

2. The Reel

2.1 Introduction

The Reel is Jaleo's main working area. Here, you create media compositions by arranging clips and effects.

Various sets of tools are available for this purpose:

- Display and presentation controls
- Editing functions
- Monitors
- A large collection of effects for one or more layers of imagery
- Matte generation and control
- Parameter control of effects over time
- Validation and Rendering of sequences

The Reel is a window to an infinite work plane that extends horizontally, representing time in this dimension and vertically to accommodate any number of layers for compositing. The Reel environment consists of all the clips placed in the reel (images, sound, groups, effects...) as well as their arrangement. It thus represents the state of your work. The Reel can be saved to disk to store your work at any time.

2.2 Starting the Reel

The Reel can be started:

- From the ToolChest
- By double clicking on its desktop icon
- By typing `jaleo` in any UNIX shell

Note that you can open multiple reel windows at the same time. This allows you to have additional workspaces that you may use for experiments, as clipboards, or for any other purpose.

To users familiar with UNIX it should be mentioned that there will always only be one copy of the executable in memory, no matter how many reel windows you open. Even if you type `jaleo` from the shell another time, the system will make sure that no resources are wasted by duplicating executables.

2.3 The Application window

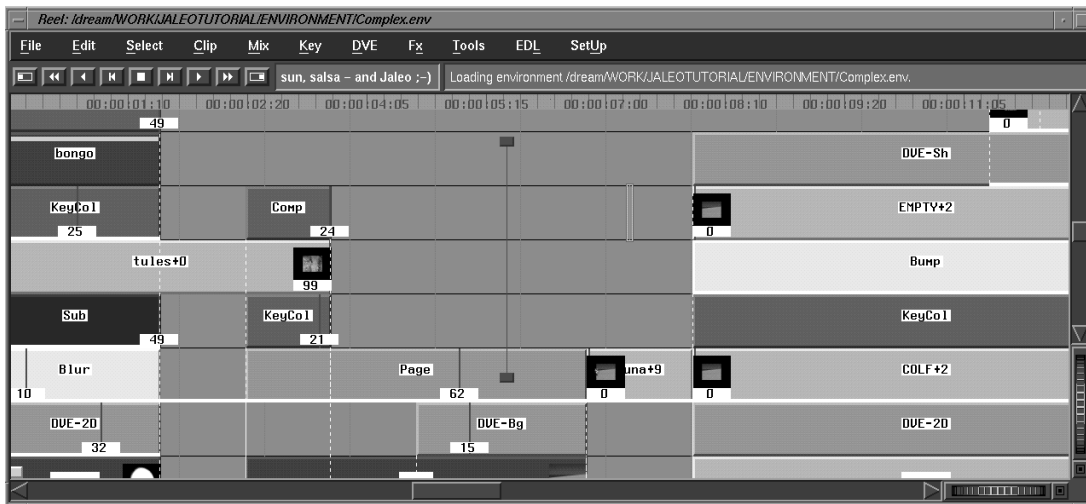


FIGURE 15. The Reel Window

2.3.1 Menu Bar

From the menu bar, one can access practically all of the functionality of Jaleo. Here, basic file and editing functions can be found, as well as setup options for the Reel. Auxiliary windows can be opened from the tools menu. Finally, all available effects are created using menu commands.

For quick access, the Edit, Select and Clip menus are also available as popup menus directly in the reel window:

To popup either of this menus, press the right mouse button with the cursor positioned over reel while holding the following modifier keys:

- Press **Shift** and press the right mouse button to popup the Edit Menu.
- Press **Ctrl** and press the right mouse button to popup the Clip Menu.
- Press **Shift** and **Ctrl** and press the right mouse button to popup the Select Menu.

Finally it is also possible to “tear off” some menus to use them as floating toolbars. Menus and submenus that have a dashed line as their uppermost entry can be torn off by selecting this dashed line. The menu will then appear as a separate window that can be placed on screen wherever convenient.

2.3.2 Work Area

This area is the large empty and yellowish space. Depending on the setup options selected (see “Setup” on page 72), it displays any combination of the following:

Grid

The horizontal grid lines subdivide the work area in layers:

- The space between two lines is called a layer, into which clips can be placed. As there is no limit to the number of available layers, there is no layer numbering. You can always scroll just a bit more upwards or downwards and you will always find space to add another layer of material or effects.
- The vertical gridlines partition time in units depending on the current reel window zoom factor. Timecode values are displayed on top of the work area to visualize the partitioning.

Note that clips of any type can be placed freely in time (down to the resolution of 1 frame), but vertically they will always be aligned to a layer. You cannot position a clip “between” two layers. The grid display can be switched off using an option found in the setup menu. Both Grid and Timecode will not be drawn during shuttle playback.

Cursors and Markers

Different cursors and markers can be displayed in the work area:

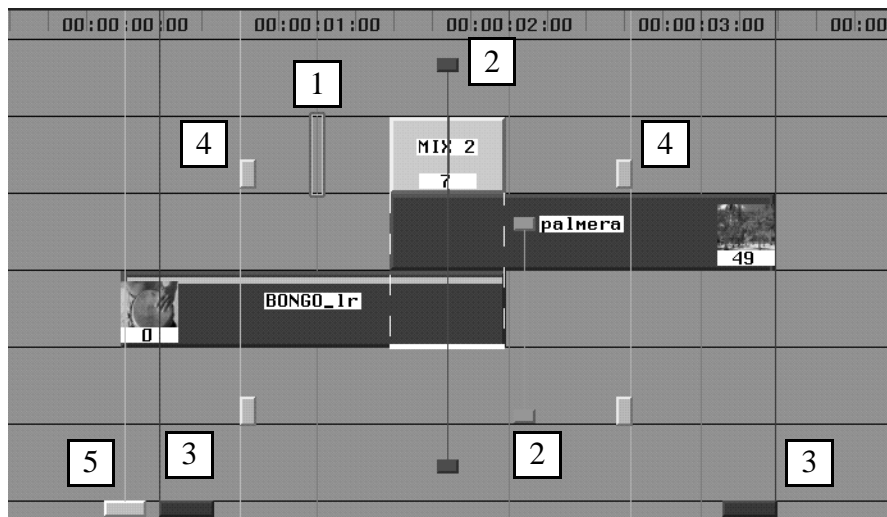


FIGURE 16. Cursors & Markers

1. The Reel Cursor: Appears at the position of the last mouse click in the work area. It is used as a reference position for some commands from the selection and edit menus. The reel cursor is represented by a rectangle the size of a single frame with a green vertical line in the middle.
2. Monitor Cursor: Used to preview a composition in a Monitor Window. The monitor cursor has the same color as the border surrounding the image in its corresponding monitor. There can be any number of monitors active at any time. To show a monitor cursor, a Monitor Window must be opened from the Tools menu. Dragging the monitor cursor over the reel will evaluate the underlying clips and display the result in the associated monitor window. To position the cursor quickly in complex environments, evaluation can be suppressed by holding the SHIFT key while dragging.
3. Play Marks (purple): Delimits the play area for previewing. The play marks are normally hidden and can be brought to the screen using the appropriate option in the setup menu (see “Set Up > Shuttle > Play Marks” on page 75).

4. Editing Marks (light yellow): Specifies editing positions for some commands from the Edit menu. The edit marks are normally hidden and can be brought to the screen using the appropriate option in the setup menu (see “Set Up > Edit > Edit Marks” on page 74). *Do not confuse the edit marks with the clip position markers that can be used to temporarily mark a particular position in a clip (see Clip > Mark, page 66).* In particular, all edit functions always refer to the edit marks, *not* the clip markers.
5. Zero Mark (white): indicates the zero position (Time Code 00:00:00:00) of the reel.
6. Render Marks (not shown): Delimits a Render area. These marks are light brown (mustard colored) and look very similar to the editing marks. They will only be shown while the render tool window is opened.

Clips and Effects

The most important elements to be seen in the work area are clips and effects. Clips are placed in the Reel by using drag&drop (see below) from either the Loader, the Gallery or the Flipbook, or from SGI desktop file manager windows. Just drag a clip into the reel and let the mouse button go in the layer and time position where you want the clip to appear. In this manner, one can load image and sound clips as well as effect and group setups previously saved to disk.

New effects can be created by selecting the desired effect from any of the effects menus. If one or more clips are previously selected in the reel, an effect clip is created for each of them and placed on top of the corresponding display bar in the reel. Its length will be exactly the same as the length of the underlying clip object. Its effect extent or scope (ambit) will be set to comprise the clip the effect is “fitted” to (see section 2.5.5 on page 50 for more information on effect extends).

If no clips are selected in the reel, the new clip will be placed at the current pick position and it will have a length of one second assigned.

When evaluating effects, Jaleo has to make decisions regarding the visibility of layers. For any given frame, layers are processed top down with decreasing priority. That is, if two image clips are layered on top of each other, only the uppermost will be visible.

Whenever two or more clips are to be combined in any way, you must use an effect clip to compute the combination. The most common combination effects are probably mix, wipe and composite.

A mix simply mixes together underlying images, while a composite effect places image clips over an background, using their alpha channels for transparency information. More complex effects combine images using 3D DVE or 3D deformations. Other effects extract alpha information to provide alpha channels suitable for compositing (for example, chroma keying).

As effect clips can use the output of other effect clips as inputs, one can create arbitrarily complex process trees by putting layers together to a final output. This underlying process tree structure can be visualized using the Flow Monitor (see also section 4.3 on page 79).

There is one exception to the hierarchical treatment of clip layerings: sound. here, it does not make sense to “hide” one sound under the other, like an image clip hides another one. Instead, all sound clips at a certain point in time are just mixed together, independent of their position in the layering. See the introduction chapter for more information on clips and effects.

2.3.3 Logo Area - Shuttle

Upon start-up, a Jaleo logo is shown in this part of the Reel window, just below the File menu. It can be replaced by the shuttle buttons (see “Set Up > Shuttle > Show Shuttle” on page 74)

2.3.4 Edit Argument Area

In the argument area, the user can enter arguments for some edit commands.

You can edit the content of the argument field in three ways:

- If the mouse cursor is positioned over the argument area and clicked, all text editing functions are available. You can now position the text cursor with the cursor keys, or use backspace or delete to edit the content. Also, selection by dragging the mouse is possible, just as in any text entry field.
- Typically, however, it is more than sufficient (and much quicker, too) to enter numbers directly and without repositioning the mouse over the text field. In this case, you only need to type numbers and a few special characters, as letters will be interpreted by the Reel as keyboard short-cuts.

Whenever you start typing a number or any of the special characters, the argument area will be cleared automatically and your typing appears. It will not be deleted by retyping until you execute a command from the edit menu.

These are the special characters for direct argument typing:

- The “+” or “-” characters to denote positive and negative argument values (“+” is optional, if no “-” is present the value is understood positive by default)
- Letters and punctuation marks to delimit parts of a Time Code (characters such as “.”, “:”, “,” to write time code values like 07:03:12:23)
- As a third option, you can copy text or values in the argument field using drag&drop. This is particularly useful to copy position information from the Position Window (see “The Position Window” on page 112)

Editing arguments can be either frame or timecode values. Their particular meaning depends on the desired operation. See the description of editing commands below (“Edit” on page 56).

A simple number always is interpreted as a duration or position given in frames. If a timecode is given, leading zeros can be omitted. Example: when working in 25 fps, then:

- 25 indicates 25 frames or 1 second

- 75 indicates 75 frames or 3 seconds
- 1:0 indicates 25 frames or 1 second
- 3:5 indicates 80 frames
- 1:3:10 indicates 1585 frames or 1 minute, 3 seconds and 10 frames

2.3.5 Message Area

The message area is used by Jaleo to print messages for the user.

2.3.6 Reel Controls

Zoom Dials

- Time Zoom. This is a horizontal dial located in the lower right corner of the Reel Window. It zooms the time (horizontal) axis of the work area. Hence:
 - Moving the dial to the right zooms in
 - Moving the dial to the left zooms out
- Layer Zoom. This vertical dial is located on the Reel Windows lower left corner; it allows you to vertically scale the layer representation within the work area, such that:
 - when you move the dial up, the vertical size of the layer display will increase, giving you a larger display of the preview images.
 - when you move the scale down, the vertical layer size will be reduced

Scroll Bars

- Time scroll bar. Located under the work area, allows you to scroll the Reel Window towards the left or the right to see the entire reel content.
- Layer scroll bar. Located on the right hand side of the work area, allows you to scroll up and down through the layers in the work area.

Note: Scrolling in both directions can also be achieved by pressing mouse button 3 (the right button) over the reel background and, while keeping the button pressed, dragging the mouse.

2.4 Drag&Drop Integration

Drag&Drop is a universal exchange mechanism for data in the Jaleo Environment. It is used to exchange clips between the Jaleo applications, to load files from the SGI desktop tools and for many other applications.

Drag&Drop is a very simple metaphor: Pick up an object using the mouse, and while keeping the mouse button pressed, drag the object to a target object. In general, drag&drop can be initiated using the middle mouse button on almost any clip object. Here are some general rules on drag&drop operation:

2.4.1 Drag&Drop of Clips Between Applications

Clips can be loaded into all Jaleo applications using Drag&Drop. From the desktop filemanager tools, the drag can be initiated using either the left or the middle mouse buttons on the selected objects.

You can, for example, in a file manager window select any number of clips from Jaleos CLIPIMAGE directory and drag them over the Jaleo Reel Window, always keeping down the left mouse button. If you let go the button over the reel, the clips are loaded at the position in time where you let go the reel. This works as well with groups, sound clips and effects.

Note that from the Jaleo Project Manager, you can directly open an SGI file manager window on the current Jaleo project.

Environments (i.e. complete arrangements) can also be dragged to the reel window; however, they cause a replacement of the current reel content. You will be asked to save your current work before replacement.

You can also drag image clips from the reel to the Flipbook or the Gallery and vice versa.

2.4.2 Drag&Drop with the Loader

The loader is an extended file select box providing instant access to Jaleo's project directory structure. In contrast to conventional file selectors, it does not have an apply or load button. Instead, you can load any file from the list by dragging it to the reel, the flipbook or the gallery using the MIDDLE mouse button.

2.4.3 Drag&Drop Inside of the Reel

The reel window allows to use Drag&Drop to copy clips inside of the Reel. A drag of the selected clip initiated with the middle mouse button will copy the selected clip to the position where you let go of the mouse button.

2.4.4 Other Drag&Drop Applications

Drag&Drop also has other applications:

- You can copy selected text strings between all text fields of Motif applications. Use the middle mouse button to do these drags. All Jaleo applications are Motif applications, as well as the SGI desktop tools. A practical application is to copy timecode values from the Position Window to the Edit argument field. Another application is to copy a file path from a desktop tool window to the device parameter fields of the IO subsystem.
- If you drag a clip icon from the SGI filemanager onto a file path field in the IO subsystem device parameters, the path and file name of the clip will be pasted into the text field. This works in general: Dragging a file object from a filemanager window to a text field will copy the path to the file into the target text field.

Generally, you can simply try out if drag&drop operation is supported in a particular part of an applications interface: If an object supports drag&drop, the cursor will change its shape to a distinctive form when you start dragging on the object or field of the application with the middle mouse button down. If you let go the mouse button over the desired target source, it will either accept (by changing the fields value) or refuse (shown by a cursor action) the drop. Normally, all Motif text fields allow drag&drop of their text content.

2.5 Clips Within the Reel

Clips are the main “working units” within Jaleo and they are arranged in the Reel. Clips appear as a color bar and their length shows the clips duration. They represent image sequences, sound or effects, generated by the user within his/her work, or generated through the input/output module of Jaleo.

The following clip types can be placed within the Reel:

- Image clips
- Sound clips
- Effects clips
- Group clips

2.5.1 Image Clip (Blue Bar)

Image Clips represent image sequences. Typically, an image clip has been originally created by reading in images either from disk or video peripherals using the Input/Output or Capture applications of Jaleo, but it may also be the result of a render process.

An image clip positioned in the reel shows a small preview image (unless the zoom factor in either time or layering does not leave enough space to do so) on its bar. This preview image can be dragged to any frame within the clip using the right mouse button.

Image clips can be either with or without alpha (or mask, key) channel information. All effects can work with images with or without alpha channels, although for some effects an input layer without alpha does not make a lot of sense (a composite effect for example uses the alpha channel of the foreground input as a transparency when composing it over the background - an image without alpha will simply be nontransparent, making the composite pretty useless).

Jaleo offers a large number of mask generation functions, ranging from simple luminance keys to advanced chroma key functions. The paint module can be used to create masks by rotoscoping. Also, any image can be used as a key by itself (a mask can thus be an image, typically a black and white image), and alpha information can be converted to image channels and vice versa. Typically, images captured from video equipment do not have pre-defined alpha information while results of computer animation systems typically include the mask channel.

2.5.2 Sound Clip (Light Blue)

A Sound Clip represents an audio recording. Sound clips are always created by the I/O program; as a short-cut, sound files (in aifc or aiff format) can be dragged directly into the reel.

A sound clip positioned in the reel shows a small image representation of the audio waveform on its bar, just like the preview image of an image clip (unless the zoom factor in either time or layering does not leave enough space to do so). This preview image can be dragged to any frame within the clip using the right mouse button. The waveform display can help to synchronize sound effects to frames.

Waveforms are also displayed in the Monitor Windows when the sound clip is the uppermost of the layers under a Monitor Cursor. However, sound is only played back when the monitor playback is done using the shuttle controls. Simple dragging of the Monitor Cursor will not playback audio.

Sound Clips need to be played back with accurate frame rates. Therefore, Fast Draw mode is recommended to playback sound (see Monitor Playback Speed, page 78). Skip Frame playback (see “Setup > Shuttle > Skip Frame Playback” on page 75) is currently not recommended for sound playback, as sound samples may be dropped as well.

2.5.3 Group Clips, or Groups (Light Green), Timewarps

This is a powerful utility that allows you to combine a number of clips to a single clip icon, greatly reducing space utilization in the reel. Groups help to maintain order and understandability of complex layerings. Powerful group navigation utilities allow to “navigate in” into a group, thus editing the groups content without being distracted by the surroundings (see “Clip > Navigate and Group Navigation Monitoring” on page 68).

As groups can be saved to disks, they can be used like editable templates for effects or arrangements. Furthermore, once a group has been established, a cache memory option can be switched on in order to show clips in real time despite their complexity. Therefore, the effects do not have to be calculated each time the result needs to be shown.

Cache operates on a “per frame” basis, i.e. whenever a frame is requested that has not yet been cached, it will be put into the cache. No explicit renderings are thus required, and display speed-up will come automatically with the cache being filled by normal work procedures. Once a cache is calculated, a group clip shows a draggable preview image just like an image clip.

2.5.4 Groups as Timestretching Effects

Group clips are also used to create timestretching/squeezing of image clips. Groups do have a single parameter curve, to be controlled by the time editor window, defining the progression through the frames. Normally, this curve is a straight diagonal line, telling the system to play back one frame after the other in linear speed. The curve can be deformed in any

desired manner, though, thus producing slow motion, back and forth shuttle or any other dynamic motion effect.

2.5.5 Effects Clip: Fx (Red-Orange)

Effect clips are used to process one or more underlying layers. Typically, an effect clip has a number of animateable effect parameters that can be controlled using the time editor window. Some effects also produce an image without an underlying image clip those can be used as “synthetic image generators”, creating texture or pattern effects.

As discussed in “Clips and Effects” on page 44 above, new effects typically are created to “fit” a selected clip in the reel window. Just as a reminder, to do so, it is enough to select a clip before the effect is created from the menu. The new effect will then be placed above the selected clip, having the same length. If no clip has been selected prior to effect creation, the effect will be created at the current Reel position with a default length of 25 frames.

Effect clips can be used as inputs to other effect clips, thus allowing arbitrarily deep layerings of image material and processing layers. As layerings have the potential to be very complex, the Flow Monitor (see “Process Flow Monitor” on page 79) option can be used to visualize the layering structure at any point in time as a process tree graph.

Effect clips, when selected, show a little red bar on their lower side, extending over their total length. This bar can be dragged downwards to encompass any number of layers. Alternatively, the effect clip can be dragged upwards, causing the red bar to stick to its previous vertical position. In either case, the effect will be to drag a “capture rectangle” around a number of layers. The extent of this “capture rectangle” is called the *effect scope* or *effect extent*. It determines the number of input layers to the effects: All clips inside of the extend rectangle are used as inputs to the effect. Here, absolute position of a layer is not important, just the order of the inputs counts. That is, there may be as much empty layers between various inputs as required by the structure of the layout.

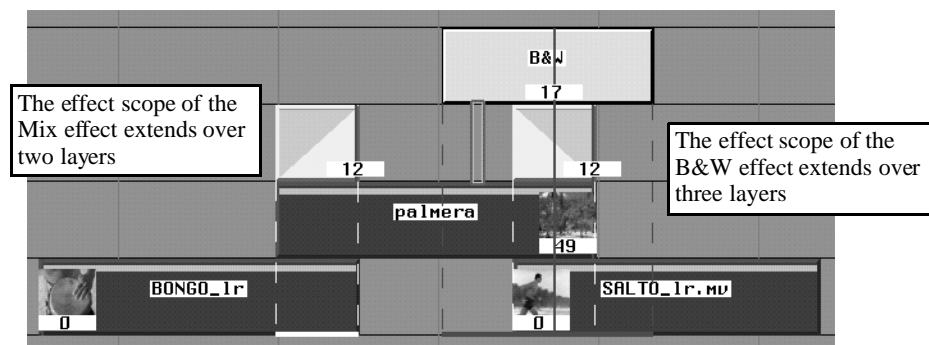


FIGURE 17. Effect Scope

Some effects have a limited extent (no more than for example 1 or 2 layers), while others can have any number of input layers.

Like group clips, effect clips can be cached to speed up playback. Therefore, the effects do not have to be calculated each time the result needs to be shown. Cache operates on a “per

frame” basis, i.e. whenever a frame is requested that has not yet been cached, it will be put into the cache. No explicit renderings are thus required, and display speed-up will come automatically with the cache being filled by normal work procedures. Effect clips display a small draggable marker cursor on their bar, even if they do not show a preview image.

2.5.6 Effect Clip color code

Different types of effects have slightly different bar colors:

- Image effect clips (Image) are light brown.
- Mix effect clips (Mix) are yellow.
- Motion effect clips (Motion) are orange.
- Matte effect clips (Key) are dark red.
- Noise effect clips (Noise) are red.
- Sound effect clips are sky blue.
- Booleans are a darker red than the matte effect clips.

The color coding of the effects allows the user to understand the essentials of a composite with a single glimpse.

2.5.7 Creation and Loading

Image and sound clips can be loaded into the Reel Window using drag&drop from:

- The Loader. Place the mouse cursor over the clipname you want to load and drag with the middle mouse button. You do not need to select the clip (left mouse button) before dragging, but selection of image clip allows you to preview in the monitor area of the loader.
- Silicon Graphics File Manager. You can drag the selection either with the left or the middle mouse button.
- The Flipbook (see “The Flipbook” on page 125). Use the middle mouse button to drag content.
- The Gallery (see “The Gallery” on page 131)
- The Reel (any selected clips can be copied by dragging it using the middle mouse button)

Groups are normally created using the menu commands in the Clip menu. However, it is possible to save a group to disk as a template and to reload it using the Loader or desktop file manager. Drag-copies with the middle mouse button are also possible.

Although effect clips are usually created using the respective menu bar commands, specific instances with all their parameter settings can also be saved to disk and later be reloaded using either the loader or the desktop file manager windows. Drag-copies with the middle mouse button are also possible.

See “Drag&Drop Integration” on page 46 for more information on drag&drop.

2.5.8 Clip Selection

A clip can be selected within the Reel by:

- Moving the mouse cursor over the clip and clicking the left mouse button. This will deselect all previous selections.
- Moving the mouse cursor over the clip and clicking the left mouse button while holding down the Shift key. This will select the new clip without deselecting the previously selected clips.
- Clicking the mouse on the Reels background and dragging a selection rectangle. All clips within the selection rectangle will be selected.
- Using any of the commands of the Select menu, giving you the opportunity to select all, nothing, or anything left, right, above or under the last mouse click in the work area (remember that the last mouse click in the reel is denoted by the Reel Cursor). There is also a function to invert a selection.

Notes: Clicking in the work area background will deselect everything. When a clip is selected, its bar icon will show a white highlight.

2.5.9 Clip Movement and Copying Within the Reel

Once clips are in the Reel, they can easily be moved. Click on the clip that you wish to move and drag it with the mouse to the position and/or layer where you want to place it, then let the mouse button go.

If you press the Ctrl key while dragging clips, movement is restricted to the vertical direction. If you press Alt while dragging, only movement in time (horizontal) is allowed.

Movements of multiple selections are also possible in the same way: Just click on any of the selected clips to drag all selected clips around.

It is also possible to use drag&drop for copying: If you drag a selection of clips with the middle mouse button, a copy will appear wherever you let go the mouse button.

Using options from the Edit menu, clips can also be treated using cut, copy and paste. Furthermore, there are movement and alignment commands to be found in the Edit menu.

2.5.10 Adjusting the Duration of Clips

The duration of a clip can be adjusted by using either the mouse or by using commands from the edit menu. To adjust a clips length using the mouse, do the following:

- Select the clip to be modified.
- Press and hold the right mouse button with the mouse cursor over the clip.
- Drag the mouse to the right and/or left - you will notice that the little clip frame marker will move following the mouse.

- Drag the little cursor with the frame number (or the preview image in case of an image or sound clip) over the bar using the right mouse button.
- When you have dragged to either end of the clip (first or last frame) press the left mouse button along with the right button and keep on dragging. The clip will be extended or shortened, following your drag.
- Once you have reached the desired length, release both mouse buttons.

Note that this method of resizing clips can also be applied to multiple selections.

Using the Edit menu commands, there are multiple ways to change the length of a clip. (See the descriptions of the edit commands Force Size, Split, Trim and Extent for more information.)

2.5.11 Difference Between Image and Effect Clips for Resizing Operations

Resizing effect and group clips is quite straightforward - their timecurves are simply rescaled to the new length. Image and sound clips, however, are really just references to source material. While resizing the length of a clip could have been implemented as a timestretching operation, it is far more common in editing situations to request trimming of the source material. Changing the length of sound and image clips thus amounts to a trimming operation, while the more seldomly required effect of timestretching can be achieved in a far more flexible (e.g. nonlinear) manner using the control curve of the group clip. Trimming is explained further in the section on the Edit menu commands.

