Set Sound from the Score menu.**
    The Set Sound dialog box appears.

3. **Select the sound you want to use, and click OK.**
    The number that corresponds to the sound's position in the cast window fills the sound channel.

4. **Play the section of the movie where you've set the sound to see how many frames it takes to play the sound once.**
    The movie may run faster or slower on a computer that runs at a different rate from yours, so it may take a different number of frames for the sound to play once on a different computer.

5. **Select the cell in the frame after the one where the sound ended, and choose Clear Cells from the Edit menu.**

▶ *Tip*   *You can also clear the cell by pressing the Backspace or Delete key.*

6. **Skip over as many cells as you need to play the sound a second time, and clear the cell in the frame following that group.**

7. **Repeat step 6 throughout the entire range you originally selected.**

Working with transitions

Without transitions, the only way to get from the end of one scene to the beginning of another is with a jump cut: the first scene ends and the next abruptly replaces it. Director provides more than 50 alternatives to the jump cut. For example, you can dissolve from one scene to the next, display a new scene strip by strip, or switch to it as if revealing it through Venetian blinds. You can wipe across the screen revealing the new scene as you go, slide the old scene off the stage revealing the new scene underneath, or slide the new scene onto the stage covering the old. You can also use many of the transitions to make individual elements appear or disappear from the screen, and you can even use transitions to create animation—for example, you can make bars appear to grow on a bar chart as you wipe the new scene over the old.

The procedures in this section show how to select the transitions you want to use and where to place them in the score to get the effect you want to achieve.

Other things you can do

What you can do	Where to find out how
Fade to black or white	"Set Palette" in the Score menu section in Chapter 6
Gradually shift from one set of colors to another	"Extending a palette transition over time" later in this chapter

Adding transitions

Transitions, like tempos, palettes, and sounds, have a channel set aside for them in the score.
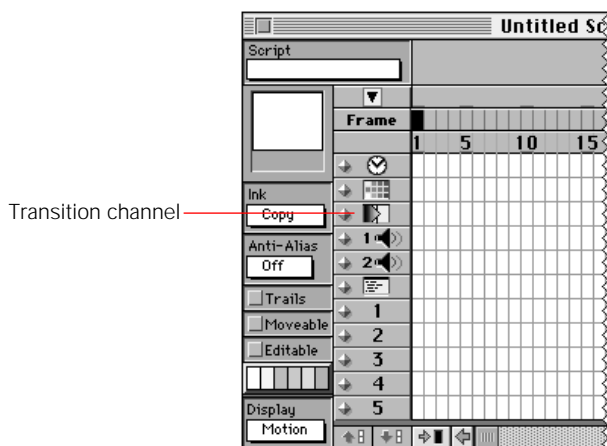
Before you select the frame where you want to set a transition, it's important to understand how transitions work. A transition always takes place between the end of the current frame and the beginning of the frame where the transition is set. So, if you want to do a dissolve between two scenes, set the transition in the first frame of the second scene, not the last frame of the first scene.

Note   *It's a good idea to avoid setting a transition, a palette change, and a tempo change all in the same frame.*

To add a transition:

1. **In the score, go to the transition channel and select the cell where you want the transition to occur.**

2. **Choose Set Transition from the Score menu.**
   The Set Transition dialog box appears. It lists the transitions you can choose from.

Set Transition dialog box showing a scrollable list of transitions (Center Out, Horizontal; Center Out, Square; Center Out, Vertical; Checkerboard; Cover Down; Cover Down-Left; Cover Down-Right; Cover Left; Cover Right; Cover Up; Cover Up-Left; Cover Up-Right) with "Transition Applies to:" options (Stage Area, Changing Area), Duration slider "in 1/4 seconds", Chunk Size slider (smooth to rough), and Set, Cancel, Help buttons.

▶ **_Tip_** _You can also open the Set Transition dialog box by double-clicking a cell in the transition channel._

3. **Select the transition you want.**
   For many of the transitions, a default setting for Duration and Chunk Size appears in the scroll bars at the left of the Transition dialog box. You can adjust the scroll bars to make the transition faster or slower, smoother or chunkier.

   For many of the transitions, you can also select whether the transition affects the entire stage or just the area that's changing (the area where any sprites that weren't on the stage in the previous frame appear).

   Some transitions look significantly different on Macintosh and Windows computers. For more information, see "Set Transition" under "Score menu" in Chapter 6, "Menu Reference."

▶ **Tip** *You can scroll to the transition you want to select in the transition dialog box by typing the first letter of the transition's name.*

4. **Click Set.**

   Director displays the number that corresponds to the transition in the transition channel.

   If you export a movie that contains transitions as a QuickTime movie or PICS file, the transitions may not be preserved.

Working with color palettes

OPEN ISSUE: This information needs to be reviewed.

Director's palette window provides a place where you can work with the color palettes that are part of a movie.

A monitor—depending on its type and the graphics display card that's installed—can display 1-bit color (black and white), 2-bit color (4 colors), 4-bit color (16 colors), 8-bit color (256 colors), 16–bit color (32,768 colors), 24-bit color (16.7 million colors), and 32-bit color (16.7 million colors and 8 bits of special effects). Color palettes are available only when the monitor's color depth is set to 2, 4, or 8 bits. When you have the monitor set to 1 bit, there's no color palette because the only colors you have to choose from are black and white. When you have the monitor set to thousands of colors (16–bit color) or millions of colors (24- or 32-bit color), you choose colors not from a palette—a collection of 4, 16, or 256 discrete colors—but from a continuous spectrum of the thousands or millions of colors available.

You can use the palette window to display any existing palette and to rearrange or change the colors it contains. You can also make a copy of the palette you've displayed in the palette window and use the copy to create a new palette.

This section explains how cast members are linked to palettes and what determines which palette is active. It shows how to make a palette active, how to remap the cast to a new palette, and how to create a common palette for cast members that don't share the same palette. It also describes how to move colors around in a palette, how to make changes to the colors a palette contains, and how to find the color chip in the palette that corresponds to a color on the stage.

Other things you can do

What you can do	Where to find out how
Cut, copy, and paste colors in a palette	"Cut," "Copy," and "Paste" under "Edit menu" in Chapter 6
Blend colors in a palette	"Blend Colors" under "Palette menu" in Chapter 6
Reverse the order of colors in a palette	"Reverse Color Order" under "Palette menu"
Rotate colors in a palette	"Rotate Colors" under "Palette menu"
Sort the colors in a palette	"Sort Colors" under "Palette menu"
Reserve colors in a palette	"Reserve Colors" under "Palette menu"
Select all the colors that aren't being used by any of the cast members in a movie	"Select Used Colors" under "Palette menu"
Import a cast member with its palette	"Import" in the File menu section of Chapter 6
Remap a cast member to the palette that's active when you import it	"Import" in the File menu section of Chapter 6
Have Director remap cast members automatically	"Movie Info" in the File menu section in Chapter 6

How cast members are linked to palettes

Each cast member that's set to a color depth of 2, 4, or 8 bits is associated with a palette. (Cast members with a color depth of 16 or 24 bits aren't associated with palettes because they have the entire spectrum of colors the monitor can display associated with them.) A palette gets associated with a cast member when you create it. For example, if you create a cast member in the paint window, the palette that was selected when you created the cast member becomes the palette that's linked to that cast member. If you create a cast member by scanning an illustration in a color scanner at a color depth of 2, 4, or 8 bits, the scanner's software creates a palette that's linked to the cast member.

The palette associated with a cast member provides Director with the information it needs to display a cast member in the same colors it had when you created it. When you import a cast member that was created with a palette different from the palette, Director lets you import its palette as well so you can display it exactly as it looked when it was created.

A potential problem arises when you want to display a cast member associated with a palette that's different from the palette that's currently active. The computer can display only one palette at a time, so you need either to change the palette that's active to the one the cast member uses or to remap the colors in the cast member to the colors in the current palette. Director makes it possible to take either approach.

A more vexing problem caused by the computer's inability to display more than one palette at a time arises when you want to display two (or more) cast members that were created with different palettes. The best solution is to create a **common palette** that contains most of the colors in each of the cast members. You can then remap each cast member to the common palette. (For more information, see "Creating a common palette" and "Remapping the cast to a new palette" later in this chapter.)

What determines which palette is active

The score has a palette channel where you can set which palette you want to become active at any given frame in a movie.

Palette channel ——
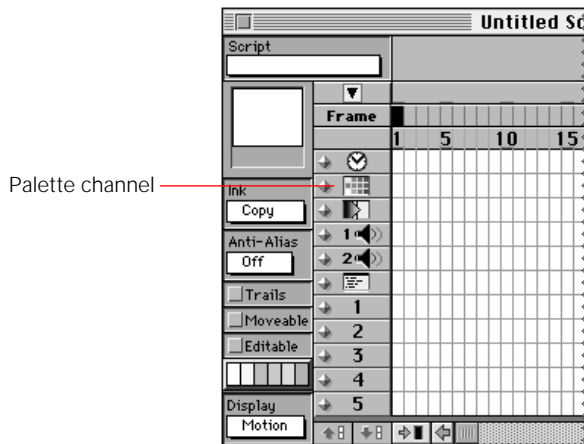
While a movie is running, the palette in control of the monitor is determined by the position of the playback head in the score.

When a movie is stopped, the palette associated with the window that's currently active is in control. The most obvious example is the palette window: when it's active, the palette that's selected is in control. If the cast window is active, the palette associated with the cast member currently selected is in control. (Since a palette can be a cast member, you can switch control from one palette to another just by selecting their respective cast members in the cast window.) If the paint window is active, the palette associated with the cast member displayed there is in control. And so on.

One of the most important things to remember when you're working with palettes is that changing from one palette to another affects everything on the screen—not just the stage, but Director's interface, the Finder, and anything else displayed on the monitor.

Changing palettes in a movie

The palette channel in the score determines which palette is active at any point in a movie. The default setting for the palette channel is the System-Mac palette. If you place a cast member with a different palette on the stage—and it's the first cast member with a different palette in the frame—Director adds the new palette to the palette channel automatically. The new palette becomes the active palette unless you clear it from the palette channel or replace it with a different palette, and it remains in effect until you set a different palette in the palette channel.

To switch from one palette to another in a movie:

1. **In the score, select the cell in the palette channel where you want the palette to take effect.**

2. **Choose Set Palette from the Score menu.**
    The Set Palette dialog box appears.
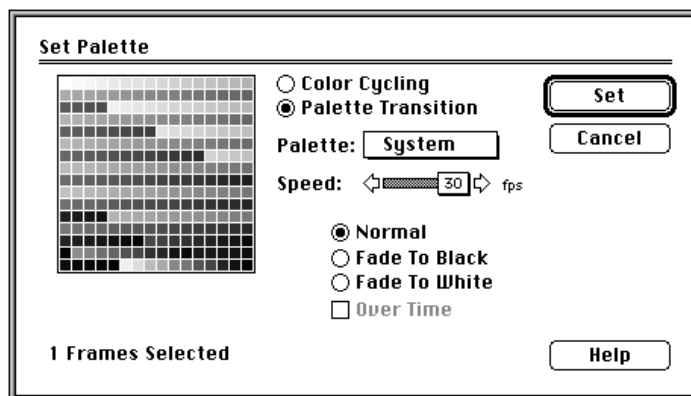
> **▶ Tip** *You can also open the Set Palette dialog box by double-clicking a cell in the palette channel.*

3. **Select a palette from the Palette pop-up menu.**
   The choices always include System–Mac, System–Win, Rainbow, Grayscale, Pastels, Vivid, NTSC, Metallic, and VGA palettes. If you've added any other palettes to the cast they also appear in the Palette pop-up menu.

► *Tip* *Since the palette you choose affects everything displayed on the monitor—including Director's interface—you may find it difficult to see what you're doing after you select a new palette. If that's the case, choose Preferences from the File menu, and then choose Black and White User Interface from the Preferences dialog box. The black-and-white interface looks the same no matter which palette is active.(You might also want to deselect the Colored Cells checkbox in the Score Windows Options dialog box.)*

4. **Click Set.**
   The palette you choose now appears in the cell you selected in the palette channel of the score. It remains in effect in the movie until you set a different palette in the palette channel.

Hiding a palette change with a transition

When you switch from one palette to another, you'll notice that sprites on the stage in the frame just before the change occurs appear briefly in the colors of the new palette. To mask the flash of color, set a transition in the same frame where you set the new palette.

To mask the flash of color with a transition:

1. **In the score window, double-click the cell in the transition channel that's in the same frame where the new palette appears.**
   The Set Transition dialog box appears.
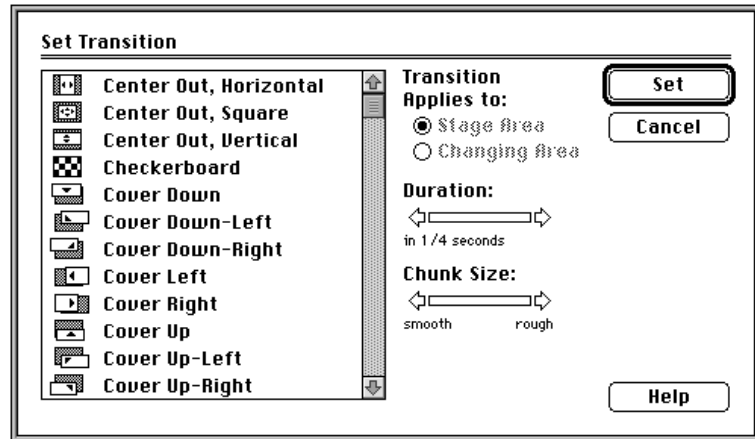
2. **Select a transition.**

The best transitions for hiding the flash of color are ones that happen quickly over the entire screen, such as Checkerboard, Boxy Dissolve, or Venetian Blinds.

3. **Click Set.**

When you play the movie, the transition doesn't completely hide the flash of color, but it does distract the eye of the viewer and make the flash less obvious.

A more effective way of handling the change from one palette to another is with a palette transition. For more information, see "Creating color effects" later in this chapter.

Remapping the cast to a new palette

If cast members you've assembled in the cast window use different palettes, the task of using them in the same movie—even if cast members with different palettes don't appear on the stage at the same time—can be complicated.

You can avoid the problems of switching from one palette to another by mapping the entire cast to a single palette. The best approach is to find the palette that contains most of the colors most of the cast members use (a quicker approach is to use the palette the majority of the cast members already use) and then to remap any cast members using a different palette to the one you've chosen. If you can't find a palette with enough common colors, you can create one (see "Creating a common palette" later in this chapter).

When Director remaps a cast member to a new palette, it finds the colors in the new palette that most closely match the colors in the original palette. The result is usually a close, although not identical, match.

You can also have Director remap a cast member when you import it (see "Import" under "File menu" in Chapter 6, Menu Reference") or automatically when it's needed (see "Movie Info," in Chapter 6).

Note   *Make a duplicate of a cast member before you remap it to a different palette. That lets you preserve the cast member the way it was meant to look in case you don't like the results of the remapping.*

To remap a cast member to a new palette:

1. Go to the cast window and select the cast member you want to remap.
If you want to remap more than one cast member, select them all.

▶ *Tip* *If you're working with a large number of cast members, use the Find Cast Members command to select all the cast members that use a specific palette.*

2. Choose Transform Bitmap from the Cast menu.
The Transform Bitmap dialog box appears.
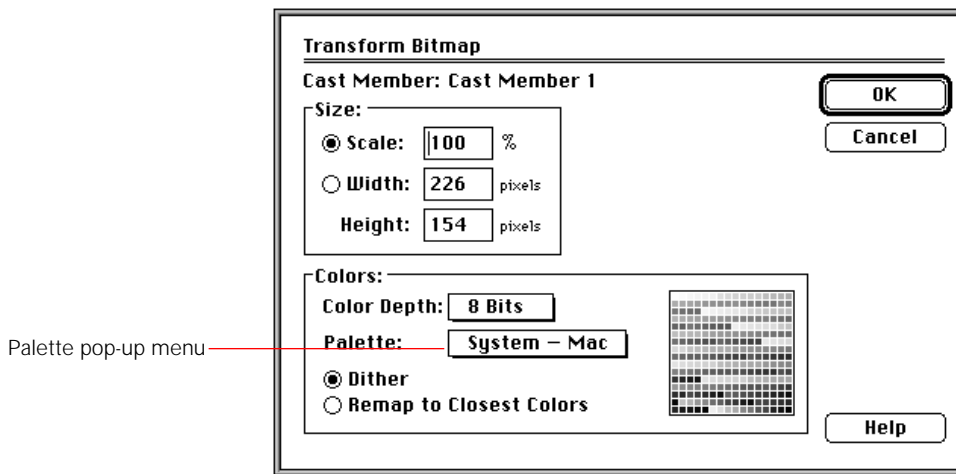
Palette pop-up menu

3. From the Palette pop-up menu, choose the palette that you want to remap the cast member to.

4. Select Dither or Remap to Closest Colors.
Dither produces blends of colors that approximate as closely as possible the original color. Remap to Closest Colors uses the solid color in the new palette that's closest to the original color.

5. Click OK.
An alert appears. It tells you that you can't undo the change and asks if you want to transform the cast member.

6. Click OK.
Director replaces the colors in the cast member with the colors from the new palette that match them most closely.

Creating a common palette

If you can't find a palette that contains most of the colors used by most of the cast members in a movie, you can create one. You can then remap all the cast members to the common palette.

Although the process varies depending on the range of colors the cast members use and the number of cast members and palettes you're dealing with, it follows the same general steps:

◆ Find the existing palette you want to use as the basis of the common palette.

◆ Assemble the common palette.

◆ Remap the cast to the common palette.

To find the existing palette that you want to use as the basis of the common palette:

1. **Select the cast member in the cast window with the palette that seems like the best candidate.**
   If you have a cast member that doesn't use all the colors in its palette, try it first.

2. **Choose Color Palettes from the Window menu (or press Command-8) to open the palette window.**
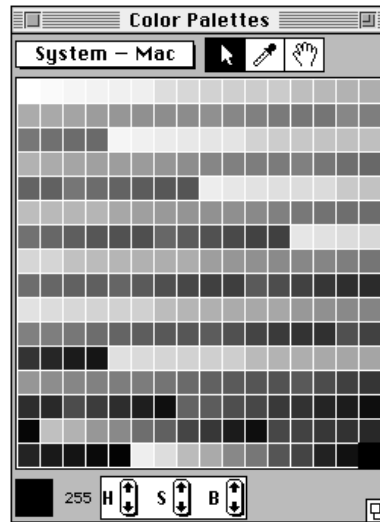
3. **Choose Select Used Colors from the Palette menu.**
   The Select Colors Used in Bitmap dialog box appears.
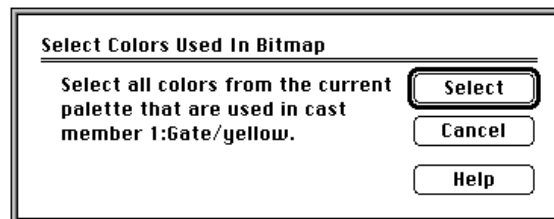
4. **Click Select.**
    Director highlights the colors used by the selected cast member.

    If the cast member uses all or most of the colors, try another palette. The goal is to find a palette with as many unused colors as possible so you can add colors to it without disturbing the original palette or the cast member that the palette is associated with. When you find a palette that has a large number of unused colors, you can duplicate it and use the copy to build the common palette. If all the cast members use most of the colors in their respective palettes, you can duplicate any of the palettes.

5. **When you find the palette you want to use as the basis for the common palette, choose Duplicate Palette from the Palette menu.**
    Director displays a dialog box where you can enter a name for the new palette.

6. **Name it Common Palette, and then click OK.**

The next part of the process is to assemble the common palette. The first step is to move the selected colors—the colors used by the cast member that's currently selected—to the top of the palette where you won't disturb them when you add colors used by other cast members.

If the selected cast member uses a large number of the colors in the palette, you may want to select just a representative sample of the colors it uses. For example, if the cast member has a wide range of reds and greens you can probably sacrifice a number of intermediate shades without degrading the quality of the image.

To assemble the common palette:

1. **Use the hand tool to drag any color that's selected to the color chip in the upper left corner of the palette.**
Director consolidates the colors into a contiguous range. The colors on the screen change, reflecting the change in the palette.

2. **Choose Invert Selection from the Palette menu.**
Invert Selection reverses the selection so all the color chips that weren't selected before are now highlighted. The colors now highlighted are the ones you don't need in the common palette.

3. **To make the part of the palette you don't want to keep easier to identify, choose Blend Colors from the Palette menu.**
Director replaces the unused colors with a smooth blend of colors. You can replace the blended colors with the colors the other cast members use.

To add colors from another cast member to the common palette:

1. **Choose a cast member with a different palette from the cast window.**

2. **Make the palette window active, and then choose Select Used Colors from the Palette menu.**
The Select Colors Used in Bitmap dialog box appears.

3. **Click Select.**
Director highlights the colors used by the selected cast member.

If the selected cast member uses a large number of the colors in the palette, select just a representative sample. If several cast members use the palette, you may need to repeat the previous three steps for all of them to find a sample that's representative of all of them.

4. **Choose Copy Colors from the Edit menu (or press Command-C) to copy the selected colors.**

5. **Choose Common Palette from the pop-up menu in the Palette window.**

   The common palette reappears in the palette window.

6. **Select the first color chip in the area that contains the blended colors and choose Paste Colors from the Edit menu (or press Command-V).**

   Director pastes the colors you copied into the common palette.

7. **Repeat steps 1 though 6 for each cast member with its own palette.**

Once you've created a common palette that contains a representative range of colors from all the other palettes, you're ready for the final part of the process: remapping each cast member to the common palette.

It's best to work with a copy of each cast member rather than the original. You'll discover the best palette for all the cast members only by experimenting. If you don't like the results of remapping to one palette, you can create a new common palette and try remapping the cast members to it. Having the original cast member to go back to makes it much easier to experiment until you get the results you want.

To remap the cast to the common palette:

1. **Select all the bitmap cast members in the cast window.**

2. **Choose Duplicate Cast from the Cast menu (or press Command-D).**
    Director makes copies of all the cast members you've selected and displays them in the next available spots in the cast window.

3. **Choose Transform Bitmap from the Cast menu.**
    The Transform Bitmap dialog box appears.

4. **Choose Common Palette from the Palette pop-up menu.**

5. **Select either Dither or Remap to Closest Color.**
    Dither produces blends of colors that approximate as closely as possible the original color. Remap to Closest Colors uses the solid color in the new palette that's closest to the original color.

6. **Click OK.**
    An alert box appears. It tells you that you can't undo the change and asks if you want to transform the cast member.

7. **Click OK.**
    Director remaps the cast to the new palette.

You may need to try several times before you create a palette that has the right set of colors you need to make all the cast members look good. But you'll find that many cast members look virtually the same with fewer than half the colors of their original palettes.

Editing palettes

You may find that while the palette you've chosen has all the colors you need for most of the cast members, it needs one or two more colors for a particular cast member. It's easy to add a new color to a palette—but because every palette has space for only a finite number of colors, adding a new color means replacing a color that's already part of the palette. When you do that, you have to make sure you don't replace a color you're using for some other cast member.

The Color Picker

The easiest way to choose a new color for a palette is with the Color Picker.
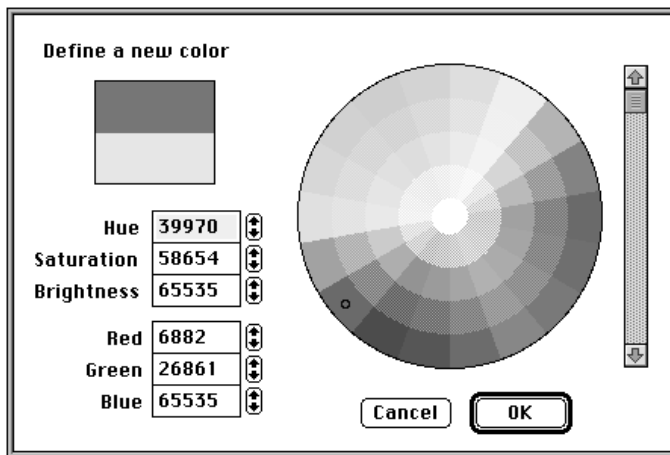
The Color Picker is similar to the color wheel artists use to organize the spectrum of colors. The Macintosh Color Picker uses two systems to measure color: Hue, Saturation, Brightness (HSB) and Red, Green, Blue (RGB). Each of the 16 million colors that the Macintosh can display has unique values in the HSB and RGB systems.

The color currently selected in the palette window appears in the color box on the left side of the dialog box; its location on the color wheel is marked by a small square. As you change the color, only the top half of the color in the box changes so you can compare the current color with the original.

Below the box are the controls to change the Hue, Saturation, and Brightness. You can type numbers directly into the boxes for the H, S, or B values, or click the up or down arrows. The numbers are a useful reference if you're trying to duplicate a color exactly. As you change the hue, you can see the spot in the color wheel move around the color wheel in a circle. As you change the saturation, the spot moves toward or away from the color wheel's center.

You can also click or drag in the color wheel to set the hue and saturation. Brightness is controlled with the scroll bar to the right of the color wheel.

Changing a color with the Color Picker

To change a color with the Color Picker:

1. **Choose Color Palettes from the Window menu (or press Command-8) to display the palette window.**

2. **Select the name of the palette you want to change from the Palette pop-up menu.**
   The palette you select appears in the palette window.

3. **Double-click the color you want to change.**
   The Color Picker appears.

4. **Select the color that you want to replace the current color with, and then click OK.**
   If you're working with one of the default palettes, a dialog box appears so you can name and save the new palette.

5. **Type a name and click OK.**
   The new color replaces the old color in the palette.

Moving colors in a palette

Sometimes you need to shuffle the order of the colors in a palette (for example, when you're drawing a gradient with adjacent colors or isolating a range of colors to create a common palette). In either case, you can use the hand tool in the palette window to move colors around.

To move colors in a palette:

1. **Select the hand tool in the palette window.**

2. **Select the color you want to move.**

3. **Drag the color to a new position.**
   If you're working with one of the default palettes, a dialog box appears so you can name and save the new palette.

4. **Type a name for the new palette, and then click OK.**

You can drag the hand tool across a number of colors in a palette to select a range of colors, or you can press the Command key and click with the hand tool to make a discontiguous selection of colors. When you have a discontiguous selection, dragging one of the colors to a new position reorganizes all the selected colors so they occupy a contiguous range.

Identifying colors on the stage

You may find that you need to identify the specific color chip in the palette that matches a color that appears on the stage. For example, you may want to create another cast member that uses exactly the same color; or you may want to create a color cycling effect that includes the color. To identify the color chip in the palette that matches any color on the stage, use the eyedropper tool in the palette window.
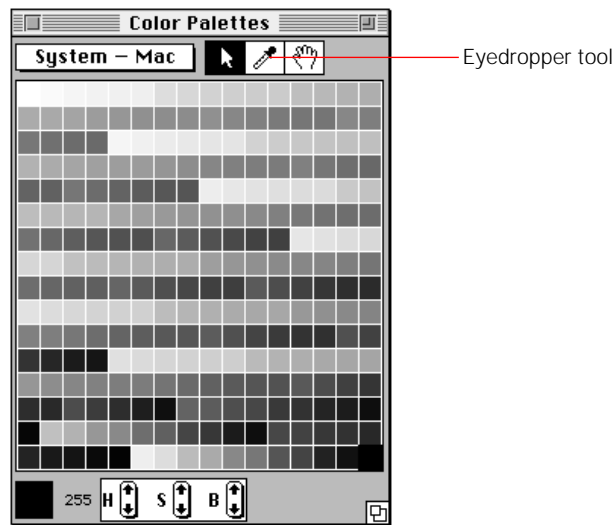
Eyedropper tool

To use the eyedropper to identify a color:

1. **Choose Color Palettes from the Window menu (or press Command-8) to display the palettes window.**

2. **Select the eyedropper tool.**

3. **Click any spot on the stage.**
    The color chip that matches the color of the pixel you click is selected in the palette.

Creating color effects

There are two ways you can use palette settings in the palette channel of a movie's score to create effects with color:

◆ **Palette transitions.** Use palette transitions to control a shift from one palette to another. A palette transition can mask a change from one palette to another by fading the screen to black during the change, or it can animate the change either between frames or over a series of frames, shifting every color gradually through a range of intermediate colors to its counterpart in the new palette.

◆ **Cycling through colors.** Use a palette setting to cycle through a range of colors you've selected in a palette. Cycling colors is a great way to represent flowing, spinning, or pulsing objects.

The most important thing to remember about effects you create with palette settings is that they affect not just the stage, but anything that appears on the monitor. For example, if you fade to black to mask a palette change, the entire screen fades to black.

Hiding a palette change with a fade

When you switch from one palette to another, you'll notice that sprites on the stage in the frame just before the change occurs appear briefly in the colors of the new palette. You can mask the flash of color with a transition in the transition channel, but a more effective way to handle the change is to fade the screen to black (or white), change to the new palette, and then fade up from black with the new palette already in effect. Director can handle the entire process with a single palette transition.

Remember that when you fade the screen to black or white to switch palettes, the entire screen—not just the stage—fades to black or white.

To mask a palette change with a fade:

1. **Go to the score, and select the cell in the palette channel where you want the new palette to take effect.**

2. **Choose Set Palette from the Score menu.**
    The Set Palette dialog box appears.
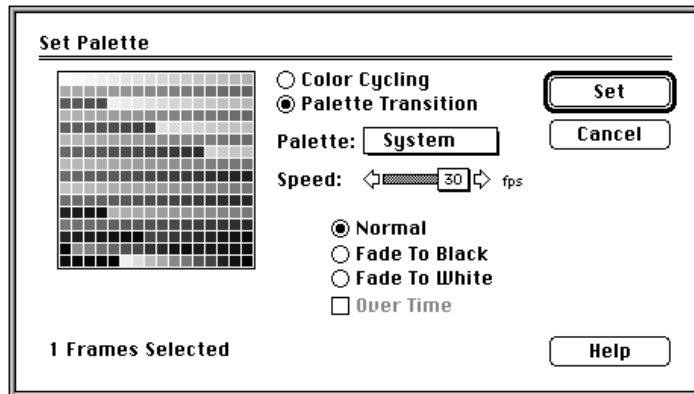
▶ *Tip*   *You can also open the Set Palette dialog box by double-clicking a cell in the palette channel.*

3. **Select Palette Transition near the top of the dialog box.**

4. **If you haven't already set the palette that you want to change to, choose it from the Palette pop-up menu.**

5. **Select Fade to Black or Fade to White.**

6. **Make sure the checkbox next to Over Time isn't selected.**

7. **Click Set.**
    The number of the palette that you're changing to appears in the cell in the palette channel.

Setting palette transitions between frames

Fading the screen to black or white may not be an appropriate effect at the point in the movie where you want to switch from one palette to another. Another technique you can use to prevent an abrupt switch from one set of colors to another is a gradual change that occurs between the last frame where the old palette is in effect and the first frame where the new palette assumes control.

Don't use this technique if an animated sequence spans the frames where the palette change occurs. The gradual change from one palette to another—because it occurs between two frames—stops any animation that's in progress while the change is occurring. For information about creating a palette transition that happens at the same time animation is in progress, see the next section, "Extending palette transitions over time."

Remember that the transition from one palette to another affects the entire screen, not just the stage.

To create a palette transition between frames:

1. **Go to the score, and double-click the cell in the palette channel where you want the new palette to take effect.**
   The Set Palette dialog box appears.
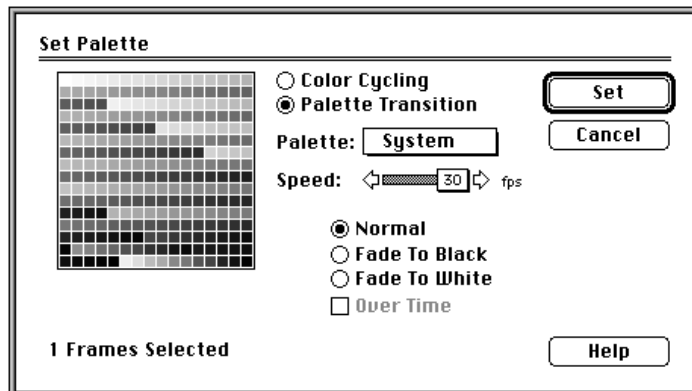
2. **Select Palette Transition near the top of the dialog box.**

3. **If you haven't already set the palette that you want to change to, choose it from the Palette pop-up menu.**

4. **Use the Speed slider to set the speed of the transition.**
   The farther to the right you drag the slider, the faster the transition happens.

5. **Make sure the check box next to Over Time isn't selected.**

6. **Click Set.**
   The number of the palette that you're changing to appears in the cell in the palette channel.

Run the animation to test the speed you've set. If it's too fast or too slow, double-click the cell in the palette channel where the setting appears and adjust the Speed slider.

▶ **Tip** *You can get a better idea of how the palette transition works if you open the Palette window and watch the transition there.*

Extending a palette transition over time

When Director changes from one palette to another over time, the animation continues on the stage as the palettes change.

To extend a palette transition over time:

1. **In the score window, select the cells in the palette channel during which you want the transition to take place.**

2. **Choose Set Palette from the Score menu.**
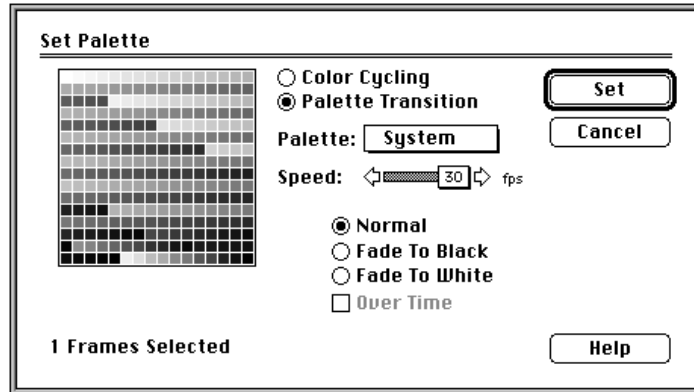
The Set Palette dialog box appears.

3. **Select Palette Transition near the top of the dialog box.**

4. **If you haven't already set the palette that you want to change to, choose it from the Palette pop-up menu.**

5. **Select the checkbox next to Over Time.**

6. **Click Set.**

The number of the palette that you're changing to appears in the entire range of cells you've selected. The change isn't complete, however, until the playback head reaches the last cell in the range.

Cycling colors

You can have Director cycle through a range of colors you've selected in the palette. As Director cycles through the colors, any spot on the stage where any of the colors in the range appear changes in turn to each of the other colors in the range.

You can use color cycling to create effects such as a sunrise or sunset, a ball spinning, or a waterfall.

You can set up color cycling so that it occurs in a single frame or over a range of frames.

> ▶ **Tip** *Since color cycling affects everything displayed on the monitor—including Director's interface—you may find it difficult to see what you're doing when you're working with color cycling. If that's the case, choose Preferences from the File menu, and then choose Black and White User Interface from the Preferences dialog box. The black-and-white interface looks the same no matter which colors are in effect.*

To cycle colors:

1. **Go to the score window, and in the palette channel select the cell or cells where you want the cycling to take place.**

2. **Choose Set Palette from the Score menu.**
   The Set Palette dialog box appears.
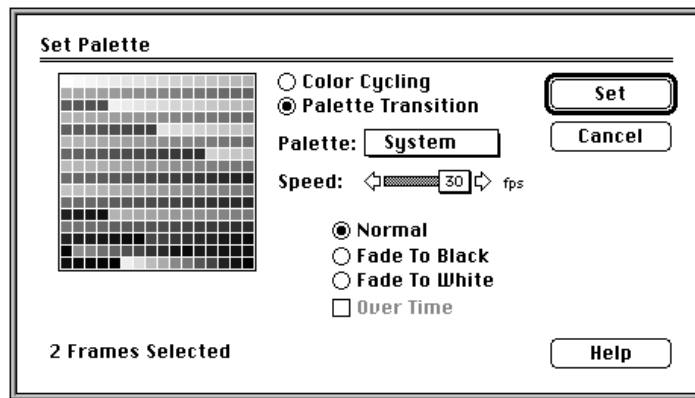
3. **Select Color Cycling.**

4. **If the palette you want to use isn't the one that appears in the dialog box, choose the palette from the Palette pop-up menu.**

5. **Use the palette in the dialog box to select the range of colors you want to cycle.**

6. **Select the settings you want to use.**
   For information about the settings, see "Set Palette" under "Score menu" in Chapter 6, "Menu Reference."

7. **Click Set.**
   The number of the palette you've selected appears in the cells you selected in the score.

When you play the movie, as the playback head reaches the frames where the color cycling is in effect, any sprite that contains a color in the range you selected changes in turn to each of the other colors in the range.

▶ **Tip**   *You can get a better idea of how color cycling works if you open the Palette window and watch the cycling there.*

Creating a projector

A ***projector*** is a play-only version of a Director movie. Anyone—even someone who doesn't own a copy of Director—can play it. The only thing that's needed is a computer that meets certain basic system requirements. (For details, see "Hardware and Software Requirements" in the introduction.)

Note *OPEN ISSUE: What are the system requirements to play a projector?*

A projector is the ideal way to package movies for distribution. Anyone can play them, but no one can open them again in Director and edit or copy them.

If you've created a series of related movies that play one after another or a movie that branches to one or more other movies, you can include them all as part of the same projector. If the order in which the movies play is important, you need to arrange them in the same order before you turn them into a projector.

For more information about projectors, see "Create Projector" in Chapter 6, "Menu Reference;" also see "Frequently Asked Questions" in *Tips & Tricks*.

To create a projector:

1. **If you have a movie open, save it, and then close it.**

2. **Choose Create Projector from the File menu.**
   The Create Projector dialog box appears.
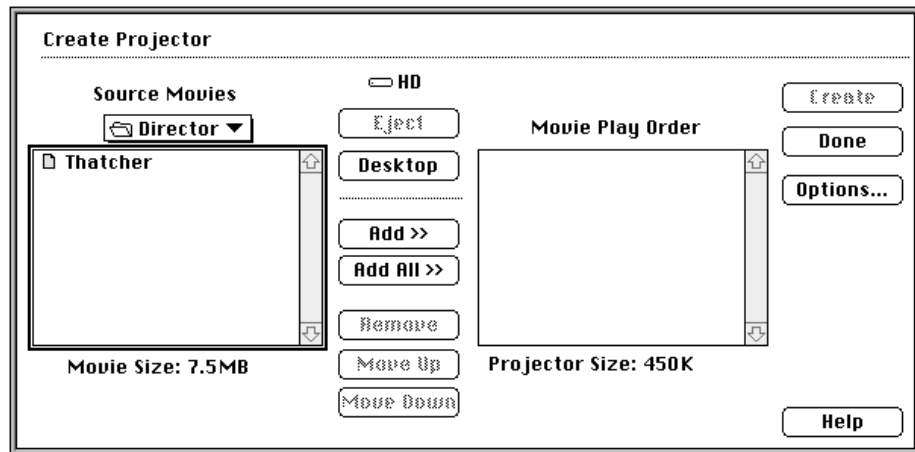
3. **From the list of source movies on the left side of the dialog box, select the movie you want to turn into a projector, and then click the Add button.**
   Director transfers the name of the movie to the list on the right.

   If you want to add more movies to the projector, repeat the step for each one. If you want to include all the movies that are in the directory that's open, click the Add All button.

4. **Click the Options button.**
   The Projector Options dialog box appears.
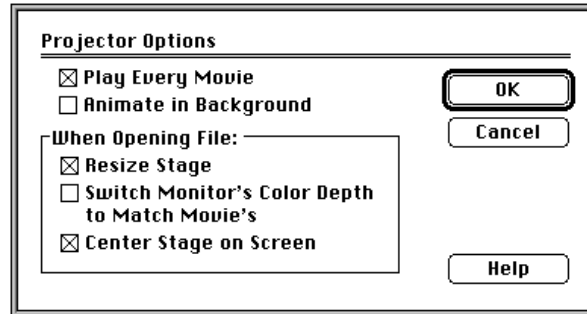
5. **Select the options you want, and then click OK.**
   For information about the options, see "Create Projector" under "File menu" in Chapter 6, "Menu Reference."

6. **Click Create.**
   The Save dialog box appears.

7. **Name the projector, and then click Save.**
   Director turns the movies you've selected into a projector.

If you want to create a projector for a different movie or set of movies, repeat the procedure. When you're finished:

▶ **Click Done to close the dialog box.**

To play a projector, you double-click the icon associated with it. The projector starts the play-only version of Director, plays the movies, and then quits Director automatically.

Chapter 4

Making a Movie Interactive

Making a movie interactive means building into it the ability to respond to choices that users make. The goal of interactivity is to give users some degree of control over a movie. Interactivity can sometimes be extraordinarily subtle and difficult to achieve, but when your goals are modest you can achieve remarkable results with very little effort.

Normally, the only control a user has over a movie you've created is to start it and let it run until it reaches the end. The simplest level of control you can build into the movie itself is to give users control over the pace at which they move from one part of the movie to the next.

Director gives you two ways to provide that kind of control. The easiest to use is a tempo setting. One of the options you have to choose from when you create a tempo setting stops the movie and simply waits until the user clicks the mouse button or presses any key on the keyboard before it allows the movie to go on to the next frame. (For more information, see "Wait for Mouse Click or Key" under "Set Tempo" in Chapter 6, "Menu Reference.") A more sophisticated approach is to create "next" and "previous" buttons that allow users to move both forward and backward through a movie. For an example of "next" and "previous" buttons, see the sample movie *Noh Tale to Tell* (go to the Macromedia Director 4.0 folder, open the Sample Movies folder, then the Lingo Expo folder, and finally the Storybook folder, and then start Noh_Tale).

A more complex form of interactivity is branching—allowing users to choose a path through a movie, rather than limiting them to a single path that goes directly from beginning to end. For an example of how branching works, see the sample movie *Furniture + Philanthropy* (go to the Macromedia Director 4.0 folder, open the Sample Movies folder, then the Lingo Expo folder, and finally the Kiosk folder, and then start Begin.Dir). Branching uses buttons to show users what their choices are—but as you can see in *Furniture + Philanthropy*, buttons can take many different shapes and forms.

Whenever you create a button—whether to allow users to go from one segment to the next or to choose the path they want to follow— you also need to write a Lingo script that tells Director what to do when someone clicks the button. While writing scripts may sound like the kind of thing only people with experience in programming should try, it's a lot easier and less intimidating than you may think.

The procedures in this chapter show how to create and use markers, how to set up hypertext links, and how to create buttons and write scripts for them.

Using markers

You can write a script that tells a movie to go to a specific frame that marks the beginning of a segment. Such a script would say something like `go to frame 13`—which means to go to the frame numbered 13 in the score.
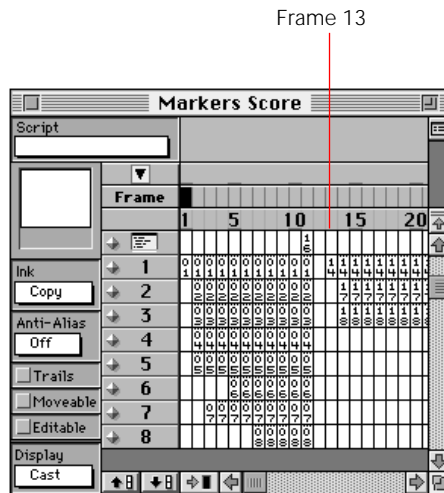
Frame 13

The problem with that approach is that if you add or delete a frame before frame 13, the script no longer tells the movie to go to the right place. A much better practice is to put a marker in the first frame of a segment and give the marker a name.

Marker

Marker name
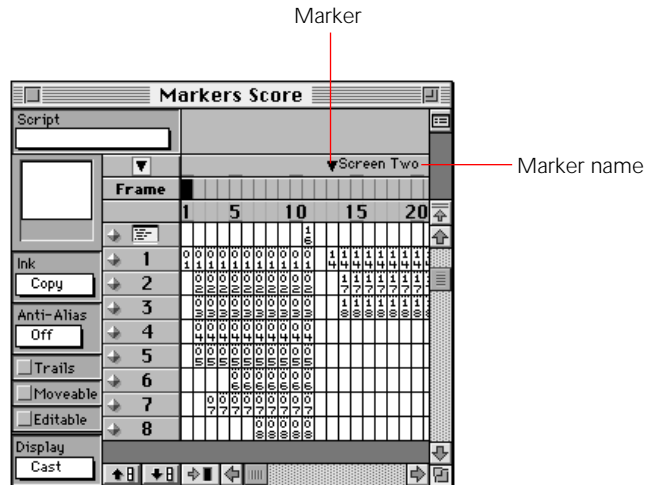
When there's a marker, the script can tell the movie to go to the marker, and you can add and delete frames without worrying about having to rewrite scripts whenever you do so. A script that tells a movie to go to a marker looks something like this:

```
go to frame "Screen Two"
```

It's always accurate as long as you don't rename the marker that the script refers to.

Creating and labeling a marker

To create a marker:

1. Drag a marker from the marker well and place it above the frame where you want the marker to appear.

Marker well   Marker positioned above frame 13
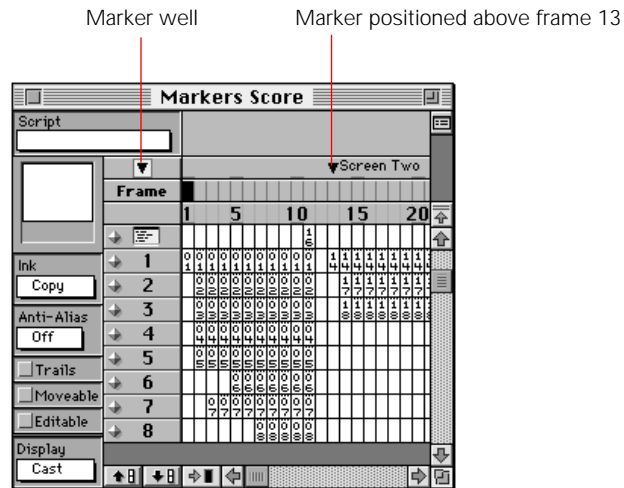
2. Type the name you want to give the marker and press Return.
The name appears to the right of the marker.

Using the marker window

Once you've set a marker, it appears not only in the score, but also in the marker window. The marker window has two uses. You can select the name of a marker to display the part of the score where the marker is located. That can come in handy when you're working on a complex score with lots of frames. You can also use the marker window to add comments about each segment of a movie where you've placed a marker.

To use a marker to display the part of the score where it's located:

1. **Choose Markers from the Windows menu.**
   The Markers window appears.
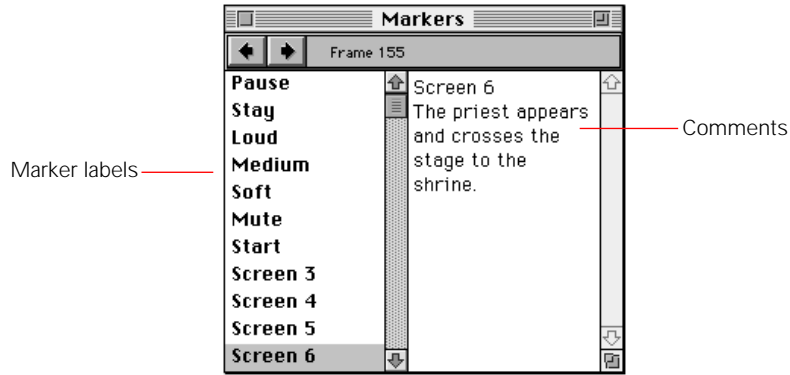
The names of all the markers are listed on the left side of the marker window. Any comments you've added about the marker that's currently selected appear on the right side of the window.

2. **Select the marker located in the part of the score you want to display in the score window.**
   Director moves to the part of the score where the marker is located.

Creating buttons

The Tools window provides tools for creating standard buttons, radio buttons, and checkboxes.

Standard button tool ———

Radio button tool ———

Checkbox tool ———

Pause ———— Standard button

○ Deutsch
○ English ———— Radio buttons
○ Français

☐ Dining Out
☐ Shopping ———— Checkboxes
☐ Skiing
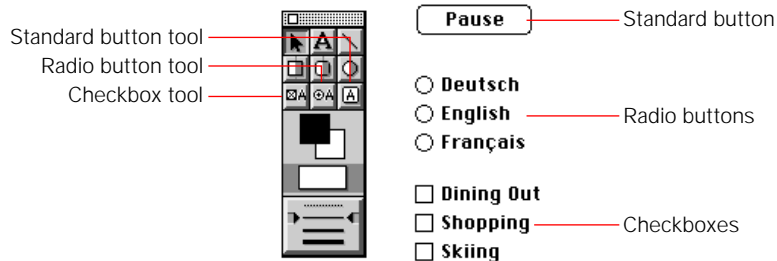
◆ **Standard buttons.** Use standard buttons when you want a movie to respond to the user immediately. For example, use a standard button to allow a user to pause the animation on the stage, to branch to a different part of a movie, or to quit a movie.

◆ **Radio buttons.** Use radio buttons for mutually exclusive options. For example, if you're creating a storybook that displays text in more than one language, use radio buttons to let users select which language they want to appear on the screen.

◆ **Checkboxes.** Use checkboxes for options that aren't mutually exclusive. For example, if you're creating a kiosk with travel information, use checkboxes to allow users to select the activities they're interested in.

Each type of control operates just as you'd expect. When you click a standard button, it's highlighted as you press the mouse button down and then returns to normal as you release the mouse button. When you click a radio button, a dot appears inside the circle; when you click it a second time, the dot disappears. When you click a checkbox, an X appears in the box and then disappears when you click the box a second time. But remember that any control you create with any of the tools is just an animated image—it needs a Lingo script before it can cause anything to happen.

Simple Lingo scripts are easy to create. The scripts for buttons that allow users to choose a path through a movie are about a half dozen words long—and Director writes part of the script for you.

To create a button:

1. **Choose Tools from the Window menu to open the Tools window.**

2. **Select the tool for the type of button you want to create.**

Standard button tool ———
Radio button tool ———
Checkbox tool ———
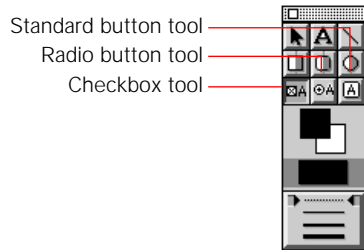
3. **Position the pointer on the stage, and drag toward the left or right until the box that appears is big enough to accommodate the text for the button.**
    The button appears on the stage. Director also adds it to the cast window.

    A radio button or checkbox always appears aligned with the left edge of the box you've drawn—no matter which way you draw the box—so you can type the text to the right.

4. **Type the text you want to appear on or next to the button.**
    If you want to change the way the text looks, select it, and then choose the appropriate settings from the Text menu.

5. **Create a script for the button.**
    For information about creating a script, see "Writing scripts" later in this chapter.

▶ **Tip** *You can edit a button's text either in a text window or on the stage.*

Creating a hypertext link

A hypertext link works just like a button: when a user clicks some text on the screen—an entire block, just a phrase, or a single word—a script associated with the text tells Director to go to a different segment of the movie.

There are two ways to set up a hypertext link. You can make the entire cast member containing the text act as the button, or you can make just a word or phrase within the cast member act as the button. Making just part of the text in a cast member act as a button is a little more difficult than making the entire cast member act as a button.

The two procedures in this section will work for nearly every situation in which you want to create a hypertext link. If you want to do something more sophisticated than either of the procedures can accommodate, you'll need to rely on what you can accomplish with Lingo. For example, if you want to create a hypertext link in a scrolling text field, you can use the `mouseWord` function. For more information, see *Using Lingo*.

Using an entire text block as a button

To make an entire text block act as a button:

1. **Create the text.**
   You can use either the paint text tool or the text tool in the tools window. If you use the text tool in the tools window—which creates QuickDraw text—it's best to convert the cast member to a bitmap when you've finished editing the text. See "Creating text with the tools window" in Chapter 1, "Working with Cast Members," for more information.

2. **In the cast window, select the cast member that contains the text.**

3. Click the Script button at the top of the cast window.

A script window appears.

```
Script of Cast Member 1

1

on mouseUp

end
```
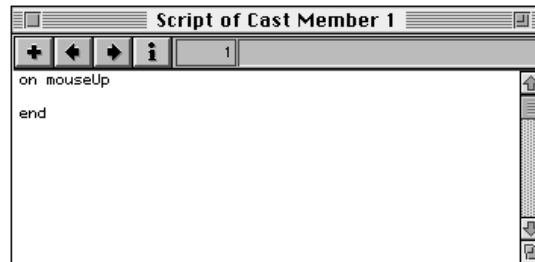
4. Type the script that creates the hypertext link, and then close the Script window.

A typical script for a hypertext link would take the user to a different segment of the movie. It might look something like this:

```
on mouseDown
 go to frame "woodwinds"
end
```

"Woodwinds" is the name of the marker that marks the beginning of the segment. For more information about writing a script, see "Writing scripts" later in this chapter.

You can use the hypertext cast member you've created just as you would any other block of text. The only difference between it and a normal block of text is that when a user clicks it, Director follows the instructions in the script you've attached to the hypertext cast member and goes to the movie segment you've indicated in the script.

Using part of a text block as a hypertext link

When you want to use a word or phrase in a block of text as a hypertext link, setting up the link involves:

◆ Creating the text

◆ Converting the text to a bitmap

◆ Creating a transparent cast member that first you place over the word or phrase and then attach a script to

◆ Writing the script.

The first part of the process is to create the text block:

1. **Create the text using the text tool in the Tools window.**

2. **Select the word or phrase you want to act as a button and make it a different color, font, size, or style to make it stand out.**

3. **Arrange the text on the stage exactly as you want it to appear.**

The text you create with the text tool in the tools window is QuickDraw text. Remember that Director can display the font you've chosen for QuickDraw text only if the font is installed on the computer where it's running—and someone running the movie you've created may not have the same fonts you have. If the font you've chosen isn't available, the system will replace it with a different font. The text may end up looking quite different from the way you laid it out.

To make sure the text doesn't change, convert it to a bitmap:

1. **In the cast window, select the cast member that contains the text.**

2. **Choose Convert to Bitmap from the Cast menu.**
   Director turns the text cast member into a bitmap cast member.

The next step is to create a transparent cast member you place over the text you want to act as the hypertext link. The transparent cast member is actually the button that makes the hypertext link work.

To create the transparent cast member:

1. **Select the filled rectangle tool from the tools window.**
   Be sure you select the filled side of the rectangle tool. When you draw a rectangle with the unfilled rectangle tool, you create what's essentially an empty frame: the inside of the rectangle is invisible because there's nothing there. An empty frame won't work as a button, because when you click inside it you're clicking empty space. On the other hand, when you draw a rectangle with the filled rectangle tool and then make it transparent, there's something inside the rectangle—it just happens to be invisible because you've made it transparent.

2. **Select the same color from both the foreground and the background color chips in the tools window.**

3. **Draw a rectangle over the text you want to use as the hypertext link.**

4. **Choose Background Transparent from the Ink pop-up menu in the score.**
   The rectangle becomes invisible.

The final step is to write the script for the invisible button:

1. **Go to the cast window, and select the transparent cast member.**

2. **Click the script button at the top of the cast window.**
   A script window appears.

```
Script of Cast Member 10
| +  | ◄ | ► | i |    10
on mouseUp

end
```
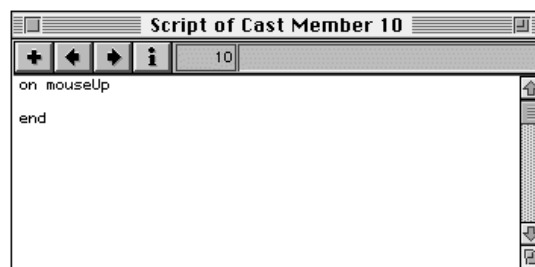
3. Type the script, and then close the script window.

A typical script for a word or phrase that's a hypertext link looks the same as the script for an entire block of text that acts as a link. For more information about writing a script, see "Writing scripts," next.

When users click the part of the text that's formatted differently, they're really clicking the transparent cast member you've placed over the text. Director follows the instructions in the script you've assigned to the transparent cast member and goes to the movie segment you've indicated in the script.

Writing scripts

This section describes four script scenarios that outline the kind of navigation techniques you'll find yourself using again and again.

Writing scripts is a lot easier and less intimidating than you may think. None of the scripts in this section is longer than seven words. You can master all the Lingo you need to know to use the techniques in this section in under an hour.

Note *You may notice that after you've added buttons to a movie, the cursor seems to disappear occasionally. That happens because Director doesn't display the cursor when there's nothing on the screen to click.*

Types of scripts

The script scenarios in this section use three types of scripts:

◆ Cast member scripts

◆ Sprite scripts

◆ Frame scripts.

Sprite scripts and frame scripts are also known as score scripts because they appear in the score.

Note *Director has a fourth kind of script that you'll encounter after you've mastered basic Lingo—movie scripts. For information about them, see* Using Lingo.

Cast member scripts

Every button is a cast member. A cast member script—which you attach to a button in the cast window—becomes a permanent part of the button. The script goes with the button no matter where you use the button in the movie. (You can attach a script not just to a button cast member, but to any bitmap, PICT, shape, or text cast member; that means you can use any of those cast members as a button.)

A cast member script looks something like this:

```
on mouseUp
 go to frame "Screen Two"
end
```

Director automatically supplies the first and last lines of the script. You need to supply only the middle line.

The first line, on mouseUp, means "when a user clicks the mouse on this button." The last line, end, indicates the end of the script. So, if you add a middle line that reads

```
go to frame "Screen Two"
```

the script means, "When a user clicks the mouse on this button, go to the frame that has the marker named *Screen Two*. That's the end of the script."

Use a cast member script when you want Director to do exactly the same thing whenever anyone clicks the button that the script is attached to. But be aware that "do exactly the same thing" means "do absolutely exactly the same thing."

Suppose, for example, you've set up a button named *Next* at the end of the first screen of a movie, and you want the button to take the user to the second screen. You label the marker in the first frame of the second screen *Screen Two* and attach this cast member script to the button:

```
on mouseUp
 go to frame "Screen Two"
end
```

The button works fine. But if you try to use the same button on the third screen, Director will go, not to the fourth screen, but back to the second screen. That's because even though the button says *Next*, the script tells Director to go to the frame labeled *Screen Two* no matter where the button is located in the movie.

When you attach a script to a cast member, an indicator appears in the lower left corner of the cast member's thumbnail in the cast window.

Script indicator
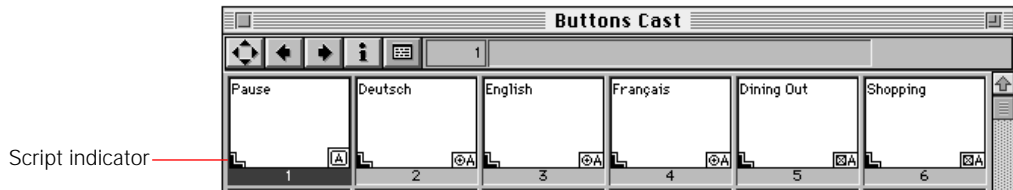
Sprite scripts

Remember that when you place a cast member on the stage, what Director displays is not the cast member itself, but a sprite associated with the cast member. The cast member remains in the cast window, and the sprite—an image of the cast member—appears on the stage.

Remember also that a cast member and a sprite aren't identical. A cast member is the template for a sprite, and the sprite has information associated with it—such as its position on the stage—that isn't associated with the cast member. Director stores information associated with a sprite in a cell in the score, and that information— like the sprite's position—can change from cell to cell. Part of the information that can be stored in the cell is a script associated with a sprite.

Because the information associated with a sprite can change from cell to cell, a sprite script—unlike a cast member script—is associated with a button in only one cell at a time. You could, for example, have two sprites associated with the same button cast member on the stage at the same time, and if they had different sprite scripts, something different would happen when you clicked each of them.

A sprite script for a button looks identical to a cast member script for a button, and Director automatically supplies the first and last lines of the script. You need to supply only the middle line.

It's possible for a cast member to have both a cast member script and a sprite script associated with it. When that happens, the sprite script overrides the cast member script.

Frame script

There's a third type of script you may use occasionally in conjunction with a cast member or sprite script—a frame script. A frame script is associated with an entire frame in the score, rather than with a cast member or a sprite.

A frame script looks something like this:

```
on exitFrame
 pause
end
```

Director automatically supplies the first and last lines of the script. You need to supply only the middle line.

The first line, on exitFrame, means "when everything else in this frame has been done." The last line, end, indicates the end of the script. So, if you add a middle line that reads

```
pause
```

the script means, "When everything else in this frame has been done, wait for an instruction to continue. That's the end of the script."

One of the most common ways you'll use frame scripts is to pause a movie to wait for a user to press a button.

Script scenarios

The four scenarios in this section cover the four most common situations that you'll want to write scripts for:

◆ Allowing users to go from one segment to the next at their own pace

◆ Allowing users to go to a segment that's not immediately after the current segment in the score

◆ Allowing users to go to a segment and returning them automatically to the spot they branched from

◆ Allowing users to quit a movie.

Going to the next segment after a pause

If you want to allow users to go from one segment of a movie to the next at their own pace, you need to write two scripts:

◆ The first script pauses the movie at the end of a segment.

◆ The second script resumes the movie when the user clicks a button.

Script one: pause

The script that pauses a segment is a frame script. It looks like this:

```
on exitFrame
 pause
end
```

To create the script:

1. Go to the score, and in the script channel, select the cell where you want the script to appear.

2. Choose New from the script pop-up menu.

Script pop-up menu ——
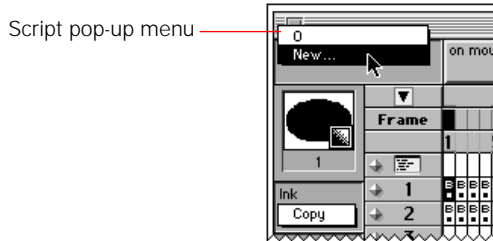
A script window appears.

3. On the middle line of the script, type:
```
pause
```

That's all you need to add.

4. Close the script window.

Add the same script to the final frame of every segment in the movie.

Script two: continue

The script that goes to the next segment is a cast member script. You attach the script to the button you want users to click to continue to the next segment. The script looks like this:

```
on mouseUp
 continue
end
```

To create the script:

1. **In the cast window, select the cast member that you want to attach the script to.**

2. **Click the script button in the cast window.**
    A script window appears.

```
┌─────────────────────────────────────────────┐
│ ▤□═══════ Script of Cast Member 1 ═══════▣  │
├─────────────────────────────────────────────┤
│ [ + ][ ◆ ][ ➜ ][ i ]│     1    │            │
├─────────────────────────────────────────────┤
│ on mouseUp                              ⬆    │
│                                         ▯    │
│ end                                          │
│                                              │
│                                              │
│                                              │
│                                         ⬇    │
│                                         ▫    │
└─────────────────────────────────────────────┘
```
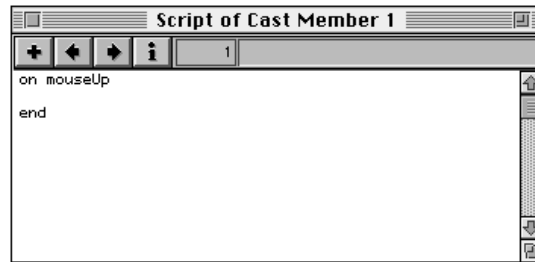
▶ ***Tip*** *Control-click the cast member to display a script window.*

3. **On the middle line of the cast member script, type:**
    `continue`

    That's all you need to add.

4. **Close the script window.**

Add the button with the script to the final frame of every segment in the movie. The script is part of the button, so it goes with the button wherever you place the button in the movie.

Note *For the final segment of the movie, you probably want to have a Quit button instead of a Continue button. See "Leaving a movie" later in this chapter for the appropriate script.*

About pause and continue

The `pause` and `continue` commands are easy to use, but unfortunately that makes them easy to use in the wrong circumstances.

It's important to understand exactly what `pause` does: it stops Director's playback head. Using it is just like pressing the pause button on a VCR: the picture remains frozen on the screen until you press the play button again. The difference between a videotape and a Director movie is that more may be going on in a Director movie than just the image that appears on the screen. When you use `pause` to stop the movie, you also stop any Lingo scripts that may be running unseen in the background.

When you start creating movies where things are happening behind the scenes, the appropriate alternative to the `pause` command is the statement `go to the frame` (the next section describes how to use it). When you use `go to the frame`, the playback head remains in the same frame, but it never stops moving—it keeps returning to the same frame over and over until you give Director an instruction to go to a different frame.

Going to a segment identified by name

If you want to allow users to follow a path of their own choosing through a move, you need to write two types of scripts:

◆   The first makes the movie wait at the end of a segment until users click a button.

◆   The second—slightly different for each button—takes the user to a different segment.

Script one: go to the frame

The script that makes a movie wait at the end of a segment for the user to click a button is a frame script. It looks like this:

```
on exitFrame
 go to the frame
end
```

The `go to the frame` statement, as explained in the previous section, is an alternative to `pause`. Like `pause`, `go to the frame` keeps the playback head from moving to a different frame. But there's an important difference between the two: `pause` stops the playback head completely; `go to the frame` keeps the playback head returning to the same frame over and over until you give Director an instruction to go to a different frame.

To create the first script:

1. Go to the score, and in the script channel, select the cell where you want the script to appear.

2. Choose New from the Script pop-up menu.

Script pop-up menu ———
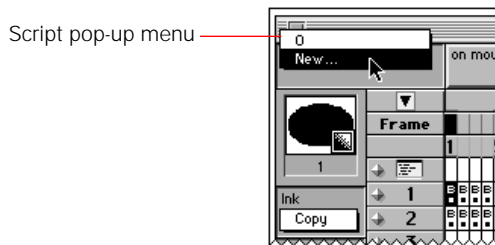
A script window appears.

3. On the middle line of the script, type:
    `go to the frame`

That's all you need to add.

4. Close the script window.

Add the same script to the final frame of every segment where you want the movie to wait for the user to click a button.
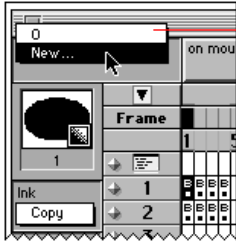
Script two: go to frame "name"

The script that goes to a particular segment when the user presses a button can be either a cast member script or a sprite script, depending on the nature of the movie you're creating. For example, if the movie is a kiosk providing travel information about different cities, the button for each city will have a different name, so you'd use cast member scripts for each button. But the information about each city is going to fall into the same categories: lodging, restaurants, attractions, and so on. You'd create one set of buttons for each category, and then use sprite scripts in the appropriate cells to allow each category button to branch to the appropriate information for the specific city a user has chosen.

The exact text of the script varies, depending on the name of the marker that identifies the specific segment of the movie that you're branching to, but the form of the script is the same whether you're creating a cast member script or a sprite script. It looks like this:

```
on mouseDown
 go to frame "name"
end
```

The script for each button looks slightly different: for each one, in place of *name,* you type the name of the marker that identifies the segment that you want the button to go to.

Cast member script	Sprite script
To create the script for a cast member:	To create the script for a sprite:

Cast member script

To create the script for a cast member:

1. **In the cast window, select the cast member that you want to assign the script to.**

2. **Click the script button in the cast window.**

A script window appears.

3. **On the middle line of the script, type:**
   ```
   go to frame "name"
   ```

   In place of *name*, type the name of the marker that identifies the segment that you want the button to go to. Make sure you enclose the name of the marker in quotation marks.

4. **Close the script window.**

Sprite script

To create the script for a sprite:

1. **In the score, select the cell (or cells) that contain the information about the sprite you want to assign the script to.**

2. **Choose New from the Script pop-up menu.**

— Script pop-up menu

A script window appears.

3. **On the middle line of the script, type:**
   ```
   go to frame "name"
   ```

   In place of *name*, type the name of the marker that identifies the segment that you want the button to go to. Make sure you enclose the name of the marker in quotation marks.

4. **Close the script window.**

Note   *You probably want to have a Quit button in various segments. See "Leaving a movie" later in this chapter for the appropriate script.*

Going to a segment and returning automatically

You can set up a segment so that users automatically return to it when they reach the end of a segment that they've branched to. For example, if you create a movie that has help screens, you'd want to set it up to work like this: when a user clicks a help button, the movie branches to the appropriate help screen, which has a return button on it. When the user clicks the return button, the movie goes back to the screen where the help button appeared.

To set up a segment to branch and return automatically, you need to write three types of scripts:

◆ One that waits at the end of the segment for the user to click a button

◆ One for each button that takes users to a different segment

◆ One at the end of each of those segments that tells Director the segment is done and it's time to return.

Script one: go to the frame

The script that waits at the end of a segment for the user to click a button is a frame script. It looks like this:

```
on exitFrame
 go to the frame
end
```

To create the script:

1. **Go to the score, and in the script channel, select the cell where you want the script to appear.**

2. **Choose New from the Script pop-up menu.**

Script pop-up menu ———

A script window appears.

3. **On the middle line of the script, type:**

   ```
   go to the frame
   ```
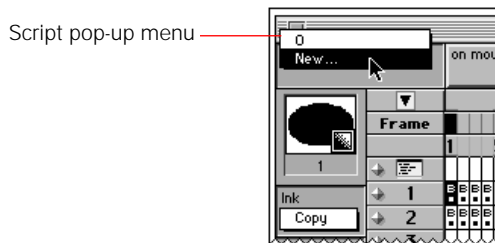
   That's all you need to add.

4. **Close the script window.**

Add the same script to the final frame of every segment where you want the movie to wait for the user to click a button.
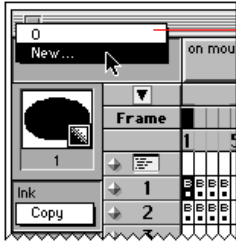
Script two: play frame "name"

The script that goes to a particular segment when the user presses a button can be either a cast member script or a sprite script, depending on the nature of the movie you're creating.

The exact text of the script varies, depending on the name of the marker that identifies the specific segment of the movie that you're branching to, but the form of the script is the same whether you're creating a cast member script or a sprite script. It looks like this:

```
on mouseDown
 play frame "name"
end
```

The script for each button looks slightly different: for each one, in place of *name,* you type the name of the marker that identifies the segment you want the button to play.

Cast member script	Sprite script
To create the script for a cast member:	To create the script for a sprite:

Cast member script

To create the script for a cast member:

1. **In the cast window, select the cast member that you want to assign the script to.**

2. **Click the script button in the cast window.**

A script window appears.

3. **On the middle line of the script, type:**
   ```
   play frame "name"
   ```

   In place of *name*, type the name of the marker that identifies the segment that you want the button to go to. Make sure you enclose the name of the marker in quotation marks.

4. **Close the script window.**

Sprite script

To create the script for a sprite:

1. **In the score, select the cell (or cells) that contain the information about the sprite you want to assign the script to.**

2. **Choose New from the Script pop-up menu.**

Script pop-up menu

A script window appears.

3. **On the middle line of the script, type:**
   ```
   play frame "name"
   ```

   In place of *name*, type the name of the marker that identifies the segment that you want the button to go to. Make sure you enclose the name of the marker in quotation marks.

4. **Close the script window.**

Note *You probably want to have a Quit button in various segments. See "Leaving a movie" later in this chapter for the appropriate script.*

Script three: play done

The script that tells Director that it's time to return is a frame script. It belongs in the script channel in the last frame of the segment that the user has branched to. It looks like this:

```
on exitFrame
 play done
end
```

To create the script:

1. **In the script channel, select the cell where you want the script to appear.**

2. **Choose New from the Script pop-up menu.**

Script pop-up menu ———
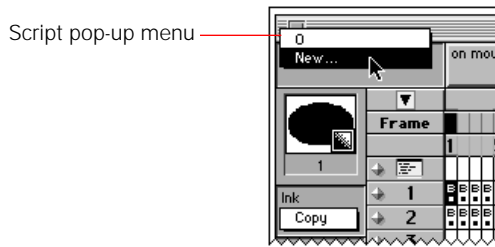
A script window appears.

3. **On the middle line of the script, type:**
    `play done`

    That's all you need to add.

4. **Close the script window.**

Add the same script to the final frame of every segment where you want Director to return to the segment that it came from.

Leaving a movie

If you create a movie that allows users to follow various paths, they may never reach the final segment of the score—so the movie will never end. To allow users to leave a movie before they reach the end of the score, you need to write a simple script that ends the movie when the user clicks the appropriate button. (The button, of course, must appear in a frame where there's a script that waits for the user to click a button.)

The script that ends a movie is normally a cast member script assigned to a Quit button. It looks like this:

```
on mouseDown
 quit
end
```

The `quit` command does the same thing as the Quit command on Director's File menu: it exits Director and returns to the Finder.

To create the script:

1. In the cast window, select the cast member that you want to assign the script to.

2. Click the script button in the cast window.

```
┌──────────── Script of Cast Member 1 ─────────────┐
│ [+] [◄] [►] [i]      [      1 ]                    │
│ on mouseUp                                    ⇧    │
│                                               ▤    │
│ end                                                │
│                                                    │
│                                               ⇩    │
│                                               ▣    │
└────────────────────────────────────────────────────┘
```
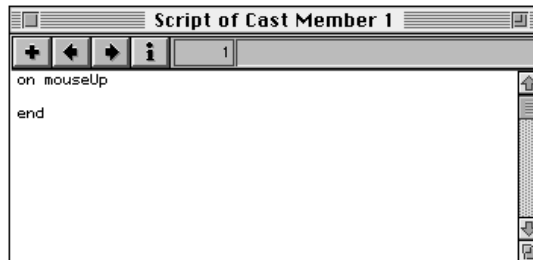
A script window appears.

3. **On the middle line of the cast member script, type:**
    ```
    quit
    ```

    That's all you need to add.

4. **Close the script window.**

Add the button to every frame in the movie where you want to give users the option of quitting. The script is part of the button, so it goes with the button wherever you place the button in the movie.

Learning more about Lingo

There's much more that you can do with Lingo than the few scripts in this chapter suggest. The table that follows lists the things you may want to try next. For a complete introduction to Lingo, work through the tutorials in *Using Lingo*.

Director's on-line help is another valuable resource when you're first learning Lingo. There's an entry for every Lingo element in the on-line help system. Each entry has a sample script that shows how to use the element. You can copy the sample script that's part of an entry, paste it in a script window, and then use the sample script as a template for the script you want to write.

Other things you can do with Lingo

What you can do	Where to find out how
Go to the next marker no matter what its name is	`go to`, `next`, and `marker` in *Lingo Dictionary*; also see Chapter 2, "Navigation," in *Using Lingo*
Go to the previous marker no matter what its name is	Chapter 2, "Navigation," in *Using Lingo*
Keep the playback head in the same frame	Chapter 2, "Navigation," in *Using Lingo*
Make a sprite highlight when a user clicks it	Chapter 4, "Using Puppets," in *Using Lingo*
Have something happen when the user holds the mouse button down	`on mouseDown` in *Lingo Dictionary*; also see Chapter 6, "Using the Keyboard and Mouse," in *Using Lingo*
Have something happen when the user moves the pointer off a button without releasing the mouse button first	`on rollOver` in *Lingo Dictionary*; also see Chapter 6, "Using the Keyboard and Mouse," in *Using Lingo*
Start a different movie, play it, and then return automatically to the movie where you started	`play` in *Lingo Dictionary*; also see Chapter 2, "Navigation," in *Using Lingo*

Window Reference

This chapter describes each Macromedia Director window in the order in which it appears in the Window menu.

The Director menus and commands are described in Chapter 6, "Menu Reference."

See Appendix A, "Director Shortcuts," for a complete list of all keyboard shortcuts for working with windows.

The stage

The stage is the backdrop against which all Director animation appears. The size of the stage is set with the Preferences command on the File menu. In most cases, the edges of the stage window extend to the edges of your screen, so you can use all of the monitor for your movie. Movies continue to play on the stage when other windows are open and active. This permits you to study the movie in the score, for example, while keeping an eye on the stage.

The Stage command on the Window menu brings the stage to the front of the screen. It temporarily hides open windows and the menu bar. Use the keyboard shortcut Command-1 to toggle back and forth between seeing the stage with the other open windows and the menu bar or just the stage.

The menu bar is invisible but active when only the stage is showing. To open a menu just move the pointer to the top of the screen to the menu's position, and hold the mouse button down.

Resizing sprites on the stage

To resize a sprite that's on the stage:

1. **Go to the score and select the cells where the information about the sprite is recorded.**
   On the stage, a selection rectangle with resize handles appears around the sprite.

2. **Drag any of the resize handles to change the sprite's size.**

Changing the size of a sprite on the stage doesn't change the size of the cast member that the sprite is based on.

The control panel

Open the control panel by choosing Control Panel from the Window menu or by pressing Command–2.

The control panel has controls similar to a VCR. Use it to play, stop, step forward or backward, or rewind your movie. The control panel is also used to loop animation, set tempo, turn sound on and off, lock the movie's playback rate, and change the color of the background. The control panel indicates the current frame number, the current tempo, and the actual duration of the current frame.

To move the control panel, drag it by the small title bar or by any spot that is not a button.

Control panel buttons

Step Forward ——————————————————— Play

Stop ——————————————— Disable Sounds

Step Backward ——————————— Loop

Rewind ——————— Selected Frames Only
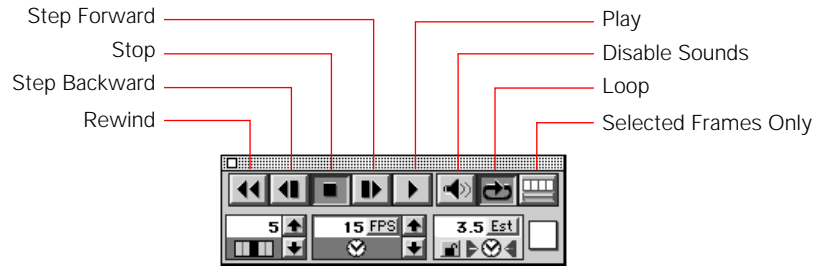
Note   *The control panel buttons correspond to commands on the Edit menu.*

Rewind

Rewind (Command–R) resets the movie to frame 1. If the movie is playing, clicking Rewind stops the movie and rewinds it to the first frame.

Step Backward

Step Backward (Command–left arrow) steps the movie backward one frame at a time. Press and hold down this button to step backward continuously.

Stop

Stop (Command-.) halts the movie.

Step Forward

Step Forward (Command-right arrow) advances the movie one frame at a time. Press and hold down this button to advance continuously.

If a score channel is in step-recording mode, stepping the movie forward also copies the contents of the current frame to the next frame.

Play

Play (Command-P) starts the current movie. If you press the Shift key while clicking Play, the open windows and the menu bar are hidden until you stop the movie.

Disable Sounds

Disable Sounds (Command-~) turns your movie's sound on and off. Click the button to alternate turning the sound on or off. When the button is pressed, sound is off and when it is not pressed, the sound is on.

Loop

Loop (Command-L) causes the movie to repeat continuously. When the movie reaches the last frame, it starts again from frame 1. Loop is in effect when its button is pressed. Loop is on by default.

If this button is not pressed, the movie does not loop.

Selected Frames Only

Selected Frames Only (Command-\) lets you play a portion of a movie. First, open the score and select the frames to be played. Click Selected Frames Only and then click Play.

A green bar at the top of the score window in the area that contains the frame numbers indicates which frames have been marked for Selected Frames Only. Clicking Selected Frames Only again turns the selection off.

This button is dimmed if you haven't selected any frames in the score.

Control panel indicators

Frame counter ——
Tempo ——
Actual ——
Stage background ——
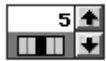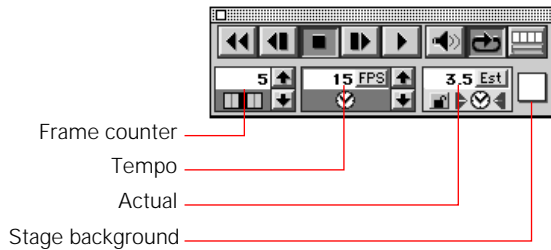
Frame counter

The frame counter displays the number of the frame currently on the stage. Click the up arrow to advance the movie or click the down arrow to rewind the movie, frame by frame. Press and hold down an arrow to rapidly advance or rewind the movie. To go to a specific frame number, click into the frame counter field, type a frame number, and press Return.

Tempo
display
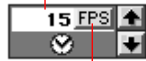
Tempo mode

Tempo display

The tempo display shows the tempo of the current frame (which may be different from the default tempo). The number displayed indicates the upper limit of the speed of your movie in frames per second (FPS). Click the tempo mode to display the tempo in seconds per frame (SPF). Seconds per frame measures the duration, in milliseconds, of a frame. The display mode you choose is saved with the movie.

To change the tempo, click or press the up or down arrow. To use a specific tempo, click into the tempo display area, type a tempo, and press Return. If you are entering a tempo in frames per second (FPS), you must enter a whole number.

Note   *It is recommended that you always enter a tempo setting in the first frame in the tempo channel.*

If there are no tempo settings in the tempo channel, the control panel displays the default tempo. (If there is a tempo setting in the tempo channel, the control panel displays the tempo of the current frame.)

Director will attempt to play the movie at the specified tempo setting, depending on the type of Macintosh you are using. The movie may play slower on slower machines.
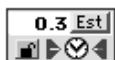
Actual display

If a movie is playing, the Actual display shows the actual duration of the previous frame in frames per second (FPS), including the time necessary to execute any Lingo scripts (except `Exit Frame` scripts). If the movie is stopped, the Actual display shows the duration of the current frame. Frames that don't have a recorded tempo value display "--" instead of a value for the actual tempo.

If the movie is locked (using the Lock button in the control panel or using the Lock Frame Durations command in the Edit menu), the Actual display shows the previously recorded frame durations.

Since not all Macintosh computers are equally fast, you can step through the movie frame-by-frame and compare the actual frame durations to the tempos you've set for the movie. This lets you see which frames your computer is not keeping up with. Comparing actual frame durations to tempos you've set is especially useful if you author on a fast computer and want to test playback on a slower computer.

Click the Actual mode button to display actual durations in seconds per frame (SPF) or frames per second (FPS). The display mode you choose is saved with the movie.

The Sum display provides a quick summary of elapsed seconds (the default) from the beginning of the movie to the current frame. The Est display provides a more accurate but slower calculation of elapsed time. It's useful if you want to include transitions and palette changes in determining frame durations. Computing estimated frame durations can reduce playback speed, so don't leave the Actual display in Est mode while playing the movie.

To lock the movie's playback rate so that it plays using previously recorded frame durations, click the Lock button.

Lock button
(unlocked state)
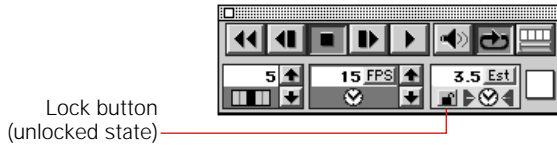
Clicking the Lock button is the same as choosing Lock Frame Durations in the Edit menu.

No recorded
duration
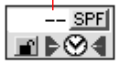
Clear all recorded frame durations from the movie if you want to record frame durations for a section of the movie and lock them. To clear all recorded frame durations, press Option while clicking the Lock button. During playback, frames that don't have a recorded duration instead display "--".
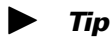
▶ **Tip**   *To find frames that have longer durations than the current tempo, set both the Tempo and Actual displays to show seconds per frame (SPF); then step through the range of frames, and look for any frame whose actual duration is longer than the current tempo.*

Stage background

The Stage background color chip lets you change the stage's background color. On a color Macintosh you can use the background control to change the color of the background to any color in the current palette. To display the palette, position the pointer on the background control and press the mouse button. Then choose a background color from the pop-up palette.

The cast window

The cast window lets you view the cast members used in a movie. It is a database of graphics, sounds, color palettes, Lingo scripts, buttons, digital video movies, and text used in a Director movie.

Open the cast window by choosing Cast from the Window menu, or by pressing Command-3.

Cast member position number —

Cast type icon —

Each cast member position is identified by a number, and optionally, a name.

A movie's cast can contain up to 32,000 cast members. You control the row width and the number of visible rows using the Cast Window Options command in the Cast menu.

Clicking any cast member selects it. Select a range of cast members by Shift-clicking. Command-click selects multiple non-adjacent cast members. Individual cast members can be cut, copied, pasted, or cleared from the cast window.

▶ **Tip** *You can select several text cast members in the cast window and change their font, size, and style using the commands on the Text menu. You can change the color of a text cast member using the foreground and background color chips in the tools window.*

For every occupied position in the cast window, an icon is displayed that represents the cast member's type.
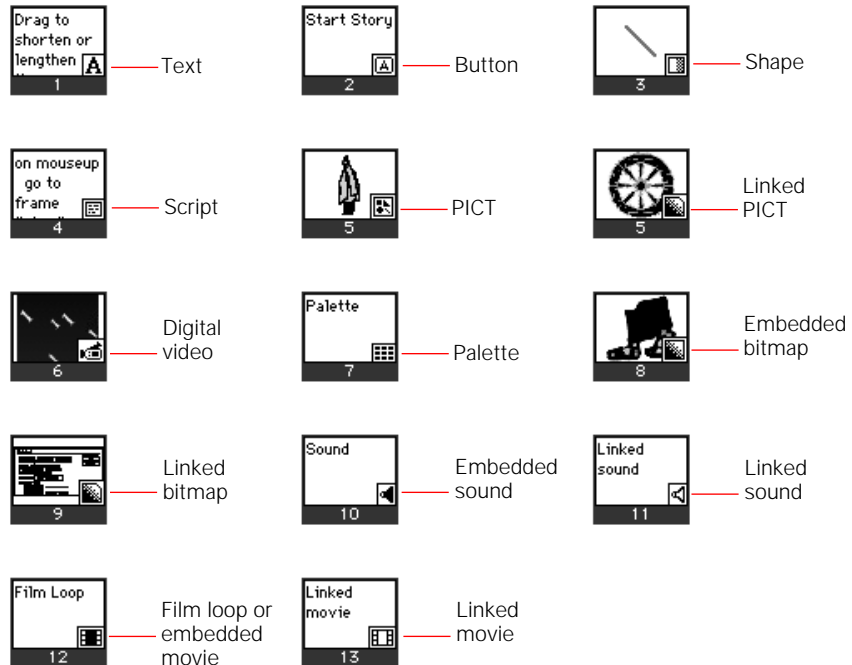
In previous versions of Director, whenever you opened a movie, the cast window would recreate every thumbnail image. In Director 4.0, thumbnails are only redrawn when you change the thumbnail size in the Cast Window Options dialog box. If the cast includes a linked file, and you edit the original file, Director does not redraw the thumbnail unless you edited it using the Launch External Editor command in the Cast menu.

Double-clicking a cast member is a shortcut for opening the paint window for a graphic cast member, the text window for a text cast member, the color palettes window for a palette cast member, the script window for a script cast member, and the digital video window for a digital video cast member.

Identifying cast members with scripts and shared cast members

Cast members with scripts display a script indicator icon in the lower left corner. To control whether or not Director displays a script indicator icon in the cast, use the Indicate Cast Members with Scripts checkbox in the Cast Window Options dialog box.

Script indicator ———
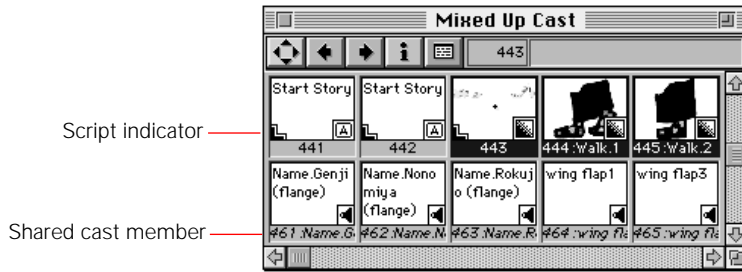
Shared cast member ———

The names of cast members that are part of a shared cast movie appear in italics. Director also italicizes the names of shared cast members in the digital video, paint, script, and text windows, and the names of thumbnail images in the upper left corner of the score window.

You must name a shared cast movie "SHARED.DIR" to have Director recognize it as a movie that contains cast members that can be shared by other movies. For information about creating a shared cast, see "Creating a shared cast" in Chapter 1, "Working with Cast Members."

Cast window features

Script

Info

Next

Previous

Place

Cast member number

Cast member name

small movie Cast

3 | vertical bar
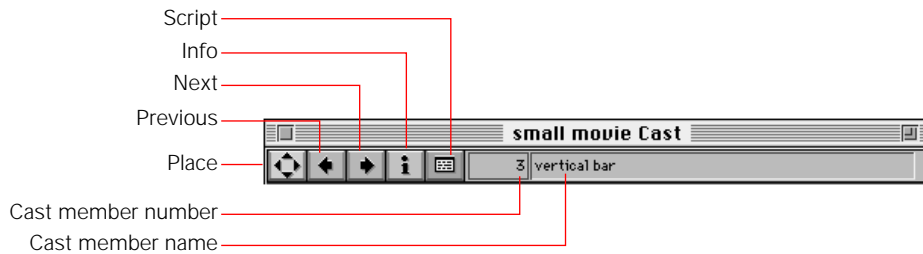
Place button

Lets you move the selected cast member to the stage or score, or move it within the cast. When cast members are moved within the cast window, the score window is updated with their new position. When you press and hold down this button, the cursor changes to an open hand to let you drag one or more selected cast members. Using this button is the same as clicking and dragging a selected cast member in the cast window. Use this button to move selected cast members that may not currently be visible in the cast window, if you've scrolled to a new location.

To use the Place button to move a cast member to a new location within the cast window:

1. **Select the cast member you want to move.**
    You can select more than one cast member and move them at the same time.

2. **Scroll to the new location in the cast window where you want to insert the selected cast member.**

3. **Drag from the Place button to the new location in the cast window.**
    As you drag within the cast window, a blinking insertion bar indicates the location where the cast member will be inserted.

4. **Release the mouse to insert the selected cast member at the new location.**

Previous, Next arrows

These arrows let you navigate to the previous or next cast member, skipping over empty cast members.

▶ *Tip*   *The keyboard equivalents for Previous and Next are Command-Shift-left arrow and Command-Shift-right arrow.*

Info button

Displays the Cast Member Info dialog box for the selected cast member. If the selection consists of more than one cast member, the dialog box displays the number of cast members selected, and their total size and purge priority.

▶ *Tip*   *Choosing Cast Member Info from the Cast menu or pressing Command–I are the same as clicking this button.*

Script button

Opens a new script window or makes an existing script window active for the selected cast member, or for the first selected cast member if more than one are selected. If the selected cast member has no script associated with it, clicking this button opens a new script window. This is the same as clicking the Script button in the Cast Member Info dialog box.

▶ *Tip*   *Choosing Open Script from the Cast menu or pressing Command-' is the same as clicking this button.*

Cast member number

Displays the position of the selected cast member in the cast window or the position of the first selected cast member in a multiple selection.

▶ *Tip*   *When the cast window is front-most, typing the number of an existing cast member automatically scrolls the cast window to the cast member's location and selects it. After you've stopped typing for 1/2 second, the cast window will scroll to show the new selection. Alternatively, you can press Return immediately after typing the number to scroll the cast window instantly. (You can also press Delete to delete the last digit you typed.)*

Cast member name

Displays the name of the selected cast member, or the first selected cast member in a multiple selection. Click and type into the name area to enter or edit the name of a cast member. Press Return or Enter to confirm your changes.

Moving cast members within the cast window

You can rearrange cast members within the cast window by dragging them to a new location.

Note *You can't drag a selection if it includes cast members that are part of a shared cast. You must open the shared cast movie to rearrange its cast members.*

To move one or more cast members:

1. **In the cast window, click to select the first cast member.**
   The pointer changes to a hand shape.

2. **Shift–click to select additional adjacent cast members; Command–click to select additional non–adjacent cast members.**

3. **Drag one of the cast members you just selected.**
   Dragging any selected cast member drags the entire selection.

   As you drag within the cast window, a blinking insertion bar indicates the location where the selection will be inserted.

4. **Release the mouse to insert the selected cast members at the new location.**
   The cast members are inserted to the right of the insertion bar. Cast members following the insertion bar shift over to make room for the inserted cast members.
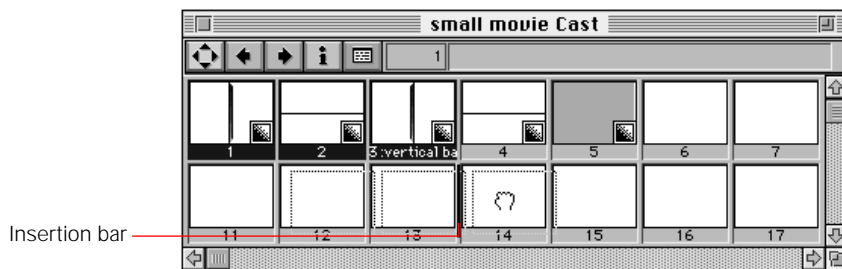
Dragging a selection within the cast window

Placing cast members on the stage

Placing cast members on the stage adds them to the score in the available channels in the current frame. If you place more cast members than you have available channels in the current frame, Director warns you that it will ignore the extra cast members.

When you place cast members on the stage (or in the score), Director adds them as sprites. A sprite is an image of the cast member on the stage or in the score that contains information about the cast member at one point in time.

To place one or more cast members on the stage:

1. **In the cast window, click to select the first cast member.**
    The pointer changes to a hand shape.

2. **Shift-click to select additional adjacent cast members; Command-click to select additional non-adjacent cast members.**

3. Drag one of the cast members you just selected to the stage.

Dragging any selected cast member drags the entire selection.

The keyboard shortcut for placing selected cast members in the center of the stage is Command–Shift–L.

As you drag the cast members over the stage, Director displays an outline indicating the size of the area enclosing all the cast members. (If you drag a sound or a palette, it does not display an outline on the stage, since such cast members have no size dimensions.)
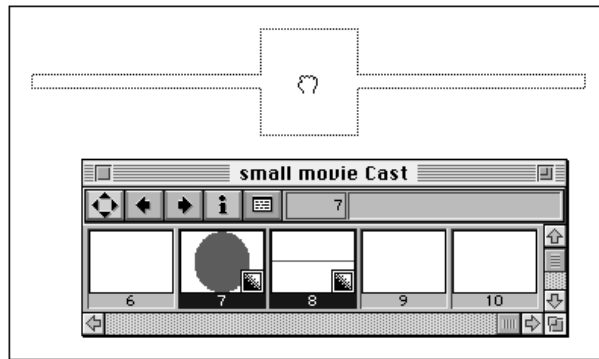
Drag cast members from the cast to the stage to place them in channels in the score

When you drop the cast members on the stage, Director activates step-record mode in the channels where the cast members were dropped.

Placing cast members over time

By default, Director places multiple cast members on the stage so that they all occupy the same frame in the score. To place cast members on the stage over time instead of in the same frame, press Option while dragging the cast members from the cast window to the stage.
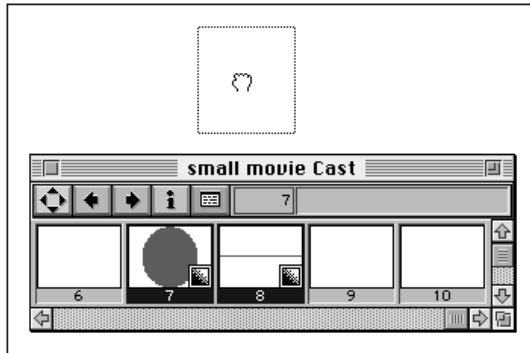
Option–drag cast members from the cast to the stage to place them over time in the score

As you Option-drag the cast members over the stage, Director displays an outline indicating the dimensions of the first visual cast member in the selection, which will be placed in the current frame. The rest of the cast members in the selection are placed into adjacent frames.

If the score is open while you are dragging cast members to the stage, Director outlines the cells in the score where the cast member selection will be dropped. When you Option-drag cast members to the stage, Director prevents you from dropping cast members into occupied cells in the score. (If you instead drag the cast members directly from the cast window into the score, Director does not prevent you from dropping the cast members into occupied cells and overwriting existing sprites.)

Note   *If you drag a sound cast member to the stage or score, Director places it in sound channel 1 of the current frame, or in sound channel 2 if sound channel 1 is occupied. If both channels are occupied, the sound is not dropped. If you drag a palette cast member to the stage or score, Director places it in the palette channel of the current frame, and assigns it these default properties: Speed=30 (instant) and Type=Normal.*

When you drag a cast member to the stage, Director uses the first empty cell in the current frame that is closest to the current score selection. (If you drag the cast member directly into the score, you can more precisely specify the cell that will contain the cast member.) You can force Director to use a certain set of empty cells by first selecting them in the score before dragging in the cast members.

When dragging multiple cast members to the stage, Director places each cast member into the score, beginning with the lowest-numbered cast member in the selection, as if you had individually dragged each cast member into the score.

▶ *Tip*   *The keyboard shortcut for placing selected cast members over time in the center of the stage is Command-Option-L.*

You can also place selected cast members across time in the score by choosing Cast to Time in the Cast menu.

Canceling the drag

To cancel the drag, drag the cursor over the menu bar or desktop so that the cursor changes to indicate that the location under the cursor is an invalid drop location.

Dragging cast members to the score

Dragging cast members into the score places them into a range of cells and activates step-record mode in the channels where the cast members are dropped.

 To place one or more cast members into the score:

1. **Click to select the first cast member in the cast window.**
   The pointer changes to a hand shape.

2. **Shift–click to select additional adjacent cast members; Command–click to select additional non–adjacent cast members.**

3. **Drag one of the cast members you just selected to the score.**
   Dragging any selected cast member drags the entire selection.

   As you drag the cast members over the score, Director outlines the range of cells into which the cast members will be dropped.

Placing cast members over time

By default, Director places cast members in channels in the score, so that they all occupy the same frame. To place cast members into the score across time instead of in the same frame, press and hold down Option while dragging the cast members into the score.

Placing cast members in several channels —

Placing cast members over time (Option–drag) —
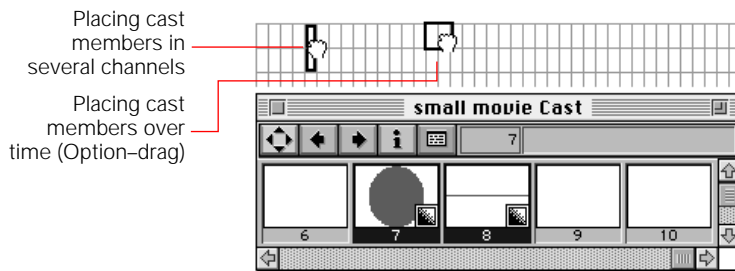
Dragging cast members to the score

As you drag cast members over the score, Director may restrict you to specific regions of the score depending on the type of cast members in the selection. For example, if you drag a sound cast member into the score, Director restricts you to the two sound channels. If you are dragging different types of cast members, Director lets you only drop them into cells of the appropriate type.

You can drag this type of cast member	...into this part of the score
Bitmap, PICT, Text, Button, Shape, Film loop, Movie, Digital Video	Sprite channels 1– 48
Sound	Sound channel 1, sound channel 2
Palette	Palette channel
Script	None

When you drop cast members into the score, Director fills the highlighted cells in sequential order by cast number. The first cast member in the selection of a particular type will be dropped into the left-most or top-most cell in the channel.

Any occupied cells in the highlighted region are overwritten by the cast members you drag in.

Creating a film loop

When you move selected frames from the score into the cast, Director creates a new film loop cast member in the cast window. This is a shortcut for copying and pasting a score selection into the cast window.

To create a film loop cast member in the cast window:

1. **In the score window, select the cells that contain the sequence of cast members that you want to use to create the film loop.**

2. **Drag the selection into the cast window.**
   As you drag within the cast window, a blinking insertion bar indicates the location where the selection will be inserted.

3. **Release the mouse button to insert the selection to the right of the insertion bar.**
   Director asks you to name the film loop.

4. **Enter a name for the film loop and click OK.**
   The film loop is inserted in the cast to the right of the insertion bar. Cast members to the right of the insertion bar will shift over to make room.

The score

The score is the heart and soul of Director. It contains the notation that describes your movie and is the primary tool for creating and editing animation. The score contains a record of everything that happens on the stage.

Open the score by choosing Score from the Window menu, or by pressing Command–4.
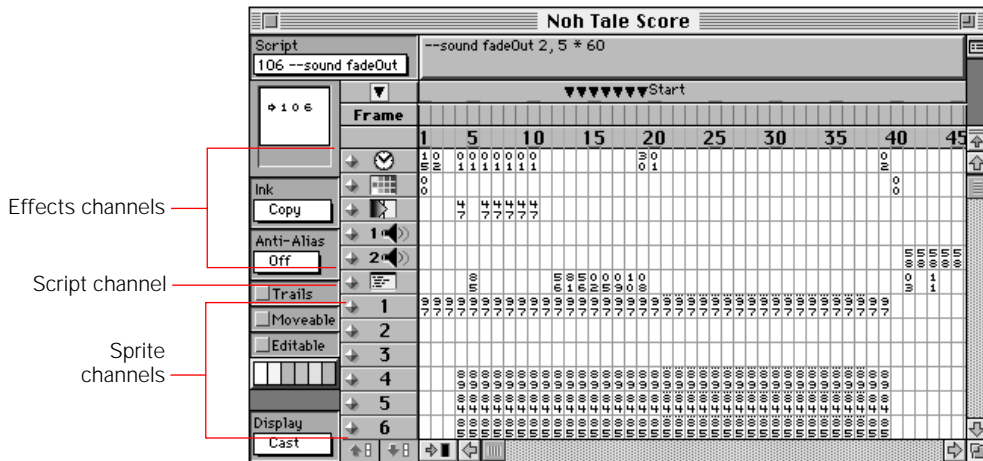
The smallest unit in the score is a ***cell***. Each cell contains information about one cast member at one point in time, called a ***sprite***. When you select a cell, a small image of the sprite that occupies that cell appears in the upper left corner of the score window. Double-click the sprite's image to open a window in which you can edit the cast member.

The first five rows, called ***channels***, keep track of special effects like tempos, palettes, transitions, or sounds. By setting effects in those channels, you can add sound to your movie, control the tempo, set and transition palettes, cycle colors, and add visual effects. The script channel is where you store scripts (instructions written in Lingo) that are executed when the movie reaches a particular location in the score.

Note   *To use sound channel 2 you must be using a Macintosh capable of multi-channel sound. If you're using some other system configuration, sound channel 2 appears dimmed in the score. Movies created with versions of Director earlier than version 3.0 have their sound information placed into sound channel 1.*

The order of sprites in the 48 animation channels determines which sprites appear in the foreground and which appear in the background. Think of the stage as a pile of transparent sheets, 48 sheets thick. The sprite that occupies a channel closer to the top of the score is like the object drawn on the last sheet of acetate. It appears behind any sprite in a channel closer to the bottom of the score.
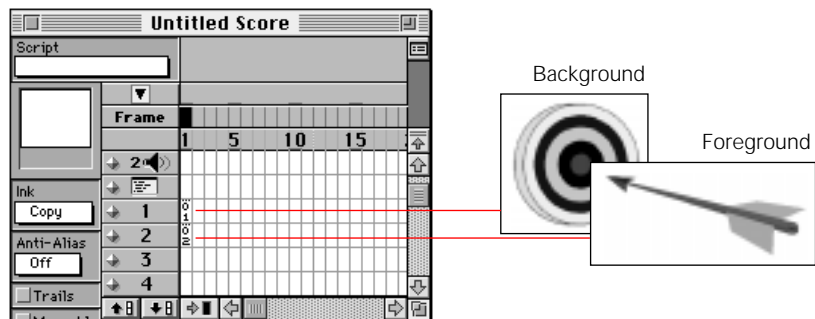
Foreground and background priority in the score

Sprites in channels closer to the bottom of the score appear in front of, or take priority over, those in channels closer to the top of the score.

A *frame* contains information about everything you see on the stage when you stop a movie at the moment that corresponds to the frame. Like a frame in a movie, a Director frame shows what each sprite is doing on the stage at one point in time. Each frame is numbered.

The score also contains small triangular markers to help you coordinate the comments in the markers window with specific frames of your movie or identify frames of your movie for printing. You can drag any number of markers from the left side of the score window and position them in any frame. Use this feature to add comments, speaker notes, or storyboard notes to specific frames of animation.
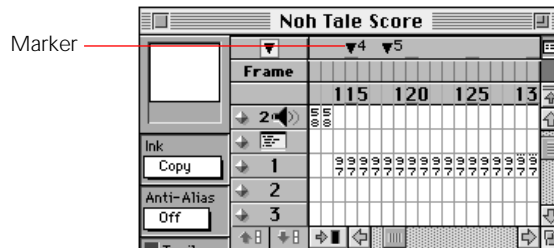
Marker —

When you position a marker in the score window, an insertion point appears to the right of the marker so you can type a short comment for that marker. Use the markers window to review and edit marker comments.

Working with score cells

This section describes the ways in which you can display and work with score cells.

The Display pop-up menu
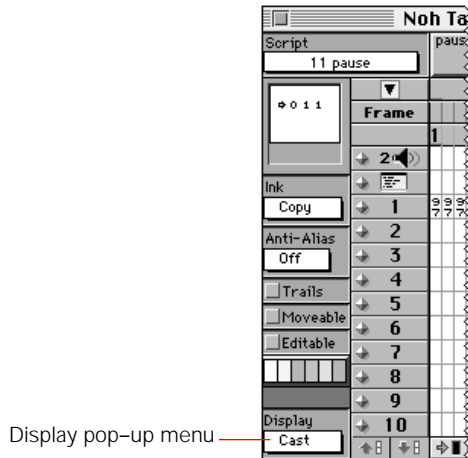
Display pop-up menu

The Display pop-up menu lets you change the type of information displayed in each cell of the score. It is located in the lower left corner of the score window. Use it to view different types of notation in the score. By default, the score displays cast notation.

Extended display notation

For the animation channels, the Extended display enlarges the score and displays all of the sprite information at once.

Cast member type — Motion relative to previous sprite

Anti–alias*

Dotted lines indicate sprite was created by in-betweening — Blend

Ink effect — Cast member number or name (last four digits)

Script number

X and Y coordinates on the stage
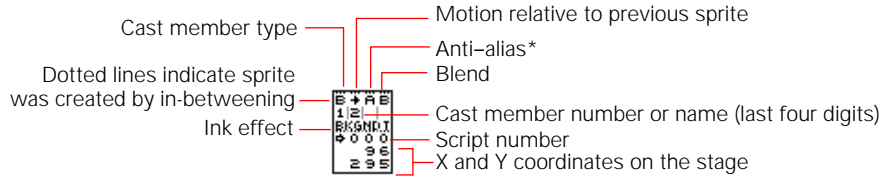
*Anti-aliasing is only enforced if you have enabled it using the Movie Info command on the File menu.

Use the Score Window Options command to choose what information is contained in the Extended display.

If you have chosen to view the cast members by name in the cast window (using the Cast Window Options command), the Extended display shows the first few letters of the cast member's name instead of the cast member's cast number, if a name exists for that cast member.

For the tempo channel, the extended notation displays the settings specified in the Set Tempo dialog box.

Tempo setting   Wait for setting

Tempo channel

Speed   Delay   Channel number
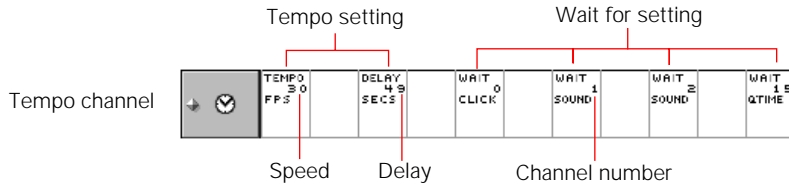
For the palette channel, the extended notation displays the settings specified in the Set Palette dialog box.

Color cycling Auto reverse Palette transition Fade to white

Palette channel

Palette   Speed   Fade to black   Over time

Cycles
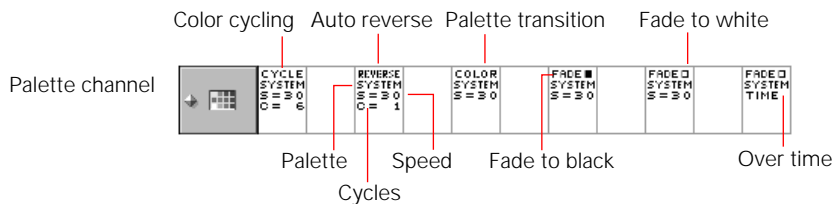
For the transition channel, the extended notation displays the settings specified in the Set Transition dialog box.
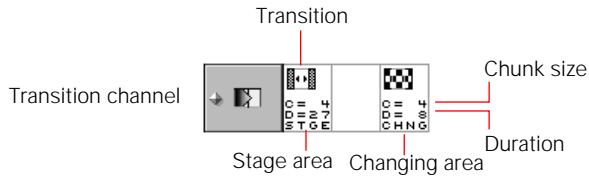
For the sound channel, the extended notation displays the cast member number.
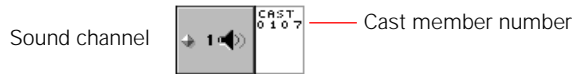
Ink display notation

The Ink display indicates which ink effect has been applied to each sprite.
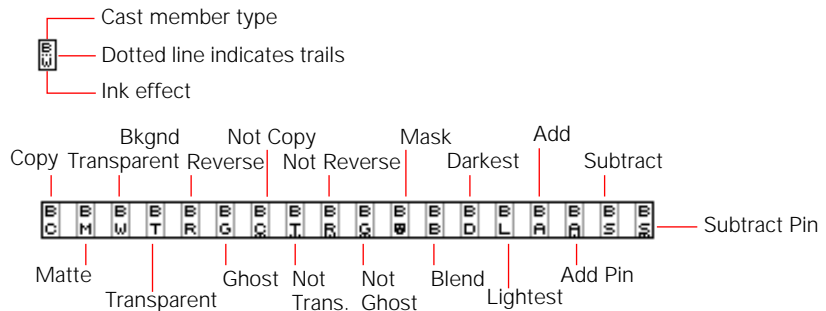
Blend display notation

The blend notation shows the blend percentage that's applied to the sprite using the Set Sprite Blend command in the Score menu.

Two squares indicate 100 percent
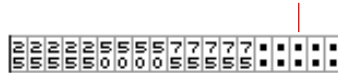
Cast display notation

The Cast display depends on how you have chosen to view cast members in the cast window using the Cast Window Options command. If the cast window displays cast members by octal number, decimal number, or by number:name, the Cast display shows the last two digits of the cast member's position number. If the cast window displays cast members by name, the Cast display shows the first two letters of the cast member's name, if a name exists for that cast member. Cast display is the default.

Last two digits of cast member position number

first two letters of cast member name

Motion display notation

The Motion display shows the direction of the sprite's movement and whether or not a new sprite appears in that cell. It is a useful way to view the score if you are tweaking a sprite to line up in a particular position relative to the sprite's previous position.

Upper symbol denotes cast member type

Lower symbol denotes motion relative to previous sprite

Bitmap cast member

Text cast member

QuickDraw cast member

Film loop, QuickTime, or linked movie cast member

PICT cast member

Stop
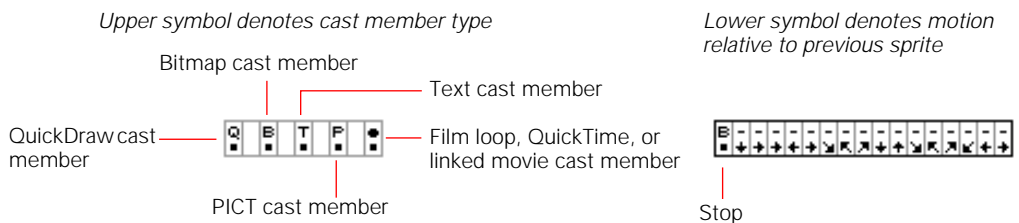
Script display notation

The Script display shows the location and number of the script associated with each cell in the score.

Each script has an identifying number associated with it. Cells without scripts display 00. Sprites with cast scripts display a plus (+) sign in the cell.
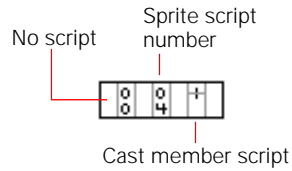
Selecting cells

Drag across cells to select them. If you have the Playback Head Follows Selection checked in the Score Window Options dialog box, the movie will advance or rewind as you select cells in the score. You can see the frames on the stage as you select them in the score.

To select this:		Do this:
		Click a single cell
		Drag across cells or Shift–click cells
		Double–click the channel number
		Double–click the channel number and drag down
		Drag across the frame numbers at the top of the score window
Insertion point		Click a frame number at the top of the score window
		Double–click an occupied cell to select all adjacent cells that contain the same cast member
		Command–click for discontinuous selections
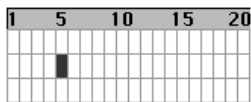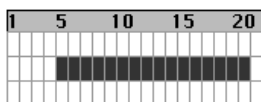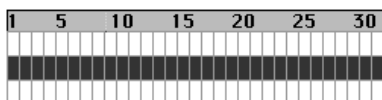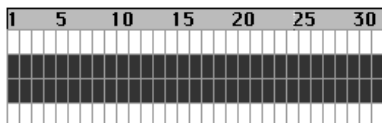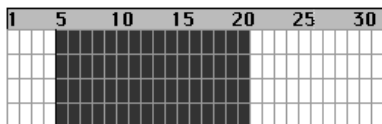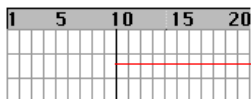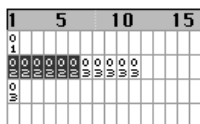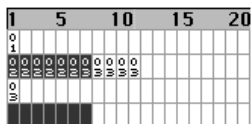
The consequences of each type of selection are very important. For example, if only one cell in the score is selected, only one sprite in one frame of the movie is affected by the commands you choose. On the other hand, if you select a number of cells in a channel, you can select a sequence of sprites over a period of time. Then, any changes you make affect that sequence.

Whenever you select less than all the channels in a frame, from a single cell to a range of cells over one or more channels, you are editing and affecting space. Cutting, copying, pasting, or clearing either adds or removes elements within a time sequence but does not affect the length of the sequence.

Moving selections within the score

You can move one or more selected cells to a new location within the score or to the cast. (You cannot drag score selections to the stage.)

To move selected cells to a new location within the score:

1. **Select the cells.**
   The cursor changes to a hand.

2. **To select additional frames, Shift–click them.**

3. **Drag the frames to the new location.**
   As you drag, an outline of your selection appears under the cursor. Dragging to the edge of the window will auto-scroll the window.

   To instead move a copy of the selection, press the Option key while dragging the selection.

4. **Release the cursor to place the selection at the new location.**

    The contents of the frames you move replace the contents of existing frames at the new location.

    If Playback Head Follows Selection is checked (using the Score Window Options command in the Score menu), the selected frames will be displayed on the stage as you drag the selection in the score.

    To cancel the drag, move the cursor over the menu bar or desktop or choose Undo.

Moving around the score

The ***playback head*** at the top of the score indicates which frame of the movie is currently on the stage.
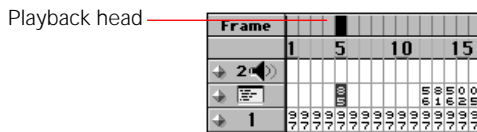
Playback head ———

The playback head travels in the scratch bar as the movie plays. You can drag the playback head or click to move to a specific frame. If Playback Head Follows Selection is checked in the Score Window Options dialog box, the playback head travels with any selection you make in the score.

Another way to move your view of the score to the current frame of your movie is the Jump button, located in the lower left corner of the score window.
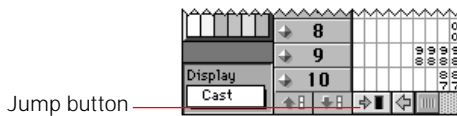
Jump button ———

Whenever you click this button, Director brings the playback head into view and your view of the score jumps to the frame that is currently on the stage.

The Jump to Top button at the top right side of the score window scrolls the score window to the script channel when you click it.
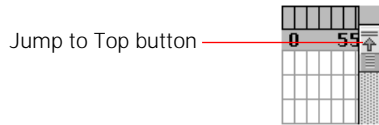
Jump to Top button ———

If the score channel is already visible, clicking the Jump to Top button scrolls the score window to the top of the effects channels.

An additional aid to navigation is the frame counter that pops up in the middle of the horizontal scroll bar when you drag the horizontal scroll box. It indicates how far you have advanced or rewound the view of the score as you drag the scroll bar.

Frame counter ———

11
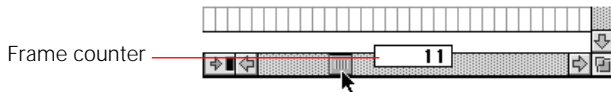
The Shuffle Forward and Shuffle Backward buttons let you move a selection of sprites up or down in the score, to change their foreground priority on the stage.

Shuffle Forward ———
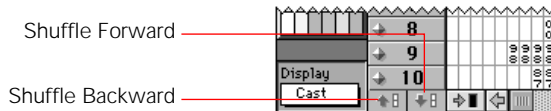
Shuffle Backward ———

Shuffle Forward switches a range of cells you've selected in a channel with the cells in the channel below it. The sprites associated with the selected cells move in front of the other sprites.

Shuffle Backward switches a range of cells you've selected in a channel with the cells in the channel above it. The sprites associated with the selected cells move behind the other sprites.

▶ **Tip** *The keyboard shortcut for Shuffle Forward is Command–Shift–down arrow; the keyboard shortcut for Shuffle Backward is Command–Shift–up arrow.*

Applying color to cells

Cell color selector
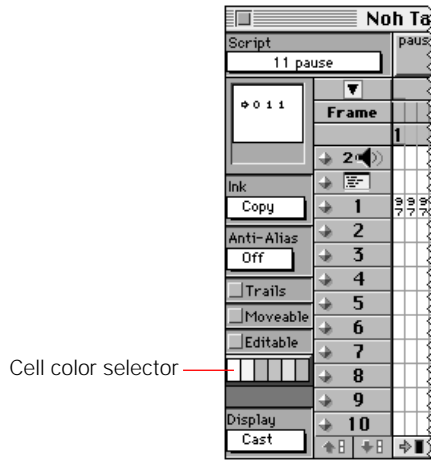
The cell color selector lets you apply color to score cells. The color affects only the cells in the score; it doesn't affect how sprites appear on the stage. Applying color to cells can help you identify different sections in a large score.

To apply color to cells, select them and click a color from the cell color selector. You can apply color to empty or occupied cells. The color is carried with the cell if you move it or copy it.

You show or hide cell colors using the Colored Cells option in the Score Window Options dialog box. If you've already applied color to cells, hiding cell colors doesn't remove their color. Score window scrolling performance is faster if you hide cell colors.

The script pop-up menu

Script pop–up menu —————

The script pop-up menu lists all the score scripts used in the current movie. The script pop-up menu displays the script number associated with a selected frame in the script channel. If the selected cell has no script associated with it, the pop-up menu is blank. You can use this pop-up menu to apply existing scripts to areas of the score. Select the cells you want to apply the script to; then choose the script you want from the script pop-up menu.

Choose the New option in the script pop-up menu to create a new score script. Choose the 0 option to remove the script from the selected cell.

For a complete description of how to create and use scripts, refer to the *Using Lingo* manual.

The script preview button

Script Preview button

NAVGATOR 2.8 Score

Script
26 on exit

on exit
set the mouseDownScript = "gotMouseClick"

Show/Hide button
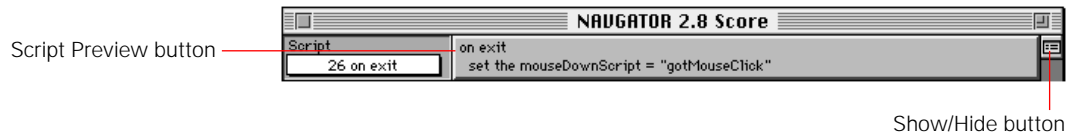
The Script Preview button displays the first two lines of the script associated with one or more selected cells in the script channel. If the selection has no script associated with it, the Script Preview button is blank. Clicking the Script Preview button opens a new script window.

To hide the script pop-up menu and the Script Preview button, click the Show/Hide button.

The script window

Score Script 9:test script

9 | test script

if the hilite of cast "Button Choice" = TRUE then go to
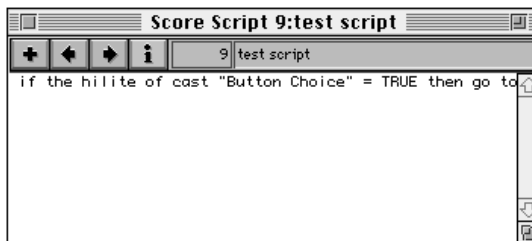
Click the Script Preview button to open the script window associated with the current script. Use the script window to enter and edit the script associated with one or more selected cells in the script channel. Scripts can contain up to 32,000 characters.

For more information about the script window, see "The script window," later in this chapter.

▶ **Tip** *Double-clicking a cell in the script channel opens a script window. This is the same as selecting the cell and clicking the Script Preview button.*

Sprite attributes

This section describes the score's controls for seeing and changing sprite attributes.

Ink pop-up menu
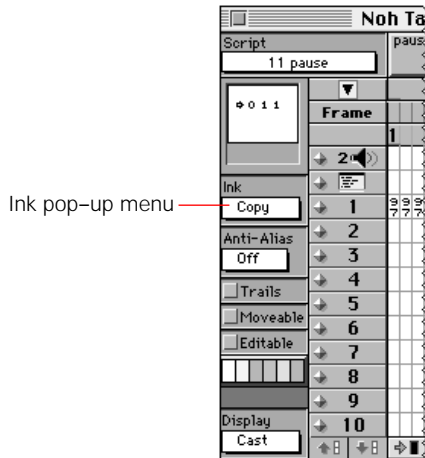
Ink pop–up menu

You apply inks to cast members to change the way they appear on the stage. Choose an ink from the pop-up menu in the score window. The Ink pop-up menu also indicates the current ink applied to selected sprites in the score.
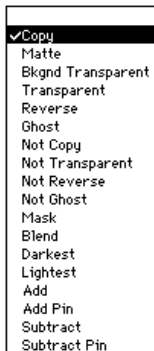
The score window inks fall into two categories. The first set of inks can be used with black and white or color artwork. They are: Copy, Matte, Transparent, Reverse, Ghost, Not Copy, Not Transparent, Not Reverse, Not Ghost, and Mask. The second set of inks only works with color. They are: Bkgnd Transparent, Blend, Darkest, Lightest, Add, Add Pin, Subtract, and Subtract Pin. Copy, Matte, and Mask are useful in black and white or color work.

To apply an ink, select the cells in the score, then choose the ink from the Ink pop-up menu.

When dragging a cast member to the stage, the default ink is the last ink you chose in the Ink pop-up menu.

The initial default ink is Copy. When you use Copy, a bounding box appears around the sprite. The bounding box is invisible when displayed on a white stage, but when the sprite passes in front of another sprite, or the stage is black, you will see the bounding box.

To eliminate the bounding box that appears around a sprite, select the sprite in the score and choose the Matte ink. Use it sparingly though, because it slows down screen redraw and uses more memory than other inks.

To change the ink for a sprite, select the cell or cells, and choose an ink from the Ink pop-up menu. Your choice replaces the previous ink assigned to the sprite.

Choose an ink carefully, since some inks can result in decreased performance when animating a cast member. For example, the following inks are listed in order of decreasing performance: Copy, Matte, Background Transparent, and Blend.

Score window inks

Ink	What it does
Copy	Copy is the default ink. It draws every pixel within the bounding box of the sprite and makes the bounding box opaque. If the cast member is not rectangular, a white box appears around the sprite when it passes in front of another sprite, or is displayed on a black background. Copy is useful for backgrounds and when sprites do not appear in front of other artwork. Sprites with the Copy ink animate faster than sprites with any of the other ink effects. You can use Matte to hide the white box around the sprite while keeping the sprite opaque.
Matte	Makes an opaque sprite without a white box around the sprite. Matte does not draw any pixels outside the sprite's boundaries. Artwork within the boundaries, however, will be opaque. Matte functions much like the lasso in the paint window, in that the artwork is outlined rather than enclosed in a rectangle. Matte, like Mask, uses more memory than the other inks, and sprites with this ink animate more slowly than other sprites.
Bkgnd Trans.	Pixels in the background color of the selected sprite appear transparent and permit the background to be seen. As with Matte and Mask, this may make your sprite animate more slowly.
Transparent	The Transparent ink makes the pixels that are the background color transparent so you can see the artwork underneath the transparent pixels.
Reverse	Reverses overlapping colors. A pixel that was originally white becomes transparent and lets the background show through unchanged. Reverse is good for making custom masks.
Ghost	When Ghost is applied to the foreground sprite, any black pixel turns the pixel beneath it white. Anything white becomes transparent. Ghost is useful for reversing black and white.
Not Copy, Not Transp., Not Reverse, Not Ghost	These inks are variations of the previous four inks. The foreground image is first reversed, then the Copy, Transparent, Reverse, or Ghost inks are applied. These are good for odd effects. Like Transparent, the Not Transparent ink is good for reversing black and white. Just choose Not Transparent, select a white fill, and then draw a QuickDraw rectangle on stage on top of the artwork you want to reverse.
Mask	When Mask is applied to the foreground art, you can see the background through any holes in the cast member. For example, you can see the background through a car window that has a mask. For this to work properly you must create a duplicate of the cast member to be masked and place it in the cast window in the cast member position to the immediate right of the cast member being masked. The mask must be drawn in 1–bit black and white. The opaque areas of the mask must be black. Mask and Matte use twice the memory of any other ink because Director has to internally create a duplicate of the artwork.

Score window inks

Ink	What it does
Blend	When Blend is applied to a sprite, the sprite's color changes to blend with the color of the background sprite. Since the Blend value is tweened and changes from frame to frame, it can reduce performance when animating a sprite. Applying the Blend ink ensures that the sprite uses the blend percentage specified in the Set Sprite Blend dialog box.
Darkest	Compares pixel colors in the foreground and background, and uses whichever pixel color in the foreground or background is darkest.
Lightest	Compares pixel colors in the foreground and background, and uses whichever pixel color in the foreground or background is lightest.
Add	Creates a new color that is the result of adding the color value of the foreground sprite with the color value of the background sprite. If the value of the two colors exceeds the maximum color value, the addition wraps around the color scale.
Add Pin	Similar to Add, the foreground sprite's color is added to the background sprite's color, but the value of the new color cannot exceed the maximum color value.
Subtract	This ink subtracts the value of the foreground sprite's color from the value of the background sprite's color to arrive at the new color. If the color value of the new color is less than the minimum color in the color scale, the new color is determined by wrapping around and starting at the top of the color scale.
Subtract Pin	The color of the sprite with this ink is determined by subtracting the color value of the foreground sprite from the value of the background sprite. The value of the new color does not wrap around the color scale.

The best way to see how each ink effect works is to play the sample movie *Ink Effects*. To find it, go to the Macromedia Director 4.0 folder, open the Tutorials folder, and then open the Learning Director folder. Double-click the icon labeled Ink_FX. When you're finished watching the movie, press Command-period to stop it.

Note *The following inks produce jagged text if you have Adobe Type Manager installed: Not Transparent, Not Reverse, Not Ghost, Blend, Darkest, Lightest, Add, Add Pin, Subtract, and Subtract Pin.*

The mathematics of color

The effect of the color ink effects on sprites can be predicted if you know a bit about how the Macintosh calculates color. Colors are represented by three numbers which represent the proportion of red, green, and blue in a color. For example, the value of black, which is a complete absence of any color is 0, 0, 0. White, which is a mix of all colors, is 100, 100, 100. Grays are produced when all three colors have equal percentages less than 100, or more than 0, for example, 40, 40, 40 is a dark gray, and 80, 80, 80 is a lighter gray. Keep in mind that these are percentages of colors, not the absolute values you see in the Macintosh Color Picker.

The names of the color ink effects come from the way the new color is calculated for each pixel when a foreground sprite crosses paths with a background sprite. The color values of the two sprites are blended, added, subtracted, or the color with the darkest or lightest value is used.

Take the example of mixing a red pixel with a white background. The value of the pixels are shown in the following table.

Sprite color	% Red	% Green	% Blue
Red	100	0	0
White	100	100	100

When the red pixel has various ink effects applied, the resulting color can be predicted as shown in the following table.

Ink	% Red	% Green	% Blue	Resulting color
Darkest	100	0	0	red
Lightest	100	100	100	white
Blend	100	50	50	pink
Add	100	100	100	white
Subtract	0	100	100	aqua blue

When an added or subtracted value exceeds the color scale, it wraps around the color scale. For example, if 50 is added to 75, the final color exceeds 100, so it starts at the beginning of the scale and the final color is 25. Add Pin and Subtract Pin mean that those effects do not wrap around. They "pin out" at 100 or 0. If Add Pin were used in the example, 50 and 75 would pin out at 100.

Anti-Alias pop-up menu

Anti–Alias pop–up menu
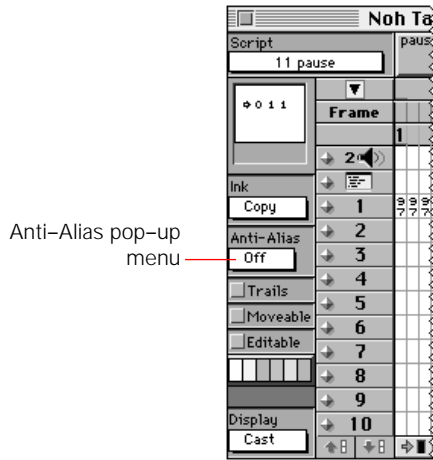
This pop-up menu lets you apply an anti-alias modifier to a text or bitmap graphic cast member in the score. Anti-aliasing can reduce or remove the jagged or stair-step distortions in a graphic image or in text.

Note *In order for the anti-alias effect to be visible during playback, anti-aliasing must be checked in the Movie Info dialog box.*

Using the anti–alias ink modifier is not recommended for 8-bit cast members that have a gradient fill, since the anti-alias effect may cause the gradient to appear banded.

To apply the anti-alias effect to a text or graphic sprite:

1. **Open the score.**

2. **Select the cells that contain the sprites that will receive the anti–alias effect.**

3. **Choose an anti–alias level from the Anti–Alias pop–up menu.**
   The anti–alias level you choose determines how much the distortions are reduced or removed. Choose the level that gives you the most desirable result. You may have to experiment with different levels to find the most appropriate one.

► **Tip** *Using the anti–alias effect will cause your animations to play more slowly. Anti–aliasing can be disabled for the entire movie using the Movie Info command on the File menu. Disabling anti–aliasing while editing the movie will improve drawing speed, and you won't have to disable it for each frame of the score.*

To improve playback speed, only apply anti–aliasing to the first and last frame of an animation sequence (unless you are recording to videotape). Alternatively, you may prefer to create anti–aliased text using an application such as Adobe Photoshop.

Trails checkbox
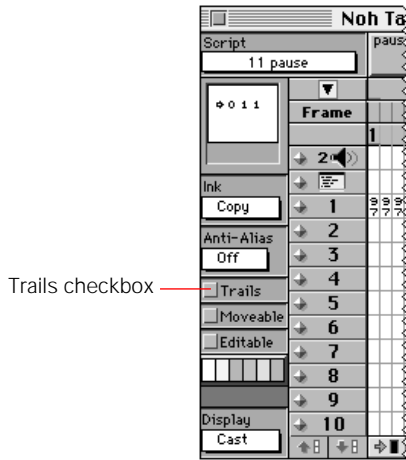
Trails checkbox ————

If Trails is checked, the selected sprite remains on the stage, leaving a trail of images along its path as the movie plays. If Trails is unchecked, the selected sprite is erased from previous frames as the movie plays. The checkbox also reflects the current selection. If the current selection includes sprites that don't all have the same setting, the Trails checkbox is shaded gray.

Trails enabled ————
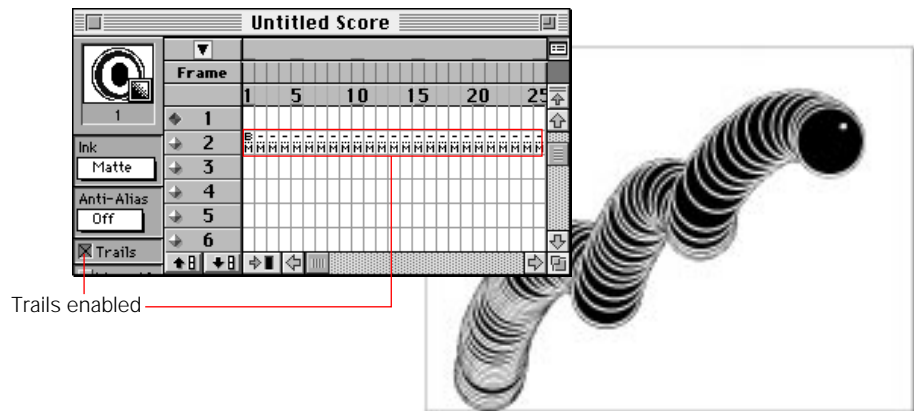
A sequence with trails

► **Tip** *The dashed line in the center of the cells that appears when you view the score using the Ink or Extended display indicates that those cells have trails applied to them. You can also see if a cast member has trails by selecting the cast member on the stage or in the score and looking at the Trails checkbox.*

Trails is indicated by a
dotted line ⎯⎯⎯
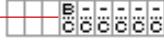
Moveable checkbox

Moveable checkbox ⎯⎯⎯
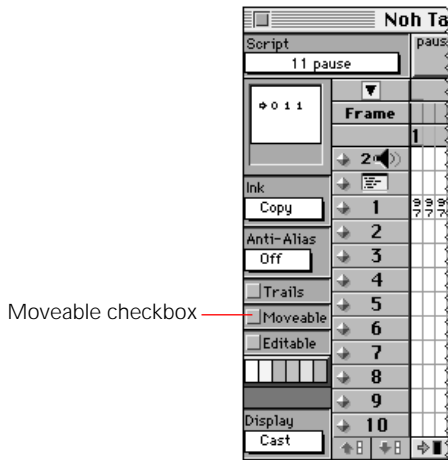
This option is only available if you select one or more cells in the sprite channels in the score. If Moveable is checked, users can move the selected sprite(s) around on the stage during playback. If checked, the "Moveable" setting is in effect only when the playback head is executing those frames that contain the moveable sprites. The checkbox also reflects the current selection. If the current selection includes sprites that don't all have the same setting, the Moveable checkbox is shaded gray.

Editable checkbox

Editable checkbox
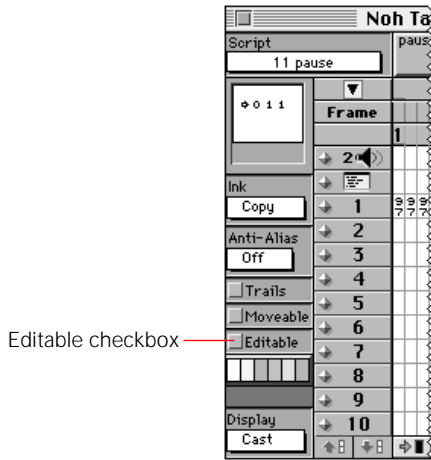
This option is only available if you select one or more text sprites. If Editable is checked, users can edit the selected text sprites on the stage during playback. This option is convenient for making a text sprite editable in some frames, and non-editable in others. You can turn this setting off when it is no longer required. If checked, the "Editable" setting is in effect only when the playback head is executing those frames that contain the editable sprites. The checkbox also reflects the current selection. If the current selection includes sprites that don't all have the same setting, the Editable checkbox is shaded gray.

Note   *You can set a text cast member to always be editable using the Text Cast Member Info dialog box. If you set a text cast member to be editable in the cast, it is always editable when used in the score. Director ignores the score's Editable checkbox setting for the cast member.*

Using the Lingo command `set the editableText of sprite to true` *is the same as checking the Editable checkbox in the score.*

Recording and playback in the score

This section describes how to step-record, real-time record, and suppress a channel during playback.

Step-recording in a channel

Step-recording lets you create frame-by-frame animation in a channel. To activate step-recording in a channel, Option-click the channel number in the score where you want recording to occur. Select additional channels by Option-clicking their channel numbers.

Note *Step-record mode is automatically invoked if you drag cast members from the cast window to the score or the stage.*

Step–recording indicator —————

A step-recording indicator appears in the channels that are in step record mode.

When you choose Step Forward from the Edit menu or control panel, the sprite in the channel with the step-recording indicator is copied into the next frame of your movie.

Step-recording remains in effect until you Option-click the channel number again, click out of the channel, drag the playback head, or click Rewind or Step Backward.

Real-time recording in a channel

Real-time recording lets you move a sprite directly on the stage while recording its motion in a score channel. To activate real-time recording in a channel, press Control–Spacebar while clicking a cell in the desired channel. To activate real-time recording in the first empty score channel, just press Control–Spacebar.

Real–time
recording indicator

An indicator appears next to the channel number to indicate that real-time recording will occur in that channel. Only one channel at a time can be used for real-time recording.

To record a cast member's path in the score, first select it in the cast window. Then hold down Control–Spacebar and click anywhere on the stage to begin recording the sprite's path. Director records the motion of the sprite in the score as you move it across the stage. Information in any of the other channels is copied as you record.

To stop real–time recording, release the mouse button.

Turning a channel on and off

Turning a channel off tells Director to ignore the channel during playback. By default, no channels are ignored (i.e., all channels are active). Clicking the button next to a channel turns the channel off, causing Director to ignore that channel when you play the movie.

This channel is off
This channel is on

If you turn the script channel off, Director ignores all scripts during playback. (This is the same as checking the Disable Scripts command in the Edit menu.)

Channel on/off settings are not saved with the movie.

The paint window

The paint window has a complete set of paint tools and inks you can use to create cast members for your movies. The paint and cast windows share a dynamic link. Anything you draw in the paint window becomes a cast member automatically and is displayed in the cast window. When you make a change to a cast member in the paint window, the image in the cast window is instantly updated—as is the cast member wherever it appears on the stage. Conversely, when you paste or import a new bitmapped cast member into the cast window, it appears in the paint window.

Open the paint window by choosing Paint from the Window menu, or by pressing Command-5. When you open the paint window, the Paint and the Effects menus appear on the menu bar.

▶ **Tip** *A shortcut for opening the paint window is to double-click a bitmapped cast member on the stage or in the score or cast windows. The paint window opens with that cast member showing.*

The paint window contains a complete paint program so you can create or edit cast members without leaving Director. The paint tools are contained in the tool palette at the left side of the window.

Cast member buttons ——

Tool palette ——

Ink pop-up menu ——
Destination color chip ——

Foreground color chip ——
Background color chip ——
Pattern chip ——

Line width selector ——

Color resolution indicator ——
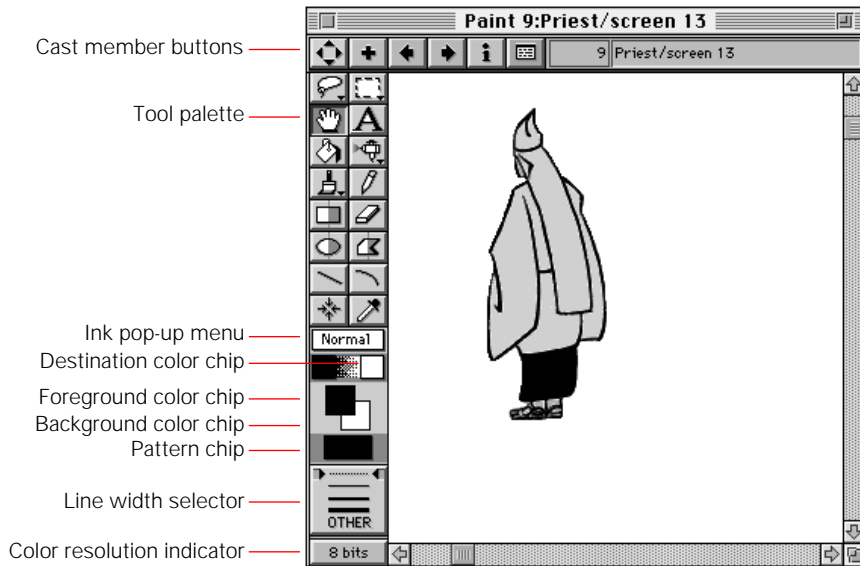
The paint window

Working with easels

The *easel* is the area of the paint window where you draw. Use the Paint Window Options command on the Paint menu to choose between two types of easel display, One Cast Member or 50 Cast Members. If you choose One Cast Member, one cast member at a time is visible in the paint window; if you choose 50 Cast Members, each cast member occupies a separate easel in the paint window.
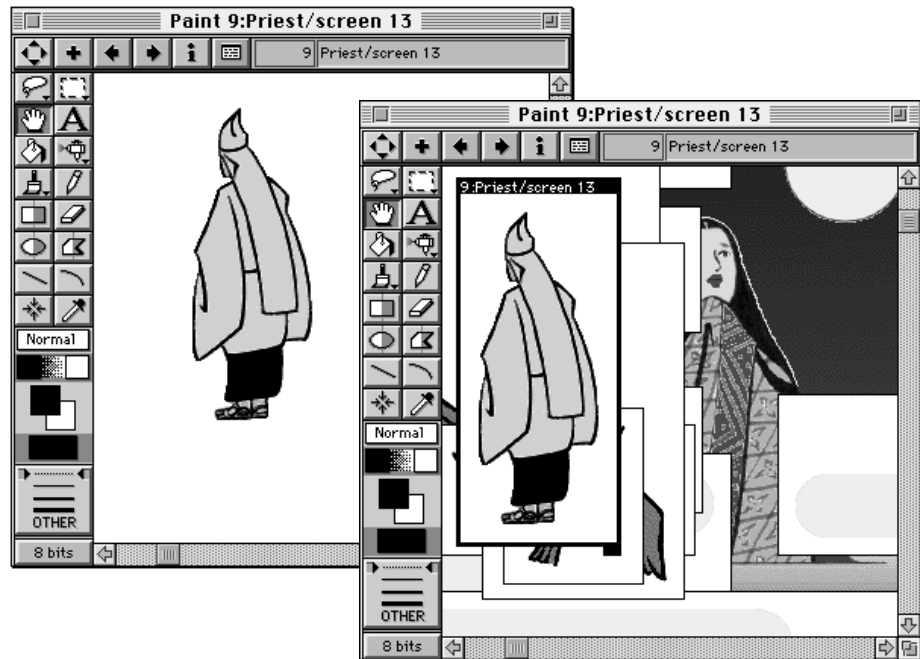
The paint window can display one cast member at a time or 50 cast members

Creating a new bitmap cast member

To create a new cast member:

▶ **Click the Add button, or press Command-Shift-A.**

Add button
Previous, Next buttons
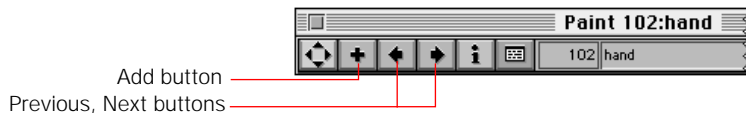
Director creates a new, empty easel in which you can create the cast member. Whatever you draw is placed in the first available cast member position.

The Previous and Next buttons control which cast member is displayed. For descriptions of the other buttons, see "The cast window," earlier in this chapter.

Using rulers

The paint window has a set of vertical and horizontal rulers to help you align and size your artwork.

Click to change the unit of measurement
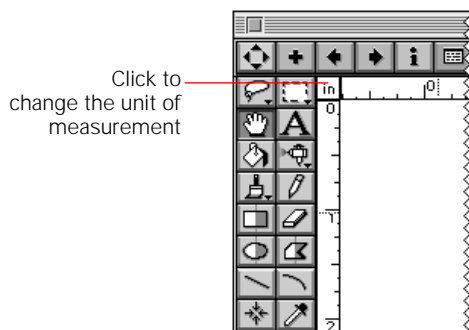
To use the rulers:

▶ **Choose Show Rulers from the Paint menu.**
The rulers appear at the top and left side of the paint window.
The default unit of measurement is inches.

To change the unit of measurement:

▶ **Click the corner where the rulers meet.**
With each click the unit of measurement changes, first to centimeters, then to pixels, then to picas, then back to inches.

To change the location of the zero point:

▶ **Drag right or left along the ruler at the top of the window or up or down along the ruler at the side.**

To remove the rulers from the paint window:

▶ **Choose Hide Rulers from the Paint menu.**

Zooming in and out

The Zoom commands on the Paint menu permit you to zoom in or out at four levels of magnification.

To zoom in on the image in the paint window:

▶ **Choose Zoom In (Command–+) from the Paint menu.**
The image size increases to the first level of magnification. To increase the magnification, choose Zoom In again. The zoom centers on the last part of the image clicked in the paint window. To zoom in on a particular feature of the image, Command–click the image, or position the pointer over the feature before choosing Zoom In.

Click here to return to the normal–size view
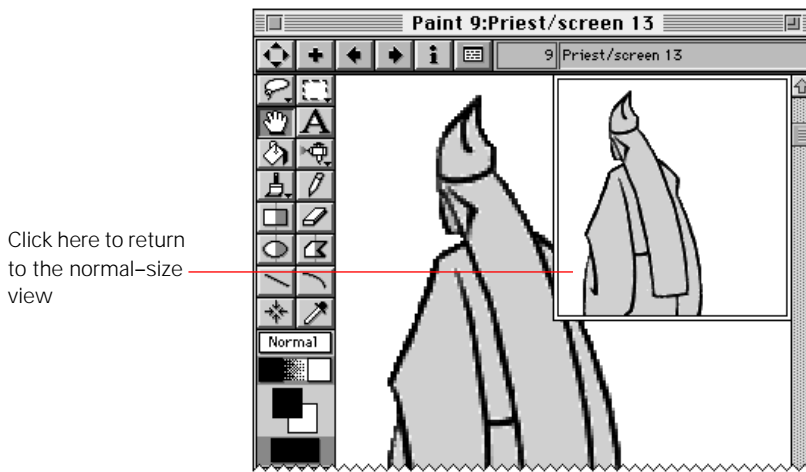
You can see a normal-size view of the image in the box in the upper right corner of the paint window. You can go back to the normal-size view any time by clicking inside the box.

Zoom Out reverses the direction of the zoom. To reduce a magnified view:

▶ **Choose Zoom Out (Command–minus) from the Paint menu.**

▶ *Tip* *Switch back and forth between normal size and the last level of magnification you chose by double-clicking the pencil tool or by pressing the Command key and clicking the art with any tool.*

Selecting colors and patterns

Colors and patterns are similar in the way you choose them and in the way you make use of them. You choose both colors and patterns from pop–up palettes (the pop–up colors palette isn't available if you have your monitor set to black and white), and you make use of both with the same set of tools.

The colors that appear on the pop–up palette come from a set of colors known as a *palette*. Although the Macintosh is capable of displaying over 16 million colors, it can only display a given set of colors at any one time, depending on the capabilities of your video card. If the Macintosh you're working with has a 4-bit video card, you can work with palettes of 16 colors. If you're working with an 8-bit video card, you'll be able to work with palettes of 256 colors.

Director has nine standard palettes: two System palettes (for Macintosh and Windows systems), Rainbow, Grayscale, Pastels, Vivid, NTSC, Metallic, and VGA palettes. (The standard palettes aren't all available all the time; which palettes are available depend on the number of colors your monitor is set to display.) The System palette for your platform is the default palette. You can create as many additional palettes as you want.

There are three types of colors you can choose from the current palette: the foreground color is the color that you paint with when the pattern is solid and the ink is Normal. The background color is the secondary color in a pattern. The destination color is the color you want to replace the foreground color with when you use the Switch ink or the Switch Colors command; when you use the Cycle ink, the destination color is the end of the range of colors (beginning with the foreground color) that you want to cycle through; and when you use the Gradient ink, the destination color and the foreground color define the two extremes of the range that make up the color gradient.

Destination color ——————

Foreground color ——————
Background color ——————
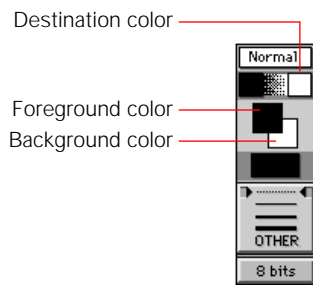
Director has three standard palettes of patterns—Grays, Standard, and QuickDraw—as well as a custom palette. The custom palette contains a set of default patterns; you can create new patterns by editing the default patterns in the Patterns dialog box. You can also create a *tile*—a multicolored pattern that's a duplicate of a small rectangular section of an existing cast member.

See "Working with color palettes" in Chapter 3 for more information.

Paint window buttons

Place button ———
Add button ———

Place button

Lets you drag the selected bitmap cast member to the stage, score, or cast window. Press and hold down this button to drag the selected cast member.

Add button

The Add button creates a new bitmap cast member. Director creates the new cast member in the first empty slot in the cast window that follows the location of the current cast member. If there are no empty slots following the current cast member, Director continues searching for an empty slot from the beginning of the cast. The new cast member inherits the stage monitor's color depth.

▶ *Tip*   *The keyboard shortcut for Add is Command-Shift-A.*

The other buttons work the same as they do in the cast window. See "The cast window" earlier in this chapter.

Paint window tools

The paint window has a set of paint tools for creating or modifying cast members. If you're familiar with Macintosh paint applications, you'll feel right at home with the way the tools work.

Lasso	Selection rectangle
Hand	Text
Paint bucket	Airbrush
Paintbrush	Pencil
Rectangle	Eraser
Ellipse	Polygon
Line	Arc
Registration	Eyedropper
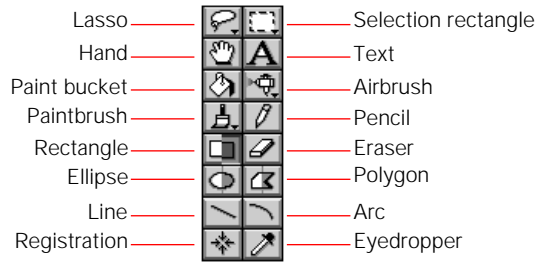
In most cases, pressing the Shift key while dragging a tool constrains it to horizontal or vertical. The ellipse and rectangle tools are constrained to a perfect circle or square when Shift–dragging.

If you press the Command key and click the image in the paint window, your view of the artwork will zoom in to a magnified view.

The following table shows whether clicking and/or dragging makes the tool work.

Tool	Click	Drag	Result
Lasso		•	Selects irregular shapes
Selection rectangle		•	Selects rectangular areas
Hand		•	Moves artwork within easel
Paint bucket	•		Fills with foreground color or current pattern
Air brush	•	•	Sprays foreground color or current pattern
Paintbrush	•	•	Paints foreground color or current pattern
Pencil	•	•	Toggles pixels between foreground and background color
Rectangle		•	Draws hollow or filled rectangles and squares
Eraser	•	•	Erases artwork
Ellipse		•	Draws hollow or filled ellipses and circles
Polygon	•		Draws hollow or filled polygons
Line		•	Draws straight lines
Arc		•	Draws arcs (one quarter of an ellipse or circle)
Registration	•		Sets registration point
Eyedropper	•		Picks foreground color

Drawing with the shape tools

The shape tools are the line, rectangle, ellipse, and polygon tools. The rectangle, ellipse, and polygon tools have a left, or hollow side, and a right, or shaded side. When you click the hollow side, the shape you draw is only an outline; it is not filled with a pattern or color. When you click the filled side, the shape you draw is filled with the currently selected foreground and background colors and patterns.

► **Tip** *If you press the Option key while drawing with one of the shape tools, the border of the shape is drawn with the current pattern.*

If you press the Shift key while drawing with the line tool, the line is constrained to horizontal, vertical, or 45–degree angles.

Double-clicking the shaded side of the rectangle, ellipse, or polygon tool opens the Gradients dialog box.

Lasso

The lasso can be used to select an area. Once selected, drag the artwork, cut, copy, or clear it. You can also use the following commands from the Effects menu: Invert Colors, Trace Edges, Fill, Darken, Lighten, Smooth, and Switch Colors.

► **Tip** *If you press the Option key while dragging the lasso, the lasso draws straight lines to select a polygon shape. Click the lasso to anchor a point and draw another straight line. Double-click when you reach the end of your selection.*

Once an object is selected with the Lasso, pressing the Option key while dragging the object makes a copy of your selection.

Pressing the Shift key while dragging the object constrains its movement to a horizontal or vertical line. To move the cast member in one-pixel increments, select it on the stage and use the arrow keys on your keyboard.

Use the lasso to select everything but the pixels of a certain color. The color of the pixels not selected is determined by where you begin to drag the lasso. For example, if you're selecting an object that is red, white, and blue, and you only want to select the red and white pixels in the object, begin your drag on a blue pixel. Then, only the red and white pixels will be selected. If you want to avoid this effect, use the No Shrink option in the Lasso pop-up menu.

Lasso pop-up menu

Pressing and holding the mouse button while the pointer is on the lasso tool causes the lasso pop-up menu to appear.

Choosing a command from the lasso pop-up menu modifies how the lasso works.

◆ Shrink causes the lasso to tighten around the selected object so that only the object is selected.

◆ No Shrink permits you to select the entire area you drag around. The lasso selects whatever is inside the selected area.

◆ See Thru causes your selection to become transparent, as if the Transparent ink effect were applied.

Selection rectangle

The selection rectangle can be used to select artwork in the paint window. When selected with the selection rectangle, artwork can be dragged, cut, copied, and cleared. It can also be modified with the commands in the Effects menu.

Select the contents of the visible part of the paint window by double-clicking the selection rectangle.
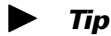
► **Tip**   *Stretch and compress art that is selected with the rectangle by holding down the Command key while dragging the art.*

When artwork is selected with the selection rectangle, hold down the Option key while dragging the artwork to make a copy of it.

Selection rectangle pop-up menu

If you press and hold the mouse button when the pointer is positioned on the selection rectangle tool, the selection rectangle pop-up menu appears with commands to modify the action of the tool.

◆ Shrink causes the rectangle to shrink around the selected artwork.

◆ No Shrink permits you to select everything within the selection rectangle.

◆ Lasso makes the selection rectangle tighten around your selection like the lasso tool. The selection tightens around the object and selectively selects the pixels according to the color of the pixel beneath the crosshair when you started your drag.

◆ See Thru Lasso makes the selection rectangle tighten around your selection like the lasso and applies the Transparent ink.

Double-clicking the selection rectangle tool selects the entire paint window or active cast member.

As with the lasso, you can reposition the selected cast member. Move the crosshair inside the selected area until the crosshair turns into an arrow pointer and drag the selected area to reposition it. Several key combinations affect the selected area when you drag it.

Effect	Mouse or key combination
Copy	Option–drag
Stretch	Command–drag
Stretch proportionally	Command–Shift–drag
Copy and stretch	Command–Option–drag
Constrain to horizontal or vertical	Shift–drag
Clear	Backspace or Delete

You can also use the arrow keys to move the selected area one pixel at a time.

Hand tool

The hand tool moves the image within the paint window, changing your position in the window relative to the artwork. Click the hand tool to select it, then drag the artwork to pan the view. If you press the Option key while using the hand tool, its effect is the same as scrolling the view with the horizontal and vertical scroll bars.

▶ **Tip**   *A shortcut for using the hand is pressing the Spacebar. This turns any tool (except the text tool) into the hand tool when the mouse button is pressed.*

A *Text tool*

The text tool lets you type in any font, size, or style in the paint window. Use it to set the font, size, and style of the text.

The text you create in the paint window is bitmapped. It can be dragged around the paint window before you deselect the text. However, once you click outside the text box after creating the text, you cannot edit its font, size, or style. To change the font, size, or style after clicking, you must erase the text and replace it with new bitmapped text with the attributes you prefer. However, you can modify selected text with ink effects from the Ink pop-up menu, patterns from the patterns pop-up palette, or foreground and background colors with the foreground and background color chips in the paint window.

Paint bucket

The paint bucket fills any enclosed area with the currently selected color and pattern. The fill can be further modified with the ink effects in the Ink pop-up menu in the paint window. If there is a break in the outlined area you are filling, the paint will leak out and fill the surrounding area. If this happens, immediately choose Undo Bitmap from the Edit menu. Then choose Zoom In from the Paint menu to get a magnified view and inspect the outline for breaks.

▶ **Tip** *Double-clicking the paint bucket tool opens the Gradients dialog box.*

Air brush

The air brush sprays the currently selected color and pattern. The spray can be further modified by choosing the ink effects from the Ink pop-up menu in the paint window. The longer you hold the airbrush in one spot, the darker it fills in the area.

▶ **Tip** *Double-clicking the air brush in the tool palette opens the Air Brushes dialog box. Use this dialog box to set the size of the air brush's spray, the size of the dots of paint it sprays, and how fast it sprays paint.*

Air brush pop-up menu

If you press and hold the mouse button when the pointer is positioned on the air brush, the air brush pop-up menu appears. Each of the five settings in the pop-up menu can be defined so you can have several types of spray available without opening the Air Brushes dialog box.

To define a setting:

1. **Choose the menu item you want to define from the Air Brush pop-up menu.**

2. **Choose Air Brushes from the Paint menu.**

3. **Select the type of spray you want in the Air Brushes dialog box.**

4. **Click Set.**
    The choices you make in the Air Brushes dialog box are assigned to the menu item and remain until you change them.

Paintbrush

The paintbrush draws with the currently selected colors, ink effect, or fill pattern. Double-click the paintbrush to change the size and shape of the brush. When the Brush Shapes dialog box appears, click the brush shape you need, and then click Set.
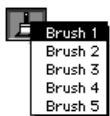
Paintbrush pop-up menu

The paintbrush pop-up menu is similar to the air brush pop-up menu. Press and hold the mouse button while the pointer is positioned on the paintbrush tool to open the pop-up menu.

Each of the five settings in the pop-up menu can be defined so you can have several brush shapes available without opening the Brush Shapes dialog box.

To define a setting:

1. **Choose the menu item you want to define from the Paintbrush pop-up menu.**

2. **Choose Brush Shapes from the Paint menu.**

3. **Select the brush shape you want in the Brush Shapes dialog box.**

4. **Click Set.**
   The choices you make in the Brush Shapes dialog box are assigned to the menu item in the pop-up menu and remain until you change them.

Pencil

The pencil creates a one-pixel-wide line. On a black and white monitor, the pencil draws black pixels on a white background and white pixels on a black background. On a color monitor, the pencil draws with the currently selected foreground color unless you are drawing on pixels that are the foreground color. In that case, the pencil draws in the background color.

Double-clicking the pencil tool magnifies your view of the artwork in the paint window. It magnifies the current easel at the point last clicked with any of the paint tools. You can also zoom in while using the pencil or any other tool by pressing the Command key and clicking.

Once you are in a magnified view you can edit the cast member pixel by pixel. You can use any of the paint tools while in a magnified view. Clicking the reduced view in the upper right corner of the paint window returns you to a 100% view. Double-clicking the pencil in the tool palette while in magnified view also returns you to a 100% view.

Move around the magnified view using the paint window's scroll bars or by using the hand tool.

Rectangle tool

The rectangle tool draws rectangles of any shape and size. When you click the left or hollow side of the rectangle tool, it draws an outline in the current foreground color as you drag the crosshair diagonally. When you click the right or shaded side of the rectangle tool, the rectangle you draw is filled with the current foreground and background colors in the current ink and pattern. The thickness of the rectangle's border is controlled with the line width selector at the bottom of the tool palette.

To constrain the rectangle to a square, press the Shift key as you drag with the crosshair pointer. If you press the Option key while drawing a rectangle, the border is drawn with the current pattern.
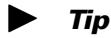
▶ **Tip** *Double-clicking the shaded side of the rectangle tool opens the Gradients dialog box.*

Eraser

The eraser clears the portion of the cast member you drag across. The eraser always clears to white. Double-clicking the eraser tool erases everything in the paint window's visible area.

Ellipse tool

The ellipse tool creates circles and ovals. Like the rectangle tool, the ellipse is an outline if you click the tool on the left or hollow side, and is filled with the current foreground and background colors, ink, and pattern when you click the tool on the right or shaded side. The thickness of the line is controlled by clicking the line width selector at the bottom of the tool palette.

When you hold down the Shift key as you draw, the ellipse tool draws perfect circles. If you use the ellipse tool while pressing the Option key, the border of the circle is drawn with the currently selected pattern.
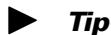
▶ **Tip** *Double-clicking the shaded side of the ellipse tool opens the Gradients dialog box.*

Polygon tool

The polygon tool draws polygons with as many sides as you want. As with the rest of the shape tools, the left or hollow side of the tool creates an outline, and the right or shaded side of the tool draws an area filled with the current foreground and background colors, ink, and pattern. When you click the tool, the pointer becomes a crosshair. Click in the paint window to start drawing the side of a polygon. Each time you click, a line is drawn from the spot you clicked previously. When you are ready to finish off your shape, double-click and a line is drawn connecting the spot you just clicked and the point of your first click.

The thickness of the lines drawn with the polygon tool is controlled with the line width selector at the bottom of the tool palette. If you press the Option key while drawing a polygon, the border is drawn with the currently selected pattern.

▶ **Tip** *Double-clicking the shaded side of the polygon tool opens the Gradients dialog box.*

Line tool

The line tool draws straight lines at any angle. When you hold down the Shift key, the line tool draws vertical, horizontal, or 45–degree lines, depending upon the direction you begin to drag. Change the line width by clicking the line width selector in the tool palette.

The line is drawn with the currently selected foreground color and ink effect.

▶ **Tip** *Pressing the Option key while drawing a line causes the line to be drawn in the currently selected pattern.*

Arc tool

The arc tool draws one quarter of an ellipse or circle. When the tool is active, the pointer becomes a crosshair. Drag the crosshair from the starting point of the line and move the pointer to see the curve. Experiment with dragging the tool until it produces the line you need. The thickness of the arc is controlled with the line width selector at the bottom of the tool palette.

The line is drawn with the currently selected foreground color and ink unless you press the Option key while dragging, in which case the arc is drawn with the current pattern.

Registration tool

When you create a cast member in the paint window, it is automatically assigned a registration point that centers on the artwork. You can see this by creating a simple cast member and clicking the registration tool. When you click the tool, dotted lines appear in the paint window. The intersection of these dotted lines is the *registration point* of the cast member. Using registration points speeds your ability to quickly and accurately put cast members on the stage and have them all line up with the same point.

The registration tool is used to line up cast members for frame-by-frame animation. When you have a series of cast members, you can align their registration points so you have a fixed reference point for animation. A simple example might be the hands of a clock. The hands are made up of different cast members at various positions around the face of the clock, but they must be anchored to the center of the clock. Setting a registration point on the hands at the point about which they rotate enables them to line up in the proper position on the stage.

Another example of using registration points is a running figure. You can set a registration point at the same spot on the ground so when the series of running figures is animated, they bounce up and down relative to the same point on the ground.

Registration points are most useful when animating with the Switch Cast Members command in the Score menu, with film loops, and when previewing a sequence of cast members in the paint window with the Align Bitmaps command in the Cast menu. When you use the Align Bitmaps command, the cast members in the paint window are all lined up on each other's registration points, permitting you to preview the animation by quickly flipping through the cast members using the left and right arrows at the top of the paint window.

The default registration point for a bitmap image is the center of the cast member in the paint window. However, the registration point for shapes, buttons, or text is always the upper left corner of the image. Clicking a point in the paint window sets the registration point at that location.

To set a registration point:

1. **In the paint window, select the cast member that you want to register.**

2. **Click the registration tool.**
   The dotted lines in the paint window intersect at the registration point. The default registration point is the center of the cast member.

   The pointer changes to a crosshair when you move it to the paint window.

3. **Click a location in the paint window to set the registration point.**
   You can also drag the dotted lines around the window to reposition the registration point.

▶ *Tip*   *To reset the default registration point at the center of the cast member, double-click the registration tool.*

 Eyedropper

The eyedropper is used to match colors. When you select the eyedropper, any color you click in the paint window becomes the foreground color. Use it to match colors without opening the color palette. Pressing the Control key turns any tool into the eyedropper.
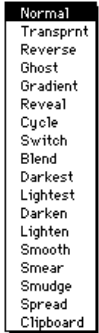
Ink pop-up menu

Below the tool palette is a pop-up menu with a number of inks that modify the way each tool is used. The result of the ink you choose depends on whether you are working in color or black and white. Another factor to keep in mind is the pattern the ink is used with. Some inks work better when painting with patterns and others work better when painting with solid colors.

Ink	B&W	Color	Works with
Normal	√	√	Solids and patterns
Transparent	√	√	Patterns
Reverse	√	√	Solids and patterns
Ghost	√	√	Solids (b&w) and patterns (color)
Gradient	√	√	Paintbrush, paint bucket, shape tools
Reveal	√	√	Paintbrush, shape tools
Cycle		√	Solids and patterns
Switch		√	Paintbrush
Blend		√	Solids and patterns
Darkest		√	Patterns
Lightest		√	Patterns
Darken		√	Paintbrush
Lighten		√	Paintbrush
Smooth		√	Paintbrush
Smear		√	Paintbrush
Smudge		√	Paintbrush
Spread	√	√	Paintbrush
Clipboard	√	√	Paintbrush

Normal

Normal is the default ink. It is opaque and maintains the color of the current foreground color and pattern.

Transparent

Transparent ink makes the background color of patterns transparent so you can see artwork drawn previously in the current cast member through the pattern.

Reverse

Reverse ink makes overlapping colors reverse. Any pixel in the foreground art that was originally white becomes transparent. Any pixel that was black reverses the color of the background art.

Ghost

Ghost in black and white creates an image than can only be seen when placed over a black background. In color, Ghost draws with the current background color.

Gradient

Gradient lets you paint with the gradient fill selected in the Gradients dialog box. A gradient fill is one that progresses from one color, the foreground, to another color called the destination color. You can paint with Gradient ink with the paintbrush, paint bucket, or shape tools.

Reveal

Reveal works indirectly with the art in the previous cast slot. Imagine the previous cast member's artwork covered with a white area. Reveal erases the white area to show the artwork in the previous easel. Reveal can be used to create specific shapes from shades created with the air brush. Since it is impossible to mask certain shapes for the air brush, spray an area with the air brush first; then in the next cast member, paint the shapes you need with a Reveal ink. As you paint your object, you will expose the air brush pattern in the previous easel.

Cycle

Cycle is a color ink. As you draw with a cycling ink, the colors change as the ink progresses through the palette. The beginning and ending points of the color cycle are determined by the foreground and destination colors. If you want to cycle through the whole palette, choose white as the foreground color and black as the destination color.

Switch

Switch changes any pixel that is the current foreground color to the current gradient destination color as you paint over that color.

Blend

Blend creates a translucent color ink. You can see the background object, but its color is blended with the foreground object's color. You can choose the percentage of blend in the Paint Options dialog box.

Darkest

Darkest is a useful ink for colorizing black and white artwork. For example, if you are painting yellow over black and white, black will remain black since it is darker than yellow, and white will become yellow because yellow is darker than white.

Lightest

Lightest is another useful ink for colorizing black and white artwork. For example, if you are painting yellow over black and white, black objects become yellow when painted with the Lightest ink effect, and white remains white because it is lighter than yellow.

Note *In very rare instances you may experience bugs in the Macintosh QuickDraw routines. These occur when you use the Darkest or Lightest inks. For example, mixing colors with Darkest or Lightest ink will not work well if one of the colors is a gray pattern. Use a solid gray rather than a pattern to mix colors. Another anomaly crops up when you use the air brush's speckled paint option to spray with the Darkest or Lightest ink. The size of the large drops of speckled paint will not be as large as they are with the other inks.*

Darken

Darken makes colors darker. The more the paintbrush passes over an area, the darker it becomes. The color of the foreground, background, or destination inks has no effect on Darken. Darken creates an effect that is the same as reducing a color's brightness with the controls in the color palettes window. You can vary the rate of this ink effect in the Paint Options dialog box.

Lighten

Lighten makes existing artwork lighter. The more times you pass over the artwork with the paintbrush, the lighter it becomes. The color of the foreground, background, or destination inks has no effect on Lighten. Lighten creates an effect that is the same as increasing a color's brightness with the controls in the color palettes window. You can vary the lightness of this ink in the Paint Options dialog box.

Smooth

Smooth blurs existing artwork when painted with the paintbrush. It is not directional as are Smear and Smudge. The color of the foreground, background, or destination inks has no effect on Smooth. Smooth only works with art already in the paint window. Use it to smooth out jagged edges.

Smear

Smear works with the paintbrush. It is similar to mixing paint. Any area you drag across with a Smear ink is spread in the direction of the brush and fades as it gets farther from its source. The color of the foreground, background, or destination inks has no effect on Smear. Smear only works with art already in the paint window.

Smudge

Smudge is a color ink for the paintbrush that is similar to Smear. It is also like mixing paint. The colors fade faster as they are spread. The color of the foreground, background, or destination inks has no effect on Smudge. Smudge only works with art already in the paint window.

Spread

Spread works with the paintbrush in color. Whatever is under the paintbrush when you start to drag is picked up as the ink for the brush. Copies of what is beneath the brush are pushed across the window as you draw.

Clipboard

Clipboard uses the current contents of the Clipboard as a pattern to paint with.

Destination
color chip
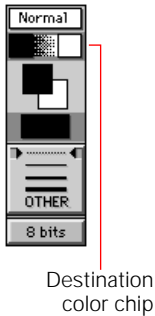
Destination color chip

The range of colors between the foreground and destination colors is used with the Gradient, Cycle, and Switch inks. You select the destination color using the destination color chip.

A gradient is a blend of a range of colors that can be used for shading, highlights, backgrounds, and special effects. On a black and white monitor, gradients are created with a pattern of black and white pixels that fade from black to white or vice versa. With a color monitor, the two colors that form the beginning and end of a gradient are the foreground color and the destination color.

To set the current foreground color, click the left side of the selector and choose a color from the pop-up color palette. To set the destination color, click the right side of the selector and choose a color from the pop-up palette.

▶ **Tip** *Hold down the Option key while pressing the up or down arrow key to cycle through the colors in the destination color chip.*

Foreground color chip

Gradient color
selector —

Foreground color —
chip
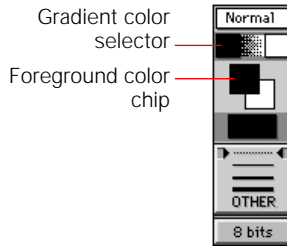
The foreground color is the color displayed in the foreground color chip. It's also displayed in the color chip on the left side of the gradient color selector. The foreground color is the color you work with when you're using the solid pattern and the Normal ink.

▶ **Tip**   *Press the up or down arrow key to cycle through the colors in the color palette associated with the Foreground color chip.*

Double-click the foreground, background, or destination color chip to open the color palettes window.

Background color chip

Background color —
chip
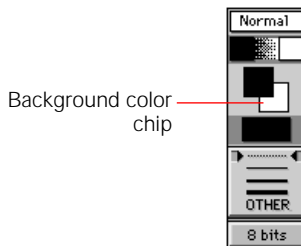
The background color is the color displayed in the lower right color chip. The background color is the secondary color that appears in a pattern.When used with the Transparent ink, the background color in a pattern is drawn so you can see through the background color to artwork beneath. The background becomes transparent.

Hold down the Shift key while pressing the up or down arrow keys to cycle through the colors in the color palette associated with the Background color chip.

Pattern chip

The current pattern is displayed in the pattern chip below the two color chips in the tool palette.
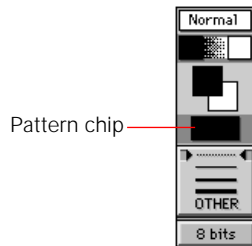
Pattern chip ———

Click the pattern chip to select a new pattern from the pop-up palette.

Pressing the Option key before displaying the pattern palette permanently changes the patterns to shades ranging from the foreground color to the background color rather than the set of patterns you see without pressing the Option key. Press the Option key again to return to the default set of patterns.

Double-click the pattern chip to open the Patterns dialog box. Use the dialog box to edit or select new sets of patterns.

Line width selector

Line width selector
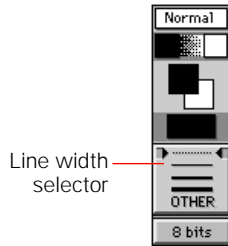
The line width selector controls the thickness of the line drawn by the line or arc tool and the thickness of the borders drawn by the shape tools.

The width of the line drawn by the line, arc, rectangle, ellipse, and polygon tools can be changed with the line width palette. The line width palette has several settings for line width ranging from no line (the dotted line in the line selector) to Other. Use the dotted line setting when you want to draw filled shapes without borders. If you choose Other, the line width is determined by the Other Line Width setting in the paint Window Options dialog box.

▶ **Tip** *Double-click the line width selector to open the Paint Window Options dialog box. Use it to set the Other Line Width.*

Color resolution indicator

Color resolution
indicator
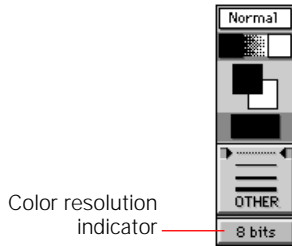
The color resolution indicator displays the color resolution of the current cast member in the paint window.

Double-clicking the color resolution indicator opens the Transform Bitmap dialog box. Use the Transform Bitmap dialog box to change the color resolution of the current cast member in the paint window. Changing the color resolution from color to black and white saves disk space. You can still make a selected 1-bit cast member a color other than black by selecting colors with the foreground and background color chips in the tools window after it has been reduced to 1-bit. (This colorizes the sprite on the stage, but does not affect the original cast member, which remains black and white.)

If you import black and white cast members, changing their color resolution to multiple colors permits you to colorize them with any color in the current palette.

For more information, see "Changing color depths" in Chapter 1.

The text window

Use the text window to create and edit a text cast member.

The commands on the Text menu set text attributes and find and replace text. You can also use the tools window to set the foreground and background colors of the text you create.

Text created in a text window prints well with a laser printer. When printing frames from your movie you can avoid the jagged lines of bitmapped text by using the text window rather than the paint window to create text.

To open a new text window, choose Text from the Window menu. Director adds the name of the text window to the bottom of the Window menu. The window's title displays the position of the first empty cast member where the text will be entered in the cast window.

Alternatively, double-clicking a text cast member in the cast window or on the stage will either open the cast member's text window or bring it to the front if it is already open.

Add button —
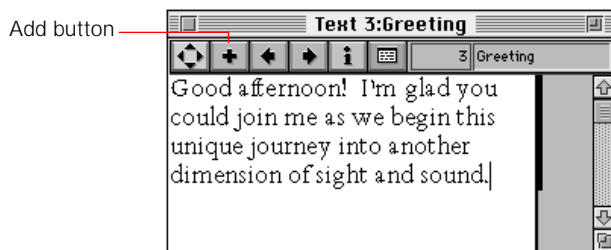
Changes made in the text window are automatically reflected in the cast after you stop typing for more than 1/2 second, switch to a different window, or if you click outside the text window or close it. All other windows displaying the current text cast member are automatically updated.

Except for the Add button (which the cast window doesn't have), the text window buttons work the same as they do in the cast window. For a description of the text window's other buttons, see "The cast window," earlier in this chapter.

Add button

Creates a new text cast member. Director creates the new text cast member in the first empty slot in the cast window that follows the location of the current cast member.

▶ **Tip** *The keyboard shortcut for Add is Command-Shift-A. To switch to a new empty cast member and open a new window for it, use Option-Command-Shift-A.*

Selecting and editing text

Click in the text window to set an insertion point. The text you type is inserted into the current cast member and automatically appears in the cast window. You can enter up to 32,000 characters, including spaces.

You select text in the text window or on the stage by dragging across the text, or by double-clicking to select a whole word. Triple-clicking selects all text in the cast member, which is the same as choosing Select All from the Edit menu.

You can cut, copy, and paste text between text windows.

Resizing text width

When text is on the stage, or in the text window, a resize handle at the right of the text controls the width of the text and the shape of any border set with the Text menu. Drag the resize handle in the text window or on the stage to change the text's width.

Resize handle

To produce pictures in which the characters speak has been the object of many inventors, ever since the first motion pictures flickered dizzily across a screen.

Text 1

To produce pictures in which the characters speak has been the object of many inventors, ever since the first motion pictures flickered dizzily across a screen.
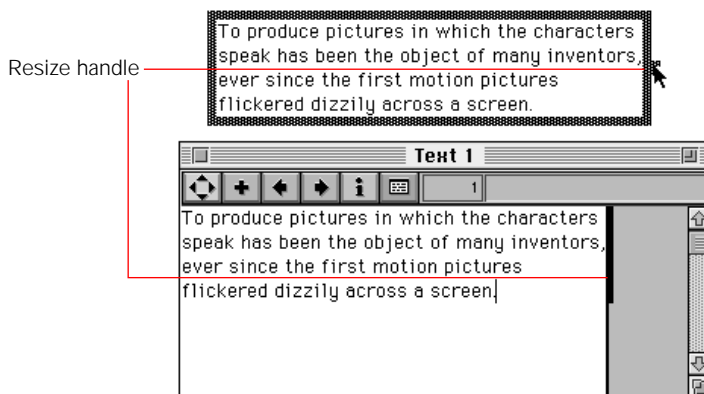
The minimum width of the text window is 16 pixels.

The handle's thickness in the text window indicates the current vertical extent of the text. The handle appears thicker in the area occupied by the text, and narrower where there is no text.

▶ **Tip** *To create another view of the same text window, hold down the Option key while choosing the name of the active text window from the Window menu. This creates a second view of the text window. This is useful if you are editing a large text cast member, since you can display different sections of the text in each view, and cut and paste between them.*

Formatting text

To apply a format to text, select it and choose a command from the Text menu. You can apply a font, size, and style to text on a per–character basis.

Applying color to text

To apply a color to text:

1. **Select the text in the text window.**

2. **Choose the Tools command from the Window menu.**
   The tools window appears.

3. **In the tools window, choose a text color using the foreground color chip.**
   The color you choose is applied to selected text in the text window.

4. **Choose a color for the text window's background using the background color chip.**
   The color you choose is applied to the text window background.

The tools window

The tools window has tools for creating QuickDraw text and graphics directly on the stage. QuickDraw text and graphics make excellent backgrounds and print well with a laser printer. They are easy to create and are resizable. They also use less memory than bitmapped images you create in the paint window. If you are producing handouts for a presentation, use text created with the text tool to avoid the jagged lines of bitmapped text.

The shapes you create with the QuickDraw shape tools appear as cast members in the cast window and the score window. The text you create with the QuickDraw text tool appears in the cast, score, and text windows. QuickDraw shapes and text do not appear in the paint window.

Using QuickDraw text for animation does have a drawback. It tends to animate more slowly than bitmapped text, so it's best to use bitmapped text if animation speed is an issue.
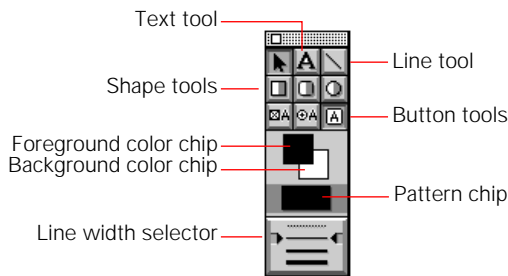
Text tool

The text tool is an alternative to the text window for creating text. When you create text with the text tool on the stage it can also be seen in the text and cast windows. Click the arrow to select text that is already on the stage. You can change the color of selected QuickDraw text using the foreground and background color chips in the tools window.

Line tool

Click the QuickDraw line tool to select it and drag it across the stage to draw. You can choose the color for the line with the foreground and background palettes that appear when you press on the color chips. The width of the line tool is controlled with the line width selector at the bottom of the tools window.

Shape tools

Click the shape tools on the left or hollow side to draw an outline of the shape. Click the right or shaded side of the tools to draw with a solid color or pattern. You can choose the color for the shape with the foreground and background palettes that appear when you press on the color chips. Use the pattern chip to select the current pattern. The thickness of the borders of the shape tools is controlled with the line width selector at the bottom of the tools window. You can change the shape using the Shape pop-up menu in the Cast Member Info dialog box.

Button tools

Director provides three tools for creating buttons, checkboxes, and radio buttons. Click the checkbox tool, button tool, or radio button tool and drag a rectangle on the stage to create a button. Then type the text that you want to appear on or next to the button. If necessary, set the font, style, and size. The button is placed in the cast as a button cast member. You can edit the button's text on the stage or in a text window. You can then attach a script to the button so that it responds appropriately when clicked.

Foreground, Background color chips

The foreground and background color chips in the tools window can be used to set the color of text typed in the text and script windows, set the color of QuickDraw text and shapes, and set the color of sprites.

To set the color of text you type in the text or script windows, make the text or script window active, and then choose a text color using the foreground color chip. The color is subsequently applied to text you type, but not to existing text. To set the window's background color, choose a color using the background color chip.

To set the color for a sprite, select the sprite in the score or on the stage and choose a new foreground color using the foreground color chip, or a new background color using the background color chip.

If you change the color of a 1-bit cast member, Director changes the color of the sprite on the stage but does not change the color of the actual cast member, which remains black and white.

Pattern chip
Lets you select the current pattern for a shape tool.

Line width selector
Lets you select the current width of the line tool, or the border for a shape tool.

Creating shapes

You create shapes with the line, rectangle, rounded rectangle, and ellipse tools. As with the paint tools, clicking the left side of the tool produces a hollow shape. Clicking the right side of the tool produces a shape filled with the current color or pattern in the pattern chip.

▶ **Tip** *Pressing the Shift key while dragging the crosshair constrains the tool to drawing a perfect square or circle. The line tool is constrained to horizontal, vertical, or 45-degree lines with the Shift key.*

To create a shape that is the full size of the screen, draw one as large as you can, drag it up and to the left, then extend it by dragging the handle in the lower right corner. You can then reposition it slightly lower and to the right to hide the edge along the right and the bottom. You can also use the Sprite Info command on the Score menu to enter the exact dimensions and position of the shape, to make it the same size as the screen.

Changing a shape

To change a shape:

1. **Click the pointer in the tools window.**
   The pointer allows you to select shapes.

2. **Click a shape on the stage to select it.**

3. **In the tools window, select a new foreground color, background color, pattern, or line thickness.**
   The shape changes to match your selection.

The color palettes window

The color palettes window lets you determine which palette to use to color the cast members on the stage. When you open the color palettes window, the Palette menu appears in the menu bar and the color palettes window displays the current palette (either 16 or 256 colors). You can edit colors or switch palettes entirely. To use a palette in the score, select a cell in the palette channel and choose Set Palette from the Score menu.

Hand tool

Eyedropper tool

Arrow

Lets you select reserved colors. (This button only appears if you reserved colors using the Reserve Colors command in the Palette menu.)

Palettes

Index number

Hue, saturation, and brightness controls
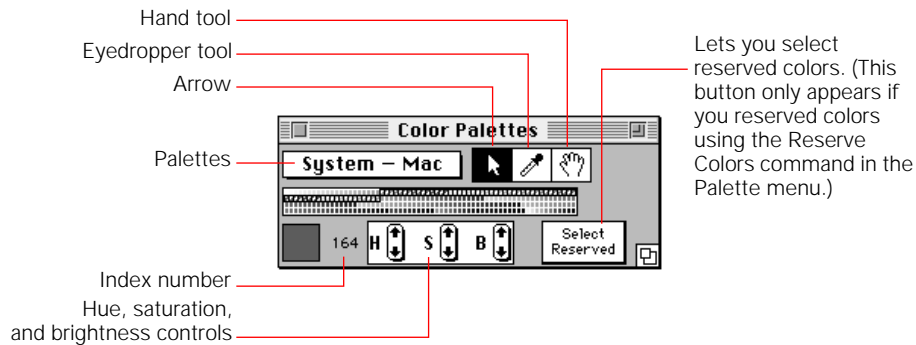
Director has nine built-in palettes:

◆ System – Mac

This is the standard 256-color Macintosh system palette.

◆ System – Win

This is the standard 256-color Windows palette.

◆ Rainbow palette

◆ Grayscale palette

◆ Pastels palette

◆ Vivid palette

◆ NTSC palette

◆ Metallic palette

◆ VGA palette.

The VGA (Video Graphics Array) palette is a special palette for VGA 4-bit displays. It provides consistent results when playing Director movies under Windows in 4-bit mode.

If you add new palettes to your movie from other graphics applications, those palettes also appear in the pop-up menu and in the cast window. Duplicated palettes that you modify also appear in the color palettes window's pop-up menu.

When you switch to a new palette, the pixels change color in sprites on the stage based on the position number of their colors in the original palette.

Sprites always take on the colors of the palette that is currently active. The active palette is determined by which cast member is selected in the cast, score, or paint windows or which palette is selected in the color palettes window.

Use the hand tool to drag a color from one spot in the palette to another to reposition the color.

Use the eyedropper to match the color of any pixel you click with the tool.

Clicking the arrow changes your pointer back to the pointer.

Editing colors

The easiest way to edit colors is with the Macintosh Color Picker. To edit a color using the Color Picker, double–click a color in the color palettes window. The Color Picker uses both the HSB (Hue, Saturation, Brightness) system and the RGB (Red, Green, Blue) system to measure color. The index number of the selected color appears in the lower left corner of the color palettes window along with a sample of the color.

To edit selected colors in the color palettes window using the HSB system, click the arrows at the bottom of the window to increase or decrease the value of hue, saturation, or brightness.

Hue is the primary or secondary color created by mixing two primaries. There are six hues that blend together as you travel in a circle around the Color Picker.

Saturation is a measure of how much white is mixed in with the color. A fully saturated color is vivid; a less saturated color is a washed out pastel or even a shade of gray.

Brightness controls how much black is mixed in with a color. Colors that are very bright have little or no black. As the brightness is reduced, the color gets darker as if more black were added. If brightness is reduced to 0, then no matter what the values for Hue or Saturation, the color will be black.

For information on editing a palette, see "Editing palettes" in Chapter 3.

The digital video window

Double-clicking a QuickTime cast member in the cast window or on the stage displays the cast member's digital video window.

The digital video window lets you play a digital video movie. Use the controls at the bottom of the window to play, stop, advance, or rewind the movie. When the movie is stopped, you can cut, copy, and paste frames from the movie into another digital video window.

Note *On a Macintosh, the term "digital video" refers only to QuickTime animations. However, on a PC, Director for Windows supports two digital video formats: Microsoft's Video for Windows (.AVI) and QuickTime for Windows.*

Digital video window buttons

Add button —

The Place, Previous, Next, Info, and Script buttons work the same as they do in the cast window. See "The cast window" earlier in this chapter for a description of these buttons.

Add button

The Add button creates a new digital video cast member. Director creates the new cast member in the first empty slot in the cast window that follows the location of the current cast member. If there are no empty slots following the current cast member, Director continues searching for an empty slot from the beginning of the cast.

Press Option while clicking the Add button to create a new digital video cast member in a new window.

▶ **Tip** *The keyboard shortcut for Add is Command-Shift-A. To switch to a new empty cast member and open a new window for it, use Command-Option-A.*

When you paste a QuickTime movie into an empty digital video window, Director automatically converts the movie into a linked cast member. Director creates a QuickTime movie file in the same folder as the Director movie, and links the movie to the cast. The filename consists of the movie name, followed by the cast member name and number.

Creating a digital video cast member

To add a digital video movie to the cast, you either paste it or import it. Director automatically links the movie to the cast and adds it to the cast window. If you paste the movie, Director first asks you to name the file in which to store the movie.

Using multiple digital video windows

You can create as many digital video windows as memory allows and play them simultaneously. A movie continues playing even if it is not the front-most window.

You can also create multiple views of the same digital video window, to display the same cast member in separate windows. This is useful for editing the movie, since you can play the movie independently in each window, and cut and paste between each window.

Changes to the cast member in one window are automatically reflected in any other windows that display the cast member.

The script window

Use the script window to enter and edit Lingo scripts. A script window can contain up to 32,000 characters.
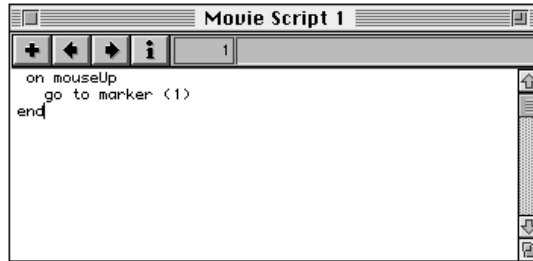
For a description of the buttons at the top of the script window, see the section called "The cast window," earlier in this chapter.

▶ **Tip** *In Director's help window, Lingo commands include examples, attached as notes, that you can paste into your scripts and use.*

You can have multiple script windows open at the same time. The Window menu lists all open script windows. The active script window appears underlined.

Director saves changes you make in the script window when you close it (by clicking the close box or by pressing Enter on the keyboard or Command-W) or if you choose Recompile Script or Recompile All Scripts in the Text menu.

▶ **Tip** *Double-clicking a cell in the script channel opens the script window.*

See "Writing scripts" in Chapter 4 for information about creating scripts. For complete information about using scripts, see *Using Lingo*.

The message window

The message window is a convenient place to experiment with and test Lingo scripts. Actions occur immediately when you press the Return key, so you can see the results before you insert your scripts into a movie. This allows you to see the results of any script, including whether it is a valid script.
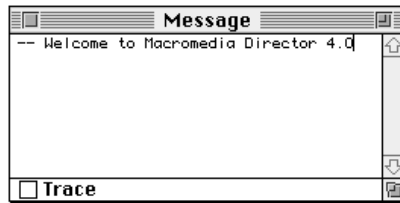
To move around the message window, use the arrow keys or scroll the window. Press Command–up arrow to move the insertion point to the top of the window. Press Command–down arrow to move the insertion point to the bottom of the window.

Use Cut or Clear to remove text from the message window. To clear all the text from the insertion point to the bottom of the window, press Command–Shift–Delete.

The message window has a Trace feature that can help you find problems in scripts. If Trace is checked, you can play a movie and all the Lingo commands will appear in the message window as they are executed. Using the Trace feature slows down animation, so turn it off when you're not using it.

See *Using Lingo* for more information about working with the message window.

The tweak window

The tweak window allows you to move one or more selected sprites in any direction with precision. Drag the point in the left side of the window to set the number of pixels. The value in the boxes will continue to increase or decrease as you drag the line beyond the boundary of the tweak window.
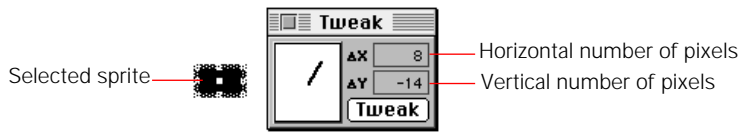
Tweaking the location of a cast member on the stage

After you set the number of pixels, click the Tweak button to move the selected sprites. Continue clicking the Tweak button to repeatedly move the selected sprites the same distance.

▶ **Tip** *You can also use the arrow keys on your keyboard to move selected sprites one pixel at a time.*

The markers window

The markers window lets you write comments associated with markers you set in the score. For example, a Director animation can have staging or acting directions, storyboard scripts, or speaker's notes written in the markers window and tied to specific frames in the score. A storyboard, transparencies, or handouts can be printed that include pictures of selected frames of your movie along with the comments written in the markers window. Double-clicking one of the triangular markers in the score window opens the markers window to the comment associated with that frame.

Once you've marked a frame in the score, you can use the marker name in your scripts. This is important because references to frame numbers may become invalid if you insert or delete frames in the score. Marker names remain constant no matter how much you edit the score.

Click a marker name to scroll the score window to the marker's location
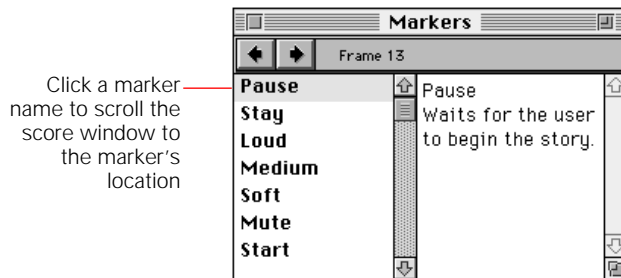
The left column of the markers window displays the marker names from the score. Clicking a marker name or clicking the left or right arrow in the markers window moves the playback head to the selected marker location in the score window, and displays the comments associated with the marker in the markers window.

To enter a comment, click a marker name to select it. You can then enter your comments beginning at the insertion point that appears in the right column of the markers window. By default, the marker name appears as the first line of text in the right column. If you edit the marker name, your changes are also reflected in the score window. If you don't want to edit the marker name, press the Return key to start a new line, and enter your comments on the new line in the right column of the markers window.

Menu Reference

This chapter is a complete reference to the Director menus and commands. The menus are described as you see them in the menu bar from left to right. Four Director menus—Paint, Effects, Palette, and Lingo—only appear if you open a certain window.

Windows are described in Chapter 5, "Window Reference."

See Appendix A, "Director Shortcuts," for a complete list of all keyboard shortcuts for working with commands.

Apple menu

The Apple menu includes three Director commands, followed by all currently installed Apple Menu Items files.

About Director...

Choosing About Director displays a dialog box that shows you how much memory is available to Director for your movie. It also indicates how much memory different parts of the current movie use and the total disk space the movie occupies.
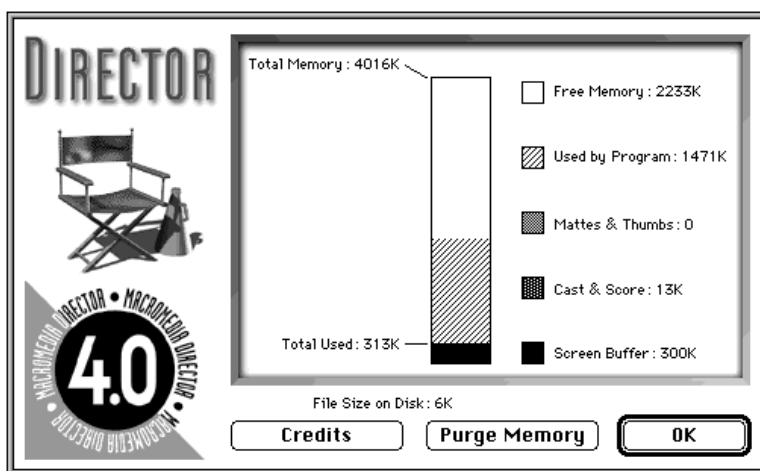
Total Memory
Shows you the total memory available to Director to run your movie. This number depends on the size of the memory partition in the Finder, the amount of RAM installed in your computer, and any virtual memory.

Total Used
Indicates how much RAM is being used for your movie.

File Size on Disk

Shows you how much disk space the current animation occupies. This number is updated every time you save the file. If you have created a new movie and have not saved it yet, this item is not displayed.

Free Memory

Indicates how much more memory is currently available to Director.

Used by Program

Indicates the amount of memory used by Director.

Mattes & Thumbs

Shows you how much memory is used by cast members that use the Matte ink in the score window, and by thumbnail images in the cast window.

Cast & Score

Indicates the amount of memory used by the cast members in the cast window and the notation in the score window. Cast members include all the artwork in the paint window, all the text in the text windows, and any sounds, palettes, buttons, digital video movies, or linked files imported into the cast and currently loaded into memory.

Screen Buffer

Shows how much memory Director reserves for a "working area" while animating on the stage.

Click Credits to display the names of the team that brought you Director.

Click Purge Memory to remove all purgeable items from RAM, including all thumbnail images in the cast window. All cast members that have a purge priority greater than zero (as specified in the Cast Member Info dialog box) are removed from memory. (Edited cast members don't get purged.) This is useful for gaining as much free memory as possible before importing a large file.

Help…

Displays a help window that gives you access to Director Help. To display the help window, do one of the following:

◆ Choose Help from the Apple menu.

◆ Choose Help Pointer from the Apple menu and then choose a window or menu to display the appropriate help screen for the object you chose.

◆ Click the Help button in any dialog box.

Click a topic to display help on that topic
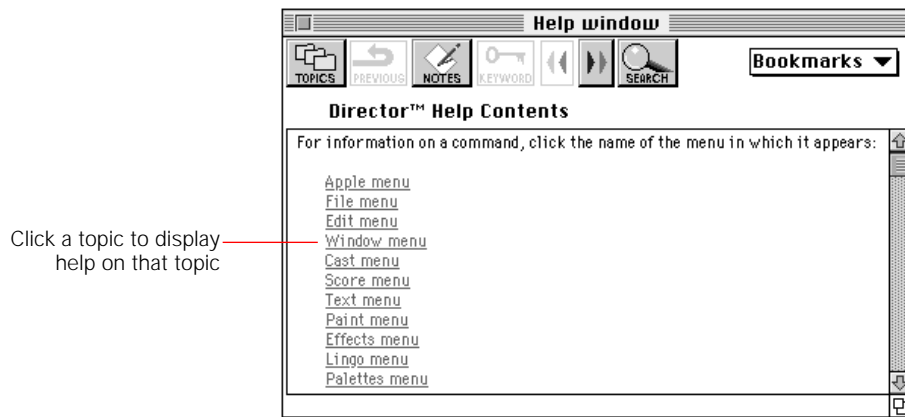
Use the buttons at the top of the Help window to navigate through the help system.

Topics
Returns you to the help contents window. This is the first window you see when you choose the Help command.

Previous
Returns you to the last window you were looking at before the current window.

Notes
Displays a dialog box that lets you enter a note for the current topic. The note is automatically attached to the current topic.

Keyword

Displays the keyword window, which you can use like an index. The list on the left shows each keyword in the help system. When you select a keyword, the list on the right shows each topic where the selected keyword is referenced. Click a topic to display its help screen.

Back

Returns you to the previous window in the help system.

Forward

Takes you to the next window in the help system.

Search

Displays a window that lets you search for a word or phrase.
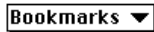
Bookmarks

Lets you assign a bookmark to the current window, so that you can quickly return to it by choosing the name of the bookmark from the pop-up menu.

▶ *Tip*   *Lingo commands include examples, attached as notes, that you can paste into your scripts and use.*

Click to display the note

Help Pointer

$^+_?$ Changes the cursor to a question mark shape, for getting context-sensitive help. Choose a command or click a window to display the appropriate help screen. To cancel context-sensitive help, choose this command again.
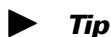
▶ **Tip** *Command–? is the keyboard shortcut for this command.*

Scrapbook

Scrapbook files are an easy way for you to transfer artwork from another application into Director. Use the Import command to bring Scrapbook files into Director. When you import a Scrapbook file, Director automatically places each item in the Scrapbook in a cast member position in the cast window.

You can also use the Scrapbook to transfer the score from movies you've created to new movies. When you copy parts of a score to the Scrapbook, the score notation is stored in the Scrapbook along with references to the cast members in the movie.


```
                  Scrapbook
Macromedia Director Animation from:
HD:Movies:Trip to the Zoo movie file
Channels 4 to 5
Frames 26 to 44




7 / 9                              TEXT,SCVW
```
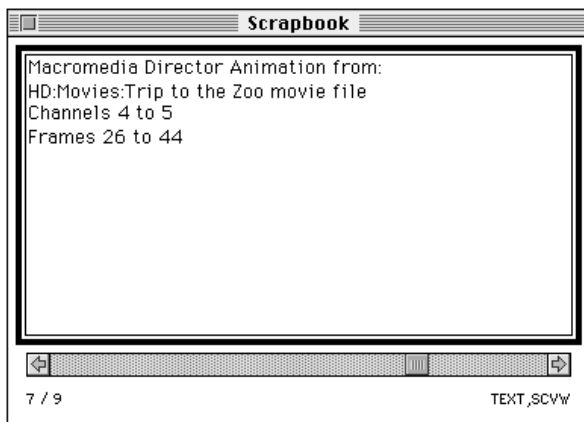
Storing animation from the score in the Scrapbook

The Scrapbook FKey

Director includes a Scrapbook FKey that you can use to quickly build a Scrapbook file in any application. The Scrapbook FKey lets you capture a portion or all of the screen, including any custom palette which is currently active.

Activate the Scrapbook FKey from within any application by pressing Command–Shift–8. When the cursor changes to a crosshair, you can drag to select a portion of the screen, or click the mouse to save the entire screen. Director creates a special file in the System folder called "Anim Scrapbook" to store each image you capture.

File menu

```
┌─────────────────────┐
│ File                │
├─────────────────────┤
│ New            ⌘N   │
│ Open...        ⌘O   │
│ Close Window   ⌘W   │
│ Save           ⌘S   │
│ Save and Compact    │
│ Save As...          │
│ Revert              │
│                     │
│ Import...      ⌘J   │
│ Export...           │
│ Update Movies...    │
│ Create Projector... │
│                     │
│ Movie Info...  ⌘U   │
│ Preferences...      │
│                     │
│ Page Setup...       │
│ Print...            │
│ Quit           ⌘Q   │
└─────────────────────┘
```
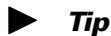
The File menu contains commands for creating Director movies, opening and saving movies, importing and exporting files, creating projectors, and printing.

New

The New command opens a new, untitled movie. Name the untitled movie by choosing Save from the File menu.

The color depth of a new movie is determined by the monitor's color depth, as specified in the Monitors control panel. See "Changing color depth" in Chapter 1 for more information.

▶ **Tip**   *Command-N is the keyboard shortcut for this command.*

Open…

The Open command opens an existing Director movie. When you choose Open, the directory dialog box appears with a list of movie names.

The dialog box only lists movies created by the Macintosh version of Director, or movies with a .DIR extension (such as a shared cast movie or movies created with the Windows version of Director).

Note   *If you open a movie created with a previous version of Director, Director converts the movie into a Director 4.0 format file when you save the movie. Director 4.0 movies cannot be saved as earlier movie format files.*
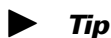
▶ **Tip**   *Command-O is the keyboard shortcut for this command.*

Close Window

Closes the current window, but doesn't close the stage.

▶ **Tip** *Command-W is the keyboard shortcut for this command.*

Save

The Save command saves the current movie to your disk. When you choose Save, the current version replaces the previous version with the same name. The first time you save a new Director movie or a movie created by a previous version of Director, the Save As dialog box is displayed so you can name the movie. It's a good practice to save often while you're working.

The first time you save a movie created with a previous version of Director, Director:

◆ converts the movie into a Director 4.0 format file

◆ places the movie script in the cast

◆ converts text macro cast members to movie scripts, which appear in the cast window. The "macro" syntax is replaced with the "on" syntax.

(These changes make it easier to find and edit Lingo scripts, but they do not affect the movie's behavior.)

In addition:

◆ Director converts any unlinked QuickTime movie cast members into linked cast members.

For each unlinked QuickTime movie cast member, Director creates a QuickTime movie file in the same folder as the Director movie. The filename consists of the movie name, followed by the cast member name and number.

◆ Score scripts appear as cast members.

◆ Only sounds stored as cast members are converted (Sound file sounds are not converted).

◆ Overview documents and movies created with Macromedia Accelerator are not converted.

Any movie you save in Director 4 file format is compatible with Director 4 for Windows.

▶ **Tip** *To change the movie's color depth, change the monitor's color depth (using the Monitors control panel) before saving the movie. See "Changing color depth" in Chapter 1 for more information.*

Command-S is the keyboard shortcut for this command.

Save and Compact

Lets you save a movie under its original name so that it is optimized for playback. Since this operation reorders the cast and compacts the file, it takes longer than using the Save command, especially if you are saving a very large file. However, this command produces smaller and more efficient movies.

Use Save and Compact instead of the Save command to:

◆ Reduce a movie to its minimum size

Save and Compact rewrites the file's entire contents so that any wasted space that might have accumulated in the original file is eliminated. This command differs from the Save command because the Save command only saves the cast members or other elements that have actually changed since you last saved the movie.

◆ Gain optimum performance for playback on a CD-ROM drive or a slow hard disk.

If you are working with a large movie, using the Save command will be faster. For a large movie, you might want to use Save and Compact when you are done authoring.

▶ **Tip** *Command-Option-S is the keyboard shortcut for this command.*

Save As…

Use the Save As command to name and save a movie, save the movie under a different name, or to save it to a different disk. Type the new name of the movie in the text box to name it, or click the Drive button to save to a different drive.

▶ **Tip** *To change the movie's color depth, change the monitor's color depth using the Monitors control panel before saving the movie. See "Changing color depth" in Chapter 1 for more information.*

Command-Shift-S is the keyboard shortcut for this command.

Revert

The Revert command opens the last saved version of the current movie. This command is dimmed if you have not made any changes or if you are working on a new untitled movie that you have not yet saved.

Import…

Use the Import command to import PICT files, MacPaint files, sounds, Scrapbook files, PICS files, Director movies, or QuickTime movies into the cast.

▶ **Tip** *Command-J is the keyboard shortcut for this command.*

When you choose Import, Director opens the cast window and displays a dialog box so you can choose the file you want to import.
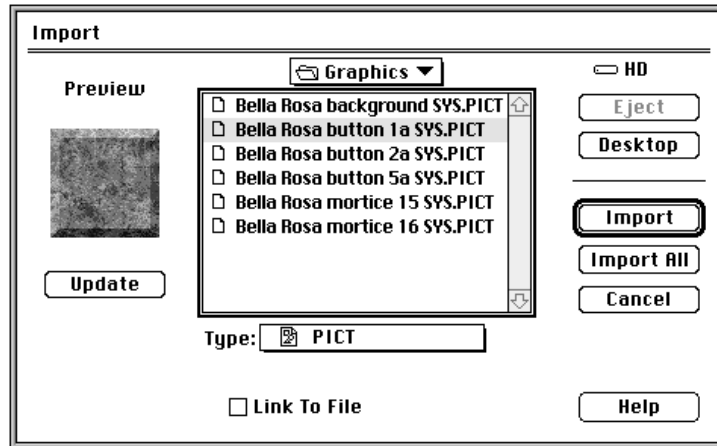
Import dialog box for a PICT file

The Create button is active for file types that can display a preview image. Click it to create a preview image of the selected file in the dialog box.

Choosing a file type from the Type pop-up menu only displays the files available in the chosen file format. When you select a file and click Import, the file is imported and appears in the first available cast position in the cast window. Clicking Import All causes all files of the selected type in the current folder to be imported into the cast. This button is dimmed for PICS and Scrapbook files.

Linking to a file

When you import a PICT file, AIFF sound file, or a Director movie, you have the option of creating a link to the file in the cast rather than copying the contents of the file into your movie. This allows you to add a PICT, sound, or Director movie to the current movie without increasing the size of the movie. It also allows you to share the same linked file among several movies. If you change the linked file, the changes are automatically reflected in your movie. Director looks for any linked cast members when you open the movie. If it cannot find a linked file, a dialog box appears so you can locate the file.

Linking to a file also allows you to edit the file using the Launch External Editor command.

Director always imports digital video movies by linking to the file.

Note   *Director cannot keep track of filenames with more than 255 characters. Occasionally, files that are nested too many folders away from the movie file will fail to link correctly. For this reason, it's a good idea to keep linked files in a folder that's close to the original movie file.*

In previous versions of Director, each time you opened a movie, the cast window would recreate every thumbnail image. In Director 4.0, cast window thumbnails are only redrawn when you change the size of the thumbnails (using the Cast Window Options command) to a larger size. If you have linked to a file and edited the original file, it will not redraw the cast member unless you edited it using the Launch External Editor command.

Importing cast members with palettes

If you import a cast member that uses a palette that is different from the currently active palette, Director asks you if you want to remap the cast member to the currently active palette, or import the cast member's palette as a separate cast member.
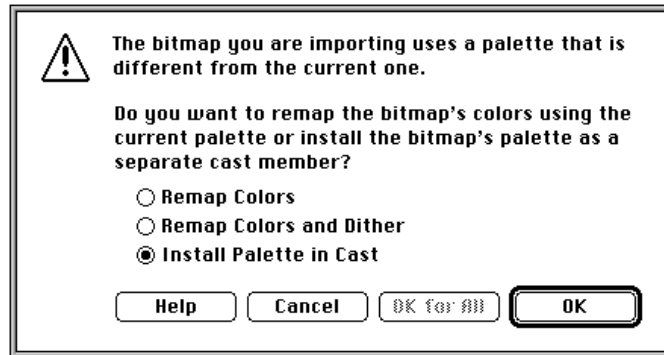
The currently active palette is the palette currently in use as set in the score. Only one palette can be active at a time. The currently active palette may differ from the palette that the movie uses. See "Working with color palettes" in Chapter 3 for more information.

Importing the cast member's palette ensures that the cast member looks as it did when it was originally created.

Remapping the colors causes the cast member to appear in the colors closest to the colors in the current palette.

Importing PICT files

If you import a PICT file, Director converts it to a bitmapped cast member and adds it to the cast. (To create a PICT cast member, you must paste the image into the cast using the Paste as PICT command in the Cast menu.)

The color depth of an imported PICT image depends upon the color depth of the monitor on which Director's stage appears. For example, if the stage appears on a second monitor when you import the image, the second monitor's color depth determines the image's color depth. You set the monitor's color depth using the Monitors control panel. For example, if you import a 24-bit PICT image, it will become a 24-bit cast member only if the stage monitor is set to support millions of colors. If the stage monitor is set to 256 colors, the PICT will become an 8-bit cast member. Switching to millions of colors after you import the PICT image, or using the Transform Bitmap command will not change the cast member to a 24-bit image. See "Changing color depth" in Chapter 1 for more information.

Link to File
If this box is checked, Director creates a link to the location of the PICT file on disk. This is useful if you want to add large (24–bit) images to your movie without increasing the movie's size.

Note *If you edit a linked PICT file, your changes are reflected in the file on disk when you save the movie. For example, if you import a 24-bit PICT file by linking to the file, and later change its color depth using the Transform Bitmap command, when you save the movie, Director alters the bit depth of the PICT file on disk.*

Importing MacPaint files

If you import a MacPaint file, Director adds it to the cast window.

Importing sounds

Imported sounds are added to the cast. You can import SoundEdit files, AIFF files, AIFC files, and SND (8-bit) resources.
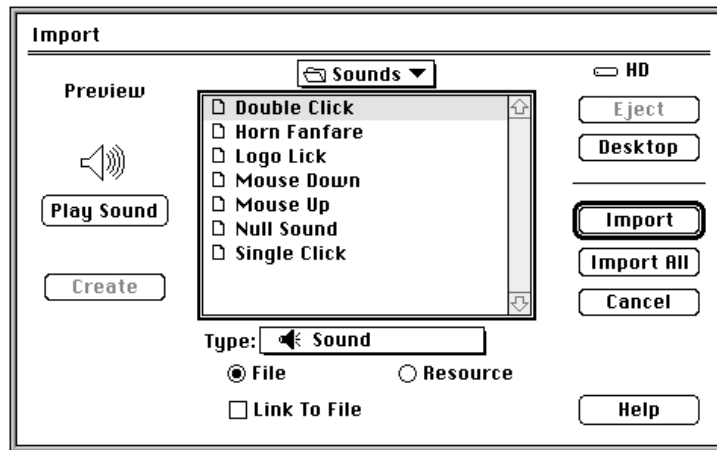
Import dialog box for sounds

◆ File

Displays sounds stored as Macintosh files.

◆ Resource

Displays sounds stored as resources in applications.

Link to File
If checked, lets you create a link to an AIFF format sound file on disk. (You must create a link to an AIFC format sound file.)

Note   *If you import a stereo sound, Sound Manager 3.0 or later must be installed in order for Director to play the left and right channels.*

Importing scrapbooks

If the Scrapbook file contains color graphics created with a palette that is not in the cast window, you will have the opportunity to import the palette with the Scrapbook file or remap the images in the Scrapbook file to the current palette. The sequence of images in an imported Scrapbook is added to the cast window and to the score window at the insertion point so you can immediately play the imported sequence.
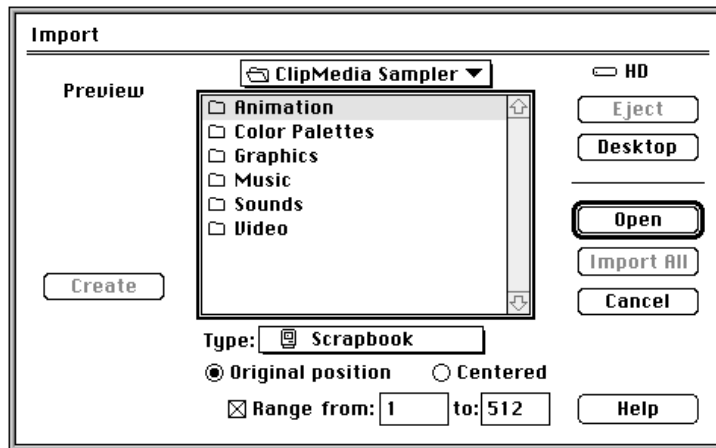
Import dialog box for scrapbooks

◆ Original position

   Causes the imported artwork to appear in the paint window in its original position relative to the other artwork in the series.

◆ Centered

   Causes each piece of imported artwork to be centered relative to the rest of the artwork in the series when seen in the paint window.

Range

If checked, you can selectively import up to 512 frames from a Scrapbook file. Each frame will be imported as a separate cast member.

If you select a single cell in the score, the imported frames will be added to the score beginning at the selected cell. Any existing score data will be replaced by the imported frames. If you set an insertion point, the imported frames are inserted in channel 1, beginning at the insertion point. If you select a range of cells, the imported frames that are inserted will occupy the number of cells in the selection. If you do not make a selection or set an insertion point, the imported frames are placed at the end of the movie in channel 1.

▶ *Tip*   *Sometimes when you import a Scrapbook file, the images jump when you play the movie. That's because the registration points of the cast members aren't set properly. For information about resetting registration points, see "Registration tool" in Chapter 5, "Window Reference."*

Importing PICS files

If the PICS file contains color graphics created with a palette that is
not in the cast window, you will have the opportunity to import the
palette with the PICS file or to remap the PICS file to the current
palette. The sequence of images in an imported PICS file is added to
the cast window and to the score window so you can immediately
play the imported sequence. Note that the PICS file is imported into
the score window beginning at the currently selected frame, and
overwrites the contents of the frames that follow.
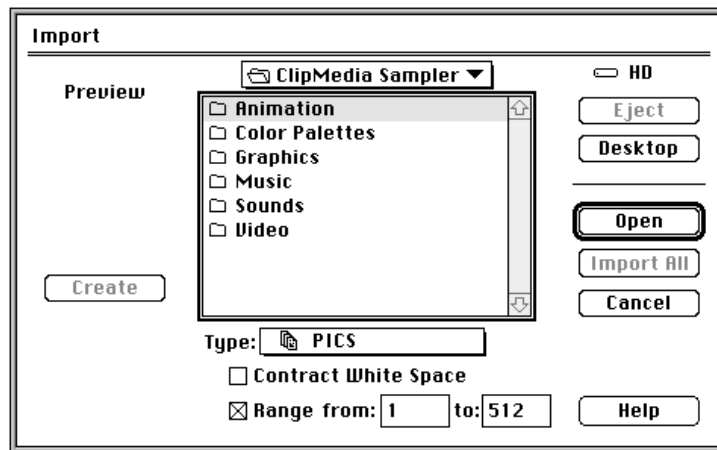
Import dialog box for PICS files

Contract White Space

If checked, allows you to import only the image, not the surrounding
white space.

Range

If checked, you can selectively import up to 512 frames in a PICS
file. If the PICS file was created using a previous version of Director,
you must enter the number "1" as the starting frame to import. Each
frame will be imported as a separate cast member.

▶ Tip *Sometimes when you import a PICS file, the images jump when you play the movie. That's because the registration points of the cast members aren't set properly. For information about resetting registration points, see "Registration tool" in Chapter 5, "Window Reference."*

Importing Director movies

Importing a Director movie converts the movie into a film loop, which Director adds to the cast window. Director imports all the movie's cast members, adds them to the cast window, and updates any references to them to reflect their new positions in the cast window. Director doesn't import the movie's resources, tempos, transitions, or markers. Although it imports any scripts that are part of the movie, the movie's score scripts are no longer active. (That's because a score script can't be made part of a film loop.) If you want the movie's scripts to remain active, link the movie rather than importing it.

Link to File
Lets you create a link to a Director movie. Linking doesn't convert the movie into a film loop, nor does it add the movie's cast members to the cast window. Instead, it adds a single cast member—a linked movie cast member—to the cast window. One advantage in linking to a movie rather than importing it is that a linked movie doesn't increase the file size of the current movie. Another important advantage is that any scripts that are part of the linked movie remain functional. (To activate the scripts, select Enable Scripts in the linked movie's Cast Member Info dialog box.) Unlike scripts, however, tempo settings, palette settings, and transitions that are in a movie aren't functional when the movie is linked. (For a comparison of film loops, QuickTime movies, linked Director movies, and movies in a window, see "Movies within Director movies" in Chapter 2, "Creating Animations.")

Note *You cannot link to a movie created with a previous version of Director. To link to the movie, first update it to Director 4.0's file format using the Update Movies command in the File menu.*

Importing digital video movies

Importing a QuickTime movie automatically links the file to the current movie and adds it to the cast window.

When you import a QuickTime movie, Director creates a link to the digital video movie. Any changes you make to the digital video movie inside Director or with a digital video editor outside Director are reflected in the linked file.

Note   *The imported digital video movie's contents do not become part of the Director movie. If you make a copy of the Director movie, be sure to include all digital video movies that are part of the movie.*

Export…

Exports frames of Director movies from Director to the Finder so you can record frames to videotape, save images as stills, or create digital video movies. You can choose to export frames of movies as Scrapbook files, PICS files, PICT files, or QuickTime movies.

```
Export
┌─Range of Frames:──────────────────┐    ┌──────────────┐
│  ○ Current frame: 1               │    │    Export    │
│  ○ Selected Frames                │    └──────────────┘
│  ◉ All                            │    ┌──────────────┐
│  ○ From: [      ]  To: [      ]   │    │    Cancel    │
│                                   │    └──────────────┘
│  Within Range of Frames:          │
│  ◉ Every Frame                    │
│  ○ Every Nth Frame,  N=[      ]   │
│  ○ Frames With Markers            │
│  ○ When Artwork Changes           │
│     in Channel: [      ]          │
│                                   │
┌─Destination:──────────────────────┐
│  File Type: [ ▣  PICS          ]  │
│                                   │
│       [  QuickTime Options...  ]  │
│                                   │    ┌──────────────┐
│       ☒ Frame-Differenced PICS    │    │     Help     │
└───────────────────────────────────┘    └──────────────┘
```
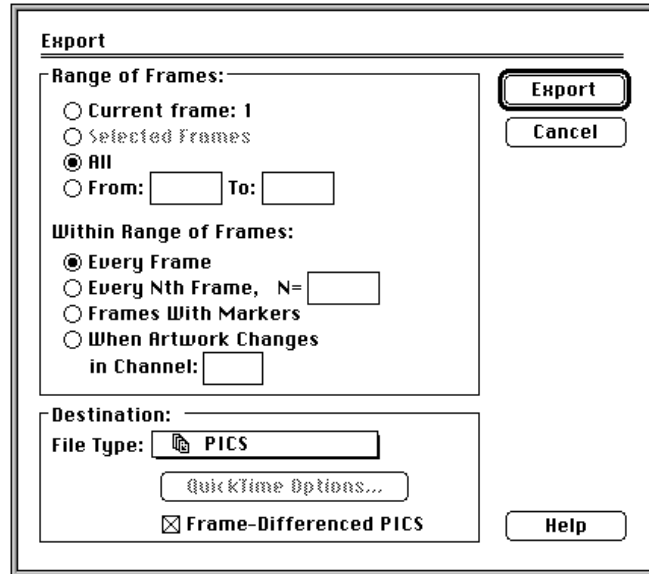
▶ **Tip** *Command-Shift-E is the keyboard shortcut for this command.*

Range of Frames

These options determine which frames to export:

◆ Current Frame

Exports just the current frame on the stage. This is the default.

◆ Selected Frames

Exports the selected frames in the score window.

◆ All

Exports all frames.

◆ From: To:

Exports only the range of frames that begin and end with the frame numbers you enter in the From: and To: boxes.

Within Range of Frames

Further modifies your selection specified in the range of frames.

◆ Every Frame

Exports all frames in the selected range.

◆ Every Nth Frame

Exports only the frames at the interval you specify in the "N=" box.

◆ Frames With Markers

Exports frames with markers set in the score window.

◆ When Artwork Changes in Channel.

Exports frames only when a cast member changes in the channel you specify in the box.

Destination

File Type

Choose the exported file format from the Type pop-up menu. File formats you can export are PICT, Scrapbook, PICS, and QuickTime.

QuickTime Options

This button is dimmed unless you choose QuickTime from the Type pop-up menu. For a description of the options, see "Exporting QuickTime movies," later in this section.

Frame-Differenced PICS

This option is dimmed unless you choose PICS from the Type pop-up menu.

If checked (the default), PICS images are exported as frame-differenced images, in which each frame after the first frame contains only the pixels which have changed from the previous frame. This results in a much smaller file, but the file can only be used by an application such as Director that can access the information in that format. If not checked, this option lets you export full frame PICS images in which each frame is a complete image. This lets you export PICS images that can be used by the ImageWorks module in Macromedia Three-D, or later be selectively imported back into Director.

Export

When you click Export, a directory dialog box appears, allowing you to name the file. If you are saving in PICS or Scrapbook format, only one file will be created. If you are saving in PICT format, Director automatically creates one file for each frame, attaching the corresponding frame number to each file. For example, if the name of the exported file is "Myfile", Frame 1 will be exported to a file named "Myfile0001".

Exporting Scrapbooks

If you press the Option key while clicking Export, each cast member in a given frame is stored as a separate PICT if you choose the scrapbook file type from the Type pop-up menu. Otherwise, the cast members in each frame are merged into a single PICT image. Exporting cast members as separate PICTs allows you to reposition and resize them individually in other drawing programs.

To view the scrapbook file using the Scrapbook, you must name it "Scrapbook File" and save it in the System Folder.

Note   *To avoid overwriting your existing Scrapbook file, move it out of the System folder before exporting a scrapbook file using Director. Alternatively, you can use a utility like Now Utilities' Now Scrapbook to manage mutiple scrapbook files.*

Exporting QuickTime movies

To export your Director movie as a QuickTime movie, choose QuickTime from the pop-up menu.

See "Exporting a Director movie as a QuickTime movie" in Chapter 2 for more information.

The QuickTime Options button in the Export dialog box opens the QuickTime Export Options dialog box. This dialog box has controls for determining the tempo, compression method, quality, color depth, size, and audio channels of the QuickTime movie you export.
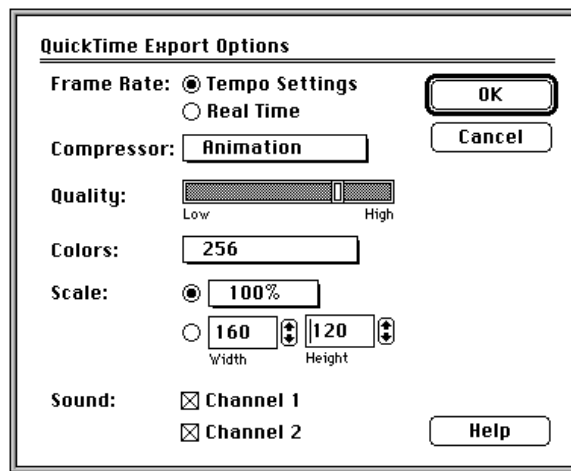
Frame Rate

◆ Tempo Settings

If you click Tempo Settings, the QuickTime movie uses the tempo settings specified in the tempo channel of your Director movie's score. This setting lets you create a QuickTime movie at 24 or 30 frames per second, even though Director can't play the movie at that speed.

The size of an exported QuickTime movie is influenced by the tempo settings, transitions, and palette transitions in the Director movie. Fast tempos, certain transitions, and palette transitions all increase the size of the QuickTime movie. The tempo settings determine the number of QuickTime frames per second and the number of frames per transition. The faster the tempo, the more frames per second.

A movie that would work well with this setting is one in which the tempo settings have been carefully timed. For instance, some frames could be set to a tempo of ten per second and their QuickTime frame durations would be exactly one tenth of a second; other frames later in the movie could be set to a tempo of one frame per second. When the movie is exported, these slower frames would each last precisely one second in the QuickTime movie.

A movie that would not work well with this setting is one in which the tempo is set to 60 throughout but Director typically only plays at 5 frames per second because the frames are very complex. The movie's frames would have extremely short durations and would play back much too fast (possibly skipping many frames).

◆   Real Time

Lets you export a QuickTime movie that matches the performance of the Director movie. (You should always play the entire movie with Lingo disabled before using this feature.)

When exporting a movie with Real Time selected, each Director frame becomes a QuickTime frame. Each frame in the QuickTime movie will match the duration of the same frame in the Director movie.

Director will generate as many frames as required to duplicate each transition, up to 30 frames per second. To reduce the number of frames created for any transition, reduce the chunk size of the transition.

This option causes Director to use the actual durations that were stored the last time you played the entire movie, regardless of the actual tempo settings of the movie.

Compressor

Compressors reduce the file size of a QuickTime movie at the expense of quality:

◆ Use the Animation compressor for simple animations.

◆ Use the Graphics compressor for exporting single frames of computer graphics.

◆ Use None to export a movie with no compression.

◆ Use the Photo-JPEG compressor with scanned or digitized continuous-tone still images.

◆ Use the Video compressor when exporting video clips.

Quality

The quality setting you choose determines the compression quality and resulting file size when using the chosen compressor. A higher quality setting preserves the appearance of the images and motion but increases the size of the file. A lower quality setting results in poorer image quality but decreases the size of the file.

Colors

Color depth is a measure of the number of colors that artwork can display. Artwork with a color depth of one bit can have only two colors. Artwork with a color depth of 8 bits can have up to 256 colors. The compression method you choose determines the range of color depth options available to you in this pop-up menu.

QuickTime is optimized to play movies on a 16-bit monitor (thousands of colors). If you have an 8-bit monitor, you can still export the movie at a 16-bit depth. The movie will have a 16-bit palette with only 256 colors. See "Changing color depth" in Chapter 1 for more information.

Scale

There are two ways to scale the exported QuickTime movie. You can choose a percentage from the Scale pop-up menu, or you can type pixel dimensions in the fields. By entering the number of pixels, it is possible to stretch a movie so that it plays in a rectangle that does not adhere to the original aspect ratio.

Sound Channel

The Sound Channel checkboxes allow you to choose which sound tracks are exported with your movie. A checked box indicates that the associated sound channel in the score window is exported with your QuickTime file.

External sounds (sounds you imported as linked cast members) don't get exported when you export a digital video movie. To include sound when you export a digital video movie, you must import the sounds as cast members instead of linking to them.

Looped sounds don't loop in a movie that you have exported as a digital video movie. To loop a sound in a movie that you plan to export as a digital video movie, you must trigger the sound by alternating it between the two sound channels.

Converting Director animations into QuickTime movies

You can export a Director animation as a QuickTime movie, and then import it into Director so that it becomes a single cast member. You might want to do this for the following reasons:

◆ Since an imported digital video movie is linked to its source file on disk, you can edit the digital video movie in another application, and your changes will be automatically reflected in the digital video movie inside Director.

◆ Director provides precise control over the digital video movie's playback, using the Digital Video Cast Member Info dialog box.

◆ Other users can use and distribute the QuickTime movie for use in any application that supports QuickTime.

You might not want to convert a Director animation into a digital video movie if the animation includes interactivity. (Digital video movies do not allow interactivity.)

See "Movies within Director movies" in Chapter 2 for more information.

▶ *Tip* *If you lose your transitions when you export a Director movie as a digital video movie, try increasing the Duration and Chunk Size settings for the transitions before you export the movie.*

Update Movies…

Converts a movie or a folder of movies created by a previous version of Director into Director 4.0's file format.

```
┌──────────────────────────────────────────────────┐
│  Choose a movie or folder of movies to update:     │
│                                                    │
│        ┌─────────────┐              ⬒ Lorelei     │
│        │ 🗁 Kiosk ▼  │                              │
│        └─────────────┘         ┌──────────────┐   │
│   ┌────────────────────────┐▲  │    Eject     │   │
│   │ 🗋 BEGIN.DIR           │⬆  └──────────────┘   │
│   │ 🗋 FURNITUR.DIR        │   ┌──────────────┐   │
│   │ 🗋 HELP.DIR            │   │   Desktop    │   │
│   │ 🗀 Kiosk (v3.1)        │   └──────────────┘   │
│   │ 🗋 LEARNING.DIR        │    ·············      │
│   │ 🗋 LUCK.DIR            │   ┌──────────────┐   │
│   │ 🗋 PHILANTH.DIR        │   │   Cancel     │   │
│   │                       │   └──────────────┘   │
│   │                       │⬇  ┌──────────────┐   │
│   └────────────────────────┘▼  │   Update     │   │
│   ┌────────────────────────┐   └──────────────┘   │
│   │      Folder "Kiosk"    │   ┌──────────────┐   │
│   └────────────────────────┘   │    Help      │   │
│                                └──────────────┘   │
│   ☐ Protect Movies                                 │
│   ☒ Adjust Pre-4.0 Shared Cast References          │
└──────────────────────────────────────────────────┘
```
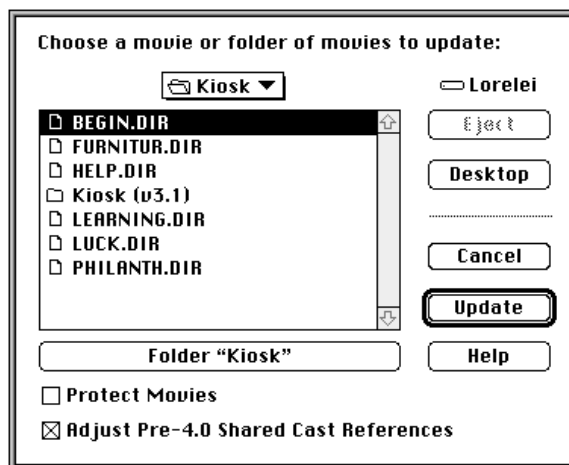
You can also use this command to protect a movie, to prevent others from editing it, or to save a movie in optimized format.

Using this command is the same as opening a movie created with a previous version of Director and saving it.

Select a movie to update and click Update. To update all the movies in the folder, click the Folder button at the bottom of the dialog box. Director then displays another dialog box so you can enter a name for the updated movie or folder.

Note   *Director prevents you from overwriting your existing movie or folder with the updated movie or folder.*

When you update a movie, Director:

◆ Converts the movie into a Director 4.0 format file

◆ Places the movie script in the cast

◆ Converts text macro cast members to movie scripts, which appear in the cast window. The "macro" syntax is replaced with the "on" syntax.

(These changes make it easier to find and edit Lingo scripts, but they do not affect the movie's behavior.)

In addition:

◆ Director converts any unlinked QuickTime movie cast members into linked cast members.

For each unlinked QuickTime movie cast member, Director creates a QuickTime movie file in the same folder as the Director movie. The filename consists of the movie name, followed by the cast member name and number.

◆ Score scripts appear as cast members.

◆ Only sounds stored as cast members are converted (Sound file sounds are not converted).

◆ Overview documents and movies created with Macromedia Accelerator are not converted.

Protect Movies

If checked, Director removes Lingo source code and cast thumbnail images when you update a movie. This prevents the movie from being edited, but does not affect the movie's scripts. A protected movie's icon looks like this:

My protected movie

Protected movies cannot be opened in Director. They can only be played from a projector. To play a protected movie from a projector, you must use Lingo to "go to" or "play" the protected movie.

Adjust Pre-4.0 Shared Cast References

If checked, Director opens a dialog box allowing you to shift references in the score to shared cast members. This prevents converted script cast members from being overwritten by shared cast references. This feature is only available for older Director movies.

Create Projector…

Lets you create a play-only version of a Director movie, called a projector, that can be played on any Macintosh.

A projector's icon looks like this:

Ink_FX

To play a projector file, double-click it. See "Creating a projector" in Chapter 3 for additional information.

If a movie is open when you choose this command, Director closes the current movie (after asking you if you want to save your changes).
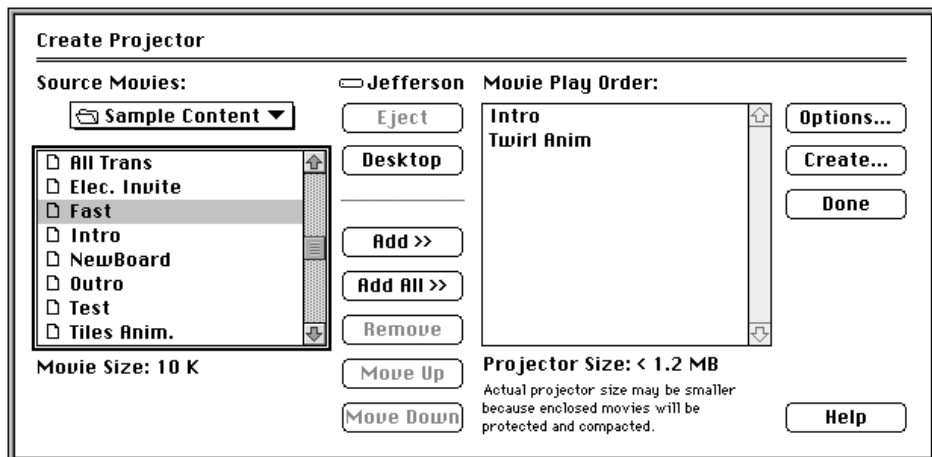
Use this dialog box to add one or more movies from the Source Folder to the projector's play list.

Clicking Add adds the selected source movie to the projector's play list. Clicking Add All adds all movies in the current folder to the play list. Clicking Remove removes a selected movie from the projector's play list.

Click Move Up to move a selected movie higher up in the play list. Click Move Down to move a selected movie further down in the play list.

You can include more than one interactive movie in the projector file list. You can also use Lingo to "go to" or "play" files while running a projector under Lingo control.

Click Create to create the projector file. Click Done to dismiss the dialog box.

Note *If your movies include links to external files, you must include the files when you distribute the projector.*

Projector Options

The Options button displays a dialog box that specifies additional preferences for creating the projector. These settings override the movie preferences you set using the Preferences command in the File menu.

```
┌─────────────────────────────────────────────┐
│ Projector Options                            │
│ ┌───────────────────────────────┐           │
│ │ ☐ Play Every Movie            │ ┌────────┐ │
│ │ ☐ Animate in Background       │ │   OK   │ │
│ │ ┌─When Opening File:────────┐ │ └────────┘ │
│ │ │ ☒ Resize Stage            │ │ ┌────────┐ │
│ │ │ ☐ Switch Monitor's Color  │ │ │ Cancel │ │
│ │ │    Depth to Match Movie's │ │ └────────┘ │
│ │ │ ☒ Center Stage on Screen  │ │            │
│ │ └───────────────────────────┘ │ ┌────────┐ │
│ │                               │ │  Help  │ │
│ └───────────────────────────────┘ └────────┘ │
└─────────────────────────────────────────────┘
```
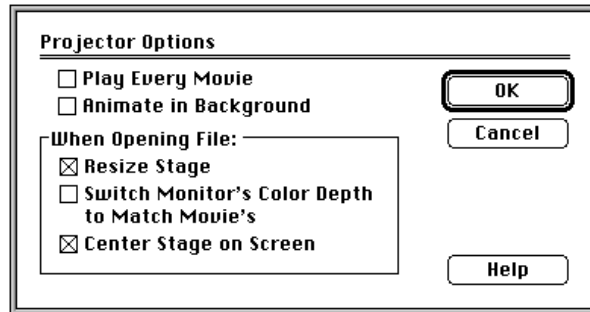
These settings apply to all movies in the projector.

Play Every Movie

If checked, the projector plays all movies in the the play list. Otherwise, the projector only plays the first movie in the play list unless other movies are called by Lingo from the first movie.

Animate in Background

If checked, if a user clicks outside the movie, on the desktop, for example, the movie continues playing. This is useful if you are using Apple Events. If not checked, the movie stops playing if the user clicks outside the movie.

Resize Stage

If checked, the stage size changes when you open a movie that uses a stage size that is different from the current stage size. If not checked, the stage size remains unchanged.

Switch Monitor's Color Depth to Match Movie's

If checked, Director automatically changes the color depth of your monitor to the color depth of each movie in the projector play list. For example, if you are working on a color monitor set to 256 colors, and a movie in the play list was created in 16 colors, the monitor will automatically switch to 16 colors.

Center Stage on Screen

If checked, the stage is centered on the screen, which is useful if the stage size is smaller than the screen size. Otherwise, the movie plays using its original stage position.

Movie Info…

The Movie Info command lets you choose basic settings for the current movie.
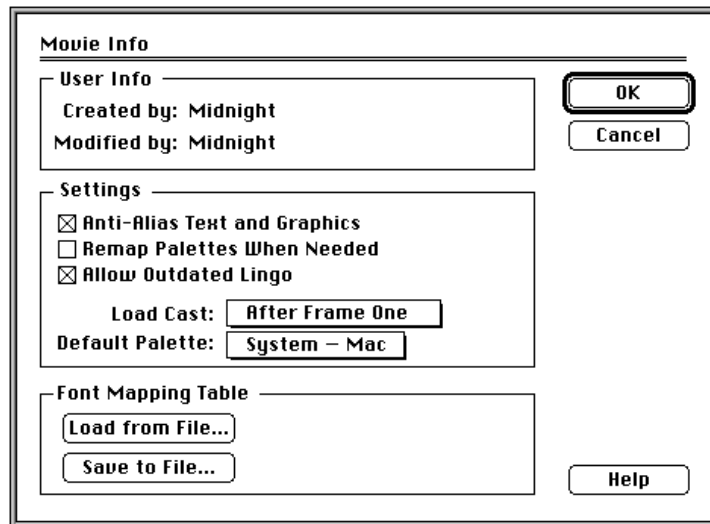
▶ **Tip**   *Command-U is the keyboard shortcut for this command.*

User Info

Specifies the creator and modifier, as entered during installation of the Director application.

Settings

Anti-Alias Text and Graphics

Anti-aliasing removes or reduces edge distortions in an image by adding and subtracting pixels to enhance the appearance of the image. If this box is checked, Director uses anti-aliasing during playback. Anti-aliasing will be enabled for any text and bitmap graphic cast members on the stage to which you have applied an anti-alias modifier using the Anti-alias pop-up menu in the score window. This box is checked by default. If this box is not checked, anti-aliasing is disabled during playback for any cast members which had an anti-alias modifier set. Disabling anti-aliasing during playback can improve playback speed.

Remap Palettes When Needed

This option only affects the appearance of cast members on the stage. If this box is checked, whenever the cast member is displayed on the stage and the currently active palette (the palette in effect in a given frame of the movie) is different from the palette associated with the cast member, Director automatically creates a common palette and remaps all images on the stage that have a different palette to the common palette. The cast members themselves are not modified. The common palette determines how the cast member is remapped. For example, if a cast member uses a grayscale palette, it will be drawn on the stage using whatever grays are available in the common palette.

Allow Outdated Lingo

Lets you include Lingo commands used by previous versions of Director, including references to octal cast members (i.e., A11). This option is dimmed unless the movie was created with an earlier version of Director.

Load Cast

Provides a pop-up menu that lists the options available for pre-loading cast members into memory.

◆ When Needed

Load cast members only when they are required and are not currently available in memory. Best for interactive movies. Don't use this option for movies that require high-speed animation.

◆ After Frame One

Display the first frame of animation and start playing any sounds in the first frame of the sound channels before loading the rest of the movie into memory. Best for large movies where you want to display an opening screen or play some initial sound while waiting for the rest of the movie to get loaded into memory. This is the default.

◆ Before Frame One

Load the entire movie into memory before playing the first frame of the movie. Best for small movies.

A new movie inherits the Load Cast setting from the movie that was previously open, as specified using the Movie Info command.

Default Palette

Lets you specify the movie's default palette. Director uses the default palette until it encounters a different palette setting in the palette channel.

Font Mapping Table

Director uses a font map table to determine the appropriate substitute Macintosh fonts for text cast members created by Director for Windows. The font map table specifies how Director maps fonts between the Macintosh and Windows platforms. The font map table consists of a text file that contains the font mapping information.

See "Mapping Macintosh fonts to Windows fonts" in *Tips & Tricks* for more information about creating and using a font mapping table.

Load from File

Click Load from File to have Director load the font mapping assignments specified in the chosen font map file.

Save to File

Click Save to File to save the current font map settings in a text file. You can then edit this file to include the names of appropriate substitute Windows fonts. (This button is dimmed unless the movie has a font map associated with it.)

Preferences…

The Preferences command allows you to modify some of Director's default settings.
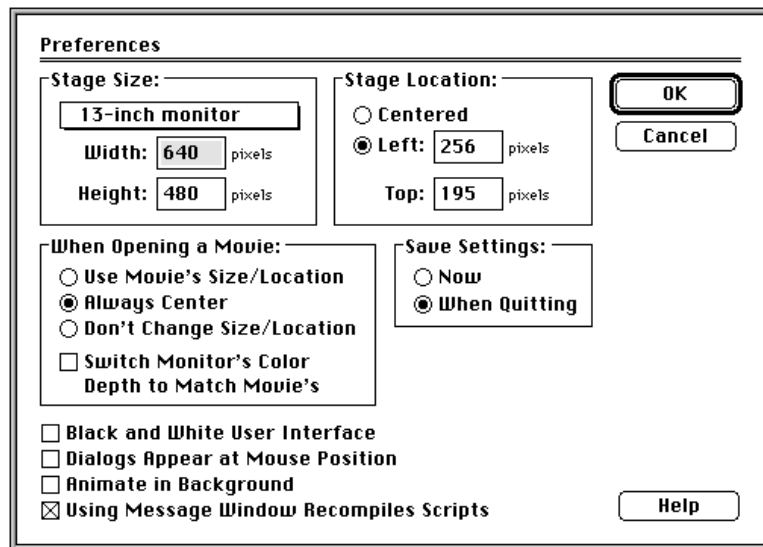
Director stores the following window settings in the Director 4.0 Preferences file: cast window options and window positions. Other preferences are saved with, and are specific to, your current movie.

▶ **Tip**   *Command-Option-U is the keyboard shortcut for this command.*

```
9-inch monitor
12-inch monitor
✓13-inch monitor
15-inch monitor
QuickTime 160 x 120
Current monitor
Multiple monitor
Custom
```
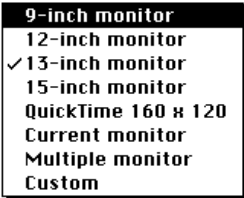
Stage size

These settings permit you to change the size of the stage window. Changing the stage size is useful if you want to display movies on a smaller or larger stage, or if you want to change the stage size to match the size of a digital video movie.

You can change the size of the stage by choosing a setting from the pop-up menu, or by entering the width and height of the stage.

If you choose a setting from the pop-up menu, the values in the Width and Height fields automatically update.

Menu selection	Example	Stage size (pixels)
9-inch monitor	Compact Macintosh	512 x 342
12-inch monitor	Macintosh LC	512 x 384
13-inch monitor	Macintosh II	640 x 480
15-inch monitor	Portrait monitor	640 x 870
QuickTime	QuickTime movie	160 x 120
Current monitor	13-inch monitor	640 x 480
Multiple monitor	two 13-inch monitors	1280 x 480
Custom	15-inch portrait monitor	640 x 870
Screen 2	19-inch monitor	1152 x 882

Note *If you enter a value for Width or Height that is not divisible by 16, Director uses the nearest smaller number that is divisible by 16.*

Stage Location

Stage Location permits you to change the location of the stage.

◆ Centered

Places the stage window in the center of your monitor. This option is useful if you play a movie that was created for a 12-inch screen on a larger screen. You can also use this option if you are creating a movie on a larger screen that will be seen on smaller screens.

◆ Left, Top

Alternatively, the values you type in the Left and Top boxes represent the number of pixels the stage is moved from the top left corner of the screen. These values only apply if the stage is smaller than the current monitor's screen size.

When Opening a Movie

◆ Use Movie's Size/Location

If you open a movie that has a stage that is a different size than the current stage, the stage size changes to the movie's stage size and location.

◆ Always Center

If you choose this option, the stage is centered on the screen when the movie opens.

◆ Don't Change Size/Location

If you choose this option, your stage size and location remain the same as the current movie.

◆ Switch Monitor's Color Depth to Match Movie's

If checked, Director automatically changes the color depth of your monitor to the color depth of the movie you open. For example, if you are working on a color monitor set to 256 colors, and you open a movie created in 16 colors, the monitor will automatically switch to 16 colors. A movie's color depth is determined by the color depth of the monitor when the movie was saved.

Save Settings

◆ When Quitting

If chosen, Director saves the settings in the Preferences dialog box every time you quit.

◆ Now

If checked, Director saves the settings when you click OK to leave the Preferences dialog box.

Black and White User Interface

If checked, Director switches to a black and white user interface. Using a black and white user interface improves performance if you switch color palettes, since Director doesn't have to update its color user interface to match the colors in the new palette each time you switch palettes. In addition, working with a black and white user interface may be less distracting as you work with the color palettes in your movie. For example, if you are working on an animation that uses multiple palettes and/or color cycling, using a black and white user interface may be less distracting.

If not checked, Director uses a color user interface. If you switch to a non–system color palette in your movie, Director switches the colors it uses in its user interface to match the palette in use.

Dialogs Appear at Mouse Position

If checked, dialog boxes are displayed at the mouse position. If this option is not checked, dialog boxes are centered on the monitor that contains the menu bar.

Animate in Background

If checked, your animation runs in the background while you are working with other applications in the Finder. When you are running animation in the background, the stage remains on the screen and the active application window appears in front of the stage.

Using Message Window Recompiles Scripts

Checked by default. If deselected, scripts should be manually recompiled using the Recompile All Scripts command before entering Lingo in the message window.

Page Setup…

The Page Setup command offers options for determining how a page is to be printed. The dialog box that you see depends on the type of printer you use. For more information about Page Setup options see your printer manual.

Print…

The Print command lets you print your movie in a variety of ways.

Print Options

Print:
- ◉ Stage
  - [Options…]
- ○ Score
- ○ Cast Text
- ○ Scripts
- ○ Marker
  - Comments
- ○ Cast Art
- ○ Cast Window

Print Range:

Range of Frames:
- ○ Current Frame: 9
- ○ Selected Frames: 9 to 9
- ○ All
- ◉ From: [   ] To: [   ]

Within Range of Frames:
- ◉ Every Frame
- ○ Every Nth Frame, N= [   ]
- ○ Frames with Markers
- ○ When Artwork Changes
  - in Channel [   ]

[**Print**]
[Cancel]

[Help]
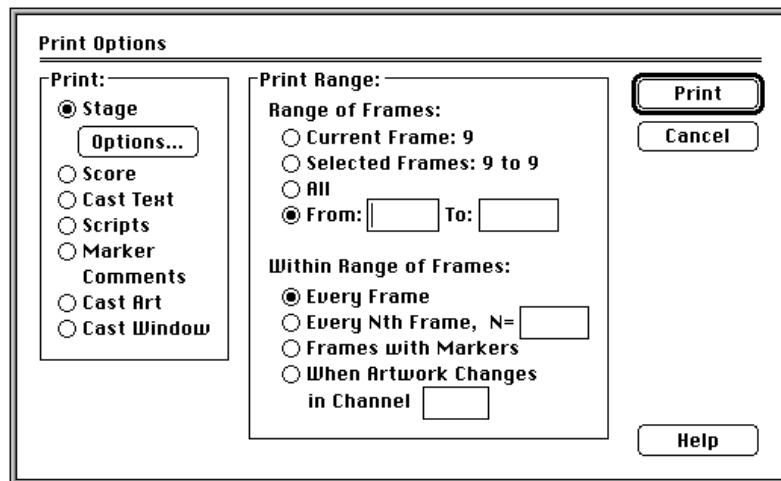
▶ **Tip**   *Command-Option-P is the keyboard shortcut for this command.*

Print

Lets you choose what part of your movie you want to print. You can print an image of the stage, the score, the cast member number and contents of text cast members in the cast window, all scripts or a range of scripts (movie, cast, score, and sprite scripts), the comments in the markers window, the cast window artwork, or all of the cast window.

If a script window is front-most when you choose the Print command, the dialog box displays the cast member ID of the current script cast member in the From: and To: boxes, so you can print just the current cast member's script.

When you use the Print command, cast members in each frame are merged into a single PICT image. If you press the Option key while clicking the Print button, each cast member in a given frame is imaged as a separate PICT. If you are printing multiple frames on a page, printing with this option causes QuickDraw elements (text, rectangles, lines, and circles) to print better. Note, however, that printing with this option may take much longer.

If you're printing the stage, the Options button lets you specify additional printing options.

Print Range

Controls which frames of your movie are printed.

◆ Current Frame

Prints the frame that is currently on the stage.

◆ Selected Frames

Prints the frames that are selected in the score window.

◆ All

Prints all the frames in your movie.

◆ From: To:

Prints a range of frames that you specify.

◆ Within Range of Frames

Refines your selection within the range specified in Range of Frames.

◆ Every Frame

This is the default and does not modify the choice in Range of Frames.

◆ Every Nth Frame

Prints frames at the interval you specify in the box. For example, if you type 10, Director prints every tenth frame.

◆ Frames with Markers

Prints only the frames that have markers in the score window.

◆ When Artwork Changes in Channel

Prints the frames in which cast members move or in which new cast members are introduced in the score, in the channel you specify in the box.

Stage Options

Displays a dialog box that lets you adjust the layout of the items you choose to print. The image at the left of the dialog box previews the layout options.
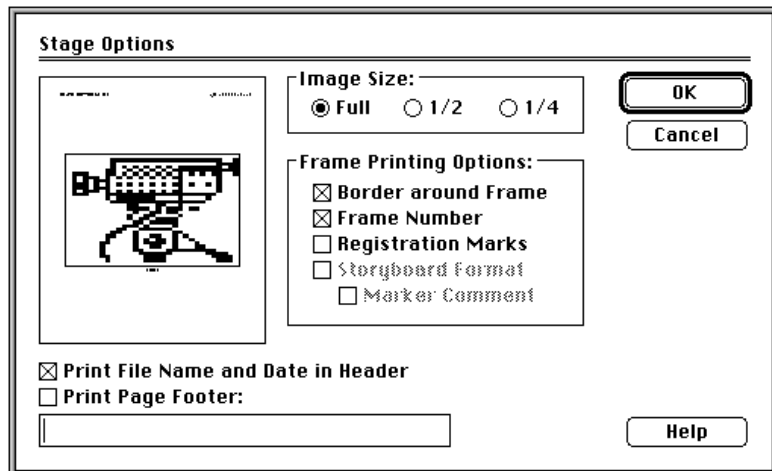
Image Size

You can print your document at full size, or scale the images to 1/2 or 1/4 size, which is convenient for printing the images in storyboard format.

Frame Printing Options

Allows you to print a border around each frame, include the frame number, print registration marks, or print in storyboard format and include the comments associated with each frame. Storyboard format is only available if you are printing 1/2- or 1/4-size images.

Print File Name and Date in Header

If checked, prints a header on each page. The header consists of the name of the Director movie and the current date.

Print Page Footer

If checked, lets you print a footer on each page. Type the footer in the field.

Quit

The Quit command quits Director.

The Clipboard is saved when you quit, and its contents are available for use in another application.

▶ **Tip**   *Command-Q is the keyboard shortcut for this command.*

Edit menu

The Edit menu contains standard commands for editing. It also includes control panel commands.

A note of caution about Cut, Copy, Clear, and Paste

The Cut, Copy, Clear, and Paste commands operate only on the currently active window. To use these commands effectively, you must be aware of which window is active, or you may accidentally cut a cast member from the cast when you were actually trying to cut frames from the score.

To avoid unintended results, observe this rule: before using Cut, Copy, Paste, or Clear, make sure the window you want to work in is active.

When you choose one of the commands from the Edit menu, the menu changes to indicate the active window. Cut, for example, is displayed as Cut Score, Cut Bitmap, Cut Text, or Cut Cast, depending on which window is active.

Note *You cannot use Cut, Copy, or Paste directly on the stage. To cut, copy or paste cast members from the stage, you must cut, copy, or paste in the score rather than directly on the stage. You can clear selected cast members from the stage with the Delete Sprites command in the Score menu.*

Undo

Undo reverses your last action. Since it works only on your last action, you must use it before making any other change to the animation. Undo works with most commands you use while writing, drawing, and animating.

▶ **Tip** *Command-Z is the keyboard shortcut for this command.*

Cut

The Cut command removes the selected object from its current location and places it on the Clipboard. It can then be pasted to another location.

▶ **Tip**   *Command-X is the keyboard shortcut for this command.*

Copy

The Copy command makes a copy of the selected colors, text, art, or sequence of art and places that copy on the Clipboard.

▶ **Tip**   *Command-C is the keyboard shortcut for this command.*

Paste

The Paste command pastes the contents of the Clipboard into a selected location.

Note   *If you paste a PICT image into the cast using the Paste command, Director converts it to a bitmap. If you want the artwork to remain in PICT format when you paste it into the cast, use the Paste as PICT command in the Cast menu.*

▶ **Tip**   *Command-V is the keyboard shortcut for this command.*

Clear

Clear removes the selected item or sequence of items, without saving it to the Clipboard. Clear is used when you have no further use for a particular piece or sequence of art or text and when you do not want to affect what is already in the Clipboard.

▶ **Tip** *Delete is the keyboard shortcut for this command.*

Select All

Select All highlights all the selectable items in the active window.

To create a new animation with the same cast members, choose Select All in the score window, and then choose Clear. This clears all the score window notation while preserving the cast members. Your animation is erased, but the cast window is unchanged.

▶ **Tip** *Command-A is the keyboard shortcut for this command.*

Play

The Play command starts the movie. If you press the Shift key while choosing Play, the menu bar is hidden and the stage is cleared of all open windows as the movie plays.

Clicking the Play
button in the control
panel also plays
the movie
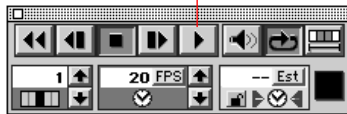
▶ **Tip** *Command-P or Enter is the keyboard shortcut for this command. The keypad plus (+) key toggles between Play and Stop.*

Stop

The Stop command halts the movie.
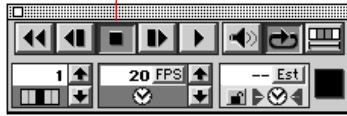
▶ **Tip** *Command-period (.) stops the movie.*

Rewind

Rewind moves the playback head back to frame 1. If the movie is playing, it also stops.
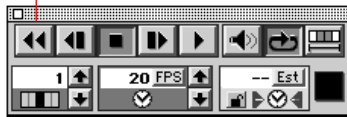
▶ **Tip** *Command-R or keypad 0 rewinds the movie.*

Step Backward

Step Backward steps the movie backward one frame at a time.

▶ **Tip** *Command-left arrow or keypad 1 steps the movie backward.*

Step Forward

The Step Forward command advances the movie forward one frame. When using the step recording technique it can be used to record cast members to the next frame of animation.

Clicking the Step Forward button in the control panel also steps the movie forward
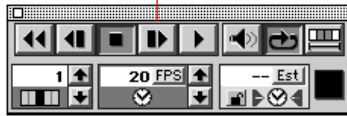
▶ **Tip** *Command-right arrow or keypad 3 steps the movie forward.*

Disable Sounds

If checked, turns your movie's sound off. By default, this option is off.

Clicking the Disable Sounds button in the control panel also disables sounds
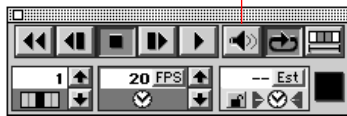
▶ **Tip** *Command-~ or keypad 7 disables sounds.*

Loop

If checked, causes the movie to repeat continuously when played. When the movie reaches the last frame, it automatically starts again from frame 1. By default, this option is on.

Clicking the Loop button in the control panel also causes the movie to loop
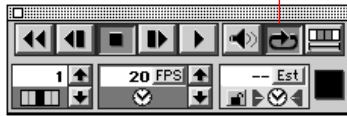
▶ **Tip** *Command-L or keypad 8 turns looping on or off.*

Selected Frames Only

If checked, lets you play a selected portion of a movie. This is convenient if you are working on just one part of a movie.

To play a portion of a movie, open the score and select the frames to be played. Choose Selected Frames Only and play the movie.

When a portion of the score has been marked as selected frames, a green bar appears at the top of the score over the selected frames.

Turn off Selected Frames Only when you want to return to normal play mode.

Clicking the Selected Frames Only button in the control panel marks selected frames
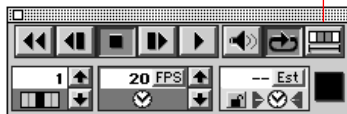
This command is dimmed if no frames are selected in the score.

▶ **Tip** *Command-\ turns Selected Frames Only on or off.*

Disable Lingo

This command lets you ignore scripts during playback. If this command is not selected, Director executes all scripts during playback. This is the default. If this command is selected, Director ignores all scripts in the movie during playback.

This command is useful whenever you want to control whether interactivity is on or off during playback.

Lock Frame Durations

When a movie's playback rate is locked, Director plays the movie using previously recorded frame durations. For frames without recorded durations, Director uses the current tempo. If checked, this command allows you to lock the movie's playback speed so that it will play back at the same speed on all types of computers.

Choosing this command is the same as clicking the Lock button in the control panel to lock frame durations.

Lock button
(unlocked state)
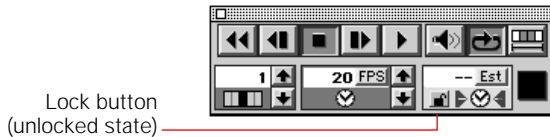
To unlock the playback rate, remove the check from this command, click the Lock button in the control panel, or make an editing change to your movie, such as adjusting the tempo, or adding or deleting a frame in your movie. Unlocking the playback rate lets you record frame durations as you play the movie.

See "Locking playback speed" in Chapter 3 for more information.

Note   *Locked movies will not play faster when played on a faster Macintosh, but may still play slower if played on a slower Macintosh.*

► **Tip** *You might want to clear all recorded frame durations from the movie if you want to only record frame durations for a section of the movie and lock them. To clear all recorded frame durations, press Option while choosing this command or while clicking the Lock button. During playback, frames that don't have a recorded duration instead display "--" .*

Window menu

The commands in this menu open and close Director's authoring windows. Open windows have checkmarks next to their names in the menu and the currently active window's name is underlined.

The bottom of the Window menu lists all open text, script, and digital video windows, sorted by category, and sub-sorted by cast member number. Choosing a window opens it and brings it to the front. If the window is open, but not in front, choosing it from the Window menu brings it to the front. If the window is already in front, Director hides it.

Director automatically hides any open windows if you choose the Stage command from the Window menu.

For a complete description of each command on this menu, see Chapter 5, "Window Reference."

Stage

The stage is the backdrop against which all Director animations appear.

See "The stage" in Chapter 5 for more information.

▶ **Tip**   *Command-1 is the keyboard shortcut for this command.*

Control Panel

Use the control panel to play, stop, step forward or backward, or rewind a movie, using controls similar to a video cassette recorder.

See "The control panel" in Chapter 5 for more information.

▶ **Tip**   *Command-2 is the keyboard shortcut for this command.*

Cast

The cast window stores a movie's cast members, including graphics, sounds, palettes, scripts, digitial video movies, Director movies, film loops, and text.

See "The cast window" in Chapter 5 for more information.

▶ **Tip** *Command-3 is the keyboard shortcut for this command.*

Score

The score window contains notation that describes everything that occurs on the stage. It is the primary window for creating and editing animation.

See "The score" in Chapter 5 for more information.

▶ **Tip** *Command-4 is the keyboard shortcut for this command.*

Paint

The paint window provides a complete set of drawing tools for creating graphic cast members. The paint window is linked to the cast window, so anything you draw in the paint window automatically gets added to the cast window.

See "The paint window" in Chapter 5 for more information.

▶ **Tip** *Command-5 is the keyboard shortcut for this command.*

Text

Use a text window to create or edit text cast members. Buttons created with the tools window can be edited in a text window.

See "The text window" in Chapter 5 for more information.

▶ *Tip*   *Command-6 is the keyboard shortcut for this command.*

Tools

Use the tools window to create QuickDraw text and shapes directly on the stage. QuickDraw text and shapes use less memory than bitmap text and graphics created in the paint window, and also print without the jagged lines associated with bitmapped images.

See "The tools window" in Chapter 5 for more information.

▶ *Tip*   *Command-7 is the keyboard shortcut for this command.*

Color Palettes

The color palettes window lets you choose or edit a palette that can be assigned to sprites, cast members, frames, or the movie itself.

See "The color palettes window" in Chapter 5 for more information.

▶ *Tip*   *Command-8 is the keyboard shortcut for this command.*

Digital Video

The digital video window displays a QuickTime movie cast member.

Note   *On a Macintosh, Director's digital video window only displays QuickTime movies. On a PC running Windows, the digital video window supports Microsoft Video for Windows (.AVI) in addition to QuickTime for Windows.*

See "The digital video window" in Chapter 5 for more information.

▶ **Tip**   *Command-9 is the keyboard shortcut for this command.*

Script

Use the script window to enter and edit the script associated with one or more selected cells in the script channel. The script window also displays the script associated with a cast member, if the cast member has a script attached.

See "The script window" in Chapter 5 for more information.

▶ **Tip**   *Command-0 is the keyboard shortcut for this command.*

Message

The message window lets you enter and test Lingo scripts. Actions execute as soon as you press Return, so you can immediately see the results before you insert the script into a movie.

See "The message window" in Chapter 5 for more information.

▶ **Tip**   *Command-M is the keyboard shortcut for this command.*

Tweak

The tweak window lets you move a selected sprite in any direction by a specific number of pixels.

See "The tweak window" in Chapter 5 for more information.

▶ **Tip** *Command-Shift-T is the keyboard shortcut for this command.*

Markers

The markers window lets you write comments for markers you set in the score.

See "The markers window" in Chapter 5 for more information.

▶ **Tip** *Command-Shift-M is the keyboard shortcut for this command.*

Duplicate Window

This command duplicates the front-most window and its contents, creating another view of it. This command only works if a text, digital video, or script window is the front-most window.

▶ **Tip** *Pressing Option while choosing a text, digital video, or script window from the Window menu is a keyboard shortcut for choosing this command.*

Duplicating a window is useful if the window's contents are large and you want to look at or edit different sections of the window simultaneously. Changes you make in the window are automatically reflected in all other views of the same window.

Cast menu

The Cast menu contains commands for managing cast members.

Cast Member Info…

Cast Member Info displays a dialog box containing information about the selected cast member: its name, cast position, its type, and its size in kilobytes. The Cast Member Info dialog box also displays additional information and options for each cast member type. Use the options in the dialog box to define the behavior and appearance of the selected cast members.

In the cast window, select a cast member and click the Info button as a shortcut for choosing this command.
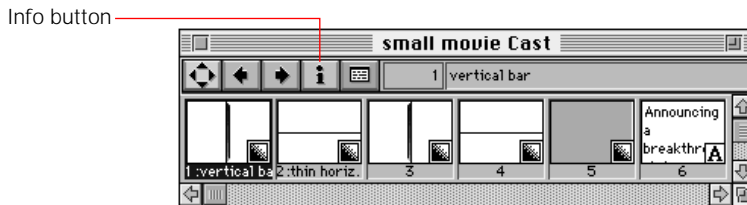
Info button ——

If you are editing the cast member in the paint, text, digital video, or script window, you can click the window's Info button as a shortcut for choosing this command.

▶ **Tip** *Pressing Command-I or pressing the Control key and clicking a cast member in the cast or on the stage is a shortcut for opening the Cast Member Info dialog box.*

Using the Cast Member Info dialog box is particularly useful when switching back and forth between creating new color cast members and editing old color cast members. You can reset the palettes of each cast member manually to avoid the confusion of working with multiple palettes.

Cast member info appears in the following sections in alphabetical order, by cast member type.

Bitmap Cast Member Info
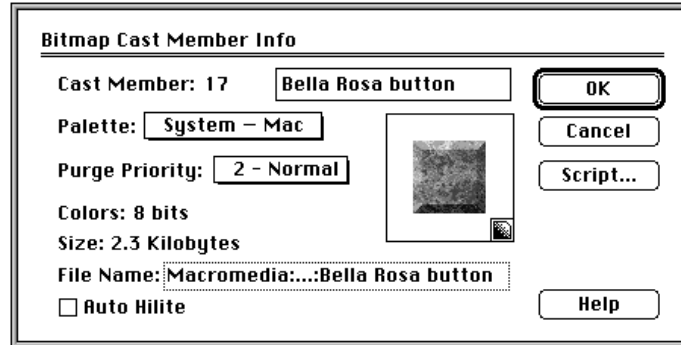
Cast Member

Enter or edit the name in the field. The name remains attached to the cast member if it is cut or copied and pasted. Director does not prevent you from creating duplicate cast member names, but you should avoid using them. If more than one cast member with the same name has a script attached to it, Lingo uses the script attached to the cast member with the lowest cast number. Use cast names instead of cast numbers to address cast members in a Lingo script, so that you don't have to update your scripts if your cast members get re-numbered or sorted.

Palette

Lets you temporarily assign a different palette to the cast member, while maintaining the cast member's original palette. You can change the palette assignment at any time by choosing another palette from the pop-up menu.

Purge Priority

Controls how Director removes the bitmap cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Note   *If you set many cast members to have a purge priority of Last or Never, your movie may run out of memory.*

Colors

Displays the color depth of the cast member.

Size

Displays the size of the cast member, in Kilobytes.

File Name

If a cast member is an external PICT file that is linked to its source file on disk, Director displays the location of the linked file. Clicking the file name lets you choose a different file to link to.

Auto Hilite

For cast members that you use as buttons, use the Auto Hilite option to have the cast member automatically highlight when the user clicks it using the mouse. Even if Auto Hilite is checked, the cast member is not affected by clicking the mouse unless it is controlled by a Lingo script.

Script...

Director opens a script window for the cast member, and displays the
Lingo menu in the menu bar. For more information on creating and
using cast member scripts, see the *Using Lingo* manual. The script
remains attached to the cast member if the cast member is cut or
copied and pasted.

Button Cast Member Info
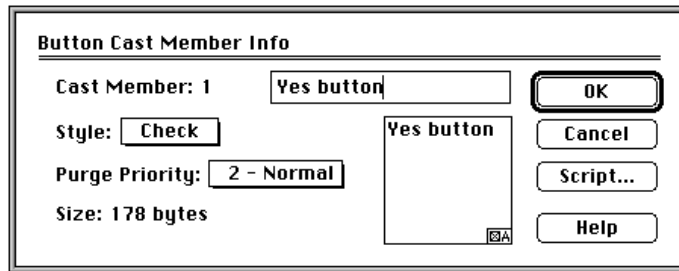
Style

The Style pop-up menu lists the button types and displays a
checkmark next to the current type. You can choose a different
button style from the pop-up menu.

Purge Priority

Controls how Director removes the cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Note   *If you set many cast members to have a purge priority of Last or Never, your movie may run out of memory.*

Size

Displays the size of the cast member, in bytes.

Script…

Director opens a script window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if the cast member is cut or copied and pasted.

Digital Video Cast Member Info

If you are using the Macintosh version of Director, this dialog box applies only to QuickTime cast members.

Length
The length of the digital video movie, in seconds.

Loop
If Loop is checked, the digital video movie loops from the end back to the beginning and continues to play.

Paused at Start
If checked, the digital video movie is paused when it first appears on the stage (while playing the Director movie).

By default, a digital video movie starts playing the moment it first appears. If you check Paused at Start, you can later start the movie using the Lingo command:

```
set the movieRate of sprite n to R
```

where:

- n is the sprite number (within the current frame)

- R is a number representing the rate. For example, 0 = stop, 1 = normal speed, 2 = 2x speed, and -1 = reverse.

Video
If Video is checked, the digital video movie's video portion plays. If unchecked, the video portion does not play. Uncheck this option and check the Sound option if you want to play the audio-only portion of a movie.

Sound
If Sound is checked, the digital video movie's soundtrack plays. If you don't have enough memory, you can leave this option unchecked so that Director does not load the movie's sound into memory during playback.

Crop
If Crop is checked, the movie retains its original size if you resize its bounding rectangle, and its edges may get clipped. If Crop is not checked, the movie is scaled if you resize its bounding rectangle.

Center
Center is only available if Crop is checked. Use Center to automatically center the movie if you resize its bounding rectangle. If Center is not checked, the movie maintains its original position, relative to the upper left corner, if you resize its bounding rectangle.

Enable Preload into RAM
If checked, Director lets you preload the entire movie (or as much of the movie as can fit into available memory) using the `preLoad` or `preLoadCast` Lingo commands.

If checked, Director loads the entire digital video movie into memory if enough memory is available. If there is not enough memory to load the entire movie, Director loads only what can fit into memory. If this option is unchecked, Director does not load the movie into memory and instead plays it from disk. This results in slower performance, since each frame must be retrieved from disk before it is played.

Direct to Stage

If Direct to Stage is checked, the digital video movie plays in front of any cast members on the stage, regardless of the channel that contains the movie. Inks are not visible on a movie that plays with this option. In general, use Direct to Stage when you want the best possible playback performance from a digital video movie and you don't need ink effects or compositing. However, results may vary, so you may have to experiment.

Note   *If the exported digital video movie plays before your transitions occur, turn off the digital video movie cast member's Direct to Stage setting in the Cast Member Info dialog box.*

Show Controller

This option is only available if Direct to Stage is checked. If this option is checked, a controller bar appears below the movie to allow the user to start, stop, and step through the movie.

Play Every Frame

This option is only available if Direct to Stage is checked. If checked, every frame of the digital video movie plays. The digital video movie's soundtrack will not play, since the movie can't play the sound track asynchronously while the video portion plays frame-by-frame. If not checked, the movie skips frames as necessary to keep up with a constant tempo.

If Play Every Frame is checked, choose one of the following options:

◆ Play at Normal Rate

Each frame plays at its normal rate, and no frames are skipped.

◆ Play as Fast as Possible

The movie plays as fast as possible while still displaying each frame.

◆ Play at Fixed Rate.

Lets you play the movie using a specific frame rate. Use this option only for digital video movies that use the same frame rate for each frame of the movie.

Purge Priority

Controls how Director removes the cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Note *If you set many cast members to have a purge priority of Last or Never, your movie may run out of memory.*

Memory Size

Size displays the size, in bytes, of the digital video movie's description in memory. It does not indicate the file size of the digital video movie. Use the Get Info command in the Finder to determine the size of a digital video movie.

File Name

Displays the name of the linked external file for the imported digital video cast member. Clicking the file name lets you choose a different file to link to.

Script...

Director opens a script window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if the cast member is cut or copied and pasted.

Film Loop Cast Member Info

Displays information about the selected film loop cast member.
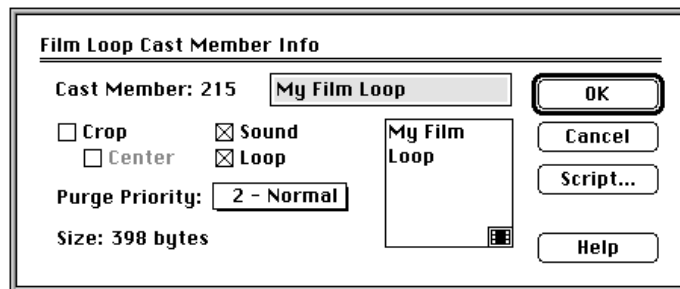
Crop

If checked, the film loop retains its original size if you resize its bounding rectangle, and its edges may get clipped. If Crop is not checked, the film loop is scaled if you resize its bounding rectangle.

Center

This option is only available if the Crop option is checked. If checked, the film loop is automatically centered if you resize its bounding rectangle. If Center is not checked, the film loop maintains its original position, relative to the upper left corner, if you resize its bounding rectangle.

Sound

If checked, sound is enabled during playback. If not checked, sound is disabled during playback.

Loop

If checked, the film loop returns from the last frame back to the beginning and continues to play. If this option is not checked, the film loop doesn't loop, and the last frame remains on the stage when the film loop finishes playing.

Purge Priority

Controls how Director removes the cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Note   *If you set many cast members to have a purge priority of Last or Never, your movie may run out of memory.*

Size

Displays the size of the cast member, in bytes.

Script…

Director opens a script window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if the cast member is cut or copied and pasted.

Linked Director Movie Cast Member Info

Displays information about an imported movie that is linked to its source file on disk.

```
┌─────────────────────────────────────────────────────────┐
│ Linked Director Movie Cast Member Info                  │
│ ──────────────────────────────────────────────          │
│ Cast Member: 16    ┌Cartoon Walk2─┐    ┌──────────┐     │
│                    └──────────────┘    │    OK    │     │
│ ☐ Crop     ⊠ Sound   ┌Cartoon──┐       └──────────┘     │
│    ☐ Center ⊠ Loop   │Walk2    │       ┌──────────┐     │
│ ☐ Enable Scripts     │         │       │  Cancel  │     │
│                      │         │       └──────────┘     │
│ Size: 0 bytes        └──────[▣]┘       ┌──────────┐     │
│                                        │ Script...│     │
│ File Name: Macromedia:...:Cartoon Walk2 └──────────┘    │
│                                        ┌──────────┐     │
│                                        │   Help   │     │
│                                        └──────────┘     │
└─────────────────────────────────────────────────────────┘
```
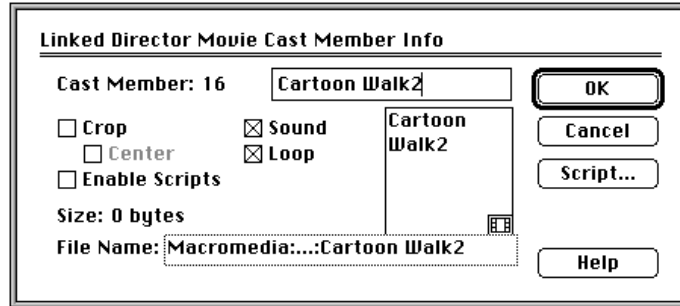
Crop
If checked, the movie retains its original size if you resize its bounding rectangle, and its edges may get clipped. If Crop is not checked, the movie is scaled if you resize its bounding rectangle.

Center
This option is only available if Crop is checked. If checked, the movie is automatically centered if you resize its bounding rectangle. If Center is not checked, the movie maintains its original position, relative to the upper left corner, if you resize its bounding rectangle.

Sound
If checked, sound is enabled during playback. If not checked, sound is disabled during playback.

Loop
If checked, the movie returns from the last frame back to the beginning and continues to play. If this option is not checked, the movie doesn't loop, and the last frame remains on the stage when the movie finishes playing.

Enable Scripts

If checked, Director activates the movie's scripts when the movie is used in the score. If this option is not checked, Director ignores the movie's scripts.

Size

Displays the size of the cast member, in bytes.
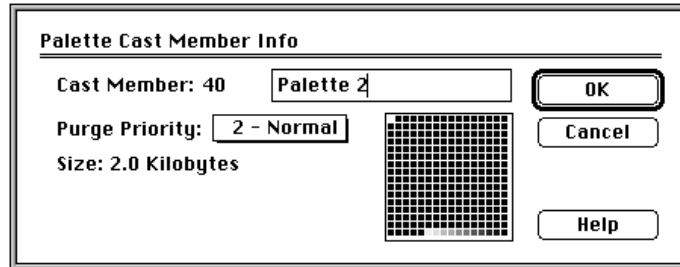
File Name

Displays the location of the external file associated with the linked movie. Clicking the filename lets you choose a different file to link to.

Script...

Director opens a script window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if the cast member is cut or copied and pasted.

Palette Cast Member Info

```
┌─────────────────────────────────────────────────────────┐
│  Palette Cast Member Info                                 │
│                                                           │
│  Cast Member: 40    [Palette 2    ]        ┌─────────┐    │
│                                            │   OK    │    │
│  Purge Priority:  [ 2 - Normal ]  ▓▓▓▓▓    └─────────┘    │
│  Size: 2.0 Kilobytes              ▓▓▓▓▓    ┌─────────┐    │
│                                   ▓▓▓▓▓    │ Cancel  │    │
│                                   ▓▓▓▓▓    └─────────┘    │
│                                   ▓▓▓▓▓                   │
│                                   ▓▓▓▓▓    ┌─────────┐    │
│                                   ▓▓▓▓▓    │  Help   │    │
│                                   ▓▓▓▓▓    └─────────┘    │
└─────────────────────────────────────────────────────────┘
```

Cast Member

Enter or edit the name in the entry field. The name remains attached
to the cast member if it is cut or copied and pasted. Director does not
prevent you from creating duplicate cast member names, but you
should avoid using them. If more than one cast member with the
same name has a script attached to it, Lingo uses the script attached to
the cast member with the lowest cast number. Use cast names instead
of cast numbers to address cast members in a Lingo script, so that you
don't have to update your scripts if your cast members get
re-numbered or sorted.

Purge Priority

Controls how Director removes the cast member from memory if
memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

PICT Cast Member Info
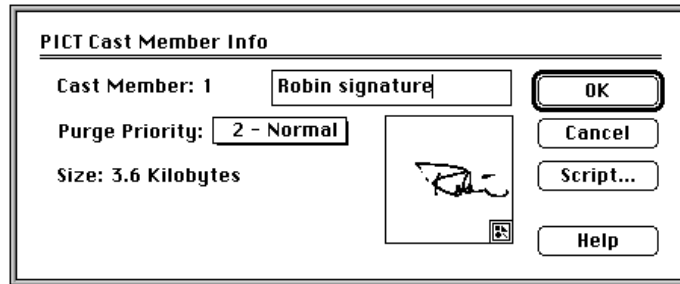
Cast Member

Enter or edit the name in the field. The name remains attached to the cast member if it is cut or copied and pasted. Director does not prevent you from creating duplicate cast member names, but you should avoid using them. If more than one cast member with the same name has a script attached to it, Lingo uses the script attached to the cast member with the lowest cast number. Use cast names instead of cast numbers to address cast members in a Lingo script, so that you don't have to update your scripts if your cast members get re-numbered.

Purge Priority

Controls how Director removes the PICT cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Size

Displays the size of the cast member, in Kilobytes.

Script...

PICT cast members can have a Lingo script associated with them. To create or review the script, click the Script button in the dialog box. Director opens a script editor window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if it is cut or copied and pasted.

Script Cast Member Info
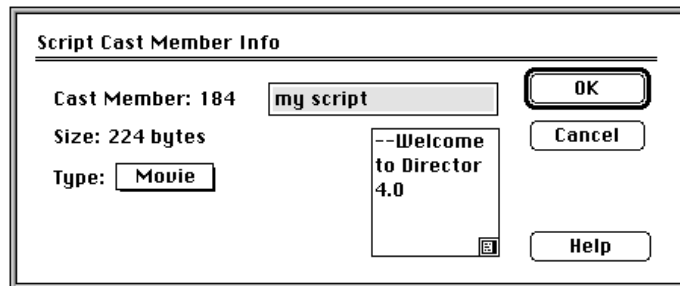
Cast Member

Enter or edit the name in the field. The name remains attached to the cast member if it is cut or copied and pasted. Director does not prevent you from creating duplicate cast member names, but you should avoid using them. If more than one cast member with the same name has a script attached to it, Lingo uses the script attached to the cast member with the lowest cast number. Use cast names instead of cast numbers to address cast members in a Lingo script, so that you don't have to update your scripts if your cast members get re-numbered.

Size

Displays the size of the cast member, in bytes.

Type

Displays the script type (movie or score) for the selected cast member, and lets you change it. A movie script's handlers are global, and can be called from other scripts. A score script's handlers are local, and cannot be called from other scripts. If you change a movie script into a score script, it appears in the script pop-up menu in the score.

Shape Cast Member Info
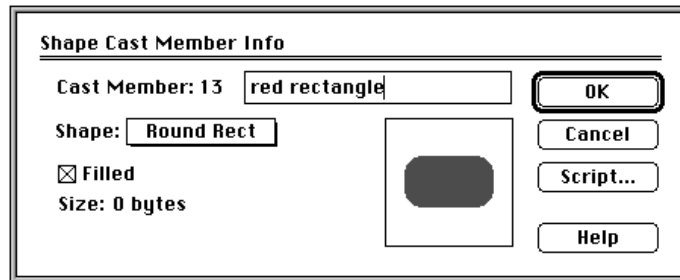
Shape

The Shape pop-up menu lists the shapes and displays a check mark next to the current shape. You can choose a different shape from the pop-up menu.

Filled

If Filled is checked, the shape will be filled using the current fill pattern and colors as specified in the tools window.

Script...

Director opens a script window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if the cast member is cut or copied and pasted.

Sound Cast Member Info
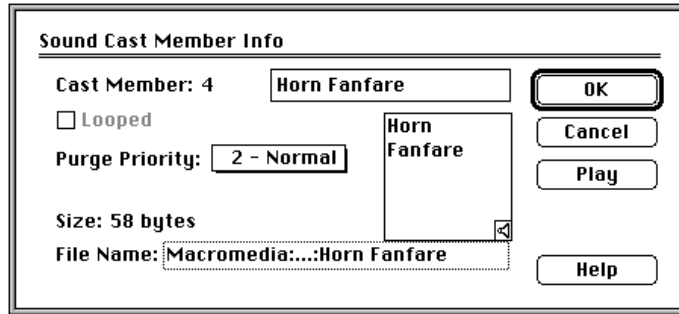
Looped

If checked, the sound plays continuously. If not checked, the sound plays once, even if the movie loops.

Note   *Director can loop mono or stereo sounds.*

Purge Priority

Controls how Director removes the cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Size

Displays the size of the cast member, in bytes.

File

If a cast member is an external sound file that is linked to its source file on disk, the Cast Member Info dialog box displays the location of the linked file. Clicking the file name lets you choose a different file to link to.

Play

Click the Play button to preview the sound at its pre–recorded sampling rate.

Text Cast Member Info

```
┌────────────────────────────────────────────────────────┐
│ Text Cast Member Info                                    │
│  ─────────────────────────────────────────────────────   │
│  Cast Member: 6    │ Intro          │    ┌────────────┐  │
│                                           │    OK      │  │
│  Style:  │ Adjust To Fit    │          └────────────┘  │
│                              ┌──────────┐  ┌──────────┐  │
│  ☐ Editable Text             │Announcing│  │  Cancel  │  │
│  ☐ Auto Tab                  │a         │  └──────────┘  │
│  ☐ Don't Wrap                │breakthroug│ ┌──────────┐  │
│                              │h in electric│ │ Script...│  │
│  Purge Priority: │ 2 - Normal│battery   A│ └──────────┘  │
│                              └──────────┘                │
│  Size: 230 bytes                         ┌──────────┐   │
│                                          │   Help   │   │
│                                          └──────────┘   │
└────────────────────────────────────────────────────────┘
```
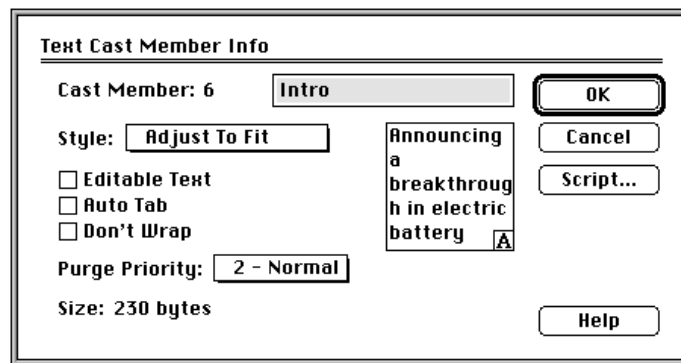
Style

Use the Style pop–up menu to choose a text display option for the text cast member.

Style	Description
Adjust to Fit	Causes the text box to expand vertically when text is entered that extends beyond the current size of the box.
Scrolling	Attaches a scroll bar to the right side of the text box. Useful for a large amount of text.
Fixed	Causes the box to retain its original size. If text is entered that extends beyond the limits of the box, the text is not displayed.
Limit to Field Size	Sets the field's width to be fixed to the size of the field. Characters that don't fit are ignored.

Editable Text

Allows the text cast member to be edited during movie playback. You can use this option instead of using the Lingo command `set the editableText of sprite to true`.

Note *If you set a text cast member to be editable in the cast, it is always editable when used in the score. Director ignores the score's Editable checkbox setting for the cast member.*

Auto Tab

Causes the Tab key to advance to the next editable text field on the stage during playback. Note that the Editable Text checkbox must be checked, or the Lingo command `set the editableText of sprite to true` must be specified for this option to have any effect.

Don't Wrap

If checked, prevents text from moving to the next line. Text that extends beyond the right edge is truncated. You must use the Return key to generate a new line.

Purge Priority

Controls how Director removes the cast member from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

Note   *If you set many cast members to have a purge priority of Last or Never, your movie may run out of memory.*

Size

Displays the size of the cast member, in bytes.

Script...

Director opens a script window for the cast member, and displays the Lingo menu in the menu bar. For more information on creating and using cast member scripts, see the *Using Lingo* manual. The script remains attached to the cast member if the cast member is cut or copied and pasted.

Getting information on multiple cast members

You can select multiple cast members with Shift–click or Command–click to get information about the number, type, and total size of your selection, and to set the purge priority for the selected cast members when memory is low.
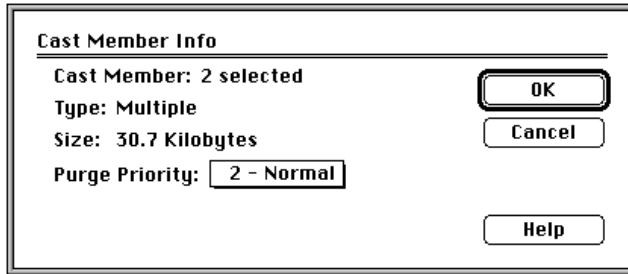
Cast Member Info for multiple cast members

Cast Member
Displays the number of cast members in the selection.

Type
When several cast members are selected, this is set to "Multiple." If all the selected cast members are of the same type, this field instead displays their type.

Size
Displays the total size, in Kilobytes, of the selected cast members.

Purge Priority

Controls how Director removes the cast members from memory if memory is low.

Purge priority	Description
3-Normal	The selected cast member will be removed from memory as necessary. This is the default.
2-Next	The selected cast member will be among the next to be removed from memory.
1-Last	The selected cast member will be among the last to be removed from memory.
0-Never	The selected cast member remains in memory and is never purged.

If all cast members have the same purge priority, the pop–up menu is blank.

Note   *If you set many cast members to have a purge priority of Last or Never, your movie may run out of memory.*

Open Script…

Opens the script associated with the selected cast member. This is the same as clicking the Script button in the Cast Member Info dialog box.

In the cast window, select a cast member and click the Script button as a shortcut for choosing this command.
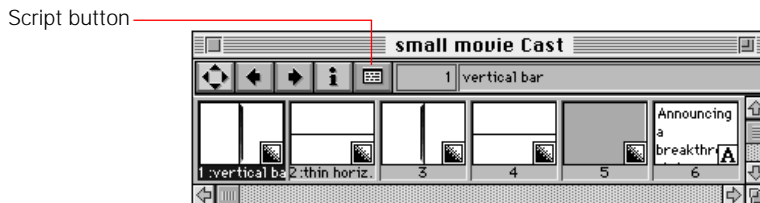
Script button

If you are editing a cast member in the paint, text, or digital video window, you can click the window's Script button as a shortcut for choosing this command.

▶ **_Tip_** *Command-' is the keyboard shortcut for this command. Press Option while choosing Open Script to open the selected cast member's script in a new script window.*

Edit Cast Member

This command is only available if there is a selection in the cast window. It displays the appropriate editing window for the selected cast member. For example, if you select a bitmap cast member and choose this command, Director opens the paint window for the selected cast member. For cast members that don't have editing windows (e.g., Shape, PICT, Sound, Movie, and Film Loop cast members) Director displays the cast member's Cast Member Info dialog box.

▶ **_Tip_** *Double-click a cast member in the cast window as a shortcut for choosing this command.*

Launch External Editor…

Automatically launches an external application so that you can edit a linked bitmap, sound, or digital video cast member.

▶ **_Tip_** *Command–, (comma) is the keyboard shortcut for this command.*

You can only launch an external editor for a linked bitmap (PICT file), sound, or digital video cast member.

Select the cast member you want to edit in the cast window, and choose this command. If you select multiple cast members, only the first (lowest numbered) cast member in the selection is used.

If an editor has yet not been specified for the type of cast member selected, or if the specified editor cannot be found, a dialog box appears so you can select the application.
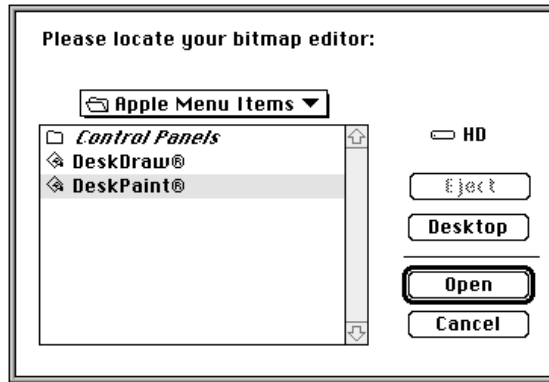
Once you select an editor, Director stores its pathname in the Director 4.0 Preferences file, so that the location and name of the editor are remembered across sessions.

Click Open to launch the new editor and open the selected cast member's linked file.

The next time you choose Launch External Editor for a selected cast member of the same type, Director automatically launches the editor and opens the cast member's linked file.

When you save your changes in the editor and return to Director, the edited cast member is reloaded and updated on the stage and in all authoring windows.

Changing editors

To choose a new editor for all cast members of the same type, select a cast member of the appropriate type and press the Option key while choosing Launch External Editor.

Director will display the dialog box asking you to locate the new editor application. Clicking Open launches the selected editor.

Record Sound…

This command lets you record short sounds and save them as cast members without leaving Director, using the standard Macintosh system sound–recording dialog box and a microphone.
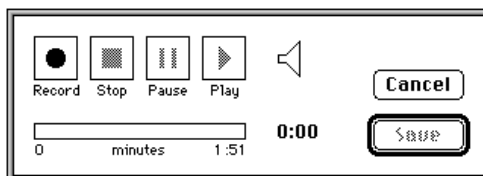
This command is dimmed if your Macintosh does not have a sound driver installed.

To begin recording, click Record. Click Stop when you are finished recording. Click Save to add the sound to the cast window.

An easy way to add sounds to your movie is with Macromedia's MacRecorder Sound System Pro. The MacRecorder is an audio digitizer like the Apple microphone.

Digitized sounds can be very memory intensive. You can decrease the sampling rate to save memory, but the quality of the sound will suffer. Experiment to find which sounds can be sampled at a lower rate without compromising the quality of the sound. For example, using a sound editing application such as SoundEdit Pro, you can reduce the sampling rate of spoken words and still understand them but sampling some types of music at that rate might not sound acceptable.

Paste as PICT

This command lets you paste a PICT image into the cast and have it remain in PICT format.

If you paste a PICT image into the cast using the Paste command in the Edit menu, Director converts it to a bitmap. If you want the artwork to remain in PICT format when you paste it into the cast, use Paste as PICT.

Graphic cast members pasted to the cast window with this command do not appear in the paint window since the paint window only edits bitmapped images.

You might want to use Paste as PICT for several reasons. PICT cast members may occupy less memory. Some PICT cast members, such as compound images consisting of lines, shapes, and text, will stretch and scale more smoothly than bitmapped cast members. PICT cast members also look better when printed on a laser printer.

However, PICT cast members animate more slowly than bitmapped cast members, and they don't support ink effects. When using color cycling or palette transitions, PICT cast members may yield unexpected results.

▶ **Tip** *Command-Shift-Y is the keyboard shortcut for this command.*

Convert to Bitmap

This command converts PICT cast members or QuickDraw text created in the text window or with the text tool in the Tool window to bitmapped cast members. The converted text or graphic can then be edited in the paint window. Once you convert PICT cast members or QuickDraw text to bitmapped graphics, you cannot undo the change.

You can't convert a QuickDraw shape to a bitmap.

Using bitmapped text gives you more choices of inks to use on the text. Another advantage to using bitmapped text is that once created, the text is not dependent on the available fonts to be displayed. On the screen, QuickDraw and bitmapped text look identical.

There is a trade-off in converting to bitmap. Bitmapped text and graphics animate faster, but they may take up more memory and disk space. They also have jagged edges when printed on a laser printer.

▶ **Tip** *You can also convert PICT cast members to bitmaps and reap some of the benefits of faster animation, but it usually takes more memory.*

Transform Bitmap…

This command lets you change the size, color depth, and palette of one or more selected cast members. The palette you choose is applied to the cast members and cannot be undone. If you want to maintain the cast member's original palette while temporarily applying a different palette, use the Cast Member Info command instead.

Transform Bitmap
Cast Member: Cast Member 5:Ball

Size:
- ● Scale: `100` %
- ○ Width: `69` pixels
- Height: `68` pixels

OK
Cancel

Colors:
- Color Depth: `8 Bits`
- Palette: `System – Mac`
- ● Dither
- ○ Remap to Closest Colors

Help
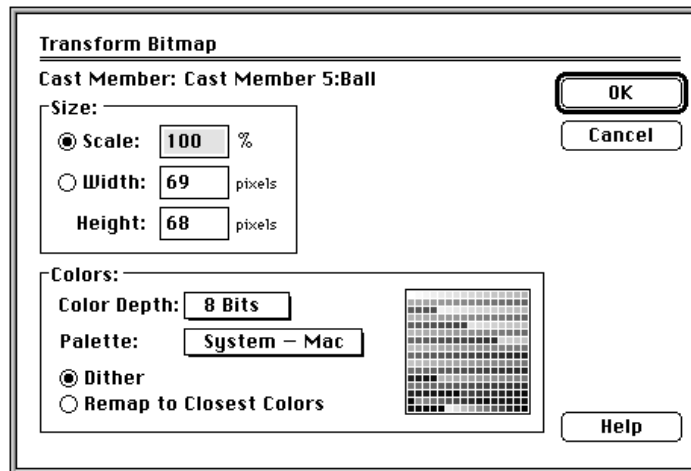
Note *If you only want to change the size of the cast member on the stage, use the Sprite Info command in the Score menu.*

The dialog box displays the values for the current cast member selection. If more than one cast member is selected, a blank value indicates that some cast members in the selection have different values. To maintain a cast member's original value, leave that value blank in the dialog box.

Size

◆ Scale

Use the Scale option to reduce or enlarge the cast member by a percentage. If multiple cast members are selected, you can scale them all relative to their original size.

◆ Width, Height

Use the Width and Height fields to specify the horizontal and vertical dimensions of the cast member in pixels. If multiple cast members are selected, you can resize all the cast members to the dimensions you enter.

Colors

◆ Color Depth

Your monitor and system software determine the set of color depth display modes available. A cast member's color depth is determined by the monitor's display mode at the time the cast member was created or imported. A movie's color depth is determined by the cast member with the highest color depth.

You can change color depth to save memory and disk space when you are creating a color movie.

Black and white display mode is 1 bit. The higher the number of bits, the more color depth choices you have available. However, larger color depths require more memory, and may also increase the time necessary for an animation to redraw. Black and white cast members require less memory than 4-, 16-, or 256-color cast members.

After the cast member is reduced to black and white, you can still color the cast member. Just select the cast member and choose a color from the tools window foreground or background color pop-up palette. (Don't use the paint window's color palette to do this.) Keep in mind that when you change the color, you are only changing the color of the sprite on the stage. The actual cast member remains black and white.

Another use for changing a cast member's color depth is when colorizing black and white cast members. Their color depth must be increased before you can use the paint tools to colorize them.

You can set the color depth of a cast member to be greater than the color depth of either the movie or the monitor. There's a performance penalty, however: if the cast member's color depth is greater than the monitor's, Director must remap the cast member every time it draws the cast member.

◆ Palette

The palettes listed in the pop-up menu are the default Director palettes, plus any additional ones found in the cast window. You can create a common palette that contains most of the colors your cast member needs.

When you use the Transform Bitmap command, Director matches the colors of the cast member with similar colors in the new palette, regardless of the position of the original color in the palette. For example, if the original artwork is red and the only red available in the new palette is pink, the red is changed to pink.

If the movie is playing, the active palette is the one that is currently in use at any given time, as specified in the score. The active palette may be different from the palette used by the movie. See "What determines which palette is active" in Chapter 3 for more information.

A mapped palette is the palette to which a color bitmap cast member is linked. Usually, this is the palette that was active at the time the bitmap was created. To link a bitmap cast member to a different palette, use the Transform Bitmap command.

Remapping

◆ Dither

Use Dither to improve the color or shading of the cast member. Director examines the palette and creates a blend from one color to another using the nearest matching colors.
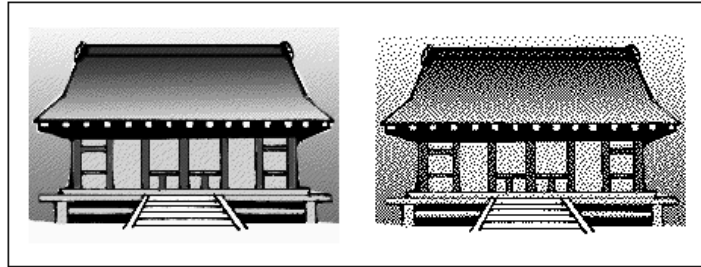
◆ Remap to Closest Colors

When you create a cast member in a color paint application, it is created with a specific palette. If you want to use that cast member in a movie, but a different palette is set in the palette channel of the score, your cast member will not appear in the colors you intended. Use this option to remap the cast member to the colors in the current palette that are closest to the colors the cast member was originally created with.
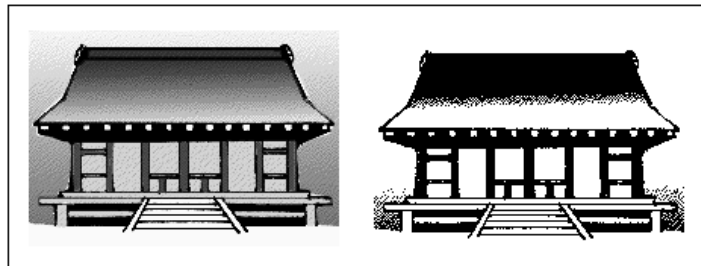
Importing cast members with different palettes

When importing cast members with palettes that are different from the currently active palette, a dialog box appears asking you if you want to remap the cast member to the current palette, or import the cast member and the cast member's palette.

> ⚠ The bitmap you are importing uses a palette that is different from the current one.
>
> **Do you want to remap the bitmap's colors using the current palette or install the bitmap's palette as a separate cast member?**
> ○ Remap Colors
> ○ Remap Colors and Dither
> ◉ Install Palette in Cast
>
> [Help] [Cancel] [OK for All] [**OK**]
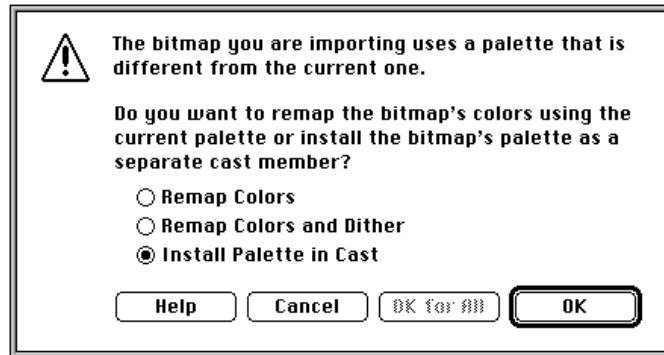
If you import the cast member and the palette, they will both be placed in the next available cast member positions in the cast window.

Remapping the cast member to the current palette causes the cast member to appear in the colors closest to those in the current palette. Importing the cast member's palette ensures that it looks as it did when originally created.

Note   *Remapping cast members is a one-way street. If you remap a colorful cast member to a grayscale palette, then remap again to the cast member's original color palette, the cast member may remain gray. The cast member always maps to the colors in the new palette that most closely resemble its current colors.*

Align Bitmaps

Align Bitmaps arranges cast members so that their registration points line up in the paint window. A registration point lets you align a series of cast members using a fixed reference point. When the registration points are aligned, you can use the left and right arrows in the paint window to flip through the cast members and preview a sequence of animated cast members. Align Bitmaps has no effect on sprite positions in the Score.

Cast to Time

Cast to Time is a quick way to create a cast member sequence in your movie. This command places selected cast members in the cast window sequentially into the score.

If you select a single cell in the score before choosing this command, the selected cast members are added to the score beginning at the selected cell. Any existing score data is replaced by the Cast to Time sequence. If you set an insertion point in the score before choosing this command, the Cast to Time sequence is inserted in Channel 1, beginning at the insertion point. If you select a range of score cells before choosing this command, the Cast to Time sequence that is inserted will only be as long as the number of selected cells in the score.

► **Tip** *You can also place selected cast members across time in the score by holding down the Option key while dragging them from the cast.*

Duplicate Cast Member

The Duplicate Cast Member command duplicates the selected cast member and pastes the duplicate into the next available position in the cast window. Duplicate Cast Member can't be used with a cast member that's part of a shared cast.

▶ **Tip** *Command-D is the keyboard shortcut for this command.*

If the paint, text, digital video, or script window is open when you choose this command, the contents of the window changes to the new cast member. The name and registration point of the duplicate is the same as the name and registration point of the original cast member.

This is a quick way to create a series of cast members for frame-by-frame animation. Duplicate a cast member, change it slightly, duplicate the changed cast member, alter it some more, duplicate it again, and so on.

▶ **Tip** *If the cast window is front-most, you can select multiple cast members and use this command to duplicate the entire selection at the same time.*

Find Cast Members…

Find Cast Members permits you to quickly identify those cast members that are either unused in the current movie or are created with one of the palettes in the palette pop-up menu. You can also select cast members by name or type. Use this command to identify cast members to clear from your movie or candidates for remapping to another palette.

```
┌─────────────────────────────────────────────────────────┐
│ Find Cast Members                                         │
│                                                           │
│  ● whose type is:  ┌ All ───────┐      ┌───────────────┐  │
│  ○ whose name begins with: │       │   │  Select All   │  │
│                                         └───────────────┘  │
│  ○ that use the ┌ System – Mac ┐ palette  ┌ Select ┐      │
│  ○ that are not used in the score         └────────┘      │
│                                         ┌───────────────┐  │
│  ┌────────────────────────────────┐ ▲  │     Done      │  │
│  │  20: Additional Sleeve        │▒│   └───────────────┘  │
│  │ 185: Bird at the Edge A       │▒│                      │
│  │ 171: Bird at the Edge A       │ │                      │
│  │ 186: Bird at the Edge B       │ │                      │
│  │ 172: Bird at the Edge B       │ │                      │
│  │  50: Bird.1                   │ │                      │
│  │  41: Bird.1                   │ │                      │
│  │  51: Bird.2                   │ │                      │
│  │  42: Bird.2                   │▼│                      │
│  └────────────────────────────────┘                      │
│                                         ┌───────────────┐  │
│  View ○ by Number  ● by Name            │     Help      │  │
│                                         └───────────────┘  │
└─────────────────────────────────────────────────────────┘
```
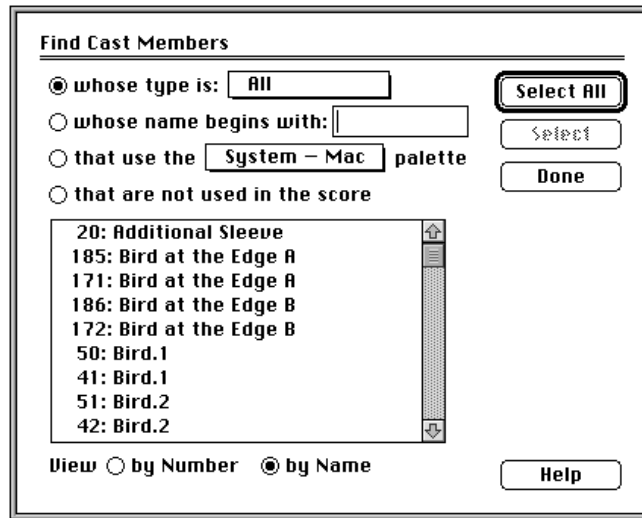
▶ **Tip**   *Command-; (semicolon) is the keyboard shortcut for this command.*

The dialog box lists cast members in the current movie, including shared cast members.

Find Cast Members

◆ whose type is

Choose a cast member type from the menu if you only want to find cast members of a specific type. (The default is All.)

◆ whose name begins with

Finds cast members whose name begins with the characters you enter.

◆ that use the palette

Finds cast members that use the chosen palette.

◆ that are not used in the score

Finds cast members that are not used in the score. Keep in mind, however, that a cast member that is not used in the score may still be used in a Lingo command.

View by

◆ Number

Sorts cast members by cast member number.

◆ Name

Sorts cast members alphabetically by name.

Selecting a cast member in the list and clicking Select (or double-clicking a cast member) closes the dialog box and selects the cast member in the cast. Clicking Select All closes the dialog box and selects all matching cast members in the cast.

Clicking Done closes the dialog box without affecting the selection in the cast window.

▶ **Tip** *To quickly select cast members by name, begin typing the first few letters of the name, and the dialog box will automatically display a list of cast members whose name begins with the letters you type.*

Sort Cast Members…

This command lets you rearrange selected cast members in the cast and eliminate empty cast member positions in between non–empty ones. It's particularly useful when you want to reorganize a selection of cast members or the entire cast in a compact format.

To rearrange the entire cast, first choose Select All from the Edit menu before choosing this command.

Director automatically updates the score with the new frame number for each repositioned cast member and the animation sequence is unaltered.

Note   *Using this command will not affect shared cast members, since these cast members cannot be rearranged. To rearrange shared cast members, you must open the shared cast movie, called SHARED.DIR.*

Because cast numbers may change when you use this command, cast number references in scripts may become invalid. If you use Sort Cast Members, you may have to go through your scripts to update them with the new cast numbers. Use cast names instead of cast numbers to address cast members in a Lingo script so that you don't have to worry if your cast members get re-numbered.
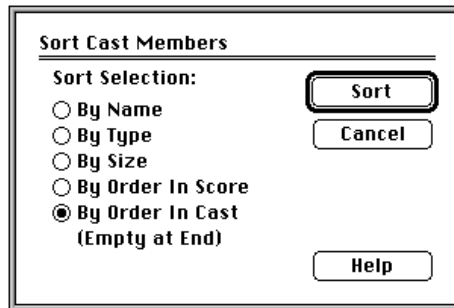
Sort Selection

◆ By Name

Sorts selected cast members alphabetically by name.

◆ By Type

Sorts selected cast members by type in the following order: bitmap, palette, button, text, sound, shape, PICT, digital video, film loop, movie, script.

◆ By Size

Sorts selected cast members by file size, in decreasing size order.

◆ By Order in Score

Sorts selected cast members in the order in which they appear in the score. If a cast member does not appear in the score it is placed after all the cast members that are referenced from the score.

◆ By Order in Cast

Sorts selected cast members in the order in which they appear in the cast. Empty cast members are placed at the end.

Note   *This option is equivalent to the Clean Up Selection command in previous versions of Director.*

Cast Window Options…

Displays a dialog box that lets you control cast window appearance.
These preferences are stored in the Director 4.0 Preferences file.

```
┌──────────────────────────────────────────────────────┐
│ Cast Window Options                                    │
│ ─────────────────────────────────────────────────     │
│  Maximum Visible:    │ 1,000           │    ┌────────┐ │
│  Row Width:          │ 10 Thumbnails   │    │   OK   │ │
│  Thumbnail Size:     │ Medium    │         ┌────────┐  │
│  Cast ID Style:      │ Number:Name │       │ Cancel │  │
│  Cast Type Icons:    │ All Types         │            │
│                                                        │
│  ☒ Indicate Cast Members with Scripts     │  Help  │  │
└──────────────────────────────────────────────────────┘
```
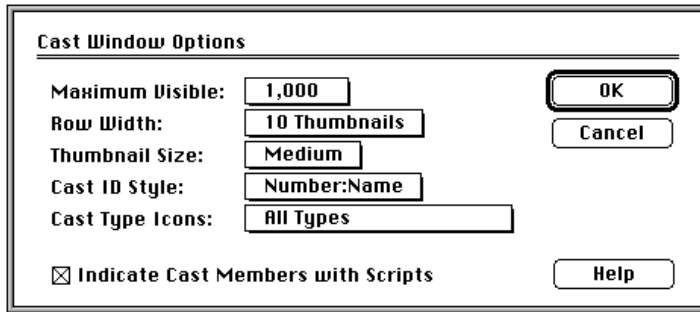
Maximum Visible

Specifies the maximum number of cast members displayed in the cast
window. Note that this option does not limit the actual number of
cast members that can exist in the cast. If you have a small number of
cast members, you can hide the remaining unused cast slots and make
better use of the vertical scroll bar. The default is 1000.

Row Width

Determines how many thumbnails are displayed in each row in the
cast window. Eight, Ten, and Twenty Thumbnails specify fixed–row
widths that are independent of the window size; if the cast window is
smaller horizontally than the width of the cast row, you must use the
horizontal scroll bar to reveal the rest of the cast. The Fit to Window
option automatically adjusts the number of cast members per row to
fit the current width of the cast window. In this mode, the horizontal
scroll bar is disabled, since the entire width of the cast is always in
view. The default is Fit to Window.

Thumbnail Size

The size of each cast thumbnail image displayed in the cast window. Thumbnails always maintain the standard 4:3 aspect ratio. The default is Medium.

Thumbnail size	Description
Small	44 x 33 pixels
Medium	56 x 42 pixels (default)
Large	80 x 60 pixels

Cast ID Style

Selects the display format of the cast member ID displayed below each cast thumbnail image in the cast window. The chosen format is also used in other windows, whenever a cast ID is displayed. The default is Number:Name.

Option	Description
Number	Displays cast number in decimal format.
Name	Displays cast name, if one exists; otherwise displays cast number in decimal format.
A11 (Octal)	Displays cast number in octal format, as used in previous versions of Director. Octal format is no longer supported in Lingo and should only be used when working with movies created using an earlier version of Director.
Number:Name	Displays cast number (in decimal format) and cast name, separated by a colon (":")., i.e., "340:Snoopy". If a name does not exist, just displays the cast number in decimal format. This is the default.

Cast Type Icons

Controls how Director displays an icon in the lower right corner of each cast member, indicating the cast member's type.

Indicate Cast Members with Scripts

If checked, Director displays a script indicator in the lower left corner of each script cast member, to indicate that the cast member uses a script.

Script indicator ——————

Cast type icon ——————
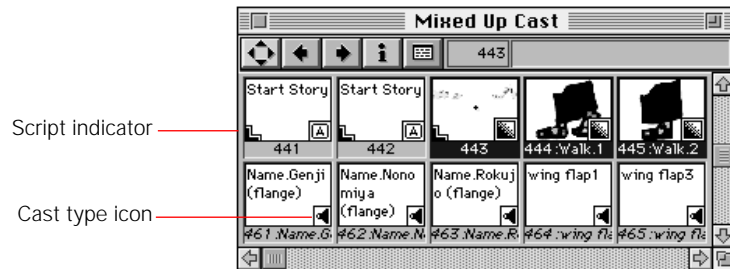
Score menu

The Score menu contains commands for editing the score and setting effects.

Sprite Info…

The Sprite Info command lets you change the size and location of a selected sprite on the stage. This command only affects the sprite's appearance on the stage and does not alter the actual size of the cast member.

If you selected more than one sprite, this command lets you edit them as a group.

The size of a sprite on the stage is controlled by its parent cast member unless you change the sprite's size using this command, or by manually resizing the sprite on the stage. Thereafter, any changes in the size of the parent cast member do not affect the size of the sprite on the stage.
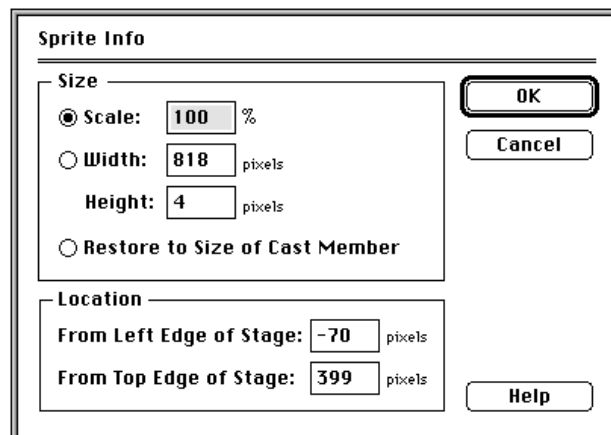
Size

These options let you change the sprite's size.

◆ Scale

To scale the sprite's appearance on the stage by a percentage, enter the percentage in the Scale % field. The sprite is scaled relative to its current size, not to the size of its parent cast member.

◆ Width, Height

Enter a specific width and height for the sprite, in pixels.

◆ Restore to Size of Cast Member

Returns the sprite to the size it was when you first moved it into the score or onto the stage.

Location

These options let you change the top left corner position of the sprite on the stage.

◆ From Left Edge of Stage

The value you enter represents the number of pixels the sprite is offset from the left edge of the stage.

◆ From Top Edge of Stage

The value you enter represents the number of pixels the sprite is offset from the top of the stage.

▶ *Tip*   *Command-K is the keyboard shortcut for this command.*

Delete Sprites

Delete Sprites removes selected artwork from the stage. Whatever is selected in the score window or on the stage is removed from your animation. Delete Sprites has no effect on the cast.

Delete Sprites is particularly useful when you want to clear sprites from the stage when the score window is closed or you have several windows open and want to avoid inadvertently deleting a cast member from the cast window.

▶ **Tip** *Command–Delete is the keyboard shortcut for this command.*

Set Sprite Blend…

Set Sprite Blend lets you specify the blend level for selected sprites in the score. This command allows you to apply a blend effect to sprites that use the blend, background transparent, mask, or matte ink. You can use this command to "fade" cast members in or out on the stage as they are animating.

You cannot apply a blend value to PICT sprites. You cannot apply a blend value to a digital video cast member if the Direct to Stage option is checked in the Cast Member Info dialog box.

Each sprite in the same frame can store its own blend value.
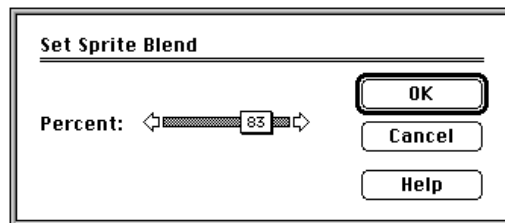
Use the score's blend display option to see the blend values.

Choosing a value sets the blend value as a percentage for the selected cells.

To set blend values to fade cast members in or out:

1. **Select the first cast members and assign them a starting blend value.**

2. **Select the last cast members and assign them an ending blend value.**

3. **Select the entire range of cast members and choose the In-Between Special command from the Score menu.**
    Make sure only the Blend checkbox is checked in the In-Between Special dialog box.

4. **Click OK.**

▶ ***Tip***   *Command-Option-B is the keyboard shortcut for this command.*

Set Tempo…

The Set Tempo command lets you set a tempo or pause in your movie. The tempo setting controls the speed at which the playback head moves from frame to frame.

Select a cell in the tempo channel of the score window and choose Set Tempo from the Score menu. When you set a tempo, it also applies to all frames to the right of the tempo setting, until another tempo is encountered in the tempo channel.

Double-clicking a cell in the tempo channel opens the Set Tempo dialog box.

```
Set Tempo
  ⦿ Tempo:   ◁▭▭▭▭30▭▭▭▭▷  fps          ┌──────────┐
  ◯ Wait:    ◁▭1▭▭▭▭▭▭▭▷  seconds      │    OK    │
  ◯ Wait for Mouse Click or Key                     └──────────┘
  ◯ Wait for Sound1 To Finish          ┌──────────┐
  ◯ Wait for Sound2 To Finish          │  Cancel  │
  ◯ Wait for QuickTime Movie           └──────────┘
     to Finish in Channel: 1           ┌──────────┐
                                       │   Help   │
                                       └──────────┘
```
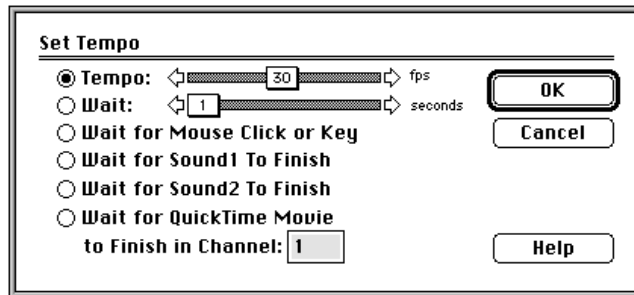
Tempo

Use the scroll bar to set the movie's tempo. This is the same as changing the tempo in the control panel.

Wait

Set the amount of delay in your movie using the scroll bar.

Wait for Mouse Click or Key

Lets you pause the playback head until the user clicks the mouse or presses a key. The cursor changes to a blinking mouse to indicate that the movie is paused.

You might want to include some text on the screen telling users to click the mouse or press a key to continue.

Wait for Sound1 to Finish

Lets you pause the playback head until a sound in sound channel 1 finishes playing.

Wait for Sound2 to Finish

Lets you pause the playback head until a sound in sound channel 2 finishes playing.

Wait for QuickTime Movie to Finish in Channel:

Lets you pause the playback head until a QuickTime movie finishes playing. If you have several QuickTime movies playing, make sure you specify the channel of the longest playing movie when using this option.

Using transitions

If you place tempo settings in the same frame as a transition, some tempo channel settings such as wait and sound playing become disabled. To avoid this, don't place a transition in the same frame as your tempo settings. Instead, place the tempo settings in the frame immediately before or after the transition.

Set Palette…

The Set Palette command allows you to change palettes in a specific frame of the movie while your animation is playing. When you set a palette in the palette channel of the score, the color of the cast members in the movie will be determined by that palette, until another palette is encountered in the palette channel.

Palettes can be transitioned from one to another during an animation. A simple form of this occurs when you set two palettes in the palette channel of the score with the Set Palette command in the Score menu. When you play the movie, the cast members change from the colors of one palette to the other. In fact, everything on the screen will change color, including the Apple in the menu bar.

The cast members' new colors depend upon the position of the previous colors. For example, if one of your cast members is yellow, and yellow occupies the fifth color in your palette, the cast member will become whatever color is in the fifth position in the new palette.

To get a visual demonstration of color cycling or palette transitions, choose a range of frames in the score to cycle or transition colors in, and open the color palettes window while the movie plays. You can see the colors transition or cycle in the open color palettes window.

See "Working with palettes" in Chapter 3 for more information.

► **Tip**   *Double-clicking a cell in the palette channel opens the Set Palette dialog box.*
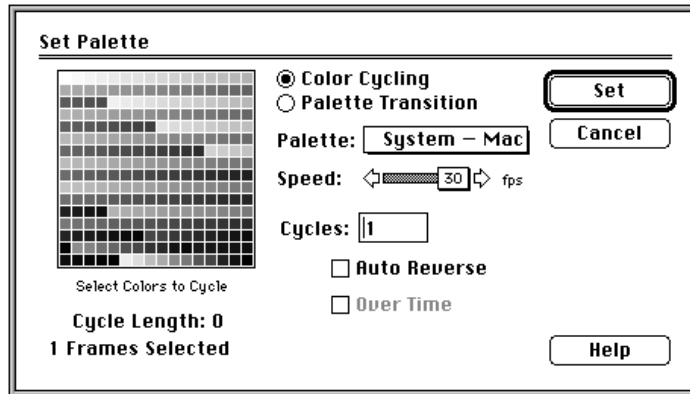
Color Cycling

This permits you to cycle a range of colors in a palette. For example, if a cast member's color is the fifth color in the palette, and you specify a range of colors four, five, and six, the cast member will change colors when the movie is played, and it will cycle through colors four, five, and six.

To select a range to cycle, drag across the colors to be cycled in the Set Palette dialog box. You can also click a color, and Shift-click another color to select the colors you click and all colors in between.

Palette
Lets you choose the palette used for the selected cells in the palette channel.

Speed
Lets you control how fast or slowly the palettes transition from one to another.

Cycles
Specifies the number of cycles per frame.

Auto Reverse

If checked, this option causes the colors to cycle in one direction, then at the end of the cycle, reverse direction and cycle through the colors in the reverse order. Leaving this box unchecked causes the colors to cycle in one direction only.

Over Time

If you want the cycling to occur over a number of frames, check this option.

Palette Transition
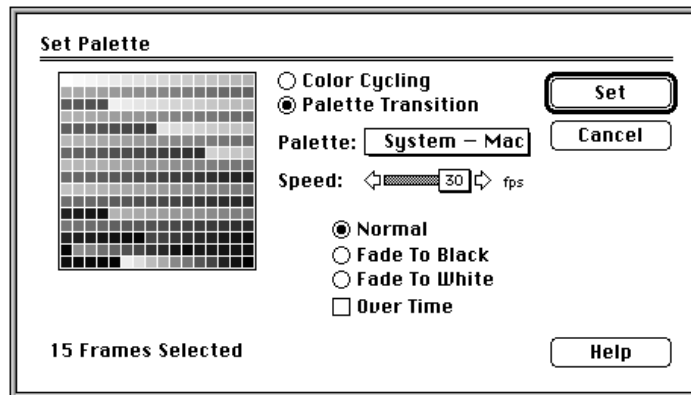
Transition makes a smooth transition from one palette to another. Instead of your cast member abruptly changing colors when you switch palettes, this option will gradually blend from one palette to the next.

Palette

Lets you choose the palette used for the selected cells in the palette channel.

Speed

Lets you control how fast or slowly the palettes transition from one to another.

Normal

The screen doesn't fade during the palette transition.

Fade to Black

Like other palette transitions, this can occur over time, or in between frames. This option makes the screen fade completely to black. A nice way to end a movie is to make the final frame a black cast member that covers the whole stage, and then fade to black over several frames before the last frame.

Fade to White

Like other palette transitions, this can occur over time, or in between frames. This option makes the screen fade completely to white. A nice way to end a movie is to make the final frame a white cast member that covers the whole stage, and then fade to white over several frames before the last frame.

Over Time

By default, the palette transition will take place between two frames. All movement will halt as the transition takes place. If you want the transition to occur over a number of frames, check this option. The range of cells you select before choosing Set Palette determines the length of the transition.

Note   *Color cycling does not work in 16–, 24–, and 32–bit environments. This is because color cycling requires either that palettes be in use or that a video card set to 256 colors is present.*

Set Transition…

To set a transition, select a cell in the transition channel of the score window, and choose Set Transition. The transition occurs when the playback head reaches that cell.

▶ **Tip** *Double-clicking a cell in the transition channel opens the Set Transition dialog box.*
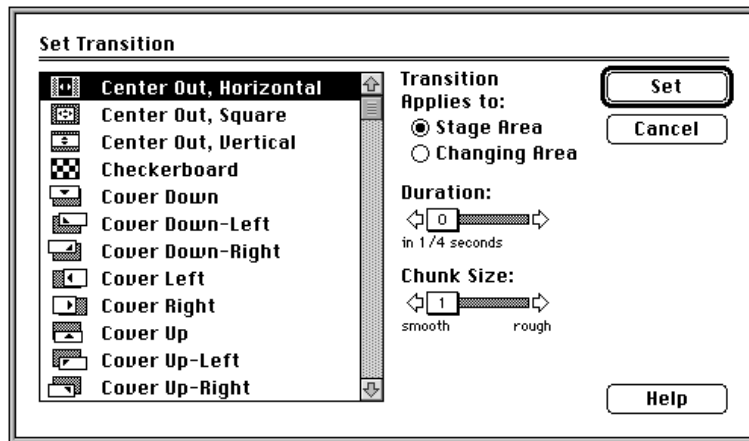
Transition Applies to

◆   Stage Area

   The transition takes place over the entire stage.

◆   Changing Area

   The transition takes place over the changing area of the frame.

Duration
Indicates the approximate amount of time (in quarters of a second) of the entire transition.

Chunk Size
Indicates how much of the screen changes in each movement of the transition. The smaller the chunk size, the smoother the transition.

▶ **Tip** *To stop a transition during playback and advance the playback head to the next frame, press Command–Period.*

Note *To play a sound while a transition takes place, place the sound in the frame immediately before the transition.*

If you are developing a movie for Macintosh and Windows computers, don't use the Dissolve Bits, Dissolve Bits Fast, Dissolve Pixels, Dissolve Pixels Fast, or Dissolve Patterns transitions. These transitions produce entirely different results on a Windows computer.

Palette transitions (including fade to black and fade to white) and bit and pixel dissolves do not work in 16–, 24–, and 32–bit environments. This is because these features require either that palettes be in use or that a video card set to 256 colors is present.

Set Sound…

Lets you paste a sound into one of the sound channels in the score. Select one or more cells in one of the sound channels, and then choose this command. If the cast contains no sounds, or if you have not first made a selection in one of the sound channels in the score, this command is dimmed.

The dialog box lists all sounds stored as cast members in the cast.

▶ **Tip**   *As a shortcut, you can select one or more cells in a sound channel, and then double-click the cast thumbnail in the upper left corner of the score to display this dialog box.*
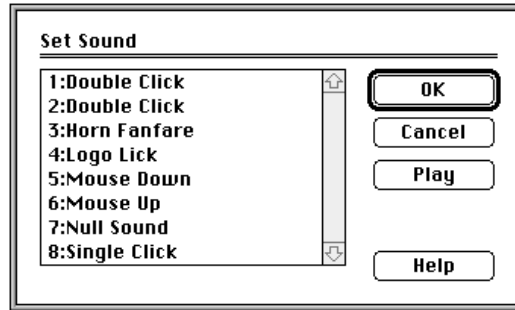
Choosing a sound from the list pastes the sound into the selected frames in the sound channel in the score. The Play button lets you preview the sound.

Insert Frame

Insert Frame adds a frame to your movie at the location of the playback head. With Insert Frame a copy of the current frame is added to the score. This can cause an apparent pause in the animation as two identical frames are played.

The new frame is inserted for all channels and adds a frame to the movie's length.

▶ **Tip**   *Command-] is the keyboard shortcut for this command.*

Delete Frame

Delete Frame deletes the frame at the location of the playback head, making the movie one frame shorter in length.

► **Tip** *Command-[is the keyboard shortcut for this command.*

In-Between Linear

In-Between Linear is used when you want a sprite to move in a straight line across the stage, grow or shrink smoothly, or remain stationary for a number of frames. Director fills in the selected cells in the score with the sprite's incremental motion between frames.

In-Between Linear interpolates the incremental positions of a sprite between key frames. Key frames are the locations of the sprite that are the starting and ending point for the sprite's motion. If the starting and ending points are the same, the sprite remains stationary. If the starting and ending points are different, In-Between Linear generates all the intermediate steps between key frames. In-Between Linear also works with sprites that are stretched or squeezed.

► **Tip** *Command-B is the keyboard shortcut for this command.*

In-Between Special…

Use In-Between Special when you want a sprite to move in a curved path, to accelerate or decelerate across the stage, or to in-between a film loop.

To make your sprite follows a curved path, you must set the sprite in at least three positions on the stage in different frames. As with the regular In-Between, select all the cells between the first and last position of the sprite, then choose this command.

```
┌─────────────────────────────────────────────────────────┐
│  In-Between Special                                       │
│  ┌─In-Between:─┐ ┌─Acceleration:──────────┐  ┌──────────┐ │
│  │ ☐ Location  │ │ Accelerate over first [   0   ]│ │    OK    │ │
│  │ ☐ Size      │ │ Frames (Ease-In)   ├─┼─┼─┼─┤│  ┌──────────┐ │
│  │ ☐ Foreground│ │                         │  │  Cancel  │ │
│  │ ☐ Background│ │ Decelerate over last [   0   ]│ └──────────┘ │
│  │ ☐ Blend     │ │ Frames (Ease-Out)  ├─┼─┼─┼─┤│             │
│  └─────────────┘ └────────────────────────┘             │
│  ┌─Path:────────────────────────────────────────────┐   │
│  │  ┌──────┐                                         │   │
│  │  │      │     ☐ Circular        ┌─────────────┐   │   │
│  │  └──────┘                       │ Preview Path│   │   │
│  │  ◄═╪═╪═╪═╪═╪═╪═╪═╪═╪═▣═╪═╪═╪═╪═╪═╪═╪═╪═►         │   │
│  │  Inside          Linear              Outside     │   │
│  └──────────────────────────────────────────────────┘   │
│  ☐ Apply to Film Loop                    ┌──────────┐    │
│                                          │   Help   │    │
│                                          └──────────┘    │
└─────────────────────────────────────────────────────────┘
```
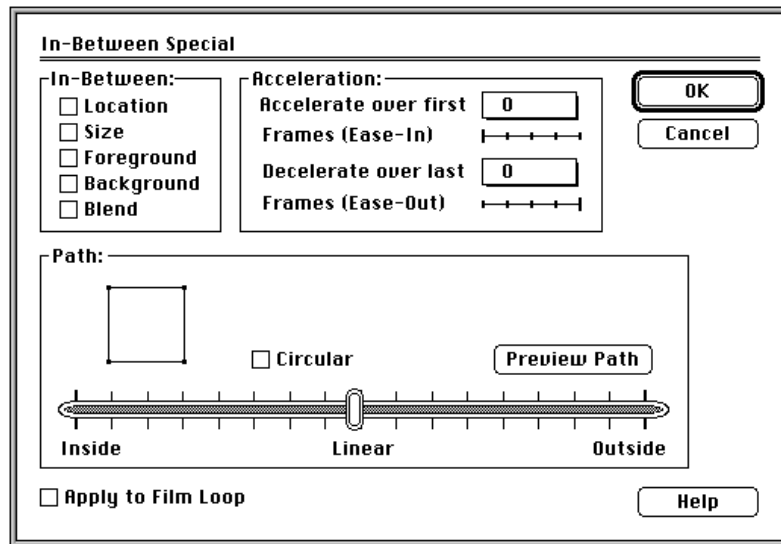
▶ **Tip**   *Command-Shift-B is the keyboard shortcut for this command.*

In-Between

You can independently tween individual parameters such as Location, Size, Foreground Color, Background Color, and Blend. Check the parameters that you want to tween.

Acceleration

Ease-In and Ease-Out options can add realism to your animations by having sprites gradually build up to full speed, or decrease in speed as they come to a halt.

◆ Accelerate over first n Frames (Ease-In)

Choose the number of frames over which you want to accelerate the sprite. If you choose to accelerate a sprite over the first eight frames, for example, a stationary sprite will ramp up to full speed over that many frames. To enter a number other than the choices in the pop-up menu, choose Other.

◆ Decelerate over last n Frames (Ease-Out)

Choose the number of frames over which you want to decelerate the sprite. For example, decelerating a sprite over eight frames will gradually bring the sprite to a halt by the eighth frame. To enter a number other than the choices in the pop-up menu, choose Other.

Path

If the beginning and ending points of the sprite are the same, the diagram in the dialog box will be circular, indicating that the sprite will travel in a circle when in-betweened. If the beginning and end points are not the same, the diagram describes a curved path, indicating that the sprite ends in a position different than the starting point. This diagram does not show the actual path of the sprite, just the type of curve it will follow.

The Inside/Outside slider controls the degree to which the sprite's curved path follows the inside or outside boundaries of the path. If you drag the slider to the left, the sprite follows a curved path that is inside the sprite positions you set before choosing In-Between Special. If you move the slider to the center, the sprite will travel in straight lines between the points you set earlier. Dragging the slider all the way to the right causes the sprite to pass through the points you set as it travels a curved path.

◆ Circular

This option only affects sprites that begin and end in the same point. If checked, the sprite will circle around the stage, but it won't pass through the starting point. The effect is to make a rounder circle. If this option is not checked, the sprite passes through the starting point during the animation.

◆ Preview Path

Lets you see the results of your choices by closing the In-Between Special dialog box and drawing a line on the stage indicating the path of the in-between. Click Preview Path to make sure your sprite is going where it's supposed to.

Apply to Film Loop

If checked, you can in-between a series of sprites. For example, if you have a sequence of six sprites that make a walking person, you can store all six as a single sprite, called a film loop. Then, the film loop can be in-betweened as if it were a single sprite. Be sure that a film loop is selected in the cast window before choosing In-Between Special.

Space to Time…

Space to Time moves selected sprites in one frame to a single channel in the score so they play in a sequence of frames.

The dialog box lets you specify the number of frames apart to spread sprites. Consecutive cells (1 frame apart) is the default.

Space to Time

Spread sprites [1] frame(s) apart   [OK]
                                     [Cancel]
                                     [Help]
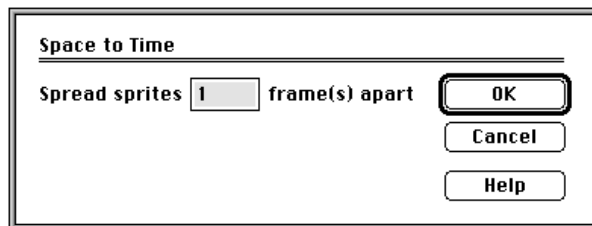
An example might be a bouncing ball. It's difficult to lay out each position of the ball without comparing it to previous positions. With Space to Time, you can drag the ball from the cast window repeatedly to lay out your sequence, select the cells in the score that contain the sprites you just positioned on the stage, then choose Space to Time, and all the sprites shift from their vertical positions in one frame to horizontal positions in one channel. You might also find this a useful way to lay out sprites before using In–Between Special.
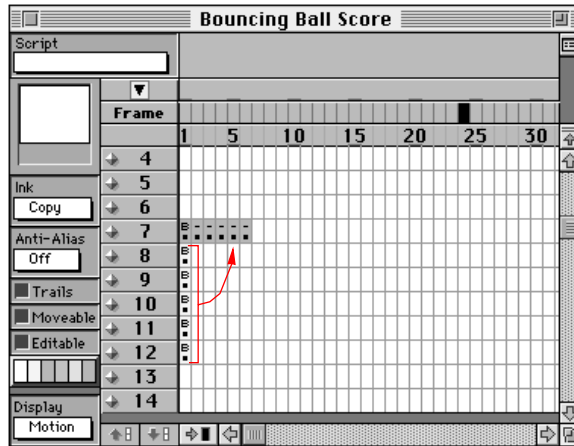
Space to Time shifts sprites from one frame to one channel across many frames

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Paste Relative

Use Paste Relative to paste a sequence of sprites at the point on the stage where a previous sequence ended. When you use this command, Director automatically adjusts the positions of cast members on the stage so that the first cast member in the pasted sequence follows the last cast member in the original sequence.

For example, to animate a ball bouncing across the stage with a sequence of five sprites that describe one bounce, you can use Paste Relative to make the second sequence of sprites start where the first sequence ended. The effect is that the two sequences are chained, one after another, in one smooth, continuous motion. This works for any repetitive sequence of sprites.
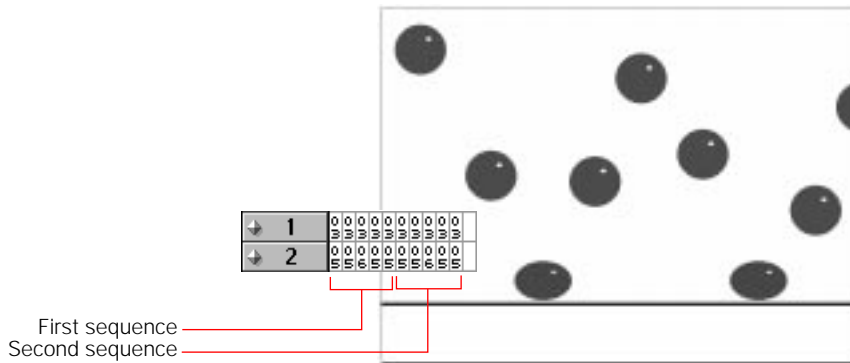
Using Paste Relative to move a repetitive sequence of sprites across the stage

When selecting cells in a sequence to be pasted relative to the original sequence, make sure the same cast member is at the beginning and end of the sequence, and that you overlap the first cell in the copy with the last cell in the original sequence.

▶ **Tip** *Command-Shift-V is the shortcut for this command.*

Reverse Sequence

Reverses the order of selected cells in the score.

Switch Cast Members

The Switch Cast Members command replaces the cast member selected on the stage or in the score window with the cast member selected in the cast window. When you use Switch Cast Members, the registration point of the new cast member lines up with the registration point of the old cast member.

▶ **Tip** *Command-E is the keyboard shortcut for this command.*

Auto Animate

The Auto Animate command permits you to quickly create titles, bar charts, and text effects to add to your movies. Director adds the auto animate notation to the score window, so you can edit it.

If you select a single cell in the score, the entire auto animate sequence will be added to the score beginning at the selected cell. Any existing score data will be replaced by the sequence. If you set an insertion point, the auto animate sequence is inserted in channel 1, beginning at the insertion point. If you select a range of cells, the auto animate sequence that is inserted will occupy the number of cells in the selection. If you do not make a selection or set an insertion point, the auto animate sequence is placed at the end of the movie beginning in channel 1.

Note *For auto animate sequences that use more than one channel, if there isn't enough room for all the channels to be placed in the score, they won't be recorded in the movie.*

Banner…

Banner allows you to create an animated message that scrolls across the screen.

A typical banner effect

You can control the number of times the banner is displayed, the length of an initial delay, and the speed at which the effect occurs.
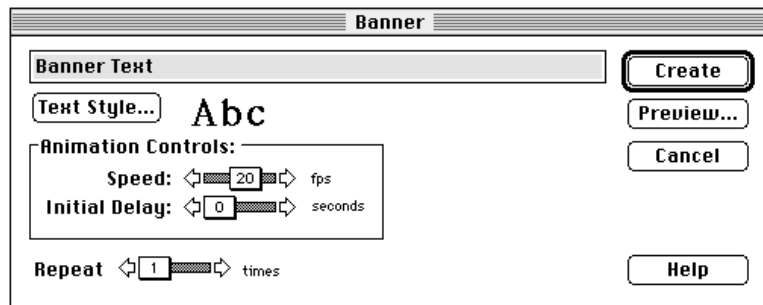
You can enter up to 255 characters in the text area. If you enter a name that is longer than 30 characters, Director only displays the first 30 characters in the dialog box.

Text Style
Gives you complete control over the text font, size, style, transparency, and color of the banner text.

Animation Controls

◆ Speed

   Controls how fast the animation occurs, in this case how quickly the text moves across the screen.

◆ Initial Delay

   Controls the length of time before the effect starts.

Repeat

Controls how many times the effect is repeated.

Preview

Displays the banner as it will appear in the presentation, including any background images. Use the Preview screen to adjust the location of the text. To set the location, click the mouse. Setting the starting location sets the position of the top of the text. Note that the starting location affects only the vertical dimension; wherever the starting location, the banner text travels from off the right side of the screen to off the left side of the screen.

Bar Chart…
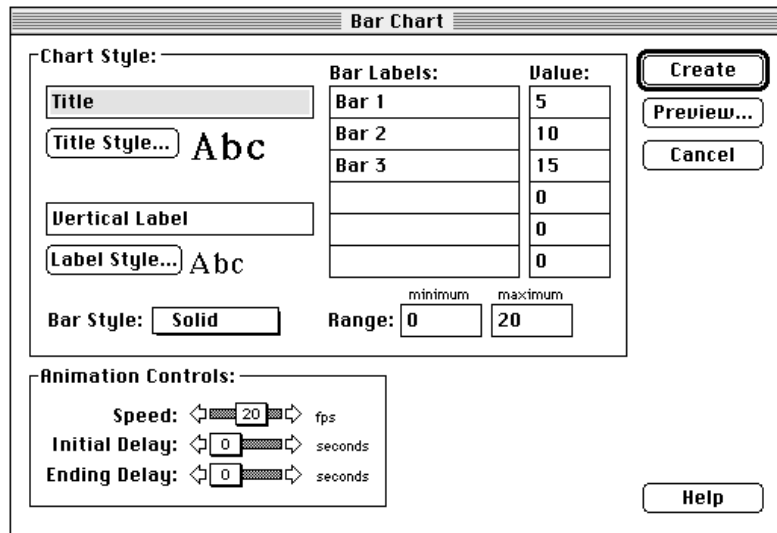
Bar Chart allows you to create an animated bar chart.
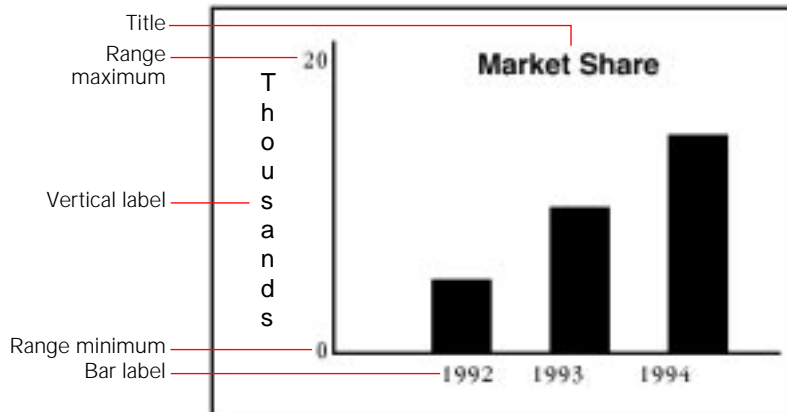
A typical bar chart

The title and labels of the bar chart appear first and are stationary; the bars grow into place through animation. Director allows you to control the scale of the chart, the height of the bars, the style of the bars, the speed of their growth, and the ending delay.

You can use up to six bars. The width of the bars is set automatically depending on the number of bars you are using. The actual length of the horizontal and vertical axes does not change, just the values on the scale. The height of the bars is proportional to the scale you set.

You can enter up to 255 characters in the Title text area and in the Vertical label text area. If you enter a name that is longer than 30 characters, Director only displays the first 30 characters in the dialog box.

Chart Style

◆ Title Style, Label Style

These options give you complete control over the text font, size, style, transparency, and color of the title text and the label text.

◆ Bar Style

Provides several choices for different types of bars.

◆ Bar Labels

Enter a label that appears below each bar. You can enter up to 31 characters for each label. If the labels are so long as to overlap, you can either use shorter labels or adjust the font, size, and style of the labels.

◆ Value

Determines the height of each bar, in relation to the scale of the vertical axis. You can enter any positive values between 0 and 32,000.

◆ Range

Determines the scale shown on the bar chart. The scale affects the height of the bars, which grow to a height proportional to the scale. You can set the maximum and minimum to any positive values between 0 and 32,000.

Animation Controls

◆ Speed

Controls how quickly the bars grow into place.

◆ Initial Delay

Controls the length of time before the effect starts.

◆ Ending Delay

Controls how long the completed bar chart is displayed.

Preview

Displays the bar chart as it will appear in the presentation, including any background images. Use the Preview screen to adjust the location of the bar chart. To set the location, click the mouse. Setting the starting location sets the position of the upper left corner of the chart. The upper left corner is determined by the top of the title text and the left edge of the vertical label text.

Bullet Chart…

Bullet Chart allows you to create an animated bulleted list.

A typical bulleted list

Typically, the title of the bulleted list appears first and is stationary; the items and their bullets travel into place through animation.

You can determine the direction from which the bulleted items come. You can choose from several different bullets. You can animate the title as well as the bullets. You can have no animation at all, simply presenting a bulleted list. Or you can dispense with bullets altogether, presenting only a title and a list.

You can enter up to 255 characters in the Title text area and in each Bullet text area. If you enter a name that is longer than 30 characters, Director only displays the first 30 characters in the dialog box.

Text Formats

◆ Bullet Type

Provides choices for different types of bullets. Choices include a Dot, a Square, a Hand, a Check, and an Arrow. Three choices allow for animated bullets that move into place. These are the Flying Hand, the Animated Check, and the Flying arrow. You can also choose to have no bullets, or to have no bullets and the text and title centered.

◆ Line Spacing

Controls the amount of space between items on the chart.

◆ Bullet Style, Title Style

Give you complete control over the text font, size, style, transparency, and color of the title text and the bullet text.

Animation Controls

◆ Motion

Provides choices for how the bulleted items appear. The choices include from Right, Bottom, Left, Top, Upper Right, Lower Right, and so on. Choices also include Stationary (no movement), Wipe from Right, Wipe from Left, and Dissolve.

◆ Speed

Controls how fast the animation occurs, in this case how quickly the bulleted items move into place.

◆ Initial Delay

Controls the length of time before the effect starts.

◆ Bullet Delay

Controls the length of the pause between lines of text moving into place. A short Bullet Delay means that there is a very short pause between one line moving into place and the beginning of the next line's movement.

◆ Ending Delay

Controls how long the completed chart is displayed.

◆ Animate Title

Causes the title text to also move into place. An animated title obeys the Motion, Speed, and Bullet delay settings.

Preview
Displays the bullet chart as it will appear in the presentation, including any background images. Use the Preview screen to adjust the location of the bullet chart. To set the location, you click with the mouse. Setting the starting location sets the position of the upper left corner of the title.

Credits…

Credits allows you to create an animated credit list that scrolls up the screen. "Credits" comes from the motion picture practice of giving credit to everyone who worked on a movie in a scrolling list at the end.
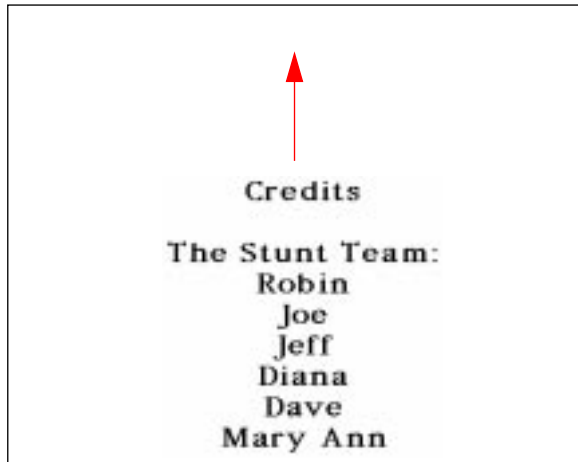
A typical credits list

You can control the number of times the credit list is repeated, the speed at which the effect occurs, the length of an initial delay, and the justification of the text (left, right, or center).
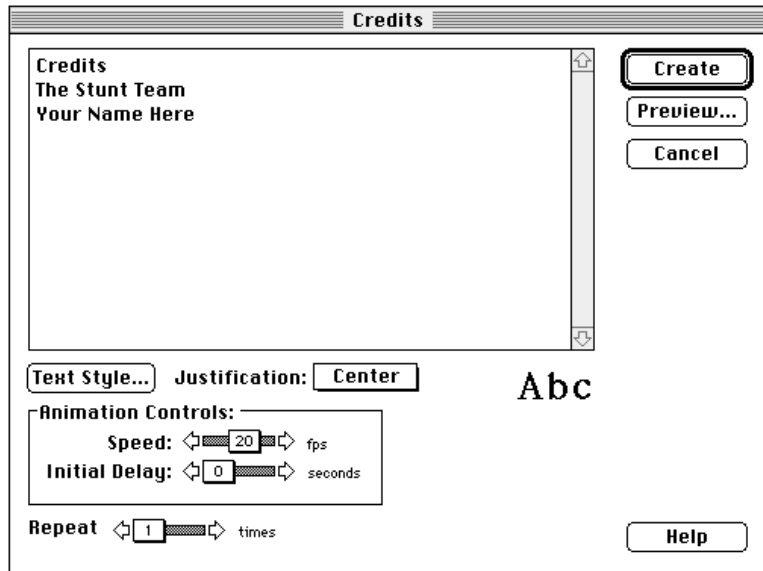
Enter text in the text area, using the Return key to end a line of text and start a new line. There is no limit to the width of an individual line, except the practical limit of the screen width. Text that is too long to fit on one line of this dialog box wraps to the next line. Text appears in the preview as it will in the final slide.

You can enter up to 255 characters in the credit list.

Text Style
Gives you control over the text font, size, style, transparency, and color of the credit text.

Justification
Controls whether the credit text is justified flush left, flush right, or is centered.

Animation Controls

◆ Speed

Controls how quickly the text moves up the screen.

◆ Initial Delay

Controls the length of time before the effect starts.

Repeat

Controls how many times the effect is repeated.

Preview

Displays the credit list as it will appear in the presentation, including any background images. Use the Preview screen to adjust the location of the text. To set the location, click the mouse. Setting the starting location sets the position of the center of the text. Note that the starting location affects only the horizontal dimension; wherever the starting location, the credit list travels from below the bottom of the screen to off the top of the screen.

Text Effects…

Text Effects allows you to create one of three animated effects on text. The effects include Sparkle, in which an animated highlight appears and disappears; Letter slide, in which the text is built up as letters slide one at a time; and Typewriter, in which the letters appear one at a time, as if typed.

Sales Awards

A typical sparkle effect

You can control the number of times the effect is repeated, the speed at which the effect occurs, the length of an initial delay, and the duration of the pause after the end of the effect.
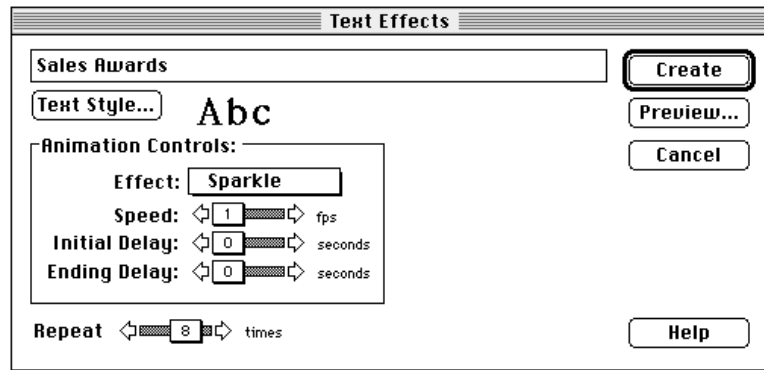
You can enter up to 255 characters in the text area. If you enter a name that is longer than 30 characters, Director only displays the first 30 characters in the dialog box.

Text Style
Gives you complete control over the text font, size, style, transparency, and color of the text.

Animation Controls

◆ Effect

Provides three choices for the effect you want. Choices include Sparkle, Letter Slide, and Typewriter.

◆ Speed

Controls how quickly the text moves up the screen.

◆ Initial Delay

Controls the length of time before the effect starts.

◆ Ending Delay

Controls how long the text is displayed after the effect is finished.

Repeat

Controls how many times the effect is repeated.

Preview

Displays the text effect as it will appear in the presentation, including any background images. Use the Preview screen to adjust the location of the text. To set the location, you click with the mouse. Setting the starting location sets the position of the center of the text.

Zoom Text…

Zoom Text allows you to create an animated zoom effect. "Zoom" comes from the motion picture camera technique of changing smoothly from a long shot to a closeup (zoom in), or from a closeup to a long shot (zoom out).

Starts small———————————————1993 Sales Meeting

Grows————————————1993 Sales Meeting

Becomes——1993 Sales Meeting
full size

A typical zoom text effect

You can choose whether the text you enter grows from nothing to full size (zoom in), from full size to nothing (zoom out), or first zooms in and then zooms out. The text grows and diminishes through animation. Director allows you to control the number of times the effect is repeated, the speed at which the effect occurs, the length of an initial delay, and how long the full-size text remains on the screen.
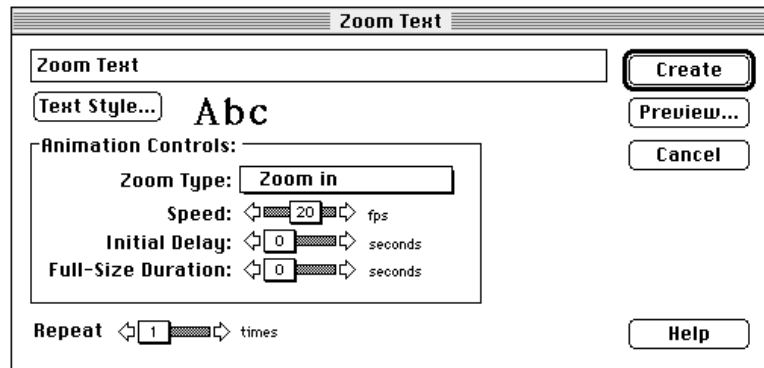
You can enter up to 75 characters in the text area. If you enter a name that is longer than 30 characters, Director only displays the first 30 characters in the dialog box.

Text Style
Gives you complete control over the text font, size, style, transparency, and color of the text.

Animation Controls

◆ Zoom Type

Determines whether the text zooms in, zooms out, or first zooms in and then zooms out.

◆ Speed

Controls how fast the animation occurs, in this case how quickly the text grows from nothing into full size or diminishes from full size to nothing.

◆ Initial Delay

Controls the length of time before the effect starts.

◆ Full-Size Duration

Controls how long the full-size text is displayed. Note that the text is full-sized at the beginning of a zoom out effect, in the middle of a zoom in and out effect, and at the end of a zoom in effect.

Repeat
Controls how many times the effect is repeated.

Preview
Displays the zoom as it will appear in the presentation, including any background images. Use the Preview screen to adjust the location of the text. To set the location, you click with the mouse. Setting the starting location sets the position of the middle of the text.

Score Window Options…

This command controls display options in the score window.

Score Window Options

Display Options:
- ☒ Colored Cells
- ☐ Magnified Cells
- ☒ Playback Head Follows Selection
- ☒ Drag and Drop

Extended Display Information:
- ☒ Cast Type, Movement, Anti-Alias, Blend
- ☒ Cast Number
- ☒ Ink Mode
- ☒ Script Code
- ☒ X & Y Coordinates
- ☐ Change in X and Y Location

OK

Cancel

Help
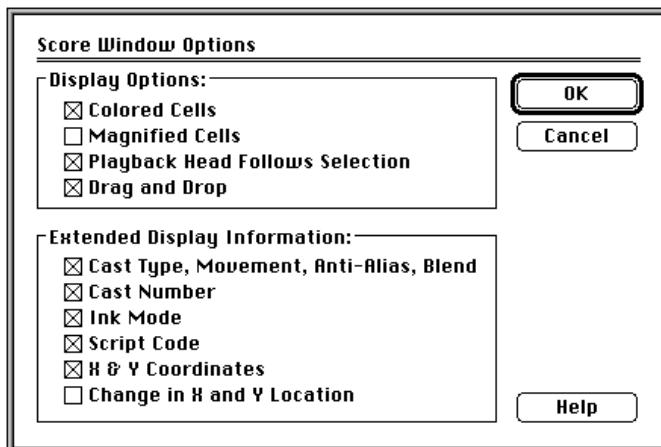
Display Options

Colored Cells

If checked, you can choose a color for selected cells using the cell
color selector on the left side of the Score window. If not checked,
the cell color selector is hidden.

Cell color selector
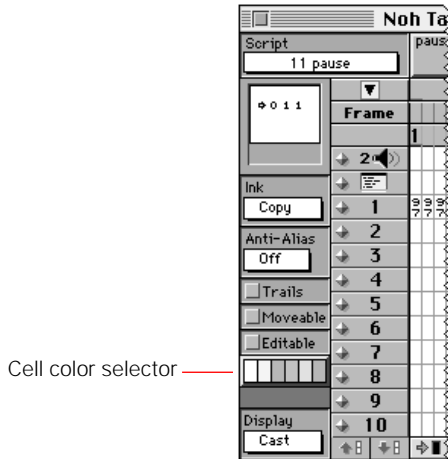
If you've already applied color to cells, unchecking this option hides
cell colors but doesn't remove them. Score window scrolling
performance is faster if you hide cell colors.

Magnified Cells

If checked, this option enlarges the cells in the score window for
better viewing. You can perform all the regular score operations
while the view is magnified.

Playback Head Follows Selection

This option toggles between two ways of selecting frames in the score. If checked, the playback head travels as you make a selection in the score window. You can see the selected frames on the stage as you select them. If not checked, your selection in the score window has no effect on the playback head and does not advance the movie as you make a selection. You might want to turn this option off if the score includes frames that take a long time to draw, such as frames with blend ink and anti-aliasing applied to them. (In earlier versions of Director, this setting was called Easy Select.)

▶ **Tip** *You can temporarily switch this option to its opposite setting by pressing the Option key while making a selection in the score window.*

Drag and Drop

This option allows you to turn off drag and drop in the score. Pressing the Spacebar while the score window is open temporarily overrides this setting.

Extended Display Information

The Extended Display options let you choose the notation information that appears in the numbered sprite channels in the score if you choose the Extended display command from the score window's Display pop-up menu.

◆   Cast Type, Movement, Anti-Alias, Blend displays the cast member type (text, PICT, or bitmap) and a directional arrow to indicate the cast member's position with respect to the previous cast member in that channel. It also indicates whether a cast member has an anti-alias setting or a blend percentage applied to it.

◆   Cast Number displays the cast member position number from the cast window. If the cast member displays its name (as chosen in the Cast Window Options dialog box), then the first few letters of the cast member name are instead displayed.

◆   Ink Mode displays the type of ink applied to the cast member in that cell.

◆   Script Code displays the number of the script associated with that cell or a plus (+) sign if the script is a cast member script.

◆   X & Y Coordinates show the screen coordinates of the cast member.

◆   Change in X and Y Location indicates the change in X and Y coordinates relative to the previous cast member in that channel.

Text menu

The Text menu controls the font, size, style, and alignment of text in the text, paint, markers, and cast windows, and on the stage.

To apply a font, size, or style to existing text in the text window, select the text before choosing a Font, Size, or Style command. If there is no selection in the text window, the font, size, or style you choose will be applied to future text entered in a text window.

In a text window, the Font, Size, or Style settings you choose can be applied on a per–character basis. The Alignment, Border, Margin, Box Shadow, or Text Shadow settings you choose are applied to the window's entire contents.

In the paint window, you can only choose one font, size, style, and text shadow for the text you are typing. (The Alignment, Border, Margin, and Box Shadow commands are not available in the paint window.) You can choose them before typing, or after typing but before clicking another tool or repositioning the insertion point. If you want to change the bitmapped text in the paint window after clicking the mouse button, you must erase the previous type and create new type in the style you want.

In the markers window, you can only choose one font, size, and style for all text in the window.

In the cast window, the Font, Size, Style, Alignment, Border, Margin, Box Shadow, and Text Shadow commands are available if one or more text cast members are selected. You can use these commands to change the text attributes of all selected text cast members at once.

Note   *If you format text, delete it, and then type new text, the new text appears in the default format. Deleting all the text in a text field on the stage or in the text window deletes the formatting.*

The Text menu has eight submenus: Font, Size, Style, Alignment, Border, Margin, Box Shadow, and Text Shadow.

Submenu	Purpose
Font	Lets you choose any font that is installed in your System.
Size	Controls the font size, in points. Point sizes that appear in outlined numbers are specifically designed for the currrently selected font and will look better than other font sizes.
Style	Lets you choose a style for text.
Alignment	Controls the alignment of text between the left and right borders of the text area. You can change the position of the right margin by dragging the right margin handle in a text window, or by dragging the handle of selected text on the stage.
Border	Adds a box around QuickDraw text on the stage.
Margin	Changes the distance between edges of the border and the text inside the border. Margins can only be used with QuickDraw text on the stage.
Box shadow	Adds a drop shadow to the text box. Drop shadows can only be used with QuickDraw text on the stage.
Text shadow	Adds a drop shadow to bitmapped or QuickDraw text. Drop shadow on text is a good way to ensure that your text will remain legible in color if you are planning to overlay text to videotape.

Find/Change…

Find/Change lets you quickly search for and replace text in the text or script windows. All searches start at the insertion point and work forward. The Find/Change dialog box lets you enter the text you want to find in the text or script window and the text you want to replace it with.
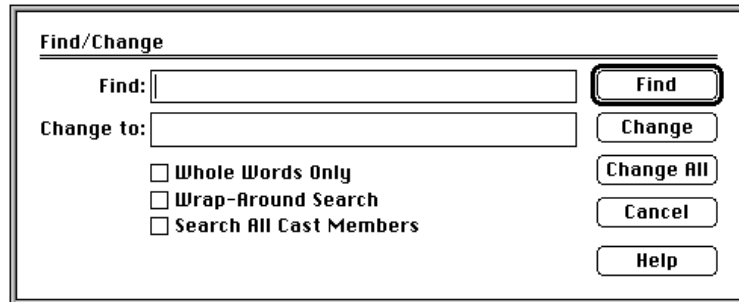
Director stores the settings you specify in the Director 4.0 Preferences file (but does not save the text you enter in the Find or Change to fields).

Searching begins at the location of the insertion point. If you want to search from the beginning of the window, make sure the cursor is at the upper-left corner of the window before you begin the search.

Find:
Enter the text you want to find. Searching is not case-sensitive: ThisHandler, thisHandler, and THISHANDLER are all the same for search purposes.

Change to:
Enter the replacement text.

Whole Words Only
Only finds occurrences of the search text as a separate word.

Wrap–Around Search

Specifies whether or not Director continues the search from the top of the window when it reaches the last line in the window. If this option is checked but Search All Cast Members is not checked, Director continues searching from the top of the current window after it reaches the bottom of the window. If both options are checked, Director searches all cast members of the same type (either text or script, depending on the window in which you initiated the search), beginning with the currently selected cast member, and wrapping around to the first cast member of that type if necessary.

Search All Cast Members

Specifies whether Director searches just the current cast member, or searches all cast members of the same type (either text or script, depending on the window in which you initiated the search). If checked, Director searches all cast members of the same type, beginning with the current cast member, and wrapping around to the first cast member if Wrap–Around Search is checked. If Search All Cast Members is not checked, Director only searches the current cast member's text or script window.

Find

Clicking Find closes the dialog box and finds the first occurrence of the specified text. The scope of the search depends on whether or not Search All Cast Members is checked. If a match is found, Director selects the text. If no match is found, Director beeps.

Change

Clicking Change closes the dialog box, finds the next occurrence of the specified text, starting from the insertion point, and replaces it with the specified text. The scope of the search depends on whether or not Search All Cast Members is checked. If no matching text is found, Director beeps.

Change All

Clicking Change All closes the dialog box and replaces all occurrences of the specified text. Director first displays an alert informing you that this operation cannot be undone. If Search All Cast Members is checked, Director replaces all occurrences of the specified text for all cast members of the same type; otherwise, Director limits the operation to the current text or script window.

Cancel

Clicking Cancel closes the dialog box without performing a search or replace. However, any changes you made to the settings in the dialog box are saved in the Director 4.0 Preferences file.

► ***Tip*** *Command-F is the keyboard shortcut for this command.*

Find Again

Find Again finds the next occurrence of the text you entered in the Find: field in the Find/Change dialog box.

► ***Tip*** *Command-G is the keyboard shortcut for this command.*

Find Selection

Find Selection lets you find the next occurrence of the currently selected text in the text or script window.

► ***Tip*** *Command-H is the keyboard shortcut for this command.*

Change Again

Change Again replaces the selected text and then searches for the next occurrence of the same text. You must choose this command again if you want to change the next occurrence of the selected text.

▶ **Tip** *Command-T is the keyboard shortcut for this command.*

Find Handler…

Find Handler lets you view the names of all handlers in the current script or movie. You can also use this command to open the script window that contains the selected handler.
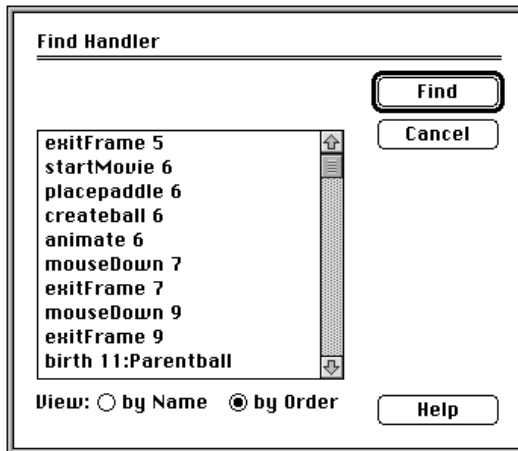
Find Handler

These buttons only appear if a script window is the active window. If any other window is active when you choose this command, all script handlers are listed.

◆   Current Script

    Lists the handlers defined in the current script.

◆   All Scripts

    Lists the handlers defined in all scripts.

View

◆   by Name lists handlers alphabetically, by name.

◆   by Order lists handlers in the order in which they appear in their respective scripts.

    Handlers from different scripts are listed in the order in which the scripts appear in the cast window.

Selecting a handler and clicking Find opens the script window in which the handler is defined.

▶   *Tip*   *Command-: is the keyboard shortcut for this command.*

Comment

Inserts the Lingo comment characters "--" at the beginning of the selected line(s).

▶   *Tip*   *Command-> is the shortcut for this command.*

Uncomment

Removes the Lingo comment characters "--" from the the beginning
of the selected line(s).

▶ **Tip**   *Command-< is the shortcut for this command.*

Recompile Script

Director saves any unsaved changes in the active script window, and
then compiles the window's script. This command is dimmed unless a
script window is the active window.

▶ **Tip**   *Command-Shift-R is the keyboard shortcut for this command.*

Recompile All Scripts

Recompiles all Lingo scripts and checks them for errors. If a script
error is found, the appropriate script window opens and the error is
selected.

If a script window is the active window, Director first saves any
unsaved changes in the current script window and compiles its script
before continuing.

▶ **Tip**   *Command-Option-R is the keyboard shortcut for this command.*

Palette menu

The Palette menu appears when the color palettes window is the active window. It contains commands for editing the current palette and for sorting its colors, and options for changing the colors in the palette.

Duplicate Palette…

Duplicates the current palette, asks you to name it, and puts it in the next available position in the cast window. Director automatically duplicates a palette if you change any of the colors in one of the built-in palettes. The duplicated palette is added to the list of available palettes in the color palettes window's pop-up menu. A duplicated palette in the cast of a movie becomes part of that file and is always available in that movie until it is cut or cleared from the cast window.

Reserve Colors…

Reserving colors in a palette is a way to isolate specific colors used in palette effects like color cycling. For example, if you are cycling colors and don't want to inadvertently use the cycling colors on a non-cycling cast member, reserve the cycling colors to prevent them from being used.

Once reserved, colors are not available for use in the paint window or when Director automatically selects colors, such as in a gradient or when re-mapping a cast member. The only exceptions are gradients that use adjacent colors. They will use any reserved colors in the gradient's color range.

To reserve colors, select them in the color palettes window and then choose this command.
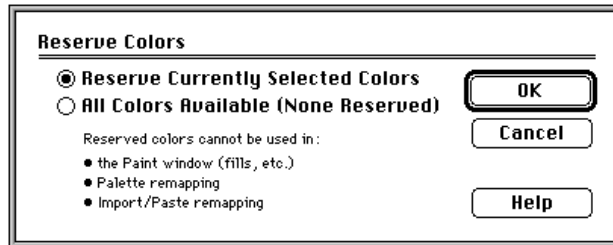
Make sure Reserve Currently Selected Colors is chosen, then click OK. Director puts a check mark next to the Reserve Colors command, to indicate that colors are reserved. (If you later make all colors available by choosing All Colors Available, Director removes the check.)

Reserved colors appear striped in the color palettes window. The Select Reserved button also appears in the window when you've reserved colors to help you see which colors are reserved.
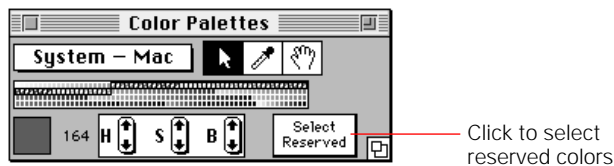
Click the Select Reserved button to display a black rectangle around each color that's reserved.

Invert Selection

When you choose Invert Selection after choosing a color or range of colors in the color palettes window, your selection is replaced by a new selection, which consists of all the colors that were not part of your original selection.

Set Color…

The Set Color command is dimmed unless you have a color selected in the color palettes window. When you choose this command, the Macintosh Color Picker appears. You can adjust the color of your selection in the color palettes window with the Color Picker. For information about using the Color Picker, see the manual that came with your Macintosh.

▶ *Tip*   *Double-clicking a color in the color palettes window is the shortcut for selecting a color and choosing this command.*

Blend Colors

Creates a blend of the first and last color of a selected range in the palette, producing a smooth color transition from the first selected color to the last selected color. Use it to create blends of color for color cycling or smooth gradients.

▶ *Tip*   *Press the Command key while selecting colors with the pointer or hand tool to make a discontiguous selection.*

Rotate Colors

Rotating selected colors displaces all the selected colors one square to the left. The leftmost color wraps around and appears at the last bottom right square. Each time you choose Rotate Colors, the selected colors shift by one more square. As the colors reach the left edge of the selection, they wrap around to the right edge and continue their journey. It is similar to the movement of color within a palette that you can see while colors cycle.

This is precisely what goes on when you use color cycling. If you are using a paint tool in the paint window with a cycling ink effect, the colors rotate through the palette as you draw. Another example of color cycling is in the Set Palette dialog box in the Score menu. You can select a range of colors to cycle as your movie plays. Any cast member that is the same color as one of the cycled colors will change as the colors rotate through the palette.

Reverse Color Order

Reverses the order of the selected colors: the first color of the palette becomes the last. The colors, however, remain unchanged. If you reverse the palette that is associated with a cast member, it produces a negative image of the cast member.

Sort Colors…

The Sort Colors command allows you to sort the selected colors in the palette by Hue, Saturation, or Brightness.

```
┌─────────────────────────────────────────┐
│  Sort Colors                            │
│  Sort Selected Colors by:   ┌─────────┐ │
│   ◉ Hue                     │  Sort   │ │
│   ○ Saturation              └─────────┘ │
│   ○ Brightness              ┌─────────┐ │
│                             │ Cancel  │ │
│                             └─────────┘ │
│                             ┌─────────┐ │
│                             │  Help   │ │
│                             └─────────┘ │
└─────────────────────────────────────────┘
```
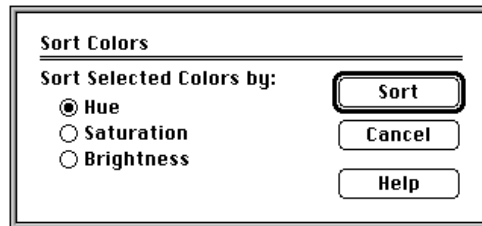
When you click Sort, the colors will appear in the palette according to the sorting order selected. If you sort colors after drawing cast members, the cast members that use the selected colors will also change color as the colors are sorted.

Select Used Colors…

The Select Used Colors command highlights colors that are used by the bitmap cast member or cast members selected in the cast window. This command is useful when you want to cycle only the colors contained in one specific cast member, or when you need to find those colors you can cycle without affecting a cast member. You can also use the Invert Selection command, after you select the used colors, to select the colors that are not used by a cast member.

Paint menu

The Paint menu appears when the paint window is open. It contains commands for editing artwork created or imported to the paint window.

Show/Hide Paint Tools

The Hide Paint Tools command eliminates the tool palette from the paint window, leaving you with more room to create your cast members. After you choose Hide Paint Tools, this command changes to Show Paint Tools.

▶ **Tip**   *Command-Shift-J is the keyboard shortcut for this command.*

Show/Hide Rulers

The Show Rulers command displays vertical and horizontal rulers in the paint window. The default setting for the unit of measure is inches. You can change the scale to picas, centimeters, or pixels by clicking the upper left corner where the vertical and horizontal rulers meet. The zero point of the rulers can be moved to a new location by dragging from the corner of the rulers. The current position of the pointer is indicated by dotted lines in the rulers. After you choose Show Rulers, the command changes to Hide Rulers.

▶ **Tip**   *Command-Shift-K is the keyboard shortcut for this command.*

Zoom In

Shows an enlargement of the artwork in the active easel. The enlargements can be 2, 4, and 8 times. Choose Zoom In from the Paint menu again to increase the magnification.

When you zoom in, a smaller representation of the 100% size artwork appears in the upper right corner of the paint window. To return to normal size, click inside the smaller window or choose Zoom Out.

▶ **Tip** *You can also magnify your artwork by double-clicking the pencil tool in the paint window's tool palette, or by Command-clicking the area you want to enlarge with any of the paint tools. To move around in a zoomed view, press the Spacebar.*

Command−+ (plus) is the shortcut for this command.

Zoom Out

Reduces the zoom factor on the artwork if you are using an enlarged view (i.e., if you have chosen Zoom In).

▶ **Tip** *Command-clicking in the paint window, or pressing Command-− (minus) is a shortcut for choosing Zoom Out.*

Tiles…

Tiles are a useful way to create patterns with more than two colors. Cast members in the paint window form the basis for creating a tile. When you choose a portion of a cast member to be made into a tile the cast member becomes a building block for a pattern created with a field of tiles. You can use tiles in the paint window or with the QuickDraw shapes in the tools window.
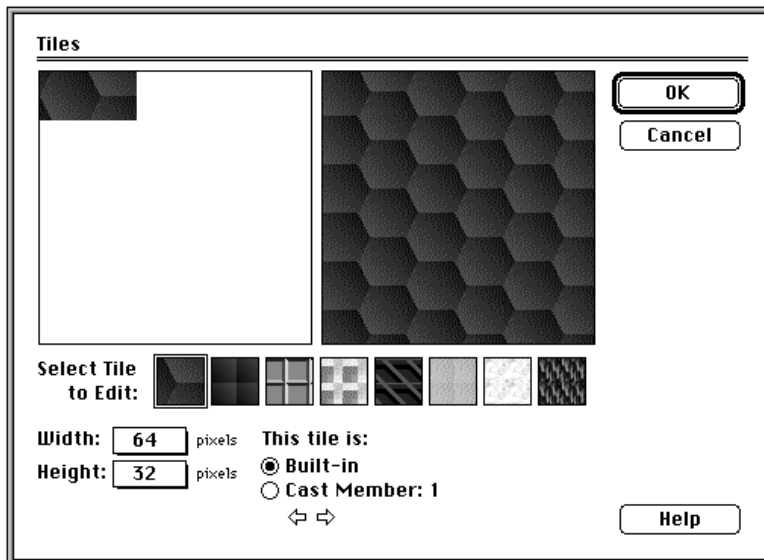
The Tiles dialog box lets you select the tile position, the cast member to make into a tile, what portion of the cast member to use for the tile, and the tile size.

The selection rectangle in the cast member box at the upper left of the Tiles dialog box determines which part of the cast member is used for the tile. Drag the rectangle to reposition it on a different part of the cast member or click a new spot in the cast member view to reposition the dotted rectangle.

Select Tile to Edit

Click the tile you want to edit. An enlarged version of the tile is displayed in the dialog box.

Width, Height

Lists the available tile sizes in pixels. You can make a tile as small as 16 by 16 pixels or as large as 128 by 128 pixels. As the size of the tile increases, more of the cast member is used for the tile.

This Tile Is

Controls which cast member is the basis for your tile. Click Built-In to indicate that the selected tile is one of the default tiles. Click the Cast Member radio button if you want to make a tile from a cast member in your movie. When you click the Cast Member radio button, left and right arrows appear that permit you to step through all the graphic cast members in your movie.

Creating tiles from a cast member

You can use tiles to make multi-colored patterns. There are eight default tiles that are always available for you to use, or you can create your own. The tiles you create are stored with the Director movie they were created in.

Once created, the tile appears in the patterns pop-up menu and can be used like any other pattern. The current foreground and background colors have no effect on the color of the tiles but switching palettes changes the color of the tiles.

To create a tile:

1. **Choose Tiles from the Paint menu.**
   The radio buttons determine whether the tile you select is built–in or made from a cast member.

2. **Click Cast Member.**
   This radio button is dimmed if all the cast members in the movie are 1-bit cast members. Tiles can only be made from cast members with color depths greater than 1 bit.

3. **Click the left or right arrows to choose a cast member.**
   As you click the arrows, the cast members in the paint window appear in the left side of the Tiles dialog box.

4. **Choose a size using the Width and Height pop-up menus.**
   As you choose a width and height for your tile, the dotted box in the left side of the Tiles dialog box changes shape to indicate the tile's size. You can also drag the dotted box to make a tile from a different part of the cast member.

5. **Click OK.**
   The tile you made is displayed in the bottom row of the pattern palette.

You can choose and use the tile just as you would select and use a pattern.

Patterns…

Use the Patterns command to change the Custom paint patterns.

The patterns pop-up menu permits you to switch between Custom, Grays, Standard, and QuickDraw patterns. Only the Custom patterns are editable.
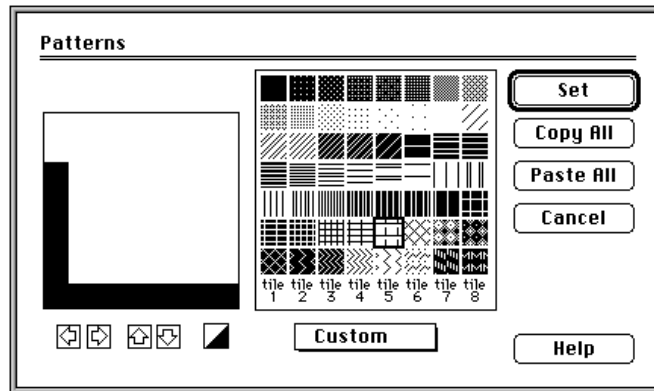
To copy a built–in pattern to the custom set of patterns:

1. **Choose one of the built-in sets of patterns from the pop-up menu.**

2. **Click Copy All.**

3. **Choose Custom from the pop-up menu.**

4. **Click Paste All.**
   The set of built–in patterns is pasted to the Custom pattern menu. You can now edit any one of the individual patterns.

The currently selected pattern is displayed at the left side of the dialog box. If you want to edit a different pattern, click the pattern in the pattern palette at the right side of the dialog box. Once you select the pattern you want to edit, you can click the pixels in the magnified view. Clicking a white pixel turns it black, and vice versa. The buttons below the editing area give you additional pattern editing abilities.

You can "pick up" patterns from areas outside the Patterns dialog box by clicking outside the dialog box. The selected pattern changes to the pattern in the area you click.

The right and left arrows bounce the pattern one pixel to the right or to the left.

The up and down arrows bounce the pattern up or down one pixel.

The black and white square inverts the colors of the pattern (e.g., black becomes white and white becomes black).

If you want to edit the Grays, Standard, or QuickDraw patterns, you can swap entire sets of patterns in the patterns pop-up menu using the Copy All and Paste All buttons. When you have a set of custom patterns you like, click Copy All, and then click Cancel. Paste the patterns into the Scrapbook. Later, you can copy the patterns from the Scrapbook and use the Paste All button to install them again as custom patterns.

When you click Set the changes are reflected in the patterns pop-up palette in the tools and paint windows. Any custom patterns you create are stored in the Director 4.0 Preferences file.

Brush Shapes…

The Brush Shapes dialog box lets you change the shape of the paintbrush. You can choose Brush Shapes from the Paint menu, or double-click the paintbrush in the paint window's tool palette. The custom brushes you create are stored in the Director 4.0 Preferences file.

The brush shapes pop-up menu in the dialog box permits you to choose from the standard default brush shapes, or create your own brush shapes from the set of custom brush shapes. Only the custom brush shapes are editable.
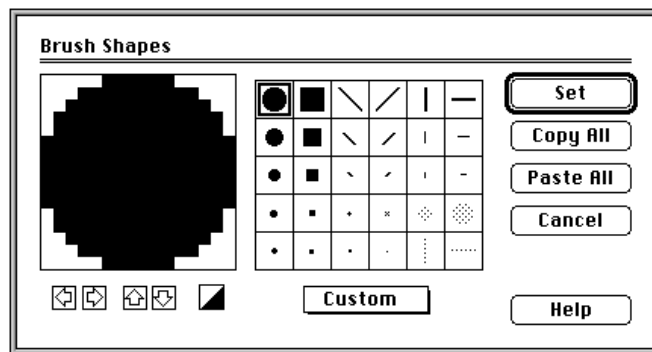
Change a custom brush shape by clicking one of the brush shapes on the right. You can edit the current brush shape by clicking the magnified image of the brush shape. Clicking a blank pixel fills it and clicking a filled pixel makes it blank.

Clicking outside the Brush Shapes dialog box picks up the shape on the screen at the point you click.

The right and left arrows move the brush shape one pixel to the right or to the left.

The up and down arrows move the brush shape up or down one pixel.

Click the black and white square to reverse the colors of the brush shape (e.g., black becomes white and white becomes black).

You can store sets of custom brush shapes in the Scrapbook for future use. Click Copy All to copy the brush shapes you want to save, click Cancel, and then paste them into the Scrapbook. To use them again later, copy the brush shapes from the Scrapbook and use the Paste All button to paste them into the custom set of brush shapes.

Air Brushes…

The Air Brushes dialog box defines the size of the area the air brush covers, the size of the dots in the air brush's spray, and the flow speed of the air brush's paint. The three radio buttons at the top of the Air Brushes dialog box control whether the air brush sprays uniformly sized dots, randomly sized dots, or dots shaped like the currently selected paintbrush.

▶ **Tip** *Double-clicking the air brush in the paint window tool palette is a shortcut for choosing this command.*
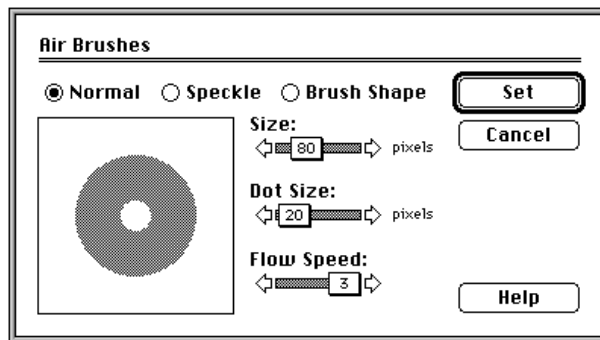
◆ Normal

Click Normal if you want the drops sprayed by the air brush to be uniformly sized.

◆ Speckle

Click Speckle to paint with randomly sized drops.

◆ Brush Shape

Click Brush Shape to spray with drops shaped like the current paintbrush.

Size

To set the size of the air brush's spray area, drag the Size scrollbar.

Dot Size

To set the size of the dots sprayed by the air brush, drag the Dot Size scrollbar.

Flow Speed

Controls how fast the air brush covers an area with paint. To change the flow, drag the Flow Speed scrollbar.

Gradients…

The Gradient effect creates a blend of colors that you can use for backgrounds, highlights, shading, and special effects. Limited gradient effects can be created with a black and white monitor.

Gradient destination color chip

Foreground color chip

Background color chip
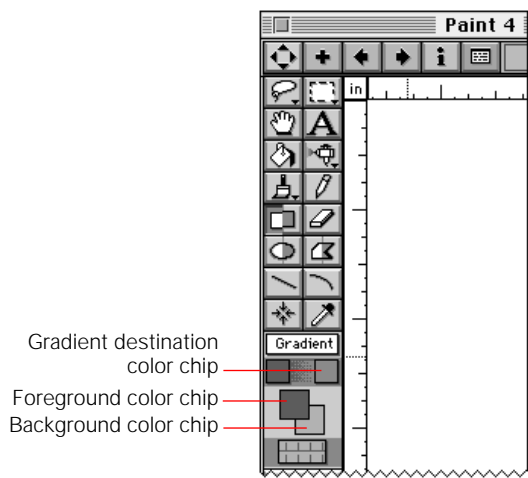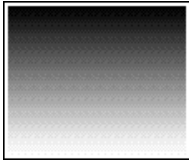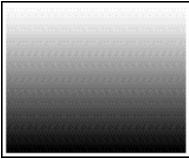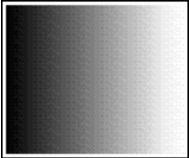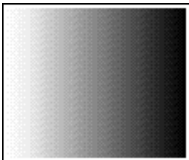
The foreground color and gradient destination color can be selected in the paint window with the gradient destination color chip or with the controls in the Gradients dialog box. When in the paint window, use the pop-up palette on the foreground color chip to select the foreground color. Pick the destination color with the pop-up palette at the right side of the gradient selection bar above the foreground and background color chips. The current foreground color is displayed at the left of the gradient destination color chip and the current destination color is displayed on the right side of the gradient destination color chip.
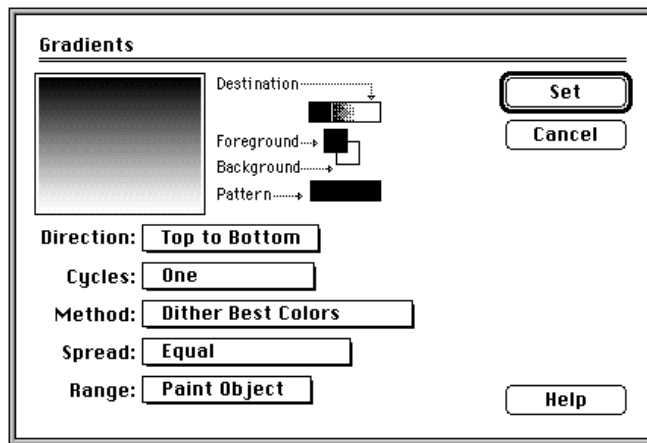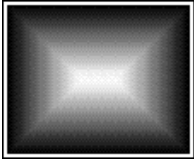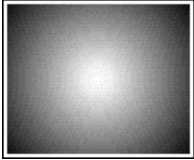
When you choose Gradients from the Paint menu you can set the foreground and destination colors as well as the pattern to use with your gradient. The Gradients dialog box also has several pop-up menus to control the style of your gradient fill. Each choice you make is immediately previewed in the Gradients dialog box.

Direction
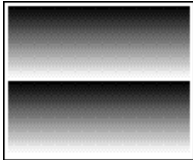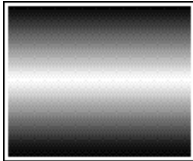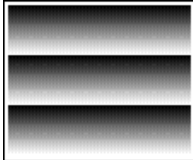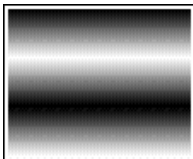
This pop-up menu determines the way the gradient fills an area in the paint window. The commands determine where the dark and light colors of your blend are located.

Option	Example	Description
Top to Bottom		Puts the foreground color at the top and the destination color at the bottom.
Bottom to Top		Puts the destination color at the top and the foreground color at the bottom.
Left to Right		Puts the foreground color on the left and the destination color on the right.
Right to Left		Puts the foreground color on the right and the destination color on the left.
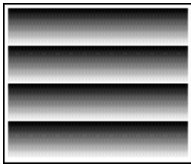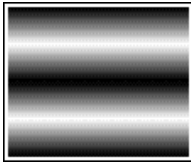
Option	Example	Description
Directional		Lets you determine the direction of the gradient. When you select this option, you will be able to set the direction of the gradient in the paint window with the paint tool used to fill the area. For example, if you use the paint bucket to gradient fill an area, a directional line appears as soon as you click the paint bucket in the area to be filled. Move the line without clicking the mouse button to establish the direction of the gradient. When the line is in the direction you want, click to fill the area with the gradient in the direction you specify. The length of the line has no effect.
Shape Burst		Creates a gradient that starts at the edge of the area and moves toward the center following the contours of the area. You can use Shape Burst with all the fill tools, the paintbrush, and the paint bucket.
Sun Burst		Starts filling at the edge of the artwork and moves in concentric circles to the center

Cycles

Controls the number of times the gradient is created within one filled area, and whether or not the colors cycle through the palette in one direction only, or auto reverse at the end of one pass through the palette. Sharp cycles have a banded appearance, while smooth cycles go from foreground to destination, then back to foreground.

Option	Example	Description
One Cycle		Takes the gradient once through the range of colors you define.
Two Sharp		Takes the gradient through the range of colors twice, from foreground to destination and from foreground to destination.
Two Smooth		Takes the gradient from foreground to destination, then from destination to foreground.
Three Sharp		Takes the gradient from foreground to destination three times.
Three Smooth		Takes the gradient from foreground to destination, destination to foreground, foreground to destination.

Option	Example	Description
Four Sharp		Takes the gradient from foreground to destination four times.
Four Smooth		Takes the gradient from foreground to destination, destination to foreground, foreground to destination, and destination to foreground.

Method

The Method pop–up menu commands control whether the gradient is made with the pattern you select with the pattern chip pop–up palette in the paint window, or with a dithered pattern. You can clearly see the difference in methods when you have a pattern rather than a solid color selected.

Option	Description
Pattern Best Colors	Ignores the order of the colors in the palette and only uses colors that create a continuous blend of the foreground and destination colors.
Pattern Best Colors See Thru	Ignores the order of the colors in the palette and only uses those colors that create a continuous blend of the foreground and destination colors. White pixels in patterns created with this method are transparent.
Pattern Adjacent Colors	Uses all the colors in the palette between the foreground and destination for the gradient.
Pattern Adjacent Colors See Thru	Uses all the colors in the palette between the foreground and destination for the gradient. White pixels in patterns created with this method are transparent.
Dither Best Colors	Ignores the order of the colors in the palette and only uses colors that create a continuous blend from foreground to destination colors and blends them with a dithered pattern. Dithering is a technique of creating color with two or more colors of pixels interspersed together.
Dither Adjacent Colors	Uses all colors between the foreground and destination colors and blends them with a dithered pattern.
Dither Two Colors	Uses only the foreground and the destination colors and blends them with a dithered pattern.
Dither One Color	Uses only the foreground color and fades it with a dithered pattern.
Standard Dither	Ignores all colors between foreground and destination and adds several blended colors with a dithered pattern to create the gradient.
Multi Dither	Ignores all the colors between foreground and destination and adds several blended colors with a randomized dithered pattern to create a smooth gradient. You can interrupt the drawing of this kind of dither by clicking anywhere in the dialog box.

Spread

The commands in the Spread pop-up menu let you choose how to distribute colors between the foreground and the destination colors of the gradient.

Option	Description
Equal	Provides an even spacing of colors between the foreground and the destination colors.
More Foreground	Increases the amount of the foreground color in the gradient.
More Middle	Increases the amount of the middle color in the gradient.
More Destination	Increases the amount of the destination color in the gradient.

Range

Range commands let you determine whether the full range of the gradient is created over the paint object, cast member, or the entire paint window. The options provide greater control over how the gradient is created relative to the cast member's position on the stage or in the paint window.

Option	Description
Paint Object	Paints the full gradient as the fill or brush stroke of the object, regardless of the object's location in the paint window.
Cast Member	Paints the full gradient with respect to the size of the cast member.
Window	Paints a full gradient only if the object is the length or width of the entire window, otherwise it paints a partial gradient corresponding to the object's location in the window.

Paint Window Options…

The Paint Window Options command allows you to modify the settings of a number of tools and drawing methods in the paint window. All of the options you choose are saved in the Director 4.0 Preferences file.

```
┌─────────────────────────────────────────────────────────┐
│ Paint Window Options                                     │
│ ┌─Display:──────────────┐ ┌─Effects:─────────┐  ┌──────┐ │
│ │ ● One Cast Member     │ │ For Smooth, Lighten, │ │  OK  │ │
│ │ ○ 50 Cast Members     │ │ and Darken Ink Effects: │ └──────┘ │
│ └───────────────────────┘ │ ● Use Best Colors │  ┌──────┐ │
│ ┌─Brushes:──────────────┐ │ ○ Use Adjacent Colors │ │Cancel│ │
│ │ □ Color Sticks to     │ │                  │  └──────┘ │
│ │   Brush Tools         │ │ Lighten & Darken Rate: │         │
│ │ ⊠ Ink Effect Sticks   │ │ slow ◁[16]▭▭▷ rapid │         │
│ │   to Tool             │ │ Blend Amount:    │         │
│ │ ⊠ Smooth Cycle Brush  │ │ ◁▭[50]▭▷ %       │         │
│ └───────────────────────┘ └──────────────────┘         │
│ Other Line Width: ◁[4]▭▭▷ points         ┌──────┐ │
│                                           │ Help │ │
│                                           └──────┘ │
└─────────────────────────────────────────────────────────┘
```
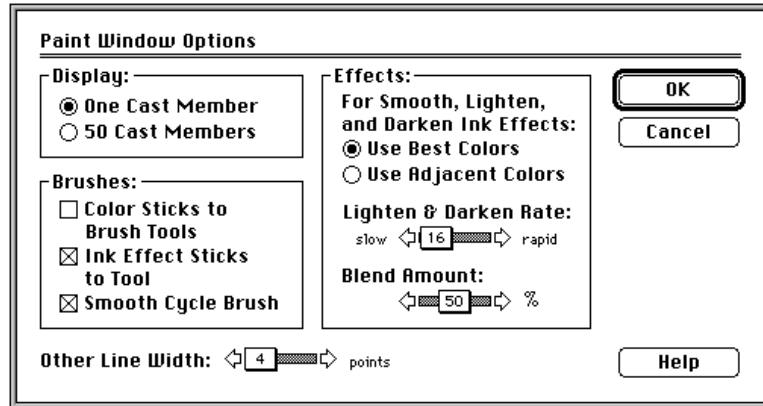
Display

◆ One Cast Member

Permits you to see one cast member at a time in the paint window.

◆ 50 Cast Members

Permits you to see multiple cast members at a time. Each cast member occupies an individual easel in the paint window. The easels can be resized by dragging the handle in the lower right corner of the easel.

Brushes

◆ Color Sticks to Brush Tools

   If checked, the last color used with a tool stays selected the next time you use the paintbrush or air brush.

◆ Ink Effect Sticks to Tool

   If checked, the last ink used with a tool stays selected the next time you use the paintbrush or air brush.

◆ Smooth Cycle Brush

   Controls the way colors cycle when you draw with cycling ink. If checked, this option produces a cycle that goes from the foreground to the destination color and then destination to foreground. If not checked, colors cycle from foreground to destination, then repeat foreground to destination.

Effects

These settings apply to the smooth, lighten, darken, and cycle effects.

◆ Use Best Colors

Use Best Colors ignores the order of the colors in the palette and produces a continuous blend of the foreground and destination colors.

◆ Use Adjacent Colors

Use Adjacent Colors uses all the colors in the palette between the foreground and destination colors when using smooth, lighten, darken, or cycle effects.

◆ Lighten & Darken Rate

Sets the rate at which artwork changes when you use the Darken or Lighten effect in the paint window or when you choose Darken or Lighten from the Effects menu. You may have to experiment to find the best setting.

◆ Blend Amount

Blend Amount sets the opacity of the selected color when using the Blend effect in the paint window. Use the scrollbar to vary the blend value between 0 and 100 percent.

Other Line Width

Other Line Width allows you to set a thicker line width than the widths available in the paint window. You can change the line's width, as measured in pixels, with the scroll bar. The width you set will be the width that appears when you draw a line after selecting Other in the line width selector in the tool palette.

Effects menu

The Effects menu is available when there is a selection in the paint window. It contains commands to transform your artwork in various ways. The full range of Effects menu commands is available to you when you use the selection rectangle to select the artwork. Not all the Effects menu commands are available to you when you select the artwork with the lasso.

Invert Colors

The Invert Colors command reverses the colors of the selected area in the paint window. To see what the reverse colors are, open the color palettes window, select all the colors in the palette, and choose Reverse Colors from the Palette menu. You'll see that the effect is an upside-down mirror image of the palette. If you are working in black and white, Invert Colors changes black to white and vice versa.

Flip Horizontal

Turns the selected area in the paint window horizontally from right to left.

Flip Vertical

Turns the selected area in the paint window vertically from top to bottom.

Trace Edges

Trace Edges creates an outline around the edges of the selected artwork. The outline is the same color as the selected line, if the line is a solid color. If the original line is multicolored, an outline is created for each section of the line. You can add multiple outlines by choosing Trace Edges or Repeat Effect repeatedly.

Fill

The Fill command fills a selected area with the current foreground color and pattern.

Darken

Reduces the brightness of the selected artwork. It is the same as decreasing the brightness in the color palettes window or in the Macintosh Color Picker.

Lighten

Increases the brightness of anything in the selection rectangle. It is equivalent to increasing the brightness in the color palettes window or in the Macintosh Color Picker.

Smooth

Softens the edges of the selected artwork by adding pixels of blended color to the artwork's edges.

Switch Colors

Switch Colors changes each pixel that is the currently selected foreground color to the currently selected destination color.

Note *This command only works for images whose color depth is 8 bits or less.*

Rotate Left

Rotates the selected area in the paint window 90 degrees counterclockwise.

Rotate Right

Rotates the selected area in the paint window 90 degrees clockwise.

Free Rotate

Allows you to rotate the selected area in the paint window any number of degrees clockwise or counterclockwise. When you choose Free Rotate, handles appear at the corners of the selection rectangle. To rotate the artwork, drag any handle in the desired direction.

The Free Rotate command is one of four special effects you can apply to artwork selected with the selection rectangle in the paint window. The other special effects are Perspective, Slant, and Distort. When you choose one of the special effects after selecting the artwork, handles appear at each corner of the selection. Dragging the handle produces the desired effect.

Perspective

Perspective stretches the selected artwork to give it a perspective effect. When you choose Perspective, handles appear at the corners of the selection rectangle. Drag one or more handles to create the effect you want. For example, you can bring the two top handles closer together to create the illusion of linear perspective.

▶ **Tip** *To make artwork appear to be vanishing into the distance, choose Perspective and move the handles on one side of your selection together and the handles on the opposite side of your selection apart.*

Slant

The Slant command skews the selected artwork. When you choose Slant, handles appear at the corners of the selection rectangle. Dragging a handle in the desired direction moves the opposing corner an equal amount in the same direction, maintaining a parallelogram shape.

Distort

When you choose Distort, handles appear at the corners of the selection rectangle. Each corner can be dragged in any direction independent of the other corners. When you release the mouse button, the selected artwork assumes the shape that you have created.

Auto Distort…

The Auto Distort command automatically generates in-between
positions for any cast member that is free rotated, made into a
perspective, slanted, distorted, or stretched. After artwork has been
altered with one of these five effects, and before you deselect the
artwork, choose Auto Distort, and type the number of in-between
cast members in the Create New Cast Members field in the Auto
Distort dialog box. The new cast members are placed in the next
available cast member positions.

Auto Distort

First: Use Rotate, Slant, Perspective, or Distort.
Then: Use this command to generate cast members
for in-betweens.

Create ⟨1⟩ **New Cast Members**
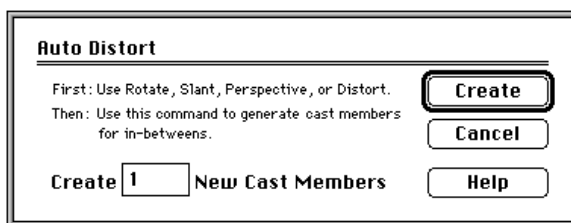
[**Create**]
[**Cancel**]
[**Help**]

For a rotated bitmap image, Auto Distort uses the center of the image
as the rotation point. Consequently, you will have to use the paint
window's registration tool to reset the registration point of each
in-betweened cast member created by the Auto-Distort operation.

To reset the registration point:

1. **Before you rotate the image, create a temporary dot in the image at the desired rotation point.**
   Make this dot a unique color so you can change it to the proper color later.

2. **Select the image and rotate it using the appropriate rotate command on the Effects menu.**

3. **Choose the Auto Distort command and specify the number of in–between cast members.**

4. **Use the registration tool to click the colored dot within each cast member in the rotation sequence.**

5. **Use the Switch Colors command to change the colored dot to the appropriate color.**

▶ **Tip**   *Use the Auto Distort command in conjunction with Rotate Left, Rotate Right, Free Rotate, Perspective, Slant, or Distort to quickly create a number of cast members in between the artwork you selected and the artwork that has been changed. Auto Distort also works with artwork that is stretched or squeezed in the paint window.*

Repeat Effect

Repeats the last command chosen from the Effects menu for the selected area. It's a shortcut for choosing that command again.

▶ **Tip**   *Command–Y is the keyboard shortcut for this command.*

The Lingo menu
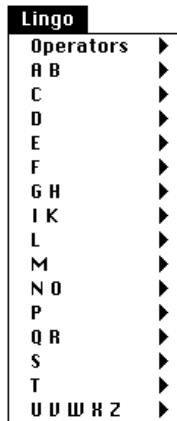
The Lingo menu appears when the message or script windows become the active window. This menu displays the complete set of Lingo commands that you can use to create scripts for your movie.

Use the Lingo menu to enter any Lingo command into a script. This saves you from typing the command and also eliminates typing errors. Simply choose the command you want from the appropriate submenu. The command is entered in the script at the insertion point. For a complete description of the Lingo menu, refer to the *Using Lingo* manual, or use the help pointer to display an explanation for a particular command.

Appendix A

Director Shortcuts

In addition to the keyboard shortcuts listed in the menus,
Director has many additional shortcuts.

Menu shortcuts

Apple menu

Command	Shortcut
Help Pointer	Command-?, Command-/, or pressing Shift-Option and clicking a menu command

File menu

Command	Shortcut
New	Command-N
Open	Command-O
Close Window	Command-W
Close All Windows	Command-Option-W (or Option—Close Window)
Save	Command-S
Save and Compact	Command-Option-S
Save As	Command-Shift-S
Import	Command-J
Export	Command-Shift-E
Movie Info	Command-U
Preferences	Command-Option-U
Print	Command-Option-P
Quit	Command-Q

Edit menu

Command	Shortcut
Undo	Command-Z
Cut	Command-X
Copy	Command-C
Paste	Command-V
Clear	Delete
Select All	Command-A
Play	Command-P or Enter (toggles between Play and Stop) or keypad plus(+)
	Shift-Enter clears the stage and plays
Stop	Command-. or keypad Enter or 2, 5, or . (period)
Rewind	Command-R or keypad 0
Step Backward	Command-left arrow or keypad 1 or 4
Step Forward	Command-right arrow or keypad 3 or 6
Disable Sounds	Command-~ or Command-` or keypad 7
Loop	Command-L or keypad 8
Selected Frames Only	Command-\ or Command-|

Window menu

Command	Shortcut
Stage	Command-1
Control Panel	Command-2
Cast	Command-3 or Command-up arrow
Score	Command-4
Paint	Command-5
Text	Command-6
Tools	Command-7
Color Palettes	Command-8
Digital Video	Command-9
Script	Command-0
Message	Command-M
Tweak	Command-Shift-T
Markers	Command-Shift-M

Cast menu

Command	Shortcut
Cast Member Info	Command-I
Open Script	Command-tick mark (')
Edit Cast Member	Double-click or Command-down arrow
Launch External Editor	Command-comma (,)
Reselect external editor and launch	Command-Option-comma (,)
Paste as PICT	Command-Shift-Y
Duplicate Cast Member	Command-D
Find Cast Members	Command-semicolon (;)

Score menu

Command	Shortcut
Sprite Info	Command-K
Delete Sprites	Command-Delete
Set Sprite Blend	Command-Option-B
Paste Relative	Command-Shift-V
Insert Frame	Command-]
Delete Frame	Command-[
In-Between Linear	Command-B
In-Between Special	Command-Shift-B
Switch Cast Members	Command-E

Text menu

Command	Shortcut
Find/Change	Command-F
Find Again	Command-G
Find Selection	Command-H
Change Again	Command-T
Find Handler	Command-colon (:)
Comment	Command-greater than (>)
Uncomment	Command-less than (<)
Recompile Script	Command-Shift-R
Recompile All Scripts	Command-Option-R

Paint menu

Command	Shortcut
Show/Hide Paint Tools	Command-Shift-J
Show/Hide Rulers	Command-Shift-K
Zoom In	Command-+ (and Command-=)
Zoom Out	Command-- (and Command-_)

Effects menu

Command	Shortcut
Repeat Effect	Command-Y

Window shortcuts

Contents of stage

When there is a sprite selected on the stage, the arrow keys nudge. Exceptions (i.e., windows that grab the arrow keys first) are within a text selection in the paint, text, markers, and script windows.

Action	Shortcut
Open cast member editor	Double-click sprite
Inks pop-up	Command-click
Toggle record light on and off	Option-click sprite
Real-time record	Control-spacebar drag cast member
Display cast member info	Control-click sprite
Display sprite script	Control-Option-click sprite
Change contents of stage to black	Keypad - (minus)
Invert everything on stage	Keypad /
Cursor display on/off	Keypad =
Previous marker comment	Keypad: Option-1 or Option-4
Next marker comment	Keypad: Option-3 or Option-6

Cast window/Cast editor windows

Action	Shortcut
Open cast member editor	Double-click a paint, text, palette or script cast member or Command-Shift-down arrow
Switch selected cast member with score selection	Option-double-click thumbnail
Display cast member info	Control-click cast thumbnail
Display cast member script	Control-Option-click cast thumbnail
Open script in new window	Option-click Script button or Option-Open Script command
Place button	Command-Shift-L (places in center of stage)
Center multiple cast members on stage over time	Command-Option--L
Add button (new cast member)	Command-Shift-A
Left arrow (previous cast member)	Command-Shift-left arrow
Right arrow (next cast member)	Command-Shift-right arrow
Scroll up or down one window	Page Up, Page Down
Scroll to top left of cast window	Home
Scroll to show last occupied cast member	End
Scroll to a cast member	Type cast number. Press Return key to scroll immediately. Delete key deletes last digit typed.
Scroll to a selected cast member	Double-click cast number
Resize digital video window to larger size	Double-click zoom box

Score window

Action	Shortcut
Duplicate selection of cells	Option-drag
Open cast editor for selected sprite	Double-click cast thumbnail
Select entire range of a cast member	Double-click cell with a sprite in it
Select channel	Double-click channel number
Select multiple channels	Double-click channel number and drag up or down
Toggle record light	Option-click channel number
Move playback head to end of movie	Tab
Move playback head to first frame	Option-Tab
Move playback head to beginning/end of selection	Command-Shift-left/right arrow
Open markers window	Double-click any marker
Open appropriate Set dialog box	Double-click tempo, palette, or transition channel
Open Set Sound dialog box	Select one or more cells in a sound channel and then Command-double-click in the selected sound cells.l
Go to next marker comment (or jump 10 frames)	Command-Option-right arrow
Previous marker comment (or back 10 frames)	Command-Option-left arrow
Shuffle Backward	Command-Shift-Up arrow
Shuffle Forward	Command-Shift-Down arrow
Temporarily turn off/on drag and drop	Press Spacebar

Paint window

Action	Shortcut
Undo	~
Next/previous cast member	Keypad left/right arrow keys
Turn selected tool into foreground eyedropper	Control key, while pressed
Turn selected tool into background eyedropper	Shift-Control key, while pressed
Turn selected tool into destination eyedropper	Control-Option key, while pressed
Turn selected tool into hand tool	Spacebar, while pressed
Nudge selection rectangle or lasso selection	Keypad arrows with selection rectangle or lasso
Change airbrush size	Keypad up/down arrows with airbrush selected
Change airbrush flow	Keypad left/right arrows with airbrush selected
Change foreground color	Keypad up/down arrows, all other tools
Change background color	Shift-keypad up/down arrows, all other tools
Change destination color	Option-keypad up/down arrows, all other tools
Draw border with current pattern	Option-shape or line tools
Select background color	Shift-eyedropper
Select destination color	Option-eyedropper
Toggle between custom/grayscale patterns	Option-click pattern
Polygon lasso	Option-lasso

Action	Shortcut
Duplicate selection	Option-drag
Stretch	Command-drag
Draw with background color	Option-pencil tool
Open Gradients dialog box and set ink to gradient	Double-click ellipse, paintbrush, rectangle, paint bucket, or polygon tool
Open Air Brushes dialog box	Double-click airbrush
Clear visible part of window	Double-click eraser
Open color palettes window	Double-click foreground, background, or destination color chip
Open Patterns dialog box	Double-click pattern chip
Open Brush Shapes dialog box	Double-click paintbrush
Open Paint Window Options	Double-click line width selector
Open Transform Bitmap dialog box	Double-click color resolution indicator
Toggle Zoom in/Zoom out	Command-click in window or double-click pencil tool

Color palettes window

Action	Shortcut
Open Set Color dialog box	Double-click a color

Markers window

Action	Shortcut
Move cursor to next or previous comment	Command-Option-left/right arrow

Message window

Action	Shortcut
Go to top/bottom of window	Command-up/down arrow
Delete contents of window	Command-Shift-Delete

Glossary

AIFF	An acronym for Audio Interchange File Format. A standard for exchanging sound information between applications.
anti-aliasing	Removes or reduces edge distortions in an image by adding and subtracting pixels to enhance the appearance of the image.
background	Objects that appear to be behind other objects on the stage. Objects in channels closer to the top of the score are said to be in the background, since they appear behind objects closer to the bottom of the score.
background color	The background color is the secondary color that appears in a pattern and the gradient destination color for use with gradients. The background color is set using the background color chip in the paint window.
bit depth	The number of bits per pixel a video card is capable of displaying. Director supports 1-, 2-, 4-, 8-, 16-, 24-, and 32-bit color environments.
bounding box	The rectangular border around the image of a sprite on the stage.
cast	The cast is a multimedia database of graphics, film loops, sounds, text, palettes, scripts, buttons, shapes, movies, and digital video movies that are stored in the cast window.
cast member	An individual graphic, text, film loop, movie, sound, palette, script, button, shape, or digital video movie stored in the cast window.
cast member number	The number that identifies a cast member in the cast window.
cell	The smallest unit in the score window. Each cell contains information about one cast member at one point in time, called a sprite. See also *sprite*.
channel	A row in the score. Each channel holds one sprite or one special effect. The score window has 48 channels for graphics, 5 effects channels for palettes, transitions, tempos, and sounds, and a script channel for creating Lingo scripts.

color cycling	A color effect that steps through a defined range of colors. When color cycling is applied to artwork, pixels that are the same color as the colors in the defined range change colors as the defined range cycles.
color depth	The number of colors a cast member can display.
color resolution	Similar to color depth, color resolution refers to the number of colors a monitor can display at one time. Depending on the video display card you're using, your monitor can display 1-bit color (black and white), 4-bit color (16 colors), 8-bit color (256 colors), 24-bit color (16.7 million colors), and 32-bit color (16.7 million colors and 8-bits of special effects).
common palette	A palette that contains a representative sample of colors that permits artwork created with a variety of palettes to be displayed in colors that are as similar to the original colors as possible.
current frame	The frame which is currently displayed on the stage. The current frame number is shown in the frame counter in the control panel. In the score, the playback head points to the current frame.
current palette	The palette that controls the color of the artwork on the stage in the current frame.
digital video	A generic term that refers to QuickTime on a Macintosh and Video for Windows on a PC.
dithering	The process of changing a range of grey scales to patterns of black and white.
editable	In the score, controls whether or not users can edit a text sprite on the stage during playback.
foreground	Artwork that appears in front of other artwork on the stage is said to be in the foreground. In the score window, artwork in channels closer to the bottom of the score appears in front of artwork in channels closer to the top of the score.
foreground color	In the paint window, the foreground color is the color that you paint with when the pattern is solid and the ink is Normal. The foreground color is set using the foreground color chip.

frame A frame of animation is a snapshot of your movie. It includes the artwork and effects that appear in one column of the score. One movie might be hundreds or thousands of frames in length. The frames are numbered across the top of the score, starting at 1. Also see *current frame*.

film loop A sequence of cast members that you use as a single cast member. Like other cast members, a film loop resides in the cast window and can be treated as one cast member, even though it's made of one or more sequences of cast members. You can in-between a film loop just as you would an individual cast member.

In-Between A feature of Macromedia Director which simplifies the animator's task by filling in the frames between the beginning location and the end location of an animation sequence. In-Between is also used for extending held artwork, and sliding (and stretching) artwork between the points. This feature is available in the score menu.

inks Permit you to control the appearance of artwork. Inks can range from transparent to opaque. Inks also permit you to reverse white and black, create ghost images, change solid black regions to any pattern, and create other effects. Score window inks determine how artwork on the stage interacts with artwork in the foreground or background.

key frames Frames that mark key positions in an animated sequence. The positions of the cast members that determine the path of the in-betweened cast members when animating with In-Between or In-Between Special. The In-Between command fills the positions between the key frames with the in-between positions of the cast member.

mask An opaque image used to block the view in one area, but with holes that allow the image to be viewed in other areas. An example is a mask of a car with holes for the windows, which allows you to view the background through the windows.

matte An ink that allows artwork to appear without the white bounding box around it.

MIDI An interface for the synchronization and control of MIDI musical instruments and other devices. It is an acronym for Musical Instrument Digital Interface.

moveable	In the score, controls whether or not users can reposition a sprite on the stage during playback.
movie	A Macromedia Director animation. The terms file, document, movie and animation are loosely interchangeable.
multiplane	Traditional term for animation stand–based technology. The channels in the score can give you a 2 1/2 D effect by enabling artwork to move in front of and behind other artwork. This effect is called a multiplane effect.
PAL	Phase Alteration Line System, the system of broadcast video display used in Europe.
palette	A subset of all the possible colors that the Macintosh can display. Palettes are used to control the colors of artwork on the screen.
pixel	Short for picture element, a pixel is one dot of a screen image. On the Macintosh it is 1/72 of an inch square.
playback head	The small black square at the top of the score window that indicates the frame that is currently seen on the stage.
protected movie	A movie in which Lingo source code and cast thumbnail images have been removed. This prevents the movie from being opened or edited, but does not affect the movie's scripts. A protected movie's icon looks like this:

My protected movie

	A protected movie can only be run under Lingo control from a projector. You must use Lingo to "go to" or "play" the protected movie.
projector	A play-only version of a Director movie, that can be played on any computer. To play a projector file, double-click it.
real–time recording	Recording animation by dragging a selected cast member on the stage while pressing the Control and Spacebar keys.

record light	The indicator light that appears in a channel when a cast member is first dragged to the stage. When the record light is on, the cast member is recorded to the next frame when the movie is stepped forward.
registration point	A fixed reference point used to align a series of cast members for animation.
RGB video	A video signal or monitor that uses three separate signals for the red, green, and blue primary colors.
scene	A sequence of action on stage. You can clear the stage of all action by selecting everything in the score and deleting it. This leaves the contents of the cast window unchanged.
score	The contents of the 48 animation channels and 5 effects channels in the score window constitute a movie's score. The score window is a notational editor for the movie, displaying animation information left to right over time.
trails	In the score, controls whether or not a sprite leaves trails as it moves across the stage during playback.
sprite	One instance of a cast member on the stage at one point in time. Changes you make to a sprite in the score or on the stage do not affect its parent cast member in the cast window.
stage	The window in which animation appears. The contents of the stage at any point in time is determined by the current frame in the score.
step recording	Lets you create frame-by-frame animation in a channel. To activate step recording in a channel, Option–click the channel number in the score where you want recording to occur.
synchronization	The relative positioning of sound and pictures so that they are timed together.
tempo	Controls the speed of animation. Director plays a movie at the tempo you've set until it encounters a new tempo in the tempo channel.
tile	A multicolored pattern that's a duplicate of a small rectangular section of an existing cast member.
transition	A visual effect that occurs between two different frames.

tweak   Tweak means to move a small distance. The tweak window permits you to move selected cast members on the stage a distance and direction you specify, measured in pixels.

tween   From the word "between." In traditional cel animation, "tweening" is the creation of artwork between key frames that changes shape and position (see also In–Between).

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