Director's Built-in Behaviors

Director 8 ships with a multitude of behaviors that you can use to add sophisticated interactivity and animation to your movies without having to program a single line of Lingo code (using behaviors is covered in Chapter 7). There are also behaviors that control the streaming of Shockwave movies, and that add control to media elements, QuickTime movies, and Flash assets. The new Library Palette contains Director's built-in behaviors. You can find the Library Palette under the Window menu by choosing Window ➪ Library Palette.

To take full advantage of Director's built-in behaviors, it helps to understand each behavior and its adjustment parameters. This appendix provides descriptions of the capabilities of each behavior. The descriptions of the behaviors are categorized by their location in the Library Palette.

Animation Behaviors

The Animation behaviors are designed to move sprites in ways that would be very difficult, if not impossible, through normal Score-based animation. Director 8 introduces several behaviors that use the new imaging Lingo to create transitions. The Animation Library contains three subcategories: automatic, interactive, and sprite transitions.

Automatic

When activated, automatic behaviors usually need no user intervention and function on their own.

Behavior Name	Behavior Function
Color Cycling	Cycles a sprite through a range of RGB colors or colors from the color palette used in the movie.
Cycle Graphics	Cycles through a series of selected cast members.
Fade In/Out	Gives the appearance of a sprite fading in or out. Use with bitmap, vector shapes, and Flash sprites.
Random Movement and Rotation	Causes a sprite to move and rotate randomly within a defined area.
Rotate Continuously (frame-based)	Continuously rotates a sprite at a predetermined number of degrees per frame.
Rotate Continuously (time-based)	Continuously rotates a sprite at a predetermined rate of time, regardless of the tempo setting in the movie.
Rotate to Follow Path	Determines the rotation angle that a sprite uses to follow an animation path. Can be used to create a banking aircraft.
Rotation (frame-based)	Rotates a sprite through a predetermined angle during a set number of frames. An angle greater than 360 degrees causes the sprite to rotate more than once.
Rotation (time-based)	Rotates a sprite through a predetermined angle using a set amount of time. Positive rotation values rotate the sprite clockwise; negative values rotate a sprite counterclockwise. A rotation angle greater than 360 degrees rotates the sprite more than once.
Scale and Clip	Scales a sprite over a predetermined number of frames or amount of time. Scaling a sprite greater than 100 percent of its size causes it to be clipped.
Slide In/Out	Slides a sprite from one predetermined point to another. Can also control the speed and number of times that the sprite will slide.
Sway	Rotates a sprite at set angles both clockwise and counterclockwise through a predetermined number of frames.
Waft	Rotates a sprite clockwise and counterclockwise while moving through a predetermined number of frames. Good for creating a falling-leaf effect.
Zoom In/Out	Zooms in and out on a sprite. Can be used with bitmaps and text.

Interactive

The interactive animation behaviors require some type of user interaction to activate them. For example, when you apply the Draggable behavior to a sprite, you can move the sprite around the Stage by clicking the sprite and holding the mouse button down, and then dragging the sprite to a new position.

Behavior Name	Behavior Function
Avoid Mouse	Moves a sprite away from the cursor.
Avoid Sprite	Moves one sprite to maintain a set distance from another sprite. Can control the speed if the event happens automatically or is triggered by another event, and constrain the movement to the limits of the Stage.
Constrain to Line	Creates a slider that constrains to a line cast member. This behavior requires a working knowledge of Lingo to implement.
Constrain to Sprite	Constrains the movement sprite within the bounding box (rect) of another sprite. Can be used with the Draggable or an animation behavior.
Drag and Toss	Enables a sprite to be thrown across the Stage and then caught. (Anybody up for a little game of baseball?)
Drag Quad Points	Enables a bitmap or text sprite to be distorted interactively on the Stage. Options can be set to restore the sprite to its original shape. ***Caution:*** Distorting bitmaps and text sprites can cause them to look very pixelated.
Drag to Rotate	Used to interactively drag a sprite in a circle around its registration (reg) point.
Drag to Scale	Enables a sprite to be interactively scaled on the Stage. Cannot scale the sprite smaller than 3×3 pixels, because you cannot scale it back up.
Drag to Stretch and Flip	Flips a sprite vertically or horizontally, and flips a sprite on its axis. Creates the illusion of 3D rotation when using a 2D sprite.
Draggable	Makes a sprite draggable when the mouse is clicked and held down on the sprite. Can be constrained to the Stage size.
Follow Sprite	Causes a sprite to follow another sprite at a user-defined speed.

Continued

Behavior Name	Behavior Function
Move, Rotate, and Scale	Uses a set of predefined modifier keys to move, drag, and rotate a sprite.
Multiple Sprite Drag	Enables multiple sprites to be dragged as a group.
Rollover Cursor Change	Changes the cursor to a built-in pointer supplied with Director or to a custom bitmap pointer when the mouse rolls over a sprite.
Rollover Member Change	Changes the cast member of a sprite when the cursor rolls over it.
Snap to Grid	Defines an invisible grid to which a sprite is constrained. When the mouse button is released, the sprite automatically snaps to the nearest grid coordinate.
Sprite Track Mouse	Makes a sprite track the mouse movement. The sprite's movement is aligned with its registration (reg) point in the center of the cursor's registration point.
Turn to Fixed Point	Causes a sprite to always point to a set point on the Stage. Works much like the Rotate to Follow Path behavior except that it follows a point.
Turn Towards Mouse	Causes a sprite to face away from the cursor, even if the cursor is moving.
Turn Towards Sprite	Makes a Sprite either face or turn away from another sprite, even if one (or both) of the sprites is moving. This would be a good behavior for a moving eyeball that watches another sprite.
Vector Motion	Constrains the movement of a sprite to a straight line.

Sprite transitions

Sprite transition behaviors use imaging Lingo to create some interesting new transitions that can applied to bitmap and text sprites. It's possible to have several transitions occur simultaneously because transitions can be applied to individual sprites.

Caution   If you stop the movie in authoring mode before a sprite transition has finished executing, the cast members that were created by the behavior may not be erased. If you do not delete them, your movie's file size may increase dramatically.

Behavior Name	Behavior Function
Barn Door	Creates the illusion of two doors opening or closing to reveal another sprite. Supports alpha channels. You select when the transition will take effect. The Start parameter (the beginning of the Sprite) makes the doors swing shut at the beginning of the sprite span; the End parameter (End of the Sprite) makes the door open to hide the sprite at the end of its span.
Pixelate	Causes a sprite to transform from a low-resolution to a high-resolution image. You can control the number of frames over which the transition occurs, as well as the minimum number of pixels the image will have.
Slide	Used to create an animation of a sprite sliding under another sprite. The transition can make the sprite slide out from under a sprite, or slide under a sprite from its fully revealed position. Supports alpha channel for 32-bit bitmaps.
Soft Edge Wipe	Used to create an animation of a sprite appearing on or disappearing from the Stage in a predetermined number of steps. Each step has a blend, ranging from completely transparent to fully opaque.
Stretch	Creates an animation of the sprite, stretching horizontally, vertically, or in both directions. Control the number of frames over which the effect will occur.
Wipe	Similar to the Soft Edge Wipe transition listed elsewhere above, except that there is no blend setting applied to the steps.

Control Behaviors

Control behaviors create user interface elements such as buttons in your movies.

Behavior Name	Behavior Function
Analog Clock	This behavior is applied to a group of three vector shape sprites that function as the hands of a clock. Position each sprite on the Stage at its 12 o'clock position. When you attach the behavior, you can specify whether the sprite is the hour, second, or minute hand. When the movie plays, the sprites move into position to display the current time according to the computer's system clock.

Continued

Behavior Name	Behavior Function
Display Text	Displays a string of text in either a text or field cast member. Good to use with the ToolTips behavior to create ToolTip or status bar messages. Can also be used with the Source Status behavior to display the pathname of a linked cast member.
Draw Connector	Enables the user to draw a straight line with the mouse. The default setting starts drawing a line on the `mouseDown`, and then completes the line when the mouse button is released.
Dropdown List	Changes a field cast member into a drop-down list. Parameters can be set to capture the item that the user chooses from the list. Can be used to simulate menu commands.
Jump Back Button	Sends the movie to the previously visited markers in all movies. This behavior uses the global navigation list to visit the previously visited markers contained in the list.
Jump Forward Button	Advances the movie through the path of visited markers stored in the global navigation list.
Jump to Marker Button	Advances the movie to the chosen marker in the current movie. Can store the marker information in a global navigation list that can be referred to by the other Jump behaviors.
Jump to Movie Button	Works the same as Jump to Marker except that it jumps to another movie. Can be set to jump to a specific marker in another movie.
Multi-State Button	Toggles a sprite between an ON and an OFF state. You can also define a rollover, down, and inert state for the sprites. Can also be used with a group of sprites to create a radio button group. If used with a group of sprites, give each button in the group the same ID.
Push Button	Creates buttons that use different cast members for the up, down, rollover, and inert states of the button. Can send a message that activates other behaviors that have been applied to other sprites on the Stage.
Radio Button Group	Controls a group of radio button sprites. When the user clicks one of the sprites in the group, the other sprites are turned off. Can be used with Director's built-in radio buttons or graphic sprites.
Tooltip	Use this behavior with the Display Text behavior to create a single line message that appears when the mouse rolls over a sprite.

Internet Behaviors

The behaviors in the Internet Libraries control Internet-related functions, such as posting forms, connecting to a server, creating chat environments, and controlling the download of Shockwave movies. There are three subcategories in the Internet library: Forms, Multiuser, and Streaming.

Forms

Form behaviors create forms that interact with CGI scripts. CGI scripts run on a Web server are often used to generate dynamic content based on user input. The output is usually HTML- or e-mail based.

Behavior Name	Behavior Function
Form Post—Dropdown List	Use this behavior with Dropdown List behavior to post the selection the user makes from a drop-down list.
Form Post—Field	Apply this behavior to an editable text sprite. Posts the text the user enters into the field.
Form Post—Hidden Field	Use this behavior for fields that aren't visible on the Stage and that contain information that doesn't change but still needs to be submitted with the form, such as identifiers for a database, or the number of items returned in a search.
Form Post—Submit Button	Use for a form Submit button to post the form data to the CGI script on the server.

Multiuser

The behaviors in the Multiuser library connect a user to a server and regulate chat input.

Behavior Name	Behavior Function
Connect To Server	Apply this behavior to a sprite to initiate a server connection when the sprite is clicked.
Disconnect From Server	Apply this behavior to a sprite to end the server connection when the sprite is clicked.

Continued

Behavior Name	*Behavior Function*
Display Group List	Apply this behavior to a text field to display the names of the groups in a chat session. Also displays the number of members in each group.
Display Group Member Names	Apply this behavior to a text field to display the user names of a chat session.
Chat Input	Apply this behavior to a text field to enable users to enter text to send to a chat session.
Chat Output	Apply this behavior to a text field to display text from a chat session.
Send Chat Button	Apply to a sprite that acts as a button that enables the user to send the text from a chosen text member to the server.
Whiteboard (Shared Canvas)	Used on the same sprite as the Canvas behavior found in the Paintbox category in order to relay the paintstrokes to users connected with a multiuser connection.

Streaming

Streaming behaviors control the download of Shockwave movies over the Internet.

Behavior Name	*Behavior Function*
Loop Until Next Frame is Available	Loops a Shockwave movie on the current frame until the next frame is downloaded.
Loop Until Member is Available	Loops the Shockwave movie on a specified frame until a specified cast member has fully downloaded, and then continues playing the movie.
Loop Until Media in Frame is Available	Loops the Shockwave movie on a specified frame until the media in another specified frame is downloaded, and then continues playing the movie.
Loop Until Media in Marker is Available	Loops the Shockwave movie on a specified frame until the media in a specified range of markers has downloaded, and then continues playing the movie.

Behavior Name	*Behavior Function*
Jump When Member is Available	Loops the Shockwave movie on a specified frame until a specified cast member has fully downloaded, and then continues playing the movie or jumps the movie to a specified frame of the movie.
Jump When Media in Frame is Available	Loops a Shockwave movie on the current frame until the next frame is downloaded, or jumps the movie to a specified frame of the movie.
Jump When Media in Marker is Available	Loops the Shockwave movie on a specified frame until the media in a specified range of markers has downloaded, and then continues playing the movie or jumps the movie to a specified frame of the movie.
Progress Bar for Streaming Movies	Apply to a sprite to make it display a progress bar of the current streaming status of the Shockwave movie.
Progress Bar for URL Linked Media	Works the same as the Progress Bar for Streaming Movies behavior, except that it's used to display the progress of a linked element in a Shockwave movie.
Show Placeholder	Displays a vector graphic in place of a cast member that has not been downloaded yet. You can use a box, circle with a slash, or any custom vector graphic.

Java Behaviors

The behaviors in this library are Java-safe equivalents of other behaviors listed in this appendix. When you are building Director movies that will be exported as Java applets, you should substitute the behaviors in this library for the similar ones that are applied from the other libraries.

Caution   Unless you are creating a movie that will be used only as a Java applet, you should save the movie as a different name before applying the Java behaviors. The Java behaviors are meant to replace other behaviors applied in your movie. The movie will not work properly if it is saved as a projector or Shockwave movie.

Media Behaviors

The media behaviors control and alter the playback appearance of QuickTime, audio, and Flash media elements. There are three subcategories in the Media Library: Flash, QuickTime, and Sound.

Flash

You can apply Flash behaviors only to sprites that refer to Flash or vector-shape cast members.

Behavior Name	Behavior Function
Set Click Modes	Determines how a Flash cast member reacts when clicked, and whether the mouse events are passed to Director.
Set Playback Quality	Sets the playback quality of the Flash sprites. Set parameters to determine the playback speed versus the image quality.
Set Scale, Origin, and View	Adjusts the scale, origin point, and angle of view for a Flash sprite.

QuickTime

You can apply QuickTime behaviors to sprites to create custom controllers for QuickTime movies.

Behavior Name	Behavior Function
QuickTime Control Button	Apply this behavior to a sprite to create a custom button that controls the playback of a QuickTime sprite. You can set a parameter to define the type of action the button will perform.
QuickTime Controller Slider	Apply this behavior to a sprite to create a video controller similar to the video controller displayed with QuickTime movies.

Sound

Sound behaviors play sound files and cast members without having to place them into a sound channel in the Score window.

Behavior Name	Behavior Function
Play Sound	Plays a sound cast member when the user clicks a sprite to which the behavior has been applied. Can be used with internal or external cast members.
Pause Sound	Pauses a sound that is playing. Can be applied to sprites and triggered at the beginning or end of the sprite, or it can be activated by an event.
Stop Sound	Applied to the Stage sprite or script window to stop a sound that is currently playing.
Sound Beep	Plays the system's beep sound when the user clicks a sprite to which the behavior has been applied.
Channel Volume Slider	Used on a graphic sprite to create a slider that controls the volume of the sound.
Channel Pan Slider	Used on a graphic sprite to create a slider that controls the volume of the sound coming out of the left and right channels.

Navigation Behaviors

The Navigation Behaviors Library contains behaviors that control the playback of your movies. You can use these behaviors to open new movies, pause the movie at a specified frame, and advance the playback head to other frames in the movie.

Behavior Name	Behavior Function
Go Loop	Moves the playback head back to the nearest marker when the user clicks a sprite to which this behavior is applied.
Go Next Button	Advances the playback head to the next marker when the user clicks a sprite to which this behavior is applied.
Go Previous Button	Moves the playback head back to the previous marker when the user clicks a sprite to which this behavior is applied.

Continued

Behavior Name	Behavior Function
Go Frame X Button	Moves the playback head to a specified frame when the user clicks a sprite to which this behavior is applied.
Go to URL	Opens a specified URL in a Web browser when the user clicks a sprite to which this behavior is applied.
Hold On Current Frame	Causes the movie to loop on the current frame until another behavior causes the playback head to move to another frame in the movie.
Loop for X Seconds	Loops the movie on the current frame for a specified number of seconds.
Play Done	Returns the playback head to the point in a movie from which the most recent play command was sent. This behavior can be attached to a sprite or to a frame.
Play Frame X	Jumps the movie to a specified frame in a movie. If the new frame contains a Play Done behavior, it can return to the original frame in the movie where the Play Frame X behavior was activated.
Play Movie X	Works the same as the Play Frame X behavior, but works between different movies.
Wait for Mouse Click or Keypress	Holds the movie on the current frame until the mouse is clicked or a key is pressed.

Paintbox

You use the Paintbox behaviors to create a simple drawing program in Director. These behaviors can be used with the multiuser behaviors to create an interactive whiteboard that several users can work on simultaneously. Most of these behaviors use imaging Lingo, which was introduced in Director 8.

Behavior Name	Behavior Function
Canvas	Attach this behavior to a bitmap sprite to enable single or multiple users to paint on a sprite. The image of the member of the sprite will be modified. Use with the Whiteboard behavior found in the Multiuser category to create a multiuser whiteboard that can be used over a connection to a server.

Behavior Name	Behavior Function
Color Selector	Determines the paint color used by the Canvas behavior. Is set by the pixel color a user clicks on.
Erase All Button	Attached to a sprite that acts as a button that entirely erases the image of the sprite to which the Canvas behavior is applied.
Tool Selector—Brush	Defines a bitmap member to be used as a paintbrush by the Canvas behavior.
Tool Selector—Eraser	Defines a bitmap member to be used as an eraser by the Canvas behavior. Can be set so that a double-click erases the entire image.
Undo Paint	Used to create an Undo button that will undo the image created with the Canvas behavior

Text

Text behaviors control and format text, and they create special text effects as well.

Behavior Name	Behavior Function
Add Commas to Numbers	Apply to field and text cast members that contain long numbers. This behavior automatically adds commas, making the numbers easier to read.
Calendar	Apply to text cast members to create a calendar. Works with any date between the years 1901 and 2099.
Countdown Timer	Apply to a text sprite to create a timer that counts down to zero from a specified time of up to 24 days. This behavior can be activated by an event, or when the movie enters the frame that contains the sprite.
Custom Scroll Bar	Creates a custom graphic scroll bar for a text sprite. Apply the behavior to four sprites that serve as an up arrow, down arrow, dragger (the square box on a scroll bar), and scroll bar.
Filter Input Characters	Filters the characters that can be entered into an editable field or text sprite. If the user enters an invalid character, a system beep sound plays and the character does not appear in the text field.

Continued

Behavior Name	Behavior Function
Force Case	Automatically converts the text in an editable field or text sprite to all lowercase or all uppercase. *Note:* This does not work for accented letters.
Format Numbers	Formats the display of numbers in an editable field or text cast member. The formatting is applied after the user has entered the number and pressed the Tab key to continue to the next editable sprite.
Get Net Text	Retrieves text or HTML data from the Internet. The text and HTML data can be converted to standard text or kept as the original HTML code.
Hypertext — Display Status	Use this behavior with the Display Text behavior to display the URL of a hyperlink contained in a text or HTML sprite when the mouse rolls over it.
Hypertext — General	Works the same as the Hypertext Go to Marker behavior except that this behavior executes an action based on the contents contained in the beginning of the data string; for example, if the beginning of the data string contains `http:`, it displays a URL in a Web browser. This behavior supports the following URL schemes: `http`, `https`, `ftp`, and `mailto`. You can also begin the data string with `Lingo:` to execute a Lingo command.
Hypertext — Go to Marker	Jumps the playback head to a marker when a hyperlink is clicked. Use the Text Inspector to specify the marker.
Password Entry	Converts a field or text sprite into a password entry field. *Note:* You should set the cast member's font to either Arial or Helvetica because the characters typed into the sprite display as bullets. Any other font may display the bullets incorrectly.
Ticker Tape Text	Causes the text in a sprite to scroll horizontally in a single line.
Typewriter Effect	Makes text appear to type onto the screen one character at a time. You can set the delay time for each character and assign a sound cast member to play after each character is typed.

❖   ❖   ❖