Avid® Liquid Installation

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Site Settings

"Site" refers to the computer system on which Avid Liquid is running and the video peripherals connected to it. Among others, the settings include the selection of connected players and recorders.
These settings, which you can access under *Edit* > *Control Panel* > *Site* tab, apply to all system users and, therefore, are not saved for an individual user but are called each time the system is restarted.

The *Site* tab contains the following elements:

Player Settings

Parameters of connected players/recorders/other devices *page 3*

System Settings

Parameters and information on your computer's software and hardware equipment *page 17*

Media Management Settings

Here you can define the drives and directories that should be used for digitizing
For a detailed description of these parameters and options please refer to the Reference Manual, chapter "Administration", *page 332*.

Codec Presets

These topic is also covered in the Reference Manual, chapter "Administration", *page 319*.

FX Editors Settings

Settings for render and preview quality, etc. *page 23*

Plug-In Settings

Information on the storage location for third-party effects and Effect Editors *page 25*

Player Settings



Icon Player Settings

Double-click the icon *Player Settings* (via Avid Liquid´s *Start Menu* > *Control Panel* > *Site)* to specify players and recorders connected to the system and video, audio and control connections. The dialog box that appears offers two tabs: *Settings* and *Connections*.

Changing Parameters

How to change default values *page 4*

Settings tab

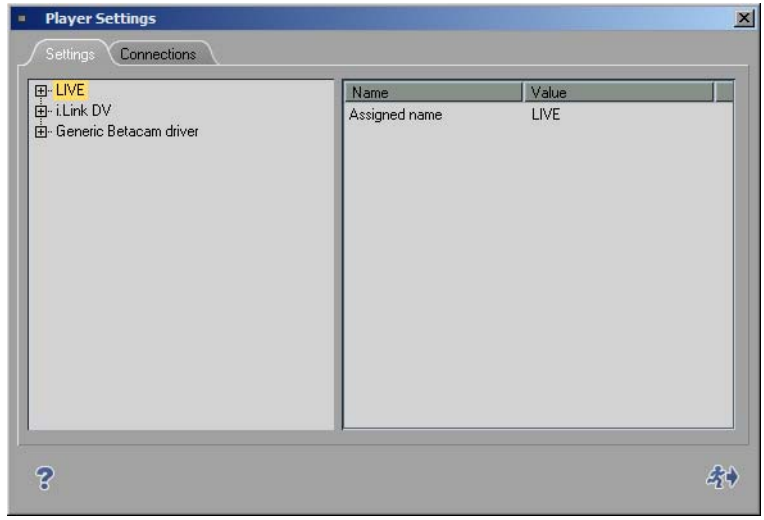
Device-specific settings such as drive ballistics, available inputs and outputs, etc. *page 5*

Connections tab

Here you can define the communication and signal interfaces used by your hardware *page 15*

How to Change Parameters

This dialog box is similar to Windows Explorer in terms of its organization. The categories that can be selected appear on the left; to display subcategories, click the plus sign in the box. Use the right-hand field to adjust the parameters for each category by double-clicking a value, entering one with the keyboard or selecting one from the appropriate drop-down menu.



Settings Tab

This tab can be used for adjusting the technical parameters of the connected devices.

Avid Liquid recognizes three categories of players and differentiates among them based on the protocols used for remote control of the devices:

- *Live* -
  A virtual player that is not controlled.
- *i.Link DV* -
  Controlled via the DV protocol (as per the IEEE 1394 standard). Compatible with all the latest DV and HDV devices.
- *Betacam* -
  A control protocol that is processed via the serial interface as per the RS 422 (or RS 232) standard. More precise than DV i.Link; used in professional environments.



With Windows XP OS it is possible to connect more than one DV device to your computer. All working DV devices are listed under *System Settings* > *Inputs/Outputs*. The device that is selected there can be configured here, in the *Player Settings* dialogs. If you want to switch to another device, turn to the *System Settings* dialog (*page 17*).

How to assign and configure new devices *page 6*

Live Input *page 8*

i.Link DV (IEEE 1394) *page 9*

→ Timing *page 9*

Generic Betacam driver (controlled via RS 422)

→ Timing *page 10*

→ Functional description *page 11*

→ Options *page 12*

→ Tape protection *page 14*

Assign and Configure Devices

The following options allow you to

- select player and recording devices
- configure these devices.

The devices that appear under *Player Settings* are available in the *Logging Tool*, for *EZ Capture* (DV devices only) and in the *Record to Tape* tool (recorders only). In the default configuration, three players are configured. You can add additional devices.

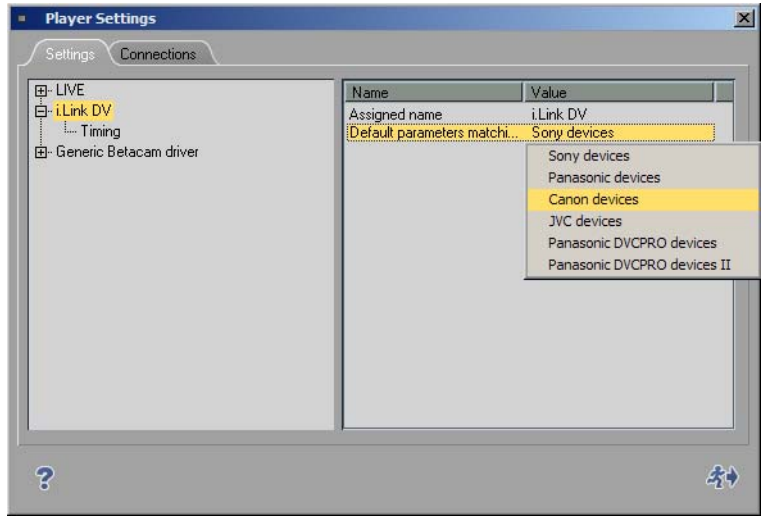
Assigned Name

For each default setting, a device has either a model, manufacturer or remote control name (e.g. *Sony Device, LIVE, Generic Betacam driver* or *i.Link DV*). Initially, this is the same name as the one listed under *Default parameters matching* (see below). Consequently, you should first select the device and then match the name.
You can assign an individual name (such as "Player 1") to each device. Double-click the default name, enter the individual name in the edit field, then press ENTER.

Default Parameter Matching / Select Device

Here you can configure your video devices.

First, click the device or connection name on the left of the dialog, then double-check the manufacturer name on the right-hand side. Select the manufacturer of the connected device from the list.



Select manufacturer

If necessary, you can enter the exact device name in the line above the manufacturer name. Double-click this line to edit it and press ENTER to finish editing.
Additional device settings are not usually necessary. However, if you have problems controlling the device, see the information on device timing below.

Add Devices/Remove Devices

It is possible to add devices to the list.

1 Right-click somewhere below the list of devices in the left-hand section of the dialog. In the shortcut menu, select *Add*.

2 In the submenu, select the matching remote control protocol or an additional *Live Player*.

3 Select a precalibrated device from the list of devices as described above (*Default parameters...*)

4 If you like, assign an individual name for the new device (*Assign ed Name*).

To remove a device from the list, right-click that device and select *Remove*.

Live Input (Virtual Live Player)

Use the *Live* Player if the video or audio signal is not from a controllable source (such as TV) or if you are controlling the player source using the controls on the device itself. You can assign a user-defined name for the *Live Player*. See also *"Assigned Name"* on page 6.



A remark for users of Avid Liquid in combination with analog input/outputs: Use the *Live Player* to capture analog signals. With IEEE 1394 (i.Link DV) remote control there is DV in/out exclusively.
This restriction does not concern Avid Liquid systems equipped with RS 422 interface. You can use analog inputs in combination with RS 422 control.

Options

You can add TC data to the live input signal or use the supplied TC data of the signal.

1 Click the plus (+) symbol,

2 click *Options*,

3 and, in the right-hand section, double-click the current *Value*.

Choose one of three options:

- *Custom* - It defines that a TC value manually specified in the *Logging Tool* should be used for generating timecode data. The timecode starts with the value entered in the *Position* timecode field. Start/stop the TC counter by clicking *Play* (toggle button).
  See also *"Timecode Position Field (A)"* on page 115.
- *Time of day* - The system time is used for generating timecode data. "Time of day" is only guaranteed with a correctly set system clock.
  TC count starts immediately after initialization of the *Logging Tool*.
- *Video* - TC data embedded in the DV input signal. (VITC cannot be used.)

i.Link DV Devices (IEEE 1394)

i.Link DV is a name for devices connected and remote controlled via a DV interface. Other, more or less synonymous names are Firewire or IEEE 1394 (the latter is the official standard name). This interface needs to be integrated in your computer or in the breakout box.
With the exception of timing parameters, there are no further settings to define.

Timing (IEEE 1394, DV)

Double-click the *Value* you want to edit. Selection varies according to your product version.

Wait After Sending Record [ms]

This value defines the length of time from the moment the record command is sent to the recorder until the actual *Timeline p*lay. When it is set to 5000, you automatically receive a black image for 5 seconds before the film is recorded.

Wait Before Sending Record [ms]

This value defines the length of time from the moment the *Record* button in the *Record To Tape* dialog box is selected until the record command is actually sent to the recorder.

Almost all devices work perfectly with a value of 0. If your recorder does not record despite numerous attempts, we advise you to increase this value in steps of 1000 ms until the recorder records.

The reason for this problem is that some DV devices cannot be switched to record mode until an image is present and an immediate synchronization was not possible with a value of 0.

Max. Duration of Goto [s]

This entry determines the amount of time your DV device may require to go from one position on the tape to another position, such as a mark-in.

Preroll [frames]

This value determines the preroll time for *Batch Digitize* and *Record to Tape*.

The higher the value, the longer the preroll time. Some DV devices require a preroll time of at least 15 frames in order to guarantee a successful synchronization between Avid Liquid and the DV device.

If a clip cannot be cleanly digitized with *Batch Digitize* (e.g. the error message “Preroll Position not found” is issued), Avid Liquid automatically attempts to digitize this clip up to three times.

Send 2 Step commands [on/off]

Some players step field by field, some frame by frame. This means: Some transport the tape by one field, some by one frame, when a step command is received. This option forces the fieldsteppers among the players to move frame by frame, when you click the one frame forward tool button: 2 x field steps = 1 frame step.

Generic Betacam Driver (Controlled via RS 422)

This driver is used to control professional tape decks via a serial cable.

Timing

CAUTION: Change these parameters only when the connected device works inaccurately. With Avid Liquid with RS 422 interface, some of the following options do not apply. A special 232-422 cable is needed for RS 422 control. Please contact your Avid Technology, Inc. dealer.

Position Request

This default set value should not be changed.

Play TC Delay [Fields]

Adjust this setting until the video is frame-accurately captured by the *Logging Tool* at the mark-in point. Use burned-in timecode instead of the ordinary timecode overlay to ensure the results are not affected by the construction delay of the timecode overlay. To generate a tape with burned-in timecode simply record the Monitor (Superimposed) Out signal on a second VCR and use this tape as a reference.

Rec TC Delay [Fields]

Place two successive clips on the *Timeline* and record (Insert) them to tape. Adjust this parameter until the hard cut from Clip 1 to Clip 2 appears at the proper position on the tape (same position as on the *Timeline*).

Edit Delay [Fields]

After having adjusted Rec TC Delay, adjust the edit delay until the recording (Insert) starts at the first frame of Clip 1.

Note: To obtain reproducible results, clean the area around the insert point before each attempt by recording over it with a different clip.

Encoding delay [fields]

This setting affects tape decks that work with a compressed format (such as DV) but should receive uncompressed signals. In this case, the uncompressed signal must first be encoded inside the device before it can be recorded to tape. The result is a delay in the device's video path (encoding delay). To correct this delay, enter the correction value for the corresponding number of fields here, i.e. for a delay of two frames, enter a value of 4.

Step Emulation Delay [Fields]

As the protocol does not define a definite single-step command this behavior is emulated with a jog command at a speed of 1/10 for a certain period of time. With this parameter you can control how long the interface command (1 frame forward / backward) is to be maintained to emulate a one-frame step.

Functional Description (RS 422)

The technical options for the connected devices are described here. All entries in the functional description section simply specify the functional features of the device. They are not intrinsically used by the driver but serve to help the software identify which features should be available if a specific device is selected.

You may use these options to configure a taylor-made machine, one, for instance, featuring a YUV-SDI converter at its output, which therefore can be described as being equipped with a SDI output.

NOTE: With `Avid Liquid` (with RS 422 option), some of the following options do not apply.

Machine Type

The Machine Type property informs the front-end about the recording capabilities of the device. The following options are available:

- *Player* - the device does not possess any recording capabilities.
- *Recorder* - the device is capable of simple recording, i.e. striping and dumping, but no insert edit.
- *Assemble Recorder* - The device also has assemble mode but not insert mode.
- *Edit Recorder* - in addition to simple dumping, the device is also able to execute insert edits.

Digital Audio

If this parameter is activated, the recording device must be equipped with digital audio tracks which become visible in the *Record to Tape* tool's track settings dialog box.

Maximum Shuttle Speed

Defines maximum shuttle speed for a device. This parameter controls the mapping of shuttle values received from the `Avid Liquid Control` (optional control panel) between the second grid point (assigned to speed x2) and the maximum shuttle position. If improperly specified (usually too high), the device usually enters the maximum shuttle speed once the control ring/knob is moved past the x2 lock position.

Video Outputs

Depending on the individual device you find the following outputs, either assigned by default (*Yes)* or not available *(No)*:

- *Composite* (CVBS, FBAS)
- *S-Video* (Y/C)
- *Component* (Y/R-Y/B-Y)
- *SDI*
- *SDTI*
- SDTI x (hyper-speed transfer 2x, 4x)

The *Yes/No* settings here describe the standard features of the device. You may add outputs according to your specific studio setup. This serves as cross-references in the *Settings* > *Player Settings* > *Connection* dialog and defines the inputs that can be assigned to the editing system.

Audio Outputs

Mimics the video logic for audio outputs.

- *Analog*
- *AES/EBU*
- *SDI*
- *SDTI*

The *Yes/No* settings here describe the standard features of the device. You may add outputs according to your specific studio setup. This serves as cross-references in the *Settings* > *Player Settings* > *Connection* dialog and defines the inputs that can be assigned to the editing system.

Options

Minimum Preroll PLAY [s]

Controls the minimum preroll time used by the driver before automatic preroll adjustment has started during the initial digitization process. If it becomes apparent during the calibration process that the device will never lock faster than with 3 seconds preroll, this parameter should be set to 3 seconds to avoid unnecessary retries during the digitization of the first clip. However, this setting will not negatively influence the behavior of the driver if the value initially specified is too low. If it is too high, the driver will take longer than necessary to log a clip.

Minimum Preroll REC [s]

Controls the minimum preroll time initially used by the driver before automatic preroll adjustment starts during the first recording. Do not force the driver to use values less than 5 seconds since, unlike with traditional linear editing suites, actual recording occurs rather infrequently and it is not worth performing unnecessary retries (which take several multiples of 5 seconds) by starting with a too low record preroll time.

ClipLink Safe Preroll

This setting affects the digitizing of DV tapes to which the ClipLink technique was applied during recording. If the camera was switched off between two takes, in some cases the cut between the first take and the second take may not be precisely flush, which can in turn result in timecode breaks in the preroll. To avoid problems when digitizing, you can configure a value for the *ClipLink safe preroll* here. The default value is three seconds. During these three seconds of preroll time, no data is digitized.

Record Color Frame Selection

Controls the Color Frame Select command sent to the device before any type of recording.

Timecode

Defines which type of timecode should be used for the device in timecode request. The setting can either be

- *VITC* (Vertical Interleave Timecode)
- *LTC* (Longitudinal Timecode)
- *CTL* (Control Track)
- *Auto* (VITC/LTC); recommended setting

TC Monitor Accuracy [Frames]

This parameter is required for detecting TC breaks (see the TC break options in the *Logging Tool*). The system compares the target and actual values in the current TC. On an ideally synchronized player, the value can be 0 frames; in actual practice, however, deviations can also occur. For this reason, the default setting is *3*, meaning that deviations of up to three frames are ignored.

Ignore Reference Warnings

Avid Liquid displays an error message when the player or recording device signals an imminent problem with the sync or reference signal. Set this value *On* to ignore these warnings.
However, we recommend to pinpoint the cause of the problem, because it may impede the editing accuracy.

Tape Protection

Standby Off After (Active)

Controls the time in Still mode (Shuttle 0 or normal STOP) after which the device is switched to *Standby Off* when the device is being actively used (i.e. it is currently selected as the active device in the *Logging* or *RecordToTape Tool* and at least one of these is visible on screen).

Standby Off After (Inactive)

Controls the time in Still mode (Shuttle 0 or normal STOP) after which the device is switched to *Standby Off* when the device is not being actively used (i.e. it is currently *not* selected as the active device in either the *Logging* or *Record Tool* = normal background operation).

Connections Tab

Use these functions to combine video and audio inputs and outputs of the editing system with the outputs and inputs of the connected players, recorders and live sources. Also select the remote control settings for connected devices.
Begin by specifying (click on device name) in the left field to which recorder, player or live source the subsequent settings are to apply.

Communication Port (IEEE or RS 422) *page 15*

Video and Audio Inputs *page 16*

Video and Audio Outputs *page 16*

Communication Port

- If you have connected a controllable DV device (camera or recorder/player) via the IEEE 1394 interface (as opposed to a non-controllable live source), click the device name or *i.Link DV/1394* in the left-hand box and check that *IEEE 1394* appears as a *Communication Port*.



This selection refers to the device that was selected in *System Settings* > *Inputs/Outputs* > *Video inputs* (in case that more than one device is connected).

- With `Avid Liquid` RS 422: select the COM port (serial interface) to which the 232-422 cable is connected.
- If you wish to use image and sound material via the *Live Player* (i.e. not controllable), make sure the following list options are selected. In the list *Video Input*: *Liquid: IEEE 1394;* in the list *Audio Input: IEEE 1394*, or, provided your product version supports this, the appropriate analog inputs. This restriction does not concern `Avid Liquid` systems equipped with RS 422 interface. You can use analog or digital inputs in combination with RS 422 control.
- *None* - Choose this option if you want to control the player/recorder directly on the device itself and not via Avid Liquid.

Video Inputs

- *1394* - Choose this option if you connected the selected player via an 1394 input (i.Link DV, Firewire).

Note for users of Avid Liquid versions equipped with analog signal inputs and outputs: Use the *Live Player* to input analog signals.
With analog video inputs there is no remote control via IEEE 1394 possible.
CVBS refers to the cinch connector video input on the break-out box (usually marked yellow).

- *CVBS* (Composite) - Choose this option if you have connected the selected device via the composite input (*LIVE* player or RS 422).
- *Y/C (S-video)* - Choose this option if you connected the selected players via the S-video input (*LIVE* player or RS 422). S-video offers superior quality compared to CVBS.
- *None* - Choose this option to operate the selected device without a video interface.

If you have a `Avid Liquid PRO Box` connected to your system, the selection offers two component inputs, *YUV* and *RGB*. Select according to actual signal input.

Audio Inputs

- *DV Embedded* - Choose this option if you want Avid Liquid to use the audio signal at the DV connector. The video input switches automatically to *1394*.

Only for users of Avid Liquid versions equipped with analog signal inputs and outputs:

- *Ch1-Ch2* - Choose this option if you want Avid Liquid to use the audio signal at the analog audio connectors (cinch connectors on breakout box).
- *None* - Choose this option to operate the selected device without an audio interface.

If you have a `Avid Liquid PRO Box` connected to your system, you have two additional digital audio inputs: AES and SPDIF. Select according to actual signal input.

Video Output

These settings concern the actual video outputs of the computer or the breakout box (if connected). Select the output to which the recording device is connected. This setting will be used in the *Record to Tape* tool.
Entries with a preceding “Liquid:” refer to generic interfaces of the computer, such as a built-in DV (IEEE 1394) connector.

Audio Output

Assign an audio output to the selected device.

System Settings



Icon Systems Settings

Systems Settings contains parameters which affect the system itself, such as the still image display or the render file storage location. Double-click the icon *Systems Settings* to open the dialog box.

Changing Parameters

Procedure for changing default values *page 17*

General Tab

Contains the *General, Video Display* and *Rendering* areas *page 18*

Inputs/Outputs Tab

Lists audio and video inputs/outputs available in the system *page 19*

Changing Parameters

This dialog box is similar to Windows Explorer in terms of its organization. The categories that can be selected appear on the left; to display subcategories, click the plus sign in the box. Use the right-hand field to adjust the parameters for each category by double-clicking a value, entering one with the keyboard or selecting one from the appropriate drop-down menu.



Restore Initial State - Click this button to restore the settings that were activated when you first opened the item.

General Tab

This tab contains the following sections:

General *page 18*
Video display *page 18*
Rendering *page 18*

General

- *Digital Audio Reference Level* -
  You can set the audio reference level in single steps in a range from -9 dBFS to -20 dBFS. The red range (start of overload limit) of the Avid Liquid audio level meters is adapted accordingly (for instance in the *Audio Tool*).

Video Display

- *Still Display* - Select one of three options:
  Both (fields)
  Odd (fields)
  Even (fields)

Double-click a value to open a selection menu. *Odd* is default; this setting avoids the flickering of the still image on the video monitor (the inlay is not affected).
These settings have no effect on progressive video.

- *Viewer Mode* -
  Choose *Overscan* or *Underscan. Overscan* is the default setting; it roughly corresponds to the picture area that normally appears on a TV monitor.
  Underscan and *Overscan* affect all video inla*page 19*ys of the software. If you select *Individual*, you can use the tool buttons of each *Viewer* to toggle *Underscan* and *Overscan*.

Rendering

- *Destination Volume* -
  Enter the directory for saving rendered files.
  Double-click *Value* to open an edit field (quit with ENTER), or click the "three dots" to browse for a destination directory.
- *Holdoff* -
  The value entered here defines the time in seconds, after which rendering should begin after the last processing step of an effect. If you enter 3 seconds, the system begins rendering 3 seconds after the effect was last processed.

Inputs/Outputs Tab

On this tab, you can configure the inputs and outputs.

(Recorders and players are assigned on the *Player Settings* > *Connections* tab.)

Video Inputs

- *IEEE 1394* -
  each available DV device is listed here with its manufacturer name and a number; if no device is connected, it says so: *No device*.
  The system receives this information directly from the Windows operating system, which in turn checks all i.Link (DV, Firewire, IEEE 1394) connections of the computer and on the breakout box, if connected.
  If more than one device is connected, you can select one. The device you select here is the one that is controlled by the DV remote interface. It can be used in *EZ Capture* and in the *Logging Tool* for clip logging and capturing of AV data to the system's hard disks.
  Please note: the software does not list DV interfaces but devices connected to an interface: a DV interface remains invisible until an operating DV device is connected.

Only for users of Avid Liquid versions equipped with analog signal inputs and outputs:

- *Y/C* -
  PAL *Setup*: *B,G,H* or *SECAM*
  NTSC *Setup*: *NTSC M* or *NTSC M-J*; *Hue*
- *CVBS* -
  PAL *Setup*: *B,G,H* or *SECAM*
  NTSC *Setup*: *NTSC M* or *NTSC M-J*; *Hue*
- *Component YUV* -
  see *CVBS*.
- *Component RGB* -
  see *CVBS*.

Video Outputs

- *IEEE 1394 > Selected Device* -
  same functionality and setting as described above.
- *IEEE 1394 > DV Output Format* -
  Select either *DV* or *DVCPro 25*.
  If you want to output DV captured material via *Record to Tape* on a DVCPro device, you need to switch formats (and v.v.). Be aware that *Timeline* clips will be rendered to the other format before the recording can start.
- *IEEE 1394 > MPEG output format* -
  These options are important for outputting MPEG2 video (HDV) via the IEEE-1394 interface.
  First select an output format that the connected device can record:
  - *Micro MV* (PAL or NTSC frame rate)
  - *DVHS* (25 or 30 fps)
  - *HD 1 or 2 (50 or 60; see remarks below)*
  - *ProHD/25* or *ProHD/30*

  The output interface is now ready.

The following is a brief overview of the subsequent procedure:
Call the *Record to Tape* module, check whether the correct recorder is selected, and click *Start*. The *Timeline Sequence* is rendered in the format configured in the *Timeline Properties*.



If this format is not supported by the selected recorder, an error message will appear. Select a different *Timeline* format. Refer to the manual for your recorder to determine which formats (based on resolution, frame rate and interlacing) are permitted. It is generally best to configure a suitable format before beginning the *Timeline* editing process.

Following a tape query, recording begins. Because no image is displayed in the inlay and no sound is played via the sound card, it is recommended that you connect a monitor and speaker to the recorder (looped signal).
The recorder stops when the entire *Sequence* has been played.

HDV variants

In many ways, the HDV field is still under development. Standards have not yet been established, not even under specific names, and different manufacturers are pursuing different interests, even though they all refer to it as “HDV”.

As a rule of thumb, select *HDV2* for a Sony device and *HDV1* for a JVC device. Additional criterion: HDV1 for up to 1280x720 pixels; HDV2 is always 1440x1080. The numbers 50 and 60 refer to the (former) PAL and NTSC regions. If in doubt, test your devices using one of the two settings.

- *CVBS, Y/C* and *Component* (with analog outputs only, depending on current video signal and product) -
  - Under *Setup*, you will find the NTSC and PAL modes;
  - *Loopthru* ...
  This option applies (in the *Logging Tool/EZ Capture*) to the video display on a video monitor connected to the breakout box (Pro Box, MovieBox, AV/DV):
  If the *LIVE* output ("Monitor" icon on the taskbar) is set to *Liquid: None*, either the signal from the connected player (*Loopthru = On*)
  or from the standard color bars (*Loopthru = Off*) can be displayed.
  - *Quarter resolution* ...
  This option reduces the load on the USB interface by reducing the video signal to a quarter of its original resolution. Image quality is somewhat compromised.
  This option is recommended if, for example, only a USB-1.1 interface is available (generally, however, the USB-2.0 interface is recommended!).
- *Component > Mode* -
  `Avid Liquid PRO Box`: several options for the component output:
  - *YUV* (normal)
  - *YUV Progressive* (non-interlaced full frames)
  - *RGB* (RGB signal output)
  - *Y/C* (Y and C separated on two connectors)
  - *Triple FBAS/CVBS* (identical CVBS signal on three connectors) .

Audio Inputs

- *IEEE 1394/DV Embedded* -
  Here you can mute the incoming audio signals (*On*), provided that the player is not in play mode.

Audio Outputs

- *Sound device* > *Selected Device* -
  If you have a choice here, select the sound card or driver that you would like to use for your system's audio output.
  You may use high-quality audio cards based on the ASIO standard, e.g. for 5.1 or 7.1 sound. Make sure that the ASIO version is 2.0 or higher.
  For ASIO drivers, manufacturer-specific editing options are available that vary with regard to their scope.
  Normally, you will find your DirextX sound card or the sound chip on the motherboard here. Many current models support 5.1 sound.
  Your selection here will affect what you see in the *Output Mapping* of the *Audio Editor.*
- *Digital* > *Mode* -
  Applies to `Avid Liquid PRO Box`: Select either the *SPDIF* or *ADAT* mode that should be output via the optical digital audio interface.

FX Editors Settings



Icon FX Editors Settings

These settings influence the quality of effects, both in finished sequences and in the preview in the *Effect Editors*. Double-click the icon *FX Editors Settings* to open the dialog box.

Please be aware that these settings apply only to rendered (*Classic*) effects. Realtime effects are not affected by these parameters.

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Preview Quality Tab *page 23*
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Advanced Settings *page 24*

Render Quality Tab

Select either *Best, High* or *Preview Quality* for rendering effects. *Preview* delivers the fastest results, but the lowest quality. Always use *Best* for masters.

Preview Quality Tab

Use this tab to specify the quality of the effect preview display. Keep in mind that the system has to do a lot of processing to display clips at maximum resolution. Therefore, clips in the effect preview display may appear a bit jerky, especially if the effects are complex - even at maximum quality.

- If you choose *Fast Preview First* and *Best Quality Last*, the effect preview will first appear with a low resolution. This gives you a quick look at the effect. Maximum resolution is then used for the final preview so that you can ultimately see the effect at maximum quality.
- Whether or not *Fast Preview First* and *Best Quality Last* can be selected depends on which preview quality you selected. With *Best, Best Quality Last* is automatically selected. With *Fast Preview*, *Fast Preview First* is automatically selected. With *High Quality*, either *Best Quality Last* or *Fast Preview First* can be selected.

First click the required main preview quality: *Best, High* or *Fast Preview* and then the corresponding options *Best Quality Last* or *Fast Preview First.*

System Tab

- *Video Draw Method - Bitmap (BMP)* is the default setting. Other options are *Video Driver*, *Video for Windows* and *Bitmap (DIB)*.
- *Image Cache Size* - used for specifying cache size. Default setting: 64megabytes. If your system is well equipped with RAM, increase the setting to achieve higher performance.
- Avid Liquid supports the MMX function of Pentium processors. If your computer can handle MMX extensions, activate this function to increase system performance.
- *SSE1/2* relates to a subset of Intel processor commands. If you're using one or more SSE capable CPU(s) in your system, check these options to enhance system performance.

Advanced Settings

Use *Advanced Settings* to fine tune effect rendering parameters. You should, however, edit these parameters only if you're knowledgeable in the field of render mathematics. We recommend consulting specialized literature before you make any changes here, since a detailed description is beyond the scope of this reference manual.

Plug-In Settings



Icon Plug-In Settings

These settings are used for specifying which folder contains the additional video filters and video effects to be used with Avid Liquid. The plug-in files must be compatible with the "Adobe Premiere interface for plug-ins" (*.prm). Double-click this icon to open the *Plug-In Settings* dialog box.

Click *Add* and select the directory containing the plug-in you want to add. As soon as you confirm your selection by clicking *OK*, the path is entered in the plug-in directory window.

To remove a plug-in directory, select the path and click *Remove*. If you remove a plug-in from the directory window, only the path to this plug-in is deleted and not the plug-in itself.

Use the *Move Up* and *Move Down* arrows to change the order of the paths in the plug-in directory window.

Whenever you add a plug-in or delete a plug-in from this directory window, you must restart Avid Liquid in order for the changes to take effect. To save time, therefore, make several changes in a single procedure before confirming your actions by clicking *OK*.

Once you have followed this procedure to add new plug-ins, Avid Liquid identifies each plug-in as either a *Transition Plug-In* or a *Clip Plug-In* and stores it in the *Project* window on the `Library` tab. It is then available in the *PlugIn Racks* and can be used like any other effect.

If no PlugIns have been registered, the mentioned *Racks* do not show.

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Avid® Liquid

Reference Manual

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Version 7.1 / March 2006 / Pinnacle Systems Documentation, Munich, Germany

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Chapter 1

Introduction

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Avid®

This purpose of this introduction is to provide you with an overview of Avid Liquid and familiarize you with existing documentation.

About Avid Liquid *page 19*

Sources of Information *page 20*

List of Chapters *page 21*

Preface

Avid Liquid is the professional solution for professional video editing on a computer. All its functions are specifically adapted to meet the requirements of today's video editing. Its main focus is on the basics: image, audio and editing. Avid Liquid is operated intuitively. Beginners will quickly produce successful results and professional editors will achieve the highest productivity and precision.

Efficient *Project* management and extensive storyboarding functions help you develop your ideas. The integrated video and audio viewers allow you to monitor and control active processes (for example, when reading in video material or editing clips). A Timeline as well as effect and audio editors provide you with options for optimally transforming your visions into reality. Moreover, Avid Liquid relies on proven, future-oriented standards, enabling the generated results to be effectively integrated in the latest video production processes.

You can tailor the Avid Liquid user interface to your own particular language, working style and *Project*s. You can flexibly configure the views, tools and keyboard assignments. You can also save your customized settings and transfer them to other systems.

Users with more sophisticated requirements can take advantage of numerous possibilities for expanding Avid Liquid.
If you have any further questions concerning options and expansions for Avid Liquid, contact Avid Technology, Inc. or one of our authorized Avid Technology, Inc. partners.

Sources of Information

Product Manual

This separate manual describes hardware and software installation, the connection of system components and hardware, non-product-specific settings, etc.

Avid Liquid Reference Manual

This manual is available in hardcopy form and as well as Acrobat pdf. It describes all functions of Avid Liquid. It is suitable for learning the basics of operation as well as for looking up specific functions as you need them.

This Reference Manual was written for all products of the Avid Liquid family. Although these products share most of the same functions of Avid Liquid (i.e. the software), they also differ in some respects. Differing passages are clearly marked. Occasionally you may see a function in one of the screenshots (Menu, Checkbox, Tab, etc.) that does not appear in your own software, or you may not see a function that does appear. For reasons of space, we were unable to include all versions of the screenshots in the manual. In case of doubt, the manual text and your own software apply.

New functions and features in a new software version

Please read the "New in Version [X]" (What's new) document under Windows Start menu > Programs > Avid Liquid > Online Help (or as a PDF file located in the installation directory for Avid Liquid under ..\Help\FS\Frames\Readme\WhatIsNew.pdf).

Avid Liquid Help

Help offers you instant access to the information you currently need. It is context-sensitive and includes an interactive table of contents and comprehensive index with a find function. Its other components include the Avid Liquid Online Manual, a glossary and a readme file. See also *"The Online Help"* on page 29. You can call Help either from the menu bar or by pressing F1.

World Wide Web

Avid Technology, Inc. has set up contact and information options specifically aimed at Avid Liquid users, which you can access via our Web page at www.avid.com. For example, you can retrieve current product information or contact other Avid Liquid users through discussion forums. There is also an overview of current updates, options and trainings that keeps our customers informed of all the latest developments.

Tooltips

All Avid Liquid toolbar buttons have tooltips. These miniature information windows (pop-ups) are displayed when you rest the mouse pointer on a button for more than one second.

List of Chapter

Introduction

This chapter provides you with an initial introduction to Avid Liquid. It also tells you about sources of information that will help you work with Avid Liquid (*page 17*).

Documentation

This chapter familiarizes you with the user interface and Online Help and offers you tips on the effective use of this documentation (*page 25*).

Basics

This chapter describes the Avid Liquid user interface and introduces you to the terminology used (*page 33*).

Signup

Logging on to the system; working with user names and user profiles, password protection (*page 61*).

High Definition Television (HDTV)

This chapter describes everything you need to know about the HDTV and multiformat capabilities of Avid Liquid (*page 71*).

Input

This chapter describes everything you need to know about the raw materials of editing: Digitizing audio/video (capture); importing graphics, titles, etc. (*page 103*).

Data Exchange and Networking

This chapter describes all the functions for exchanging data with other applications, including EDL, ALE, XML, batch/shot lists, XReceive/XSend, etc. It also provides a basic description of a simple Avid Liquid network (*page 167*).

Administration

Explains arranging and viewing the material inside a *Project*; working with Media Files (media management); creating a rough cut (storyboarding); batch digitizing (*page 205*).

Edit

Editing (cutting) films with sample applications; basics of audio editing; special functions (nesting and consolidating *Sequences*; *page 351*).

Finish

This chapter provides general and introductory information on the effects in Avid Liquid, as well as descriptions of the *Classic Effect Editors* (*page 499*).

Software-Based Realtime Effects

These effects take advantage of the performance capabilities of modern computer systems by using the graphics-card and mainboard processors for the realtime processing of effects (*page 599*).

Commotion Clip FX

These effects are especially suited for complex compositing and keying (*page 643*).

Special Effects

This chapter provides information on Avid Liquid's powerful color correction functions as well as the *Linear* and *Dynamic Timewarp Editors* for smooth, dynamic increase/decrease of video speed (*page 723*).

Audio

This chapter describes everything you need to know about audio editing in Avid Liquid (*page 793*).

Titler

Avid Liquid comes bundled with a title generator, a powerful software for creating roll, crawl and still titles, which can easily be integrated in your *Project*s (*page 881*).

DVD Authoring

Avid Liquid guides you from the importing of material to its editing and authoring and all the way to burning it to DVD. The entire production process is seamlessly coordinated. You can even design the DVD menus in Avid Liquid (*page 885*).

Export and Output

How to output on tape an edited film (in Avid Liquid lingo, a *Sequence*), burn to CD or DVD. exporting various data formats (single images, animation, etc; *page 941*).

Customize Avid Liquid (User Settings)

How to configure your Avid Liquid workstation and how to create, customize and save your own user profiles (*page 983*).
The site specific settings (regarding the computer system, inputs and outputs, players and recorders, etc) are described in the Product Manual that came with your Avid Liquid.

Glossary and Index

The Appendix contains a comprehensive glossary of video, editing and computer terms, as well as the index (*page 1003*).

Chapter 2

Documentation

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This manual for Avid Liquid contains all information available at the time of printing of this manual.

Conventions and Symbols *page 27*

Comments and Suggestions for Documentation *page 28*

The Online Help *page 29*

Conventions and Symbols

This section describes the conventions used to identify special texts, such as warnings.

Caution



Calls the reader's attention to particularly important information, or especially "dangerous" actions, i.e. actions that could lead to a loss of data.

Note



Calls the reader's attention to important information and practical tips.

Functions of Specific Products

Some of the functions described in the manual apply only to a specific product. The Avid Liquid software is the basis for a number of products that differ with regard to hardware (such as connection boxes, plug-in cards, etc.). The following format is used to differentiate among functions:

Avid Liquid

This paragraph applies only to Avid Liquid.

If a paragraph with this format does not mention your product specifically, the function does not apply to your product.

Italics

Terms from the Avid Liquid user interface are written in *"italics"* when they are part of instructions on how to perform a given function *(*for example, the *Import* option in the *Rack* shortcut menu*)*.

>Click Sequence >

The symbol ">" is used to indicate a string of menus, buttons, etc. that have to be selected to access a given function. For example:

Rack shortcut menu > *Picon View* > *Medium*. Meaning: In the *Rack* shortcut menu, click *Picon View*. In the pop-up menu that appears, click *Medium*.

Avid Liquid comes with a Windows-compatible menu bar.

- Menu bar > *File* > *New* > *Project*

You can also run Avid Liquid in the Classic Mode (software interface before version 6); see *"Starting and Exiting"* on page 35.

Keyboard Symbol



Many of the functions in Avid Liquid can be executed by means of keyboard shortcuts. This symbol identifies a keyboard shortcut. The key names are written in small caps (example: DEL, SHIFT, CTRL).

Mouse Wheel



If your mouse has a wheel for scrolling, you can also execute some functions using the mouse wheel; move the *Playline*, for instance.

Comments and Suggestions for Documentation

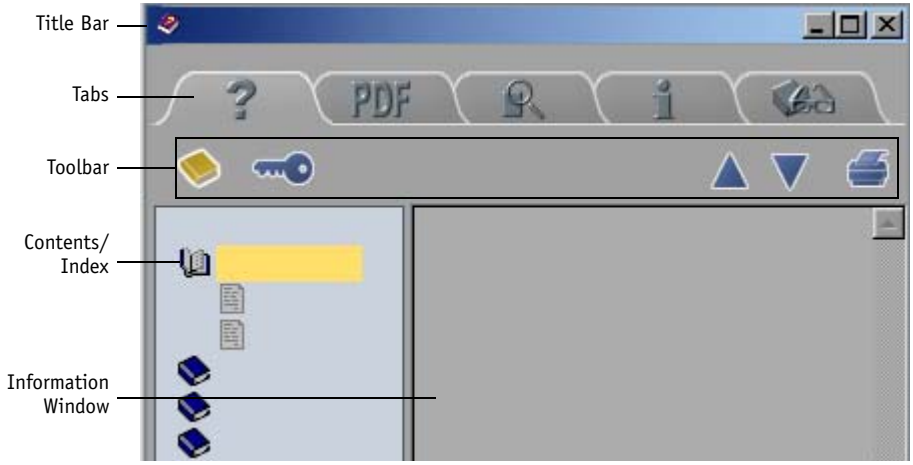
If you have any suggestions, requests, corrections or additions relating to the Avid Liquid manuals and help files and would like to share them with us, please contact us at:

liquid.documentation@pinnaclesys.com

Write your message in either English or German and be as precise as possible about the subject of your comments. While we will not be able to respond to your e-mail directly (though it may happen), rest assured that your input is important to us.

The Online Help

You can call Help either from the menu bar or by pressing F1.



Simplified View of the Help Window

Title Bar

The title bar is the same as in all Windows windows (see Windows manual).

Tabs in the Help Window

Clicking one of the rear tabs brings to front its corresponding content:

Online Help



The “Online Help” tab contains the table of contents, the index and the contents window for Online Help. Texts within the paragraphs that are marked in blue indicate cross-references.

Online Manual



The Avid Liquid Online Manual reflects the contents of the (hardcopy) Reference Manual. To use the Online Manual, you must have the Adobe Acrobat Reader (new version included on the Avid Liquid installation CD). Click the tab to start the Acrobat Reader and display the Online Manual.

You will also find the PDF file in your Avid Liquid installation directory under:
..\[ProductName]\Help\FS\Frames\Manual\.

Glossary



The glossary contains general terms and information on video, computer and audio technology as well as *termini technici* concerning the art of editing.

Info



Provides product information on Avid Liquid, including the version, copyright information and trademarks.

Readme



The readme file contains important information that could not be incorporated in this document (printed manual as well as online help).
You should read this file.
The readme file can also be found in Windows Start menu > All Programs > Avid Liquid > Online Help.

Toolbar

Contents/Index



Click the “display table of contents” button to view a list of topics by chapter. Then double-click a chapter or topic to open the particular document. Under *“List of Chapter”* on page 21 of the Introduction, you will find a brief overview of the contents of each chapter.



Click the “display index” button to view a list of index entries in alphabetical order. In the entry field above the list, enter either the entire word you are searching for or the first few letters. Double-click an index entry to display the particular topic.
If you then go back to *Content* view, you can see where the index topic is situated within the context of the manual.

Previous Topics



The function of the “back” and “forward” buttons depends on what pages or chapters you have already retrieved and the order in which you opened them. The left arrow (“back”) takes you back through the pages you previously viewed.



The right arrow (“forward”) reverses this step. The “forward” button is enabled only if you previously used the “back” button to go back one or more pages.

Previous Document/Next Document



Click the up arrow to view the previous page in the chapter.



Click the down arrow to view the next page in the chapter.

Print



Click the “print” button to print out the help topic currently displayed.

Information Window

The information window displays text and illustrations of the help topics. If the topic does not fit in the current window size, scrollbars appear along the margin. Drag the bar downward to advance toward the end of the topic or click the top or bottom arrow.

An arrow button appears in the bottom left-hand corner of each help page. Clicking this arrow returns you to the beginning of the help page.

Chapter 3

Basics

make manage move | media™ Avid®

This chapter features a quick introduction in Avid Liquid: the most important software modules, the most important terms, the general principles behind their operation.

Starting and Exiting Avid Liquid *page 35*

Menus, dialogs boxes and tool buttons *page 36*

Tour de Avid Liquid *page 41*

Starting and Exiting

Avid Liquid Chrome HD

Avid Liquid Chrome HD only: In order to launch Avid Liquid, you must log on to Windows with power user or administrator rights. Otherwise the editing hardware will not be recognized.

Starting Avid Liquid

1 Switch on all the peripherals, including the VGA monitor(s), A/V disks, video recorder and A/V monitor, etc.

2 Start your computer.

3 Start Avid Liquid either via the program shortcut on the Windows desktop or from the Windows Start menu.



If you want to start Avid Liquid with the traditional (pre-V6), or „Classic“, interface, go to the Avid Liquid installation Program folder and find the small link file named „Avid Liquid [X] (Classic)“. You can drag this file to your desktop and launch Avid Liquid with a doubleclick.

4 The Avid Liquid interface is displayed in the standard view (first launch). See also *“Avid Liquid Desktop”* on page 43.

- When you start Avid Liquid for the first time after installation, the *User Login* dialog box does not appear. (See also *“Signup”* on page 61.) Then, a default *Project* is opened (Start-NTSC or Start-PAL, may contain sample clips).
- Each time you log on after this, the last *Project* you worked on is opened automatically. You then have the option of logging on under a different user name or opening another *Project*.

Exiting Avid Liquid

In the Avid Liquid menu bar, click *File* and select *Exit Avid Liquid*. A dialog box is displayed containing two options:

- Select *Quit Avid Liquid* and click *OK*. This terminates Avid Liquid.
- Select *Clear Avid Liquid desktop and log on as different user?* and click *OK* to log on as another user (*“Signup”* on page 61).

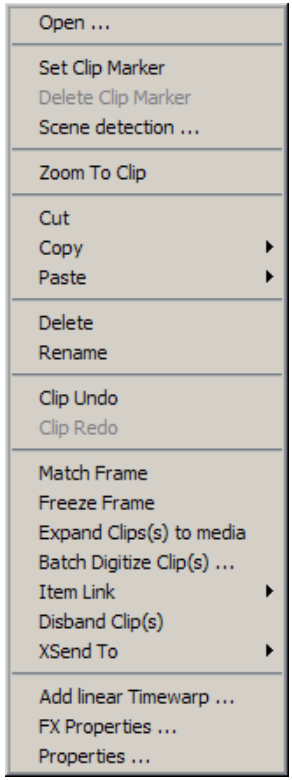
Menus, Dialog Boxes and Tool Buttons

This section provides you with an overview of elements frequently used in Avid Liquid.

Menu bar

A standard Windows menu bar is available along the top of the program window. It contains the usual menus, including *File, Help* and *Edit*, as well as menus specific to Avid Liquid. See also *"Standard Windows Menu Bar"* on page 51.

Shortcut Menus



Sample shortcut menu

Calling Shortcut Menus

1 Right-click an object or an area to open the corresponding shortcut menu.

1 Left-click an entry in the shortcut menu to call this function.

Tool Buttons and Toolbars

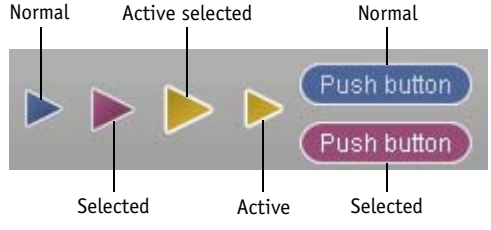
In Avid Liquid, functions (such as "*Play*") are called and executed either via a shortcut menu or via tool buttons.
Tool buttons are found in toolbars (appear horizontally or vertically in the interface).
Sometimes the button you need may not be included in the toolbar (due to restricted space). Nevertheless, you can determine for almost each toolbar which buttons it will contain and how these buttons will be arranged. To learn how to do this, see *"Customizing Toolbars"* on page 990.

Most of the buttons in Avid Liquid have tooltips, which are miniature information windows containing a brief description of the function. Tooltips are displayed when you rest the mouse pointer on a button for more than one second.

Button & Text Status

For all tool buttons, the following visual clues tell you the tools' status:

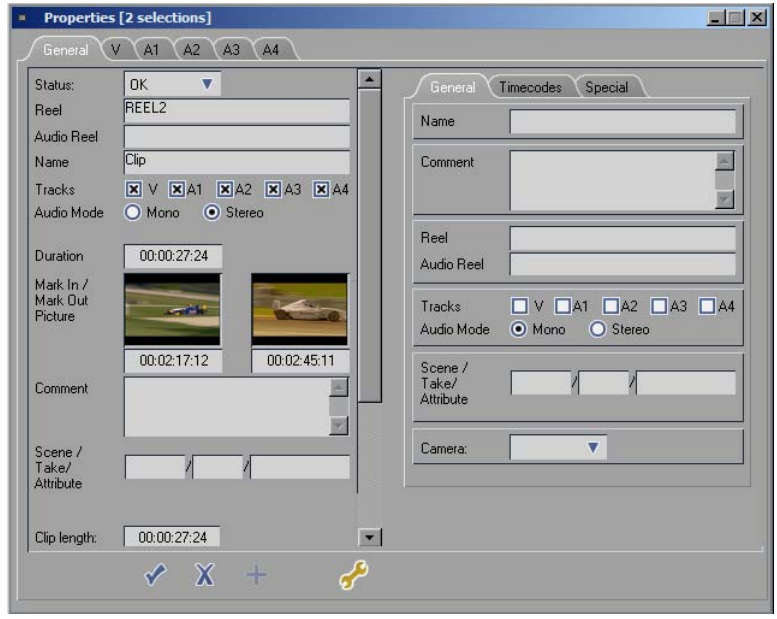
- Gray button, no glow highlight: function off, tool not in range to be selected (mouse is not pointing at the button).
- Gray button with glow highlight: function off, tool in range to be selected (mouse is pointing at the button). This tells you which tool is currently selected with the mouse and will be enabled when you click the mouse button. Example: moving the mouse across the buttons on a toolbar without clicking or dragging highlights each button as the mouse passes over it.
- Yellow button, no glow highlight: function on, tool not in range to be selected (mouse is not pointing at the icon). Example: Play tool remains yellow while a clip plays.
- Yellow button, yellow glow highlight: function on, tool in range to be selected. Example: mouse is pointing at Play tool while a clip plays.



Button & text status

Dialog Boxes

Dialog boxes contain information, let you specify functions and select options.



Sample dialog box

Typical Elements in Dialog Boxes

Most dialog boxes have a similar layout and contain the following basic elements:

Tabs



Sample tab

Clicking one of the rear tabs brings its content to the front.

Entry Fields

Entry fields allow you to enter text. Click in the entry field and make your entry via the keyboard. Confirm with ENTER or use TAB to jump to the next field.

Check Boxes



Click a check box or to select the corresponding option.



Circular check boxes are either-or selections.
Several square boxes can be checked at the same time.

Sliders and Knobs

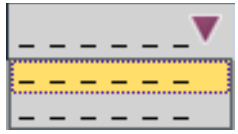


Sliders and knobs allow you to set values or ranges of values. Sliders and knobs can assume various forms depending on the dialog box.



To set a value using a slider or knob, click the corresponding element and drag it to the desired position. You can also enter the values in entry fields via the keyboard.

Drop-Down List Boxes



Sample drop-down list box

Some windows have drop-down list boxes. Click the arrow or the visible list entry to open the list. Then select an entry by clicking it.

Buttons in Dialog Boxes

These buttons apply to all settings of a dialog box.

Apply and Close



Click to apply the dialog box settings to the current item and close the dialog box.

Cancel



Click to close the dialog box without applying any changes. This is the same as closing the dialog box from the title bar or the ESC key.

Restore Initial State



Restores all settings to the state they were in when the dialog box was first opened.

Restore Default State



Resets all changes to the default software settings.

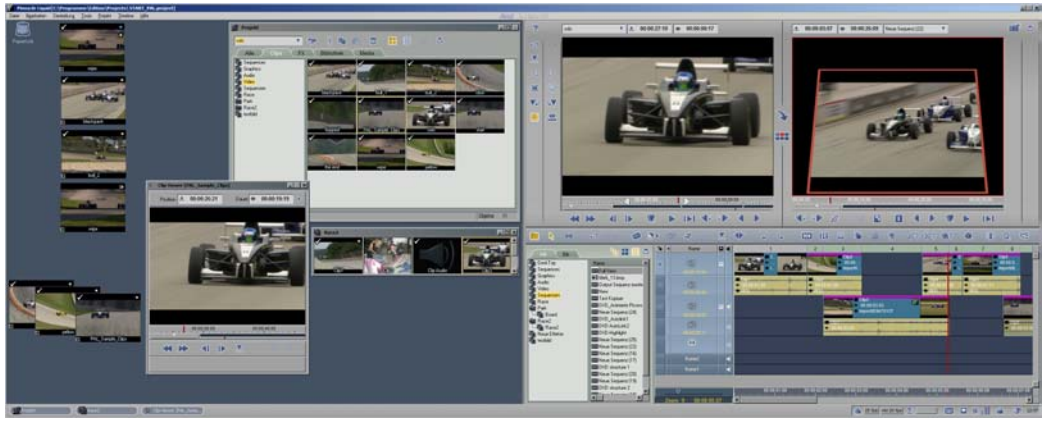
Customize Dialog Box



Some dialog boxes can be customized. This button opens the corresponding tool box.

Tour de Avid Liquid

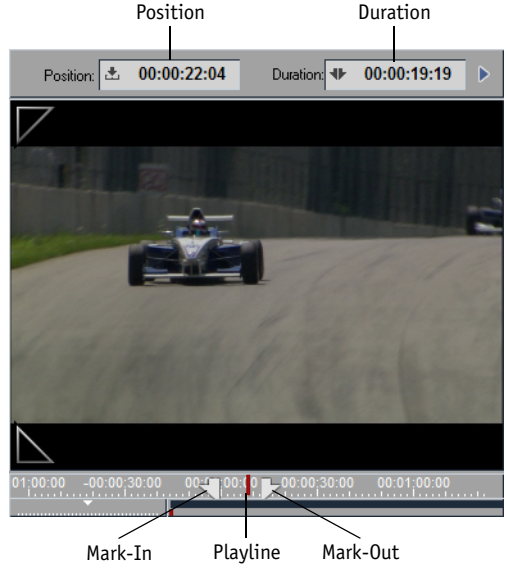
If your are not familiar with Avid Liquid, have a look at the next few pages. We would like to introduce to you some of the most important software modules, viewers and editors.



That's how Avid Liquid may look on a dual monitor setup

Inlays

Inlay windows let you have a look at your video (moving or still), titles and graphics, effects to be rendered, etc. Even audio is displayed - as wave form.
Placed around the inlay windows you find all kinds of functions and displays. The example below (a snapshot taken from the *Clip Viewer*) shows the position of the *Playline* and the duration of the clip between the mark-in and mark-out points.
The inlays of *Source* and *Master Viewers* can be scaled to the size of the computer monitor. See *"Fullscreen Display"* on page 476 and *"Inlay Quality Menu / Inlay Size"* on page 479.



Sample inlay window (here shown with position bar and two TC displays)

Picons



Picon

All objects in Avid Liquid can also be displayed in *Picon* view. *Picons* (*p*icture *icons*) are still images that help you identify clips. *Picon view* is ideal, for example, for developing a storyboard.

Picons are found on the Avid Liquid desktop, in the *Project* window, on the *Timeline* and in numerous dialog boxes. For more information on Picons, see "*Picon View*" on page 242 and "*Picon Play*" on page 289.

Avid Liquid Desktop

The Avid Liquid desktop is the backdrop for all other elements of Avid Liquid, like *Picons*, for instance. Three things can always be found on the desktop:
The *Trash* icon, the taskbar and the *Project* window.

Otherwise, the Avid Liquid desktop functions much like the Windows desktop (refer to the Windows manual for further information).

The Taskbar

The taskbar appears at the bottom of the desktop.



Taskbar functions

Functions (from left):

Error/fps/drop frame Indicator



The "thumbs up" sign tells you that the system started correctly.
If a problem occurs, a flashing exclamation mark is displayed that is either yellow, orange or red, depending on the severity of the problem. Left-click the symbol to obtain detailed information on the current problem.

Right-click the symbol to display a shortcut menu with the following options:

- *Show latest line of error log -*
  Opens a text box in the taskbar displaying the latest message.

- *Show error log* -
  Opens the list box with all the lines.
- *Reset error indicator* -
  Deletes all lines.
- *Show System Settings* -
  Displays general system settings (same as *Edit > Control Panel > Site > System Settings)*.
- *Show current playback speed* -
  During *Timeline* playback, indicates the current number of frames per second (fps; stadard PAL: 25 fps, standard NTSC: 30 fps). Its main purpose is to allow you to check computer performance for realtime software effects.
- *Show minimum playback speed* -
  Indicates the lowest fps value reached.
- *Reset speed indicator* -
  resets speed to default fps
- *Reset speed indicator always at start playback* -
  As soon as the *Timeline* is replayed, resets the last fps information identified.

Render Viewer



The icon (Σ, the Greek letter Sigma) represents the *Render Viewer* window. "Rendering" means the computation of effects. Click the Σ icon to open the *Render Viewer* window, where you can monitor the rendering process, and start and stop rendering. (See also *"Effect Rendering"* on page 536.)

The horizontal bar next to the window shows the rendering progress.



Provided that they contain clips with realtime effects, *Slices* (numeric segments of the *Timeline*) can be rendered individually or in groups. This means that you can generally disable background rendering (*Render yellow slices*) and then render specific segments. Right-click a *Slice* to open the shortcut menu and select *Force rendering for slice(s) [n] -> [m]*. Hold down the SHIFT key while clicking to select a sequence of *Slices* (and thereby include *Slices* without effects at well; those will just be skipped).

Once the rendering process begins, the Sigma icon is replaced by a miniature of the image, provided you have not disabled this function in the shortcut menu (right click). You can also use this menu to hide the progress bar and stop the rendering process.

Key Caps



Click this icon to open the *Key Caps* window. For any software module, this window provides you with a quick reference showing the functions assigned to the keys of the computer keyboard.
Refer to *"Assign Functions to Keyboard"* on page 993 for information on how you can change these assignments.

Select Video Output (LIVE Output)



Depending on the connected hardware (e.g. Avid Liquid PRO Box), you can select various analog video outputs here.
The option *Liquid > IEEE 1394* activates output via the DV interface (useful if you have a TV monitor connected to your camcorder).
Note that realtime effects can be previewed only via an analog output and in the *Master Viewer's* video inlay.

- Direct output of HD/HDV to an NTSC/PAL monitor, as well as to an HD monitor, is possible for Avid Liquid Chrome HD with a suitable breakout box (refer to the Product Manual).
- If you own the Avid Liquid PRO Box, you can output a downscaled HD image to PAL/NTSC analog monitors. The scan rates of the video (25/50 or 30/60 Hz families) must match those of the video monitor.
  Activate this option in the *System Settings* by selecting *Edit > Control Panel > Site > System Settings > Inputs/Outputs > Video Outputs [analog] > HD Output = On.*
- *VGA Secondary Monitor* routes video output to the secondary computer monitor (available only with suitable dual-monitor graphics cards). See the readme for up-to-date information.

Audio Tool



Click this icon to open the *Audio Tool*, which you can use to control outgoing levels.
The adjacent rows of squares serve as an auxiliary level. The two uppermost segments in particular are displayed in red to warn of an overload. For related information, refer to *"Audio Tool"* on page 806.

Digital or analog audio scrub: Right-click on the icon to open a shortcut menu. Select either one of the two modes, then enable scrub by pressing the SCROLLLOCK key on your keyboard: In the icon an *A* or *D* indicates active scrub mode, and the type.
For further information on this subject see *"Audio Scrubbing - Digital or Analog"* on page 804.

View Switcher

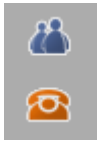


To access several views for the Avid Liquid interface, click the *View Switcher (*eye icon) and select an available desktop view (*"Click this icon to open a dialog box that can be used by members of a workgroup to exchange information. When a message is received, this icon is replaced by a flashing reddish-orange telephone icon (page 197). Desktop Views"* on page 46).



In a dual monitor setup, we suggest to select a desktop view that positions the *Source* and *Master Viewers* on the left monitor ("primary"): viewers on the right may cause dropped frames when playing back video.

InterCom



Click this icon to open a dialog box that can be used by members of a workgroup to exchange information. When a message is received, this icon is replaced by a flashing reddish-orange telephone icon (*page 197*).

Desktop Views

The Avid Liquid desktop is able to display several windows at once, and you can configure them on the desktop in different ways. The current configuration of windows visible on the desktop is called a "view." The *View Switcher* (eye icon) on the taskbar opens a shortcut menu that sets the current view on the VGA monitor.



You can arrange icons such as those for the *Trash* and for *Racks* via the desktop shortcut menu.

Single VGA Mode

To change the arrangement of windows on the desktop:



1 Click the *View Switcher* icon at the right end of the taskbar to display the selection menu.

2 Click the particular view that you want.
You have now selected the view and the desktop is arranged accordingly.

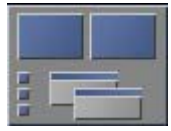
or



1 Drag an object that you want to edit in another module to the *View Switcher* icon, keeping the mouse button depressed. The selection menu is displayed.

2 Now drag the object to the particular view that you want and rest it on this view for a few moments. The view changes and you can now continue working with the object.

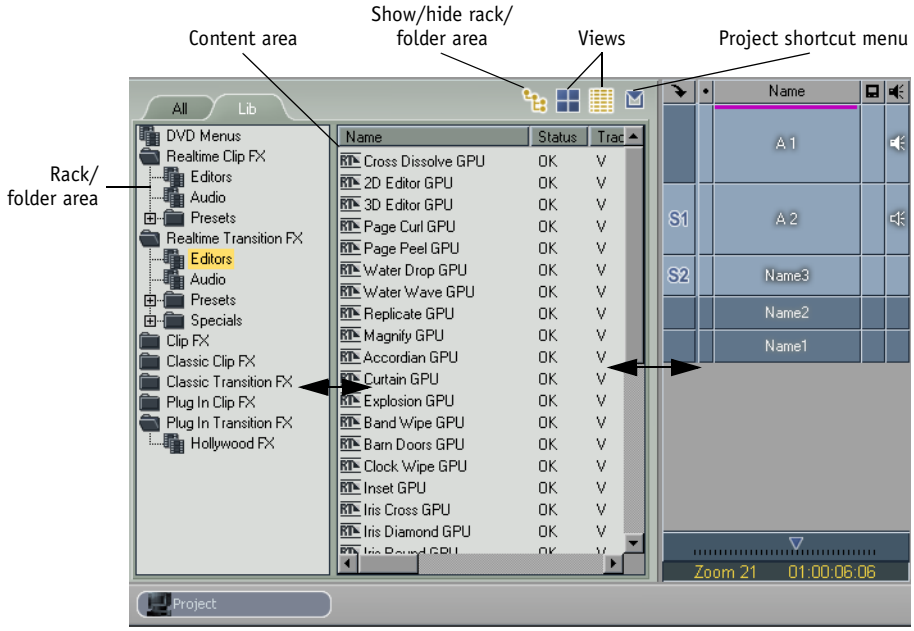
Views (One Monitor)

	- *Timeline* only
	- *Sequence Editor* above, *Project* window below
	- *Project* window above, *Timeline* below
	- *Project* window only
	- *Sequence Editor* above, *Timeline* below
	- *Single Monitor View (Project* window, *Source/Master Viewer* and *Timeline*)

The most common views are "*Project* window only" for developing *Projects* and "*Project* window above, *Timeline* below" or "*Sequence Editor* above, *Timeline* below" for the actual editing.

Using the Project Browser

The *Project Browser* proves especially useful when working on a single monitor system. When active, the *Project Browser* takes up some space of the *Timeline*.



Project Browser



The *Project Browser* is a miniature *Project* window. Use the this tool button to call up the browser. If you do not find the button on the *Timeline* tool bar, retrieve it from the corresponding tool box *(see "Customizing Toolbars"* on page 990). To close the *Project Browser,* click the tool button again.

- Change size and positions of browser -
  The boundaries between *Timeline* and *Project Browser* as well as between content area and *Rack/Folder* area can be moved. Place the mouse on the separating line and drag it to the desired position (see arrows in screen shot above).
  You may also change the positions of content area and *Rack/Folder* area. Right-click on the separating line between the areas and select a combination. *Relative* preserves the relative size of both areas when dragging bigger or smaller.
  To move the *Project Browser* to, say, top of the *Timeline*, right-click the separating line between browser and *Timeline Headers* and select an option from the shortcut menu.

- *Show/Hide Rack Tree* -
  Click here to either show or hide the rack/folder area, depending on the current view.
- Toggle tabs -
  Click to toggle available *Project* tabs.
- Switch *Project* -
  In case you need material from a *Project* other than the current, it is possible to switch *Projects*. The current *Sequence* remains on the *Timeline*.
  To do so, right-click the *Show/Hide Rack Tree* button. You get a list of the most recent *Projects* you worked on (same list as in the *Open/Create Project* submenu). Click the *Project's* name to select it. If you need a different *Project,* you will first have to open and close it the conventional way in order to get it on the most recent list.

More information on *"The Project Browser"* on page 218.

Dual VGA Mode

To change the arrangement of windows on the desktop:



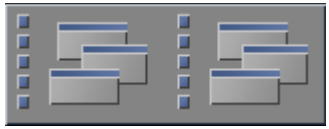
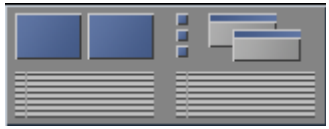
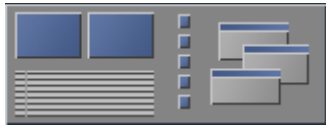
1 Click the *View Switcher* icon at the right end of the taskbar to display the selection menu.

2 Click the particular view that you want.
  You have now selected the view and the desktop is arranged accordingly.

In a dual monitor setup, we suggest to select a desktop view that positions the *Source* and *Master Viewers* on the left or primary monitor: *Viewers* on the right may cause dropped frames when playing back video.

If you want Avid Liquid to span both monitors, the resolution of the monitors must be identical.

Views (Two Monitors)

	- The *Timeline* appears on both monitors
	- The *Project* window appears on both monitors
	- Left monitor: *Sequence Editor* above, *Project* window below. - Right monitor: *Timeline* occupies entire monitor
	- Left monitor: *Sequence Editor* above - Right monitor: *Project* window above, *Timeline* occupies bottom of both monitors
	- Left monitor: *Sequence Editor* above, *Timeline* below - Right monitor: *Project* window occupies entire monitor
	- Left monitor: *Project* window occupies entire monitor - Right monitor: *Sequence Editor* above, *Timeline* below

Standard Windows Menu Bar

The menu bar is located along the top of the program window. You can use the usual Windows buttons in the top right-hand corner to minimize or maximize the program window, but not to scale it to a particular size.

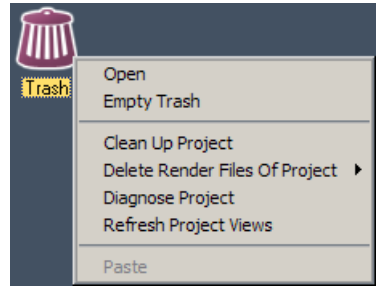
- Most of the menu commands can also be accessed in other ways. For example, it is also possible to open the *Logging Tool* for capturing video and audio by clicking a tool button or pressing a function key. Other commands can be selected from the specific shortcut menus.
- For some commands, you must first select a *Rack* or several clips in order to indicate where you want to apply the function. For example, if you want to import a clip, first select the *Rack* to which you want to import it.
- You'll notice that the background of certain windows starts to flash (light-gray – dark-gray). This means that the subsequent action will be applied to this particular area. This is especially helpful when, for instance, you have opened or selected multiple *Racks*.
- Moreover, the contents of a menu can change depending on which area is currently activated. Thus, for example, the *Project* menu is much shorter when you're working in the *Project* window on the *Library* tab.

The Trash



To remove items from *Racks*, or shortcuts from the desktop, you can drag them to *Trash*. The can expands to indicate that there are items in it. The *Trash* tooltip, which appears when the mouse pointer rests on the icon for more than one second, indicates the number of items in *Trash*.

Right-click *Trash* to access its shortcut menu.



- *Open* -
  opens a window that displays *Trash* contents. You can drag items from the *Trash* window to the *Project* window to restore them. Dragging an item from the *Trash* window to the desktop creates a shortcut to the item, but you cannot access the target object unless it also exists in the *Project* window.
- *Empty Trash* -
  removes the items in *Trash* from the *Project*. Note that this does not delete the media, effect, etc. files on the hard drive, it just removes them from the *Project*.
- *Clean Up Project* -
  The complete undo history of the current *Project* including all deleted objects will be erased. This function should be used to minimize the size of a *Project* file, for example in the case of having finished a program.
- *Delete Render Files Of Project* -
  See "Deleting Render Files" on page 347.
- *Diagnose Project* -
  see *"Diagnose Project"* on page 224
- *Paste* -
  puts the clipboard contents (an object you copied or cut from its original location) in *Trash*. This is the same as using the *Trash* button or the *Delete* key, or selecting *Delete* in the shortcut menu.



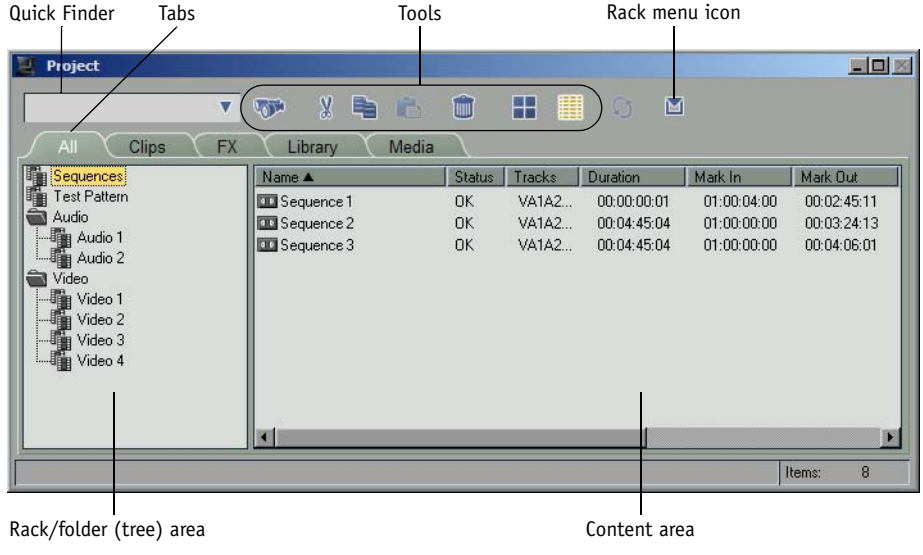
Right-click in the *Trash* window to select a *Detail* or *Picon* view of its contents.

The Project Window

In this window, you can administer all the items needed for editing with Avid Liquid. The *Project* window displays all the elements for the currently open *Project*, including audio and video clips, effects, graphics, etc. Similar in design and function to the Windows Explorer, the *Project* window uses a hierarchy of folders that you can customize to suit the *Project* and your own preferences.

The tree area on the left is used for creating and selecting folders and subfolders (called *Racks*). The content area on the right is used for organizing and viewing objects.

For more information on administration, see *"The Project"* on page 208.

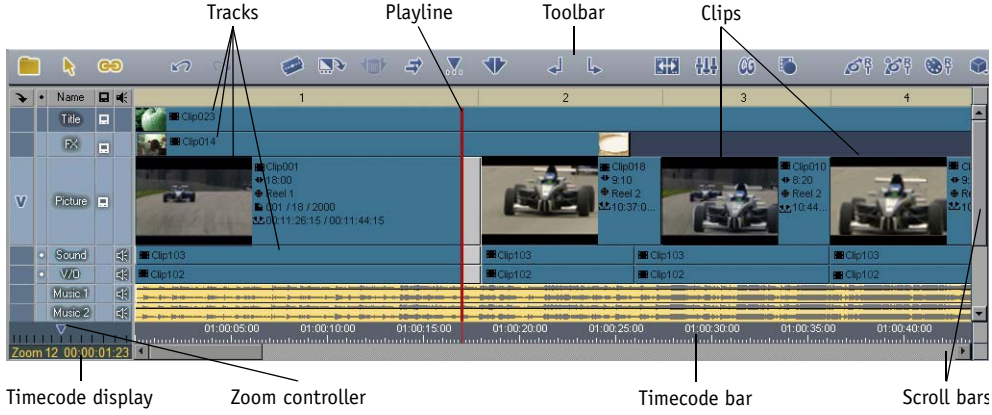


Project window

The Timeline

The *Timeline* is the workspace in which you compile a film (in Avid Liquid known as *Sequence)* from the individual objects in the *Project*. Objects are placed on *Timeline Tracks*. You can select the number and size of the *Tracks*. Other elements used with the *Timeline* include the toolbar, *Playline*, *Timecode Display* and *Timecode Bar*.

For more information on the *Timeline* and on editing video, see "*Timeline Layout*" on page 354.

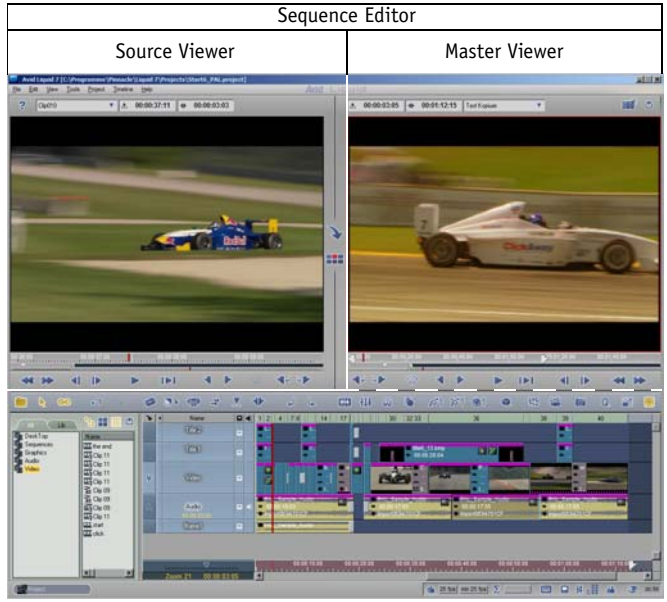


Timeline window

The Sequence Editor

The *Sequence Editor* combines the *Source Viewer*, *Master Viewer* and the *Timeline*. The *Source Viewer* (“player”) displays the clip that you want to edit. The *Master Viewer* (“recorder”) lets you play the *Sequence* located on the *Timeline*.

For more information, see *“Sequence Editor”* on page 391.

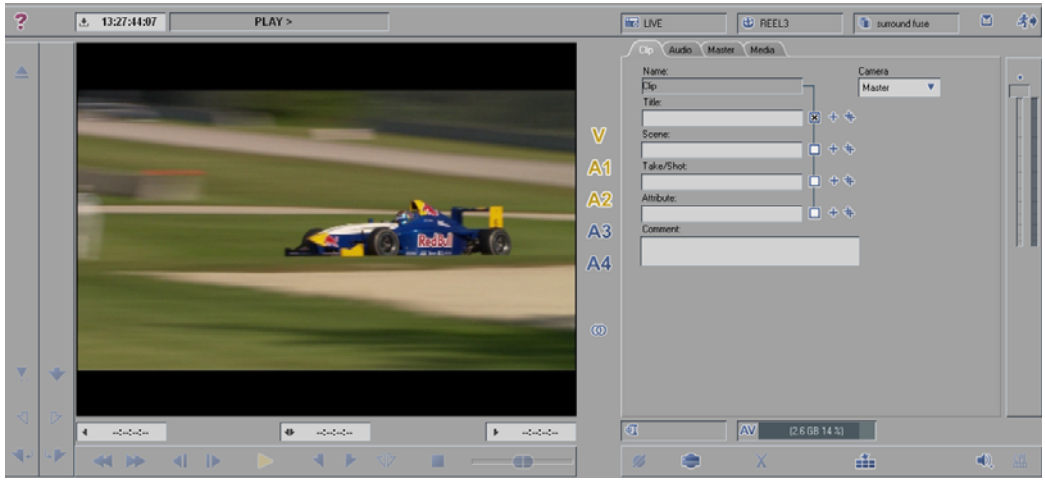


Sequence Editor and Timeline

The Logging Tool

Before you can edit a video in Avid Liquid, the corresponding raw material must be available on your computer or within in the network. The *Logging Tool* lets you transfer the video data to your hard disk (mostly from a tape). Plus, you can control incoming audio and name clips.

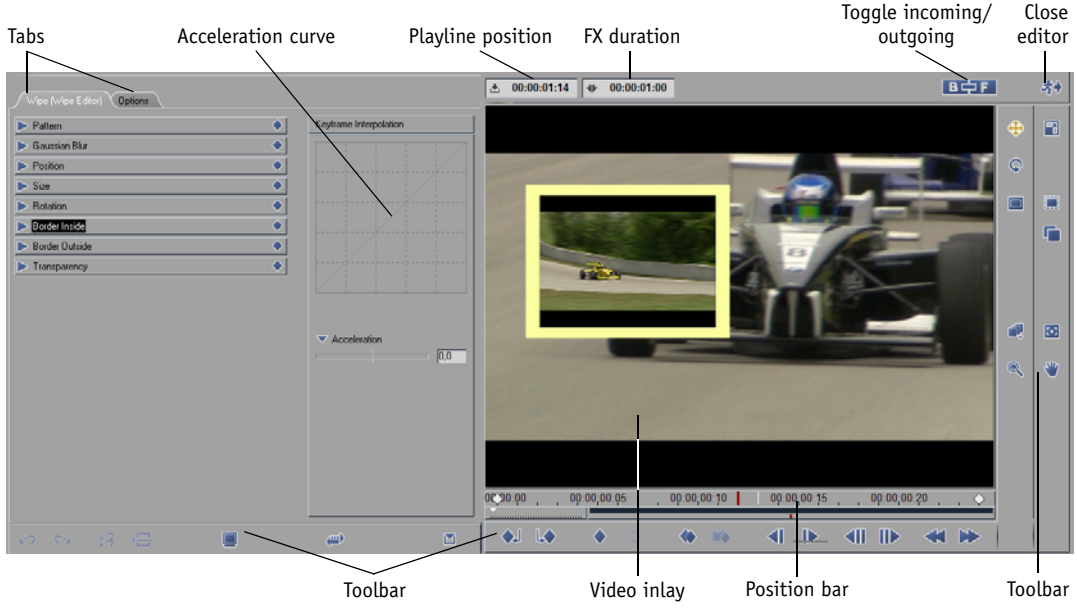
For information on working with the *Logging Tool*, see the chapter *"Input"* on page 103.



Logging Too

The Effect Editors

With the *Effect Editors*, you can create T*ransitions* and clip effects (FX).

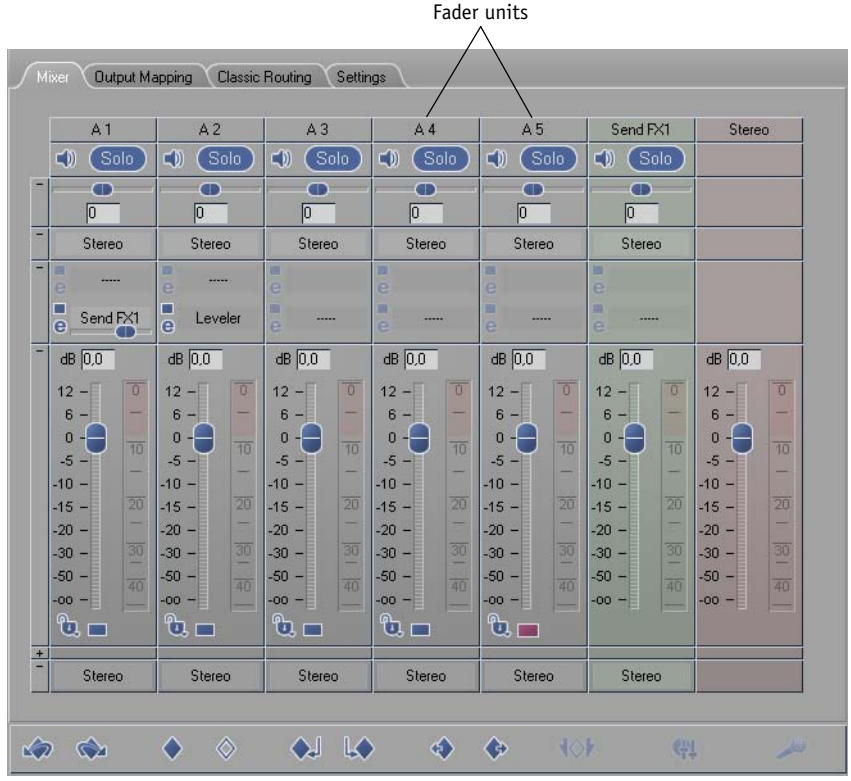


Sample (Classic) Effect Editor

The Audio Editor

Most of the work that you do with audio material requires the *Audio Editor*. In the standard view, the *Audio Editor* replaces the *Source Viewer* above the *Timeline* and starts with the *Mixer* tab in front. The second tab contains *Output Mapping*. It allows you to mix audio signals in subgroups and distribute them to the available outputs.

See *"Audio Editor"* on page 810.

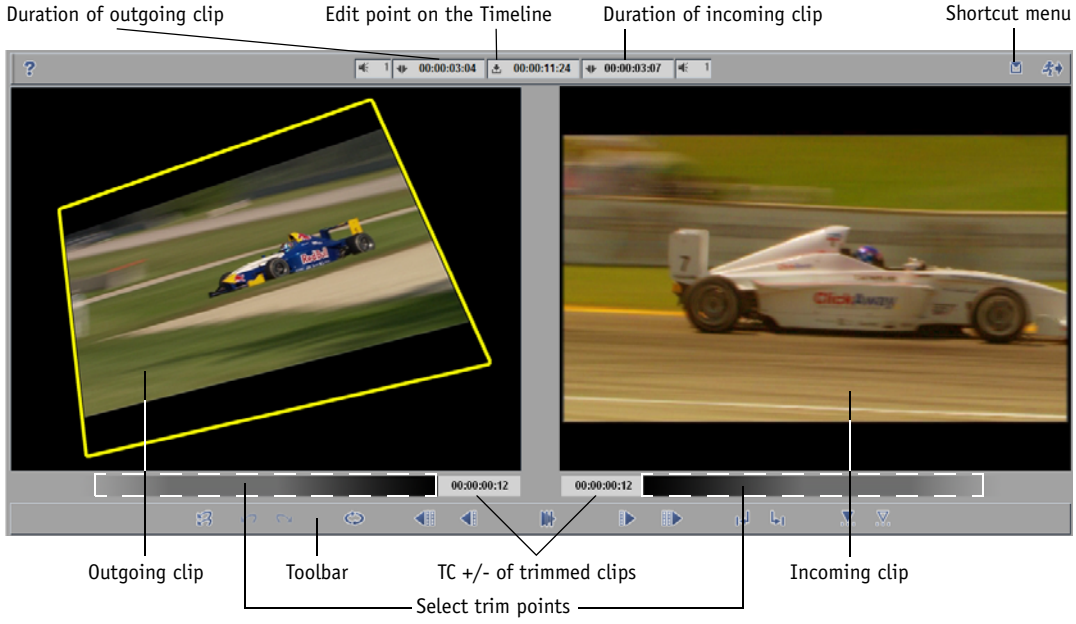


Audio Editor

The Trim Editor

With the *Trim Editor*, you can optimally coordinate movement in the image for editing purposes and precisely trim transitions between individual cuts. The two inlays show you the frames before and after the edit point. You can check the edit in *Preview* mode. The *Slip Clip* function allows you to trim the mark-in and mark-out simultaneously.

See also *"Trim Editor"* on page 428.



Chapter 4

Signup

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You do not necessarily have to log on to Avid Liquid in order to work with the system, but doing so offers certain advantages, especially when several users are working on the same system. If you log on under a specific user name,

- The last *Project* edited under this name is opened with exactly the same status that it had when it was last exited.

- The Avid Liquid user interface is configured with the customized settings for this user (toolbars, keyboard assignment, etc.).

- If applicable, you are prompted to enter a password that protects the settings against unauthorized accesses.

All your individual settings (*User Profile*) can be saved on a diskette and used on any system running under Avid Liquid, thus providing you with a portable, personalized working environment.



If the *User Login* dialog box does not appear on the system you are working on (because the software is being launched for the first time or the dialog box was not used by previous users), exit Avid Liquid by selecting *File > Exit Avid Liquid >... log on as a different user.* This will activate the login procedure. If you do not need the *User Login* dialog box, select *Cancel* or press ESC to bypass it.

Logging on as an existing user *page 63*

New user/initial login *page 64*

Loading a user profile *page 65*

User Details *page 66*

→ Comment *page 66*

→ Password protection *page 67*

Removing a user *page 68*

Save user *page 69*

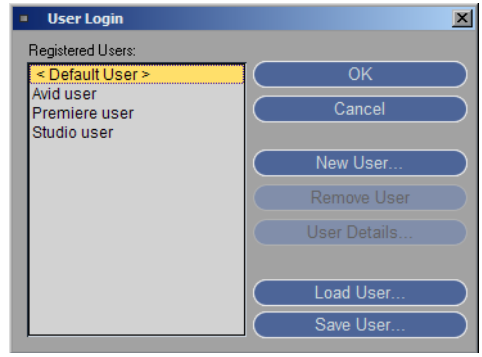
Logging on As an Existing User

If other users are already registered on the system, the *User Login* dialog box will contain a list of names. Select the appropriate name and click *OK*.

On initial installation of Avid Liquid in a directory where no previous installations exists, only one Default User setting is being created instead of the usual six predefined User Settings you may know from earlier versions (see figure). You can, however, save any existing User Settings on a disk and import them into the new installation. Also, if Avid Liquid is installed on top of an older version, the old settings remain accessible. In the case of a "true" initial installation, only the one *Default User* and three special sets are created for users of Pinnacle Studio, Adobe Premiere and AVID editing programs:

For upgraders from Adobe Premiere and Pinnacle Studio

Users upgrading from Premiere or Studio to Avid Liquid can select special keyboard and toolbar assignments. Thus, the commands are available via the usual keys, and the software user interface offers a reduced set of the most important commands.



User Login

New User/Initial Login

1 In the *User Login* dialog box, select *New User* to create a new user.

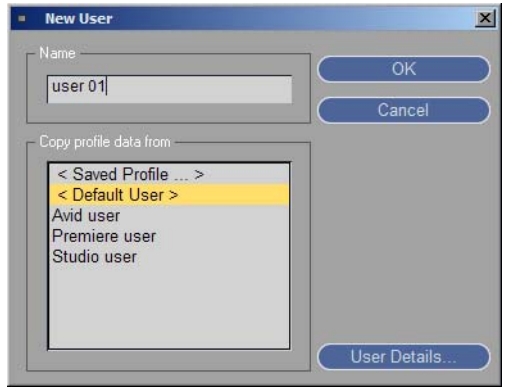
2 Then enter a name and select a user profile from the list; you can select either:

- *Default* - Basic software setting

or

- If any are present, another registered user or a sample user (basic, etc.) with his or her customized settings. In other words, you can either work with the settings of another user or use these settings as a basis for defining your own settings.

3 Click *OK*.



New User/Load User Profile

Load User Profile

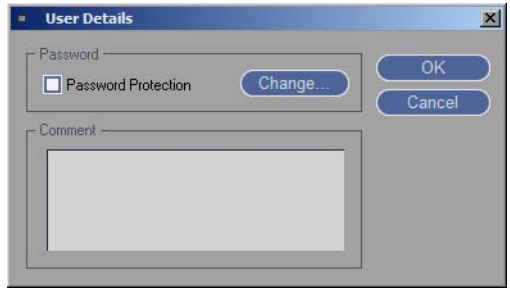
If you have been working on a different Avid Liquid system, you can load your own individual settings here.

In the dialog box, enter the source of this file (such as a diskette) and then open the file. The user name appears in the list and you can now select it.

For information on saving *User Profiles*, refer to *"Save User"* on page 69.

User Details

You can set up a new user by clicking *User Details* in either the *User Login* or *New User* dialog box. The *User Details* dialog box lets you add or change the password and comments for a user.



User Details

Comments

This option is intended not so much for biographical information as for a description of the user profile; you can configure your own aliases and optimize them for special applications (for example, “Audio User”).

Passwords

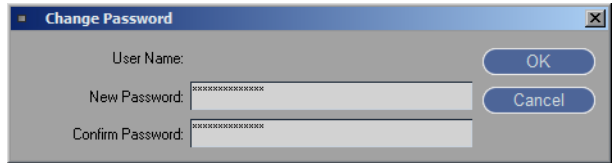
Avid Liquid permits you to use a password to protect registered user settings against unauthorized access.

Note that a *pass*word does not protect a *Project* against access; it protects a user profile. If you wish to protect the overall system, use a Windows password (see the Windows manual).

Adding/Changing Passwords

In the *User Details* dialog box, click *Password Protection* to enable it. This opens the *Change Password* dialog box. Type the password in the *New Password* box, then type it again in the *Confirm Password* box.

Click *OK* to close the dialog box and assign the password to the user.



Change Password

Removing Passwords

In the *User Details* dialog box, a check mark in the *Password Protection* item indicates that the user name is protected. To remove the password protection, click *Password Protection*. Avid Liquid prompts you to enter the existing password to remove the protection.

Remove User

The *User Selection* box also lets you remove users. Select the user to be removed in the *Registered Users* list, then click *Remove User*. If the user has password protection, enter the password to delete the user name from the list. Avid Liquid prompts you to confirm before removing the user from the list.

Save User

To save the settings of a specific user, use this function. For example, you can save the settings on floppy disk so that you can use them on a different system; see also "*Load User Profile*" on page 65).

1 Select a *User* from the list and click this button. In the dialog box that appears...

2 ... specify where you want the data to be saved.

The following configurations are saved:

- Toolbars
- *Object Properties* dialog box settings
- Property sets saved under *Control Panel* > *User* tab
- Layout of software interface (desktop)



Project templates and *Timeline templates* cannot be saved together with a *User Profile*. However, with a suitable storage medium, you can transfer *Timeline* and/or *Project* templates in the Avid Liquid folder, from one system to another.

Chapter 5

High Definition

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This chapter describes the HD capabilities of Avid Liquid.

Basics of high definition TV *page 73*
Better image, better sound: The TV of the future

High definition in Avid Liquid *page 82*
→ HD-compatible products under Avid Liquid *page 84*
→ HD workflow: Adapting settings *page 83*
→ Timecode systems *page 84*
→ Multiformat in Projects and on the Timeline *page 85*
→ Quality ranks *page 90*

High definition at the input *page 92*
→ HDV capture in the Logging Tool/EZ Capture *page 92*
→ HDV batch capture *page 94*
→ Capturing other MPEG2 video formats (MicroMV, D-VHS) *page 94*
→ HD capture with Avid Liquid Chrome HD *page 94*
→ Importing HD media files *page 96*

High definition on the timeline *page 97*
→ Editing HD clips *page 97*
→ HD and effects *page 97*
→ HD monitoring *page 98*
→ Combining SD and HD clips *page 99*

High definition at the output *page 100*
→ Record to tape *page 100*
→ Output as MPEG2 (tape and DVD) *page 102*
→ Exporting to Windows Media HD *page 102*



In the field of HD and HDV, things are currently developing very rapidly. Due to its production cycles, this manual is unable to react to all these developments. For the latest information, be sure to read the ReadMe file that came with your software version.

Basics of High Definition TV

This section contains basic information on HDTV.

TV of the future
The meaning and benefits of HDTV *page 73*

Filming in HD
What changes... *page 76*

Editing HDTV
What stays the same... *page 76*

HDTV basic data
Overview of the standards *page 77*

TV of the future

High Definition TV (HD or HDTV) means better images and better sound that is almost cinema quality. HDTV is a general term for the TV of the future that will, over the medium-term, replace the existing PAL, SECAM and NTSC television standards. Just how fast this will occur, and which of the substandards within the many-branched standard family will prevail is not yet known. In the US, where the transition has been stipulated by law, the conversion to digital television is expected to be completed by 2006. In Asia, Europe and other regions of the world, there is no fixed agenda for the introduction of HDTV. Japan, however, has been experimenting with high-resolution formats since the early '90s. Industry, TV stations and production houses are preparing for HDTV. More and more HD cameras are available, not just for professionals but in the consumer sector as well (keyword: HDV). Major events are being recorded and distributed as HD productions. HD television sets are available in markets where HD programs are already being broadcast.

Here is an overview of HD properties:

- Standardized -
  The HDTV standard, meaning all the essential technical standards and specifications, is defined by the SMPTE (Society of Motion Pictures & Television Engineers). The ATSC (Advanced Television System Committee) has formulated a number of "standard sets" comprising all possible combinations of resolutions, aspect ratios, frame rates, progressive vs. interlaced, etc. A distinction is made between production formats and transmission formats (more later).

- Digital -
  HDTV is digital, from its recording to its output on the TV set. It is digitally recorded, digitally edited, digitally broadcast or transmitted via a cable network, and received on a digital device. (Converters make it possible to continue using analog TVs and video monitors.)
- Compressed/uncompressed -
  HD video is generally compressed as per the MPEG2 Standard in order to reduce the data rate. Uncompressed HD video also exists but, in this case, the standards are only manufacturer-specific and not global.
- High resolution = better image -
  HDTV provides "more image" in two ways:
  Spatially: Up to 1920 x 1080 pixels (as compared to NTSC: 720 x 486).
  Time-wise: Up to 60 frames per second in progressive mode (see below).
  HDTV images are much sharper and more detailed than conventional TV images. They are suitable for projection onto a big screen.
- "Widescreen" 16:9 -
  Although HDTV also supports various 4:3 formats, the emphasis is clearly on the 16:9 widescreen aspect ratio. The real strengths of HDTV can be appreciated only in 16:9.
- Better audio, surround sound -
  HDTV supports 5.1 spatial sound audio (AC-3). This means five channels plus one, where the latter provides the bass sound (low frequencies) and the other five channels (two in the rear, three in the front) surround viewers/listeners with sound. Most feature film DVDs are already equipped with 5.1 sound.

- Progressive -
  NTSC and PAL/SECAM work with fields. Each of the 30/25 images recorded per second is played twice on the TV screen - once on the even-numbered lines (2, 4, 6, etc.) and once on the odd-numbered lines (1, 3, 5, etc.). This interlacing keeps the image from flickering.
  TV that is based on the HD standard can (but does not necessarily have to) display full frames, at a rate of up to 60 fps (frames per second).



Interlaced: The lines are clearly visible

Filming in HD

When filming in HD video, PAL and NTSC filmmakers face a new set of creative challenges:

- The cinematic widescreen format (16:9) requires a new type of image composition and a different resolution for scenes. There tends to be "more" in the image.
- Progressive mode (frames at a frequency from 24 to 60 fps) can make movements in the image appear differently than they typically did in interlaced mode (field mode). Each still is either sharp or shows motion blur, depending on the shutter speed. The comb-like artifacts produced by interlacing in NTSC and PAL do not occur with progressive HD.
- This detailed recording causes things that used to disappear into the background, such as skin blemishes, a forgotten coffee cup and the like, to suddenly become much more noticeable. Consequently, the preparation and setup of scenes for film shoots can turn out to be more costly and time-consuming.

Editing HDTV

HD clips are processed on the *Timeline* in exactly the same way as PAL or NTSC clips. Before you begin editing, you set the *Timeline* to the particular HD version, which also means that you can now edit MPEG2 IPB clips frame by frame on the *Timeline*.



Set your *Timeline* format (by selecting *File* > *New* > *Sequence* or in the *Timeline Properties*) to match your recording device capabilities' or the desired destination format.

Once you've committed yourself to a particular HD format, all the other visual elements adopt this format. To prevent unpleasant scaling effects, you should make sure graphics, titles and image menus have the same resolution as the video HD format. Basically, however, it is possible to combine different formats in a *Project* and on the *Timeline*.

For more information on HD and MPEG2 IPB editing, see *page 97*.

HDTV Basic Data

There is no definitive HD standard, but a whole range of different substandards. It is not yet clear which of these substandards will prevail. The individual substandards listed below are not directly compatible.

Standard Television (SD) Production and Transmission Standards

Lines (total)	Lines (active)	Aspect ratio	Frame rate / mode
525 (NTSC)	486	4:3 (rectangular pixels)	29.97 i
625 (PAL/SECAM)	576	4:3 (rectangular pixels)	25 i
625 (PAL plus)	576	16:9 (rectangular pixels)	25 i
525 (NTSC)	486	16:9 (rectangular pixels)	29.97 i

"i" = interlaced

Digital TV Transmission Standards (to ATSC)

Vertical lines (active)	Horizontal lines (active)	Aspect ratio	Frame rate / mode
(HD)1080	1920	16:9 (square pixels)	24p, 30p, 30i
(HD) 720	1280	16:9 (square pixels)	24p, 30p, 60p
(SD) 480	704	4:3 (rectangular pixels)	24p, 30p, 30i, 60p
(SD) 480	704	16:9 (rectangular pixels)	24p, 30p, 30i, 60p
(SD) 480	640	4:3 (square pixels)	24p, 30p, 30i, 60p

"p" = progressive; "i" = interlaced

This table covers only the current NTSC market and only the *Send* formats.
NTSC drop frame formats (29.97 fps) are no longer supported.

Digital TV Production Standards

Production standards are relevant for filming (recording) and post-production. The table below lists the drop frame formats that are eliminated by the send standard.

Active resolution (h x v)	Resolution (all lines)	Aspect ratio	Frame rate / mode
1920 x 1080	2376 x 1250	16:9 (square pixels)	50p, 25i
1920 x 1080	2640 x 1125	16:9 (square pixels)	25p, 25i
1920 x 1080	2200 x 1125	16:9 (square pixels)	60p, 59.94p, 30p, 29.97p, 30i, 29.97i
1920 x 1080	2750 x 1125	16:9 (square pixels)	24p, 23.98p
1920 x 1035	2200 x 1125	16:9 (rectangular pixels)	30i
1280 x 720	1650 x 750	16:9 (square pixels)	60p, 59.94p
960 x 486	1144 x 525	16:9 (rectangular pixels)	29.97i
720 x 483	858 x 525	16:9 (rectangular pixels)	59.94p
720 x 486	858 x 525	16:9 (rectangular pixels)	29.97i
720 x 576	864 x 625	4:3 (rectangular pixels)	25i
948 x 486	1135 x 525	4:3 (rectangular pixels)	29.97i
948 x 576	1135 x 625	4:3 (rectangular pixels)	25i
768 x 486	910 x 525	4:3 (rectangular pixels)	29.97i

“p” = progressive; “i” = interlaced
“h x v” = horizontal x vertical resolution

HDV: HDTV for Consumers and Professionals

The HDV standard introduced by Canon, JVC, Sharp and Sony is intended to make HDTV available in the consumer sector as well. This format, which is also based on MPEG2 compression, is transmitted via the IEEE-1394 interface (DV, FireWire) and provides two audio channels (MPEG1 Layer 2, 16-bit, 48 kHz @ 384 kbps). It is recorded on standard (mini) DV tape.
Special HDV tapes are now available and should also be used because of their better quality and reliability. Because of MPEG2's GOP structure, one dropped I-Frame can cause the loss of more than one video frame.
Avid Liquid can record and output HDV via the IEEE-1394 interfaces in native format (MPEG2 Transport Stream Packetized Elementary Stream).

HDV mode	Active resolution (h x v)	Bit rate compr.	Aspect ratio	Frame rate / system	MPEG Profil@Level	GOP configuration
HD 2	1440 x 1080	25 mbps	16:9	60i, 50i (interlaced)	MP@HL 14 (4:2:0)	60/30: N <=15, M<=3 50/25: N <=12, M<=3
HD 1	1280 x 720 1280 x 720 720 x 480/576 720 x 480/576	19 mbps	16:9 16:9 16:9, 4:3 16:9; 4:3	60p/50p 30p/25p 60p/50p 30p/i, 25 p/i	MP@HL MP@HL 14 MP@HL 14 MP@ML	 60/30: N <=15, M<=3 50/25: N <=12, M<=3

Overview of the HDV modes

With its progressive frame rates, the look of HD1 is more similar to film. The reduced spatial resolution places fewer demands on the computer system than HD2 with its 1440x1080 pixels, making HD2 more like "true" HD in its effect.

More Information on HDV and Similar MPEG2 Formats

(As of March 2006)

Device types

All the device types listed are connected via the IEEE-1394 interface and record in one of the MPEG2 format standards. Not all the standards are implemented, nor is their implementation necessarily complete.

- D-VHS (e.g. JVC HM-DH30000U);
  Audio formats: MPEG1 Layer 1/2, MPEG2, Linear PCM, AAC, AC3
- Sony MicroMV (720x576, 25i/720x480, 29.97i @ 12 Mbit/s; MP@ML 4:2:0; GOP: N<=12/15, M<=3; e.g. Sony DCR-IP7);
  Audio format: MPEG1 Layer 2, 256 kbit/s, 48 kHz

- HD1 camcorder (e.g. JVC JY-HD1U, 1280x720p/29.97fps/18.3 Mbit/s; 720x480p/59.94fps/18.0 Mbit/s)
- HD2 camcorder (e.g. Sony HDR-FX1E, 1440x1080i/25/29.97fps/25Mbit/s)
- ProHD camcorder/recorder (e.g. JVC GY-HD100, BR-HD50, 25/50 and 30/60 fps).

Device control and timecode

HDV/MPEG2 devices can basically be controlled via the DV (aka AV/C) protocol. However:

- There is no single-frame stepping (frame-by-frame transport) comparable to standard DV. This means you cannot manually jump frame by frame to timecode positions.
- Some devices (e.g. the Sony HDR-FX1E) do not display an image in still mode in *Logging Tool Video Inlay*. This is due to the IPB structure of MPEG2 video recording.
- When setting a mark-in in the *Logging Tool*, HD2 devices do register the exact TC but the next I-frame is recorded for the clip *Picon*.
- Nevertheless, a reliable TC is implemented with HD2 and ProHD devices: Each frame corresponds to an exact TC position.
  With HD1 - at least with the devices currently available - you can expect deviations of plus or minus one second because the TC is based on a different specification.
- MicroMV devices do not supply timecode information to Avid Liquid. In the *Logging Tool* (i.e. during capture), the TC fields remain empty but the device can be controlled. Each digitized clip begins with a "TC" of 00:00:00:00 generated by the system.
- Although the D-VHS "timecode" is available, it is not reliably linked to the individual frames. It actually is only a counter.
- With HD2 devices, an insert edit is possible (at least according to the specification) but is not implemented anywhere at this time. That is why only the familiar *Dump to Tape* method from the DV standard is available in the *Record to Tape* module.

Automatic scene detection (Logging Tool/Clip Viewer)

Automatic Scene Detection in the *Logging Tool* based on metadata does work with HD2, ProHD and MicroMV video (the latter does not supply TC data, but Scene Detection registers the recording time stamp).
However, scene detection based on video content in the *Clip Viewer* is always possible.

MPEG2 levels and profiles

In the MPEG2 standard, "levels" and "profiles" are provided as a means of distinguishing the different formats from one another. The most important are:

- Main Profile (MP) -
  For SD applications
- High Profile (HP) -
  For HD applications

The levels define the bitstream parameters, such as frame sampling, resolution and bit rates:

- Main Level (ML) -
  for SD formats
- High Level (HL) and High1440Level (HL14) -
  For HDTV up to 1920x1152 or 1440x1152

You will find these designations with the *Codec Settings* or in the *Logging Tool*, e.g. an entry such as *MPEG-2 MP@HL*: the profile before the @ and the level after. In the table below, note that the resolutions and bit rates (Mbps) specified are the maximum values.

HIGH (HL)		4:2:0 1920x1152 80 Mbps I,P,B	4:2:2 1920x1080 300 Mbps I,P,B			4:2:0, 4:2:2 1920x1152 100 Mbps I,P,B
HIGH 1440 (HL14)		4:2:0 1440x1152 60 Mbps I,P,B			4:2:0 1440x1152 60 Mbps I,P,B	4:2:0, 4:2:2 1440x1152 80 Mbps I,P,B
MAIN (ML)	4:2:0 720x576 15 Mbps I,P	4:2:0 720x576 15 Mbps I,P,B	4:2:2 720x608 50 Mbps I,P,B	4:2:0 720x576 15 Mbps I,P,B		4:2:0, 4:2:2 720x576 20 Mbps I,P,B
LOW (LL)		4:2:0 352x288 4 Mbps I,P,B		4:2:0 352x288 4 Mbps I,P,B		
Level / Profile	SIMPLE	MAIN (MP)	4:2:2 (422P)	SNR	SPATIAL	HIGH (HP)

MPEG2 Levels and Profiles

High Definition in Avid Liquid

The advent of high definition video resulted in several changes in Avid Liquid. This section summarizes the what, where and why of those changes.

HD-compatible products under Avid Liquid *page 84*

HD workflow: Adapting settings *page 83*

Timecode systems *page 84*

Multiformat in projects and on the timeline *page 85*
How HD and SD clips coexist

Quality ranks *page 90*
For greater clarity in the network

HD-Compatible Products under Avid Liquid

All Avid Liquid products (Avid Liquid Chrome HD and Avid Liquid) can work with HDV, D-VHS and MicroMV at the input and output via the IEEE-1394 interface.

Avid Liquid Chrome HD permits uncompressed HD (up to 1920x1080) in the SDI input and SDI output via special breakout boxes.

All Avid Liquid products can import and edit HD media files of any format via a network or data volume.

HD Workflow: Adapting Settings

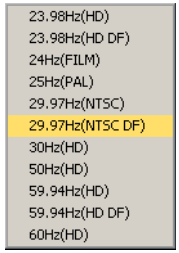
Before you decide to work with HD, here are a few tips on the workflow in Avid Liquid. There are three basic stages:

1 Capture (EZ Capture, *Logging Tool*) -
What do you want to record? What can the player provide (some have different output options)?
Avid Liquid automatically adapts to the input format (DV in).
Avid Liquid Chrome HD: Go to *Player Settings* > *Connections* and select the exact same format that the player provides.

2 *Timeline: Sequences* -
When creating a new *Sequence*, adapt the *Timeline* format to the digitized material with regard to its frame rate (fps) and resolution (pixels, horizontal x vertical).
If in doubt, select the format that matches most of the existing clips and - very important - a format that your recorder can also record.

3 *Record to Tape / Export to File...* -
Edited MPEG2 material on the *Timeline* is rendered in an intact stream before output.
The recorder's/camcorder's recording format and the current *Timeline Format* must go together.

Timecode Systems



Timecode systems, e.g. for LIVE Player (Logging Tool)

HDTV comes with a variety of frame rates (i.e. the number of frames played per second of video). As a result, the previously manageable range of timecode systems offered has grown slightly. The eleven different TC systems in Avid Liquid's TC displays are identified by the separator between the positions (period, comma, semicolon, colon). Initially, this only indicates the number of images per second - for example, how many frames are counted before the timecode display jumps forward one second.

Note that all TC fields in Avid Liquid are always frames and never fields. The list below specifies the last frame before the full second.

Frames/second (Hz)	*Used for*	*TC display*
23.98	HD	00:00.00,23
23.98	HD DropFrame	00.00.00,23
24	Film	00:00:00,23
25	PAL	00:00:00:24
29.97	NTSC	00:00:00.29
29.97	NTSC DropFrame	00.00:00.29
30	HD	00:00:00;29
50	HD	00:00.00:49
59.94	HD	00:00.00.59
59.94	HD DropFrame	00.00.00.59
60	HD	00:00.00;59

These TC formats appear, for example, in the timecode indicators for the *Timeline*, for the *Master, Source* and *Clip Viewers,* for the *Logging Tool* and for *Record to Tape*.

There can be only one TC system with a specific frame rate on the same *Timeline* and in the same *Sequence* (see the next section).

Multiformat in Projects and on the Timeline

Multiformat in Avid Liquid means:
You can import any clips and media data to one and the same *Project* and view and edit them in the *Project* and on the *Timeline*, regardless of their origin (PAL, NTSC, HD or SD).

Avid Liquid can handle all formats and timecode systems.

Differences in the aspect ratio and image resolution *page 85*

Different timecode systems *page 87*

Conversions *page 88*

→ TC systems *page 84*

→ PAL to NTSC and vice versa *page 89*

→ SD to HD and vice versa *page 88*

Differences in the aspect ratio and image resolution

There may be differences in the aspect ratio (4:3 or 16:9) and in the vertical and horizontal resolution of the image formats (e.g. NTSC = 720 x 486 vs. HDV 720 = 1280 x 720).

Clip Viewer and Source Viewer

The *Clip Viewer* and *Source Viewer* adopt the setting of the current *Sequence* (check *Timeline Properties*). In the case of clips and objects that do not match this setting, the *Scaling* settings for these clips and objects have priority.

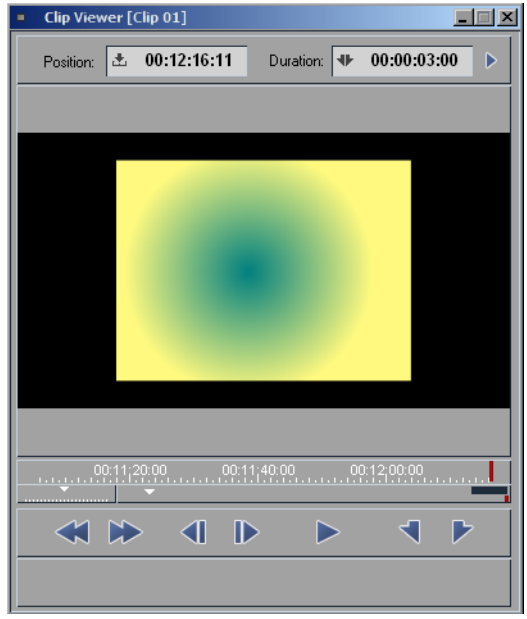


Clips in the *Source Viewer*'s list are automatically converted when the *Timeline* format is changed. If you want to suppress this rendering, right-click on the list and select the *Clear List* option.

The *Scaling* options for the clip or object can be found in the clip's or object's *Properties* (also see *"Media Management and Object Properties"* on page 338).

Depending on the setting for *Scaling*, one of the following may occur:

- *Scaling* not activated -
  The image is centered in the image window. At a higher resolution, part of the image is displayed outside the image window; at a lower resolution, a border is visible on all or just two sides:



4:3 PAL clip in a 16:9 1280 x 720 image window without scaling

- *Scaling* activated -
  The image is scaled, that is, stretched or squeezed, depending on the scaling option selected.
- *Use image alpha* activated or not activated -
  If this option is not activated, objects with a lower resolution are displayed with a black border or bars. Otherwise, the area is transparent.

When converting to higher-quality formats, you can also use the Effect Editors (2D, 3D, Classic or RT).

Timeline and Master Viewer

Basically, the same applies to the *Timeline* and *Master Viewer* as to the other two viewers. It is possible to combine clips with different aspect ratios and resolutions in one *Sequence*. However, you will probably prefer to try adapting the non-conforming clips to the *Timeline* or *Sequence* format selected, because a mixed master is undesirable.
The *Master Viewer* also adopts the setting for the *Timeline*: If the *Timeline* is set to an HDV format of 1280 x 720, 16:9, square pixels, the *Master Viewer* has the same aspect ratio and clips with a different format are handled as described in the section above (i.e. according to their *Scaling*).

True and Pseudo 16:9

Many camcorders (including semiprofessional ones) have a 16:9 switch. Although this switch produces the desired aspect ratio, 72 lines at the top and 72 lines at the bottom are displayed as black bars. The loss of these lines results in a poorer image quality when the image is scaled to the greater width.

This type of 16:9 should not be confused with HD; it is merely modified NTSC or PAL.

Different Timecode Systems

The timecode systems differ with regard to the frame rate (fps) and, to a certain extent, with regard to the drop frame/non drop frame problem (also see *"Timecode Systems"* on page 84).

Clip Viewer and Source Viewer

The *Clip Viewer* and *Source Viewer* always load and play clips and objects, both audio and video, using their original TC system. This means you can always work frame by frame and insert objects on the *Timeline* from mark-in to mark-in or at the *Playline* position.
If several clips with different TC systems are loaded in the *Clip Viewer* at one time, the TC system for the current *Sequence* applies (*Timeline Properties*).

Converting TC Systems (Media Import Option)

Normally, the TC systems of objects are automatically detected when these objects are imported or captured. This is controlled by an option in the *Media Import* dialog box. If you wish to impose a certain TC system on a clip, re-import it in the desired TC system with the automatic feature disabled (see *"Default TC System"* on page 156). This generates a copy of the clip at the selected frame rate. However, it may cause the associated audio to become asynchronous, so you should only import the video clip.

Timeline and Master Viewer

On the *Timeline*, there can be only one timecode system per *Sequence*. *Timeline* clips whose TC system differs from the TC system configured for the current *Sequence* are always played at the current frame rate. This means either that frames are omitted or that new frames are interpolated; the clip length remains the same. The system first attempts to accomplish this using a realtime effect. If it is unsuccessful, the relevant clips are rendered.

Conversions

When converting between formats, take into account the time resolution (frame rate, interlaced or progressive, i.e. TC system) and spatial resolution (pixel resolution and aspect ratio). The following provides an overview:

HD to SD and vice versa

HD clips that you intend to use on an SD timeline (either NTSC or PAL) must be scaled, i.e. the original aspect ratio must be reduced (for more information, see *"Clip Viewer and Source Viewer"* on page 87). When you scale to NTSC/PAL-4:3, black bars appear above and below the frame.

The TC system can, but does not have to be customized. An HDV2 clip (1440x1080, 50i), for example, is played on a standard PAL *Timeline* at 25 fps. An HDV2 clip (1440x1080, 60i) is converted to the *Timeline* TC format.

It is also possible to convert SD material to HD. However, the reduced PAL and NTSC resolution will always be noticeable.

Converting TC Systems

Linear Timewarp provides a high-quality conversion. Apply this *Timewarp* to the relevant clips (*Timeline* clip shortcut menu), leaving the *Speed* at 100%. The clips are re-rendered with the TC system of the current *Timeline*/*Sequence*.
This action has no effect on audio, which remains synchronous following the conversion.



As is always the case with *Timewarps*, this action must be performed before any other modifications take place (scaling, effects).

PAL < > NTSC conversions

Format conversions between PAL and NTSC can be performed by selecting the appropriate *Timeline Format* and using *Timewarp* (at 100%). To view the material on a TV/monitor you need PAL or NTSC devices.

Example: PAL to NTSC: Place the PAL clips on a *Timeline* with the *NTSC 4:3* format (or *NTSC 16:9*; in this case, don't forget to scale the clips), combine the *Sequence* into a *Container* and process it with 100% *Linear Timewarp* (*Render yellow slices* = activated).
This method cannot replace a high-quality, dedicated format converter.

Effect Viewer

If the effect is applied to a *Timeline* clip, the Effect Editors and their Effect Viewers adopt the settings of the *Timeline* and *Master Viewer*.

If the effect is applied to a *Project* clip, the clip retains the original TC system, aspect ratio and resolution.



Nevertheless, the effect parameters themselves are non-format-specific, meaning that stored effects can be applied to all possible TC systems, formats and resolutions.

Quality Ranks

Cautionary note:

Unless you have a very good reason for making a change, always keep these quality ranks *set to* Normal *wherever you find them. For more information, see the next section.*
The quality ranks do not affect the video's image quality when capturing!

"Quality" is a subjective rather than an exact variable. The final decision belongs to you or your customer. A scale of five levels (ranks) is provided for differentiating among the various materials you work with in Avid Liquid, where *Lowest* is the worst acceptable quality and *Highest* is the best. You will find these quality ranks in the *Logging Tool*, clip *Properties* and *Timeline* properties. These ranks can be assigned to any media formats (codecs), regardless of HD or SD.

But note the following: The final decision is entirely up to you. We offer you only a prepared list of possible designations for these ranks. It is not until you capture one or more clips with the media format I-MPEG2 5 Mbit/s and designate them as *Medium High* quality rank that they really adopt this rank. Or to put it another way: The preset quality ranks are not permanently linked to any particular media format. Also, even if you use the *Highest* rank to digitize a DV tape in the *Logging Tool*, the visual result will be no better than if you had digitized using the *Lowest* rank.



If you do not want to work with different material "quality ranks", you would be better off leaving the default as is (*Normal)*. Then you won't have to adjust the setting in other modules and will not encounter any problems due to filtered-out media data (*page 404*).

So why use quality ranks?

They help you differentiate among different versions of the same material. The individual ranking results in a hierarchy of media files. This is useful, for example, when you perform offline editing. Or in the case of:

- Problems with storage media capacity. First select a format that requires less storage space.
- Shortage of bandwidth in the network. Formats with a lower data rate require less bandwidth.

A typical offline-online workflow involving quality ranks might look like this:

1. Select a quality rank (*Logging Tool*).
2. Capture the material in a format with a low data rate (e.g. DV (AVI)). Assign each clip the "Medium Low" property, for example.
3. Edit the *Sequence(s)* on the *Timeline*.

4 Batch the *Sequence(s)* in the master format using, for example, *Uncompressed* (*Batch Digitize* module). Call this format "Highest", for example (it basically makes no difference).
The media files at level "Medium Low" are retained.

5 Under *Timeline Properties* > *(Minimal) Media Quality*, change the *Sequence(s)* to the master-compatible format (in our example, "*Highest*"). When playing the material, the system now accesses the uncompressed media files.

6 Output to tape/disk medium/export/etc.

When are the quality ranks relevant and what do they do?

To summarize once again:

- *Logging Tool*, *Media* tab -
  Establish the link between a selected media format and a particular quality rank.
- Clip *Properties*, *V* tab -
  Assign an individual clip to media files with the same timecode but with a different quality rank.
- *Timeline* properties -
  Switch all the clips in a *Sequence* to different media files by selecting a different quality rank matchting the rank of the files.

High Definition at the Input

An HDV or MPEG2 signal can be played via the DV (IEEE 1394) interface of the editing computer and recorded with the Avid Liquid *Logging Tool or EZ Capture*.

HDV capture in the Logging Tool/EZ Capture *page 92*

HDV batch capture *page 94*

Capturing other MPEG2 video formats (MicroMV, D-VHS) *page 94*

HD capture using Avid Liquid Chrome HD *page 94*

Importing HD media files *page 96*

HDV Capture in the Logging Tool/EZ Capture

HDV does not require any additional hardware; you need only the IEEE-1394 (DV) interface on your editing computer or the 1394 port on the connection box. Configure your camcorder or player to output MPEG2 HDV.

The *Logging Tool/EZ Capture* automatically adapts to the imported signal, meaning that the image window is set to the 16:9 aspect ratio. The system records MPEG2 video 1:1 native, i.e. without transcoding. Audio is decompressed and recorded as WAV.

Installing device drivers under Windows

Unlike DV devices, HDV/MPEG2 devices are not necessarily detected automatically or correctly by Windows. You may have to install the necessary drivers manually.

- Sony HDV devices -
  XP with Service Pack 2 installs the required drivers automatically as “AV/C Tape Device“ (check Windows Device Manager > Sound, video and game controllers).
  In the case of XP with Service Pack 1, manually select “Sony” as the driver during hardware detection. You should then see an entry for “Sony Digital Device (D-VHS)” in the Device Manager.
- JVC HDV devices -
  XP with Service Pack 1 requires manual configuration. During hardware detection, select “Sound, video and game controllers”, then JVC as manufacturer and “JVC Tape Device” as model.

Control Functions and Display in the Inlay

HD1 and HD2 devices (e.g. camcorders) can be controlled via the IEEE-1394 interface using the control functions of the *Logging Tools/EZ Capture*, but not necessarily with the same level of convenience experienced with DV (for information on the limitations, see *"Device control and timecode"* on page 80).

MPEG2 IPB Settings



You can access the *MPEG IPB Settings* if an HDV or other MPEG2 device is connected via IEEE 1394 and ready for operation. To open this dialog box, click the *Monitor* icon (for analog input, known as *Video Tool*) above the *Stereo/Mono* rings in the *Logging Tool*. The following options are available:

- *Video display* tab
  Decoding the MPEG2 stream for a preview in the *Logging Tool*'s inlay places a very heavy load on the system's CPU. You can select:
  - *decode all frames*: Fluid display at full frame rate possible; maximum CPU utilization (default setting);
  - *decode I and P frames*: Somewhat fluid display (B frames are not decoded); medium CPU utilization
  - *decode only I frames*: Sequence of stills at the rate of the GOP length, i.e. from I frame to I frame; lowest CPU utilization.

These settings affect only the display in the inlay. The complete MPEG2 stream is transferred to the hard disk.

- *Use TPM frames for video shuttle* -
  In "TrickPlayMode", some MPEG2 devices output these TPM frames when shuttling (fast forward/rewind) so that the video will be recognizable in the preview. If you encounter problems with the display (as happens with some devices), activate this option.
- *Stream-Info* tab
  This tab provides information on the current incoming MPEG2 stream, such as its frame rate and resolution.

HDV Batch Capture

For batch capture, the source material needs a reliable timecode, especially if you are planning on digitizing clips more than once using batch capture (for example, to restore an old *Project* whose media data has been deleted). Deviations by even one or two frames can make edited *Sequences* unusable or result in a great deal of trim work.

With HDV, the technical requirements for batch capture are not necessarily optimal, above all with HD1 devices. Test your player with Avid Liquid to determine whether batch capture is advisable.

Capturing Other MPEG2 Video Formats (MicroMV, D-VHS)

MicroMV devices can be controlled in the *Logging Tool* via the IEEE interface. Because this format does not provide any timecode, the TC field above the inlay is empty. Consequently, batch capture of MicroMV is not possible. To digitize MicroMV material, click the *Digitize* icon (Start/Stop). The system sets a "start TC" (mark-in) of 00:00:00:00 and an "end TC" (mark out) for each digitized clip corresponding to its length.

The timecode supplied by D-VHS devices is unreliable. Deviations of plus or minus one or two seconds are entirely possible. Consider this when setting mark-ins and mark-outs.

HD Capture Using Avid Liquid Chrome HD: Workflow

To ensure an effective workflow, edit your media data in the same format, from shooting to master, especially with regard to the frame rate.
Although conversions are possible, they usually involve sacrifices in quality, time or cost.

The following is an overview of the settings required for working with HD (not HDV):

1. *Avid Liquid Chrome HD: HD standard* -
   Base your decisions on the output format (master): All recordings should be in the same format.
   (Edit > Control Panel > Site > Chrome HD Calibration Controls > Standard > HD Standard)

2. *Player Settings: SD compatibility mode* -
   Set this parameter for each player you use. Select *SD* or *HD* based on the frame rate(s) that the player outputs via HD SDI. This is important for output to a video monitor (*Edit > Control Panel > Site > Player Settings > Settings > [PLAYER NAME] > Functional description > SD compatibility mode > SD/HD).*

3. *Player Settings: Video Input* -
   Select the exact HD format provided by the player. The resolution and frame rate must match. Naturally, a *Live* source can also supply the necessary signal.

Audio is automatically assumed to be SDI-embedded.
(*Edit* > *Control Panel* > *Site* > *Player Settings* > *Connections* > *Video Input)*
At this point, you can also define the video and audio output for the relevant recorder.

4 Capture: *Logging Tool* -
Select the previously configured player/live source as a play source.
HD video is always recorded in an uncompressed form, media format *[Uncompressed 2VUY(HD)]*.
Audio is recorded in *16 Bit PCM* or *32 Bit PCM Floating Point* mode (see *Edit* > *Control Panel* > *User* > *Audio Settings*).

5 Edit: *Timeline* -
Select the appropriate *Timeline Format* for the *Sequences* you want to produce from your previously imported material. The easiest way to do this is by creating a new *Sequence*.
Example: If the play source is set to *HD: SDI 1080@50i*, use the corresponding *Timeline Format*, i.e. *1080/50i*.
The software viewers (*Master, Clip, Source*) play any type of HD material. Use *Fullscreen* mode to display fullscreen HD video on your computer monitor.

6 External monitor: *SD Standard* -
The HD video signal can also be directed to an SD monitor (NTSC or PAL, 4:3 or 16:9) via the analog output of an SD breakout box.
(Edit > *Control Panel* > *Site* > *Chrome HD Calibration Controls* > *Standard* > *SD Standard*).
Connect an HD monitor to the Pro HD Box or HD&SD box or to the HD recorder (looped).

7 Primary output and Genlock -
The "primary output" is optimized for synchronous output (Genlock). The recorder should be connected via this output. At the bottom right, click the monitor icon on the taskbar. From the submenus displayed, select, for example, *HD* > *Video Output.*
If the reference signal is fed from an external source (e.g. house sync), open the *Calibration* dialog box and specify this on the *Video Output* tab under *Ref Source* (*Ref In* or *Video*).

8 Output: *Record to Tape* -
This module is used for RS-422-controlled recording. Under *Player Settings*, select the recorder and define the outputs used, such as *HD: Digital Outputs*.
Also verify that the output is defined as "primary" as described under "7" above in order to guarantee synchronization.
(File > *Record to Tape* > lower list box > *Edit Player)*

Importing HD Media Files

Import HD material (whether HDV or uncompressed) using Avid Liquid's standard import functions.



Not every HD format can be imported directly. Some HDV transport streams must first be converted to standard MPEG files. Converters for this type of output are freely available on the Internet.

High Definition on the Timeline

This section provides information on HD clips and effects on the *Timeline*. Basically, you can combine clips of all formats and codecs in one and the same *Sequence*. This is the principle of the Avid Open Timeline.
For the smoothest workflow and best performance, however, try to use material that is as homogenous as possible.

Editing HD (MPEG2) clips *page 97*

High definition and effects *page 97*

HD monitoring *page 98*

Combining SD and HD clips in the same sequence *page 99*

Editing HD (MPEG2) Clips

Usually, high definition video is a compressed digital video signal of the type MPEG2 IPB. HD clips (e.g. imported native from HDV) can be edited frame by frame on the *Timeline* and in the *Viewers*. At each edit or trim point, the MPEG2 codec generates an I frame and organizes a new GOP (for more information, see the Export chapter, DVD burning, IPB Settings).

Therefore, the areas that were changed by editing or effects (and only these areas) must be rerendered before being output to tape or exported as a file.



The *Consolidate* function cannot be used for working with HD (MPEG2 IPB) material.
ALE and OMF data exchange based on HD *Sequences* is not possible.

High Definition and Effects

Continue to use effects (video and audio) as usual. Realtime performance for playback also depends on the HD format (i.e. the data rate) used. Rendering creates render files in the *Render/Fuse Format* currently set (see *Timeline Properties*).

HD Monitoring and Preview

The image of the HD clips from the *Timeline* is displayed in the *Master Viewer* inlay. HD clips can also be displayed in the *Source Viewer*, *Clip Viewer* and *Effect Viewers*.

Using fullscreen display



In order to enjoy the biggest and best (i.e. unscaled) display of the HD video inlay, your computer monitor and graphics card should have a high resolution: An HD frame can measure up to 1920 by 1080 pixels.
Access *Fullscreen mode* using the toolbutton located on the *Timeline* toolbar or in the *Tool Library*. Press ESC to exit fullscreen mode. Keyboard commands and scrubbing in the fullscreen inlay with the mouse continue to function as usual. The *Source Viewer* can also be switched to fullscreen mode (but not the *Clip Viewer*).
You can also toggle between fullscreen and software interface by double-clicking the inlays.
In dual monitor mode: The fullscreen display appears where the *Source* and *Master Viewer* are positioned.

Avid Liquid Chrome HD: HD and HDV output to video monitor

With Avid Liquid Chrome HD, an HD video monitor can be connected to the HD SDI output of an HD-compatible box; an SD monitor can be connected to an analog output of an SD box. For more information, refer to the Product Manual.

Depending on the system configuration (camcorder, VTR, converter), additional connection options are possible, such as looping the HDV or SDI HD signal.

Avid Liquid PRO Box: Preview via IEEE and/or analog outputs

If the *Timeline* is set to an HD format, MPEG video is displayed only in the *Viewers*. Output via IEEE 1394 (except in the *Record to Tape* module) is not possible.

With the Avid Liquid PRO Box, you can perform scaled output of HD video to a PAL or NTSC monitor via analog outputs. Activate this option in the *System Settings* by selecting *Edit* > *Control Panel* > *Site* > *System Settings* > *Inputs/Outputs* > *Video Outputs [analog]* > *HD Output* = *On*.
The video monitor should be able to display 16:9. Scan rates are not converted.

Depending on the system configuration (camcorder, VTR, converter), additional connection options are available for output to tape, such as looping the HDV signal.

Combining SD and HD Clips in the Same Sequence

As mentioned above, you can combine all possible formats and resolutions on the *Timeline*. Each time you create a new *Sequence*, however, you define a specific output format for each *Sequence* so that a uniform master of the *Timeline* can be output. Clips that do not exactly match the defined output format are converted to the master format. This includes

- Frame rate (fps) -
  This property is adapted automatically by duplicating or eliminating frames. One second is always one second; each clip always retains its original length. The system initially tries to accomplish this by performing a realtime adaptation (also see "*Different Timecode Systems*" on page 87).
- Interlaced/progressive -
  Automatic adaptation to a uniform interlaced or progressive mode.
- Aspect ratio -
  This adaptation must be defined for each clip individually (or for several together) in the clip *Properties*. According to the default setting, each clip initially retains its original aspect ratio.
- Image resolution (size) -
  Images that are too big or too small are initially centered in the *Master Viewer* inlay; clips that are too big are partially trimmed and those that are too small are displayed with black bars of varying widths. In order for these clips to fill the inlay, set the *Scaling* option in the clip *Properties* accordingly.
  An NTSC clip in an *HDV 720p Sequence* is initially displayed with a black border but can be expanded to fill the window by changing the resolution to 1280 x 720 pixels. Note that this "upgrade" from SD to HD will not improve image quality (sharpness or richness of detail).

High Definition at the Output

Before output, an MPEG2 *Sequence* that is fully edited up to this point in the process must be converted to an intact, continuous MPEG2 stream. The IPB structure of the clips used, which was changed by editing and effects, is converted to a new, uniform IPB structure.

Output via the DV interface *page 100*

Output to MicroMV and D-VHS *page 102*

MPEG and Fuse *page 102*

Exporting to Windows Media HD *page 102*

HDV Output via the DV Interface

With HDV, the *Sequence* is output by means of the *Record to Tape* module (controlled via DV). If the *Sequence* is not yet or not fully rendered when the module is called, output is delayed until rendering has been completed.



Use high-quality DV tapes or special HDV tapes in order to prevent dropouts (missing frames) in your recording.
Insert two to three seconds of black clip or another preroll/postroll before the beginning and at the end of your *Sequence*.

Follow these steps:

1 Prepare the recording device (such as an HDV camcorder) for recording. Make sure the device can record the current *Timeline* format; if not, an error message is output in the *Record to Tape* module.



What should you do if the *Timeline* format and recording format of the MPEG recorder don't go together?
This should not normally happen because, as a rule, you use the same format and codec to import into the system (=Capture) as to output. If not, make sure subsequent recording to tape can work by checking the *Timeline Properties* or when creating a *Sequence*: Most important are the *Resolution, Frame Rate* and *Interlacing* parameters. A recorder that can only perform interlaced recording (i.e. in field mode) will have problems, for example, with a progressive *Timeline*.

2 Select an output device and device type -
Select *System Settings* > *Inputs/Outputs* > *Video Outputs* > *IEEE 1394*.
Check whether the available recorder appears under *Selected Device*. If the player is connected

and ready for operation but does not appear in the list, it is not detected or supported by Windows.

3 Select MPEG output format -
Under *MPEG Output Format*, select the appropriate format for your recorder, such as *HD1* or *HD2, ProHD, MicroMV* or *D-VHS*.



As a rule of thumb, select HD1 for a JVC device and HD2 for a Sony device. Additional criterion: HDV1 for up to 1280x720 pixels; HDV2 is always 1440x1080. The numbers 50 and 60 in the frame rate (fps) refer to the PAL and NTSC regions. If in doubt, test your devices using one of the two settings.
See also *"HDV: HDTV for Consumers and Professionals"* on page 79.

4 Call the *Record to Tape* module and select the MPEG recorder. Select the options (*Entire Sequence/Mark In to Mark Out*) and click *Record*.

5 The current *Timeline Sequence* is first rendered (if it wasn't already) and then exported in a continuous MPEG elementary stream. You can track the process in an export window.
Don't worry: As long as the inlay in the export window remains black, the existing MPEG material on the *Timeline* is transferred in the new stream at a 1:1 ratio. An image is visible only while rendered sections are being converted.

6 Recording to tape, no video is visible in the inlay, nor is there any audio output via the sound card. For monitoring purposes, connect a video/audio monitor to the recorder (looped signal where technically possible).
A progress bar helps you keep track of the process. When the end is reached, the recorder stops.



The elementary stream file (*P2T.m2v*) and audio file (*P2T_s.wav)* from Step 5 are temporary files stored under *...My Documents*\Avid Liquid*Data**Media**LogMedia* and are deleted when you exit Avid Liquid You can copy these files to another directory, import them and position them on the *Timeline* as a clip as needed, and then output them to tape. In this case, there is no reconversion to an elementary stream.

Output to MicroMV and D-VHS

Basically, this works exactly like HDV: Set the appropriate *MPEG Output Format* (go to *System Settings* > *Input/Output* > *Video Outputs* > *IEEE 1394)* and output the *Sequence* using the *Record to Tape* module.

MPEG2 IPB and Output Using a Fuse Process

If you want to output a *Sequence* made up entirely or partly of HD clips as an MPEG2 IPB file, use the *Fuse* process. See also *"Fuse"* on page 959.

First set the *Render/Fuse codec* in the *Timeline Properties* to *MPEG2 HP@ML (m2v)*.
Then open *Export to File* > *Fuse* and select a suitable preset. This generates an elementary stream (*.m2v).

The system encodes only areas in which the original GOP structure was changed by editing or effects.

Export to Windows Media HD

Windows Media Player Version 9 (or later) must be installed on your system.

Select *File* > *Export to File* > *Windows Media* > *HD Profiles* and find the profile that meets your needs.

For information on how you can modify a preset profile, refer to the Export chapter (*page 958*).

Chapter 6

Input

make manage move | media™ Avid®

This chapter describes the integration of material (objects) for editing and processing in Avid Liquid. This material will generally originate from external sources (for example, digitizing via the video interfaces); however, some object types can be created using local resources (for example, title and color clips).
For information on data exchange and networking, refer to the next chapter (as of *page 167*); all the ways to output from Avid Liquid are described in the Export chapter (*page 941*).

EZ Capture

Quick and easy file based capture *page 105*

Logging and digitizing (Capture) *page 110*

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→ The Logging Tool and its functions *page 114*

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Import objects *page 150*

→ Import - where from, where to? *page 151*

→ What can be imported? *page 152*

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→ Image import: Global settings *page 157*

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Transfer objects from other Projects *page 159*

Create objects *page 161*

→ Color clip *page 162*

→ Generate signal clip (reference level tones) *page 164*

→ Titles *page 881*

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→ Voice-over (audio clip) *page 861*

EZ Capture

EZ Capture is a tool for the quick and easy recording of DV and HDV video via the IEEE-1394 interface (Firewire, iLink) or for recording analog sources via the analog inputs on a breakout box.
The A/V signal can be saved in a number of different file formats, such as MPEG2 video for a DVD.
For more complex tasks (such as a subsequent *Batch Capture*) or for capturing from players controlled via RS 422, use the *Logging Tool (see page 114)*.

Starting EZ Capture

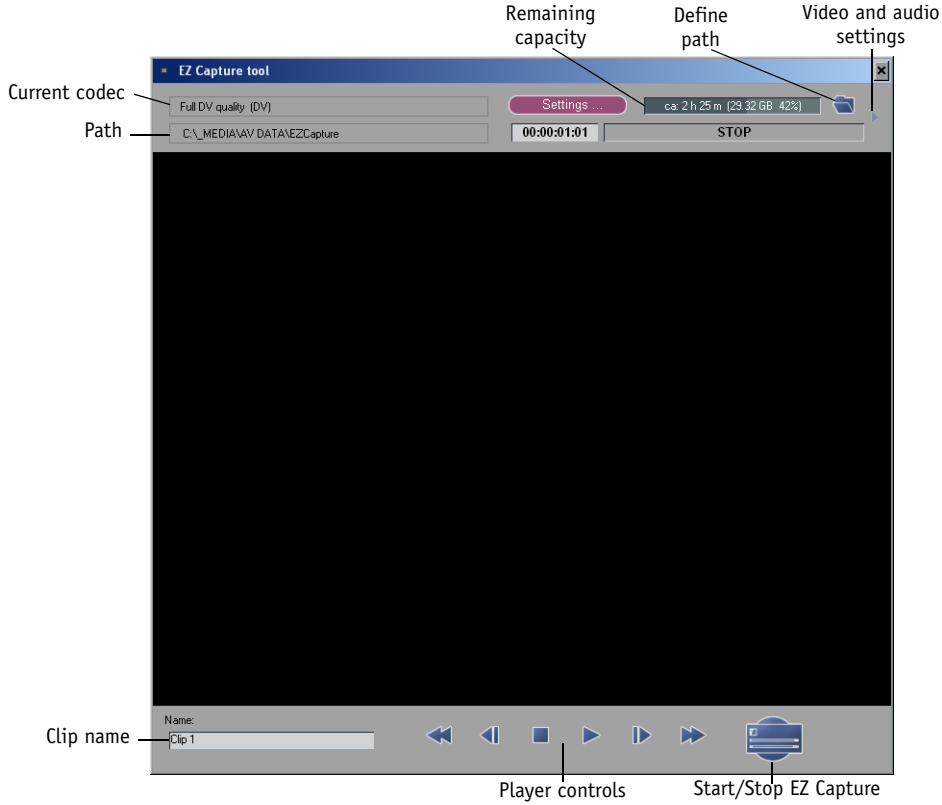
Select menu bar > *File* > *EZ Capture*,

or

use quick access toolbar at the top > *Input* > *EZ Capture*,

or

select *File* > *Import Wizard* and then this function.



EZ Capture

EZ Capture step by step

1 In the *Project* window, select a *Rack* in which to store the clips.
If you don't select a *Rack*, one is automatically created and numbered sequentially: *Capture1, Capture2*, etc.

2 Start *EZ Capture* (*File* > *EZ Capture*, for example).



3 Select or create a directory for the resulting media files (icon for an open folder).
The default directory is *..\EZ Capture*, which was created during installation and is located in the media directory.

4 If appropriate, select a *Capture Format* or *Codec* (such as *DV* or *DVD-compatible;* see *EZ Capture Settings on page 107).*

5 If appropriate, select *Capture device/Video Input*, such is *RGB/YUV* or *IEEE 1394 (*see *EZ Capture Settings on page 107)*. The preset is DV input.

6 Enter a name for the clip.
If you don't change the name, a sequential number is appended to the name for the next and all subsequent clips (Name1, Name2, Name3, etc.). Unless you specify differently, the system starts with "Clip 1".

7 Use the controls to cue the tape to the desired position and start playback.
For an uncontrollable source, start playback manually.



8 Click the *Capture* button. If the tape is not yet rolling, clicking *Capture* will.
Click the button again to stop recording.

9 The clip is stored in the selected *Rack* or in the automatically created *Rack Capture 1* (...).
Define additional clips as needed.

Changing the Video and Audio Levels

With an analog signal input, you can change the video levels (one fader each for *Brightness, Contrast, Sharpness, Saturation* and *Hue*) and audio levels (*Volume, Balance*). Click the small triangle in the upper right-hand area of the *EZ Capture* dialog box to open the *Extended Dialog Box*.
In the case of a digital signal input that can't be adjusted, the triangle is grayed.

More Information on EZ Capture

EZ Capture is file- and directory-based. This means that you define the file name and the directory in which the data is stored for each clip. This media data is not compatible with Avid Liquid's *Media Management*. No compatible metadata, such as a timecode or *Reel* name, is stored with the data. That's why a subsequent *Batch Digitize* is not possible. However, a subsequent *Automatic Scene Detection* based on DV time/datestamp (in the *Clip Viewer*) and scene detection based on video content will still work.

EZ Capture Settings

When recording DV or HDV, you can generally start *EZ Capture* immediately. For special requirements or when recording analog sources, click *Settings* to open a dialog box with two tabs:

Player Settings

Whether the options described below are available depends on the connected hardware.

Capture Device

Select the capture device here (for example, a DV/HDV camcorder or a breakout box such as the `Avid Liquid PRO Box`). DV/HDV devices are specified by manufacturer or by the name registered by the Windows hardware detection. Only one IEEE camera may be connected to the computer.

Video Input

- *Signal Input* -
  Select the input via which the video signal is routed.
- *PAL* or *NTSC* -
  Select the video signal's TV standard.
- *Aspect Ratio* 4:3 or 16:9 -
  For analog recordings: Select the correct aspect ratio.
- *VCR* -
  Activate this option if the signal is supplied by an older, analog recorder, such as a VHS recorder. This will make the signal input more tolerant.

Codec Settings

These settings determine the file format of the audio and video recording. The number of options activated depends on the signal type and codec.

Reference Sets

The particular *Reference Sets* offered for selection depends on your system's hardware and the input signal selected. If you select an (unedited) *Reference Set*, none of the other options in this dialog box will be accessible.

- DVD-compatible (MPEG2) -
  Saves the input signal in a format that can be burned to DVD without additional encoding.
- SVCD-compatible (MPEG2) -
  Saves the input signal in a format that can be burned to SuperVideoCD without additional encoding.
- VCD-compatible (MPEG1) -
  Saves the input signal in a format that can be burned to VideoCD without additional encoding.
- HDV quality -
  Records as MPEG2 in the HDV standard just as it is received at the IEEE input.
- Full DV quality -
  Records as DV (avi).
- Analog input: M-JPEG better/good -
  Captures in preview quality. Lower data rate than DV.
- Digital input: M-JPEG low/medium/high quality -
  Captures in preview quality. Lower data rate than DV.

Editing a Reference Set

You can edit the preset parameters individually.



If you do so, however, note that compatibility is no longer guaranteed, and that the data format may no longer match DVD or SVCD standards, for example.

As soon as you activate edit mode, the following options become available in the *Reference Sets* field:

- *AVI*
- *MEPG1 SS* (System Stream)
- *MPEG2 ES* (Elementary Stream)
- *MPEG2 PS* (Program Stream)

The options under *Video Settings* and *Audio Settings* vary depending on your selection in the top field:

Video

- *Compression* -
  Here you can select a video codec:
  - MPEG1, MPEG2, MPEG4
  - M-JPEG
  - DivX
  - DV
- *Video Size* -
  Select the size of the recorded video (width by height, specified in pixels).
- *Frame rate* -
  Frames per second.
- *Quality/Data Rate* -
  Depending on the codec, you can influence the data rate of the video stream and/or the quality of the recording here. A high data rate/quality generates larger files.

Audio

- *Compression* -
  Select an audio codec here:
  - MP2, MP3
  - PCM
- *Channels* -
  This option is offered if you have multiple selectable inputs.
- *Sample rate* -
  Internally, Avid Liquid operates at 48 kHz.

Logging and Digitizing (Capture)

In Avid Liquid, the *Logging Tool* is responsible for logging (views) and digitizing (saving to hard disk) A/V signals or A/V data played via the system's video and audio interfaces. In the process, clips and Media Files are generated with specific properties such as *mono* or *stereo*, an aspect ratio of *4:3* or *16:9*, in a specific Media Format and in offline or online quality (product-dependent).
The *Batch Digitize* module permits the automatic digitizing of multiple clips (*page 292*).



About timecodes:
With regard to tapes in the player, make sure there is a continuous timecode without interruptions, jumps or repeated TC areas (for example, repeated positioning at 00:00:00.00).
Avid Liquid's internal *Media File* management depends on unique *Reel* (tape) names and a correct and continuous TC. It is recommended that you either digitize problematic tapes *live* (for example, with a system TC, generated by the computer system clock) or first copy to tapes with a clean timecode.

Basics *page 111*

The Logging Tool and its functions *page 114*

Methods *page 139*

Logging *page 140*

Digitizing *page 142*

Basics

Logging and/or digitizing defines clip properties:

→ "Logging" and "digitizing" *page 111*

→ Clip-in/clip-out and mark-in/mark-out *page 112*

→ Stereo or mono *page 113*

"Logging" and "Digitizing" (Capture)

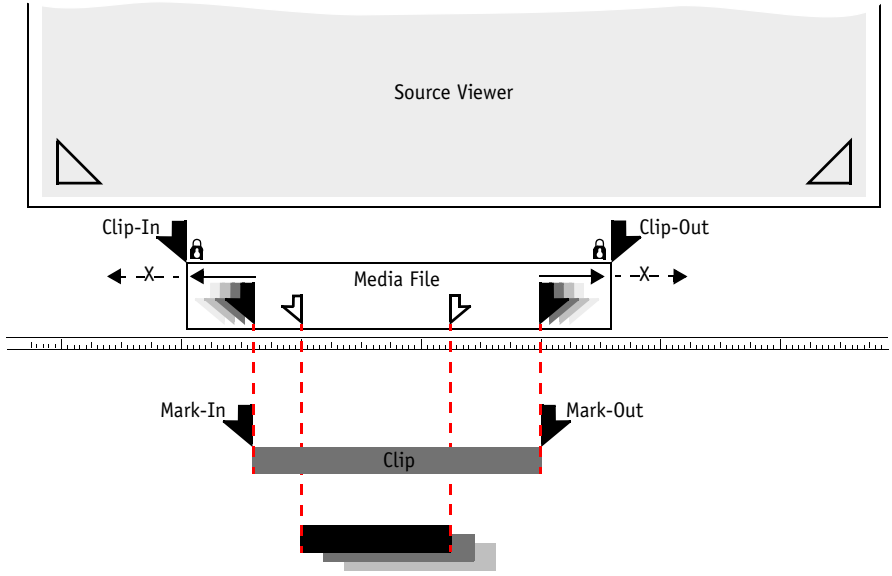
Let's begin by defining our terms:

- "Logging" means viewing (and listening to) played A/V material, where clips can be defined by means of their mark-in and mark-out. You can name and attach comments to these clips, store them in *Project Racks* and, if desired, transfer them directly to the *Timeline*.
  You can but do not necessarily have to digitize logged clips. You can make this decision later on.
- "Digitizing" means transferring A/V data to the system's A/V storage media so that it can be played and edited in Avid Liquid. Since this term has come into common usage, it is also used where there is no actual "digitizing" (conversion via codec) taking place but data is simply being copied as when, for example, DV material is "digitized" (when it is transferred via i.Link/IEEE 1394). Another term for the very same process is "capture".
  Digitized clips are normally stored in *Project Racks* but can also be inserted directly on the *Timeline* (see *"Send Clips To Timeline (Direct Insert)"* on page 133).

Clip-In/Clip-Out and Mark-In/Mark-Out

There is a fine distinction between the two:

The clip-in defines the first frame of a clip and the clip-out defines the last frame. Clip-in and clip-out points cannot be moved. If the *Playline* is positioned on the clip-in (for example, in the *Clip Viewer*), a triangle is displayed in the lower left-hand corner of the video inlay indicating that "there is no material to the left of (i.e. before) this point."
Mark-in and mark-out points can be moved within the boundaries of clip-in and clip-out points but cannot be moved outside them:



Similar but different: The clip-in and mark-in for a clip

If, for example, you define a new clip in the *Logging Tool*, the clip-in and mark-in as well as the clip-out and mark-out start out in the same position and stay this way until you edit the mark-in and /or the mark-out. Any number of (sub)clips with many mark-in/out points can be attached to a single *Media File*, i.e. they point to the same *Media File* and refer to its data when played back.

Sometimes the software refers to a "*Handle Length*". This means that a few frames are added before a clip's existing mark-in and/or after its mark-out and that the mark-in/out is shifted accordingly. However, the boundaries of the clip-in/out cannot be exceeded.

Subclips are clips without their "own" clip-in and clip-out points whereas master clips each have their "own" clip-in and clip-out points.

Stereo or Mono?

Whether an audio clip is logged and digitized as “stereo” or “mono” has a decisive influence on audio editing in Avid Liquid. Its behavior at the audio output of the system is determined, i.e. which sound tracks of the recording device are recorded. For detailed information on this topic, see *“Stereo and Mono, Panorama and Balance”* on page 801.

Stereo and Mono Functions



The symbol of a single ring or of the two engaged rings below the *Source Track* icons in the *Logging Tool* enable you to switch between mono (ring) and stereo (engaged rings) and assign the audio clips to “mono” or “stereo”. The main difference becomes evident as soon as the clips are placed on the *Timeline*:

- As a standard, stereo-audio clips are assigned to left/right. This means, uneven *Source Tracks* (A1/A3) are assigned to the outputs CH-1/CH-3, even ones (A2/A4) to the outputs CH-2/CH-4. This corresponds with the convention left=uneven, right=even.



Also one individual audio clip can be a “stereo” clip: the *Source Tracks* A1/A3 are placed on the left output, the *Source Tracks* A2/A4 on the right one (this is true for standard stereo routing).

- Mono audio clips are panned centrically by default, which means that their levels are uniformly assigned to the even and odd output.

In the *Project* Racks, the stereo/mono status of a clip is indicated in the *Tracks* column by an attached *S* or *M*, for example *VA1A2-M* (this refers to enabled *Detail View*).



The mono/stereo setting is not final! You can change this assignment simultaneously for several selected clips via *Properties* or *Adjust Audio*.

Balance and Panorama

One more important thing:

- The balance is controlled in stereo clips (like in your stereo system): the signal amplitude of one channel is reduced leaving the other one unchanged. The left/right signal assignment remains unchanged.
- The panorama is controlled in mono clips: the signal of a channel “migrates” e.g. from left to right. This does not change the signal amplitude, only the left/right assignment.

The Logging Tool and Its Functions

The *Logging Tool* is used for logging and digitizing (=capturing) material played from either a live source or a controllable player. In other words, it defines every aspect of clips from their length to their volume level and even their Media Format.



To open the *Logging Tool*, press the F6 KEY on the keyboard or select *File* > *Logging Tool.*
To close the *Logging Tool* click the exit symbol in the upper right corner.

This section describes the individual functions of the *Logging Tool (*sometimes also applicable to *Batch Digitize);* logging and digitizing methods are described in the subsequent section (*page 139*).

The Logging Tool (Functions)

→ Display (inlay, timecode and status) *page 115*

→ Select player source *page 117*

→ Racks and Reels *page 119*

→ Controls (player and edit buttons) *page 121*

→ A/V inputs (select Source Tracks) *page 124*

→ Stereo or mono? *page 125*

→ 4:3 or 16:9? *page 125*

→ Select Media Format and Codec *page 125*

→ Destination drives for digitizing *page 127*

→ Select Audio Out *page 128*

→ Video Tool / Calibration Tool / MPEG IPB settings *page 128*

→ Clip tab: Name and number clips *page 129*

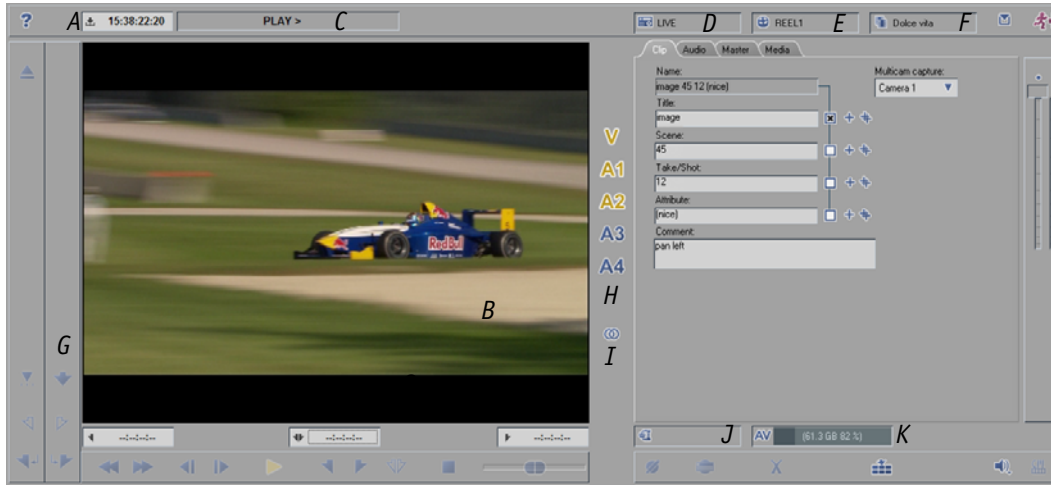
→ Audio tab: Control and edit level *page 130*

→ Master tab: Timeline video in the Logging Tool *page 132*

→ Media tab: where to store the media data *page 133*

→ Insert clips directly on the Timeline *page 133*

→ Properties *page 134*



Logging Tool (letters refer to descriptions in text)

Video Inlay, Timecode Fields and Status Field

The video inlay displays the video signal currently being applied. If you are logging/digitizing audio data only (video *Source Track* not activated; *page 124*), a loudspeaker icon appears in the inlay.

Timecode Position Field (A)

Depending on current settings, this field (to the left above the inlay, A) indicates

- the player's current TC position -
  (if the player's timecode is being used; may include a selected shift, *page 120*). TC data is transmitted via the remote interface (RS 422 or IEEE 1394).
  When a MicroMV device is used as a player, the field remains empty. These devices do not supply a TC. Use the *Live Input* instead (*page 117*).
- the system time -
  if the TC generated from the system clock is used (only in connection with the *Live Player*; *Time of Day* option.
  TC count starts immediately after opening the *Logging Tool* or the selection of the *Live Player.*
- an individually defined TC -
  only in connection with the *Live Player*; *Custom TC* option).
  Click in the TC field and enter a value.
  To start or stop the TC count, use the *Play* function.

- an LTC -
  supplied at an analog audio input (optional with some products; *LTC In*).

When a mark-in and mark-out are set, the current value in the TC position field is used. The same happens when you use the *Log* and *Digitize* functions.

For more information on the timecode options mentioned above, see *"Live Input"* on page 117.

Timecode Systems

With the advent of HDTV, the previously straightforward offering of PAL and NTSC timecode systems has been expanded considerably: 11 different TC systems are identified by the separator between the numbers (period, comma, semicolon, colon). For a list of timecode systems, refer to the section entitled *"Timecode Systems"* on page 84.

Go to a Specific TC Position:

Click the position field, enter a valid TC value and press ENTER. The player cues up the tape to the desired position. If you enter invalid values (such as 25:00:01:01), the digits are displayed in red.



The same method is used in the *Source Viewer, Clip Viewer* and *MasterViewer* and in *Record to Tape*.

Timecode Mark-In, Mark-Out and Duration Fields (B)

These three fields below the inlay specify (from left to right):

- Mark-in (start of a scene or take)
- Duration (from mark-in to mark-out)
- Mark-out (end of a scene or take)

Edit TC Fields/Calculate a Timecode/Clear Fields

You can edit these fields. Missing values are automatically inserted. For example, if you set a mark-in and enter a duration via the keyboard, the mark-out is calculated. To add times to or subtract times from values, press the PLUS or MINUS key on the keyboard before entering the number. Example: To move the mark-in timecode 10:01:02:03 ahead (towards the beginning of the tape) two minutes, click the field and enter:
-00:02:00:00 (you may omit the colons). Then press ENTER.

In the case of invalid entries, the TC digits are displayed in red.



To clear all timecode fields (except *Position*), hold the SHIFT-KEY while clicking *Cancel*.

Status Field (C)

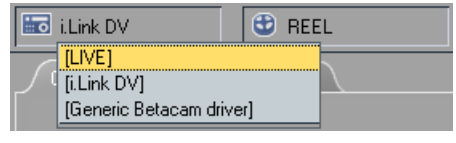
This field located above the inlay displays player status messages in plaintext (*PLAY, STOP, STILL, REWIND, LOCAL, DIGITIZING,* etc.).

Graphical Display of Player Status

Alternatively, you can right-click the field to display the shortcut menu and switch to a graphical display. The player status messages are then displayed as "LEDs" with accompanying text (*Servo, Color Servo, Reference*, *Remote, Rec Inhibit*).
This can help to identify a player problem, such as a missing or bad reference signal.

Player Source (D)

From the drop-down list box to the right of the status field, select a player source: either the *LIVE Input* or a controllable player/recorder (mandatory for *Batch Digitize*) connected via an interface (such as RS 422 or IEEE 1394/i.Link DV/Firewire). Timecode data for the material is transferred via the control interface.



Selecting a player

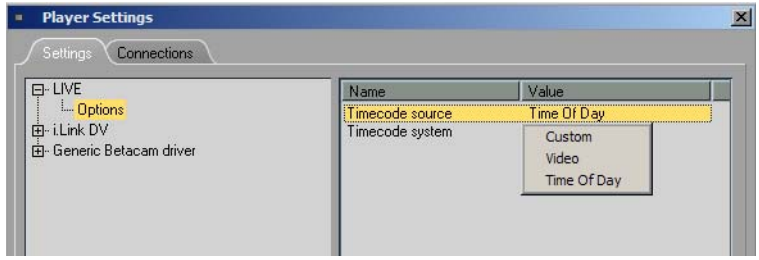
The options available in this list reflect the settings under *Edit > Control Panel > Site > Player Settings*. The corresponding video and audio inputs are switched to the *Logging Tool*. To display this dialog box directly, click the icon to the left in the drop-down list. For descriptions of the various devices, refer to the separate product manual.

Live Input

The *LIVE* input is used for non remote-controllable video and audio signals, i.e. when you feed in a signal directly from a camera or from a TV Tuner. In Avid Liquid, the *LIVE* input is treated as a player, but without the option of controlling it via RS 422 or IEEE 1394 (DV).
Its video and audio inputs are configured in the same way as any other player (*Edit > Control Panel > Site > Player Settings > Connections*).

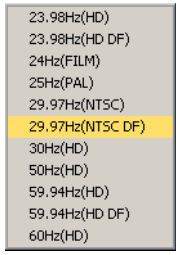
The LIVE input must have a timecode, which is defined under the *LIVE Player* options:

1 From the *Logging Tool*, click the player icon next to the player drop-down list box (see figure above) to display the *Player Settings* as shown below:



Selecting a timecode for the LIVE player

2 Click the plus sign in front of the LIVE entry, then select *Options* and double-click *Timecode source*. Select:
- *Custom*: Lets you enter a start TC in the *Logging Tool's* TC display (*"Timecode Position Field (A)"* on page 115).
- *Time of Day*: Generates the TC from the computer's system clock.
- *Video*: Takes the TC from the video signal played (DV timecode). Note: VITC is ignored.



Timecode systems for the Live Player (Live input)

3 *Custom* TC: Select the *Timecode System* that matches the material being played.

For more information on timecode systems, refer to the chapter "High Definition".

Avid Liquid

A remark for users of Avid Liquid in combination with analog input/output hardware: Use the *Live Player* to capture analog signals. One exception: with RS 422 remote it is possible to input analog signals and control a player device.
With IEEE 1394 (i.Link DV) remote control there is HDV/DV in/out exclusively.

Reels and Racks (E, F)

Reel names define where the material originates. *Racks* define its destination. A *Reel* is usually a (video) tape but generally stands for a specific source.

An unambiguous and unique *Reel* name for each source is especially important in networked systems and for a subsequent *Batch Digitizing* operation. In the first instance it is important because Avid Liquid Media Management is primarily *Reel*-name-oriented; in the second instance because automatic digitization is based on timecode data alone and can function only if the correct tape/source is inserted in the player.

If you are wondering what a "unique" *Reel* name is and how to come up with one as easily as possible, here is a suggestion: Use the day's date in the *Reel* name:
For example, *Reel01 12-09-02* (or a four-digit year to avoid the next millennium bug).
If you digitize live, you are certain to have a unique name if you combine a realtime TC (24-hour format!) and the day's date. In a network, you can achieve further clarity by appending the editor's initials. For example, *Reel07 12-09-02 CPR*.

The *Shift Timecode* function allows you to define a TC shift for a tape.

Racks permit you to arrange logged/digitized material. See "*What Are Rack Folders and Racks?*" on page 212.

Selecting/Creating a Reel (E)

The top middle list box allows you to select or create a new *Reel*. The term *Reel* refers to the source of the material (video tape, audio CD, DAT, etc.). Live sources are also assigned a *Reel* name.

- To create a new *Reel*, click the icon to the left in the list box. A dialog box is displayed over the inlay where you can enter a name for the *Reel*.
  Click the *double-plus* symbol to the right of the text box to append a digit to the *Reel* name entered that will automatically be incremented by 1 each time you change *Reels* (Tape 1, Tape 2, Tape 3, etc.). This option is per default active.
- If one or more *Reels* already exist in the *Project*, select a suitable *Reel* from the list:
  The three most recently used *Reels* are at the top; below them are all the *Reels* available in the *Project* (provided that Media Files already exist for them).
- Optionally you can configure the *Change Reel* dialog box to not open when you call the *Logging Tool* (*page 134*). Per default the dialog will come up.



Avid Liquid Media Management requires that Media Files be assigned to specific *Reels*. The *Reel* name should be unique (especially in a networked environment) to provide Media Management with unambiguous access to the material (*page 313*).
About timecodes:
With regard to tapes in the player, make sure there is a continuous timecode without interruptions, jumps or repeated TC areas (for example, repeated positioning at 00:00:00.00).
Avid Liquid's internal Media File management depends on unique *Reel* (tape) names and a correct TC. It is recommended that you either digitize problematic tapes *live* (for example, with a system TC) or first copy to tapes with a clean timecode.

Shift Timecode

This function in the *Select Reel* dialog box allows you to shift the timecode supplied by the source to a specific value. This shift applies to the entire *Reel*.

- You can use this function, for example, to synchronize several tapes for a multicamera edit (see *page 495*).

Enter a value in the field preceded either by a "+/plus" or "-/minus" sign. This value is added to or subtracted from the TC specified in the *Position* field and used for a mark-in/mark-out.



If this function is not available in the dialog box, this means it has been deactivated in the *Logging Properties (page 134*).

Selecting/Creating a Rack (F)

The top right list box allows you to select or create a new *Rack*.

- To create a new *Rack*, click the icon to the left in the list box. A dialog box is displayed over the inlay where you can enter a name for the *Rack*. The logged clips will be stored in this *Rack* until you select another one. See*"Creating New Folders/Racks"* on page 213.
- If one or more *Racks* already exist in the *Project*, double-click a suitable *Rack* in the list. The list also contains *Rack Folders* for the *Project*, which you can also open by double-clicking them.



You can also configure that the last *Rack* used will be activated when the *Logging Tool* is called. See *"Start Logging Tool with last selected Rack"* on page 134.

Controls (Player and Edit Buttons, G)

The buttons for controlling the player and for defining clips are located on the left below the inlay. These buttons and their specific icons are found in many Avid Liquid modules.



The toolbars are configurable (see *"Customizing Toolbars"* on page 990). You can also call these buttons via the keyboard. See *"Modifiers and Keyboard Shortcuts (Defaults)"* on page 997 and *"Assign Functions to Keyboard"* on page 993.

Player Buttons

These buttons allow you to control a connected (linear) player. In other modules where non-linear data is played, these buttons are used in the same way, i.e. for a digitized clip, "rewind" means a direct jump to the first frame in the clip/*Sequence*.

Play



Starts play. To stop play, click this button again or click *Stop*.

Stop



Stops play at the current position. To stop play, you can also click the *Play* button again.

Goto Start/Rewind



Rewinds the tape/jumps to the start of a clip/*Sequence*.

Goto End/Forward



Forwards the tape/jumps to the end of a clip/*Sequence*.

Step Back 1 Frame



Goes back one frame.

Step Forward 1 Frame



Goes forward one frame.

Shuttle Slider

Shuttles the tape ahead (drag to the right) and back (drag to the left).



You can also fix the slider in one position: Press the SHIFT key and release the mouse button at the desired speed.

Goto Mark-In



Cues up/jumps to mark-in, if any; otherwise to clip-in.

Goto Mark-Out



Cues up/jumps to mark-out, if any; otherwise to clip-out.

Play In to Out



Plays in a continuous loop from the mark-in to the mark-out, if both are set. If no mark-out is set, plays from mark-in to end. If no mark-in is set, plays from the beginning to the mark-out, if one is set, or to the end.



To stop "in to out loop play," press the SPACEBAR on the keyboard, or click the *Play* or *Stop* button.

Shuttle Playback (JKL)

For forward and reverse playback at specific speeds, the *Shuttle Playback* button is also available in the *Logging Tool*, provided that the player supports this type of control. See also *"Shuttle Playback (JKL)"* on page 275.

Edit Buttons

These buttons (in the default configuration, located in the two vertical toolbars next to the inlay) allow you to define clips.

Mark-In



Sets the mark-in point at the current *Playline* position. You can set the mark-in point "on the fly" (during playback), or use the player commands to move to the point for the mark-in. If the mark-in point is already defined when you click this button, it moves the mark-in to the new position.



At this point the video image in the form of a *Picon* (miniature) is used as a visual reference. For a pure audio clip, a loudspeaker icon serves as the *Picon*.
See also "*Views*" on page 238.

Mark-Out



Sets the mark-out point at the current *Playline* position. You can set the mark-out point on the fly (during playback), or use the jog/shuttle commands to move to the point for the mark-out. If the mark-out point is already defined when you click on this button, it moves to the new position. At this point the video image in the form of a *Picon* (miniature) is used as a visual reference.



If you set a mark-in at a position after the mark-out, the mark-out is deleted. If you set a mark-out at a position before the mark-in, the mark-in is deleted.
The frames which designate mark-in and mark-out points are included in the total duration.

Clear Mark-In and Mark-Out



Removes both the mark-in and mark-out points, if set. If only one is set, removes it.

Clear Mark-In



Removes the mark-in point.

Clear Mark-Out



Removes the mark-out point.

To clear all timecode fields (except *Position*), hold the SHIFT-KEY while clicking *Cancel*.

Set Index Picture



In some cases the first frame and last frame index pictures may not clearly represent the content of a clip, i.e. in a pan the most telling images may only appear towards the end of the pan. Click *Set Index Picture* to select another frame, which will serve as the *Picon* of the clip. See also *"Views"* on page 238.

Set Marker



You can set markers at any position and attach comments to them. Also see *"Setting Markers and Adding Comments"* on page 271.
When a live source is used, the marker button is not available.

A/V Inputs (Selecting Source Tracks, H)



The A/V signals (*Source Tracks*) to be digitized are determined by a series of buttons to the right of the inlay. Click the appropriate buttons to select (icon highlighted) or deselect them.



Source Track selection affects Media File generation. See also *"Media Management"* on page 313.



For example, activate the *Video Source Track* and *Audio Source Tracks A1* to *A4*. The system then creates five different Media Files, one for each signal.



However, this occurs only when digitizing.

DV: Channels 3 and 4

Some DV camcorders can record and play four audio channels, although at a reduced sampling quality of 32 kHz. When captured, this audio is converted to system-compatible 48 kHz. However, in DV embedded, only two channels (@ 48 kHz) can be output.

Avid Liquid

Note that even if you want to capture DV audio only, there must be a video signal present (to ensure correct synchronization).



It is possible to later add *Source Tracks* to clips and to re-capture these clips with all active *Tracks*. Add *Tracks* by clicking the appropriate checkboxes in the clip's *Properties*.
The number of *Audio Source Tracks* available depends on the system configuration and the current audio input.
If *V* is not selected, the video signal will not be displayed in the inlay.

Stereo or Mono (I)



Whether an audio clip is logged and digitized as “stereo” or “mono” has a decisive effect on audio editing in Avid Liquid.

Click this button to switch between *Mono* (single ring) and *Stereo* (engaged rings).



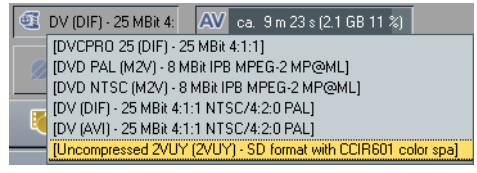
Also see *“Stereo or Mono?”* on page 113 or for detailed information on this topic, see *“Stereo and Mono, Panorama and Balance”* on page 801.

4:3 or 16:9 (I)



For analog video input only: Select the appropriate aspect ratio for the source material.

Selecting a Media Format/Codec Preset (J)



List of Media Formats (sample)

Here you can define the format in which the Media Files are digitized (or captured), in other words, determine the codec to be used (if any).

Depending on your editing system and the options installed, and selected signal inputs, the list box contains a varying selection of *Media Formats* or Codec Presets. If you read *Native Transfer [format]*, this means: The incoming signal will be transferred bit by bit, unaltered by any codec. In all other cases (except *Uncompressed*) a codec will be involved in the capture process - for example when an analog signal is fed. Native Transfer is restricted to certain inputs and is not available with analog inputs.
The icon on the left in the list box takes you directly to the *Codec Presets (Edit > Control Panel > Site),* but only if this is a supported feature of the selected Media Format or codec.

For more information on how to create a custom Media Format, see *“Define Codec Presets”* on page 319.

The Problem of Selecting Formats

Depending on the particular product, a large selection of media formats is now available for selection. Advice as to which one to actually select is hard to give. If you shoot and output DV or HDV, *Native Transfer [avi]* is probably a good choice: the image quality will be preserved throughout, its storage capacity demands are moderate, and AVI files are compatible with many applications in the field.
In a more professional environment there are other things to consider. Sometimes it can become necessary to first edit in "offline" quality and later finish the project in Uncompressed media quality ("online"). Network bandwidth, compatibility with playout servers or news editing systems can also be important and thus influence the selection of a certain format.

"Media Format" or "Codec"?

The way we use these two terms they're basically interchangeable. Though "Uncompressed" is, strictly spoken, a *Media Format*, but not a codec - because there is no encoding or decoding by a codec involved. The *Codec Presets* are pairs of a codec and file format (see *"Define Codec Presets"* on page 319).

Information in TV signal lines 9 through 22

Closed captioning (under titles) in Avid Liquid only works with the Uncompressed (2vuy, yuv) format. It does not work with DV, DVCPro, MPEG, MXF and IPB formats. Uncompressed is the only capture format (*Logging Tool, File Ingest*) that preserves the CC data in the video stream. Also note that applying an effect to two streams of video (that is, mixing the video) causes the CC data to be discarded.
All information that is contained in the lines 9 to 22 of the video signal (such as VITC, video text, CC) will be discarded in formats other than Uncompressed.

Destination Volumes for Digitizing / Capture Volumes (K)

The two fields at the bottom right allow you to select the volumes (i.e. hard disk drives or directories) on which the A/V data should be saved (captured), one for video data (*V*) and one for audio data (*A*).



List of available volumes (V and A)

If only one field *AV* is visible, separate recording of video and audio was deactivated (see also *Video Tab/ Audio Tab* on page 333).
These list boxes combine several functions:

- *Display recording capacity* -
  The remaining recording capacity of the current selected volume is displayed and continuously updated (time remaining, percentage of total capacity, absolute capacity remaining) during digitizing.
- *Select volume* -
  On the list boxes, the mouse pointer changes to a triangle; click it to display the list of available drives and directories from which you can select a volume for digitizing.
  This also changes the *Primary Volume Definition*, *page 333*.
- *Edit Media Management settings* -
  Whatever you can select from the list is defined in the *Media Management Settings* (*Edit > Control Panel > Site > Media Management Settings*; *page 332*). Click the *V* or *A* icon to go there directly.
- *Tooltip with volume information* -
  When you rest the mouse pointer on the field, a tooltip is displayed indicating the complete path of the volume currently selected.
- *Warning before capacity limit is reached* -
  If you define a clip whose dimensions exceed the available memory, a warning flashes in the list box.



For capturing (digitizing) purposes, use NTFS partitioned hard disk drives exclusively. FAT32 may cause problems with longer clips (i.e. > 18 minutes).

Select Audio Monitor /Mute

See also *"Source Viewer (Monitor Bus)"* on page 827.

Video Tool / Calibration Control /IPB Settings



Depending on the situation and product, this icon opens three different dialog boxes:

- In `Avid Liquid` - analog input only - the *Video Tool*.
- In `Avid Liquid Chrome HD` - Also for analog input only - the "*Calibration Control*". For a detailed description of all the *Calibration Control* parameters, refer to the `Avid Liquid Chrome HD` Product Manual, chapter 2.
- All Avid Liquid products, and only with an active MPEG2 signal (e.g. HDV) via an IEEE-1394 input - the *MPEG-IPB Settings*. These settings are described in the High Definition chapter on *page 93*.

Note: The *Video Tool* is not available when capturing uncompressed video (2VUY, YUV).

Video Tool

- *Brightness/Contrast/Saturation* -
  This option affects the black level (contrast), brightness (video level) and color saturation (chrominance) of the incoming video signal.
  All changes that you make are immediately visible in the video inlay and on the connected monitor.
- *VCR* -
  Activate this checkbox if the video signal being played does not appear to be reliable, e.g. it comes from an old or poor quality VHS cassette. This can cause problems with capture.



The *Video Tool* has an immediate effect, meaning that an appropriately modified Media File is generated during the digitizing process. For this reason, the procedure is also said to be "destructive".
During logging, no *Video Tool* parameters are written to the clip data, nor are they taken into account for a subsequent *Batch Digitize* operation.

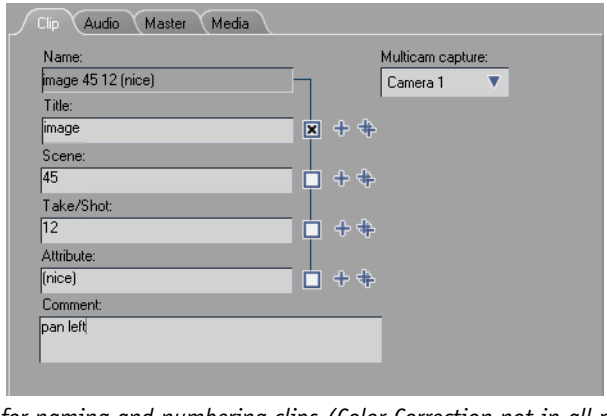
Clip Tab: Naming and Numbering Clips

The *Clip* tab contains text fields and functions for naming and (automatically or manually) numbering clips, as well as for selecting camera settings for the Multicam function.

Taken all together (but also individually), the entries in the *Title, Scene, Take/Shot* and *Attribute* fields produce the *Clip Name* specified above the text fields. *Textual Presets* can also be used (*page 134*).

- Activate the checkbox to the right of an input field to add a particular entry to the clip name.
- *Edit Clip Name* -
  Use this button to position the cursor in the *Title* field with a single click (if necessary, drag button from the Function Library to the toolbar (right-click > *Customize* > *Special*)). Tip: Assign to a key as well.
- Use the TAB key to move from field to field.
  As soon as you press ENTER, the keyboard returns to player control mode. For example, you then can start or stop the player by pressing the SPACEBAR.
  Press TAB again to return you to text input mode: Pressing TAB once takes you to the *Clip* tab and pressing it a second time takes you to the *Title* text field.
- Click an individual plus sign to increment the count by one. For the first clip, a "1" is appended to the text. If you activate automatic counting (double plus sign), numbering is performed automatically for each newly logged or digitized clip.

Automatic numbering is especially helpful with default textual presets. You can define these presets in the *Logging Tool* properties (*page 134*).



Clip tab for naming and numbering clips (Color Correction not in all products)

Multicam Capture

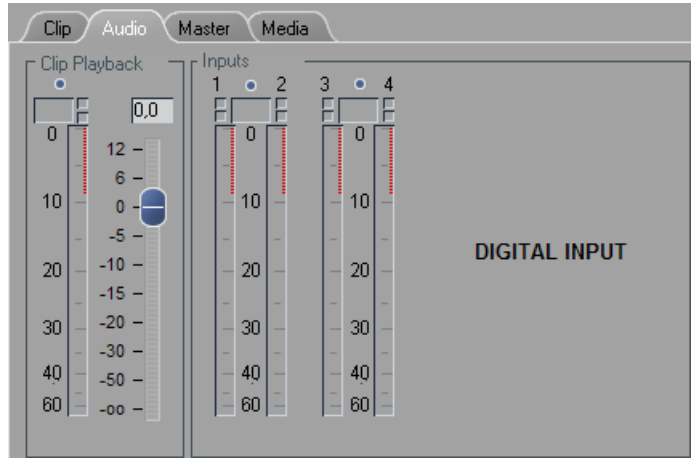
If - and only if- you can use tapes with synchronized timecodes (i.e. tapes with identical TCs) for a *Multicam* edit, assign a camera number here to each of the tapes used. Important: The *Reel* name must remain the same for all tapes of the *Multicam* edit.
For detailed information on the *Multicam* function, refer to the Edit chapter: *"Multicamera Capture in the Logging Tool"* on page 494.



If your tapes do not have identical TCs, it is not necessary to assign camera numbers.

Audio Tab

Here you can control and adjust incoming audio signals.
For a description of the functions and elements of the faders and audio peak meter, see *"Audio Tool"* on page 806.



Audio tab (sample)

Destructive and Non-Destructive

When an incoming audio signal is digitized or saved without any signal-related changes, the procedure is "non-destructive". Modifications such as level changes are recorded separately as parameters and are not used until playback. (See *"Playback Level"* on page 132.) The advantage is that the Media File remains unchanged.
In the destructive procedure, the signal is already modified before being saved to the storage medium. The only way to the original is via the original itself.

Avid Liquid always gives you the option of adjusting all signals in non-destructive mode using the *Playback Level* function. Depending on the product hardware and the signal type, however, the audio input can also be adjusted destructively.

ASIO Drivers

Avid Liquid uses ASIO drivers only for output or playback (*Timeline, Clip Viewer, Source Viewer*). The activity of an ASIO driver is blocked while the *Logging Tool* is open, because some ASIO-compatible sound cards interfere with playback via DirectSound (e.g. Windows Media Player).

Therefore, when you open the *System Settings* from within the *Logging Tool*, you'll find a corresponding entry under *Sound Device > Selected Device*.

If anything seems unclear or if strange errors occur, check which sound card is selected as the default playback device in the Windows sound (multimedia) and audio settings.

Input

These four faders and the associated levels affect or control the incoming audio signal of active *Audio Source Tracks* (product and signal dependent; see overview below).
For a detailed description of operation and information on digital audio (level scales, clipping, headroom, etc.) see the *"Audio Tool"* on page 806.

Level Is Too High

If the amplitude of the input level is clearly too high (and cannot be compensated by adjusting it downward, as far as possible):

- For analog signals:
  Control the input resistance and attenuation at the input
  `Avid Liquid Chrome HD`: *Edit > Control Panel > Site > Calibration Control > Audio Input*.
- For digital signals:
  To adjust these signals, you would have to connect a suitable mixer in series or adjust them at the output of the signal source.

`Avid Liquid Chrome HD`: To adjust input channels 5 to 8 (SDI and AES/EBU), select *Edit > Control Panel > Site > Player Settings* to switch to the corresponding audio input.

Playback Level

The *Playback Level* (volume) is a clip attribute and a non-destructive setting. You can already define the volume level at which the clip should be played back on the *Timeline* when logging/digitizing.

Control the *Playback Level* using the fader on the left side of the tab. The associated level meter (right) is always visible.
It displays up to four audio input signals as narrow yellow bars, as well as the current *Playback Level* as a slightly wider bar with a numeric indicator above it.

Note the following:

- The *Playback Level* applies to all the *Audio Source Tracks* of a clip and to the complete clip (no *key frames*).
- For identification purposes, a small blue star appears in the upper right-hand corner of the *Picon* of clips with a modified *Playback Level* (see also *Object Icons (Picon View)* on page 245).
- The waveform display of audio clips in the *Timeline* and in the *Source Viewer's Waveform Inlay* represents changes made to the clip's *Playback Level*; i.e., a low volume *Playback Level* results in a flattened waveform.
- The level meter on the right remains visible regardless of which tab is in the foreground.
- The *Playback Level* can also be set later on via the extended dialog box in the *Clip Viewer* (*page 263*).
- To deactivate the modified attributes, see the sections on *Attributes*, *"Tab: Special"* on page 285 and *"FX Properties"* on page 286.



Your settings are retained from clip to clip unless a *Reel* change has since been performed and a restoration of values is activated (see *Logging Tool Properties*, *page 134*).

Master Tab

This tab shows an inlay containing the frame on which the *Timeline Playline* is currently positioned. It lets you determine the insert point for the *Direct Insert* function (*Send clips to Timeline;* see next section). Using the mouse, you can scrub directly in the inlay or in the *Timeline/Timecode bar*.
Note: You cannot play the current *Sequence* in this inlay.

`Avid Liquid Chrome HD`: Scrubbing is limited to *Timeline* sections that do not contain realtime effects.



If you scrub the *Timeline* during digitizing (capturing), individual frames may be omitted (not captured to the file). We recommend that you wait until digitizing has been completed before scrubbing the *Timeline*.

Media Tab

WARNING: The Quality Ranks do not affect the image quality of captured video. Your clips will not look better if you raise the Quality Rank, but you may easily experience problems with "disappearing" media files if you use this function. For more information, refer to the High Definition chapter.

- *Quality rank* -
  leave this setting at its *Normal* default unless you have specific reason to change it.
- *CMS/Local* -
  this selection is only for systems configured for *Liquid Editing for Workgroups* or Vortex networks. You can either save captured data to a local storage or via a CMS/MDC (Content Management System/Meta Data Controller) to a network storage location. For local storage, check the *Media Management Settings* (*Edit* > *Control Panel* > *Site...*). Other network-related settings should be left to the network administrator.

Send Clips To Timeline (Direct Insert)



This function allows you to compile a rough cut directly from the *Logging Tool*, either with already captured (digitized) clips, or with logged-only clips. A non-digitized *Sequence* can then be digitized by means of *Batch Digitize* (*page 292*).
This button is either activated (icon highlighted) or not.

1 Click the button repeatedly to toggle between insertion in *Film Style* (yellow icon), insertion in *Overwrite Style* (red icon) and deactivate insertion (see also *Edit Styles* on page 378).

2 To specify the *Tracks* on which the clip should be inserted, activate the *Tracks* you want using the correct *Mapping* (*page 375*).
You can drag all *Track Labels* with the mouse to specify certain destination *Tracks* for certain clip types.

3 Open the *Master* tab and define an insert point
either by means of a mark-in
or at the position of the *Playline* (important: a mark-in has priority over the *Playline* position).
You can also set a mark-out.

4 Start logging/digitizing using any one of the methods described.

5 The clip is inserted on the *Timeline* as soon as it has been completely logged/digitized.
The clip is also stored in the current selected *Rack*.

If you exit the *Logging Tool* while *Send Clips To Timeline is activated*, it is then deactivated.

Properties



This button (upper right-hand corner next to *Rack* drop-down list box) opens the *Properties* menu. Some of the options described below are also relevant for the *Batch Digitize* module.
(The menu also offers direct access to the *System Settings* dialog.)

General Settings

Open/Close/Change Reel Section

Open Select Reel dialog on entering Logging Tool

If this option is activated, the *Select Reel* dialog box (*page 120*) is displayed automatically each time you open the *Logging Tool*.

Stop attached player when Logging Tool is closed

If this option is activated when you close the *Logging Tool,* a stop command is issued to the player.

Start Logging Tool with last selected Rack

If this option is selected, the *Logging Tool* is opened with the last *Rack* selected. This allows you to begin storing logged/digitized clips without making any other selections.

Keep Color Correction/Audio when changing the Reel

This option ensures that *Color Correction* values and the *Playback Level* are retained each time the *Reel* is changed.

Activate TC Shift mode

If this option is activated, the *Select Reel* dialog box contains a timecode field in which you can enter the desired shift.

DEVICE Section

Stop attached player after Open End capture

Stops the player the next time you click *Digitize*, effectively terminating the capture process.

Capture device to Stdby Off if not used

This option reduces wear on the tape and video heads.

CAPTURE Section

Ignore dropped frames for LIVE Capture

The capture process normally aborts when frames are dropped. When active, this option causes any dropped frames to be ignored while the live capture process continues. Bear in mind that inconsistent timecode can make subsequent *Batch Digitize* impossible.

Ignore Timecode embedded in source stream

Most analog to DV converters do not handle TC data. In *Batch Digitize*, this can lead to problems. TC data can, however, also be transmitted over a RS 422 remote connection. To use this data instead of the DV TC, enable this option. With this method, however, frame accurate batch capture cannot be guaranteed. We recommend the use of converters that embed RS 422 TC data in the DV stream.
VITC contained in the video signal is ignored.



If this option is activated, neither the TC break options (see *page 136*) nor *Automatic Scene Detection* based on time/datestamp are available.

Enable RapidCapture (only with RS-422 control)

With this option enabled, the system starts digitizing (capture) the very instance when the servo of the player goes in its "locked" status, that is, when the video signal is stable. It makes no difference whether the player was started manually or controlled by the *Logging Tool*.

Thus, you only need to open the *Logging Tool*, insert a tape in the player, name or select a *Reel*, and click the *Play* button. Capture starts as soon as the video signal is stabilized. This function can also be used in combination with *Automatic Scene Detection*.
There is one additional option:

- *Discard if less than... [frames]*
  Clips which duration would be below the specified limit will not be kept, but discarded. This duration refers to the interval between start of player and stop of player. If this interval is shorter than the entered time, the clip will not be stored.

Set Lead-In for Mark-In during logging

If this option is activated, the mark-in will be shifted ahead (toward start of tape) by the specified value. The player must be in PLAY mode (not fast forward, rewind or shuttle). This primarily serves to compensate for response time delays during "on the fly" logging (*page 140*).

Automation Section

Auto 3pt

(Available only in conjunction with the *Send Clips to Timeline (Direct Insert)* function - see *page 133*.) You do not need to set a mark-out when capturing in the *Logging Tool* but mark-in and mark-out on the *Timeline* are mandatory. *Send Clips to Timeline* must be activated. The *Logging Tool* records the clip for the duration of time period specified by the mark-in and mark-out on the *Timeline*. The clip is then inserted on the *Timeline* (and in the rack).

Use Scene Detection, If Available

See *"Automatic Scene Detection"* on page 145.

TC Break Behaviour (Logging Tool only)

Discontinuous timecode on a player tape can cause problems during digitizing. If the mark-in is set too close to a TC break, this can interfere with the tape deck's preroll; during *Batch Digitize* the correlation of clips and corresponding locations on the tape can be lost.

TC breaks with DV/DVCPro/HDV

The options can also be applied to DV and DVCPro material input via IEEE-1394. However:

TC break detection

- does not work with signals that have gone through a converter,
- does not work if the *Ignore timecode embedded in source stream* option is activated,
- can operate more or less reliably, depending on the device manufacturer and model, but not as precisely as with RS-422 control.

The first two points above also prevent correct *Automatic Scene Detection* based on metadata.



If you use `Avid Liquid` with an RS-422-controlled player, disable the "RefAlarm" function at the player. This is an alarm message indicating a missing reference (Genlock). Because `Avid Liquid` cannot be synchronized with a studio clock, the software error message "Reference missing or bad" is output.



Complete loss of sync (for example, noise between encoded/recorded sections of a tape) can cause the digitizing process to be cancelled. Some players can be set so that at least a stable synchronous signal is always output.
These features work under the assumption of TC "breaks", that is, skipped TC info, while the synch, or burst, signal remains intact.
TC delivered via *LTC In* (analog audio input) does not qualify for these options.

Select one of the following four options (Important: Only in Open End mode, i.e. if no mark-out is set):

- *Create new clip after TC Break* -
  Avid Liquid detects a TC break and stops digitizing in order to continue after the interruption.
  The new mark-in is set so as to take into account a five second preroll time.
  The additional clip is clearly indicated and stored in the current *Rack*.
- *Continue digitize* -
  Digitizing continues. This option is not recommended if the clips will later be digitized by means of *Batch Digitize*.
- *Continue digitize and set TC Break Marker* -
  Digitizing continues; where the timecode was interrupted, red markers are set on the position bar in the *Clip/Source Viewer* and on a *Timeline* clip.



In order to delete a TC break *Marker*, place the *Playline* over the *Marker*, hold the CTRL and SHIFT keys simultaneously and click the *Delete Marker* button.

- *Stop digitize at TC Break* -
  Digitizing is stopped, the system prompts you to either cancel the ongoing process (media and clip will be discarded), or keep the so far digitized clip.

Disk Full State / Change Volume

As soon as the current capture drive (destination volume) becomes filled to a certain limit, the system can automatically change to another volume or drive although not without issuing a warning. In other words, here you can define when the drive is considered "full".

- *Disk considered Full if remaining disk space less than* -
  Enter the amount of disk space (in MB) that should still be available on the capture drive when one the following actions is performed:
- *Full State warning lead time (remaining logging time until full state condition is reached)* -
  If activated, a warning is issued in the video inlay and in the capture drive list box when the disk approaches the *Full State*. You can define when this warning should be issued in terms of the number of seconds remaining before the limit is reached.
  This is a *Logging Tool* feature only.



It is recommended that hard disk storage not be used to the limit of its capacity, i.e. that you set the limit so that at least 20 percent remains. Never set *Disk Full State* to *0* (zero)!

- *Switch to next available free volume after Full has been reached (Batch only)* -
  Avid Liquid checks whether the current clip can be completely digitized within the space remaining on the current storage medium. If not, it immediately changes to the next drive.
  This is a *Batch Digitize* feature which does not work in the *Logging Tool*.



The “next volume” meant here is the next available volume with sufficient storage capacity, not necessarily the one which follows as next in the list.
Drives and volumes are defined in the *Media Management Settings*.
Important: The access rights must be set to *Write* (“*Video Tab/Audio Tab*” on page 333).
Additional changes are possible if the list of drives is sufficiently long.
If *Disc Full State* is ultimately reached (no further volume changes possible or enabled), digitizing stops and the *Digitize* button starts flashing: see *“Full Control Digitize”* on page 142.

Textual Clip Presets

Here you can define the defaults for the text fields (see also *Clip Tab: Naming and Numbering Clips* on page 129). These entries are then permanently defined for each newly created clip and can, for example, be supplemented with automatic numbering. Of course, the default presets can also be deleted from the fields on a case-to-case basis.

Methods

Various methods are available for logging and digitizing that can be selected on the basis of the particular application and as a matter of personal preference.

→ Before logging/digitizing: Checklist *page 139*

→ Logging *page 140*

→ Digitizing *page 142*

→ Stop (All Stop) *page 144*

→ Automatic scene detection *page 145*

→ File ingest *page 147*

Before Logging/Digitizing: Checklist

Before you start logging and/or digitizing, be sure to check the following important settings and options:

- Is the correct source selected (*page 117*)?
- Has a *Reel* been selected/named and a *Rack* found (*page 119*)?
- Has a *Media Format* been selected (*page 125*)?
- Have the correct capture drives (volumes) been specified (*page 127*)?
- Have *Source Tracks* (audio/video) been specified (*page 124*)?
- Has *Mono/Stereo* been defined (*page 125*)?
- Are problems with the timecode to be expected (*page 136*)?



Even while the *Logging Tool* is active, objects in the *Timeline* and in the *Project* remain accessible and can be edited.

Logging



Logging is possible only with material played via a source that can be controlled by Avid Liquid. Signals that are played live can only be *digitized* (and only „open end“).

Logging with a Mark-In/Mark-Out

The most precise method is as follows:

1 Cue up the player to the mark-in point.
See also *“Controls (Player and Edit Buttons, G)”* on page 121.



2 Set the mark-in.



3 Cue up to the mark-out point and set the mark-out.



4 Enter any necessary text in the text fields and click the *Log* button.
This serves to store the logged clip in the selected *Rack* and clear the timecode fields; the *Logging Tool* is then ready for you to define another clip.



All data can be modified until you click the *Log* button.
You can also set a mark-in and mark-out while the player is running. This is known as “on the fly” logging. In order to compensate for response times, you can set a lead-in for the mark-in (*page 134*).
If the *Send Clips To Timeline* function is activated, the clip is also set in the *Timeline*.

Changing mark-ins/mark-outs for logged clips

In the case of a clip that has already been logged and stored in the *Rack*, you can change mark-ins and/or mark-outs after the fact: Drag the clip to the *Logging Tool* inlay. Edit the value in the timecode field or shuttle the player to the desired position, and then click the *Log* function one again. You should also change the *Clip Name*, because the modified clip is stored as a new clip in the *Rack*.

Logging with the Log Button

This variant lets you click one less time when defining clips:



1 Click the *Log* button once to set the mark-in.

2 Click it again to set the mark-out *and* transfer the clip to the *Rack* and, if the *Send Clips To Timeline* function is activated, to the *Timeline* as well.



If either a mark-in or mark-out is already set, or if either a mark-in or a mark-out is set together with a duration, clip definition is already completed the first time you click the *log* button.
You can also set a mark-in and mark-out while the player is running. This is called "on the fly" logging.

Sony ClipLink™



ClipLink™ is a function that transcends the conventional separation of shooting and editing. In conjunction with specific DVCAM players, such as the Sony DSR-60/60P, 80/80P or 85/85P, Avid Liquid generates clips automatically. Thus non-linear editing can start almost instantly. ClipLink™ log data such as the scene number and time code data are recorded into the cassette memory. Index Pictures, which are compressed images taken from the start of each scene are recorded onto the tape. When editing, ClipLink™ log data and index pictures are transferred to Avid Liquid, and clips are automatically created in a Rack.

Avid Liquid also takes over the OK/NG Flag of Clips, which is important for example for the batch digitizing (*page 292*) process.



ClipLink operates only via the DV input (IEEE1394) or in a combination of SDTI/QSDI transfer and an RS-422 connection. For more information, refer to the manuals for your Sony hardware.

Offline Logging

Offline logging occurs when clips are to be defined without players that can be controlled.
The timecode values of mark-in and mark-out points are entered manually. Otherwise the process is the same as logging with a connected player (also see *"Before Logging/Digitizing: Checklist"* on page 139).



If Avid Liquid Media Management finds a Media File that matches the clip data entered, the clip is considered digitized" and can be played immediately. See also *"Matching Clips to Media Files"* on page 326.



To clear all timecode fields (except *Position*), hold the SHIFT-KEY while clicking *Cancel*.

Digitizing (Capture)



In the *Logging Tool*, digitizing is started or terminated by means of the button displayed. Several variants are available.



If you're working with the *Live Player* set on *Custom TC*: Enter the desired start TC value in the *TC field*, start the counter by clicking *Play*. Now the *Digitize* button can be selected.

Full Control Digitize

"Full Control Digitize" means that the system controls digitizing from the mark-in to the mark-out (*Batch Digitize* is always "full control"). The other mode is "open-end" (*page 142*).
In the *Logging Tool,* individual clips can be "full-control digitized".

This happens after you click the *Digitize* button:



- Mark-in and mark-out set:
  The player cues up to the preroll position and changes to "Play". Digitizing starts at the mark-in.
  The message *DIGITIZING* appears in the status field and a progress indicator is displayed in the *Duration* timecode field.
  The digitizing process stops at the mark-out and so does the player. The digitized clip is transferred to the *Rack,* and to the *Timeline* if selected (see *page 133*).



The current process can only be cancelled by clicking the *Cancel* button (*page 144*).



A yellow flashing *Digitize* button indicates changes or additions made in the clip tab during digitizing, or the occurrence of errors. Either click *Stop* to discard the current clip or the *Digitize* button to complete the ongoing operation.

Open End

In this mode, the system has no control over the procedure. The user starts and stops the player and the digitizing process. Digitizing from a live source is always "open-ended":

- Mark-in set:
  The player cues up to the preroll position, changes to "Play" and starts digitizing as of the mark-in.
  The status field contains the message *DIGITIZING.*
  Duration timecode field: Here timing starts as of the mark-in.
  Digitizing stops as soon as you click the *Digitize* button again.
  The digitized clip is transferred to the *Rack,* and to the *Timeline* if selected (*page 133*).
  If you click *Stop*, the so far digitized clip with its corresponding *Media File(s)* are discarded.



- *Start/stop digitizing*:
  Click the *Digitize* button once to start digitizing. Click it again to stop the process and transfer the clip to the *Rack*, and to the *Timeline* if selected (*page 133*).



- If you click *Cancel* the so far digitized clip with its corresponding *Media File(s)* are discarded.

Digitizing affects the pending A/V signals as they are defined in the particular play sources (*page 117*) and as a function of the *Source Tracks* selected (*page 124*). Players (such as CD players) may have to be started and stopped manually.

Creating Subclips

Subclips are components of a higher-level clip (master clip); they all reference the same *Media File*. However, subclips have their own clip-ins and clip-outs.
To a certain extent, the creation of subclips combines the digitizing and logging processes; during digitizing, the mark-in/mark-out points are repeatedly set and clips are repeatedly stored in the *Rack* (and on the *Timeline* if selected, see *page 133*). A lack of material before and after the mark-in/mark-out is no problem because digitizing continues straight through. Each subclip can be expanded up to the size of the master *Media File* (see also *Expand Clip (To Available Media)* on page 422).
Two variants are available:

Using Mark-in and Mark-out

1. Start the digitizing process using one of the methods described above (*page 142*).
2. Set a mark-in and mark-out.
   Until you click *Log* (to transfer the subclip to the *Rack* or to the *Timeline*), the mark-in/mark-out can still be modified.
3. You can repeat the procedure described in #2 as long as the digitizing process is still running.
4. To terminate, click the *Digitize* button again. The master clip is also stored in the *Rack* (optionally on the *Timeline* as well, *page 133*).

Using the Log Button

1. Start the digitizing process using one of the methods described above (*page 142*).
2. Click the *Log* button once to set a mark-in and again to define a mark-out and insert the subclip in the *Rack* and on the *Timeline*.
3. You can repeat the procedure described in #2 as long as the digitizing process is still running.
4. To terminate, click the *Digitize* button again. The master clip is also stored in the *Rack*.



A flashing *Subclip* symbol indicates the active subclip mode. This is also to remind you that any text inputs are going to be stored with the next subclip defined.

(Re-)Digitizing Individual Clips

You can transfer a clip directly from a *Rack* to the video inlay in the *Logging Tool* using drag & drop. The clip data appears in the timecode fields.

- A new clip and a new Media File are generated in a subsequent digitizing operation. The original clip data and media data is retained.
- If you want clip and the media data overwritten, use the *Batch Digitize* function (*page 292*).

Batch Digitize

Batch Digitize permits the automatic digitizing of clips that have already been logged. The system controls the player. For more information, see *"Batch Digitize (Batch Capture)"* on page 292.

Cancel



Click this button to cancel digitizing. No Media File is created and no clip is stored in the *Rack*. The player is stopped.

To clear all timecode fields (except *Position*), hold the SHIFT-KEY while clicking *Cancel*.

Automatic Scene Detection

Automatic Scene Detection saves you the trouble of manually dividing up your material into individual clips.
This function is available only when digitizing via the DV input using i.Link (IEEE 1394) (not when logging and not via analog inputs, if any are available).

To activate this function, select [*Edit* > *Control Panel* > *User* >] *Logging Tool* > *Properties* > *General* and then *Use scene detection if available*.

Here's how it works:

1 Activate *Scene Detection* (the options are described below). Select the usual *Logging Tool* settings (*Rack, AV* sources, clip numbering, etc.).



2 Confirm your selection and exit *Properties*. Start tape playback and click *Digitize*. Although you cannot see it initially, the system marks each new scene.

3 Let the tape run until it reaches the desired exit point, click *Digitize* once again and stop the tape. Or you can edit an area between a mark-in and mark-out.

4 The scenes detected are stored as clips in the selected *Rack* and also, if *Direct Insert* (*page 133*) was activated, on the *Timeline*.



In the case of tapes with a large number of timecode jumps or breaks, you should play the tape *live* (see also *Live Input* on page 117). Scene detection continues to operate, although later on you will not be able to re-digitize the clips created using *Batch Digitize* because there is no tape TC information. A copy of the tape can help but not all device manufacturers support the transfer or recording of the timestamp data (*page 145*) necessary for scene detection.

Options and Background Information

- *Use scene detection if available* -
  Automatic Scene Detection evaluates the DV data. This data can be provided with a "timestamp": Every time you press the record button on your camcorder, the camera's system time and the date are recorded along with the timecode, thereby identifying the beginning of the scene. However, not all cameras record the timestamp so check the operating instructions. If your camera does not offer this function, you still have the option of using scene detection based on video content (*page 309*).
  The timestamp data is transferred via the i.Link (IEEE) interface, which is why you cannot use *Scene Detection* with analog inputs.

- *Create Subclips* -
  Selecting this option results in one master clip that is as long as the overall digitizing process plus a number of *Subclips* corresponding to the number that *Scene Detection* was able to identify.
  You can trim a *Subclip* up to the length of the master clip, thus making it unnecessary to enter a *Handle Length*. If you view a series of *Subclips* in the *Project* window (in *Detail View*!), you will note that they all have the same clip-in and clip-out. (See also *"Clip-In/Clip-Out and Mark-In/Mark-Out"* on page 112.)



If you select *Create Subclips*, the entire media file (one full-length file) will be captured when you subsequently perform a *Batch Digitize* operation.

- *Create Master with inside handle length* -
  This option generates master clips only, meaning clips with individual clip-in and clip-out data.
  You can enter a *Handle Length* (see below).
  Important: You can also trim these master clips to the total available length of their shared *Media File* but only by using the *Expand Clip(s)* function (*page 276*).



Use *Create Master* if you want to re-batch the clips later on using *Batch Digitize*; you will then obtain one *Media File* for each clip.

- *Handle length* -
  The clip-in is set at the point where the scene changes (according to the timestamp) and is followed by a mark-in. The "distance" between clip-in and mark-in corresponds to the *Handle Length* entered. The same distance exists between the mark-out and the subsequent clip-out defined by the end of the scene.



For both *Subclips* and master clips: If you're using *Automatic Scene Detection*, be extremely careful when deleting clips along with the *Media File*. You need to take into account that a very large number of clips is attached to the same *Media File*.

File Ingest

File Ingest makes it possible to capture material particularly for the use in a networked environment. While the capture process continues, an editor working on a separate Avid Liquid editing station can already use the media data. Every single frame becomes available the moment it is created.

Click Avid Liquid Star t menu > *Tools* > *File Ingest* to open the dialog.

File Ingest has no video inlay and no audio levels. Important: Specify the endpoint of the ingest process by entering a clip duration.
Media files created with *File Ingest* are not suitable for a subsequent *Batch Digitize*. They have to be imported in the *Project*. Avid Liquid Media Management can only register this data after is has been imported in the *Project*.

The material used for *File Ingest* must carry a consistent and intact synch signal (no “noise” on tape!). If there are TC breaks you may consider using the *Live* input in combination with *System TC*. Otherwise the ingest process will be aborted.



File Ingest

Step by Step

Some of the *File Ingest* functions you may already know from the *Logging Tool*.

1 Open *File Ingest* and select a source from the list in the upper left corner. A remote controlled source (e.g. a video recorder) can be cued to the desired starting point on the tape. However, note that *File Ingest* is basically a *Live* capture because the system determines neither the player's starting point nor its stopping point.

2 Define all *Source Tracks* (video, audio, stereo or mono).

3 The *Reel* name defaults to the current date, which is also inserted when you click the Plus sign. You may enter a different name.

4 Enter any clip name you like.

5 Now enter the *Capture Duration*. This is mandatory, even if you want to cancel the ingest process before the end of the duration.

6 *Destination*: Select the location where the media data should be saved.

7 Now select the *Media Format* (Codec, capture format). Consider the compatibility of playback formats used in all networked edit stations. For Vortex, it must be DV(avi).

8 *Create clip in active rack* causes the clip to be placed in the *Rack* currently selected in the *Project*. This lets you skip the import procedure described below.



Every file created with *File Ingest* gets a path/file name which is a combination of the individually selected clip name, the media format suffix and the directory path to where it is being saved. Examples: *X:\cpr\TEST1.AVI* or *W:\rsz\INGEST001.M2V*



9 Start the ingest process by clicking the *Digitize* button. A progress bar keeps you up to date.

Import and Editing

All clips created with *File Ingest* can only be imported to a *Project* (except when you are using Vortex - see the Vortex manual).

Important: for immediate playback on your system the imported files must conform to one of the valid playback formats of the your system. Otherwise the media files need to be rendered before playback.

1 If necessary, create a new *Rack* in the *Project*.
Open the *Rack* shortcut menu and select I*mport > Media Clip.*

2 Browse to the storage location.

3 In the case of A-V clips it suffices to click the video file(s) (CTRL+click). The corresponding audio file will be imported as well.

4 If the clips are already completely captured when they are imported, they are available in full length.

5 If the ingest process is still running while you import, the available length can frequently be updated.
The clip is loaded in the *Clip Viewer* or *Source Viewer* with its momentary length. You can extend the clip-out until the final clip length is reached.

Once an ingested clip has been imported in the *Project* it is recognized by Media Management (provided the media directory was added to the list of *Media Volumes* in *Media Management Settings*). *Batch Digitize*, however, is still not possible.

Importing Objects

The *Import* function lets you integrate objects in Avid Liquid *Projects* such as video files, audio files, graphics files, titles, subtitles, crawls, test images, etc.
Import involves either creating a shortcut (link) to the object's storage location (diskette, hard disk, network, CD-ROM, etc.) or saving the file (optionally as a copy) in a *Media Directory* of the current *Project*. In either case, a clip is stored in a *Rack*.

Import - where from, where to? *page 151*

What can be imported? *page 152*

Import media clips *page 154*

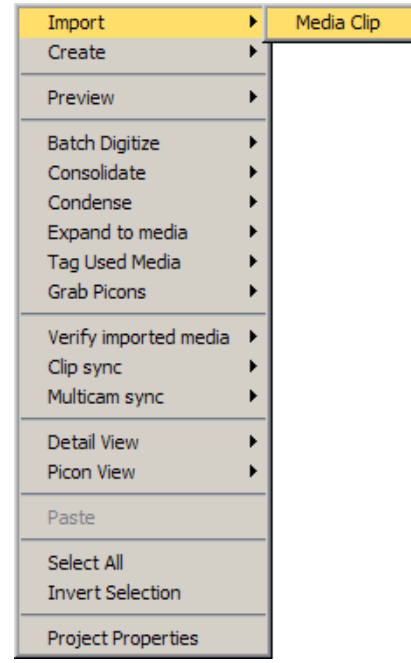
Image import (Global Settings) *page 157*

Import - Where from, Where to?

The destination of an import operation is always a *Rack*. This is where the imported clip(s) are stored. Open the shortcut menu for the *Rack* that you want as your import destination and select *Import*. A submenu is displayed:

- *Media Clip* (stills, animations, audio, video, etc.)
- *Vortex Media Clip* (only in systems connected to Vortex)

The sources for the import are determined by your system; from a diskette or from a network drive, anything that the operating system can find can be addressed.



Rack shortcut menu with Import submenu

What Can Be Imported?

The *Import Media* dialog box, which contains the same basic components as a typical Windows dialog box, indicates the file formats that Avid Liquid can use. Click the *Files of type list* box to display a list of compatible file formats.



You may have to convert a file to a compatible format before importing it.
Avid Liquid converts some external formats after import and prior to first playback respectively, automatically to one of or the valid internal file format (video: depending on hardware; audio: always PCM WAV). Some formats, such as Windows Media 9 or DivX can be played from the *Timeline* without prior conversion.

Preview/Prelisten

In the Import dialog box, you can right-click a file and, for example, open the Windows Media Player if the file is linked to this player. This allows you to have a quick preview/prelisten of video and audio files before the files are imported.

Video File Formats:

- *.dif, *.dv, *.dvsd (DV, DVC & variants)
- *.m2v (MPEG2 I-frame)
- *.yuv, *.2yuv (uncompressed, SD and HD)
- *.avi
- *.mov (QuickTime)
- *.dvd (Sony specific DV)
- *.mxf (AV and metadata conforming to the MXF Exchange Format; MXF is not exclusively a video format, contains meta data as well and can even be AV multiplex)
- *.wmv (Windows Media Video)
- *.mpeg, *.mpg, *.m1v, *.vob, *.ts, *.tsp, *.m2t, *.mp2, *.mp4, *.m4v (MPEG1/2/4 files)
- *.dvr-ms (Windows Media Center recorded TV)
- *.asf (Advanced Streaming Format)
- *.3gp, *.3g2 (video for cell phones)
- *.dtl (background graphics for Title Deko menu)
- *.alp (video alpha plane)



DV-AVI files created with Adobe Premiere or DV Tools may be imported in Avid Liquid as well. Audio integrated in AVI files will be extracted and split on import.
AVI files to be used with Premiere are best created with the *Fuse Sequence* function (*page 959*).

Audio File Formats:

- *.wav (PCM uncompressed)
- *.mpa, *.mp3 (MPEG-1 Layer 2 Audio)
- *.m4a (MPEG-4-Audio)
- *.wma (Windows Media Audio)
- *.ac3

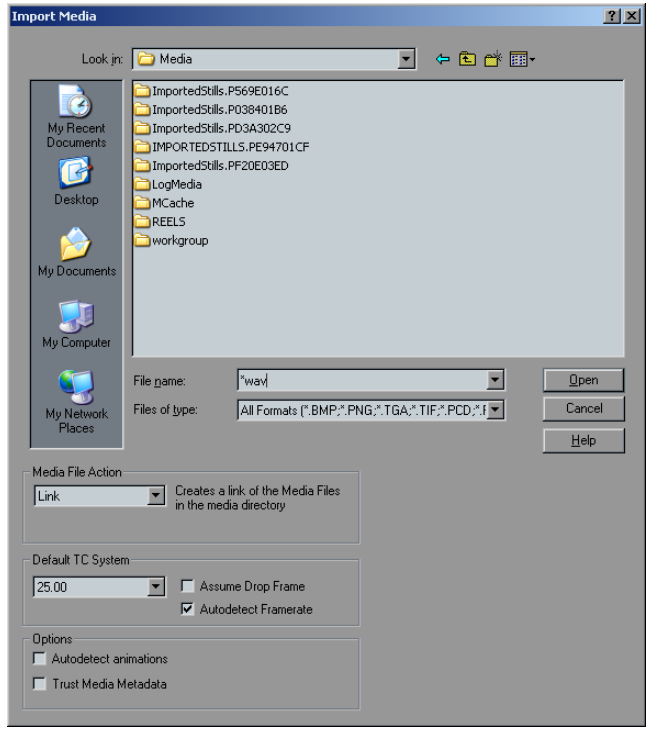
Valid audio sample rates for import are: 11025 Hz, 22050 Hz, 32000 Hz, 44100 Hz, 48000 Hz. Sample rates in between can not be imported.

Graphics (Image) File Formats:

- *.bmp, *.png, *.tga, *.tif, *.pcd, *.psd, *.pcx, *.bsi, *.jpg, *. wmf, *.tdk (TitleDeko)
  (Note: except TIFF lzw-compressed)

Importing Media Clips

From the *Rack* shortcut menu select *Import* > *Media Clip* to import objects to a *Rack*, or go via *File* > *Import* > *Media*.



Import Media dialog box

Instructions for Importing Images and Titles in the 16:9 or 4:3 Format

If you work in 16:9 mode: To avoid undesirable distortions, imported Media Files that have been produced with graphics programs or title generators must also be generated using the 16:9 aspect ratio.

Use the current or intended *Timeline* resolution as a guideline to determine the exact pixel by pixel resolution and aspect ratio needed for correctly dimensioned import graphics. Check *Timeline Properties* or the *New Sequence* dialog.

Clip Metadata

Metadata is additional information on clips that is generated and imported during logging, including:

- Clip-in/clip-out
- *Reel* name
- Clip name, if any.

This applies to Avid Liquid Version 2.55 and higher and to clips that were created in Avid Liquid. The metadata is displayed in the *Rack* in *Detail View* (list). These clips can also be digitized by means of *Batch Digitize*. See also *"Metadata"* on page 314.



Clips that were generated with *EZ Capture* have no metadata in the sense described here and cannot be digitized by means of *Batch Digitize*!

Selecting Files

Import > Media Clip can also be used for loading several objects at once. This is useful, for example, if you want to integrate several video clips from a removable hard disk or individual animation pictures in your *Project*. One way to do this is to select the required object(s) using a CTRL+click or SHIFT+click. Another way is to drag a frame around the objects or to enter a name, using a joker (?) or wildcard (*) in the *File Name* field. Click *Open*. A preliminary list which meets the criteria specified in the *File Name* field appears. From this list select the objects you require. Click *Open* again.



Images and still titles in themselves have no "length" (i.e. no true TC-in to TC-out). As clips in the Project, they are allocated the duration that was assigned in the global image import settings (default is three seconds). See also *"Image Import (Global Settings)"* on page 157.

Copying/Moving Files and Creating Shortcuts

The *Media File Action* list box in the *Import Media* dialog box defines the media import more closely. You can

- *Copy* the selected file(s) to a *Project* media directory (original stays in its position),
- *Move* the selected file(s) to a *Project* media directory (original removed from its position),

or

- Create a shortcut (*Link*) (original stays in its position).

For the *Copy* and *Move* options, the *Project Media Directory* in which the files are saved depends on the file type and the Media Management settings (see also *Project Media Directories: Where Are the Files Stored?* on page 324).
Linked files remain in their storage location.

Default TC System

Autodetect Framerate should be enabled here. The two other options are only needed in such cases where the automatic mode does not return the desired results, or when you want to force a conversion.

- *Default TC System* -
  Select the frame rate that matches the video object you want to import. All values here are fps, frames per second.
- *Assume Drop Frame* -
  Enable this option when the selected *TC System* is of the drop frame type.
- *Autodetect Frame Rate* -
  lets the system do the job of identifying the source material frame rate. Should be enabled in most cases.

See also *"Timecode Systems"* on page 84.

Options

Automatic Detection of Animations

The individual files of an animation are detected as such and loaded as a clip if their file names contain a sequence number (such as Anima001, Anima002, etc.). The system automatically converts imported animations to a playable format.
Click the file with the lowest sequence number. The associated files are loaded automatically (make sure all relevant files are in one directory).

Image Import (Global Settings)



In the *Image Import Properties* dialog box, you can define parameters for importing graphics files, such as the default duration of a graphics clip on the *Timeline*. Be be sure to check these settings carefully when you load a large number of files. These settings may be found in *Edit* > *Control Panel* > *User* > *Image Import*.

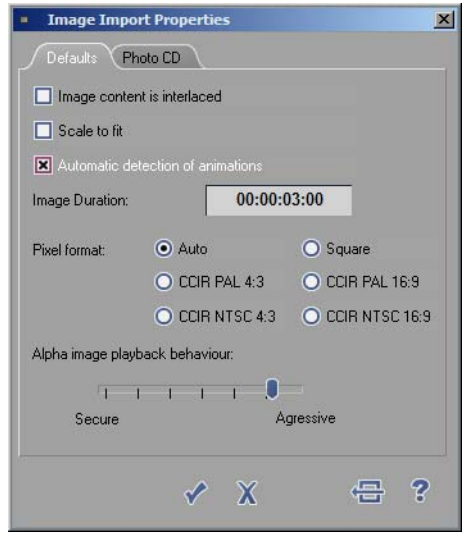


Image Import (global settings)

Image content is interlaced

An image is interlaced when it comprises two fields whose lines alternate in an interlaced pattern. This is the case with most video images. In Avid Liquid, this information is important for effect rendering. If the imported images are some type of animations in interlace mode, activate this checkbox.

Scale to fit

Activate this option if you want to adapt the imported images to the selected TV format. Depending on their original size, however, this may result in varying degrees of distortion.

Automatic detection of animations

Activate this option if you want Avid Liquid to detect the individual frames in an animation automatically. The software looks for file names that are consecutively numbered in ascending order (for example, "Image001.tif to Image099.tif").

Image Duration

Use this option to preset the length of a graphics clip on the *Timeline*. The default is three seconds.

Pixel format

Auto means that Avid Liquid automatically attempts to identify the format of the pixels that form the image; *Square, CCIR 4:3* or *CCIR 16:9* tells Avid Liquid to handle the pixels in accordance with the TV format configured for the system.
Note: This has no effect on the pixel format.

Alpha image playback behavior

This option is meaningful only if you run into alpha-channel problems when playing consecutive clips. These clips are usually played back in real time. Nevertheless, problems may result from a very large number of very short clips.
The closer you position the slider to the *Secure* end, the earlier Avid Liquid starts to render these clips in order to permit a correct playback. If you position the slider all the way to the left (*Secure end*), to be on the safe side Avid Liquid renders every clip that is longer than about a second with the alpha channel. At the *Aggressive* end (slider all the way to the right), there is no rendering; Avid Liquid attempts real-time playback at all times.

Photo CD

On this tab, you can define the resolution to be used for loading images in the photo CD format. (This setting may differ from the image format on the photo CD; in some cases, the photo CD may not support all the available formats.)

Copying/Pasting Objects from Other Projects

Another method for inserting objects in a *Project* is to copy and paste them using the Windows method: Open a *Project*, select one or more objects (for example using CTRL+click or SHIFT+click), copy the objects by pressing CTRL-C (or by selecting *Copy* from the shortcut menu), exit the *Project* and open the destination *Project*. Go to the desired location (*Rack*, desktop, *Timeline*) and paste the object(s) by selecting the *Paste* option from the shortcut menu or pressing CTRL-V.

Objects inserted in this way retain their links to their own Media Files. This means, for example, that you can continue to play a video clip.

→ It's even easier if the *Project* from which you want to copy objects is opened from the *Project Browser*. See *"Working With Two Projects Simultaneously"* on page 208.

For instructions on inserting objects on the *Timeline,* see *page 412*.



To transfer objects simultaneously from different *Racks*, first move/copy them to a "collective *Rack*". Then select them all by means of CTRL-A and copy them with CTRL-C. Or else you can copy the *Rack* with all its contents.

Media Management and Object Import

You can also integrate objects in a *Project* using Avid Liquid Media Management functions (*page 313*). Media Management primarily serves to access Media Files; if necessary, however, you can generate objects from these files. See also *"Media Files: Functions"* on page 330.

Creating Objects

This section describes objects that you can create within Avid Liquid (i.e. without exiting the program). It covers the following topics:

Create color clip

Create monochrome or color gradient backgrounds *page 162*.

Generate signal clip (reference level tones)

Using the internal signal generator *page 164*

Create title

Generate still, roll and crawl titles using the integrated titler *page 881*

Produce customized effects

... using the Avid Liquid effect editors *page 501*

Voice-over

Record live comments “onto” the image *page 861*

Creating a Color Clip

The *Create* > *Color Clip* function (in the *Rack* shortcut menu) allows you to define color clips (for example, for a title background). In the *Color Clip* dialog box that is displayed when you select this option, you can set the parameters for monochrome clips as well as linear and circular gradients.

Monochrome or Color Gradient

From the list box, select:

- *Single color* (monochrome background)
- *Linear gradient* (two colors, straight transition)
- *Circular gradient* (two colors, circular transition)

Selecting Color(s)

Click *1st Color* (for a *gradient,* also click *2nd Color*) to open the *Color Picker*, then select the color(s) you want to use.

The Color Picker

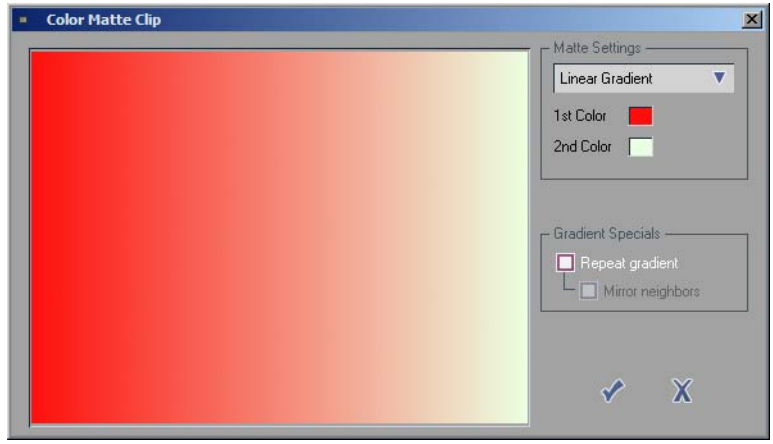
The *Color Picker* provides five different methods for defining a color. A preview of the resulting color is displayed in the color boxes (*1st Color* or *2nd Color*).

- *HLS color model* -
  Drag the marker in the three horizontal bars (one for hue (*H*), one for saturation (*S*) and one for luminance (*L*)).
- *RGB color model* -
  The combination display/entry field below the HLS bars describes a color in the RGB (red-green-blue) model. Each value can be from 0 to 255. 0’0’0 is black, 255’255’255 is white and 0’255’0 is pure green.
  For an exact reproduction of a color value with known coordinates, click the field and enter the numbers via the keyboard.
- *Color hexagon* -
  Drag the cross-hair pointer to the desired color.
- *Color scale*
  - A selection of hues. Click the appropriate box.
- *Pipette (Color Picker)* -
  The *Pipette* “sips” a color from any location on the desktop. Click the *Pipette* icon, drag it to the desired location and release the mouse button. The color value is taken from the exact tip of the *Pipette*.

Edit Gradient

The direction and density of linear and circular gradients can be changed as follows:

- Click left in the preview window and create a line with your mouse. The gradient depends on the alignment and length of this line.
- For linear gradients: Use *Gradient Settings* to repeat the pattern you created and to mirror adjacent areas.



Color Matte Clip

Generating a Signal Clip (Reference Level Tones)

Avid Liquid has an internal audio signal generator that allows you to generate individual signal tones:

1 Open the shortcut menu in any *Rack* and select the *Create* > *Signal Clip* option. A clip with the audio (loudspeaker) icon is stored in the *Rack*.

2 From the shortcut menu of the signal clip generated, open the clip *Properties*. You can now set the following on the *Signal* tab:

3 *Waveform* -
Select either *Sine, Sawtooth, Rectangle, Triangle* or *Silence* as the type. Level tones are typically sinusoidal.

4 *Frequency* -
Set the slider to the desired value (from 100 Hertz to 10 kHz).

5 *Volume* -
Select *0, -9, -12, -18 or -27 dB.*

6 On the *General* tab, name the clip so that it will be easier to identify in the *Project* later on.



The preset reference tones contained in earlier versions of Avid Liquid are replaced by this new, more flexible function.
No media data exists for a signal clip. The internal signal generator generates the signal. For the same reason there is no waveform display of a signal clip.

Creating Titles

You can create still, roll and crawl titles with the titler integrated in Avid Liquid. When you close the titler, the objects produced are automatically exported to the *Rack* that was last activated.

For more information on the titler, see the separate chapter (see *page 881*).

Producing Customized Effects

Effects are also among the objects that you can create in Avid Liquid. Using the *Effect Editors* (e.g. *2D Editor* or *Keying Editor*), you can define customized effects that can be stored as objects in the *Rack*.

Also see *"Effect Editors (Basics)"* on page 510.

Voice-Over

Voice-over permits a live audio recording to be synchronized onto the image (for example, in order to record a comment) by inserting an audio clip on the *Timeline*.

For more information on this function, see "*Voice-Over*" on page 861.

Importing EDL/AVID MediaLog Files

For more information on this topic, see the section on "*Exporting/importing EDLs*" on page 183.

Chapter 7

Exchange

make manage move | media™ Avid®

This chapter describes the functions for exchanging a wide variety of data in many formats between systems and applications.
This chapter also describes the integration of Avid Liquid in simple networks.

For information on functions that deal exclusively with output, such as *Record to Tape*, burn DVDs and export files in different formats, see the „Export“ chapter.

XML/ALE/XCE export and import

Interface to Project and media data exchange *page 169*

Create a shot list or batch list

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XSend to...

Send clips and media files to external applications such as Commotion, or Adobe AfterEffects *page 175*

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Export/Import EDLs/ AVID MediaLog files

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Store Projects and media on a network, retrieve data from network *page 192*

OMFI Export

The gateway to exchanging data with postproduction systems: *O*pen *M*edia *F*ramework *I*nterchange *page 200*

XML/ALE/XCE Import and Export

Avid Liquid offers a standard interface to exchange *Project* data in the XML and ALE formats. Clip metadata can be exchanged using the ClipExchange (XCE) format.

You can find these functions in *File* > *Import*> (or *Export to File* >) *XML/ALE...*



Although these files also have the extension *.ale, Avid MediaLog import is not the same procedure as importing ALE *Project*s; see *"Reading in Avid Media Log Logging Lists"* on page 189.
ALE export or import is not possible with HD based material (clips, *Sequences*).



ALE Export can be used to create shot lists or batch lists from a *Project* or certain *Racks* of a *Project* (see *"Use ALE Export to Create Shotlists and Batchlists"* on page 172).

Information about ALE, XML and XCE

Avid Liquid has always employed a special ALE format to exchange *Project* data including their corresponding media data. Nowadays ALE, which was developed as a simple logging data exchange format, is no longer sufficient to enable up-to-date and efficient data exchange. Therefore Avid Liquid supports, besides legacy ALE, a new XML-based *Project* data exchange format.
Export and import of individual clips is handled by means of XCE, *ClipExchange*. Both file types, XML and XCE can be opened and viewed in a simple text editor or internet browser (append the XML suffix to an XCE file: like in *clipexport.xce.xml*). The format standard specifications are available on request from Avid Technology, Inc. (please contact Support).

Import Project (XML or ALE)

All available data from the ALE file or XML file will be transferred to the current Avid Liquid *Project*, including the file paths of corresponding media files.
Select menu bar > *File* > *Import* > *etc.*

XML import does not copy any media files. To work with existing media files, the importing system needs to be set to recognize the location of these files.

Go to *Media Management Settings* and add the drive or folder path where the relevant files are stored to the list of *Media Volumes* (*Edit* > *Control Panel* > *Site*). If the *Media Volume* is already on the list, the system automatically establishes the links between clips and media files. All clips can be played instantly.

Depending on what exactly you are currently importing, there may be additional options. If these options can not be selected, they are not available in the current operation.

Media File Action

(Not with XML import.) Here you can select how the Media Files of the ALE *Project* should be handled. This function copies the Media Files referenced by the imported clips to the primary destination drive in the local system as defined in the *Media Management Settings* (*page 332*).

As a variant, however, you can also limit yourself to creating shortcuts (links) to the Media File storage location.

Further options

- *Treat audio as mono* -
  interprets audio files on import as being the mono type (even if they‘re not)
- *Size Media File(s) to Mark-In/Mark-Out* -
  Only the range of associated Media Files defined by the clip is copied/moved to the destination drive.
  Also, a *Handle Length* to be added to mark-in and mark-out may be specified.
- *Import clips into active Rack of main Project window* -
  (not in the currently active *Rack* of *Project Browser*).

Export Project (XML or ALE)

Enter the name and path of the file and select the desired format, ALE (*. ale) or XML (*.xml).
Select menu bar > *File* > *Export to File* >...

All available clip data (as can be displayed in a *Rack's Detail View* mode) will exported in the ALE or XML file. The file paths of all media files will be included.



This function does not export media data.

Choose one of the following options:

- *Export entire Project* -
  and that's exactly what it does.
- *Export selected Rack on Project Clips Tab* -
  will only export the contents of the selected *Rack* (only one *Rack* can be selected).
- *Export selected Clip(s) on Project Clips Tab* -
  exports one or several selected clip(s) in a *Rack.*

Import/Export Clips (ClipExchange, XCE)

These functions are designed to transfer XCE-formatted clip metadata plus their corresponding media files between systems. The structure of a *Project* (folders, *Racks*) is not touched by this type of export. Only clips are exported and, on import, put in a Folder which contains one or more *Racks*. All clips will be sorted by *Reel* name, meaning that all clips coming out of the same *Reel* will end up in the same *Rack*.

When you import XCE data a dialog box opens and prompts you to enter a storage location for the files. You can indicate a location. If you don't, clips will be imported without their corresponding media files. You can later establish the links between clips and media, using the *Verifyimported Media* function (*Rack* shortcut menu).

Use ALE Export to Create Shotlists and Batchlists

A shotlist (also known as logging list or batch list) contains the most important information about the clips of a project. This information is also called metadata and presented in a way similar to that of an EDL (Edit Decision List). Metadata comprise clip name, *Reel* name, mark in and mark out, comments, and other info.

Shot lists and logging lists can be exchanged between different editing systems. They may also serves to archive *Project* contents.

ALE list elements

What‘s mandatory, what‘s optional *page 172*

Working with ALE lists

How to create a logging list or batch list *page 174*

ALE List Elements

The following image shows an ALE list which was exported from Avid Liquid (see *page 171* for details on ALE export) and imported in a spreadsheet program:

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Heading													
FIELD_DELIM	TABS												
VIDEO_FORMAT	PAL												
AUDIO_FORMAT	48 KHz												
FPS	25												
Column													
Name	Tracks	Start	End	Tape	Duration	Mark IN	Mark OUT	Scene	Take	Comments	Mediapath		
Data													
Clip	VA1A2	00:21:19:12	00:21:31:02	REEL	00:00:11:15	00:21:20:12	00:21:30:19			dies ist der e	C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip	VA1A2	00:21:31:04	00:21:39:21	REEL	00:00:08:17	00:21:31:04	00:21:39:21				C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip	VA1A2	00:22:31:14	00:23:41:23	REEL	00:01:10:09	00:22:31:14	00:23:41:23	sg		letzter clip	C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 1]	VA1A2	00:22:31:14	00:22:52:08	REEL	00:00:20:19	00:22:31:19	00:22:52:03				C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 2] mit l	VA1A2	00:22:52:08	00:22:57:24	REEL	00:00:05:16	00:22:52:13	00:22:57:19			der frisuer fris	C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 3]	VA1A2	00:22:57:24	00:23:03:20	REEL	00:00:05:21	00:22:58:04	00:23:03:15				C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 4]	VA1A2	00:23:03:20	00:23:12:14	REEL	00:00:08:19	00:23:04:00	00:23:12:09			kein kommen	C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 5]	VA1A2	00:23:12:14	00:23:16:17	REEL	00:00:04:03	00:23:12:19	00:23:16:12				C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 6]	VA1A2	00:23:16:17	00:23:28:01	REEL	00:00:11:09	00:23:16:22	00:23:27:21				C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 7]	VA1A2	00:23:28:01	00:23:39:08	REEL	00:00:11:07	00:23:28:06	00:23:39:03			nur ein kurze	C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip [Scene 8]	VA1A2	00:23:39:08	00:23:41:23	REEL	00:00:02:15	00:23:39:13	00:23:41:18	gut		vorletzter clip	C:\FS_MEDIA_AV/Reels/REEL P7568018A/002		
Clip	VA1A2	12:40:23:02	12:40:49:15	REEL	00:00:26:13	12:40:23:02	12:40:49:15	1	5	und hier der z	C:\FS_MEDIA_AV/Reels/REEL P7568018A/124		

ALE shotlist representing a Racks‘s content

The elements of the lists will be explained in the following paragraphs.

Global Headings

The basic attributes of a *Project* are defined as “Global Headings”. The must appear at the top of the ALE list, and exactly the way shown in the image above, including the entry “Headings”.

- FIELD_DELIM means that all list column entries are separated by Tab stops. This is important when the ALE list is imported in a spreadsheet software.
- VIDEO_FORMAT can either be PAL or NTSC.
- AUDIO_FORMAT: 22, 24, 44 or 48 kHz.
- FPS means frames per second: NTSC 29.97, PAL 25.

Column Headings

Every column in the list has a certain Column Heading. The word “Column” precedes the row (line) of column headings. ALE specifications allow for a great number of column headings, some of which are mandatory, but much more are optional.

- *Name* (mandatory) is the name of the clip or objects (maximum 32 characters length)
- *Tracks* (mandatory) describes the video and audio tracks of the source.
- *Start* and *End* (both mandatory) refer to the clip-in and clip-out of the clip’s media file.
- *Tape* (mandatory) defines the tape or, more generally, the source (named *Reel* in Avid Liquid).
- *Duration* is the clip length between *Start* and *End*.
- *Mark IN* and *Mark OUT* (not the same as *Start* and *End*, but In and Out of the actual clip).
- *Scene, Take, Comments* are optional fields which can be filled in the *Logging Tool* while logging or in a clip’s *Properties* at any time.
- *Mediapath* is a Avid Liquid ALE specialty. Here the exact storage location of a clip’s media file is given.

Working With ALE Lists

An ALE list is a text file with no formatting. It can be viewed in a simple text editor, but also in a full-blown word processor. Because of its table-like structure it is best edited in a spreadsheet software such as Microsoft Excel.
Let's use a logging list as an example to outline the procedure. You, the editor, want to provide your client with a list of all logged clips and other objects in the *Project*.

1. Since ALE Export scans all *Racks* of a *Project* from top to bottom, it may be a good idea to check the order of *Racks* and objects within the *Racks* before the export is started.
2. Select Avid Liquid *File* > *Export to File* > *XML/ALE...*
3. The whole *Project* or just a the content of a single *Rack*? Click the appropriate checkbox and select a directory.
4. Click *Save*; the export begins.
   Sequences and effects are not exported.
5. Load the ALE file in your spreadsheet software. Depending on the product it may be necessary to change the file suffix to *.txt.
6. You can import the *.ale file directly in Microsoft Excel. A conversions routine starts automatically. Make sure that tabs are used as delimiters.
7. Now you have all the possibilities of the spreadsheet software.
   You can sort by *Tape* name to line up all clips of a certain tape, you can delete columns you don't need, or you can move the *Comment* column next to the *Name* column.
   This list can be printed.

Using the ALE as a Batch List

ALE are very versatile lists. They can easily be converted. To convert an ALE to a Batch List, which can be loaded in FinalCut Pro, for example, it suffices to rename some of the column headings and to insert two additional. The exact required format is documented in the manuals of the applications.

One thing you should not forget after having edited the list in a spreadsheet or word processor: Save the list as text file with no application-specific formatting and, if required, change the file suffix to whatever the importing application needs.

XSend To...

The *XSend To...* function allows you to transfer clips, *Containers* and *Sequences* quickly and directly from Avid Liquid to QuickTime-compatible applications such as Commotion 4.1 and Adobe AfterEffects for further processing or to an encoding application such as MediaStream for streaming.
Avid Liquid currently features predefined interfaces to Adobe AfterEffects, Windows Media and QuickTime. You can also use *XSend To...* to connect "plug-in" applications and enhance the functionality. In the current version, this has already been implemented for Adobe AfterEffects. An SDK is available on request from Avid Technology, Inc.

Objects permitted for the XSend To... function *page 175*

Calling XSend To... *page 176*

XSend To... options *page 178*

Objects permitted for the XSend To... function

With *XSend To...*, you can send single clips (both from the *Project* and from the *Timeline*), multiple clips, a complete *Sequence*, and *Containers* to an application. *Transitions* (such as *Dissolves* and *Cross Fades*) and clip effects are not considered to be objects. Optionally, however, you can use the *Fuse* function to transfer a particular effect (i.e., as a rendered *Media File*).

Calling XSend To...

You will find this function in the shortcut menu for clips and *Sequences* in the *Project* and in the shortcut menu for clips on the *Timeline*. If you have selected multiple clips, you can call *XSend To...* from the shortcut menu for any of the clips selected. From the submenu displayed, you can then select the application to which you want to send the material. If you wish to transfer a *Sequence*, go to the *Project* window and call the function from the shortcut menu for this *Sequence*.

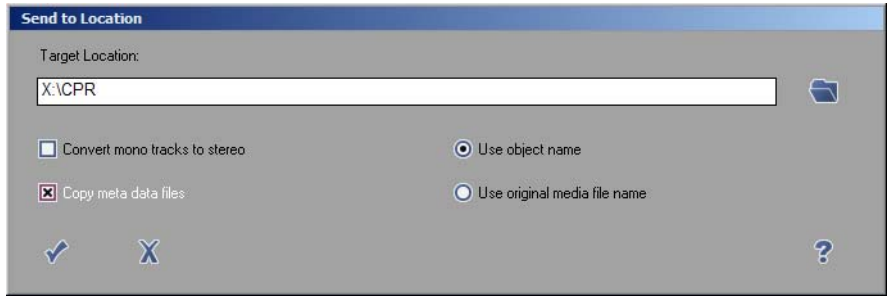
Calling XSend/XReceive via the Keyboard

You can also call the individual *XReceive* and *XSend* modules via the keyboard. To find this option, select *Edit* > *Control Panel* > *User* > *Keyboard*. On the upper left, select *Global Shortcuts* and *Global Shortcuts active* (checkmark visible), and then select the *Desktop* option in the upper right. The entries *XSend 1* to *6* and *XReceive1* to *6* appear below in the same order as they appear in the *XReceive* and *XSend* menus; for example, *XSend1* = QuickTime Player, *XSend2* = AfterEffects if these are the first and second lines in the *XSend* menu.

The one exception is *XReceive*: The series starts below the *Use existing XReceive.INI* option - for example, as of *Sony XDCAM*.

XSend to... Location

This function allows you to *XSend* (in this case, save) clips to any location on your computer or network. No software application will be opened.



XSend to... Location; with options

- *Target location* -
  Select a directory.
- *Use object name/original media file name* -
  You can either save the files under their individually assigned object name (from within Avid Liquid), or under the name originally assigned by the system.

- *Copy meta data files* -
  Enable this option if you want to save corresponding metadata (e.g. XML files) to the selected target location.
- *Convert mono tracks to stereo* -
  wraps mono audio clips in stereo files.

XSend to... Location (MPEG2-IPB)

This function is reserved for MPEG2 IPB clips. The associated audio is also stored at the selected location.

XSend To... Other Applications

1 To configure *XSend To...* for other applications that are not (yet) listed in the submenu, select *XSend To...> Others*.

2 In the dialog box, click *Add* and find the desired file in the Windows selection box displayed.
Note: Only executable (*.exe) files can be selected. The application is inserted in the list of applications.

3 Click the application and then click *XSend To...* to send the object(s) to the application.

Which Programs are Compatible?

To test whether the "other application" is compatible with *XSend*, perform the following test:
On the Windows desktop, drag a file (i.e. an icon, which is a shortcut to a file) to the icon for the particular application and drop it. The test file must be of the same type as the file you want to send to the program by means of *XSend*. If the program now starts with this file, it is "Drag&Drop-compatible" (as it is called in Windows) and can therefore be addressed by *XSend*. If not, you will have to use the usual method of opening the program and loading the file(s).

XSend to.. Macromedia Flash

Avid Technology, Inc. offers a XSend to MacromediaFlash (*.flv) interface. It can be downloaded from the Avid Technology, Inc. web homepage if it is not already installed on your system.

XSend To... Options

The options described below are offered in different combinations as a function of the source material and target application.

Single Clip

For single clips (without effects), the application selected is opened immediately.

Clip(s) with effects

- *Fuse* – Select this option if the clips should be transferred to the selected application as a result of the effect. This starts the *Fuse* process (*page 959*).
- *From Mark In to Mark Out* – Limits the section to be transferred.
- *Save Fuse File As...* – Enter the directory path or select the path from the Windows dialog box (Browse).
- *User-Defined Name (instead of Object Name)* – If desired, enter an individual name for the *Fuse* file generated.
- *As Source Clip(s) without Effects* – Effects applied to clips are ignored.

Sequence(s)

- *Fuse* – Select this option if the clips of the *Sequence* should be transferred to the selected application as a single file. This starts the *Fuse* process (*page 959*).
- *From Mark In to Mark Out* – Limits the *Sequence* section to be transferred.
- *Save Fuse File As...* – Enter the directory path or select the path from the Windows dialog box (Browse).
- *User-Defined Name (instead of Object Name)* – If desired, enter an individual name for the *Fuse* file generated.
- *As Composition(s) of Source Clips* – The vertical and horizontal arrangement of clips on the *Timeline* is transferred (without rendered effects or render files) to the application (for example, After-Effects). The source clips are available in the destination application.
- *Fuse single clips* – This option transfers each individual clip to the destination application (Adobe AfterEffects) as a result of any effects applied. The *Timeline* structure is retained.

Animation, titles with effects

- *Fuse* – Select this option if the clips of the *Sequence* should be transferred to the selected application as a result of the effect (also with roll/crawl titles). This starts the *Fuse* process (*page 959*).
- *From Mark In to Mark Out* – Limits the *Sequence* section to be transferred.
- *Save Fuse File As...* – Enter the directory path or select the path from the Windows dialog box (Browse).
- *User-Defined Name (instead of Object Name)* – If desired, enter an individual name for the *Fuse* file generated.
- *As Source Clip(s)* – Sends the output files for animation (such as single-image graphics) to the destination application. A roll/crawl title is transferred without the motion information.

Note on Using This Function with AfterEffects:

The first time you use *XSend To...* with AfterEffects, the following message is displayed:

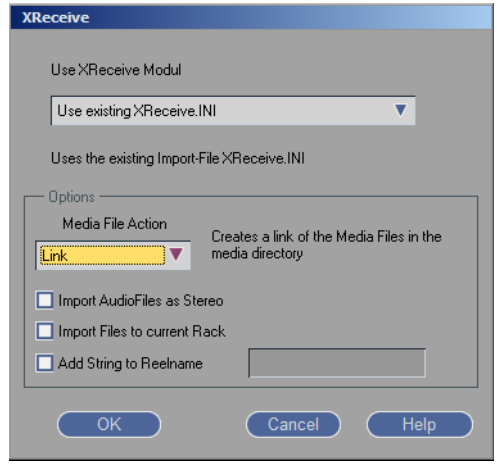
"Some of the add-on modules require that they be registered for this version of AfterEffects in order for you to be able use them." From "Skip All/Serialize All", select the "Serialize All" option.
If you already clicked "Skip All", close AfterEffects and resend to AE. The query is then repeated. Proceed as described above.

If you transfer one or more clips to AfterEffects using *XSend To...*, a dialog box is displayed after you start the program ("Add[software name] Footage") containing a list of these *Media Files* and the AE composition(s) in which these files should be integrated.
Select the *Media Files* and a composition and click *OK*.

XReceive

XReceive is to some extent the counterpart to *XSend*. You can use this function to retrieve files in your system that can't be accessed by means of a standard media import or that are not suitable for this type of operation.
XReceive connects your system via an IEEE 1394 interface, e.g. to the Sony DU1 Hard Disk Recorder. You can integrate and immediately work with media data and metadata in the Sony-specific *.dlx format in your *Project*.

Other applications can also be accessed using an *XReceive* plug in.



XReceive module

Calling XReceive

To open the *XReceive* module, select Avid Liquid *File* > *XReceive*.

Then select the application you want from the drop-down menu (if more than one application is available).

Calling XSend/XReceive via the Keyboard

See also *"Calling XSend/XReceive via the Keyboard"* on page 176.

XReceive Options

- *Media File Action* -
  These are the *Copy, Move* and *Link* options already familiar from the standard import. Note that *Move removes the file(s) from their original storage location*.
- *Import Audio Files as Stereo* -
  This option imports audio clips with the stereo attribute.
- *Import Files to current Rack* -
  If this option is not activated, a new *Rack* is created with the name *XReceive*. Otherwise the clips are imported to the *Rack currently selected*.
- *Add string to Reel name* -
  enter here a name that will be appended to the existing *Reel* name. This is especially handy when you are working with more than one hard disc recorder.

Starting XReceive

After selecting your options, click *OK*. In the Open file dialog box, navigate to your destination and select the files or folders.
The import is then performed.

MXF File Exchange Format

MXF stands for Material Exchange Format. It facilitates the exchange of AV media data including its corresponding metadata. Typical metadata would be information like timecode data and clip names. MXF is a standardized yet open format which can be used across different platforms. Like AVI, MXF is a "wrapper" format, which can contain different essence data while the file format suffix always stays the same.

The following formats are supported for Fuse and render:

- *I-Frame MPEG2 MXF*
- *IPB MPEG2 MXF*

Export/Fuse MXF Files

Use the *Fuse* function to create MXF files (*File > Export to File > Fuse*). See also *"Fuse"* on page 959. Here´s the workflow:

1. Create an MXF codec preset. To do so, open *Edit > Control Panel > Site > Codec Presets*.
2. Select either the *I-MPEG2 422P@ML* or the *MPEG2 MP@HL* codec preset from the list.
3. Click the double-plus symbol and enter a description for the preset you are going to create.
4. Click *Ok* (checkmark).
5. Click *Edit* and select from the available parameters, such as profiles, bitrate and resolution.
6. In the *Fileformat* section, select *MXF*. Quit the dialog.
7. Set the *Timeline Render/Fuse Codec* to the created preset (either with a new *Sequence*, or via the *Timeline Properties*).
8. Open *File > Export to File > Fuse*.
9. The selected *Sequence* or clip(s) is (are) saved as MXF file(s).

Import MXF

On import it can become necessary - depending on product version and possible system formats - to render the MXF material before it can be played on the *Timeline* or in the *Viewers*.

See also: *"XReceive"* on page 180.

Exporting/importing EDLs

An Edit Decision List (*EDL*) contains in chronological order all basic components of a film Sequence, including the mark-in and mark-out points and video and audio tracks. Avid Liquid automatically generates a new *EDL* whenever you create a new *Sequence* and continues to update the list as you add and modify editing events. EDLs can be exported and imported.

Events contained in EDLs *page 183*

Areas of application *page 184*

Available formats *page 185*

Exporting EDLs *page 185*

→ EDL without audio information *page 187*

→ Multi-layer EDLs *page 187*

Importing EDLs *page 188*

→ Reading in AVID Media Log logging lists *page 189*

Events Contained in EDLs

Since *EDLs* can be read by different types of systems, they allow for system-independent editing of videos. This means you can do preliminary editing and layout work offline on one system and final online editing on another.

In addition to *Mark-In* and *Mark-Out* points, *EDLs* also list video and audio sources, the duration of *Transitions* (e.g. dissolves and cross fades) and a SMTPE code number, provided it is known for standardized effects (for example, *004 for a wipe)*.
It addition, it indicates *Timewarp* effects. The entry *DM+050* indicates 50% slow motion and *DM-033* indicates 33% reverse playback (*DM* stands for “dynamic motion”).
However, since *EDLs* have to be compatible with many different types of systems, from the most sophisticated to the most basic, the information they contain has to be kept very simple and by no means reflects all the editing functions available with Avid Liquid. The actual media data is not stored in an EDL.

Areas of Application

Despite certain drawbacks, *EDLs* can still be very useful, especially for large projects. Since most of the work required to produce a video does not depend on quality, to keep costs down, it is sometimes useful to do rough editing and experimental work on an off-line suite. Then, with the *EDL* and source material at hand, to perform final assembly work, using a higher quality on-line editing suite.

When switching from non-linear offline editing to linear online editing, the system reads the video editing data and creates a logging list. Without EDLs such *Project*s would be nearly impossible since you would have to create every *Sequence* manually, step by step. If problems arise during final cutting which require off-line editing, *EDL* files can again be used.

Since *EDLs* contain the basic content of a *Sequence*, they permit identical versions of a video to be processed on different systems.

Typical examples include the following:

- The master is to be created in a special tape format that is not available to you.
- For on-line editing you need the technical capacities of a large studio.
- You do not have enough hard disk space to redigitize the complete project at optimum quality.



It is recommended that you do a test run in advance to check the compatibility of the *EDL* and the on-line editing system to be used. For example, some systems reject edit lists whose *Reel* names include letters (e.g. “A001” or “tape01”).
It is also recommended that you edit images only (without audio) on the on-line system, provided that the *Sequence* does not have too many special effects. The audio tracks (possibly already mixed) are played onto a timecode-identical tape that can then be mixed together later with the on-line tape.

Available Formats

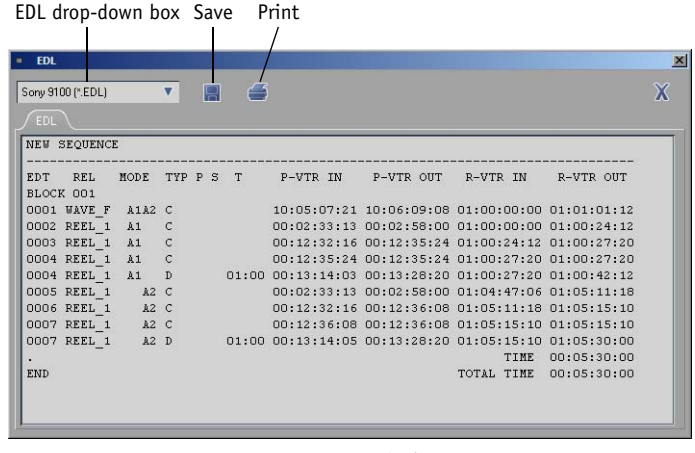
EDLs are alphanumeric files and do not contain any media data. This means the *EDLs* of even very large *Sequences* with several hundred events have convenient formats and fit easily on a floppy disk. Avid Liquid lets you export and import *EDL* files in the following standard formats:

- Sony (BVE 9100)
- CMX (3600)
- GVG

You can also convert *EDL* files from one of these formats to another, allowing you to cut the same job on different equipment using the same source material (tapes).

Exporting EDLs

Step by Step



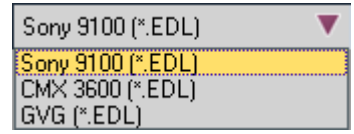
EDL Export window

To export the *EDL* of a *Sequence* created with Avid Liquid:

1 In the *Timeline*, activate playback for the *Tracks* to be exported. EDLs are limited to a single video *Track* (V) and a maximum of four audio *Tracks* (A1 to A4).

2 Click *File* > *Export to File* > *EDL*.

3 A window with the *EDL* of the active *Project* on the *Timeline* appears. The default export format setting is Sony (BVE 9100). To select a different export format (CMX 3600 or GVG) use the drop-down box in the top left-hand corner. Avid Liquid automatically converts the *EDL* to the specified format and displays it.



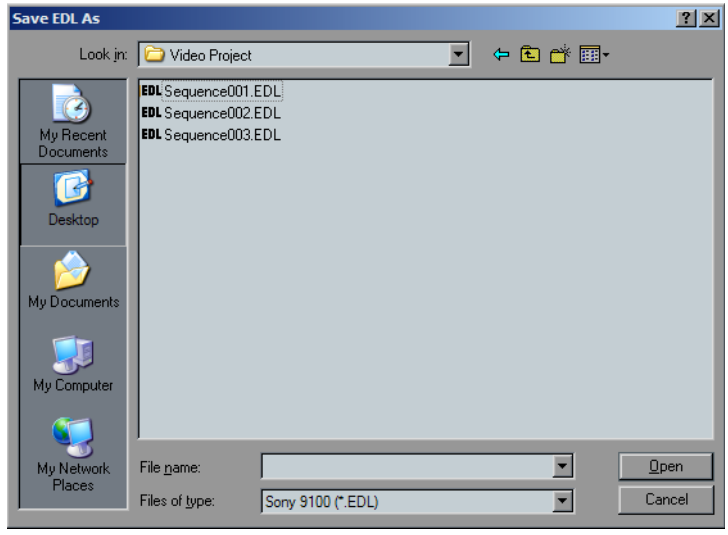
4 Specify how you want to output the *EDL* - as a printout or file.



- Click *Print* to print the *EDL*.



- Click *Save* to save the *EDL* on a floppy disk or other storage medium.



Exporting EDLs without Audio Information

To export an *EDL* without any audio information (i.e. only the video data), be sure to deactivate the *Audio Playback* of all relevant *Tracks* (deselect the loudspeaker icon in the *Audio Playback* column) before exporting it from the *Timeline*.

Multi-layer EDLs

You can also export multi-layer EDLs using separate export procedures. To do so, activate an audio or video *Track* (select/deselect the loudspeaker/monitor icon in the *Audio/Video Playback* column). The layers can be reconstructed when they are imported.

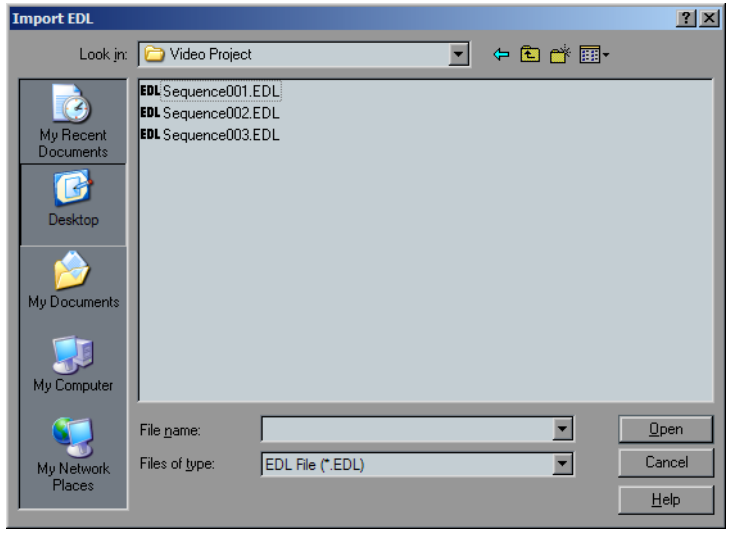
Importing EDLs

Step by Step

To import an *EDL*:

1 Click *File* > *Import* > *EDL*.

2 The *EDL Import* dialog box appears. Select an *EDL*.
(Note: Avid Liquid supports the above-mentioned *EDL* formats.)



3 Click *Open*. The selected *EDL* is transferred as a new *Sequence* to the active *Project*. In the *Project* window, a new *Rack Folder* is created. This folder contains the *Racks* of the various types of media (depends on *Sequence* imported).

After you have loaded an *EDL* in a *Project*, the *Sequence* appears as "empty" clips on the *Timeline*.

To batch digitize clips, open the *Rack Folder* created when the *EDL* was imported. Open the *Rack* shortcut menu. Select *Batch Digitize* > *All in Rack*. For more information, see "*Batch Digitize (Batch Capture)*" on page 292.

EDLs cannot be directly imported into an existing *Sequence*. Instead, a new *Sequence* has to be created.

Reading in Avid Media Log Logging Lists

Logging Lists created with Avid MediaLog can be read in in Avid Liquid and used for *Batch Digitize*. Go to *File* > *Import* > *EDL* and specify the file type "*.ALE" under *Files of type*. Open the respective file on the drive (e.g. disk drive) and you will find a folder including a *Rack* with the logged clips in *Project*. You can then start digitizing with *Batch Digitize*.



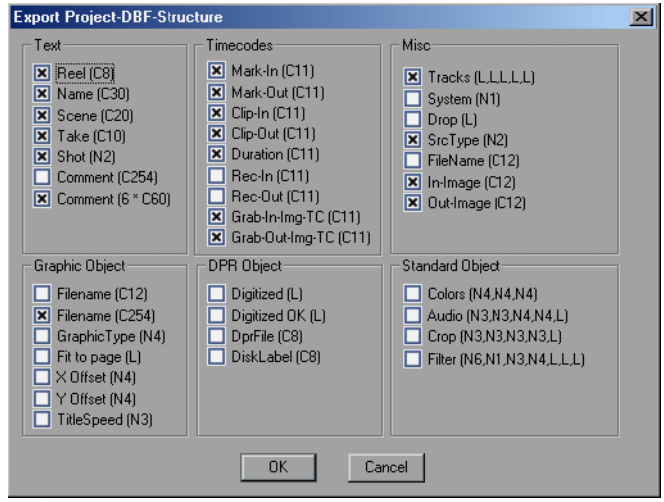
Although these files al so have the *.ale suffix, MediaLog import does not involve the same procedure as importing ALE *Project*s (also see "*XML/ALE/XCE Import and Export*" on page 169).

VideoMachine DBF Import

You can import *Project* data from VM-Studio to a Avid Liquid *Project*.

Proceed as follows:

1 Export the relevant VideoMachine *Project*. Start by selecting the *Timeline menu* > *Tools* > *General Preferences* > *DBF Export Structure*. In the dialog box displayed, you can then define which *Project* data you want to export. The data that can be exported is activated in the screenshot below. You cannot import other data or media data to Avid Liquid.



Only the selected data can be imported in Avid Liquid.

2 After making your selection, select *Project menu* > *File* > *Export Project*. The file is saved under the name you selected and with the extension *.dbf.

3 To import to Avid Liquid: Select *File* > *Import* > *Video Machine DBF*. Once the data has been converted, a folder with the name of the export file is created in the current *Project*. The Racks in this folder correspond to the Reels of the Video Machine *Project* and contain the clips along with all the data and Picons.

You can digitize these clips using the *Batch Digitize* function (*page 292*). *Sequences* (Video Machine Movies) can be exchanged by means of EDL import/export (*page 183*).



When importing graphics files, make sure that the directory paths are the same. A graphics file that was, for example, located under C:\media\graphics\ in the VM system must be stored under the same directory path in Avid Liquid so that it can be accessed by the software.

Import Projects to Pinnacle Studio

You can import projects from Pinnacle Studio 10 to Avid Liquid as follows:

1 Inside Studio:
The Studio project is saved with the extension **.stx*.

2 Start Avid Liquid.
Select *File* > *Input Wizard* > *Import Studio Project*. Select/create a *Rack* and, in the dialog box displayed, select the *.stx file previously saved.
Or select *File* > *Open project* and then the Studio *.stx file.

3 The Studio timeline now appears on the Avid Liquid *Timeline*.

- Clip effects (filters), transition effects, DVD menus and other DVD-related objects are retained.
- An Avid Liquid *Project* cannot be opened and edited in Studio.

Networking with Avid Liquid

It is possible to retrieve and save AV data not only to local storage media (i.e. hard discs directly attached to the system you are a working at) but also via a network, that is, on remote storage. Even *Projects* can be shared via a network.

To be able to work conveniently, the network needs to provide sufficient bandwidth between local and remote hardware. Thus it is possible to, for example, to use one system for capture and another one for editing.



Exchanging clips and the shared use of *Projects* is also possible with clips generated by means of *EZ Capture*. They must also be stored on shared storage media.

Assign network drive or directory *page 192*

Network settings *page 194*

→ WindowsXP network settings *page 195*

Shared Projects *page 196*

InterCom for editors sharing a common project *page 197*

Assign network drive or directory

To connect Avid Liquid to a network you have to assign network drives or directories in the Media Management Settings:

1. Select Avid Liquid *Edit* > *Control Panel* > *Site* > *Media Management Settings.*
2. Click Add and browse to the intended drive or directory. You can also create a new directory on a drive (if you have the required access rights).
3. Now make the newly selected or created drive/directory the *default capture drive*, and it will appear as default (primary) drive in the list of capture drives in the *Logging Tool*.

As long as the selected drive/directory is on this list, its media files remain available for the local system. You can locate remote media files on the *Project* window *Media* tab and integrate them in your system with the *Create clips of selected media* function. This creates a *Rack* named *Media Clips* which contains the clips transferred to your current *Project* (the media files remain at the network location). This step is necessary because these media files were not created in your *Project*. Therefore, the *Project* does not (yet) "know" the clips.

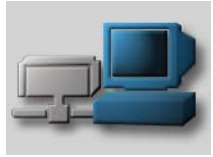
However, if you create clips in the *Logging Tool* to be saved on a network drive (non-local), the clips will already be part of the *Project*.

Save Network Data Locally

There are several possibilities to transfer data from the network to local or other network media drives:

- via the *Project Media* tab -
  The shortcut menu of the *Project Media* tab offers two options that you can use to transfer data from the network to your *Primary Media Volume*: *Create clips and copy selected media to capture volume* and *Copy selected media to capture volume*. The difference is that in the first case also clips will be added to a *Rack*.
  If the *Primary Media Volume* is a network directory, files can be copied within the network (or from local to network destinations). For information on *Media Volumes*, see *page 332*.
- Import -
  Create, if necessary, a *Rack*. Open the *Rack* shortcut menu > *Import* > *Media Clip* and select the clip(s).
  Select either the option *Copy* or *Move* (not *Link*) to actually transfer the data to the local storage. Careful: *Move* removes the data from its original place.
- using *Consolidate* -
  this works only on the precondition that the clips already exist in the *Project*. For example, use *Consolidate* if you want to locally backup data originally retrieved from the network, that is, clips you used for your current edit. Open *Rack* shortcut menu > *Consolidate* and select the clip(s) or *Sequence*(*s*). Enable the *Include identical files...* option. For more info on *Consolidate*, see *page 300*.

Network settings



Three basic options help optimize network performance.

Open (via *Edit* > *Control Panel* > *User* > *Network*) the *Network Settings* dialog and enable or disable:

Network Settings Tab

- *Do not generate AVI index files* -
  Speeds up the first file access, but may slow down a bit the overall access speed.
- *Do not generate Peak files* -
  No Peak files (used to display audio waveforms) will be created on import. This speeds up the import of large files.
- *Use small block sizes for network* -
  In 100 Mbit or gigabit networks: network transfer block size will be limited to 64 kbytes. Fiber channel networks can handle bigger block sizes.
- *Enable Local Rendering* -
  (`Avid Liquid Chrome HD` only:) In networked systems it is recommended to enable this option. Temporary render files will be stored locally (select a directory path). As a result, network traffic is being reduced.

Tab [ProductName]

- `Avid Liquid`: Optimize *AVI Capture for Network* -
  Should be enabled when you capture AVI files to a network storage medium.

WindowsXP Network Settings

You need Windows Administrator or Power User rights to install Avid Liquid. To work with Avid Liquid, standard user rights are sufficient. In networks it is often useful to restrict user access. However, this may cause an error message to pop up when Avid Liquid is launched by a user with limited rights (only on Windows XP systems). To avoid this message, the "scheduling priority" for the limited user or the limited user group needs to be increased.

1 Go Windows Start menu > Settings > Control Panel > Administrative Tools > Local Security Policy

2 Select the folder Local Policies > User Rights Assignment

3 Double-click Increase Scheduling Priority

4 Add the relevant user(s) or user group(s) and click OK.

You may want to leave these settings to your system admin or IT specialist.

Shared Projects

Two or more users can simultaneously work on the same *Project*. Note that in the basic form of a network, there is no central administration to handle such *Project* sharing.



A problem-free exchange and shared editing of Avid Liquid *Projects* requires that the Avid Liquid applications involved have the same version number. In the case of `Avid Liquid Chrome HD` and `Avid Liquid`, this means Version 6.1 or later.

When it comes to deleting and changing clips or media data, every user has the same rights. One exception: the user who first opens a *Sequence* gains exclusive access to that *Sequence* as long as it is open. A good communication between users of a common *Project* is advisable.

Refresh Project Views



The *Refresh Project Views* command lets you keep track of changes that another editor is making to the same *Project*. This toolbutton is located in the *Project* window, on the left next to the shortcut menu button. If the current *Project* is not being shared, this button is grayed (deactivated).

This function can also be assigned to a keyboard key.

1. Open the *Keyboard Settings* (*Edit* > *Control Panel* > *User...*).
2. Select *Global Shortcuts* from the end of the list in the upper left of the dialog box. The *Global Shortcuts* box must be checked.
3. Open the toolbox by clicking the wrench symbol, if it is not already open.
4. From the list in the upper right area, select *Desktop*.
5. Select *T-Main menu* > *T-Project* and drag the *Refresh Project Views* T-toolbutton to a convenient key.
6. Then confirm with *Ok* (checkmark) and all is set.

A third option is to open the *Trash* shortcut menu (Desktop) and select *Refresh Project Views*.

InterCom: Messaging For Editors Sharing a Project

InterCom lets you exchange messages over the network. To use this service you need to assign the local computer to a common root directory of a workgroup. This directory must be accessible for all users intending to be part of the InterKom exchange. You may have to ask your system administrator or IT department to set up such a directory.

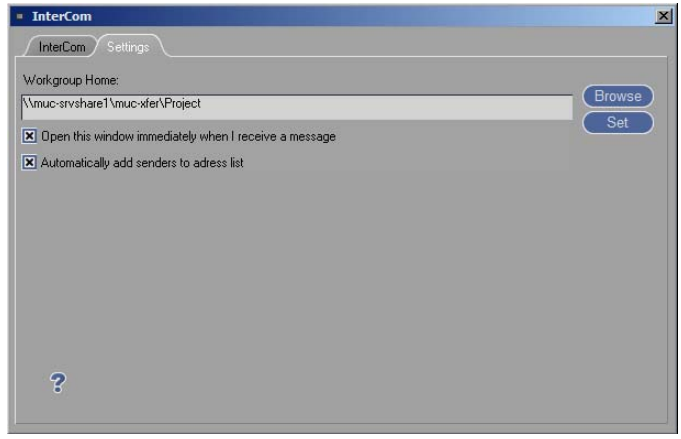
The *InterCom* address fields lists Windows computer names, not the names of the users who are logged in. It is a good idea to change those computer names to something more descriptive, e.g., “Edit 1” and “Edit 2” to designate certain editing suites.

Sign on



1 Call up the *InterCom* window by clicking the symbol shown here (it’s on the task bar, bottom right of the screen).

2 Select the *Settings* tab.



InterCom settings

3 Enter the network file path of the common directory or navigate to the directory using the *Browse* button. If you enter the path manually, click *Set* to confirm.

Options:

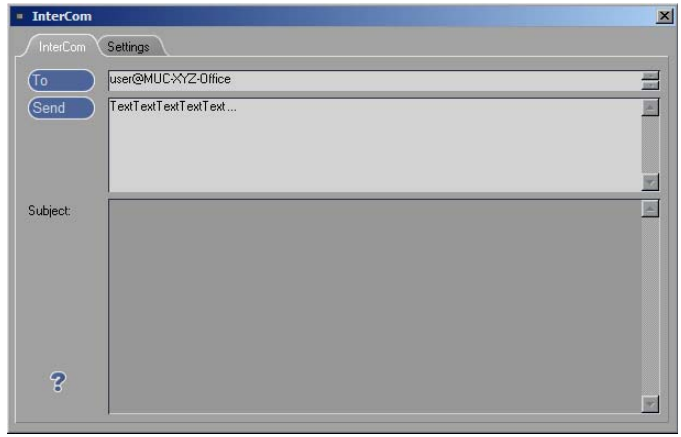
- *Open this window immediately when I receive a message* -
  makes the *InterCom* pop up in the foreground when a new message arrives.
- *Automatically add senders to address list* -
  This puts every sender who mails a message on top of the list of recipients. You can reply immediately without having to select an address from the list.

Send and Receive Messages

You can use *InterCom* as soon as the computer is assigned to the common network directory.



1 Click the tool symbol shown here to open the *InterCom* window.



InterCom window with address field, text field and field displaying sent and received messages

2 Click the *To* button (or ALT+T) to display a list of possible mail recipients. Or, if you know the address already, start entering the address. The system will complete the address while you are typing.
Everyone on list sends the mail to all people listed.
To remove a name, select it in the address line and press DEL.

The names in the list consist of two parts: the prefix before the @ denotes the Avid Liquid user name. If a user has not logged on to Avid Liquid with a specific user name, or with only the default user name, *Default* is used instead. The second part denotes the computer network name. Examples: *MOE@MUC-CPRXP* or *DEFAULT@MUC-CPRXP.*

3 Enter your message.

4 To send, click *Send* or hit ALT-S.



At the recipient's computer the incoming message triggers a blinking, red-orange telephone to appear in the place of the *InterCom* symbol on the taskbar, or, if set to do so, the *InterCom* window opens automatically (see *Settings* tab).
Click the blinking symbol to open the window.

OMFI Export

Complex audio editing is often carried out on special audio postproduction systems. The Open Media Framework Interchange (OMFI) format has established itself as the exchange standard for this type of work. OMFI makes it possible not only to export the pure editing data (EDL is limited to this type of data) but also allows audio and video *Media Files* to be exported. Furthermore, it is possible to generate a precise map of a *Timeline Sequence* with all clips and layers.

HD *Sequences* can not be exported by means of OMFI.

What is exported? *page 200*

Calling OMFI Export *page 201*

Composition
Defining OMFI components *page 202*

Media
Export formats and media types *page 203*

Options
Additional functions of OMFI Export *page 204*

What is Exported?

The *Sequence* currently located on the *Timeline* forms the basis for the export.

The export includes:

- Clips on *Tracks* with *Audio Playback* or *Video Playback* active (or both).
- An area between the mark-in and mark-out points, or the entire *Sequence*.

Calling OMFI Export

The OMFI Export Tool is located in *File* > *Export* > *OMF*. The dialog box below is displayed. It is divided into two areas: *Composition* and *Media*.



OMFI Export

Composition

In this area, you can define the components of the *Composition* (the OMFI term for a *Sequence*).

OMFI Version

Select the desired version from the menu. *OMFI 2.0* is the default setting; however, you can also select *OMFI 1.0*.

Note on importing in AVID Express: If OMFI 1.0 is selected, you should export AIFF audio data. Volume and panning settings are not retained.

Include

You can use this area to define the components of the *Composition*. This does not have anything to do with the *Media Files* that are actually exported (see below), but rather refers to the pure edit data (mark-in/mark-out points, etc.). You can choose from the following menu options:

- *Video* - only video clips are exported
- *Audio* - only audio clips are exported
- *Video and Audio* - video and audio clips are exported (default setting)

Mix video down to one Track

In situations where a detailed imaging of the *Sequence* is not essential as far as the video clips are concerned, multiple *Tracks* containing video clips can be reduced to a single video *Track* (mix down). Audio clips are not affected by this setting.

Media

The *Media* area of the dialog box contains settings that affect the form and format of the media data that is to be included in the composition:

Export with Media Files

This option is by default activated. You can use the drop-down menu to specify the file type to be exported (video, audio, audio and video (default setting)). During an actual export, the affected files are converted to an OMF file.

Consolidate media

This option is activated by default and ensures that the clips in a *Sequence* are transferred to the OMF format precisely in terms of their length. With a *Handle Length* of 0 (default setting), the resulting OMF clips cannot be trimmed beyond the mark-in or mark-out point. If a little trim leeway should remain, enter a specific handle length; if full access to the original *Media Files* is required, deactivate the function. This can, however, result in very extensive OMF files.

Video Format

This setting is important when you export video files. Select the desired compression rate. The approximate storage required is displayed next to the box.

Audio Format

This area defines the audio file format and sample rate within the OMF format. The *Audio Format* menu offers the following options:

- *WAV* - generates WAV files (default setting)
- *AIFF* - generates AIFF files

The *Sample Rate* menu offers the following options:

- *44.1 kHz* (default setting)
- *48 kHz.*

From Mark In to Mark Out only

Activate this checkbox if only a section in a *Sequence* needs to be converted to OMF. If only a mark-in point is set, the end of the *Sequence* is assumed to be the mark-out point. If only a mark-out point is set, the beginning of the *Sequence* is assumed to be the mark-in point.

Start Export

Once all the options have been set, click on the checkmark. In the dialog box that opens, specify the name and storage location for the OMF file. The file extension.omf is assigned automatically. During the rest of the export process, a window opens in which you can view the progress of the export and interrupt it if necessary.

Options

This area offers composition-related options that rarely have to be changed:



OMFI Export options

Deactivate the effects that are not supposed to be contained in the composition. *Volume* means that clip-specific volume levels are transferred.

Chapter 8

Administration

make manage move | media™

Avid®

As a preliminary step to the actual editing, this chapter deals with the sorting, finding, viewing, deleting, naming and copying of video and audio clips, i.e. the administration of a *Project* and all its components. It is divided into three parts:

Project

Everything you need to know about the organizational systems in Avid Liquid *page 208*

→ Opening and creating Projects *page 208*

→ Project templates *page 209*

→ Copying and deleting Projects *page 210*

→ Project structure (tabs, racks and folders) *page 211*

→ The Project Browser *page 218*

→ Single Monitor View *page 220*

→ Project properties *page 222*

→ Diagnose project *page 224*

→ Backing up and restoring projects *page 224*

Object

The material from which the films are made *page 233*

→ Basics *page 234*

→ Objects in the Project (views, sorting, finding, re-importing objects) *page 238*

→ Searching for and finding objects (quick search; complex search) *page 250*

→ Clip Viewer: viewing objects *page 263*

→ Object properties (object information) *page 281*

→ Storyboarding: Outlining a film *page 287*

→ Batch Digitize/Capture: Automatically digitizing (capturing) clips *page 292*

→ Consolidate: Reducing clips and Media Files *page 300*

→ Condense: Combining all the clips of a Sequence *page 304*

→ ClipSync: Synchronizing selected objects *page 306*

→ Automatic scene detection *page 309*

Media Management

Working with Media Files *page 313*

→ System formats in Avid Liquid *page 318*

→ The media tab in the Project window *page 327*

→ Media Management Settings *page 332*

→ Search and import media files *page 342*

→ Deleting clips, objects and Media Files *page 344*

The Project

The *Project* is a key Avid Liquid module, used for gathering, organizing and managing objects for productions. These objects include audio clips, video clips, *Sequences*, graphics, titles, subtitles, opening credits, closing credits, effects, animations, etc.
See also *"The Object"* on page 233.

Opening and Creating Projects

In Avid Liquid, at least one *Project* must be open at any one time.

To create a new *Project*...

- ...click *File* > *New* > *Project*.
  In the dialog, enter a *Project* name and select a *Template*, if desired (see *"Project Template"* on page 209), then click *Ok*.

To open a *Project*...

- ...click *File* > *Open Project*.
  Select the appropriate *Project* in the list that appears and click *Open*.



If more than one *Project* is being worked on in the system, you can select one of these *Project*s from the list displayed when you select *File* > *Recent Projects*...

Working With Two Projects Simultaneously

It is possible to edit two *Projects* at the same time; however, you have full access rights only to the "primary", current *Project*, i.e. the one that was loaded in the *Project* window. A second *Project* can be open in the *Project Browser*, from which you can copy objects such as clips to the current *Project*.
More detailed information here: *"The Project Browser"* on page 218.

Project Template

In Avid Liquid a *Template* refers to a predesigned standard *Project* with user-defined objects. For example, if you plan to produce a series of several parts, with a template you could define the standard elements for all parts, instead of having to load the same color bars, titles, subtitles, etc. in several *Projects*.

Save Project as Template

Templates can be generated in these ways:

1 You can either add the required standard elements to a new, empty *Project* and save it as a *Template*, or you can delete all unnecessary objects (clips, etc.) from a completed *Project* and

2 Save this as a *Template* (*File > Manage Projects > Save as Template...)*.



Templates can only be used for new *Project*s. You cannot "superimpose" a *Template* on an existing *Project*.

Delete Template

Select the *Templates* to be deleted from the list of *Templates*. Caution: the system does not prompt you again after you clicked *Delete*.



Keep the *Project* from which you have generated one or more templates because updating a *Templates* requires that you have access to the original *Project*. Make your changes in the original *Project* and then save the new *Templates* under a new name or save it under the same name to replace the old *Templates* (in this case, first delete the old *Templates*).

Copy/Delete a Project

Changes in a current *Project* are constantly saved. If you want to freeze the actual state of a *Project*, you can create a copy of it.



Do not use the Windows Explorer for copying or moving *Projects*! Doing so may cause you to lose data!
Do not use the standard Windows dialogs "Save (as)" or "Open" to copy, delete or rename *Projects*.

Save A Copy

1 Select *File* > *Manage Projects* > *Save a Copy.*

2 Type a name for the copy in the name field in the dialog box that appears.
If you want a different folder to the pre-selected folder that Avid Liquid opens first, you have to select the new location using the *Open/Create a Project* dialog box.

3 Click *OK*.

Finally, the original *Project* with the original name stays opened in Avid Liquid.



If you change the file extension the copy will not be recognized as a *Project* any more and Avid Liquid will not open it.

Delete Project (with Media and Render Files)

It sometimes becomes necessary to delete *Project*s that are no longer needed. In this case, proceed as follows:

1 Select *File* > *Manage Projects* > *Delete Project.*

2 In the dialog box that appears, select the *Project* you want to delete.



Click *Delete Media Files* to not only erase object data, such as clips and *Sequences*, but also all Media Files of a particular *Project*. This option should be used with care, since it is not possible to reverse the command once it has been carried out.
The same is true for the deletion of render files, which is also possible here.

3 Click *Delete* to erase the *Project* from the hard disk. The system will not prompt you for confirmation.

Clean Up Project

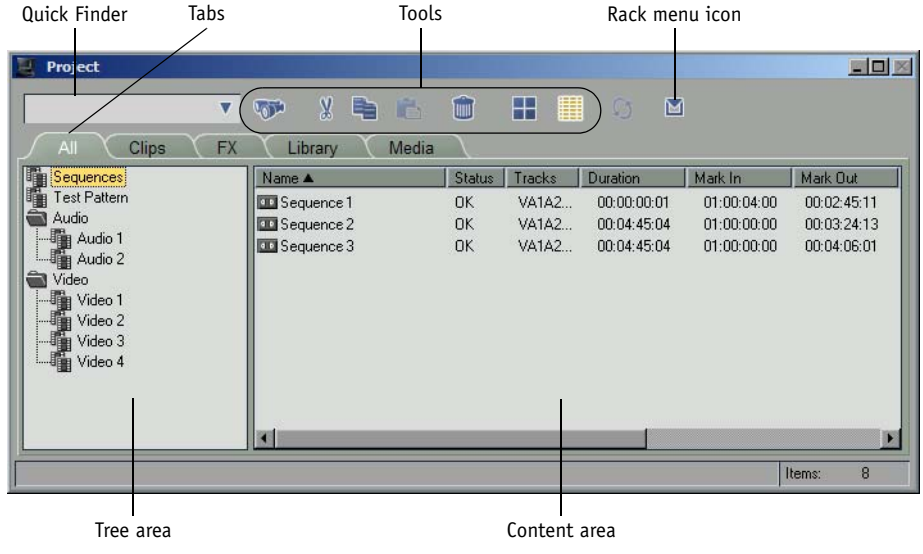
This function (located in the shortcut menu for the desktop *Trash icon*) deletes some of the peripheral *Project* data, which can become quite extensive especially for large and long, edited *Projects*.
This function does not delete any objects, *Sequences* or Media Files.

Project Structure

This section provides information on the basic elements of a *Project* and on how to work with them.

What Comprises a Project?

Look at the figure below or at any *Avid Liquid Project* on your computer's monitor. The name of the *Project* appears at the top left in the title bar of the main program window.



Project window (Sample)

- Tree area -
  The tree area on the left is used for creating and selecting *Rack Folders* and *Racks*.
- Content area -
  The content area on the right is used for organizing and viewing objects.
- Tabs -
  The five tabs provide you with an overview of your *Project's* entire contents (*All*), specific *Racks* (*Clips:* without effects *Racks)*, the individual effects *Racks* (*FX;* without clip *Racks*), the system effects *Racks* (Library) and media data (see also *Media Management* on page 313).
- *Quick Finder* -
  This button lets you locate specific objects in *Racks* (*page 250*).
- Toolbar -
  The tool buttons are used for switching viewing modes and cutting, copying, pasting and deleting objects (*page 237*).

- Rack shortcut menu -
  Clicking the shortcut menu button (or right-clicking the content area) opens the *Rack shortcut menu*.

Working with the Project Window

The *Project* window behaves like any other Windows window with one exception: You can never close it because at least one *Project* must always be open. You can, however:

- Minimize it. It then becomes an icon in the taskbar, allowing you to clear a space on your desktop;
- Maximize it. The window then fills all the space available on the desktop (depending on the desktop layout selected; see *"Click this icon to open a dialog box that can be used by members of a workgroup to exchange information. When a message is received, this icon is replaced by a flashing reddish-orange telephone icon (page 197). Desktop Views"* on page 46);
- Resize it by dragging the window border.
- Drag the vertical bar between the content and Rack/folder areas. If more contents exist than can be displayed at one time, a vertical and/or horizontal scrollbar appears.

What Are Rack Folders and Racks?

Rack Folders and *Racks* provide you with a clearer overview, particularly in the case of extensive *Projects*. Take another look at the *Project* window shown at the beginning of this section.

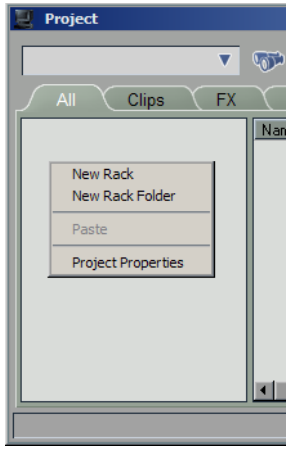
- *Racks* are combined in *Rack Folders*, which cannot themselves contain individual objects.
- Objects are combined in *Racks*.

The sample *Project* (*"Project window (Sample)"* on page 211) contains the "Audio" *Folder* in which the "Audio1" and "Audio2" *Racks* have been stored.



With some features, the "active" (or current, selected, clicked, highlighted...) *Rack* is of importance. Newly created clips, for instance, may be placed in the active *Rack*. It is, however, possible to have more than one active *Rack*.
In such a case, the active *Rack* is the one selected and visible (tab in front) in the *Project* window. If you use the *Project Browser*, the selected and visible *Rack* in the *Browser* is "active". If both *Project* window and *Project Browser* are visible with selected *Racks*, the *Rack* in the *Project* window has priority.
If the system can not access an active *Rack*, a new one will be created under the name *Imported Media Files*.
See also *"The Project Browser"* on page 218.

Creating New Folders/Racks



Rack/Folder area menu

There must be at least one *Rack* in your *Project* in order to structure, organize, load, log and digitize the material you need for editing. In the default configuration, a *Rack* with the name *Sequences* is created for each newly generated *Project*. *Rack Folders* are optional.

1 To create a new *Rack Folder* or *Rack*, right-click the tree area. Or click *File* > *New* > *Rack*.

2 In the shortcut menu that appears, click either *New Rack* or *New Rack Folder*.

3 The new *Rack Folder* or *Rack* is initially created under the placeholder name "New Folder (number)" or "New Rack (number)" and highlighted, meaning that you can immediately edit this name. Enter a name via the keyboard and press ENTER.

Multiple Folder Levels

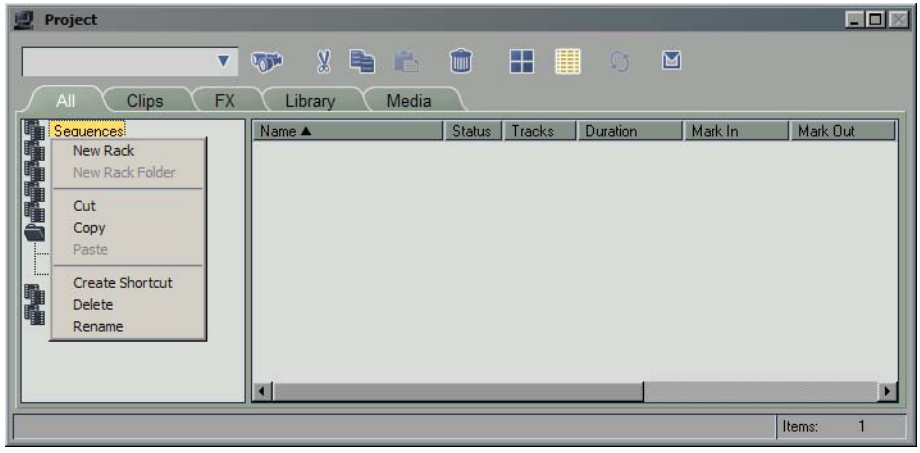
You can nest *Rack Folders* to virtually any level, thus generating "sub-*Rack-folders*", "sub-sub-*Rack-folders*", etc. To do so, right-click a *Rack Folder* to display its shortcut menu and create another folder as described above.

Copying and Moving Racks and Folders

If your *Project* contains one or more *Rack Folder*s or *Racks*, additional functions appear in the *Rack Folder/Rack shortcut menu* for working with *Racks* and *Rack Folders*. Right-click a *Rack Folder* or *Rack* to access the shortcut menu.

Cut/Copy/Paste

- Use *Cut* to delete a selected *Rack* or *Rack Folder* from its current position.
- Use *Copy* to create a copy of a *Rack* or *Rack Folder*; then use *Paste* to re-insert it somewhere else.
- Use *Paste* to insert a "cut" or copied *Rack* or *Rack Folder* somewhere else (for example, you may want to insert a *Rack* in a different *Rack Folder*).



Rack Folder/Rack shortcut menu

Copying, cutting and pasting can also be done with the drag&drop function. To move *Racks* and *Rack Folder*, even several at once, drag them from *Rack Folder* to *Rack Folder*. To copy *Racks*, CTRL+drag them (a small plus symbol appears next to the mouse pointer).

Creating a Shortcut to a Rack

A *Shortcut* is a link to a *Rack* or *Rack Folder*. Any changes you make to a *Shortcut* (such as deleting an object it contains) are also made directly to the *Rack*, and vice versa. The only exception is deleting: if you delete a *Shortcut*, the original *Rack* is not deleted.

1 Right-click a *Rack* to display its shortcut menu and select *Create Shortcut*.

2 The system generates the shortcut under the original *Rack* and assigns it the same name; however, the *Rack* icon now has a small arrow.



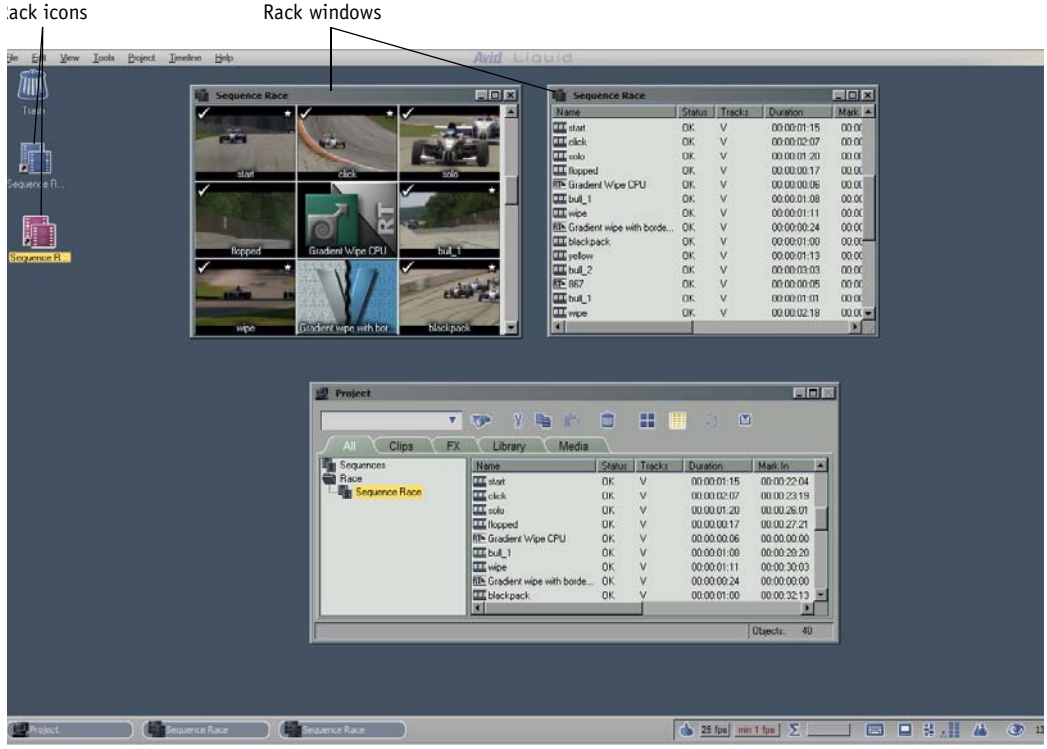
You can also create a *Shortcut* to a *Rack* using the *drag&drop* function: Drag the *Rack* to the desktop. A *Shortcut* is identified by the small arrow in the bottom left-hand corner of the *Picon* (the arrow appears on the icon in the *Detail View*).

Why Use Rack Shortcuts?

Rack shortcuts are especially useful on the desktop (see note above). They allow you to keep several *Racks* open at once, thus providing you with a broader, simultaneous overview of the materials available.

Open Several Racks Simultaneously

To view more than one *Rack* at once, drag a *Rack* icon from the *Project* window's tree area as a shortcut to the desktop. Double-click the icon to open its *Rack* window, which is now a *Shortcut* of the original *Rack* within the *Project* window.



Desktop with Project window, shortcut icons and Rack windows

Deleting Racks and Folders

1 To delete a *Rack* or *Rack Folder*, right-click the *Rack* or *Rack Folder*.

2 In the shortcut menu that appears, click *Delete*. The object is transferred to the desktop *Trash*. If necessary, you can still retrieve it from there.

If you want to use a single object contained in a *Rack Folder* or *Rack* in *Trash*, you have to copy the whole *Rack* or *Rack Folder* back to the *Project* window. It is not possible to access individual objects contained in *Racks* or *Rack Folder* in *Trash*.

Renaming Racks and Folders

Use *Rename* to rename a *Rack* or *Rack Folder*.

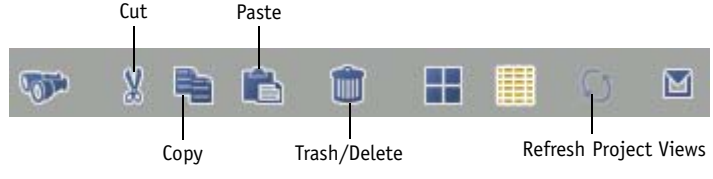
1 To do so, right-click the object. In the shortcut menu that appears, click *Rename*.

2 The object's name field can now be edited. Enter a new name and confirm with ENTER.

You can also edit an object name by delayed double-clicking the name and then entering a new name, which is the same way as used in MS Windows.

Tools

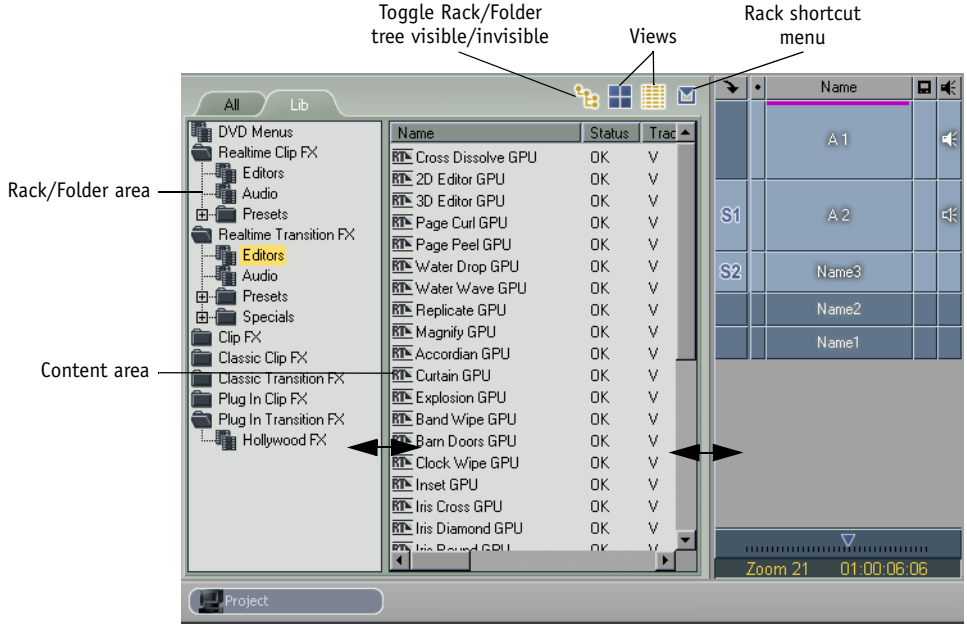
You can also call the *Cut, Copy, Paste* and *Delete* functions from the *Project* toolbar by clicking the particular button.
For information on the *Refresh Project Views* function, see *"Shared Projects"* on page 196.



Project toolbar

The Project Browser

When active, the *Project Browser* takes up some space of the *Timeline*.



Project Browser



The *Project Browser* is a miniature *Project* window. Use the this tool button to call up the browser. If you do not find the button on the *Timeline* tool bar, retrieve it from the corresponding tool box *(see "Customizing Toolbars"* on page 990). To close the *Project Browser,* click the tool button again.



Project window and *Project Browser* differ in one important issue: A selected (sometimes also called active) *Rack* or *Rack Folder* in the *Project window* is not automatically selected or active in the *Project Browser*. Keep this in mind when using functions which refer to active, or selected, *Racks* (*page 212*).

- Change size and position of browser -
  The boundaries between *Timeline* and *Project Browser* as well as between content area and *Rack/Folder* area can be moved. Place the mouse on the separating line and drag it to the desired position (see arrows in screen shot above).
  You may also change the positions of content area and *Rack/Folder* area. Right-click on the separating line between the areas and select a combination. *Relative* preserves the relative size of both areas when dragging bigger or smaller.
  To move the *Project Browser* to, say, top of the *Timeline*, right-click the separating line between browser and *Timeline Headers* and select an option from the shortcut menu.

- *Show/hide rack tree* -
  Click to toggle between showing and hiding the *Rack*/folder tree.



The *Rack Desktop* shows clips and effects that were placed on the Avid Liquid desktop, but no *Racks*.

- Switch *Project* -
  In case you need material from a *Project* other than the current, you can switch *Projects*. The current *Sequence* remains on the *Timeline*.
  To do so, right-click the *Toggle Rack Tree* symbol. You get a list of the most recent *Projects* you worked on. Click the *Project's* name to select it.
  If you need a different *Project,* you will first have to open and close it the conventional way in order to get it on the most recent list.



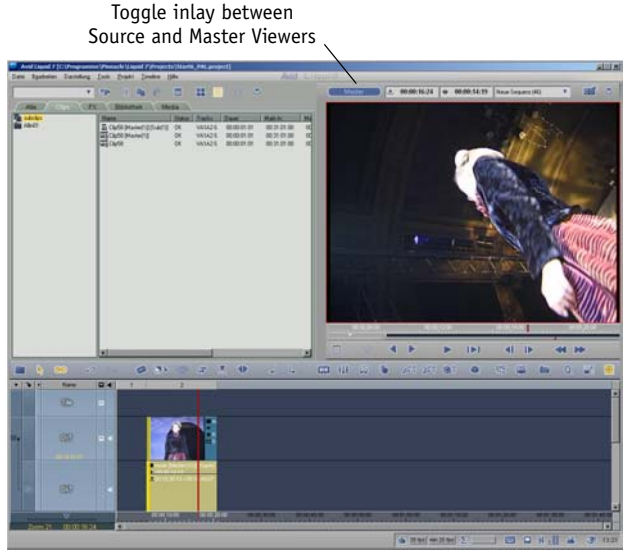
Using this function, it is possible to have two different *Projects* in *Project* window and *Project Browser.* The *Project* in the *Project* window *(Working Project)* stays the primary, current *Project* for which the user owns complete access rights. You can copy objects from the secondary *Project* (the one in the browser) to the current (the one in the window), but not vice versa.



Depending on context, a left mouse button double-click on an object results in different actions:
Project Browser: object is sent to the *Source Viewer.*
Project window *(Rack)*: object is loaded in *Clip Viewer.*

Single Monitor View

This monitor layout displays a *Project* window in the place of the *Source Viewer*, along with the *Timeline* and *Master Viewer* in their usual positions. This view is especially recommended if you use only one monitor. You then have all three of the most important work areas in a single view: *Project, Timeline* and video inlay, which can be alternated between the *Source* and *Master Viewers*.
This *Project* window provides all the functions of the large, freely moveable *Project* window.



Screen layout with Project window in the upper left

Opening and Closing the Single Monitor View



To select this view from the list of available variants in the *View Switcher*, click the *Eye* icon in the lower right-hand corner on the taskbar.



Icon for Single Monitor View layout

To exit this view, select a different monitor layout in the *View Switcher*.

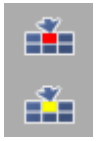
Toggling between Master Viewer and Source Viewer

Because the *Project* takes the place of the *Source Viewer*, you can manually switch the *Master Viewer* to the *Source Viewer* and back again by clicking the button above the video inlay. They are also switched automatically:

- When you scrub on the *Timeline*, the inlay changes to the *Master Viewer*.
- When you double-click an object in the *Project*, the inlay switches to the *Source Viewer*.

Timecode fields, lists of clips and *Sequences*, and toolbars also change. If you want to keep working with the *Insert Arrow*, add it to the *Viewer's* toolbar in *Source* mode.

- Since it isn't possible to scrub in the inlay in *Source* mode, you can drag the clip directly to the *Timeline* (i.e. without pressing the CTRL key, as is standard procedure in standard view with *Master* and *Source Viewer* both visible).

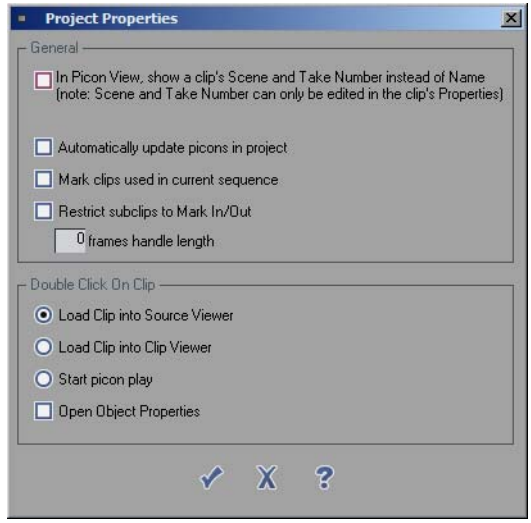


- In this view, the *Insert Arrow* and the *Edit Style* selection tools between the *Master* and the *Source Viewer* are inaccessible. Therefore, two function symbols can be found on the *Timeline* tool bar (shown on the left). Use them to insert clips in either *Film Style* or *Overwrite Style*. See also *"Overwrite Style"* on page 379 and *"Film Style"* on page 380.



Tip: You can assign the tool symbol pictured on the left to a keyboard key (*Edit* > *Control Panel* > *User* > *Keyboard* > *Special* tab, separately for the *Timeline/Master Viewer* and *Source Viewer* modules). This will make it easier to toggle between the *Viewer* inlays. The key will also apply in the *Fullscreen* display.

Project Properties



The *Project Properties* are a combination of several basic settings that users can modify to fit a particular use or preference.

To open the *Project Properties*, right-click the content area or tree area, or click the shortcut menu button on the right-hand side of the toolbar and select *Project Properties*.

All properties and settings that you can open and modify in the separate modules correspond exactly to the *Properties* and *Settings* in *Edit* > *Control Panel* >... You can thus make your settings in both places.

- Click *In Picon View Show Clip's Scene and Take Number Instead of Name* - to display scene and take numbers in *Picon* view.
  If you haven't already specified these during logging/digitizing, then you can do this at any time in the *Clip Properties* (*page 281*).
- *Auto update project Picons* - updates all *Picons* in a *Project* (according to current mark-ins and mark-outs as well as index picons).
  See also *"Grab Picons"* on page 235.
- *Mark clips used in current Sequence* -
  Tells you which clips are being used (completely or partially) on the current *Timeline Sequence*. In *Picon View* a checkmark in the upper left corner of the *Picon* indicates such a clip, in *Detail View* it says *Yes* in the *Used* column position. You may have to edit the view to make this column visible: see *"Edit View"* on page 240.

- *Restrict subclips to Mark In/Out* -
  This option lets you insert a sort of "brake" at mark-in and mark-out points that keeps the subclip from overshooting the current mark-in or mark-out during playback or scrubbing. If this option is not activated, you can continue to view the subclip's entire media file, including outside the boundaries of the mark-in and mark-out.

To define what action is carried out when you double-click an object, select one of the options available in the *Double-Click On Clip* area:

- *Load Clip into Source Viewer* - loads clip/object into the *Sequence Editor's Source Viewer* for processing ("*Source Viewer*" on page 393).
- *Load Clip into Clip Viewer* - loads clip/object into the *Clip Viewer* (*page 263*).
- *Start Picon Play* - starts playback of a clip in *Picon* view (*page 289*).
- *Open Object Properties* - opens the object's *Properties* box in order to view or modify clip data, such as a name or comment (*page 281*).

Diagnose Project

You can find this function the desktop *Trash* shortcut menu. It is used to recover *Projects* and objects that were damaged or lost because of a computer malfunction, or a manipulation of files.

If a problem was detected and if the recovery was successful, you will find a new *Rack-Folder* in the *Project*, named *Diagnose Project*.

Backing Up and Restoring Projects

You can back up all *Project* data, including *Media* and render data, on storage media such as hard disks, CDs or DVDs and import it from these media back to Avid Liquid.
This function is suitable for archiving entire *Projects*. It's worthwhile backing up the *Project* media data, especially when it would be very difficult to recreate it (e.g. tapes without timecodes, live recordings, no access to sources). Depending on the scope of the *Project*, however, this can be a very lengthy process and may require a great deal of storage space.

It is possible to back up and restore *Project*, *Media* or render data separately.



Note that all data is copied and nothing is automatically deleted. Make sure you have performed the *Bakkup/Restore* correctly before you delete your data.

You can access the backup and *Restore* functions under *File* > *Manage Projects*

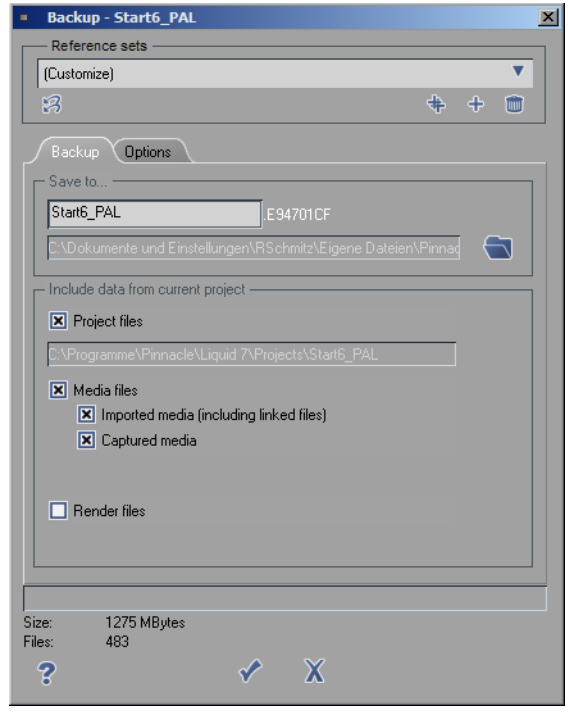
Backing Up a Project *page 225*

Restoring a Project *page 230*

Opening and Editing a Restored Project *page 232*

Backing Up a Project

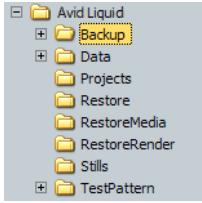
You can back up all or specific parts of the data for a *Project*.
You can access this function under *File* > *Manage Projects* >...



Backing Up a Project

The *Backup project* dialog box contains the following options:

Save to...:



Directory Structure for Project Backup

Here you have another chance to change the *Project* name, if appropriate. The *Project ID* assigned by the system is appended in any case. The two combined form the name of the main backup directory. All other directories and files are stored on subordinate levels, depending on what you chose to back up.

You can also define a specific backup directory. Click the icon to the right of the field and look for the path you want, or create a new directory.
If you do not define a directory, the *Project* is saved to a directory called *Backup* that is created in the "My Documents" directory as a subfolder of "Avid Liquid". In the Explorer: ..\Documents and Settings\[WindowsUserName]\My Documents\Avid Liquid\Backup.

Do not change the directory and subdirectory structure (for example, using the Windows Explorer) if you want to be able to use the *Restore* function.

Include data from current project:

Project files

Activate this checkbox if you want to back up the *Project* currently loaded. This option saves all essential *Project* data (such as the clips with their *Picons*, *Sequences*, etc. - i.e. the actual editing work). The path of the current *Project* is specified on this line and cannot be changed.
Saved *Project* data is protected and cannot be changed.

Media files

This option differentiates between imported and captured media data.

- *Imported media (including linked files)* -
  This includes all data added to the *Project* by means of the *Import* or *Copy/Paste* commands. It also includes title graphics generated with TitleDeko and *Media Files* that were integrated in the *Project* using the *Copy* commands on the *Project's Media Tab*. Media files generated by means of *Consolidate* are also affected as well as files that were imported via a link.
- *Captured media* -
  This refers to the *Media Files* that were logged and captured either with the *Logging Tool* or the *File Ingest* tool. It makes no difference whether the files were saved locally or in the network (including CMS/MDC).

Media data captured with the *EZ Capture* tool will also be included in the backup.

Media files from Version 2.55 or earlier are not compatible with the current Media Management (among other things, because of the incompatible file names) and are stored in a separate directory.

Even if you activate *Media files* only (without *Imported/Captured*), the system includes a number of other files in the backup. These are Media Management link files that are used for restoring media paths in a networked environment. Leave the *Media files* checkbox activated if you need to reestablish access to a fixed stock of media data from the backed up and restored *Project*.

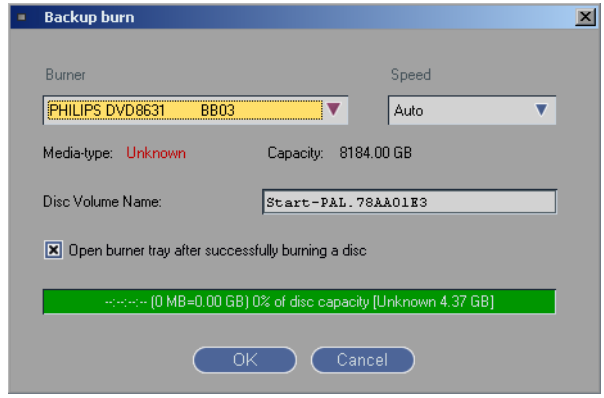
Render files

You can also back up render files generated by effects. Note, however, that you can restore render files at any time if you have the *Media Files* and the actual *Project* data. If storage space is limited, it is better to do without the render files.

Options

The second tab in the dialog box contains three options:

- *Overwrite without warning* -
  If a full or partial backup already exists, select this option to accelerate the process. The system will then refrain from prompting you to confirm.
- *Compress project files* -
  This option reduces storage requirements by compressing the project data. When restored, the data is automatically decompressed.
- *Burn to CD/DVD* -
  Select this option if your final backup medium is a CD/DVD.
  After all files have been stored to the hard disk, a dialog box appears (see below).
  Insert the CD or DVD and start the burning procedure. If necessary, you can specify the burner speed and enter a disc volume name.
  Once all files are saved to disk, you can delete the backup folder and its contents.



Backup burn dialog

Backup Info

The number of files selected and the resulting storage requirements are displayed at the bottom of the dialog box. Compare this information with the available capacity, especially if you wish to back up the data to DVD or CD.



The *OK* checkmark is disabled (grayed) if there is not enough room on the current hard disk for the selected options. In this case, delete unnecessary files or use the backup options.

Reference sets

Reference Sets serve to save backup configurations and options.

1. First select the configuration, such as *Project* data only, burn to DVD.
2. Click the *Plus* sign.
3. Enter a name for the reference set, such as "Project/DVD".
4. Press ENTER.

As soon as you modify a *Reference Set*, the *Double-Plus* icon is activated. Click this icon to acknowledge your change(s). Use the *Trash* icon to delete *Reference Sets* from the list.

Tips

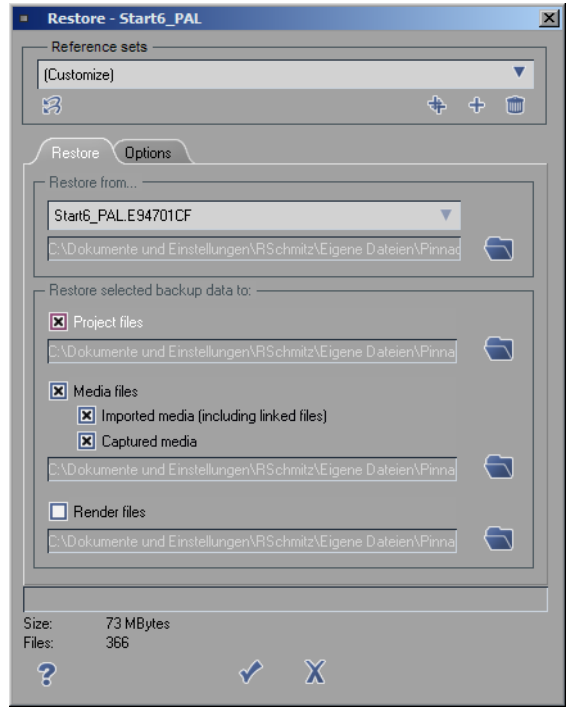
Backup is always a trade-off between security issues and convenience. It can consume a large amount of storage space and time.

- Always back up (or archive) *Project* data.
- Back up *Media Data* if you no longer have access to the original material. This also includes graphics and animations that you have developed but of which there may not be any copies. However: In the case of captured material, it is often faster and more practical to re-batch a *Sequence*. (Note: You cannot re-batch clips captured with *EZ Capture*.)
- Render files are the easiest to restore. If the media data is available, the system will do it automatically. Backing up render files is certainly the lowest priority, except in the case of productions with a large number of effects.

Restoring a Project

A *Project Restore* is basically the reverse of *Backup*. Consequently, only *Projects* that have been backed up by means of the *Backup* function can be restored. You specify whether you want *Project*, *Media* and/or *Render* files to be copied back to your system.
You can access this function under *File* > *Manage Projects*

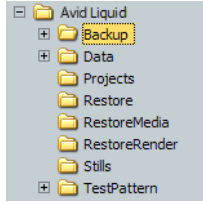
Moreover, the *Project* you are currently working on in *Avid Liquid* is not automatically replaced. After the restore operation, open the *Project* and register the actual media and render paths in the system (*Media Management Settings* > *Media Volumes* > *Add* and *System Settings* > *General* > *Rendering*).
Projects do not have to be restored on the same system from which they were backed up. *Backup* and *Restore* are possible from the network.



Restoring a Project

Restore from...

The system first looks in the *Backup* folder that was created by the backup operation. If this folder contains one or more *Projects*, they appear on a list from which you can select one of them.
If your backup files are located elsewhere, click the folder icon to the right to navigate to the storage location.



Directories Automatically Created for Restored Project Data

In any case, when you call *Restore project* the system creates three directories. It is your choice whether or not you use them:

Restore selected backup data to:

Select the components that you want restored on your system. If you want to store the data in a specific directory, select this directory. Otherwise, the data will be copied to the directories automatically created by the system.

Project files

Select this option to restore the actual *Project* data (without media).

Media files

This option differentiates between imported and captured media data.

- *Imported media (including linked files)* -
  This includes all data inserted in the *Project* by means of the *Import* or *Copy/Paste* commands. It also includes title graphics generated with TitleDeko and *Media Files* that were integrated in the *Project* using the *Copy* commands on the *Project's Media Tab*. Media files generated by means of *Consolidate* are also affected.
  In addition, files that were imported only by means of a link are backed up in separate copies.
- *Captured media* -
  This refers to the *Media Files* that were logged and captured either with the *Logging Tool* or the *File Ingest* tool. It makes no difference whether the files were saved locally or in the network (including CMS/MDC).



Media files from Version 2.55 or earlier are not compatible with the current Media Management (among other things, because of the incompatible file names) and are stored in a separate directory.

Render files

Retrieves the render files saved during *Backup*.

Restore Info

The number of files selected and the resulting memory requirements are displayed at the bottom of the dialog box.



The *OK* checkmark is disabled (grayed) if there is not enough room on the current hard disk for the selected options. In this case, delete unnecessary files or change the restore options.

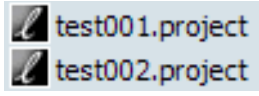
Options

- *Overwrite without warning* -
  Because existing files can also be overwritten, this option allows you to suppress the standard warning message.
- *Add media path to Media Management dialog volumes list* -
  Relates to the *Media Management Settings*: This option automatically configures the path to the restored *Media Files* (captured and/or imported) in the list of *Media Directories*.
  It saves you the trouble of assigning it manually.
  Also see *"Media Management Settings"* on page 332.

Reference sets

This option serves the same function here as for *Project Backup* (see *page 229*).

Opening and Editing a Restored Project



Note that a restored *Project* will not necessarily be located in the usual directory. Its location depends on the restore path. To open the *Project*, always look for the entry with the small symbol in front of its name as shown here:

If you performed a standard backup/restore, your *Project* will be located in the.._*Restore* folder.

The Object

This section tells you everything you need to know about objects in Avid Liquid:

Basics
Objects defined, basic methods for working with objects, etc. *page 234*

Objects in the Project
Views; sorting; re-linking *page 238*

Search for and find objects *page 250*

View objects: Clip Viewer *page 263*

Object properties
Find and edit object information *page 281*

Storyboarding
Outline a film Sequence *page 287*

Batch Digitize
Digitize clips automatically *page 292*

Consolidate
Reduce clips and Media Files *page 300*

Condense
Combine all the clips of a Sequence *page 304*

ClipSync
Synchronizing selected objects *page 306*

Automatic Scene Detection
Turn one into many *page 309*

Media Management
Working with media files *page 313*.

Basics

What Are Objects?

In a *Project*, you will primarily be working with objects. “Object” is the most general word for items contained in a *Project* such as audio clips, video clips, Sequences, graphics, titles, subtitles, opening credits, closing credits, effects, animations, etc. *Racks* and *Rack Folders* are also objects, as are *Shortcuts* and copies.

Objects, Shortcuts, Copies and Media Files

“Objects” refer to items contained in a *Project*, such as video clips, audio clips, etc. Objects comprise one or more files on the hard disk. These files are called “Media Files.”

If you have digitized, for example, a clip with a *Video Source Track* and two synchronous *Audio Source Tracks*, this is considered as one object made up of three *Media Files* on the hard disk (one video file and two audio files). However, if you ungroup (disband) the *Video* and *Audio Source Tracks* on the *Timeline*, you end up with three objects.

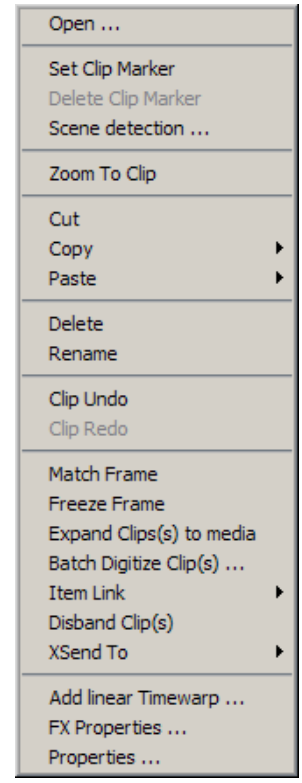
In contrast to an object, a *Media File* cannot be modified - only created or deleted. If you want to trim a video clip, the *Media File* remains unchanged since trimming a clip only involves changing the mark-in and mark-out points to that part of the object you want to work with.

In the *Project* module you can also create copies of objects and define object shortcuts:

- *Copy*
  A “copy” is completely separate from the original object. If you edit a copy, the original object is not affected. Every object you place on the *Timeline* is a copy. If you trim the clip, the object in the *Project* remains unchanged.
  Copies in the *Project* are used to create different clips from the same *Media File* or to create own effects starting with the copy of a default effect.
- *Shortcut*
  A “shortcut” is linked to the original object. If you edit an original object, the *Shortcut* is also changed and vice versa.
  Shortcuts are mostly used to get quicker access to the clip. For example, shortcuts on the desktop give you instant access to several clips which are stored in different *Racks*.

Object Shortcut Menus

Each object in Avid Liquid has its own shortcut menu containing functions that relate to the particular object type. Some functions, however, are available for all objects.



Object shortcut menu (Clip)

Grab Picons

Use *Grab Picons* to update a clip's *Picons* at the mark-in and mark-out. For automatic update of all *Picons* in a *Project*, see "*Project Properties*" on page 222.

Cut/Copy/Paste

- Use *Cut* to delete a selected object or folder from its current position.
- Use *Copy* to create a copy of an object; then use *Paste* to re-insert it somewhere else.
- Use *Paste* to insert a "cut" or copied object somewhere else (for example, in a different *Rack*).

Copying, cutting and pasting can also be done with the drag&drop function. To move objects, even several at once, drag them from *Rack* to *Rack*. To copy objects, CTRL+drag them (a small plus symbol appears next to the mouse pointer).

Creating a Shortcut

1 Right-click the object. In the shortcut menu that appears, select *Create Shortcut*.

2 The system generates the shortcut below the original object and assigns it the same name; however, the object icon now has a small arrow.



You can also create a *shortcut* to an object using the *drag&drop* function: Drag the object to the desktop.

Deleting Objects

For a detailed description of how to delete objects, refer to the section on media management (*"Deleting Clips/Objects and Media Files"* on page 344).

Renaming Objects

Use *Rename* to rename an object.

1 To do so, right-click the object. In the shortcut menu that appears, click *Rename*. The object's name field can now be edited.

2 Enter a new name and confirm with ENTER.



You can also edit an object name by delayed double-clicking the name and then entering a new name, which is the same way as used in MS Windows.

Undo/Redo

Click *Undo* to reverse the last action performed. Click *Redo* to reverse the last *Undo* action performed. *Undo* and *Redo* apply to changes made directly to the object (for example, renaming), but not if you have moved it from *Rack* to *Rack*, deleted it, etc.

Preview

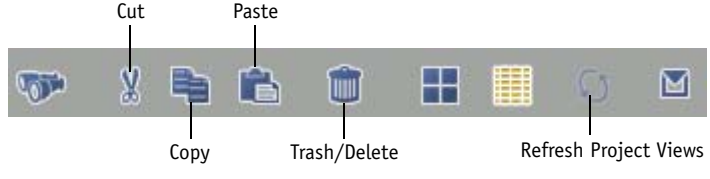
Click one or several clips in the *Rack* and select the function *Preview > Selected* from the *Rack* shortcut menu. If you wish to view all clips in the *Rack*, click *Preview > All In Rack*. The clips are now loaded in the *Clip Viewer* in the indicated given order and played back seamlessly as soon as you click *Play* (*page 263*).

Scene Detection

"Automatic Scene Detection (Clip Viewer)" on page 309.

Tools

You can also call the *Cut, Copy, Paste* and *Delete* functions from the *Project* toolbar by clicking the particular button.



Project toolbar

Objects in the Project

This section provides information on the interplay between *Project*s and objects:

Object views *page 238*

Selecting objects *page 247*

Sorting and arranging objects *page 247*

Verify imported media *page 249*

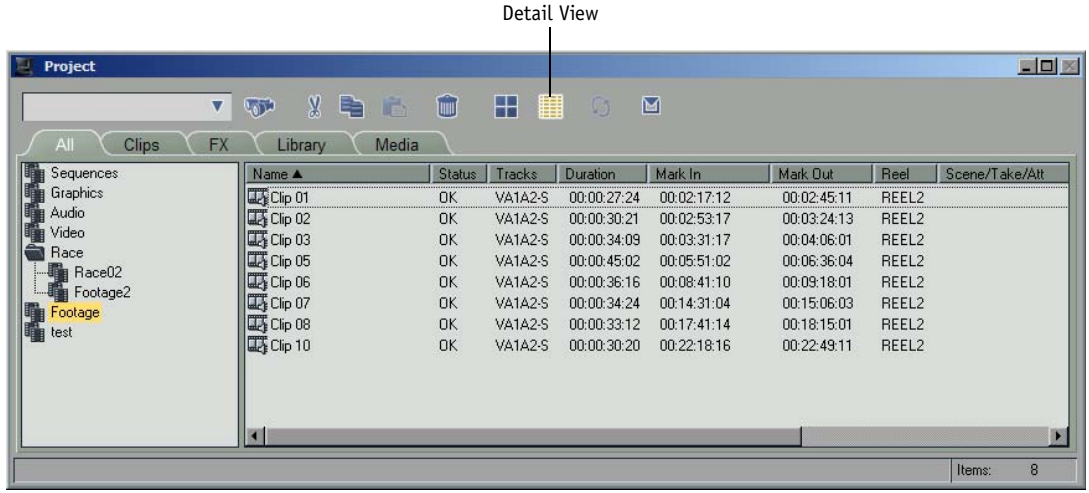
Views

Avid Liquid makes a distinction between the *Detail View* (list) and the *Picon View* (images). This results in a number of variations and editing options.

If you and other users are editing a *Project* simultaneously and you do not see certain clips in the *Project,* use the *Refresh Project Views* command ("*Shared Projects*" on page 196).

Detail View

The screenshot below shows the *Project* window with a few *Racks* and *Rack Folder*s. One *Rack* in the list is selected. It contains several clips, displayed in alphanumeric form in the content area on the right, along with their mark-ins, mark-outs, duration, *Tracks*, etc.

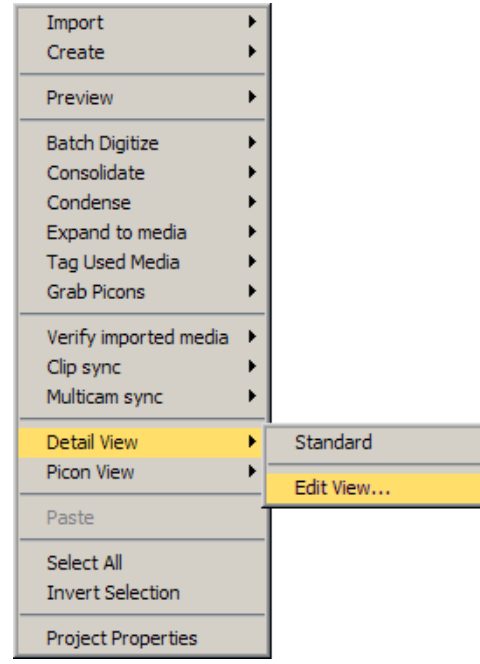


Project window with Rack in Detail View

Standard Detail View

To activate *Detail View*, right-click the *Project* window's content area or click the shortcut menu button on the right side of the toolbar. In the shortcut menu that appears, click *Detail View* > *Standard*. "*Detail*" means that information is displayed in alphanumeric form with clip names, mark-ins, mark-outs, etc.; "*Standard*" means the information is displayed with the default column settings.

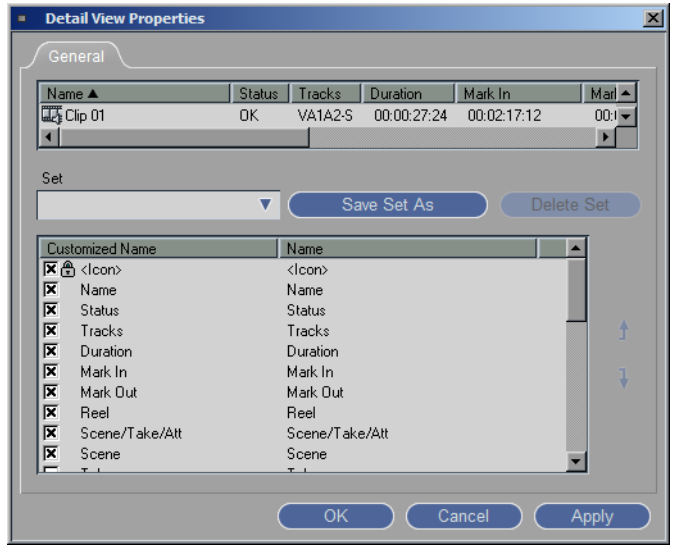
You can also activate *Detail View* by clicking its icon on the toolbar.



Rack shortcut menu (Detail View)

Edit View

To adjust the *Detail View* display, right-click the content area to open the *Rack* shortcut menu. Click *Detail View* > *Edit View* to open the *Detail View Properties* dialog box.



Properties box in Detail View

- In the list, click the check boxes of those items you want to display in detail view. The area at the top of the dialog box shows how the *Detail View* display looks. You can also use this area to change column width. To do so, drag the column divisions to the required position.
  You can also adjust column width directly in the *Rack*, however, these changes will not be saved.
- Slow double-click any column heading name in the *Customized Name* column to edit it.
- To change the order of the columns, click the column heading name of the column you want to move.



- Repeatedly click the arrow buttons to the right of the scroll bar to move the column heading up or down in the list.



Save Sets

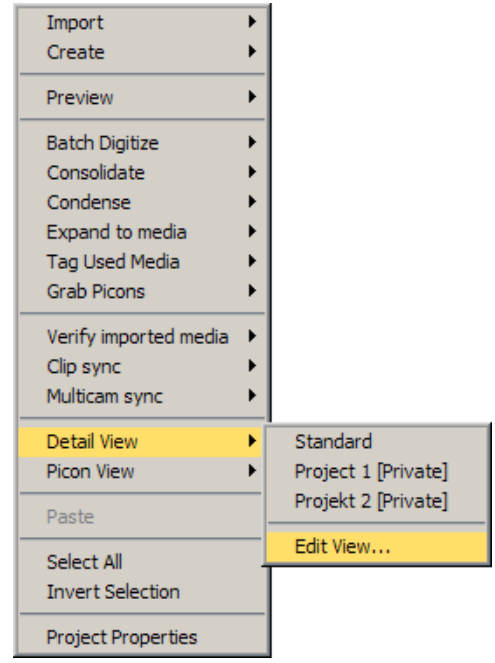
To save a certain configuration as a set, click the *Save Set As* button and enter a set name. To load a previously saved set, click the *Arrow* icon on the right of the *Set* field and click a set in the drop-down list that appears. Click *Delete* to delete sets.

Object icons must always appear at the beginning of a line, i.e. they cannot be moved. They can, however, be made invisible by un-checking the <*Icons*> box.

For a list of icons, see *"Object Icons (Detail View)"* on page 244.

Standard and Individual Settings

Individual sets can also be activated with the shortcut menu. The default (*Standard*) settings are always available.

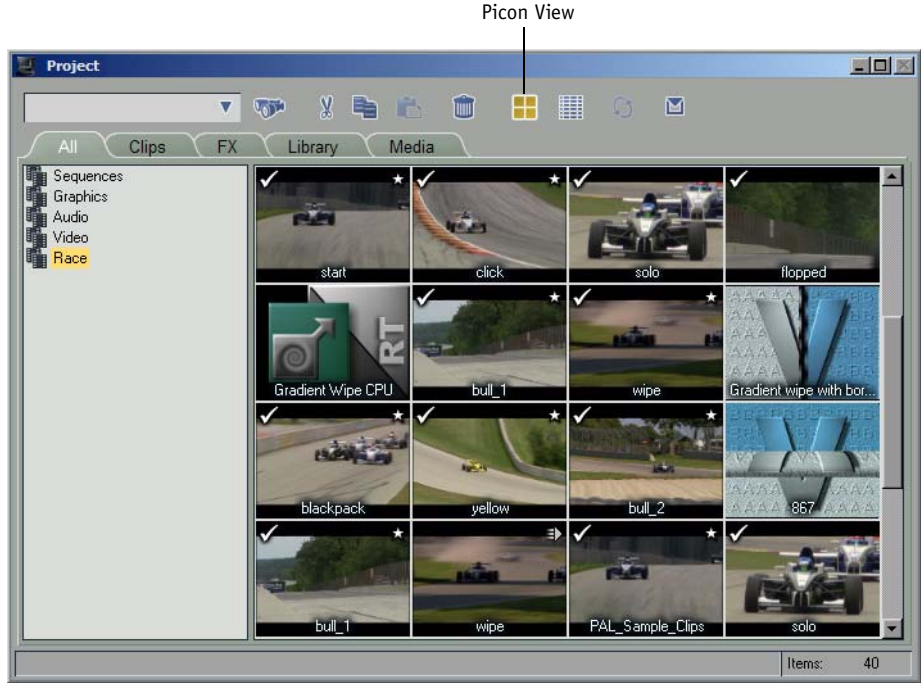


Detail View settings in Rack shortcut menu

Picon View



Use *Picon View* to display objects as miniature images (*Picons*). In the case of a video clip, the first frame (mark-in) generally appears. If you define a specific index image (during *Logging* or in the *Clip Viewer*), this image will appear. Graphics and titles are also displayed *en miniature*.
The *Grab Picons* function in the *Rack* shortcut menu updates *Picons* at the current positions of mark-in or clip-in and clip-out or mark-out, respectively.

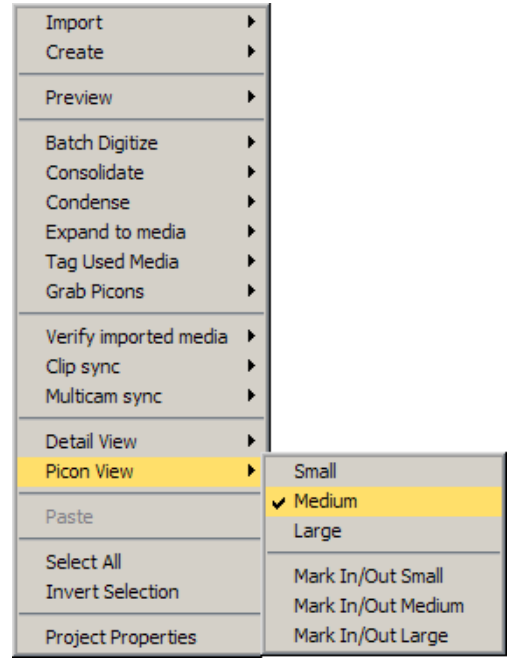


Project window with Rack in Picon view



The contents of only one *Rack* at a time can be displayed in the contents area of the *Project* window. Click the tabs or the *Racks* in the tree area for a quick overview of the *Racks* in your *Project*.

Click *Small, Medium* or *Large* to specify *Picon* size. How many objects will be visible, depends on the size of the window.



Clip names also appear in *Picon View.* If you prefer to display take and scene numbers (for example, if you are working with a screenplay), click the appropriate option under *Shortcut Menu* > *Project Properties* (see also *Project Properties* on page 222).

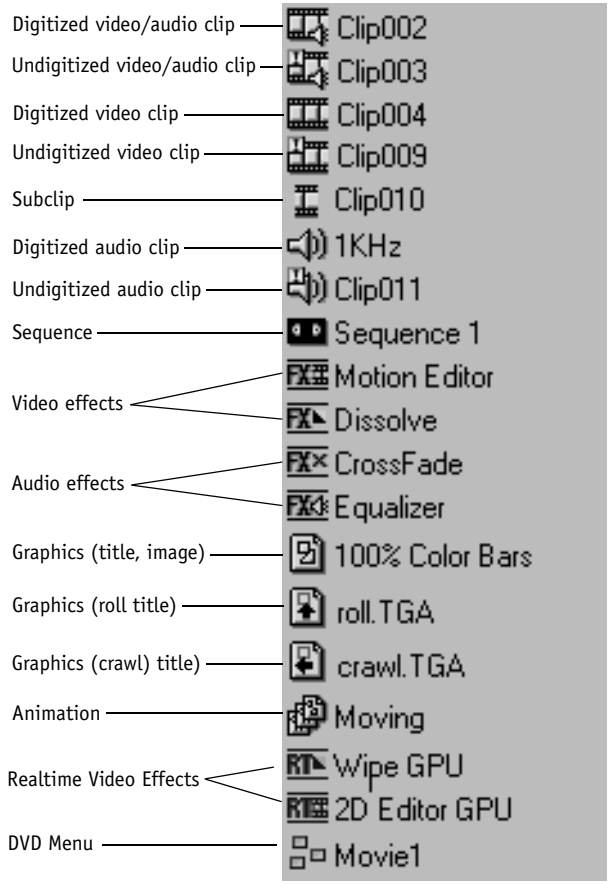
Picon View: Mark-In/-Out

To display both the mark-in *Picon* and mark-out *Picon*, under *Picon View,* click the appropriate option, depending on what size you want to display *Picons*.

In this mode, you will see fewer clips within the same window size.

Object Icons (Detail View)

In default *Detail View*, each line is preceded by an icon, representing object type and status.



Object icons in Avid Liquid

Object Icons (Picon View)

Icons indicating the object status are also used in the *Picon View*:

Effects Applied to Clips (Gray Star)

If you applied one or more effects to a clip, a grey star appears in the *Picon*:



Picon with effect and Attributes symbols (left); Media File unavailable (right)

Media File Not Available (Exclamation Mark)

The exclamation point in the upper left-hand corner indicates that a clip's *Media File* is not available. This symbol corresponds to the exclamation point in *Detail View* for undigitized video/ audio clips.
In *Detail View* you can display the *Media Online* column. *Yes* or *No* indicates the media status of an object. See also *"Edit View"* on page 240.

Modified Clip Attributes (Blue Star)

A small blue star in the top right-hand corner identifies clips whose

- *Playback Level* (*page 285*) and/or
- *Color Correction Attributes* (*Primary Color Correction*)

have been changed. You can access these modifications via the extended dialog box in the *Clip Viewer.*
To deactivate the modified attributes, see the section on *Attributes*, *"FX Properties"* on page 286.

Clip Being Used in the Current Sequence (Checkmark)

If so, the *Picon* will display a checkmark in its upper left corner. This option can be enabled in the *Project Properties* dialog (*page 222*).



In *Detail View* it says *Yes* in the *Used* column position. You may have to edit the view to make this column visible: see "*Edit View*" on page 240.

Timewarp Clip (Timewarp Symbol)

This symbol appears in the upper right-hand corner of clips that have been edited by means of the *Timewarp* function (linear or dynamic). In the *Detail View*, the *Comment* field contains the term *TimeWarp*.



Timewarp Clip

Select All/Invert Selection

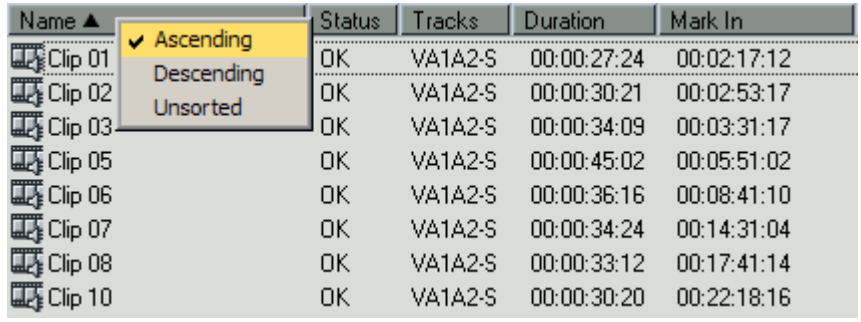
Click *Select All* in the *Rack* shortcut menu to select all objects in a *Rack*. In *Picon View*, selected *Picons* appear with a yellow frame around them; in detail view, selected items are highlighted.

CTRL+click to select individual objects.

Click *Invert Selection* to select the items not selected and vice versa. This is useful if you want to select nearly all objects in a *Rack*, except for a few. In this case, first click the objects you do not want and then click *Invert Selection*.

Sorting Objects

Objects in a *Rack* can be displayed in certain orders, regardless of whether *Picon* or *Detail View* is active. However, to actually sort items, you have to switch to *Detail View*:



Sorting clips according to ascending alphanumeric order

Sorting Using the Shortcut Menu

1 Right-click the heading of the column you want to sort.

2 In the shortcut menu that appears, click the required sorting method:
Ascending (0 to 9, A to Z),
Descending (Z to A, 9 to 0), or
Unsorted (leave in present order).

Sorting Using the Arrow Icon

Alternatively, you can also repeatedly click the heading of the column you want to sort, thereby toggling between the three sorting options, represented by the different arrow icons that appear (or don't appear) in the heading.

- An arrow pointing downwards represents ascending order,
- upwards, descending order, and
- no arrow, unsorted.

Every column can be sorted, but you can only display the information sorted based on one column at a time. In other words, you can either sort by clip name or by the mark-in point or by the mark-out point, etc. Once you have specified the sorting method for one column, the other columns are automatically rearranged accordingly.



When sorting in ascending order, Avid Liquid places numbers before letters; in descending order, letters before numbers. Although sorting functions are only available in *Detail View*, any order specified in detail view is maintained in *Picon View*. When *Batch Digitizing* (*page 292*), Avid Liquid automatically sorts in ascending order.



To rearrange clips in *Picon View*, make sure that they are - in *Detail View* - in „unsorted“ state.

Verify Imported Media

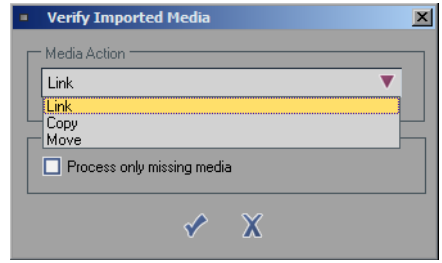
The *Verify Imported Media* function

- checks the connection between imported clips or objects in a *Rack* and matching *Media Files*,

and

- tries to restore this connection (if missing) through re-import or re-linking.

Verify Imported Media is by default performed on clips whose media is not available (exclamation mark on *Picon*). But even if your clips are *Media online*, you may copy the *Media Files* of formerly linked clips to your local directory to achieve better performance, for example.
In the *Rack* shortcut menu, click *Verify Imported Media* > *All in Rack* or *Selected*.



Verify imported Media

In the dialog choose from the list a method of restoring the connection:

- *Copy* the located *Media File* to a *Project media directory*
- *Move* the located *Media File* to a *Project media directory*
- establish a *Link* between object and *Media File* (which stays at its location).

With the option *Process only missing media* unchecked, the operation includes all clips selected or in *Rack*.

If *Verify Imported Media* cannot find a matching *Media File*, another dialog comes up. Here you can search for and select a specific file.

See also *"Media Management"* on page 313.

Searching for and Finding Objects

Finding specific objects can be difficult, especially in extensive *Project*s. Avid Liquid provides you with two tools: a *Quick Finder* and a complex *Find Tool*.

Quick Finder



Use this function (located in the upper left-hand corner of the *Project* window) to quickly find names and terms in your *Project*. Enter the term you are looking for in the field (you can also type in just part of the term). Click the *Binoculars (Quick Finder)* button.

If Avid Liquid finds partial or full matches, the objects are highlighted in their *Rack*. Click the *Binoculars* button again to continue the search.

Click the *arrow* icon to the right of the input field to open a drop-down list from which you can select and reactivate a term you searched for previously.

The *Quick Finder* function only finds objects based on the match principle and one after the other. Furthermore, the search results cannot be grouped together in one *Rack*, so this function is best used to find a specific object quickly in an extensive *Project*.

In order to find objects in a *Project* based on more complex search criteria, use the *Find Tool* (*page 251*).

Find Tool

The *Find Tool* is a powerful tool for finding practically any object in a *Project*. It offers a complex series of operators for customized searching and lets you conveniently organize results.

Opening the Find Tool *page 252*

Search criteria *page 253*

Options *page 258*

Displaying search results *page 258*

Command bar *page 260*

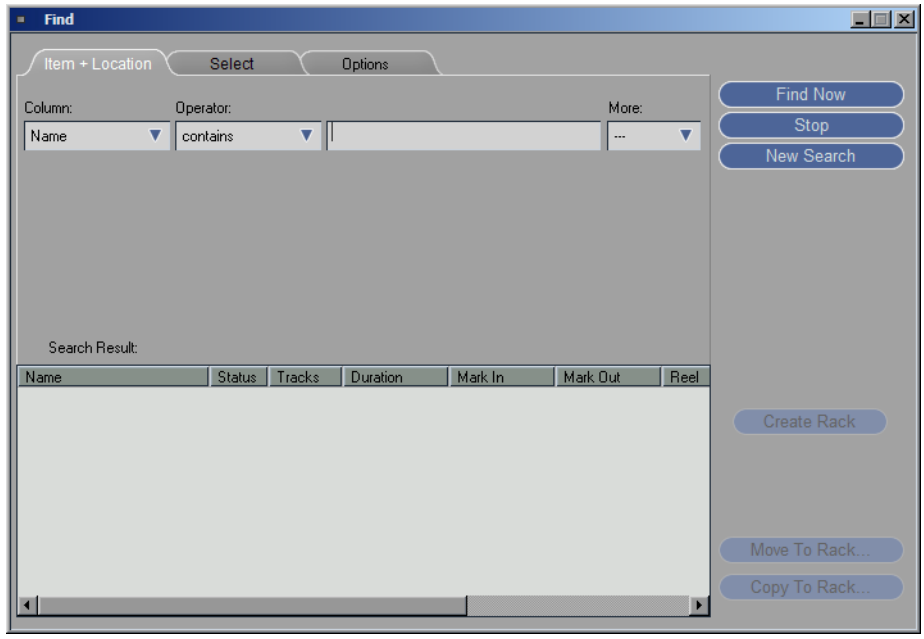
Creating a Rack *page 261*

Move to Rack *page 261*

Copy to Rack *page 262*

Open Find Tool

To use the *Find Tool*, click *Edit* > *Find*.



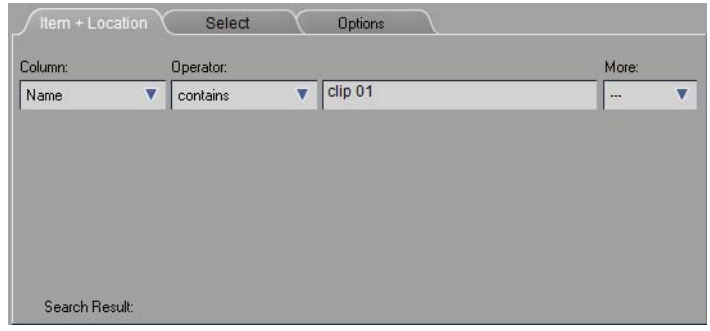
Find window

The *Find Tool* includes three tabs which are used for specifying search parameters and displaying results. On the right-hand side of the window are additional search commands and options for transferring results.

Search Criteria

The following pages show how to set tab parameters for effective searching.

Item + Location Tab



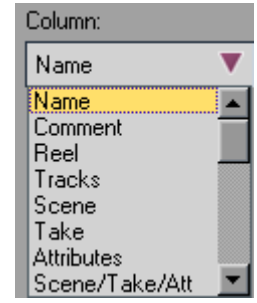
Item + Location tab with search string

Use the options in the *Item + Location* list boxes to specify the attributes of the object you want to find. To perform a search, the *Item + Location* window must contain at least one search string. A search string is made up of entries in the following boxes:

- *Column* list box
- *Operator* list box
- *Variable* field
- *More* list box

Column List Box

To begin defining the attributes for a search, first select an attribute from the drop-down *Column* list box. The box provides 18 different criteria for narrowing down a file search.

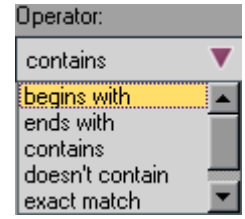


Column list box

The option you choose in the *Column* list box has a direct effect on the options available in the remaining three boxes.

Operator List Box

Use the *Operator* list box to specify criteria for further narrowing down your search.



Operator List Box

Various search routines are available in this box, for example:

- *begins with*
  Use to search for items that begin with the search term.
- *ends with*
  Use to search for items that end with search term.
- *contains*
  Use to search for items that contain the search term.
- *doesn't contain*
  Use to search for items that do not contain the search term.
- *exact match*
  Use to search for items that are completely identical to the search term.
- *doesn't match*
  Use to search for all items except those that are completely identical to the search term.

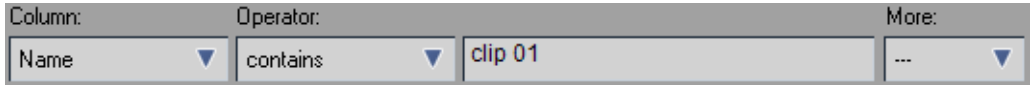


Which options appear in one box depends on what you selected in other boxes. Avid Liquid offers you logical operators to choose from.

Variable Field

What appears in this area depends on what you selected in the *Column* list box. The following boxes can appear, for example:

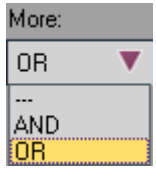
- *Text box*
  This box appears, for example, when you specify *Name* in the *Column* box and is used to search for a text string (maximum of 29 characters). Right-click the text box to open a shortcut menu with the functions *Undo, Mark* and *Copy.*



- *Tracks box*
  This box appears, for example, when you specify *Tracks* in the *Column* box and is used to define which Tracks to search.
  This is useful, for example, if you are searching for a clip, but only for video clips, not audio clips. To do so, select *Tracks* under *Column*, *contains* under *Operator* and click *V* (for video) in this box. You can also enter whether you are looking for mono (M) or stereo (S) audio clips in the select menu.



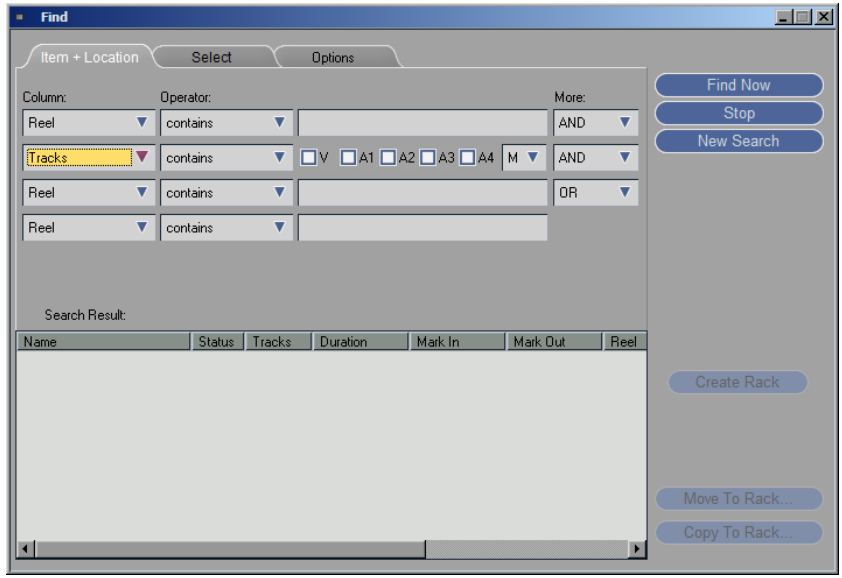
More List Box



More list box

Use the *More* list box to specify the basic search operators *AND* and *OR*. Up to four search strings can be linked with these logical operators. Every line represents a search string. The default setting is "inactive" (---), in which case the system only searches for the first string. Use the *AND* and *OR* operators to search for and link additional strings.

Whether you use *AND* or *OR* depends on to what degree you want to narrow down the results. For example, a search for a certain clip name *AND* a certain *Reel* will result in one item, that is, if a clip of the specified name is located in a *Reel* of the specified name. A search for a certain clip name *OR* a certain *Reel* will result in a list of all elements in which both terms were found independent of another.



A maximum of four strings can be linked

Select

Use the *Select* tab to specify in which areas and for what types of media you want to search. The search procedure always applies to the active *Project*. The following two options are available:

- *Racks to search in*
- *Media types to search for*



Select tab

Racks to search in

Use this function to specify which *Racks* to search through. This is especially useful if your *Project* involves many clips stored in a lot of different Racks. Click a check box to activate/deactivate it. Double-click a folder to open its substructure. If an item in a folder is selected, the check box next to the folder appears grey.

To facilitate using the *Find Tool*, it is important to name text *Racks* meaningfully and effectively organize audio and video clips and transitions (for example, sorted according to media and events).

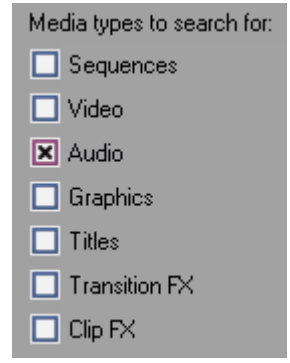
Media types to search for

Use the *Media Types to Search For* box to specify what type of media the *Find Tool* should look for.

Click the required check boxes. The logical operator between the various boxes is understood to be "*OR*".

Use this function to prevent types of media from being displayed that you are not looking for - even if they fulfill the criteria specified under *Item + Location*.

This function can be useful, for example, if you are looking for a certain video clip. If you specified *V* (for video) in the *Location* field, all filters and graphics in your *Project* will also appear. To avoid this, use this box to specify exactly what types of video data you want to find.



If you click Audio, only audio data will appear.



The options selected in this box have priority over those specified on the Item+Location tab.

Options

Use the Options tab to set the following two basic search parameters:

Case sensitive

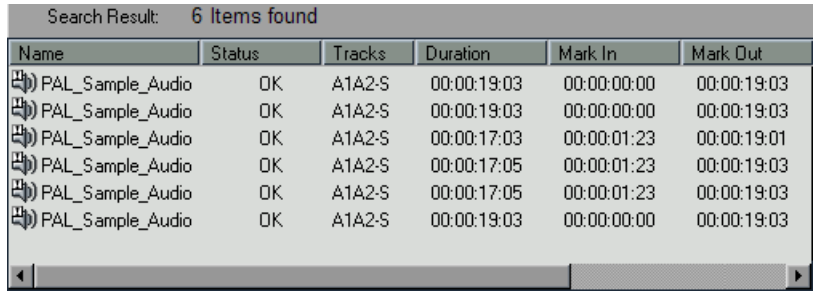
Activate this option if you want the system to consider capitalization of information in the *Text* box when searching (if box is checked, system matches capitalization; if box is not checked, system ignores capitalization).

No shortcuts

Activate this option if you want the system to ignore shortcuts. If the box is deactivated, the system will search for both original clips and crosslinks to such clips.

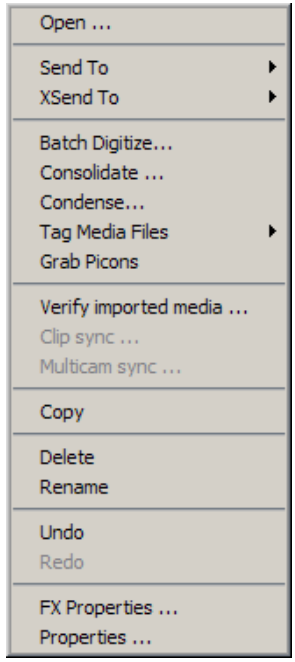
Search Result Display

This box displays the results of a given search.

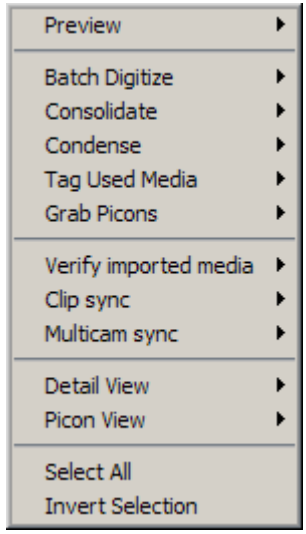


Search Result area

The *Search Result* area offers two shortcut menus.



- To open the objects shortcut menu, right-click an object in the *Search Result* area. The options provided in this menu let you open an object, transfer it to the *Timeline*, copy it etc.



- To open the *Rack* shortcut menu, right-click a free area in the *Search Result* area. The functions in this menu can apply either to all search objects or only selected objects. The options provided in this menu let you perform a preview of all selected clips, switch between object display modes, select objects etc.

Command Bar

Use the three buttons at the top of the right-hand side of the *Find* window to control the actual operation of the *Find* function.

Find Now

Once you have set all find parameters on the various tabs, click this button to begin the search.

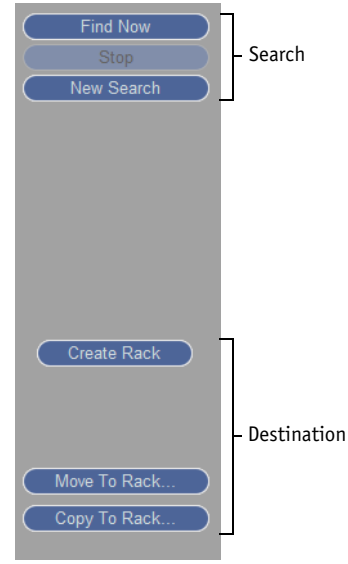
Stop

Click this button to halt a search at any time. This is useful if you realize that you have not narrowed down the possible results enough and the system is taking too long to process the command or if you already see the file you need in the *Search Result* area.

New Search

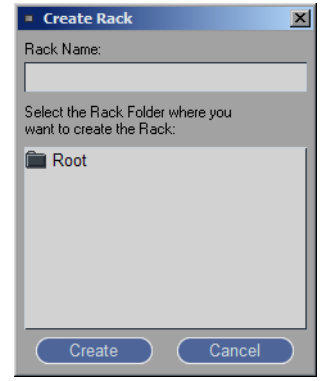
Click this button to delete all previously set search parameters and begin setting the parameters for a new search.

Use the three functions at the bottom right-hand side of the *Find* window to control *Rack* assignments of files found. You can copy either all or only selected files to an existing or new *Rack*.



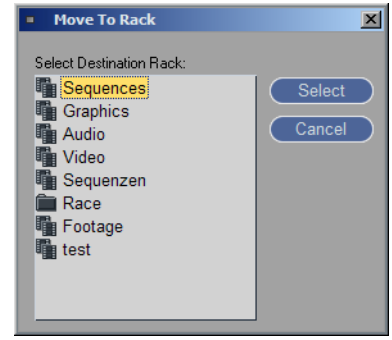
Create Rack

Use this option to create a new *Rack* into which you want to copy selected or all files. The dialog box that appears lets you specify a *Rack* name and location.



Move To Rack

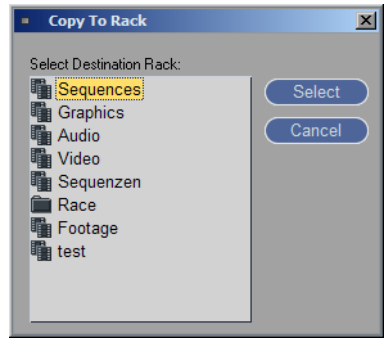
Use this function to move objects from their present *Rack* to another, already-existing *Rack* (“moved” objects are deleted from their previous *Rack*).



Use the *Move To Rack* function only if you are absolutely sure that you don’t need the objects any more at their original location.

Copy to Rack

Use this function to copy objects to another *Rack* (“copied” objects remain in their previous *Rack*).



Use this function for temporary operations with a specific selection of objects.

Viewing and Editing Objects: the Clip Viewer

Using the *Clip Viewer*, you can view (or listen to) and edit audiovisual objects. Such objects are referred to as "clips", and not just in Avid Liquid. This section covers the following topics:

Opening the Clip Viewer *page 264*

Basic Clip Viewer functions

→ Navigation using the position bar *page 265*

→ Setting the mark-in/mark-out *page 267*

→ Mark-in/mark-out and clip-in/clip-out icons *page 267*

→ Brief overview: Scrubbing *page 268*

→ Timecode fields *page 268*

→ Timecode formats *page 269*

Additional Clip Viewer functions *page 270*

→ Underscan/overscan *page 270*

→ Audio scrubbing and monitoring *page 270*

→ Setting Markers and adding comments *page 271*

→ Waveform inlayD *page 274*

→ Shuttle Playback *page 275*

→ Making a subclip *page 276*

→ Expand Clip *page 276*

→ Primary Color Correction *page 276*

→ Playback Level (audio) *page 281*

→ Auto Scene Detection *page 309*

Opening Clip Viewer

The *Clip Viewer* can be opened in one of two ways:

- Right-click an object in a *Rack* or on the desktop. Click *Open* in the shortcut menu that appears.
  or:
- Double-click the object you want to view. Provided you have selected the appropriate option in *Project Properties* (*page 222*), the *Clip Viewer* will open along with the desired object.

The image appears in the window. It can be in the form of a video inlay (when the object is a video clip) or a graphic (e.g. a test pattern). Once the *Clip Viewer* is opened, you can load further objects by double-clicking them.

The usual play control and edit buttons are located below the position bar (for a description of these buttons, refer to chapter *"Input"* on page 103).

Note that there is no *OK* button - all changes to an object are constantly saved.

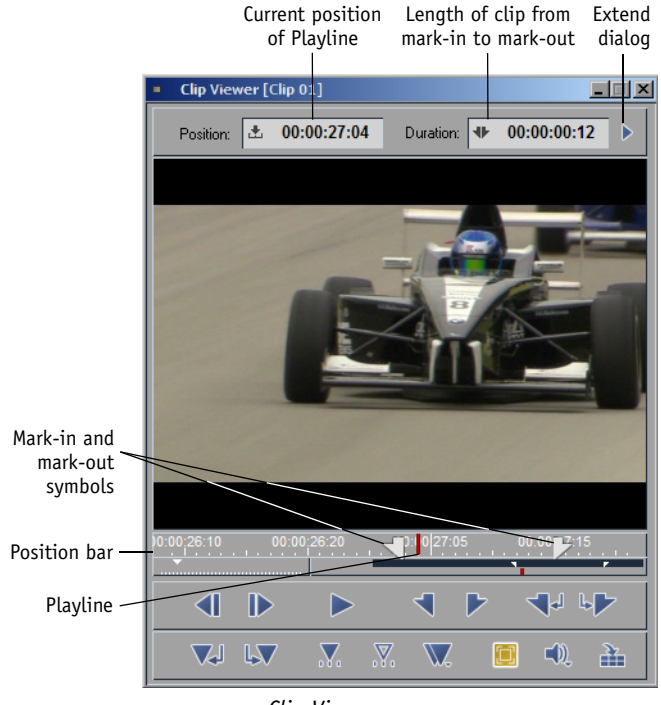


Double-clicking a *Timeline* clip opens the *Clip Viewer* with this clip. However, you cannot edit the mark-in and mark-out points because you are actually viewing a copy of the clip.
The *Color Correction* tab (for a video clip) or *Playback Level* tab (for an audio clip) is automatically displayed.



You can also configure the *Clip Viewer's* toolbars. Right-click the toolbar to open the toolbox. Here you can arrange your toolbar with drag and drop. See also *"Customizing Toolbars"* on page 990.

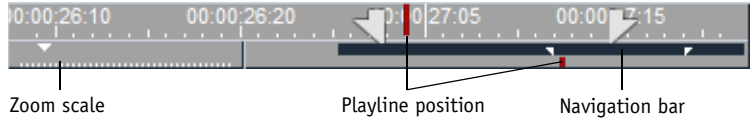
Basic Clip Viewer Functions



Clip Viewer

Navigation Using the Position Bar

The position bar is identical in the *Clip, Source and Master Viewers* and (in a miniaturized form) in *Picon Play*. Although the width of the bar is fixed, it is possible to view specific sections of a clip in the desired resolution. This makes navigation and thus finding scenes much easier, especially in long clips.



Position bar

Zoom Scale

The zoom scale allows you to change the scale of the position bar.
Use the mouse to drag the small mark triangle to the left or right. The mouse pointer then becomes a magnifying glass icon with a plus or minus sign:

- All the way to the left - greatest resolution (about seven frames along the entire width of the position bar, one frame for each line in the scale).
- All the way to the right - smallest resolution (each line on the scale represents 120 seconds).

Navigation Bar

The navigation bar represents the length of the clip with relation to the scale of the position bar.
You can use the mouse to drag the navigation bar; the results depend on the scale selected. When you drag the bar all the way to the left (right), the first (last) timecode position on the position bar is the first (last) image of the clip. The entire clip does not fit on the bar; you can view only a section. If you are unable to move the bar, it means that the entire clip appears on the position bar.
The small line below the navigation bar represents the *Playline* position within the clip. The mark-in and mark-out points (if set) are also displayed.
Functions:

- Double-click the navigation bar to toggle between two states: A full zoom-out to the mark-in/mark-out or the last zoom scale that was manually set.
- Double-click the navigation bar while pressing SHIFT to toggle between the zoom-out and clip-in/clip-out or the last zoom scale that was manually set.

Playline and Navigation Bar

When you move the navigation bar, the *Playline* retains its absolute position in the clip.

When you press SHIFT while moving the clip, the *Playline* moves with the navigation bar.

Mark-in/mark-out points and other Markers remain in their defined positions.

Set Mark-In/Mark-Out

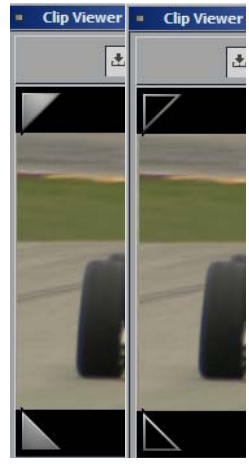
To insert a mark-in or mark-out point or to change their position, move the *Playline* to the required position and click the *Mark-In* or *Mark-Out* button.

To change the position of a mark-in or mark-out point, you can also move the mark-in and mark-out icons on the position bar while pressing ALT+drag. The mouse pointer turns into a cross. While the mark-in and mark-out points are being moved, the image in the inlay represents current position. You can also move Markers in the same way.

Press the SPACE bar to alternately stop and start playback. Press the ARROW-RIGHT and ARROW-LEFT keys to jog forward or back frame-by-frame.

If you use a mouse with a mouse wheel: turn the wheel to move the *Playline* frame by frame, press the wheel to move 10 frames at a time.
Mark-In/Mark-Out and Clip-In/Clip-Out

The icons in the corner of the inlay indicate that the *Playline* is at the mark-in or mark-out (filled triangle) of a clip or at the beginning or end of the corresponding *Media File* of a clip (outlined triangle). See *"Clip-In/Clip-Out and Mark-In/Mark-Out"* on page 112 and *"Media Management"* on page 313.



Mark-In Clip-In

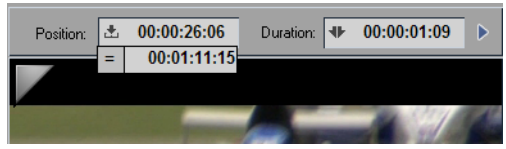
Brief Overview: Scrubbing Video

Below the image display window is a position bar which represents the length of the clip. With the *Playline* (press the left mouse button) you can move back and forth on the position bar. The process of dragging the *Playline* back and forth on the position bar is referred to as "scrubbing." During scrubbing a bracket appears next to the mouse pointer. Scrubbing also works when the mouse pointer is in the inlay so you do not always have to be right on the position bar.

Timecode Fields

The two timecode fields indicate the position of the *Playline* and the length of the clip, respectively.

Position



You can also enter a timecode value manually to move to a certain position in a clip. This can be done in one of two ways:

- Click the *Position* field. In the box that opens, enter a timecode value using the numeric keypad. Alternatively, you can also click a single digit and enter a number to replace it. When you have finished inputting a timecode, confirm with ENTER. If the timecode turns red, you have entered an impermissible value (such as 00:61:00.34). On ENTER the *Playline* jumps to the indicated position.
- Begin typing the value on the numeric keypad. The editing field automatically opens.

Duration

The Duration field can also be edited. The mark-out value can be set based on the mark-in value and duration. So the length of the clip can be defined by the mark-in value and the specified duration. Once you have entered a duration value, the system instantly sets the mark-out point. Once you have entered a value in the *Duration* field, confirm with ENTER.

To cancel an entry, press the ESC key. The display will return to the original value.

Timecode Formats

The PAL and NTSC-DF/NTSC-NDF timecode formats use different separator characters between seconds and frames. Examples:

- NTSC Non Drop Frame: 01:00:00.00 (dot)
- NTSC Drop Frame: 01:00:00,00 (comma)
- PAL: 01:00:00:00 (colon)

See also chapter “High Definition”, section Timecode Systems.

Additional Clip Viewer Functions

Underscan/Overscan



This toggle switch lets you choose between *Underscan* and *Overscan* inlay view.

- Activate *Underscan* to show the whole frame with all pixel information displayed.
- Activate *Overscan* (deactivate *Underscan*) to display a cut-off view, typical of a television picture.

The default setting is *Underscan*.

If you don't find this button in the standard toolbar of the *Clip Viewer*, open the *Customize* window (right-click in toolbar) and drag the button to the toolbar. (See also *"Customizing Toolbars"* on page 990.)

Audio Scrubbing and Monitoring

"Audio Scrubbing" in non-linear editing can be compared to what professional tape recorders are capable of, i.e. to slowly (or faster) play and rewind the tape to find a certain audio position while you're actually listening to the sound. In Avid Liquid move the *Playline* within the position bar or in the Video Inlay of the *Clip Viewer*. Avid Liquid features two types of audio scrub:

- Analog scrub -
  To activate audio scrubbing, first press the SCROLL key.
  Then right-click the *Audio Tool* icon on the task bar (bottom right). A shortcut menu is displayed from which you can toggle between analog and digital.
  Press SCROLL LOCK again to deactivate this mode.
- Digital scrub -
  Press the SCROLL LOCK key on your keyboard to activate audio scrubbing. Then right-click the *Audio Tool* icon on the task bar (bottom right). A shortcut menu is displayed from which you can toggle between analog and digital.
  Press SCROLL LOCK again to deactivate this mode.



If you use a mouse with a mouse wheel: turn the wheel to move the *Playline* frame by frame, press the wheel to move 10 frames at a time.



Activated scrubbing mode can cause *Timeline* editing to be a bit unresponsive or slower.



If the scrubbing mode was activated, you can scrub frame by frame by using the RIGHT ARROW/LEFT ARROW keys. Press the ARROW keys and the SHIFT key simultaneously to move the Playline by 10 frames each.



If `Avid Liquid Control` is connected: Activate/deactivate the *Scrubbing* mode with the SCROLL key and move the jog button or the shuttle ring. This option is supported in all modules.



Using Output Mapping for Audio Monitoring

There is a *Logical Output Bus* named *Source Viewer* that was specifically designed for audio monitoring with the *Source Viewer* and the *Clip Viewer*. See the section on *Output Mapping* in the Audio chapter, *page 827*.

Setting Markers and Adding Comments

You can set as many *Markers* as you like on the position bar and attach a comment to each one.

Setting and Deleting Markers





- Setting -
  Move the *Playline* to the *Marker* position and click the *Set Marker* function. The *Marker* icon is inserted in the position bar.
- Deleting -
  Position the *Playline* directly on a *Marker* in order to delete it using the *Delete Marker* function. You can select the *Marker* more easily using the *Goto next/previous Marker* and *Goto next/previous event* functions. (See also "*Button Navigation*" on page 383.)

Attach comment

1 Set a *Marker*.

2 Double-click a *Marker* to open its comment box.

3 Enter a text.

4 Confirm with *OK* or press the ENTER key.



Set Markers and add comments

Display attached comments

To display the entered information, including the timecode data of the given position, rest the mouse pointer on a *Marker* for about a second (comment appears automatically) or double-click the *Marker* to open the comment box.

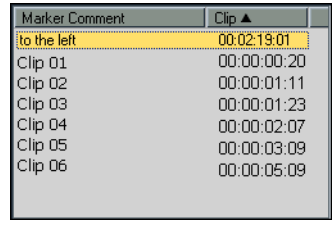
Marker comments in clips are transferred to the *Timeline* and can be accessed there in the same way.

GoTo Marker List



Click this button to open a window with a list of all *Markers* and comments for a clip. Click a given entry to move the *Playline* to this position in the clip and display the corresponding image in the inlay.

If you don't find this button in the standard toolbar of the *Clip Viewer*, open the *Customize* window (right-click in toolbar) and drag the button to the toolbar (*page 990*).



List of clip Markers

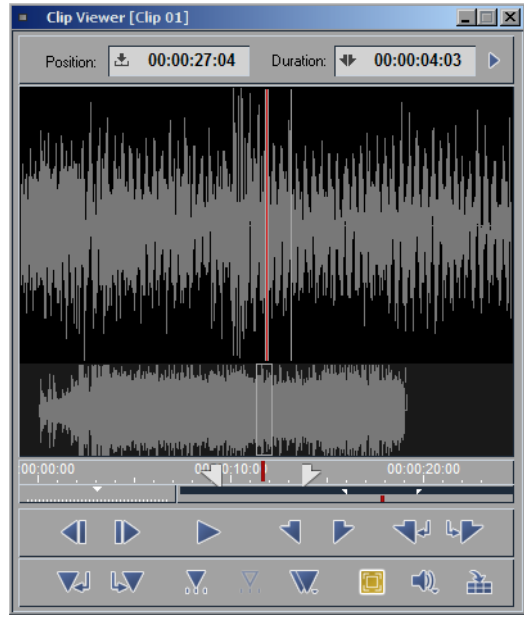
- *Marker Comment* - contains a *Marker* comment created by the user. To enter a comment, double-click the *Marker* and type in information in the field that appears.
- *Clip* - shows the timecode position of a *Marker* on a clip.

Right click in the *Marker* window to display a shortcut menu containing the following entries:

- *GoTo Marker* - Moves the *Playline* to the selected *Marker*, without closing the window in the process (as it does when you click the Marker entry).
- *Clear Selected Marker* - Deletes selected *Marker*.
- *Clear All Markers* - Deletes all *Markers*.

Waveform Inlay

If you are editing an audio-only clip in the *Clip Viewer*, the waveform of the clip is displayed in the inlay window:



Waveform Inlay

The illustration shows a mono clip. The two lines of the *Playline* encircle an image frame. The lower area shows the same *Track* in larger scale. The section above is indicated by a rectangular frame. You can mouse-scrub in the lower and upper waveform.

To change the dimension of the rectangular frame, use CTRL-ARROW-UP or DOWN.

The *Waveform Inlay* cannot display more than two *Source Tracks* at once. Use the option *Audio Source Tracks* to select the *Source Tracks* to be displayed.

If you want to edit the *Audio Source Tracks* for a video clip in the *Waveform Inlay*, first deactivate Video in the object *Properties* dialog box for the relevant clip (*page 281*).

The *Waveform Inlay* of audio clips reflects their individual *Playback Level* settings. A very low volume audio clip, for example, appears in the *Waveform Inlay* with an accordingly "flattened" waveform.

Shuttle Playback (JKL)

The *Shuttle Playback* function is available for fast or slow reverse and forward playback of video and audio. This function is available in the *Clip Viewer* (as well as in the *Source Viewer*) in two different speeds:

- 7 and 15 frames per second (slow *Shuttle Playback*; forward/reverse for NTSC; for PAL: 6 and 12)
- 30, 60, 90, and 150 frames per second (fast *Shuttle Playback;* forward/reverse for NTSC; for PAL: 25,50,75,125)

The tool icons of the *Shuttle Playback* can be found in the *Toolbox*. You can include them in your customized software interface (*page 990*).

Enable Shuttle Playback

To enable *Shuttle Playback*, click one of the icons indicated below. Click again (or press a key) to activate the next higher or lower level. Clicking the opposite icon results in stepwise acceleration or deceleration. It is moved to the opposite direction at 30 or 7 frames (NTSC).

Shuttle Playback (fast)



Allows you to switch through a playing speed of 30, 60, 90 and 150 frames per second (NTSC, forward/reverse). PAL: 25, 50, 75, and 125.

Shuttle Playback (slow)



Allows you to switch through a playing speed of 7 and 15 frames per second (NTSC, forward/reverse). PAL: 6, 12.

The *Shuttle* tools are assigned to the following keys in the standard keyboard layout:

- J - Fast reverse playback
- K - Stop
- L - Fast forward playback
- SHIFT-J - slow reverse
- SHIFT-L - slow forward

Make Subclip



Click this button to create a *Subclip* from a given clip, defined by the position of the mark-in and mark-out.

- This function is particularly useful when you want to isolate several different scenes and takes from a long clip.
- Every new *Subclip* is saved in the *Rack*.
- The term "sub" only defines the relationship of these clips to the original clip and its *Media Files*. In the *Project* window and on the *Timeline*, they are handled in the same way as any other clip. *Subclips* appear in *Racks* with the same name as their original clip, but have a *Subclip* icon (*page 244*).
- *Sub Clips* will be automatically scaled to their duration in the viewers, so you don't have to deal with the length of the *Media File*.

If you don't find this button in the standard toolbar of the *Clip Viewer*, open the *Customize* window (right-click in toolbar) and drag the button to the toolbar. (See also *"Customizing Toolbars"* on page 990.)

Expand Clip (To Available Media)



Expand Clip makes the *media file* of the clip completely available for trimming the clip in the *Clip Viewer*.

A clip can be trimmed to its clip-in and clip-out points, but not beyond. However, with a subclip, by definition, there is digitized material beyond these points available. *Expand Clip* lifts the initial limitation of the clip by expanding the clip's boundaries to the *media file's* clip-in and clip-out.

See also *Restrict Subclips to Mark-In/Out* on *page 223*.

Primary Color Correction, Playback Level and Scene Detection



Avid Liquid/Avid Liquid Chrome HD: Color correction in the *Clip Viewer* is a variant of the software-based realtime effects.

Primary color correction in the *Clip Viewer* is identical to primary color correction in the *Color Correction Editor* only with regard to its mode of operation. The corrections are separate applications that have no effect on one another.

Color Correction settings and the (audio) *Playback Level* are object *Attributes*. To work with these *Attributes*, load a clip in the *Clip Viewer* and open the extended dialog box using the small arrow to the right of the *Duration* timecode field.

The *Active* checkbox lets you temporarily deactivate or reactivate *Attributes*. Also see *"Tab: Special"* on page 285 and *"FX Properties"* on page 286.

You can also double-click a *Timeline* clip to open the *Clip Viewer* with an extended dialog box.

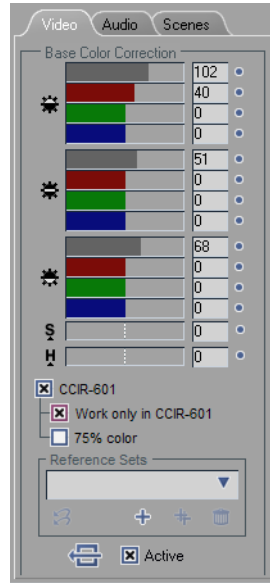
Video tab *page 277*

Audio tab (Playback level) *page 281*

Scene tab *page 309*

Video Tab (Primary Real Time Color Correction)

This tab contains the functions for primary color correction. The correction works non-destructive, meaning that its attributes are saved with the clip metadata and used in real time for playing back the digitized material.



Color Correction

Shadows, Midtones, Highlights Black, Gamma, Gain

Color Correction can be applied in measured doses in three graduated luminance areas:



- Shadows (black, pedestal)



- Midtones (gamma)



- Highlights (gain, lift, white value)

By selecting an area, you can perform selective color corrections. In each of these areas, you can control the red, green and blue color channels and the brightness (luminance - gray bar).

Hue and Saturation

These two functions affect the entire image.



- *Hue* -
  With this function you travel once around the entire color wheel either clockwise or counter-clockwise (*"Color wheel and color vectors (vectorscope view)"* on page 280).
  To view the effect, try applying this function to the color bars test image. Each color gradually changes to the color adjacent to it in the color wheel.
  This function is especially important in the NTSC standard because it can be used to balance the color shifts typical of NTSC.
  Value range: +/- 255.



- *Saturation* -
  This function adjusts the colorfulness of the image from achromatic (black-and-white, completely de-saturated) to very, very colorful (over-saturated).
  Value range: +/- 255.

Using Color Correction

Color Correction is a primary color correction (as opposed to secondary or selective color correction). It is clip-based, meaning that modifications apply from a mark-in to a mark-out (no *Key Frames*).

See also *"Primary Color Correction"* on page 752.



The *Restore to Default* button shown here resets all the parameters to zero.

Red, green, blue and brightness (luminance) can be controlled separately. Nevertheless, a change in a color channel also causes a change in luminance. Proceed as follows:



1 Select *Black, Gamma* or *Gain* (shadows, midtones or highlights).

2 Drag one of the color bars or the luminance bar to the desired position or enter a value from -255 to 255. Single-click the small button next to a bar to reset it to the original value.

3 The effect is instantly visible in the video inlay.

4 A blue five-point star appears on the clip *Picon* in the *Rack* indicating that *Color Correction* attributes exist for the clip.

5 To deactivate the modified attributes, uncheck the box below; for more info see the sections on *Attributes*, "*Tab: Special*" on page 285 or "*FX Properties*" on page 286.

6 Avid Liquid displays the modifications in real-time.

CCIR 601

Limits the image output signal to the values permitted by the CCIR-601 Standard by clipping any exceeding components.

Work only in CCIR

This option confines values within the limits of CCIR 601, meaning that illegal colors cannot even be created during correction (rather than only be clipped at the output).

75% Color

Limits the C_bC_r color components to 75 percent of the maximum permissible value.

Reference Sets

With this function, you can save up to 16 different groups of settings and restore them if necessary. The parameters of all three correctors plus tools are saved.

Click the *Plus* symbol to add a set. A modified set can be saved using the double-*Plus* symbol. *Trash* deletes the current set, which you can choose form the list.

Color Correction: Basics

Color correction is a science in itself; for this reason, only an outline can be presented here.

The Color Wheel

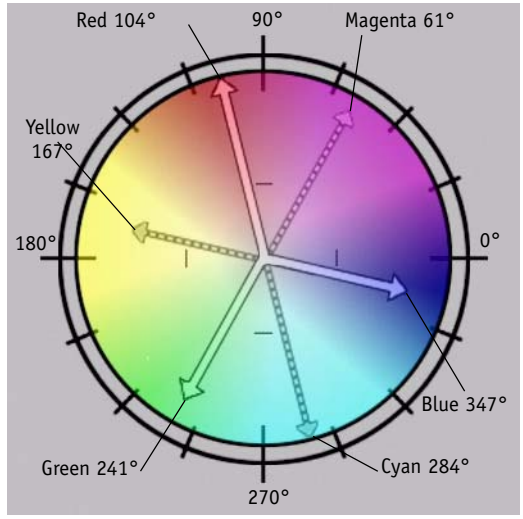
The color wheel - a physiologically inspired reflection of the phenomenon of color vision - is based on the assumption that four basic colors form two opposite pairs: red and cyan, blue and yellow.

Add to this the brightness, which ranges between white and black. These three pairs can be spread over a three-dimensional coordinate grid (color space) in which each color that can possibly be displayed is

defined by its blue or yellow component, red or green component and a brightness. In color television technology, the opposite color pairs are replaced by the color difference signals R-Y (C_r,U) and B-Y (C_b, V). The luminance signal Y forms the third coordinate.
The basic colors red, green and blue and the mixed colors magenta (violet), cyan and yellow that lie in between are points (color signal locuses) within this wheel. Thus the color phenomenon is also displayed in the vectorscope (the use of this measuring device for color manipulation is highly recommended).

When examining a color bar in the vectorscope, each of the colors named above is represented by a glowing dot at a specific location of the screen (like the tip of an arrow; see figure). The arrows are called vectors. With the aid of these vectors, all the possible points (= colors or hues) within the wheel can be precisely defined mathematically.

The position of a point relative to the center of the wheel affects the colorfulness (saturation) of a color; a pale blue is close to the center and a vibrant, fire-engine red is located near the wheel's periphery. A hue (red, green, blue, etc.) is an angle in the color wheel. Pure red is located at approx. 104 degrees and red-violet (magenta) at approx. 92°. Note that in the degree scale of the vectorscope, 0° is located at "3 o'clock".
Thus a color is adequately defined by the length of the vector and the angle. On this basis, color corrections are performed in the "YUV" color space.



Color wheel and color vectors (vectorscope view)

RGB Color Model

It is also possible, however, to use three bars for quantitatively displaying a hue. These bars (one red, one green, one blue) can be seen in Avid Liquid *Color Correction*. A color appears to be composed of different percentages (bar lengths) of the three basic colors RGB, apart from the pure basic colors themselves. RGB is generally specified in values from 0 to 255. Example: (0,255,0) is pure green; (0,0,0) is black; (255, 255,255) is white. Computer monitors and TV screens generate colors from "packages" of red, green and blue dots illuminated at different intensities.

Playback Level

Here you can set the volume level for an audio clip for playback (*Timeline* and/or *Source/Clip Viewer*). For more information on this function, see: *"Audio Tab"* on page 130.

Scenes Tab

See *"Automatic Scene Detection (Clip Viewer)"* on page 309.

Object Information: Properties

This dialog box contains detailed, object-specific information on, for example, the name of the *Media File*, file size, length, date last changed and where it is located.

The *FX Properties* provide additional information on objects to which video or audio effects have been applied.

Opening the object Properties box *page 282*

Customizing the object Properties box *page 283*

General elements of the object Properties box *page 283*

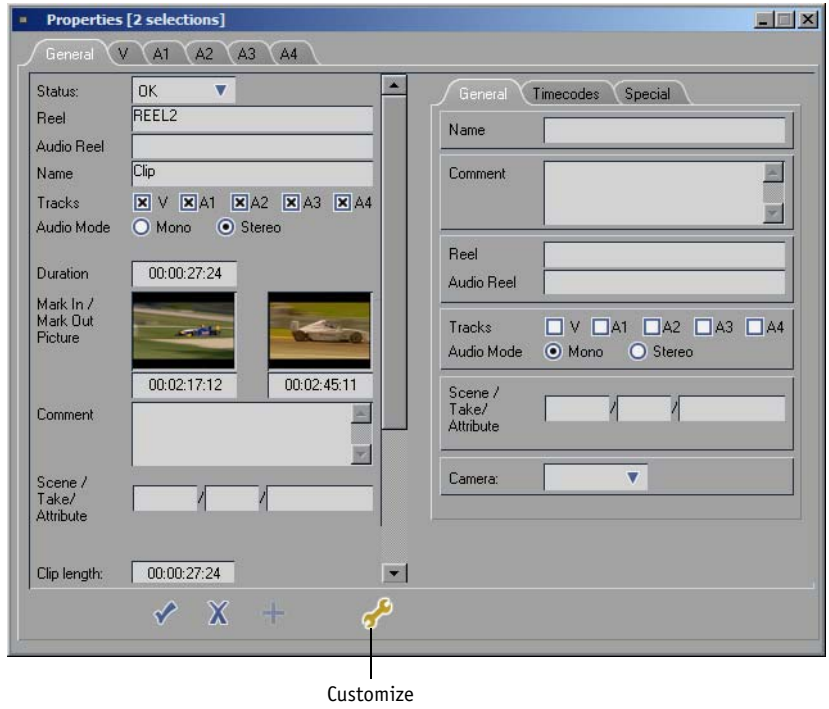
→ Edit properties of multiple clips simultaneously *page 285*

FX Properties *page 286*

Properties of a signal clip *page 164*
Setting the volume, waveform and level

Opening the Object Properties Box

Right-click an object to open its shortcut menu and click *Properties* to display the following or a similar dialog box:



Full view of Properties window with customize dialog box on right

- The *Properties* differ slightly depending on the object type.
- The *General* tab is available for all objects. See also *"General Elements of the Object Properties Box"* on page 283.
- The *V* tab is available for video clips and image objects.
  Also see *"Media Management and Object Properties"* on page 338.
- Tabs *A1* and *A2* (and in some cases, *A3* and *A4*) contain information on the audio format.
  Also see *"Media Management and Object Properties"* on page 338.

You can also customize this dialog box to meet your particular needs. This procedure is described in the following section.

Customizing the Object Properties Box



1 Click the wrench icon to open a field containing three tabs: *General, Timecodes* and *Special*.

2 Drag the elements you want to include in the dialog box from the appropriate tab to the required position. The position of existing buttons is shifted to make way for the added tools. Remove any elements by dragging them to a tab or the desktop. The mouse pointer turns into a trashcan symbol when an element is in an area in which it can be removed.
The *Customize* dialog box has to be open to move elements within the *Properties* dialog box.

3 When you have finished, click the *Customize* button again. The new settings are now used for all *Racks* in the *Project* and saved in the user profile (*page 985*).

General Elements of the Object Properties Box

The customize elements are distributed among three tabs:

Tab: General

- *Name* -
  Name of object appears initially. This can be the name automatically assigned by the system, for instance, during logging (see also *Clip Tab: Naming and Numbering Clips* on page 129) or a name you created. You can use this name or enter any name of your choice.
- *Comment* -
  Use to enter comments regarding the object.
- *Reel* -
  For a video or audio clip: Name or number of the object's source tape/medium. You cannot edit this field (see also *Media Management* on page 313).
- *Audio Reel* -
  The name of the *Reel* where the clip's audio originated. Video and audio clips from different sources can be synchronized using the *ClipSync* Function (*page 306*).
- *Tracks* -
  Used to specify the object's video and/or audio *Source Tracks*.
  You can regroup disbanded clips (following a *Disband Clip(s)* operation) by reactivating the original *Source Tracks* (see *page 424*).



In the *Track* field, you can deselect audio/video tracks that were previously digitized and add tracks that have not yet been digitized. Naturally, clips with source tracks added must be redigitized (if Media Management cannot match suitable *Media Files*).

- *Audio Mode* -
  Used to switch audio clips to mono or stereo. (See also *"Stereo and Mono, Panorama and Balance"* on page 801.)
- *Scene/Take/Attributes* -
  Use this option, for example, if you are creating your video based on a screenplay. You can adjust the *Project Properties* so that objects in *Picon View* are displayed either with their name or scene and take numbers (*page 222*).
- *Camera* -
  This option assigns the clip to a specific camera (see the section on multicam editing in chapter "Edit").

Tab: Timecodes

- *Duration* -
  Indicates the length of a clip between the mark-in and mark-out points. (Do not confuse with clip-in and clip-out points.)
- *Mark In / Mark Out Picture* -
  Displays the mark-in and mark-out points as *Picons*.
- *Clip Length* -
  Indicates the length of clip between the clip-in and clip-out points. This number reflects actual or maximum *Media File* duration, respectively. Mark-in and mark-out points can be different to clip-in and clip-out points.
  This field can be edited.
- *Clip In/Out* -
  Indicates the actual beginning and end of a *Media File*.
  You can edit these fields. Together with an appropriate *Reel* name, it is now possible to define clips in the *Object Properties* dialog box, since Media Managements matches *Media Files* with suitable clips.

Tab: Special

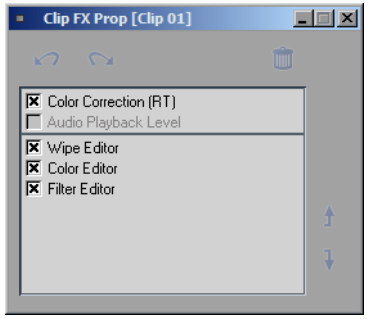
- *Created* -
  Indicates the date and time the object was created. The system clock serves as a reference.
- *Modified* -
  Indicates the date/time when the object was last changed. The system clock serves as a reference.
- *Index Picture* -
  If applicable, displays the selected index picture.
- *Parent Project* -
  For a clip that was inserted in the current *Project* by means of CTRL-C/CTRL-V or *Create Clip* (Media Management, *page 330*): The original *Project* in which this clip was created.
- *Basic Clip Attributes* -
  You can activate (check mark visible) or deactivate (no check mark) *Color Correction* and *Playback Level* settings (known as clip *Attributes*). A blue five-point star appears on or disappears from the clip *Picon*.
  See also "*FX Properties*" on page 286.
  If this checkbox is *deactivated*, these *Attributes* are just not applied.
- *Status OK/NG* -
  Clips marked with "No Good" can be excluded from the *Batch Digitize* process by activating the *Clips Marked OK* option.
- *Original Name* -
  Name of the *Media File* that the clip referenced when it was imported. The reference can change during the course of your work; this allows you to clarify sources.

Edit the properties of multiple clips simultaneously

1. Select all clips that you want to edit in a *Rack*, on the *Timeline* or on the Desktop.
2. Open *Object Properties* by right-clicking one of the selected clips.
3. Edit all relevant items, e.g. *Clip Name* or *Audio Tracks*.
4. Confirm the modifications: click the checkmark or the *Plus*(+) sign.

Properties which cannot be edited are grayed out.

FX Properties



FX Properties provide information on and access to the effects applied to an object. You can activate or deactivate the effect parameters and clip attributes.
The effect editors are listed below the horizontal line and the attributes are listed above it.

- Activating and deactivating parameters and attributes: Click the appropriate checkboxes. Double-click an entry to open the *Effect Editor* or *Clip Viewer.*
  The effects are not deleted; they are just not applied. This allows you, for example, to prevent rendering.
  The colored line on the upper edge of the *Timeline* clip (indicating the effects and attributes applied) appears interrupted if effects or parameters are deactivated.
  For *Project* clips, a black and/or blue star is displayed. See also *"Object Icons (Picon View)"* on page 245.
- You can change the order in which effects are rendered. To do so, click the effect and then click the arrow buttons to move it to the required position.
- To delete an effect from the list, click it and then click the *Trash* button.
- Right-click an effect to open a shortcut menu and click *Edit* to access its *Effect Editor.*

In the case of a *Timeline* clip, you can open the *FX Properties* dialog box from the clip's shortcut menu. For more information, see "*FX Properties*" on page 425.

Preparing for Editing: Storyboarding

A storyboard is used to roughly outline the course of an editing job. Using *Picons*, you can quickly put together a *Sequence* to get a rough idea of what a film will look like. With the *Picon Play* function and *Clip Viewer*, you can view and edit clips. Afterwards you can transfer your storyboard *Sequence* for fine editing to the *Timeline* or *Source Viewer* with the *Send To Timeline* function or with drag&drop.

Storyboarding on the desktop *page 288*

Picon Play *page 289*

Shortcut menu for objects on the desktop *page 290*

Transferring storyboards (Send To) *page 291*

Storyboarding in a Rack *page 291*

Storyboarding on the Desktop

You can arrange *Picons* on the desktop in any way you like. Drag clips from a *Rack* (or *Racks*) to the desktop to begin arranging them.

The *Picons* that appear are *Shortcuts* (represented by the arrow icon in their bottom left-hand corner). This means that any changes you make to the clips also affect the clips in the *Rack* (for example, if you define new mark-in and mark-out points they will also appear changed in the original clip).



To transfer your storyboard Sequence to the *Timeline*, make sure all *Picons* are selected (yellow border), the Picons slightly overlap, with each succeeding *Picon* on top of the previous one. Avid Liquid can then recognize the order of the clips. The bottom clip is used as the first clip in the *Sequence* on the *Timeline*; the top clip, as the last. Do not click a clip somewhere in the middle of the stack, because that would change the order.



Simple storyboard

Picon Play

Picon Play is possible both in *Picon View* and in *Detail View*.

Activate Picon Play



- ALT+double-click the *Picon* or clip name.
- Double-click a clip's *Picon* (*Picon View*) or a name (*Detail View*). For this to work, you have to have selected the option *Start Picon Play* in the *Project Properties* dialog box (*page 222*).

Avid Liquid starts playing the clip in a window in *Picon* format (its size depends on the size you specified in *Picon View*). The clips plays until you click another object or on another area of the *Project* window.

Additional Picon Play Functions:

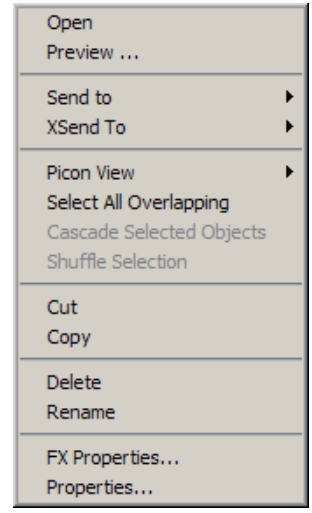
- The *Playline* shows the position in the clip being played at any given time during playback.
- To scrub, position the mouse pointer on the inlay and drag it to the left or right.
- To set mark-in and mark-out points, use the A and S keys on the keyboard (default).
- To redefine the clip, ALT+drag any existing mark-in/mark-out points. The mouse pointer turns into a cross.
- *Markers* and comments also appear, if set. To view a *Marker* comment, position the mouse pointer on the *Marker*.

Press the SPACEBAR to either start or stop playback, ESC closes the image window.

Shortcut Menu for Objects on the Desktop

Picon View can be controlled just like in a *Rack* (*page 238*) with an object's shortcut menu. Use the *Mark-In/Mark-Out* mode to see the actual images at the in and out points.

Moreover, three special functions are additionally available for desktop storyboarding:



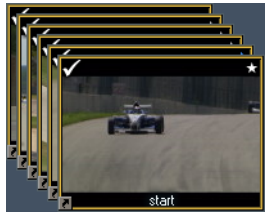
Shortcut menu

Select All Overlapping

Click an object in a series, then right-click and select this option to select all overlapping objects in the given series. If you created two or more series of overlapping clips, you have to repeat this procedure for all other series. Selected objects appear with a narrow yellow border.

You can also select objects with the mouse by dragging a frame around them or with SHIFT+click.

Cascade Selected Objects



Click this option to arrange all selected objects in a cascaded stack to create more room on the desktop.

Shuffle Selection

Click this option to view the individual objects in a cascaded stack in their defined order. Each object is displayed for about two seconds. This is useful for viewing entire clip series. Once the last object is reached, the system starts over from the beginning. To stop this procedure, click the desktop.

Transferring Storyboards (Send to)

You can also transfer a *Storyboard* (i.e. a connected series of clips) to the *Timeline* or *Source Viewer*. Select all the clips and click *Send to* > *Timeline*. The clips are then grouped (video and audio combined in one clip) and inserted (at the location of the *Playline*).

If you want to have more control over the process, proceed as follows:

1. Empty the *Timeline* ("*New Sequence*" on page 403).
2. Load one of the clips you selected to the *Source Viewer*.
3. Check the *Source Track Mapping* and drag the *V, A1* or *S* labels, etc., to the correct positions, i.e. to the places where you would like to position the video and audio clips.
4. Select *Grouped* or *Ungrouped* (= no checkmark), as appropriate, as well as *Stereo Mapping* from the shortcut menu for the first column (to the far left) before the start of the *Timeline*.
5. On the desktop, select all the storyboard clips, either by clicking *Select All Overlapping* (shortcut menu), or by dragging a lasso around them, or by clicking them while holding down the SHIFT or CTRL KEY.
6. The *Playline* should be located at the start of the *Timeline*. Now click *Send to* > *Timeline* (from the shortcut menu for any of the clips).
7. Load all of the clips to the *Timeline*.



Remember that the source mapping settings also affect the assignment of *Source Tracks* to *Timeline Tracks* (since with *Send to* > *Timeline* the selected clips are transferred to the *Timeline* via the *Source Viewer*, even if this is not apparent to the user; see "*Source Track Mapping*" on page 375).

Objects on the *Timeline* are initially linked by a hard cut, since you cannot add *Transition* effects to a storyboard *Sequence* on the desktop.

Storyboarding in a Rack

The procedure for creating a storyboard *Sequence* in a *Rack* is similar to that of using the desktop.

Use the mouse to move objects. Objects must be arranged in a certain way so that the system knows how to organize them on the *Timeline*. In *Detail View*, arrange objects from top to bottom; in *Picon View*, from left to right and from top to bottom. Click *Send To* > *Timeline* to move selected objects to the *Timeline* (same procedure as when working on the desktop).



Sorted mode must be disabled. Change briefly to the *Detail* (list) view and check whether any of the column headings contain a small triangle (pointed up or down). If yes, click this triangle until it disappears. This activates the unsorted mode. You can now rearrange the objects however you want.

Batch Digitize (Batch Capture)

Batch Digitize is the automatic digitizing of what is in many cases a large number of clips and is, therefore, usually the next step after logging (*page 140*). However, this function is also recommended for the transition from offline to online editing or for "cleaning up" *Projects*.



Clips generated by means of the *EZ Capture* function are not suitable for *Batch Digitize*. If you don't want to eliminate the possibility of subsequent batching, use the *Logging Tool* to define and digitize clips.

Call Batch Digitize *page 292*

The Batch Digitize module *page 293*

Start/Cancel Batch Digitize *page 297*

Batch Properties *page 134*

Batch Digitize and render effects *page 299*

Calling Batch Digitize

You can call *Batch Digitize* from the *Project* or from one or more clips on the *Timeline*. A remote controlled player must be connected to your system.

Batch Digitize can be applied to one or more clips, to entire *Sequences* and to clips that have been edited with the *Timewarp Editor*.

To call *Batch Digitize*, go to the *Rack* or *Sequence* containing the clips to be digitized or the *Sequence* and open either

- The clip shortcut menu (*page 235*) and then *Batch Digitize* (this clip only will be batched)

or

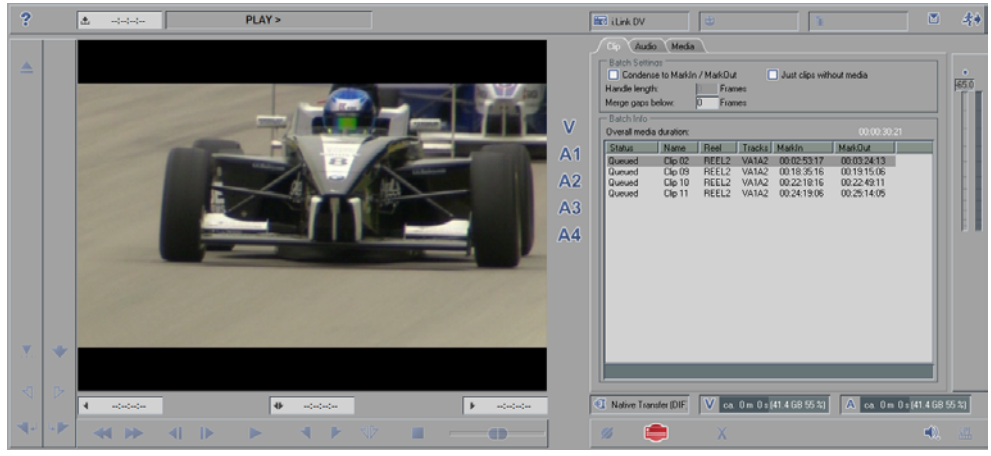
- The *Rack* shortcut menu (using the button on the top right in the *Project* toolbar or clicking in a free area of the *Rack* window).

Select *Batch Digitize* and then one of four options:

- *All In Rack* - Starts *Batch Digitize* for all the clips in a *Rack*.
- *Selected* - Starts *Batch Digitize* for all selected clips.
- *Not Digitized* - Analyzes which clips are not digitized and starts *Batch Digitize* with these clips.
- *Clips Marked OK* - Starts *Batch Digitize* with the clips whose status is set to *OK* (*page 281*). Clips that have been logged in Avid Liquid always have the *OK* status.
  This option is especially useful when using Sony ClipLink where it is already possible to assign a status of *OK* or *NG* (No Good) while recording.

The Batch Digitize Module

After the clips have been selected, the *Batch Digitize* module is displayed above the *Timeline* instead of the *Sequence Editor*.
When you call this module, the *Clip* tab is displayed in the foreground with the following segments:



The Batch Digitize Module

Batch Settings

These options affect the size and number of *Media Files* generated.

Condense to Mark-In/Out

Use this option to digitize clips from mark-in to mark-out. Otherwise clips will be digitized from clip-in to clip-out.
On first-time digitize, mark-in/mark-out and clip-in/clip-out are most probably identical. When *Use Mark-In/Out* is activated while batching a *Sequence*, only the required media data will be created. Otherwise you could end up with a lot more digitized material on your disk drives.

See also *"Condense"* on page 304.

Remember: If you plan to batch the media data of a certain *Sequence*, call up *Batch Digitize* from the *Sequence* clip's shortcut menu (you find the *Sequence* as a clip in the *Sequence Rack* of the *Project*) and check the *Use Mark-In/Out* option. Batching all original clips from the *Rack(s)* is not going to do the trick since they may have totally different mark-ins and mark-outs.

Handle Length

In the default configuration (Handle Length = 0), digitizing is performed exactly from the clip's mark-in point to its mark-out point. If you enter a value (in frames) under *Handle Length*, this will be added to both the mark-in and mark-out, i.e. the *Media File* created will be a bit longer.

Example (for NTSC): From a clip with mark-in = 00:01:00.00, mark-out = 00:02:00.00, handle length = 30 frames, a Media File is created with a length of 1:02 minutes (clip-in = 00:00:59.00, clip-out = 00:02:01.00).



Mark-in and mark-out points cannot assume values that exceed those of clip-in and clip-out points. Rule of thumb: Mark-in <= clip-in. If the media file's mark-in and clip-in points are identical, you cannot add a handle length.



Tip: If you "batched" the clips of a *Sequence* with a *Handle Length* in order to leave yourself room to trim these clips later on, expand the relevant clips before you can lengthen them (you can always shorten them). This is done by selecting *Expand Clip(s)* from the *Timeline* clip shortcut menu (also see *"Expand Clip (To Available Media)"* on page 422).

Merge Gaps below...

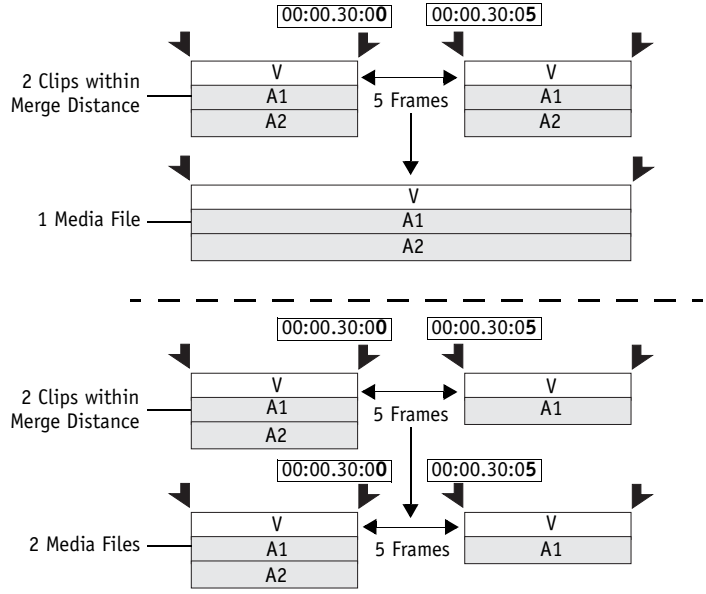
Clips that follow in very close succession on a tape can be merged into one Media File. This means that the player does not stop at the clip's mark-out (clip-out) and restart at the next mark-in (clip-in) but instead keeps running, thus avoiding any unnecessary shuttling back and forth on the part of the player. Plus, it's faster.

In the field, enter a *Distance* in frames:
If a mark-out or clip-out (first clip) and mark-in or clip-in (next clip) are within this distance (taking into account any *Handle Lengths*), a single *Media File* is created that is referenced by two or more clips.



When clips overlap (mark-in/clip-in of the later clip comes before the mark-out/clip-out of the earlier clip), the system automatically tries to merge the clips in one Media File.

Merge works only with clips of the same type; for example, if a clip with the *Source Tracks* VA1A2 follows a clip with the *Source Tracks* VA3A4, separate *Media Files* are generated. See also example illustration below.



Schematic diagram: Merge if less than... with "Distance" set to 10 Frames

Just Clips without Media

This option limits digitizing to clips that are not associated to any *Media Files*.
This options corresponds to the option found in the *Rack* shortcut menu > *Batch Digitize* > *Clips Not Yet Digitized*.

Audio Tab

On this tab, you can monitor the input level but you cannot change it.

Media Tab

On this tab, you can select the capture *Quality Rank* for the batch operation. For example, if you now want to change a *Sequence* that was edited with "offline" clips to a master-capable format by batching, select another rank here. For more information, see the Quality Rank section in chapter "High Definition".
Most users, however, should leave the default as it is.

Batch Info

This section contains information on the current batch job.

Total Duration

This field initially contains the accumulated duration of all the clips, as they were sent from the *Project* to be batched, that is, before the options *Handle Length*, *Use Mark-In/Out* or *Merge if less than...* are applied.

The actual duration of all resulting *Media Files* is calculated, and displayed, when you launch the Batch. That duration can be longer or shorter, depending on material and options selected.

Batch List

Here you find not a list of all the clips you selected for batching but rather a list of resulting *Media Files* after batching.

- Initially, all clips/resulting *Media Files* are marked Queued in the *Status* column, meaning they weren't yet processed.
- In case of merged files, the list entry carries the name of the first of the merged clips.
- Any *Handle Length* or *Merge Distance* that you may have selected (*page 294*) can change the list, which is immediately updated once you start the batch process.
- The clips/resulting *Media Files* are sorted (in an ascending order) by *Reel* and by mark-in, in order to reduce *Reel* changes and player action.

Batch Status

- The progress indicator below this field provides you with information on the overall progress of the batch operation.
- A progress indicator below the video inlay refers to the current clip being digitized/*Media File* being created.



The audio peak meters display the level being applied during digitizing. Any *Playback Levels* that were logged are not taken into account (see also *Playback Level* on page 132).

Starting/Stopping Batch Digitize

Before you begin, be sure to check the following settings:

- The *Media Format/Codec* (depending on product) selected
- Destination volumes for digitizing -
  If more than one destination volume is registered, select one from the list box.
  When necessary, *Batch Digitize* employs all volumes (disk drives) available through Media Management to complete the current batch job. See also *"Media Management Settings"* on page 332.
- Settings for the player -
  Click the player button next to the player name to open the settings dialog box (*page 117*).



The batch operation starts when you click the *Digitize* button and runs automatically following these steps:

1. First, *Batch List* and the *Duration* are updated, if applicable.
2. The system prompts you to insert a specific tape. If you haven't yet done so, insert the correct source in the player and click *OK*.
3. If all runs smoothly, one batch list entry after the other is removed from the list as *Batch Digitize* completes the job.
4. In case of successful termination the *Batch Digitize* dialog closes.
   Otherwise, see *"Error Messages"* on page 297 below.



Avid Liquid processes the clips in ascending order by mark-in points in order to avoid any unnecessary shuttling back and forth on the part of the player.

Error Messages

Clips that could not be digitized remain in the batch list, marked with one of the following error messages (*Status* column).
Note that the system proceeds to digitize all other clips on the list. There is no need to stop the batch before the batch is done. Problematic clips can be digitized after successful troubleshooting.

- *Diskspace* -
  The file(s) could not be fitted on any one of the available volumes. (See also *"Disk Full State / Change Volume"* on page 137.)
  At the end of the batch, the system goes into troubleshooting mode; see *page 298*.
- *Failed* -
  The data could not be digitized correctly, or the digitize process could not be completed.

- *Player* -
  A general player device error occurred.
  Check the device setup, cabling, existence of reference signal etc.
- *Preroll* -
  The preroll position could not be located on the tape (*Reel*).
  Most probably a wrong tape was inserted, or there is TC problem.
- *Routing* -
  The *Source Track* selection and the actual device parameters don't match (Example: the clip calls for VA1A2A3A4 but the device delivers only VA1A2).
- TC break -
  A TC break was detected and the clip(s) could therefore not be digitized.
  Note: The *TC Break Behaviour Settings* in the *Logging Tool Properties* have no influence on TC breaks detected during *Batch Digitize*.
  At the end of the batch, the system goes into troubleshooting mode.

Troubleshooting Mode

The system goes into troubleshooting mode once the batch list has been completed and at least one of the following errors has occurred:

- *TC break* -
  Assuming that clips were carefully logged, TC breaks should not occur when digitizing a batch. Due to activated *Merge if less than...* and generous *Handle Lengths*, however, TC breaks may inadvertently fall in the range of resulting *Media Files*.
- Diskspace -
  Due to the excess capacity digitized as a result of *Merge if less than...* and generous *Handle Lengths,* the system may run out of available diskspace.

In both cases the system comes up with a new batch list, now without paying heed to the *Distance* value of the *Merge...* function. Beneath the *Merge...* function a message appears, saying *Press Digitize to retry without merged media*.
Do so, and the system attempts to digitize these now un-merged clips. On successful completion the *Picons* of the clips are updated.

Stop Batch Digitize



To stop a batch operation, click the *Cancel* button. Since this does not exit the *Batch Digitize* module, you can restart the batch.

Batch Properties

The *Batch Digitize* Properties dialog box is in part identical to the *Logging Tool* Properties dialog box: *page 134*.

Batch Digitize and Render Effects

If you use *Batch Digitize* to digitize the clips of a *Sequence* that has already been edited in order, for example, to achieve a higher image quality, note the following:

- All the rendered components of this *Sequence* (clip effects, *Transitions*, slow-motion clips, accelerated clips, etc.) initially retain the quality in which they were originally rendered.
- When played, the *Sequence* accesses the existing *Media Files* of the rendered passages unless you deleted these files.
- If you deleted the render *Media Files*, Avid Liquid re-renders the appropriate passages using the current render quality (*page 539*).
- You can initiate a re-render operation manually by deleting the render files for the *Project* (*page 347*).

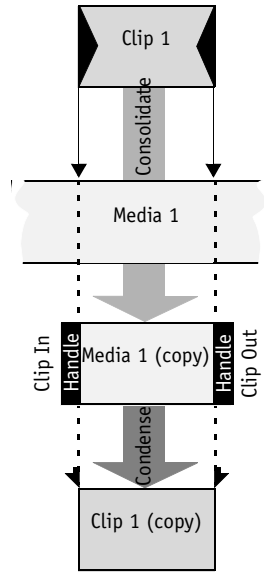
Batch Digitizing Clips with a Modified Speed (Slow-Motion, Etc.)

Media Management starts rendering these clips using the saved parameters as soon as the associated *Media Files* are available.

Consolidate

The *Consolidate* function copies the media data required by clips (individually or in a *Sequence*), thus permitting those that are no longer needed to be deleted. Once a *Sequence* has been completed you can, for example, discard the surplus raw materials in order to create more space on the storage media. *Consolidate* can also be applied to individual clips.
You also have the option of storing the consolidated clips in a *Rack* (see also *Condense* on page 304).

Consolidate is for logged clips only. It does not work with imported clips.



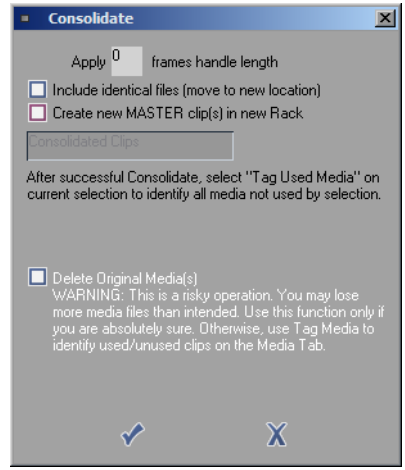
Consolidate (copy of clip is optional)

After successful *Consolidate* the "old" *Media Files* are no longer instantly accessible. That is because all consolidated clips are now referenced to consolidated (i.e. copied) *Media Files*.
As long as the "old" data has not been deleted, however, you can use *Create clip(s) from Media File(s)* to re-establish access (*page 330*).

Consolidate copies sections of selected media data, meaning you should not wait to execute this function until your storage media are almost full.
For safety's sake, the old *Media Files* are not deleted automatically unless you have expressly set this option (checkbox activated).

Calling Consolidate

The *Consolidate* function is located in the clip and *Sequence* shortcut menus (in the *Project)*, and in the *Rack* shortcut menu.



Consolidate dialog box

1 Select one or more clips, or a *Sequence*.
If you use the *Rack* shortcut menu, you can also select *Consolidate* for all the objects in the *Rack*.

2 Select *Consolidate* from the shortcut menu. When a *Sequence* is selected, all the clips in the *Sequence* are consolidated.

3 A dialog box is now displayed containing several options:

- *Handle Length* -
  This value (in frames) is added to the clip's mark-in and mark-out points in order to leave room for subsequent trimming.

Handle Length needs sufficient data on the part of the original *Media File*.

- *Create new MASTER clip(s) in new Rack* -
  If this option is activated, Avid Liquid creates a *Rack* in the *Project* containing all the clips of the *Sequence*. You can assign a name to this *Rack* in the text field provided.
  (That is basically the function of *Condense; see page 304*).

- *Include identical files (move to new location)* -
  In the default configuration, the consolidated media data is saved to the directory from which the original data was taken. However, with this option you can divert the consolidated data to a directory of your choice, which is especially useful if the original media volume is near capacity limit.
  Either select this directory in the *Media Management Settings* or create it, and identify it as the *Primary Volume* (*page 333*).
  This means that you can, for example, assemble a number of files gathered together in the network on one (local) volume.

4 If there is not enough space available in the current volume (*page 333*), an error message is displayed. In this case, determine which *Media Files* are not needed and delete them.

The *Sequence* or clip(s) can be played exactly as before. They are, however, now referenced to the newly created, consolidated *Media Files*. You can either retain or delete the "old" *Media Files* (see the next section).

Delete Original Media(s)

You can also activate the *Delete Original Media(s)* checkbox so that media files will be automatically deleted following a *Consolidate* operation. But consider the warning in the dialog box carefully because you will have no more opportunities to intervene or delete files selectively.

Consolidate and the Consequences

After *Consolidate* has been successfully applied, the number of new *Media Files* contained in the *Project Media Directory* can be no more than the number of clips contained in the consolidated *Sequence* (a single consolidated clip results in up to five *Media Files*, one video file and up to four audio files).

Avid Liquid Media Management then ensures that the clips reference these new *Media Files*, i.e. you can play them immediately in the *Clip Viewer* and on the *Timeline*. See also *"Media Management"* on page 313.

Consequently, you can now delete any "old" *Media Files* that are no longer needed. In order to avoid undesired consequences, we strongly recommend the following method to delete *Media Files*:

1. In the shortcut menu for the consolidated *Sequence*/clip(s), click *Tag used media*.
   Media Management now determines how many clips access the same Media File.
2. Open the *Media* tab in the *Project* window and under *Streamed media*, select the *Project* in which the *Consolidate* operation was executed.
   All the *Streamed Media Files* are now displayed.
3. The result of the *Tag used media* command appear in the *Tags* column as a number from 0 to..., depending on how many clips reference the same *Media File*.
4. Sort the *Tags* column by clicking the column heading (or using the shortcut menu) so that all zero (*0) Tags* are together.
   "Zero" means that the *Media File* is not used by any clip.
5. Select the *0 Tags* and then click *Delete* in the shortcut menu.

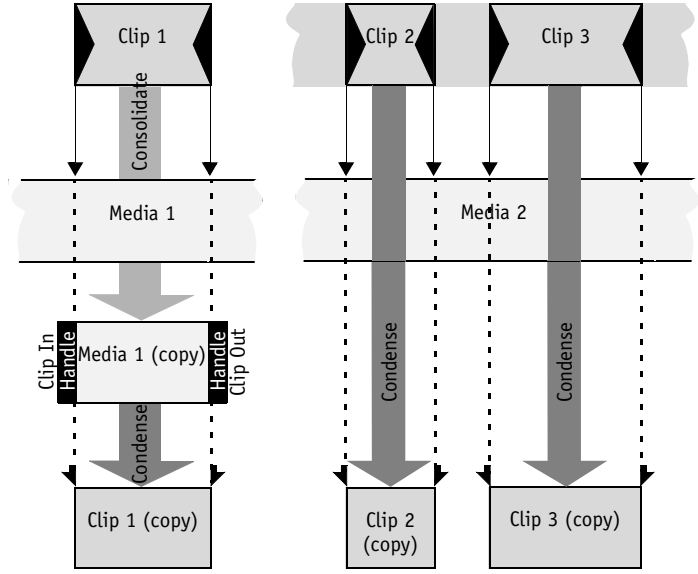


When you delete *Media Files* from the *Media* tab, the files are deleted immediately and permanently without your being asked to confirm the deletion.

Condense

The *Condense* function generates copies of clips. Associated *Media Files* are not copied (see also *Consolidate* on page 300).

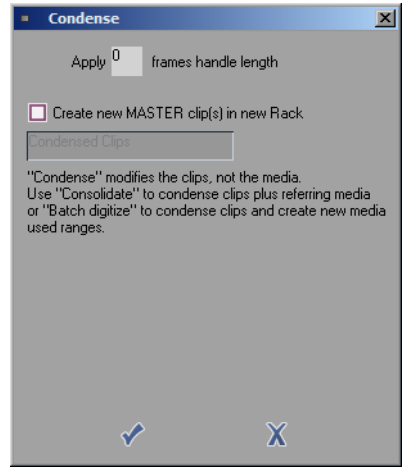
This function is used, for example, to generate the inventory of a *Sequence*. It allows you to view exactly what material and what length of material was used - a useful function if you need to create a music list or archive footage list.



Schematic diagrams comparing Consolidate (left) and Condense (right)

Calling Condense

The *Condense* function is located in the clip or *Sequence* shortcut menu in the *Project*.



Condense dialog box

1 Select one or more clips, or a *Sequence*.
If you use the *Rack* shortcut menu, you can also select *Condense* for all the objects in the *Rack*.

2 Select *Condense* from the shortcut menu.

3 A dialog is now displayed containing two options:

- *Handle Length*
  This value (in frames) is added to the clip's mark-in and mark-out points, thus creating a new clip-in or clip-out.
- *Create new MASTER clip(s) in new Rack* -
  If this option is activated, Avid Liquid creates a *Rack* in the *Project* in which all the clips created by the *Condense* operation are stored.

ClipSync

The *Rack* shortcut menu contains the *ClipSync* option that allows you to synchronize clips according to several criteria, such as a mark-in or *Markers* individually set as synchronous points.

Which objects can be synchronized? *page 306*

How to synchronize clips *page 307*

Which Objects Can Be Synchronized?

You can synchronize

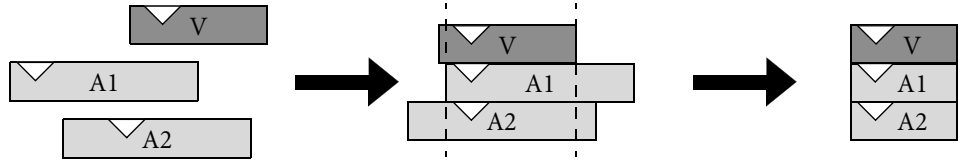
- a video clip with one or more audio clips,
- an audio clip with one or more video clips or
- audio clips with one or more audio clips,

(depending on the synchronous point selected). The result is a new clip: *VA1..A4* or *A1..A4*

In all cases, note the following:

- A video clip cannot be synchronized with audio clips from different *Reels*, i.e.: $V_{reel\#1} + A1_{reel\#2} + A2_{reel\#3}$ cannot be synchronized.
- Nor can a video clip be synchronized with audio clips from the same *Source Track*, i.e.: *V + A1 + A1* cannot be synchronized.
  Rule: Same *Source Track* clips (*V + V, A2 + A2*) cannot be synched.
- *ClipSync* attempts to perform all technically feasible synchronizations. If, for example, you select one video clip and three audio clips that can be synchronized, the almost inevitable result will be three synchronized clips.
- The names of synchronized clips have the suffix ".Sync".

When you synchronize clips of different lengths, the clip produced is as long as the longest overlapping area of all the participating clips:



ClipSync combines clips by aligning synchronous points and by clipping parts that exceed their joint overlapping range

- The timecode format must be identical for all participating clips. E.g., PAL and NTSC TCs cannot be mixed.

How to Synchronize Clips

1: Select objects

Open the shortcut menu for a *Rack* containing clips to be synchronized and select *ClipSync* (either for all the clips in the *Rack* or for selected clips).

The *ClipSync* dialog box is displayed containing a list of the selected or marked, valid clips from the rack. For example, if you have selected only video clips, there is nothing for *ClipSync* to do and so the list is empty.

You can then select specific clips from this list or synch them all (select no or all clips).



ClipSync functions on the basis of synchronous points, i.e. points in clips that are positioned frame by frame exactly above one another on the *Timeline* (see diagram above). For example, you can locate, mark and align sound of the slate in the image and the associated peak in the audio clip waveform (in other words, synchronize the two clips). Naturally, you must already have inserted your individualized marking in the form of a mark-in/mark-out or *Marker* before starting *ClipSync*. If you're synchronizing with a timecode or clip-in/clip-out, you can start *ClipSync* immediately.

2: Select synchronous points

Use the two list boxes in the middle of the *ClipSync* dialog box to select synchronous points.

Synchronize to timecode

If video and audio clips have identical timecodes, synchronizing to timecode can be very useful. Clips of different lengths are aligned to the first common TC value. Assuming that clips share common timecode values, the following rules apply:

- Several audio clips from the same *Reel* are assigned to the same synchronized clip if permitted by the *Source Tracks*:
  $V_{reel\#1} + A1_{reel\#2} + A2_{reel\#2} + A3_{reel\#2} = VA1A2A3_{.sync}$
- Audio clips from different *Reels* are combined separately with the video clip:
- $V_{reel\#1} + A1_{reel\#2} + A2_{reel\#3} + A3_{reel\#4} = VA1_{.sync} + VA2_{.sync} + VA3_{.sync}$
- One audio clip and several video clips with matching timecodes can be synchronized:
  $V_1, V_2, V_3 + A1 = V_1A1_{.sync} + V_2A1_{.sync} + V_3A1_{.sync}$

Synchronize to mark-in or mark-out/clip-in or clip-out

You can use existing mark-ins or mark-outs as synchronous points. Clip-ins and clip-outs are always present but can't really be set individually.
Otherwise the rules described under "Synchronizing to timecode" apply.

Synchronize to marker

You can synchronize to

- the first *Markers* in the clips (in earlier TC counts).

Otherwise the rules described under "Synchronizing to timecode" apply.

3: Specify criterion

If necessary, you can define the selected synchronous point more precisely by means of a second criterion. The second list box (on the right) contains:

- any name (default)
- identical clip name (exact match)
- fitting clip name (partial match)
- identical *Reel* name (exact match)
- fitting *Reel* name (partial match)

For example, if you select *Identical clip name*, only the clips with the exact same name are synchronized.

A partial match extends to matching characters in the clip or *Reel* name. Example: A video clip with the name "Clip" and an audio clip with the name "ClipABC" can be synchronized because the first four characters are the same. If – for example, in the *Logging Tool* – you insert a dot (.) in the clip name, the search for matches is applied only as far as this dot.

4: Synchronize

Once you have selected synchronous points and conditions, start *ClipSync* for all the clips in the list or for the selected clips.

- The lower box then contains a list of the synchronized clips in a display similar to that of the *Media* tab: The synchronized clips are shown first and their components are listed below them and indented. If it can be determined, the timecode shift is specified.
- Double-click the synchronized clips to open the *Clip Viewer* and quickly look over the results.
- If you finish by clicking *OK*, the clips produced are stored in the *Rack* in which you called *ClipSync*. Clicking *Cancel* discards the results of *ClipSync*.



Synchronized clips are linked in the sense of the *Item Link* function (*page 439*) and can be unlinked (or ungrouped) with the *Disband Clip* function (*page 424*).

Automatic Scene Detection (Clip Viewer)

Automatic Scene Detection (found in the extended dialog box of the *Clip Viewer)* divides a longer clip with different takes (scenes) into a number of shorter clips.

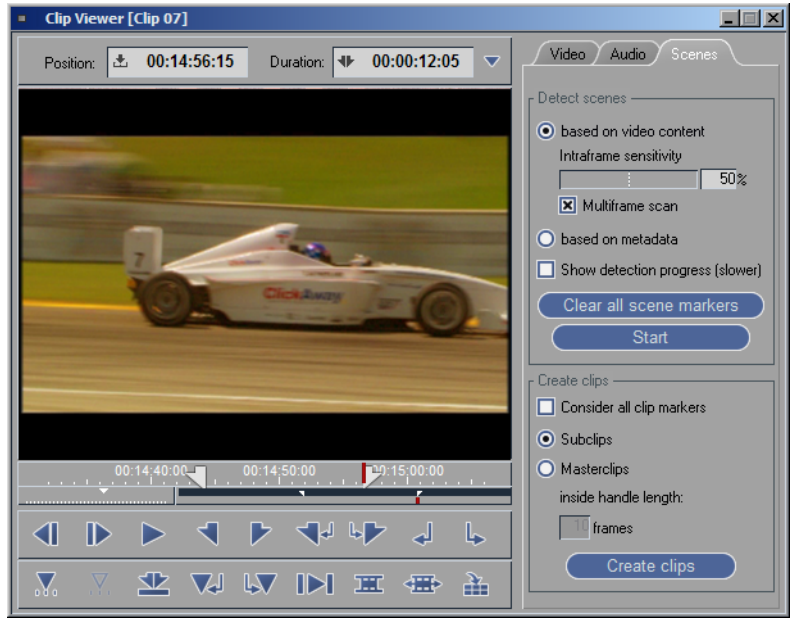
Automatic Scene Detection operates on the basis of

→ video content *page 310*

or

→ metadata *page 312*

"Foreign" media data (such as imported clips that were created with a different Codec) is automatically rendered before scene detection. This applies to all source material that cannot be played directly in the *Clip Viewer.*



Automatic Scene Detection in the Clip Viewer

Scene Detection Based on Video Content

The system analyzes differences in the video content frame by frame. For example, if a shot of an evening candlelight dinner is followed by a daytime market scene under a blue sky, it's easy to deduce that this is a new scene and create a new clip. Other motifs, such as a fast pan, can prove more problematic for the system since the content varies wildly from frame to frame.
For this reason, you are provided with a slider for setting the *Sensitivity* of the video analysis. Depending on the material, you'll need to experiment a little. It is recommended that you roughly sort through your material before starting scene detection based on video content because the same *Sensitivity* setting may not bring good results for all types of material.

Step by Step:

1 Presort the material: Images of peaceful landscapes and of autoracing require different *Sensitivity* settings.

2 Open the (first) clip in the *Clip Viewer*, click the arrow button in the upper right-hand corner of the *Clip Viewer* to open the extended dialog box and select the *Scenes* tab.
Mark-in and/or mark-out, if set, limit the *Scene Detection* range.

3 Click the *based on video content* radio button.

4 For the first run leave *Intraframe Sensitivity* at default.

5 Depending on your personal preference, activate *Show detection progress (slower)*.
Activated: The video continues playing. This however slows down the detection progress a little bit.
Deactivated: Each new scene is indicated by freezing the first frame of the scene in the *Clip Viewer* until the next scene is detected, and so forth. This method works a little faster than the other.

6 *Multiframe Scan* should be enabled in most cases (*page 311*).

7 Click *Start*.



8 The clip in the *Clip Viewer* is played back. Each time a scene is detected, a green *Marker* is set on the *Position Bar*. If you notice that scenes are not being detected or non-scenes are being detected, exit and correct the *Sensitivity* for the next run.



To jump from *Marker to Marker* use the buttons shown here or the C and V keys of the keyboard (default assignment). With the ARROW KEYS (LEFT/RIGHT) it is easy to check whether a *Marker* really indicates a scene change. If not, just delete the *Marker*.
See also *"Clear All Scene Markers"* on page 311.

9 Once you're satisfied with the scene analysis, select one of the *Create clips* options*:*
- *Consider all clip markers*: This option considers even the "normal", gray *Markers* as scene starts. Thus you can mark a clip manually, and have it sliced in *Subclips* or *Masterclips* automatically.
- *Subclips* (with identical clip-in and clip-out for all created clips)
- *Masterclips* (each clip has its own clip-in and clip-out)
See also *"Subclip or Masterclip?"* on page 311.

10 Click *Create Clips*.
Now the new clips are being transferred to the *Rack*.



If you delete unnecessary *Subclips or Masterclips*, make sure you do not delete them together with the *Media File*. All the clips created in a single scene detection run refer to the same media file.

Intraframe Sensitivity

A high value means a high sensitivity to scene changes, and vice versa. Intraframe detection takes pixel shifts as well as changes in the overall color balance of the images into account.

Multiframe Scan

This is a filter which suppresses extremely short image events in order to not create unnecessary scenes. The best example would be photo flashes that last only one frame. Should be active in most of the cases.

Subclip or Masterclip?

- All subclips created by the *Automatic Scene Detection* have identical clip-ins and clip-outs. Therefore, a subclip can easily be trimmed to the full extension of its media file.
- All master clips created by the *Automatic Scene Detection* have individual clip-ins and clip-outs. Any *Handle Length* will be added before and after, respectively, the detected scene, thus defining the clip-in and the clip-out. The mark-in sits on the green scene marker.
If you want to trim the master clip beyond the limits of its initial clip-in and clip-out, you need to expand the clip (see also *Expand Clip (To Available Media)* on page 276).

Clear All Scene Markers

This deletes all *Scene Markers*.



In order to delete several scene markers at once, it is useful to call up the *Marker List*, and the fastest way to do so is to click this symbol. On the list, right-click and select from the menu one of the delete options. If you don't find the symbol on the tool bar, right-click the tool bar and select *Customize*. Then drag the symbol from the library to the tool bar.

Scene Detection Based on Metadata

With this variation, the system analyzes the start/stop data (datestamp/timestamp) that DV camcorders write to the tape each time recording begins. Important: Not all manufacturers equip their devices with this function.



If the material does not contain timestamp data, the system automatically falls back on video content based detection.

Select the option, click *Start* and once the scenes have been created by means of *Markers* in the *Position Bar*, select *Create Subclips*.

For more information on this type of scene detection, see the Input chapter (*page 145*).

Media Management

Media Management in Avid Liquid provides greater clarity and more transparency in the handling of *Media Files*, especially for users working in a networked environment. It facilitates and organizes the exchange and shared usage of *Media Files* and the selection of *Media Formats* and digitizing drives. *Media Files*, you may remember, contain the digital image and audio information necessary for editing. Clips in a *Project* and *Sequence* establish the visible and editable relationships to *Media Files*.

Avid Liquid Media Management monitors all the relevant *Media Files* in the background and tells you, for example, whether and how often the clips connected to a *Media File* are used in a *Sequence* and *Project*. Or if you define a new clip in the *Logging Tool* by means of a *Reel* name, mark-in point and mark-out point, Media Management can immediately establish a relationship to a suitable *Media File* (if any exists). It also allows you to track down *Media Files* in networked directories, view them and, if necessary, copy or move them to your local A/V storage medium.

Basics *page 314*

The most important information on Media Files

Media Management tab *page 327*

Managing Media Files in the Project

Media Management settings *page 332*

Defining drives and directories

Media Management and object properties *page 338*

Information and functions

Media Management and the Windows Explorer *page 342*

Finding and managing Media Files

Search and import Media Files *page 342*

Deletion of clips/objects and Media Files *page 344*

Basics

Certainly it is also possible to work in Avid Liquid without giving much thought to *Media Files*. To a large extent, the software organizes the interactions between clips and *Media Files* in the background. When *Projects* become more complex and the exchange of data becomes more important, however, you should familiarize your self with some of the basics of Media Management.

Compatibility

Projects and *Media Files* that were created in Avid Liquid up to and including Version 2.55 are automatically adapted for Media Management (Version 4.0 and later).
The naming of *Media Files* was also modified between versions 5.6 and 6. Note that *Media Files* are never downwards compatible, meaning that you cannot use a 6.0 file in 4.2 version software. Older *Media Files* are converted to be used in more recent software versions.

Metadata

Simply put, a clip is made up of metadata.
Metadata such as a mark-in, clip-out or *Reel* name serves as references to specific A/V material (*Media Files*) that should be played, for example, when a clip is loaded in the *Clip Viewer*. Media Management needs some of this metadata in order to find the correct *Media File*. (See also *"Matching Clips to Media Files"* on page 326.)

Media Types

Avid Liquid Media Management distinguishes between two types of *Media File*:

- *Streamed media* -
  Media Files with "real" (i.e. timecode-based) clip-ins and clip-outs, such as video and audio data streams and animations.
- *Still media* -
  Media Files without a "real" timecode clip-in/clip-out, such as graphics inserts and title clips, which can be changed to any length by repeating the same single image.

Identifying a Media File

What makes a file a *Media File* from the point of view of Media Management?

- *Still Media File*
  This type of *Media File* is sufficiently defined by a *Reel* name and the name assigned when the file was created.

The following metadata identifies a *Streamed Media File*:

- *Reel name* -
  The name of the *Reel* must be specified for logging and digitizing (*page 119*). An unmistakable and unique *Reel* name is especially important in a network environment.



If you are wondering what a "unique" *Reel* name is and how to come up with one as easily as possible, here is a suggestion: Use the day's date in the *Reel* name:
For example, *Reel01 12-09-02* (or a four-digit year to avoid the next millennium bug).
If you digitize live, you are certain to have a unique name if you combine a realtime TC (24-hour format!) and the day's date. In a network, you can achieve further clarity by appending the editor's initials. For example, *Reel07 12-09-02 CPR*.

- *Clip-in* -
  Timecode of the first frame in a clip.
  Unlike the mark-in, which can be moved around within the clip, the clip-in cannot be changed. A *Media File* with a different clip-in (where all the other metadata is the same) is a different *Media File*.
- *Clip-out* -
  Timecode of the last frame in a clip.
  Unlike the mark-out, which can be moved around within the clip, the clip-out cannot be changed. A *Media File* with a different clip-out (where all the other metadata is the same) is a different *Media File*.
- *Stream* type (video, audio, still) and a *stream ID* (see the section on naming *Media Files*, *page 316*).

With this information, Media Management can assign clips and *Media Files* to one another. The "match-back" functionality searches all the specified directories. If a *Media File* is found that matches a clip, the clip can be played (see also *Matching Clips to Media Files* on page 326).

Naming of Media Files by Avid Liquid (Streamed media)

Up to and including Version 5.6x

Media Management names new and imported *Streamed Media File*s (see *page 314*) as well as imported animations on the basis of the timecode data. For example:

15030512N 15040613N V0.yuv

- The first number is the timecode of the clip-in (hhmmssff).
- *Timecode system: N* stands for Non Drop NTSC and *D* for Drop Frame NTSC, *P* for PAL.
- The second number is the timecode of the clip-out.
- *Stream type: V* stands for video and *A* for audio.
- *Stream ID: 0* to *3;* differentiates among streams of the same type; for example: *A0* = 1st *Audio Source Track*, *A2* = 3rd *Audio Source Track* of the clip.
- The file name extension indicates the *File Format* (in this case: YUV, i.e. *Media Format* Uncompressed).

From and including Version 6.0

The integration of HDTV also affects Media Management. There are many more timecode variants, quality ranks, resolutions and frame rates than in the straightforward PAL/NTSC world. If you're interested in the specifics, here is a list of all the designators.
A media file generated in Avid Liquid can, for example, look like this:

../Reels/MyTestReel.@c3.P CF450037 / 01231412P 01301702P V0. @rP4. @iDIF. MXF

- *MyTestReel* -
  This is the *Reel* name that was entered in the *Logging Tool*.
- *@c3 (camera)* -
  This designates the camera setting (required for multi-camera editing). Default is *@c0*.
- *P* (*Reel* timecode system) -
  - *P, N, D* (PAL, NTSC, NTSC Drop Frame)
  - *F* (24p)
  - *HF* (23.98 Non-Drop Frame)
  - *HG* (23.98 Drop Frame)
  - *HP* (HD-PAL 50 Hz)
  - *HN* (HD-NTSC 59.94 Hz)
  - *HD* (HD-NTSC DF 59.94 Hz)
  - *LP* (Proxy PAL 12.5 Hz)

- *LN* (Proxy NTSC 15 Hz)
- *LF* (Proxy Film 12 Hz)
- *H3* (HD 30 Hz)
- *H6* (HD 60 Hz)

- *CF450037* (project ID) -
  The system assigns this number for the purpose of assigning *Reels* and *Projects*.

All entries up to this point are part of the directory path name. All clips in the same directory have the same path because they come from the same *Reel*. The clip names are formed from the following elements:

- *01231412 P 01301702 P* (clip's timecode area) -
  This example means: Clip-in = 01:23:14:12, clip-out = 01:30:17:02; PAL timecode
  - *P, N, D* (PAL, NTSC, NTSC Drop Frame)
  - *F* (24p)
  - *HF* (23.98 Non-Drop Frame)
  - *HG* (23.98 Drop Frame)
  - *HP* (HD-PAL 50 Hz)
  - *HN* (HD-NTSC 59.94 Hz)
  - *HD* (HD-NTSC Drop Frame 59.94)
  - *LP* (Proxy PAL 12.5 Hz)
  - *LN* (Proxy NTSC 15 Hz)
  - *LF* (Proxy Film 12 Hz)
  - *H3* (HD 30 Hz)
  - *H6* (HD 60 Hz)

- *V* (media type) -
  Either *V* for video or *A* for audio.

- *0* (media stream) -
  Video stream = *0*; audio streams from *0* (channel A1) to *3* (channel A4).

- *@rP4* (quality and resolution) -
  Information on quality and resolution; not specified for all formats.

- *@iDIF* (internal media format) -
  For AVI and MXF, indicates what is "inside": In the example, DV-DIF in an MXF wrapper.

- *MXF* (file format) -
  One of the file formats supported by Avid Liquid; however, depends on the particular product. For example, *.avi, *.2yuv, *.dif, *m2v, etc. See *"System Formats and Codecs in Avid Liquid"* on page 318.

System Formats and Codecs in Avid Liquid

This section provides information about the system formats and codecs available in Avid Liquid.

System Formats

Analog and digital video and audio material can be recorded, stored, edited and transmitted in many "formats". The term "format" has no very precise definition and is confusing because of the many ways in which it is used. The "formats" that you work with as a Avid Liquid user primarily depend on your editing system.

File Formats

File Formats can be identified by the file name extension on the *Media Files*. But the extension not always gives away the actual content of the file. If, for example, the file extension is *.avi, the file actually may contain DV or MPEG essence data - two different video media formats. In contrast, "examplefile.2vuy" is a pure video media file, and the extension clearly indicates that fact.
Some file formats, such as AVI and MXF are so called "wrapper formats". You can put video and audio files inside an AVI wrapped filed when you, e.g., fuse a *Sequence*.

- For a list of supported formats on import, see "*What Can Be Imported?*" on page 152.
- For information on supported export formats, see "*Export to File*" on page 951.
- Information on capture, render and fuse formats or codecs can be found at the end of this chapter (*page 321*).

Render and Fuse formats

When rendering effects, Avid Liquid generates files of a specific format. This format is defined in the *Timeline Properties* dialog or when you create a new *Sequence*. The selected *Render/Fuse* format is then valid for all render files generated from that *Sequence*. It is also the format of choice when you use the *Fuse* function to create video files from a *Sequence*.

A list of available *Render/Fuse* formats can be found on *page 321*.

Codecs

The term codec is a combination of the words coder and decoder. A codec is used to convert data (analog or digital) to a specific format, or, when decoding, to extract the original data from the encoded status.

Avid Liquid employs codecs to create media data (files):

- when capturing (*Digitize*),
- during the *Fuse* process,
- when rendering,
- and of course to read out all these files and display their content as visible images and audible sounds.

A codec is a mathematical algorithm. In some cases one has to pay license fees to use a codec, e.g. for certain surround sound applications. Where no codec is necessary, we talk about *Native Transfer*: Capture from DV tape via the IEEE 1394 interface is a straight file copy operation without any coding or decoding involved. However, when you input an analog signal, you can choose from several different codecs, because the analog signal needs to be converted to a digital file that you can keep on your hard disk.

In digital editing, the codec (DV, MPEG, etc.) is commonly associated with a file format. This has led to certain conventions: a DV codec usually writes and reads AVI files (audio-video interleaved), but can also be associated with DIF files. The MPEG I 422P@ML codec in Avid Liquid is traditionally linked to the file format *.m2v. However, these associations an be modified.

Define codec presets *page 319*

Overview: All available codecs within the Avid Liquid family of products *page 321*

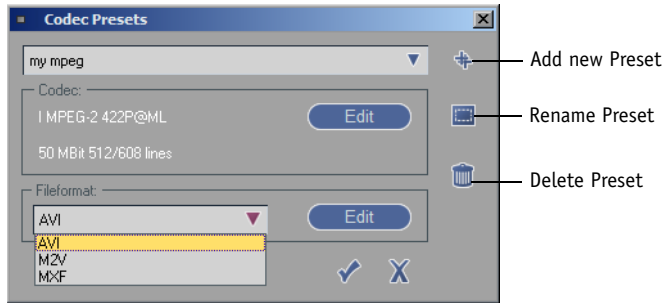
Define Codec Presets

You can create your own *Codec Presets*, that is, combinations of codecs and file formats. With some codecs there are further parameters to determine, e.g. compression rates (MPEG2 I-frame only).

(If you plan to stick with native DV input and output you can just skip the next pages.)

CAUTION: When you create and use individually defined *Codec Presets* you're always risking to operate outside commonly accepted conventions and standards. File exchange could become difficult or even impossible because of incompatible formats.

Open the *Codec Presets* dialog: *Edit* > *Control Panel* > *Site*.



Codec Presets

The list on top contains all presets currently known to Avid Liquid (to find out which presets you can use with your product, see *page 321*).

To define your own *Codec Presets* follow these steps:

1 Select one preset that is similar to what you are planning to create, e.g. *MPEG2 MP@HL (M2V)*.

2 Then click the *double plus* sign to the right of the list.

3 You may change the default name "*New Preset (1)*". Then click the small *checkmark*.

4 Now you specify the *Codec* and the *File Format*. (This depends on the selected base *Preset*. In our example you would be taken to the *IPB Settings* dialog. If it were a DV codec you'd have nothing to edit here.)

5 Click the *checkmark* (OK) to save the new *Preset*.

The newly created *Codec Preset* now appears in the list of *Media Formats* in the *Logging Tool*, in *Timeline Properties* and in the *New Sequence* dialog.

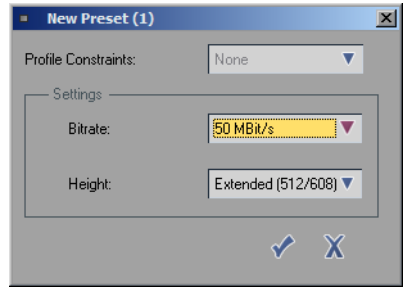
The selection of codecs in *EZ Capture* is not affected by these settings.

Presets marked with an asterisk (*) cannot be deleted from the list; only those created by a user can be deleted. Select one and click the *Trashcan* symbol. The other symbol lets you rename the *Codec Preset*. Formats with a plus sign "+" can be edited directly (without creating a copy beforehand) but cannot be deleted.

MPEG2 I-Frame Codec Options

Here you define the *Bitrate* (compression) and vertical resolution (*Height*; when *Profile Constraints* is set to *None*). When *IMX* is selected as a profile, *Bitrate* and *Height* cannot be modified.

The *Extended 512/608 Height* setting is needed only in some special cases. In “standard cases”, it neither hurts nor helps.



Special options (MPEG-I 422P@ML)

Codec Options for MPEG2 MP@HL

The special settings for this codec include the following options:

- *Profile Constraints* -
  Select *DVD*, *Main* or *High*. Depending on your selection, different bit rates are available in the *Bit Rate* field.
- *Bit Rate* -
  Depending on the profile selected, select a value between 4 to 50 Mbit/s.
- *I-frame only / 4:2:2* -
  Availability depends on the profile selected.

Available Codecs within the Avid Liquid Family of Products

These formats come into play for capture (in the *Logging Tool*), for the *Timeline* settings and in the render or *Fuse* process. The descriptions of the codecs apply to all Avid Liquid products. Remember that you can create additional codec presets. The following list contains all standard presets.

Note that the different codecs place different demands on the computer system. Uncompressed video requires, for example, a very high data throughput and HD formats require a very powerful CPU. Codec availability alone does not determine how a codec will function in your particular system.

Additional codecs are available with certain export formats, such as DivX, Windows Media, RealMedia. These are third party products. Refer to the export chapter for more information on these codecs and available export formats.

Avid Liquid Chrome HD

- Capture (native) -
  DV [dif], DVCPro 25 [dif], MPEG 2 IPB (mp@ml/hl), HD MPEG 2 IPB (= HDV incl ProHD, MicroMV, D-VHS)
  Native capture means that the video and audio signal is not transcoded but is copied on a bit-by-bit basis from source to a hard disk. This means that you cannot modify the signal during the capture procedure. Native transfer works only with IEEE-1394 and SDTI input.
- Capture (via encoder) -
  DV [dif], DVCPro 25 [dif], MPEG 2 IPB, MPEG 2 I Frame, SD Uncompressed, HD Uncompressed, IMX
  An analog or digital (SDI) signal can be saved in a large number of formats. For Analog-In, the video signal can be adjusted at the input (*Video Tool*).
- *EZ Capture* -
  DivX [avi], MPEG2 incl HDV, DVD- and SVCD-compatible MPEG2 IPB; MPEG1 (VCD); MJPEG [avi]; DV [avi]
- Realtime playback (*Timeline, Viewer*) -
  DV [dif], DVCPro 25 [dif], DVCPro 50, MPEG 2 IPB @ML/HL, MPEG 2 I-Frame, HD MPEG 2 IPB, SD Uncompressed, HD Uncompressed, IMX
  Software codecs are used to play back *Timeline* clips (as well as clips in the *Source* and *Clip Viewers*). This means that these images are not necessarily nor immediately viewable on connected hardware (e.g. a video monitor). It may be necessary to render them in a hardware-compatible format.
  Windows Media 9, DivX, MPEG Pogram Stream, MPEG 4, MJPEG (all native without prior demuxing).
- Render and Fuse -
  DV [avi], DV [dif], DVCPro 25/50, MPEG 2 I-Frame [mxf; m2v], DVD [m2v]; MPEG 2 MP@HL [m2v]; MPEG 2 IMX [m2v, mxf @ SMPTE 386M], RGB [avi]; Uncompressed (CCIR601 color space), HD Uncompressed (ITU 709 color space).
  The files created when effects are computed (=rendered) are generated in selectable formats. *Uncompressed* is recommended for complex, many-layered effect constructions, *MPEG2 IPB* is recommended for *Timelines* output to DVD and for HD-MPEG2 *Sequences* (HDV). Generally speaking, the render format should not be of a lesser quality than the clip's original media format. Example: For *Uncompressed* clips, you should not select a DV render format.
  The fuse (or downmix) process renders separate video and audio files from whole or partial *Sequences* in single video and audio files. Select a codec or format that suits your particular purpose.

Render and *Fuse*: MPEG2 I-Frame as 422p@ML and 422p@HL; MPEG2 IPB formats as MP@HL and MP@ML.

`Avid Liquid` (incl. Pro)

- Capture (native) -
  DV [avi], DV [dif], DVCPro 25 [avi/dif], MPEG2 IPB, HD MPEG (HDV incl ProHD)
- Capture (via Encoder) -
  DV [avi], DV [dif], DVCPro 25 [avi/dif], MPEG2 IPB for DVD [m2v], MPEG2 IPB MP@ML fully customizable; Uncompressed SD
- *EZ Capture* -
  DivX [avi], MPEG2 incl HDV, DVD- and SVCD-compatible MPEG2 IPB; MPEG1; MJPEG [avi]; DV [avi]
- Realtime playback (*Timeline*) -
  DV [avi], DV [dif], DVCPro 25/50, MPEG 2 IPB, MPEG 2 I-Frame, MPEG 2 IMX, HD MPEG I-Frame, HD MPEG IPB, Uncompressed, HD Uncompressed;
  Windows Media 9, DivX, MPEG Pogram Stream, MPEG 4, MJPEG (all native without prior demuxing).
- Render and *Fuse* -
  DV [avi], DV [dif], DVCPro 25/50, MPEG 2 I-Frame [mxf; m2v], DVD [m2v]; MPEG 2 MP@HL [m2v]; MPEG 2 IMX [m2v, mxf @ SMPTE 386M], RGB [avi]; Uncompressed (CCIR601 color space), HD Uncompressed (ITU 709 color space)

Dynamic Availability

The list under *Codec Presets (Edit > Control Panel > Site >* etc.) is a complete listing of all codecs known in Avid Liquid, and may also include codecs that can be purchased optionally. This does not mean that all these codecs are available in every product or module. The list of available codecs is dynamically compiled and made available for selection based on the module, *Timeline Format* and input signal.

Identical Media Files

Initially, Media Management handles *Media Files* in different *Media Formats* (I-MPEG, DV, Uncompressed, PCM, etc.) that are otherwise identical (same Reel, same clip-in/clip-out) as one clip that exists in two or three *Media Formats* (*Clip-based View*). Probably the most common example of this involves video *Media Files* with synchronous audio *Media Files* (e.g. *VA1A2*)
Another criterion is the creation time: When two or more identical files exist, Media Management focuses on the most recent. See also *"Matching Clips to Media Files"* on page 326.

Project Media Directories: Where Are the Files Stored?

The current Avid Liquid *Project* works with three different types of *Media Directories* that are created as a function of the *Media File* type and the system requirements (in the example below, written in italics; also see *"Media Types"* on page 314).
A typical path, i.e. the "road" Avid Liquid follows from the clip to a corresponding *Media File*, might be as follows:

R:/.../*Reels*/*MyTestReel.@c3.P CF450037 / 01231412P 01301702P V0. @rP4. @iDIF. MXF*

- "R:/" refers to the volume, such as a local RAID or a storage medium connected via the network.
- "/.../" stands for additional directory levels. You can define these levels in the *Media Management Settings* (*page 332*).
- For Media Management, "Reels" means: This is where *Project Reels* containing *Media Files* can be found.
- "*MyTestReel*" is the name of a *Reel* that was assigned (in this example) during logging.
  Appended to this entry is the ID of the *Project* in which logging was performed. The ID is generated automatically.
- For additional information, see *"Naming of Media Files by Avid Liquid (Streamed media)"* on page 316.



To view the path information, select *File-Based View* (see the *Media* tab in the *Project* window, *page 328*).



Each *Media Directory* also contains information on the *Project* in which the *Media Files* were created. Media Management uses this information to indicate the origin of media data on the *Media* tab (where *Reels* are arranged by *Project*; see *page 327*).

Streamed media

*Streamed Media File*s are stored as described below; the words in the directory path written in italics are generated by Avid Liquid:

- For digitized media (*Logging Tool*, *Batch Digitize)*:
  "DriveLetter:/DirectoryName/*Reels*/ReelName.*ProjectID*/*MediaFileName*", where the "MediaFileName" conforms to the convention described above (*page 316*).
  Media Management assigns these files to the *Reel* name allocated for logging/digitizing (*"Selecting/Creating a Reel (E)"* on page 120).
- For imported *Media Files*:
  "DriveLetter:/DirectoryName/*Reels/@ImportProjectID.PProjectID*/MediaFileName", where the "MediaFileName" conforms to the convention described above; see *page 316*.
  This applies to files imported by means of a *Copy/Move* operation. See also *"Importing Media Clips"* on page 154.
  Media Management assigns these files to a *Reel* with the name *Imported Files*.
- For linked files:
  "DriveLetter:/DirectoryName/MediaFileName".
  These files are identified in Media Management as linked objects; the file icon has a small arrow (see also *Object Icons (Detail View)* on page 244).
  These files retain their name (such as *Example.tif)*.

Still Media

- Stills (i.e. images, titles, backgrounds, etc.):
  "DriveLetter:/DirectoryName/*@ImportedStills.ProjectID*/FileName".
  Media Management assigns these files to a *Reel* with the name *Image*.



Here the *Project* ID ensures that identical names can be used in different *Project*s.

Where Does Media Management Look for Media Files?

The "magic word" is "Reels". In any directory tree, Media Management ignores everything above the "Reels" directory and searches for *Media Files* below it (i.e. in the subordinate directory levels). Such files must be contained in these directories and comply with the naming conventions described above.

Media Management does not detect *Media Files* outside this directory structure or files that do not follow Avid Liquid naming conventions.

Matching Clips to Media Files

In order to be able to play a clip, at least one *Media File,* or part of, must be found that matches the clip's metadata. This matching operation works as follows:

1. On the basis of the clip's metadata, Media Management first searches the associated *Reel* directory to find a *Media File* range that matches the clip's mark-in/mark-out range.
2. The first range found is preselected.
3. Next Media Management searches the other files in the directory. If the *Quality Rank* criteria and/or the creation date (most recent file) result in a better match, the *Media File* thus identified is played; otherwise the preselected file is played.

In other words, there is no fixed assignment of clip to *Media File* in the sense that exactly one *Media File* is associated with the clip.
For A/V grouped clips, matching is also extended to the associated audio files.

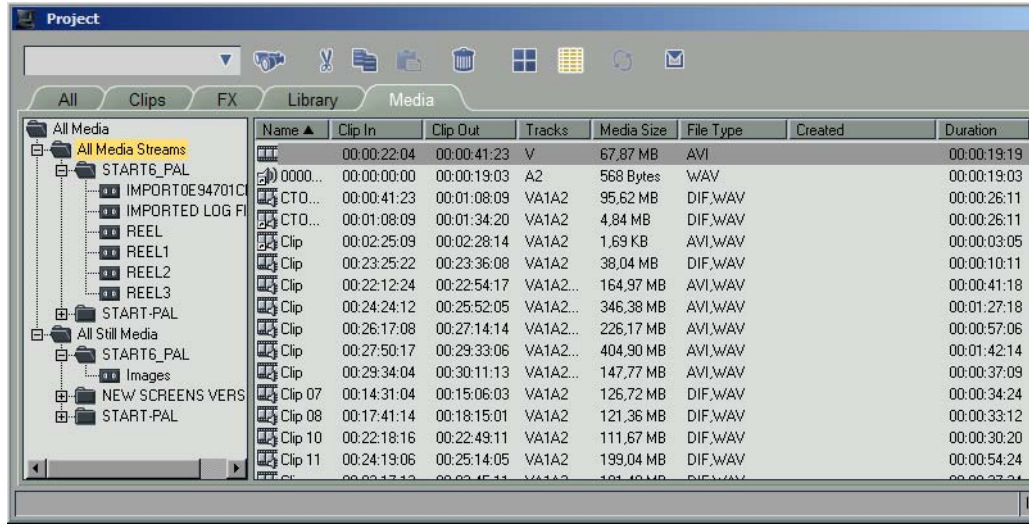
Media Tab in the Project Window

The *Media* tab in the *Project* window provides access to the *Media Files* of the current *Project* and to all *Media Files* that can be accessed by Media Management (see also *Media Volumes (Directories)* on page 333).

- The left-hand area of the window contains a hierarchical tree (arranged by *All Media Streams* and *All Still Media* on a *Project*- and *Reel*-specific basis*)*; the area on the right contains the *Media Files*.
- The current Avid Liquid *Project* is in the top position. Any other *Projects* that Media Management was able to find when scanning the registered *Media Directories* are initially displayed as closed folders.
- When the *Projects* are opened (by double-clicking), the next sorting level, the *Reel* level, is displayed. When you click a *Reel* name, only the *Media Files* for this particular *Reel* are displayed in the right-hand area of the window.
- Double-click the *Media Files* in the right-hand field to load them in the *Clip Viewer* and (if necessary and depending on network capacity) play them back - and even to send them directly to your *Timeline*.



Media Management scans all available media directories whenever you click the *Media* tab (refresh function). To induce a refresh while working in the *Media* tab, click one of the other tabs and come back to the *Media* tab. If you want to refresh while working on the *Media* tab, select *Refresh View* or *Rescan Directories* from the *Media* tab shortcut menu (*page 330*)



Media tab

Media Files: Views and List Headings

The *Media Files* can be displayed as *Picons* and in the form of a list. You can sort each column (in the *Detail* (List) *View*) and edit the list. (See also *"Objects in the Project"* on page 238.)

Right-click a free space in the right-hand area of the window or click the button at the top of the *Project* window to display the shortcut menu for the *Media* tab. Select *Detail View* followed by one of the following options:

- *File based* -
  This view displays all the file-specific information such as the directory path, video bitrates (compression), audio bit rates, etc.
  Each individual *Media File* gets one entry (one line). The object icon is displayed on the left.
  This view is recommended for identical files or for video with synchronous audio because it allows you to access the individual *Media Files* directly (see also *Identical Media Files* on page 323).
- *Clip based* -
  This view combines several identical *Media Files* in a single clip.
  Example: A video clip with two *Audio Source Tracks* (VA1A2) gets only one list entry.
- *Mixed* -
  This option combines the two views mentioned above. The first line contains the clip information with the associated file-based information listed below it.

For a description of additional menu functions, see *"Edit View"* on page 240.

List Headings

The list headings (the individual columns) are basically identical to those offered on the *Clips* tab. However, note the following differences:

- *Name* -
  An optional name for the *Media File* corresponding to the name with which the file was digitized (not to be confused with the system name, which is specified in the *File* column).
- *Tags* -
  The number specified in this column indicates the number of clips in the current *Project* or in the *Sequence* on the *Timeline* that are referenced to this *Media File*.
  0 means: This file is not used by any clip(s). (See also *page 330*.)



Tags are not updated automatically. Reset and start a new count for fresh results. For a correct count of used media be sure to choose the *Clip Based* viewing mode (*page 328*).

- *Project* -
  Name or ID of the *Project* in which the *Media File* was created.
- *Audio Rate* -
  Sampling rate for audio *Media Files*.
- *Audio Bits* -
  Bit rate for audio *Media Files*.
- *Video Aspect* -
  Aspect ratio (4:3, 16:9).
- *NDQ* -
  states the bitrate of compressed video.
- *Path* -
  Directory path for the *Media File* (see *page 324*).
- *File* -
  Name of the *Media File* (system name, *page 316*).
- *Location* -
  Freely assignable name for the volume (storage medium/location) where the file is stored, such as an abbreviation (see also *Editing Media Directories* on page 334).
- *Link* -
  If this column contains an “x”, the *Media File* was not stored in a *Project Media Directory* but a link to this file does exist. (See also *“Copying/Moving Files and Creating Shortcuts”* on page 155.)
- *Local* -
  An “x” in this column means that the media file is located on a local drive (not in the network).
- *Quality* -
  This column indicates the quality rank of the media file that the user assigned for the capture. Normally (i.e. if nothing was changed), it is set to “Normal”. See also *“Quality Ranks”* on page 90.



In each column, the entries can be sorted (see *page 247*).

Media Files: Functions

Open the shortcut menu by right-clicking on the *Media* tab in the *Project* window or clicking the tool button.

- *Open* -
  This function loads the *Media File* in the *Clip Viewer*. If the data rate is sufficiently high, *Media Files* can easily be played via a network connection as well.
  Direct editing is not possible; if you wish to do so, create a clip from the *Media File* (see below).
- *Properties* -
  This function opens the *Object Properties* dialog box (*page 281*).
- *Create clip(s) from Media File(s)* -
  This function generates one clip for each *Media File* selected. The clips are stored in an automatically generated *Rack* with the name *Media Clips* and can be edited for use in the *Project* and *Sequence*.
- *Create Clips and copy selected media to capture volume* -
  This is the method used for saving clips to a local disk from the network (or for copying them from one local directory to another local directory, or from one network directory to another network directory). The associated clips are also added to the current *Project*.
  Important: "Capture volume" refers to the primary, current directory (see *"Media Volumes (Directories)"* on page 333).
- *Copy selected media to capture volume* -
  Same as above, but does not generate a clip in the *Project*.
- *Delete selected Media Files* -
  This function deletes the selected *Media File(s)* without asking you to confirm the deletion.



This deletion if final! Before deleting the file, make sure it is not being used by any other user.

- *Tag used media* -
  of current Sequence
  of current Project
  This function counts the number of times a *Media File* is used by clips in a *Project* and/or on the *Timeline*, regardless of whether all or only part of the file is used.
  Activate this option to begin counting.
  Media Management counts the clips: *0* (zero) means: The Media File is not used by any clip. This option also helps you identify superfluous data and delete it if desired.

Tags are not updated automatically. Reset and start a new count for fresh results.
Also, for a correct count of used media be sure to choose the *Clip based* viewing mode (*page 328*).

- *Reset* -
  This function resets the values under *Tag used media* to zero (for example, to restart counting).
- *Verify Links* -
  This function checks whether the link(s) to the *Media File(s)* are correct and indicates any lost links.
- *Refresh View* -
  This function updates the list displayed. However, files that were not created by Avid Liquid in the network are not included.
- *Rescan Directories* -
  This function also applies to files that were created by other systems or were moved to the media directories by means of the Windows Explorer.

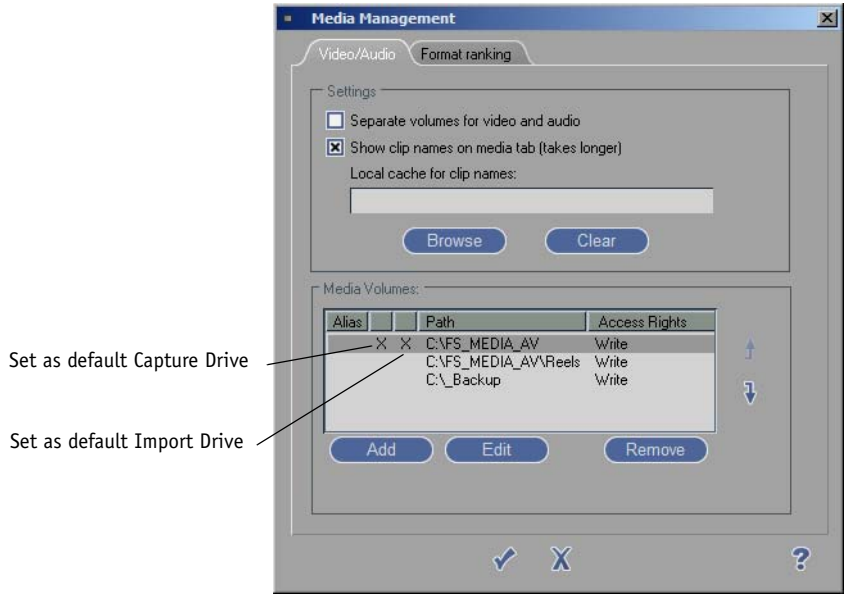
Media Management Settings



To view the options and default settings for Media Management, select *Edit > Control Panel > Site > Media Management Settings*. Among other things, these settings are important for the *Logging Tool* because they allow you to define the directories for digitize and save operations.
The Media Management settings are not user-specific; they apply to the particular system.



Media Management Settings are not relevant for *EZ Capture*.



Media Management Settings

Video Tab/Audio Tab

- *Separate volumes for video and audio* -
  Activate this option if you wish to save video and audio media files in separate directories. If only one tab is displayed (*Video/Audio* combined) a separate destination volume for audio has not been specified in the *Logging Tool* (*page 127*).
  It is normally recommended that video be saved with its audio data.
- *Show clip names on media tab (takes longer)* -
  Activate this option to display the individual clip names (as opposed to the names that were assigned by Media Management) when you open the *Media* tab. It then takes slightly longer to generate the list.
  To reduce network traffic you can set up a local drive cache for all clip name files. Clip names stay in this cache for 20 days before they are deleted.

Media Volumes (Directories)

This list applies to several modules and functions in *Avid Liquid*:

- For Media Management:
  Media Management searches the drives and directories listed here for *Media Files* that can be used by Avid Liquid.
- For the *Logging Tool* and *Batch Digitize*:
  Any data resulting from digitizing is saved to the volumes (drives and directories) specified here. If more than one volume is specified, the *Primary Volume* can be marked with an „X“.
  If *Switch to next available volume...* is activated for the digitizing drives (“*Disk Full State / Change Volume*” on page 137), digitizing continues on the next available volume(s) following the *Primary Drive* in the list or, if the end of the list has been reached, on the first drive at the top of the list (*Batch Digitize* feature only*)*.
- For media-clip import/ALE import/Consolidate:
  The *Media Files* of imported objects are saved to the specified volume (and possibly in specific subdirectories, depending on their type, *page 324*). The same applies to ALE media files.



For capturing (digitizing) purposes, use NTFS partitioned hard disk drives exclusively. FAT32 may cause problems with longer clips.

Editing Media Directories

You can add to and modify the list of volumes, remove any entries not needed and change their order. You can also assign the volumes individual names.

- *Add* -
  This function opens a Windows dialog box in which you can find and select the relevant volume. Click *OK* to add it to the list.
  You can also create a new directory (folder). Click the button and enter a location and name for the new folder.
- *Edit* -
  This function allows you to edit an existing list entry. Click the entry and then click *Edit* and follow the procedure described under *Add*.
  Or you can right-click the *Path* column to call the *Edit* and *Add* functions from the shortcut menu.
- *Remove* -
  This function deletes an entry from the list (and only from there). Click the entry and then click *Remove*.
- *Naming/Alias column* -
  Right-click the *Alias* column to open an editing field. Type in a name and press ENTER to close the field.
  This name will be used in the *Logging Tool* and in the *Media* window in the *Location* column (see *"List Headings"* on page 328).
  You can use aliases to replace technical path specifications with names that are easy to remember.
- *Primary Capture Volume* column -
  Right-click the column to define a volume as the current (primary) digitizing or capture volume. The selected entry is marked with an X. (See also *"Disk Full State / Change Volume"* on page 137.)



The primary volume can also be a network directory.

- *Import Drive column* -
  (Right next to the *Primary Volume* column) Important in networked systems where the Media Management is centrally administered. Add the network file path and put the X in front of that list entry (right-click). Thus the centralized Media Management can keep track of locally imported objects.
- *Access Rights column* -
  You can assign the *Write* or *Read* attribute (right-click to open the shortcut menu) in order to protect specific directories.

Important: This does not apply on the operating system level, i.e. it does not prevent accesses by another users.
Volumes to which the *Read* attribute has been assigned are not included in a volume change. *Write* access includes *Read* access.

- *Rearrange* -
  You can move the entries using the two arrows to the right of the list box. Click an entry and then click one of the arrows until the entry is in the desired position.

What Happens When You Create a New Media Directory?

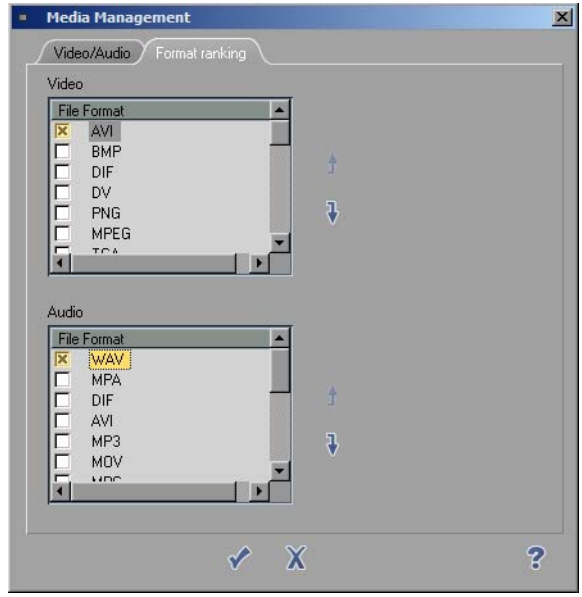
When you click *Add* to create a new media directory, the following occurs (based on an example):

1. You want to create the directory "NewVolume" on drive Q: Click *Add*, go to Q: and enter the name.
2. *Q:\NewVolume* now appears in the list of directories. A directory of the same name is created on the hard disk and:
3. Media Management automatically creates two subdirectories: *Reels* and a directory that identifies your computer in the network, using the computer name.
   Media files are stored in subdirectories of the *Reels* directory (*page 324*).

Format Ranking Tab

You need this list if you have identical clips (video or audio) in different file formats. In earlier versions of Avid Liquid, you were able to specify a preferred file format for playback - but no more than one. The variety of formats is now greater, however, and it could happen that Media Management will need information on how you wish to rank the different media types. This is of particular importance in a networked environment where, for example, “online” and “offline” files are handled, or where many users share common files. For a single seat setup this function has practically no relevance.

Select the pertinent formats and use the arrow keys to arrange them in the proper order.



Format Ranking

Importing Media Clips

When importing media clips to a *Project*, you can create copies of the relevant *Media Files* in the relevant *Project Media Directory* or move files to this directory (see *"Media Volumes (Directories)"* on page 333 and *"Project Media Directories: Where Are the Files Stored?"* on page 324).
For more information, see *"Importing Media Clips"* on page 154.



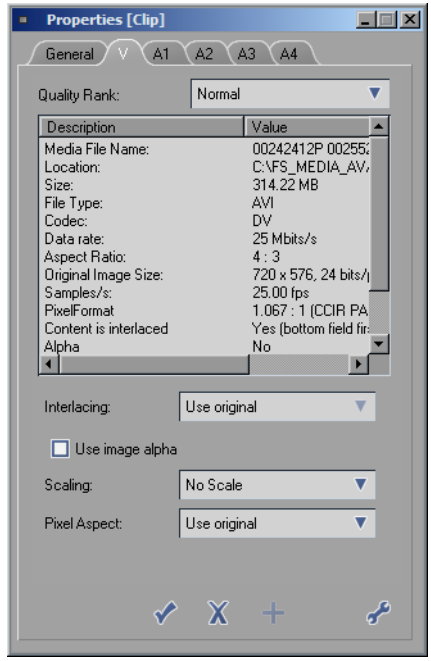
You can also bypass the import operation as described. If you have found a Media File in a specific directory, you can generate a clip for this file in your *Project* using the *Create clip(s) from Media File(s) function* (*page 330*). In this case, however, the *Media File* is not copied or moved to one of your *Project Media Directories*.

Media Management and Object Properties

The *Object Properties* window provides information on the object and to a lesser extent, on functions, depending on the object type.
You can call the *Properties* dialog box from the shortcut menu of any object. The elements on the dialog box's *General* tab are the same for all objects (see also *General Elements of the Object Properties Box* on page 283). The *V* and *A1...A4 tabs* are described below.

Tab: V

The upper area of this box lists the information that Media Management was able to find for this object; the lower area contains options that the user can set (depending on the object type).



V-Tab with video relevant information

- *Quality rank* -
  Indicates the "quality level" assigned for capture, which is normally the default value *16 (normal)*. Can be used to associate another set of media files with the current clip. See the appropriate section in chapter "High Definition".
- *Media File Name* -
  Name under which the system saved a *Media File* on the hard disk (see also *Naming of Media Files by Avid Liquid (Streamed media)* on page 316). In the case of images, the file name is displayed that was assigned when they were created.
- *Location* -
  Path and directory where the *Media File* is located. See also *"Project Media Directories: Where Are the Files Stored?"* on page 324.
- *Size* -
  Size of the *Media File* in kilobytes, megabytes or gigabytes.
- *File Type* -
  The *Media File Format*, such as *YUV* or *2VUY* for Uncompressed, *M2V* for I-MPEG or *TGA* for a Targa graphics file. Also see *"System Formats and Codecs in Avid Liquid"* on page 318.
- *Codec (Media Format)* -
  Specifies the *Media Format* that was used for digitizing or when a graphics file was created. Also see *"System Formats and Codecs in Avid Liquid"* on page 318.
- *Data rate* -
  Specifies the data throughput rate (with I-MPEG2, also indicates the compression level).
- *Aspect Ratio* -
  The original aspect ratio of the video image (4:3 or 16:9).
- *Original Image Size* -
  Dimension (height x width in pixels) and bit depth of the source file.
- *Samples per second* -
  number of video frames per second.
- *PixelFormat* -
  Specifies the aspect ratio of the video pixels and the video standard.
- *Content is interlaced* -
  Specifies whether the clip was created by means of interlacing. Most graphics files are not interlaced, nor are some HD formats.
- *Alpha* -
  Yes means the clip has its own alpha channel.

- *Modified* -
  indicates date of most recent change to the file.
- *Quality* -
  Indicates the quality level assigned when the clip was created (see *page 90*).

Options:

Depending on the object type, these options and list boxes are either available for selection or not (grayed).

- *Interlacing*
  In this list box, you can define the sequence of fields. It applies to images produced by means of interlacing, i.e. that comprise a sequence of even and odd lines.
  Some graphics programs convert the default sequence, which can cause the images to flicker.
  You may be able to prevent this effect by changing the field sequence.



The playback field order of an animations can be changed via the *Interlacing* selection. Choose either *Top Field First* or *Bottom Field First*. Access the properties from the *Project*, not from the object's *Timeline* shortcut menu.



The question of whether or not to use interlaced mode applies to graphics grabbed from a television picture, which consists of two interlaced fields. In some cases, the still may flicker if the two fields are significantly different. This is particularly true if there is a great deal of movement in the picture. In this case, it is useful to grab only the even or odd lines of a picture and fill in the missing lines through interpolation.

- *Use image alpha* -
  Deactivate this option if you do not want to use a graphic's alpha channel (in, for example TGA files the alpha channel contains information on the graphic's transparency). Avid Liquid recognizes whether a graphic contains an alpha channel or not. If not, this option is inactive.
- *Scaling* -
  Using the scaling options, you can change and adapt clips that were generated with a format other than the one currently set for the *Timeline*. However, you can also leave them as they are.
  In order to give you as much freedom as possible for adapting the clips, you can select from among seven options. *X* indicates the image width and *Y* the image height.



You can select several clips and change the *Scaling* for all of them from the *Properties* of one of the selected clips.

- *Pixel Aspect*
  Square, PAL/NTSC CCIR 4:3, CCIR 16:9 or *HDV* instruct Avid Liquid to handle the pixels according to the TV format selected for the system.
  Note: This does not affect the pixel format.
  If you selected the *Auto* option under *Control Panel* > *User* > *Image Import* > *Defaults,* Avid Liq-

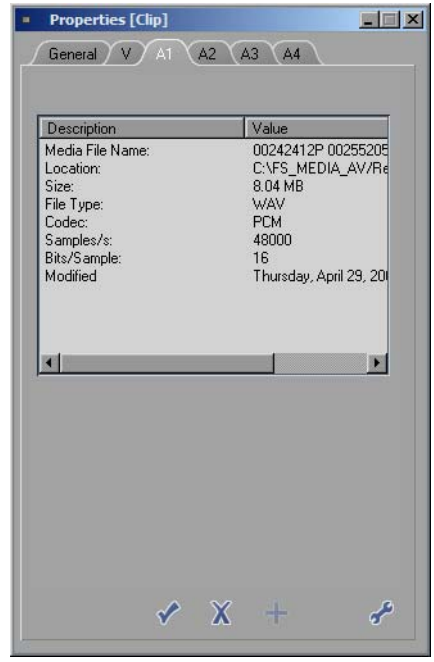
uid attempts to recognize the existing pixel format automatically.
If the import operation results in unwanted distortions/aspect ratios, you can define the correct pixel format here. *CCIR PAL/NTSC* refer to the 4:3 aspect ratio.

PAL format can vary (768x576 or 720x576) depending on pixel shape. Most graphics programs generate square pixels. Positioned side by side, 768 of them make up the full width of the video format. For television images, only 720 pixels are necessary since the pixels are somewhat wider than they are high (i.e. rectangular). As a result, 768 square pixels = 720 PAL pixels. This means a picture with 768x576 pixels created with a graphics program completely fills out the PAL television format (assuming the pixels are square). The values for NTSC are: CCIR NTSC = 720x486; NTSC (square pixels) = 640x486.

Tab: A1 (A2, A3, A4)

Similar to Tab *V*, plus audio specifics:

- *Samples/s*
  Specify the sampling rate here. Internally Avid Liquid works with 48 kHz.
- *Bits/Samples*
  The bit rate of the audio file.



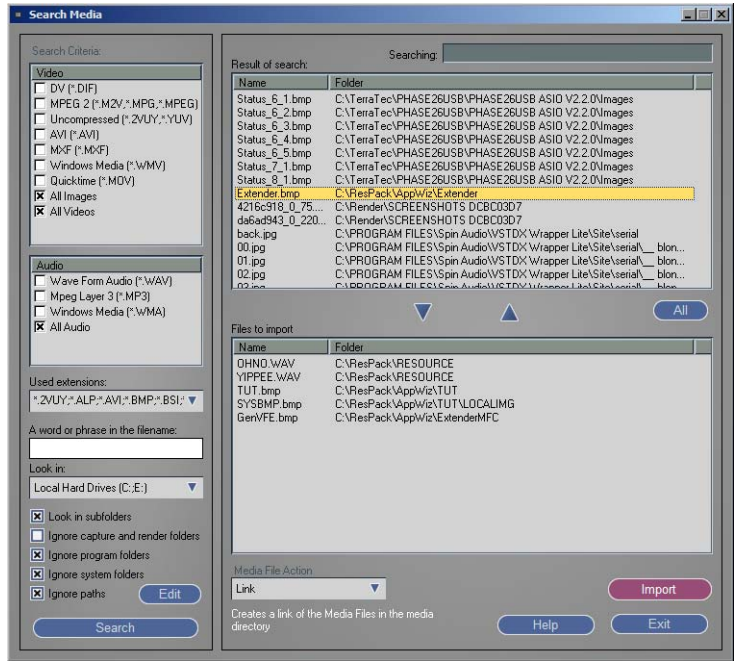
Media Management and the Windows Explorer

You can also find the file names generated by Media Management in the Windows Explorer. *Media Files* are easy to identify by the timecode information and the directory containing the *Reel* name.
For most *Media Files* a file exists with the same name containing metadata for this *Media File*.

Search and Import Media Files (Search Media)

This tool locates and imports Media Files to your *Project*. You can specify several search criteria and import options. For each media file imported, be it video, audio, graphic or a title, a clip will be added to the *Project*.

Search Media can be found in *File* > *Import*.



Search (and import) Media

1: Define Search Criteria

What are you looking for? Video, audio, images? Certain file names or parts of file names? Select the options. The list displays all selected file extensions.
Where do you want the tool to search? Select a drive or folder. To speed up the search, you may also exclude certain folders.

Using the *Ignore paths* function, you can select specific directories and exclude them from the search. To do so, click *Edit* and either enter a path name (e.g. *C:\Programs*) or use the navigation function. Click *Add* to add the selected path to the list of exclusions.

2: Start/Stop the Search

Click the *Search* button. The *Result of Search* area lists all files found. You can stop the operation as soon as the wanted file(s) show(s) up.

3: Select Files for Import

You may now move all located files to the *Import* list or select individual files (use CTRL-click or SHIFT-click). Click the *Arrow Down* symbol to transfer all selected items. The *Arrow Up* symbol shifts selected files back to the *Results* list.
The *Results* area is cleared every time a new search is started, the *Import* list area is cleared only after all files have been imported.

4: Select Import Method

Copy, Move files or create a *Link*? *Copy* and *Move* transfer the files to the current *Primary Media Volume*. Caution: *Moved* files are no longer at their original locations. A *linked* file stays where it is.

5: Import

Finally, click *Import*. In your *Project* a *Rack Folder* named *Search Media Import* and containing the *Racks* "*Video*", "*Audio*" and "*Images*" will be created. There you can find the clips that correspond to all imported *Media Files*.

Deleting Clips/Objects and Media Files

Delete clips/objects *page 344*

Delete Media Files *page 346*

Delete render files *page 347*

Restore deleted objects, Media Files and render files *page 348*

Clean up Project *page 349*

Deleting Clips/Objects

To remove one or more objects (clips, *Sequences*, effects, etc.) from your *Project, y*ou can select from among four different options:

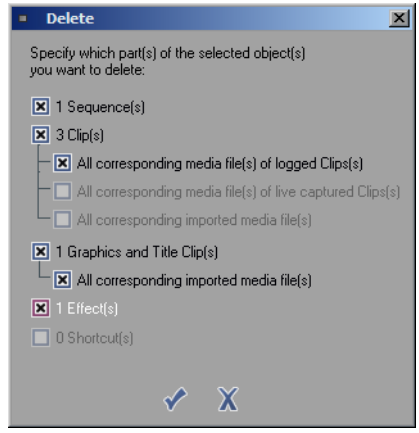
- *Delete* (shortcut menu option):
  Select one or more objects, open the shortcut menu and select *Delete*.



- *Trash* button (*Project* tool bar):
  Select one or more objects and click the button located in the *Project* toolbar.
- DEL key (keyboard):
  Select one or more objects and press DEL.
- Drag & drop to desktop *Trash* icon*:*
  Select one or more objects and drag them to the Avid Liquid desktop *Trash* icon (not the Windows Recycle Bin and not the *Project Trash* button!).
  See also "*The Trash*" on page 52.

In all four cases, the *Delete* dialog box is displayed and in all four cases the objects are placed in the desktop *Trash* from which they can also be retrieved.
Objects that are deleted from the *Timeline* are not placed in the *Trash*.

The *Delete* dialog box contains several options for deleting objects or *Media Files*. Avid Liquid always asks you exactly what you want to delete in order to keep you from accidentally deleting an object you still need.
When you delete Media Files, a second dialog box may be displayed depending on the circumstances (*page 346*).



Delete dialog box

The delete options refer to the objects you selected in the *Rack*. The number of objects selected is specified.

Single-click the appropriate option(s) to activate them:

Sequence(s)

This option deletes *Sequences* from the *Rack* and removes the *Sequence* name from the drop-down list box above the *Master Viewer*. It does not affect the Media Files.

Clip(s)

This option is applied to clips and, if appropriate, the associated *Media Files*. You can delete the clip(s), the *Media File(s)* or both:

- *Media File(s) of logged clip(s)*
- *Media File(s) of live captured clip(s)*
- *Imported Media File(s)*

When you delete specific *Media Files*, you are asked to confirm the deletion (*page 346*).

Graphics and Title Clip(s)

This option deletes graphics and title clips with/without *Media Files*. When you delete specific *Media Files*, you are asked to confirm the deletion (*page 346*).

Effect(s)

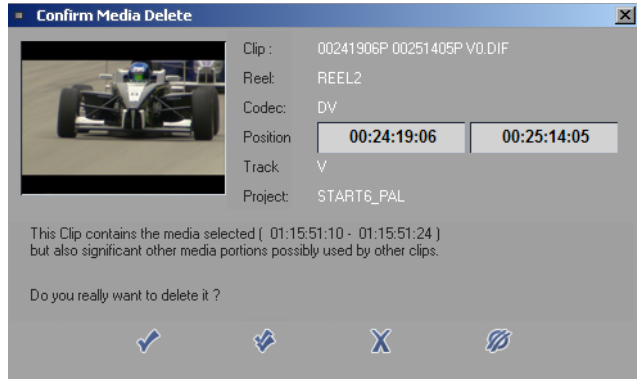
This option deletes clip effects, transitions, audio effects, etc., but not the original effects in the Avid Liquid *FX Rack*.

Shortcut(s)

This option deletes shortcuts, including those on the desktop.

Deleting Media Files

If you attempt to delete *Media Files* that are used by other clips, you are asked to confirm the deletion in a second dialog box.



Conform Media Delete

Deleting Render Files

Render files, i.e. files created when effects or *Timewarp Editor* clips are rendered, can also be deleted selectively.
It may become necessary to delete render files when, for example after a *Batch Digitize* operation, you want to perform a manual re-rendering of effects on the basis of the newly digitized material (also see "*Batch Digitize and Render Effects*" on page 299) or when you delete files you no longer need in order to make room on the storage media. The following options are available:

Deleting Render Files (Project)

The shortcut menu for the *Trash* icon on the desktop contains a number of options for deleting render files that apply to the current *Project*. Select
Delete Render Files Of Project:...

- *All* -
  This option deletes all existing render files in the *Project*.
- *Not used by any Sequence* -
  This option deletes render files that do not reference any existing *Sequences* in the *Project*.
- *Not used by current Sequence* -
  This option deletes all render files except those used in the *Sequence* currently located on the *Timeline*.
- *Not used by Sequence(s) selected in Project window* -
  This option deletes all render files except those belonging to the *Sequences* selected in the *Project* window.

Deleting Render Files (Timeline)

These delete functions are applied to render files belonging to the *Sequence* currently located on the *Timeline*. In the *Timeline* shortcut menu, select

Delete Render Files...

- *between Mark-In/Out* -
  to delete selectively or
- *of current Sequence (all)* -
  to delete all the render files of the *Sequence*.

Restoring Deleted Objects, Media Files and Render Files

A number of options are available for retrieving "deleted" objects, files and statuses. Sometimes, however, certain manipulations are required and sometimes it cannot be done. The following is an overview of emergency and preventive measures:

Object (Clip) Deleted - Media File Found

A clip can easily be created from a *Media File*:

1. Identify the *Media File* on the *Media* tab in the *Project* window, for example based on the *Reel* name, or switch to *Picon View*.
2. Then call the *Create clip(s) from Media File(s)* function from the *Media File* shortcut menu (see also *page 330*).

Media File Deleted - Object (Clip) Found

If the object is a logged object, you can quickly re-digitize it by means of a *Batch Digitize* operation (provided that the original material is still present). See *"Batch Digitize (Batch Capture)"* on page 292.
In the case of imported *Media Files*, a copy may still exist (for example, in the network). If the file is still located in the original storage location, Media Management will find it automatically.

Media File and Object (Clip) Deleted

In such a case there is little hope. Perhaps you can access the object via a working version you saved at an earlier point in time (see also *Earlier Versions* on page 349).

Render File Deleted - Effect Found

This is simple. Avid Liquid re-renders the effect when, for example, the relevant *Sequence* must be played.

Render File and Effect Deleted

Standard effects can be applied once again at the appropriate positions. Avid Liquid re-renders the effect when, for example, the relevant *Sequence* must be played.
Customized effects must be recreated. It is recommended that you save labor-intensive effects in a *Rack*. See also *"Saving Individually Created Effects"* on page 540.

Trash (Desktop)

The *Trash* icon on the Avid Liquid desktop keeps deleted objects. If you have not emptied the *Trash* in the meantime, you can regenerate all the objects it contains.
Drag or copy the relevant objects to the desired location.

Undo List

Many modules have *Undo/Redo* functions. By repeatedly clicking this function, it is possible to restore an earlier status. However, you may also lose other work steps.

Earlier Versions

You can also protect yourself from loss by periodically saving intermediate stages of your work. This is possible for *Projects* (*page 210*) and *Sequences* (*page 406*).

Cleaning up a Project

This function (located in the shortcut menu for the Avid Liquid desktop *Trash*) deletes some of the peripheral *Project* data which can become quite extensive especially for large and long, edited *Projects*. This function does not delete any objects, *Sequences* or *Media Files*.



Particularly when working with large *Projects*, be sure to empty the Avid Liquid desktop *Trash* icon from time to time. This keeps the *Project* files small.

Chapter 9

Edit

make manage move | media™ Avid®

This section describes the Avid Liquid function that deals more specifically with the editing of *Sequences* on the *Timeline*, such as how to insert, trim, delete and move clips on the *Timeline*. The basics of audio editing are also presented.

Video Editing

→ Basics (Timeline layout and customization; priorities; Edit Styles; FX basics) *page 353*

→ Sequence Editor (working with the Source/Master Viewer and the Insert Arrow; Sequence management) *page 391*

→ Timeline editing (configuring and trimming a Sequence using drag&drop) *page 410*

→ Objects on the Timeline (marking clips; disbanding clips; Match Frame; clip properties, etc.) *page 420*

→ Trim Editor - provides all the functions for precision trimming *page 428*

→ Special functions (synchronizing Tracks; linking objects) *page 437*

→ Editing - examples and illustrations (Insert Arrow, Timeline, Trim Editor) *page 442*

Audio in the Timeline

Basic information related to audio and the Timeline *page 463*

Special functions and Tools

→ Consolidate (copying the Media Files used in a Sequence) *page 300*

→ Condense (collecting all clips of a Sequence in a Rack) *page 304*

→ Matte Track and Track Matte *page 467*

→ Nesting Sequences (building a Container) *page 471*

→ Full screen display *page 476*

→ Master Viewer: Maximum-Size Inlay *page 477*

→ Inlay Quality menu *page 479*

→ Snapshot (freeze and save Timeline frame) *page 482*

→ Multi-Camera Editing *page 484*

Video Editing

Basics

This section provides you with information on the *Timeline*. The *Timeline* is the area in which the *Sequence* is compiled.

Timeline layout *page 354*

Configuring Tracks
Dimensions and information *page 364*

Track priority
Higher and lower on the Timeline *page 374*

Source Track Mapping
What belongs where? Important for working with the Sequence Editor *page 375*

Edit Styles
Overwrite or move objects? *page 378*

Navigating on the Timeline
Using the mouse, keyboard and tool buttons *page 381*

Timeline markers and cue markers
Setting markers for and adding comments at important points *page 385*

Undo/redo
Risk experimenting while editing with undo/redo *page 387*

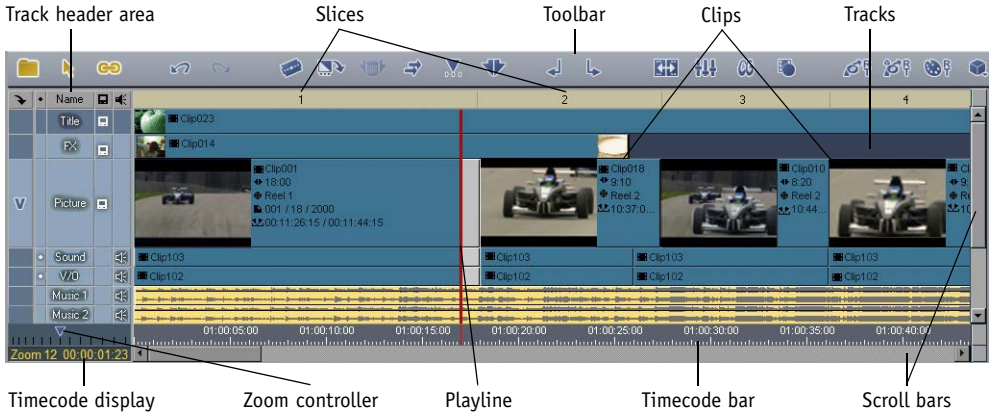
ABCs of effects
Most important information on effects *page 387*

Timeline Layout

As the basic tool for non-linear editing, the *Timeline* not only allows you to gain an overview of your editing work, it also provides flexible and powerful functions.

There is no set assignment of clips to *Tracks* - all video and audio clips, graphics, title clips and transition effects can be positioned anywhere on any *Timeline Track*.

Any changes made to the *Timeline* have a direct effect on the *Sequence*, can be played immediately and are continuously saved (except for effects that have to be rendered).



Timeline window

Timeline Display



Click the *View Switcher* on the taskbar to toggle between different *Timeline* views

(see *"Click this icon to open a dialog box that can be used by members of a workgroup to exchange information. When a message is received, this icon is replaced by a flashing reddish-orange telephone icon (page 197). Desktop Views"* on page 46).

Timeline Elements

This section describes the most important components of the *Timeline*:

"Empty" Timeline

An "empty" *Timeline* or positions on the *Timeline* at which no object (video clip, audio clip, title, etc.) is located on a *Track,* indicate the following:

- @ System's video output: black (Video Black)
- @ System's audio output: mute

In other words: You do not have to insert a particular object to generate a result of "black" or "mute" at the particular output. For example, a fade-out is generated by a dissolve in an "empty" *Timeline* position.

Timecode Bar

The *Timecode Bar* displays timecode in various scales (*page 356*), from single frames to several minutes. Mark-in points, mark-out points and markers defined on the *Timeline* or in the *Master Viewer* appear on the *timecode bar*. The space between mark-in and mark-out points appear shadowed.

Changes to *Timecode Bar* scaling have no effect on the position bar in the *Master Viewer* and vice versa.

Playline

The *Playline* displays the current position on the *Timeline* (= current position in the *Sequence*). The *Playline* also defines where certain actions on the *Timeline* should be carried out. For example, inserts made with the *Insert Arrow* are positioned at the *Playline* if no mark-in or mark-out points are set on the *Timeline*.

The *Playline* on the *Timeline* and the *Playline* on the position bar in the *Master Viewer* correspond to the same position in the *Sequence* and move simultaneously.

If the *Timecode bar* in the *Timeline* is zoomed in (1 second scale or less), a second line appears. This line specifies which frame is being shown in the *Master Viewer* (or output).



When inserting clips with the *Source Viewer*, this frame will be overwritten by the source's first frame. If, for example, a mark-in is set at this position on the *Timeline*, this frame will be overwritten with the mark-in of the source.

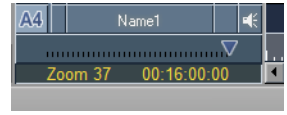
Scroll Bars

As you zoom in on the *Timeline*, less of it becomes visible. To see the hidden areas, use the horizontal scroll bar at the bottom of the *Timeline* window to scroll the *Timeline* display.

When the combined height of all the *Tracks* exceeds the available display area, a vertical scroll bar appears to the right of the *Tracks*.

Zoom Control

The zoom controller below the *Track headers* lets you zoom in and out on the *Timeline*. Move the triangular zoom slider to the left to zoom "into the *Timeline*" and to the right to zoom out. The smallest unit is a frame and the largest is a minute (distance between the scale markings.)
Important: This setting does not affect the *Zoom Controller* in the *Master Viewer*, nor does that controller affect this setting.



Zoom and Timecode Indicator; Setting the Zoom

You can also change *Timeline* resolution via the keyboard. Press the ARROW UP key (same as *Zoom Out*, dragging slider to the right) to see an overview of your *Sequence*. Press the ARROW DOWN key to display up to the highest resolution (individual frames).

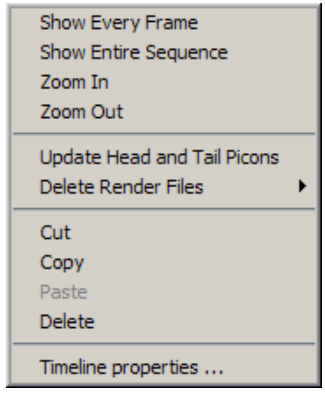
Timecode/Zoom Display

The display below the *Zoom* tool indicates the *Zoom* factor and the current position of the *Playline* on the *Timeline* (Master Timecode). The separator (,;:.) between the values indicates the TC system used. For more information refer to "*Timecode Systems*" on page 84.

You can activate a freely scalable, moveable timecode display: see *page 483*.

Timeline Shortcut Menu

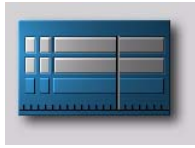
Right-click the *Timeline* to open its shortcut menu:



- *Show Every Frame* - most magnified view of the *Timeline*
- *Show Entire Sequence* - adjusts *Timeline* display to show the entire length of a *Sequence*
- *Zoom In* - magnifies *Timeline* display by one increment
- *Zoom Out* - reduces *Timeline* display by one increment
- *Insert* - inserts the contents of the clipboard at the current position
- *Update Head/Tail Picons* - updates the clip *Picons* at the beginning and end of the clip
- *Delete Render Files* - deletes render files selectively (*page 347*).
- *Cut/Copy/Paste/Delete* - see "*Timeline Editing*" on page 410
- *Timeline Properties* - see the following section.

Timeline Properties

Click the right-hand mouse button on the *Timeline* to access the shortcut menu. Under *Timeline Properties* you'll find several options that allow you to personalize *Timeline* editing.
The dialog box has two tabs: *General* relates to every new *Sequence* that you create, open or edit. The settings on the *Current Sequence* tab relate only to the *Sequence* that is currently on the *Timeline*. These options are described in the section entitled *"New Sequence"* on page 403.



You can access the *Timeline Properties* dialog also via *Edit* > *Control Panel* > *User* > *Timeline.*

General

- *Clear mark-in/out on Timeline after insert* -
  ...immediately after the clip was inserted (only when using the *Insert Arrow*). See also *"The Insert Arrow"* on page 397.
- *Clear mark-in/out on Timeline after delete marked range* -
  in analogy to the above function.
- *Automatically update Timeline Picons* -
  ... does so even while trimming the clips.
  This, however, needs some CPU power; in order to make editing smoother, turn this option off.
- *Keep stereo Audio Mode when disbanding stereo audio clips in Timeline* -
  if this option is not selected, stereo clips will be disbanded and converted to mono Audio Mode. See also *"Stereo and Mono, Panorama and Balance"* on page 801.
- *Restrict dragged Transitions to available handles* -
  This means that a *Transition* will not be applied at all, or that its original length will be automatically modified to match the available handle (*leeway*, or available media data). Caution: this option affects only the initial application of the *Transition*. Subsequent trimming is not restricted. See also *"Leeway (Overlap)"* on page 389.
- *Show dupes during trim* -
  This is an extension of the *Detect recurrent use* option which has to be enabled beforehand in the *Track Header* > *View* menu (*Name*, see *page 365*).
  A jagged line at the upper edge of the clip indicates the range of frames that is already being used on another part of the *Timeline*. With this option active, this display is active even while you trim the clip.

- *Show sync breaks during trim* -
  This works the way the *dupes* display works. You first have to enable the *Sync Break* indicator for all or one particular *Track* before you can use this option (*page 365*).
- *Extended sync break display* -
  This extends the standard *Sync Break* functionality:
  Normally, a sync break (that's when the original relation between audio and video clips is disrupted) is displayed only as long as the original clips still retain some overlap. When the clips get totally displaced, the display disappears because the system assumes that this happened intentionally.
  Now, if you enable this option, the sync break will be displayed even in the case of no overlap at all.
- *With Match Frame set Mark-In in Source Viewer* -
  sets a Mark-In right on the matched frame. See *"Match Frame To Clip"* on page 422.
- *Default magnet for scrubbing* and *editing* -
  These options make it easier to position the *Playline* (*scrubbing*), and to insert clips and *Transitions* (*editing*).
  Select the points of magnetic attraction from the lists. Below a certain distance, the *Playline* and the object will snap to the selected magnetic point.
  See also *"Snap Mode"* on page 415.

Current Sequence

These options are described under *"New Sequence"* on page 403.

Tracks

Tracks are the basic elements of the *Timeline*. They are used for positioning clips, transitions and all other objects contained in a *Sequence*. Every object on a *Timeline Track* occupies a certain area of the *Timeline*. The length of this area depends on the object's duration and on the *Timeline* display size. The mark-in point is represented by the left edge of the clip, the mark-out point, by the right edge.

Right-click a free area of the *Track* to open a shortcut menu for controlling *Timeline* display size ("*Zoom Control*" on page 356).



In Avid Liquid, all *Tracks* are the same. There are no preset video, title or audio *Tracks*.

Slice Numbers

The *Slice Number* bar, located on top of the *Tracks*, displays a number for every edit event in ascending order.

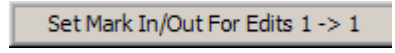


Slice numbers

The following slices are shown on the *Timeline*:

- Video clips (slice spans the mark-in and mark-out points)
- *Transitions* other than hard cuts (slice spans the entire *Transition* duration)
- Empty areas between clips on the *Timeline*
- Areas where video clips overlap, if their mark-in and mark-out points do not match

Right-click the *Slice Number* bar to open the following shortcut menu:



To select more than one slice number, hold down the SHIFT button when clicking.

- *Set Mark-In/Out for Edits # -> #*
  Click this option to set a mark-in at the slice first selected and a mark-out at the slice last selected.
- *Force rendering/Render specific slice(s) -*
  Provided that they contain clips with realtime effects, *Slices* can be rendered individually or in groups. This means that you can generally disable background rendering (*Render yellow slices*) and then render specific segments. Right-click a *Slice* to open the shortcut menu and select *Force rendering for slice(s) [n] -> [m]*. Hold down the SHIFT key while clicking to select a sequence of *Slices* (and thereby include *Slices* without effects at well; those will just be skipped).

Slice Colors

In addition to the standard gray, *Slices* can appear with one of the following colors, thus indicating how (i.e. in terms of frame rate, frames per second, fps) corresponding *Timeline* areas will be played back:

- Green -
  Green slices identify segments that are ready for immediate realtime playback. They contain either realtime hardware effects or effects that have already been rendered. The system falls back on existing render files.



- Yellow -
  Yellow slices identify segments that can be played back without waiting for rendering. Depending on processor performance and FX constellation, however, frames may be dropped during the preview. The system cannot determine whether this will occur until the *Playline* actually enters the *Slice* because processor usage (for example, for realtime software effects) is not evident beforehand. Audio-video synchronicity, however, remains intact, and the visual impression of the effects can be judged quite reliably.



- Red -
  Red slices identify segments that must be rendered prior to playback. During the rendering process, the *Slices* gradually turn green. This is the case for all Avid Liquid *Classic* effects.



- Dark Red -
  When the *Slice* above certain *Timeline* ranges turns dark red, this indicates:
  - There is no media data for the clip(s) available (also indicated by "!" in the inlay)
  - The file format of the clip(s) does not match the *Quality Ran*ks currently set for the *Timeline/Sequence* (see "*Media Quality and Min Media Quality*" on page 404).



- Gray -
  Everything that is not green, yellow or red, i.e. "normal" video and graphics, is gray and is always played back at the full frame rate.



Toolbar

The toolbar is located at the top of the *Timeline* and contains buttons for navigating on the *Timeline* and playing, marking and processing clips and *Sequences*. This toolbar can be customized like any other Avid Liquid toolbar. (See *"Customizing Toolbars"* on page 990.)

The default toolbar contains buttons for basic functions.



If you wish to call a certain function only once (without permanently storing the button on your task-bar), use the toolbar shortcut menu (right mouse-click) and select the respective function from the list. This is only carried out once, no icon is placed on the toolbar (see also *Calling Tools Once* on page 992).

Mouse Pointer Shapes



When the *Edit Mode* is deactivated (i.e. when in *Scrub Mode*), the mouse pointer always appears as an arrow accompanied by a line which represents the *Playline*.This means you can scrub at any position on the *Timeline*. See also *"Mouse Navigation"* on page 381.

When the *Edit Mode* is activated, the mouse pointer changes depending on where the mouse is located on the *Timeline*:



- When the mouse pointer is on an empty part of the *Track* it appears as crosshairs.



- When the mouse pointer is on top of a clip, it turns into an arrow accompanied by a film strip symbol. This means you can select the clip and move it in its entirety.



- When the mouse pointer is near the mark-in or mark-out of a clip or transition, the arrow is accompanied by a mark-in or mark-out symbol. This means that you can trim the object by pressing the left mouse button.



- When the mouse pointer is on a clip or a transition, the mark-in and mark-out symbols appear as empty mark-in and mark-out symbols if the function is not available.

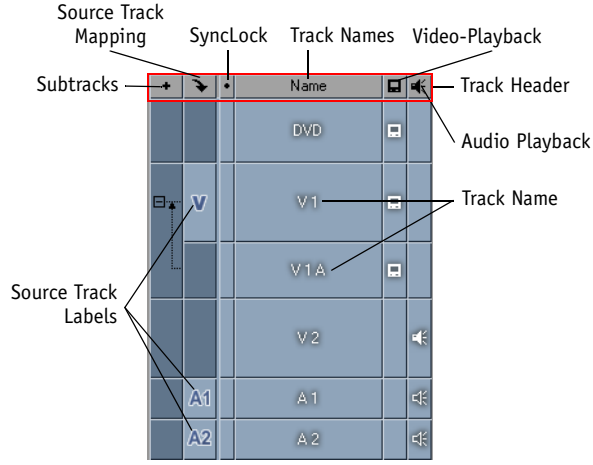
Track Headers

The *Track Headers* are in the area to the left of the actual *Tracks*. This area is used for organizing the *Tracks* in a *Sequence*, defining *Source Track Mapping*, specifying *Track* display, naming *Tracks*, etc. Whether a *Track* is active or not active for editing also appears here.

The *Track Headers* are divided into six columns:



The top row of the *Track Headers* contains the column headers. Right-click a particular column *Header* to customize *Tracks*. The settings in the column *Headers* affect all *Tracks*. Every *Track* can also be configured individually.



Track Header (Subtrack column present only if subtracks are present)

Subtracks and Matte Tracks Display

If *Subtracks* and/or *Matte Tracks* are configured, an additional column appears on the far left. The more subordinate *Subtracks* or *Matte Tracks* that are used, the wider this column becomes. See *"Add Matte Track"* on page 371 and *"Add Sub Track"* on page 372.

Source Track Mapping

The *Source Track Mapping* column shows the *Source Tracks* (video, audio 1 to 4) of the clip currently in the *Source Viewer*. You can define which *Source Tracks* are mapped to which *Timeline Tracks* in the column and you can define mapping type and completely deactivate mapping in the column header. More information on *page 375*.

Sync Lock

The *Sync Lock* column is used for linking *Tracks* to avoid that e.g. sound and image become asynchronous during trimming of objects (*page 437*).

Track Name

The *Track Name* column shows the name of every *Track*. Here you can modify the *Tracks* and adjust what appears on them (see *page 364*).
This column is also used for defining *Tracks* as active or not active for editing. See also *"Activate all / Deactivate all"* on page 368.

In this column the *Source Timecode* will be displayed, if the option has been enabled. See *page 365*.

Video Playback

The *Video Playback* column is used for activating and deactivating video playback of *Tracks*. If *Video Playback* is activated, the monitor icon appears.



Right-click the column header to open the shortcut menu, where you can activate or deactivate *Playback*.

If *Video Playback* is activated, all video clips on respective *Tracks* are played during playback. This status is represented by a white monitor icon in front of a *Track*.

If *Video Playback* is deactivated, no video is played from this *Track* and the white monitor icon disappears.

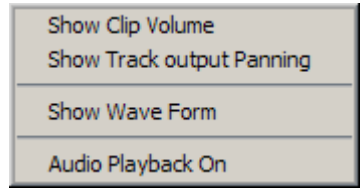
To activate/deactivate video playback of a single *Track*, click the monitor icon in the appropriate field.

Audio Playback



The *Audio Playback* column is used for activating and deactivating audio playback of *Tracks*. If *Audio Playback* is activated, the loudspeaker icon appears. In this column you can also adjust how audio clips are displayed.

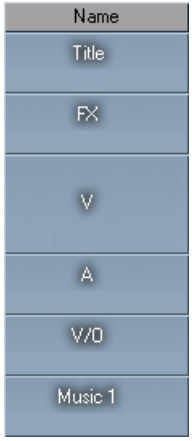
Right-click the *Audio Playback* column header to open a shortcut menu for controlling audio playback settings. See also *"Special Characteristics of Audio Clips"* on page 797.



Audio Playback menu

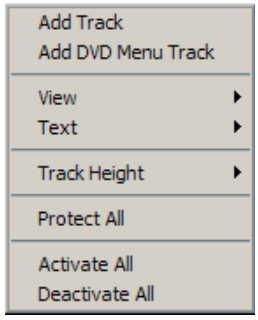
If the speaker icon appears as a contour, audio scrubbing mode is activated for the *Track*: *"Audio Scrubbing - Digital or Analog"* on page 804.

Configuring Tracks



You can configure *Tracks* both individually and for the entire *Timeline*. In other words, you can name, delete, add, copy, zoom in, zoom out, etc., either all the *Tracks* as a group or a single *Track*.

Adjusting All Tracks (Track Name Header)



Track Name header shortcut menu

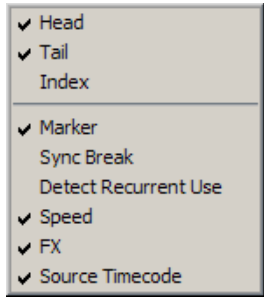
To adjust all *Timeline* Tracks as a group, right-click the header of the *Track Name* column. In the shortcut menu that appears, use the options provided to control the appearance and functionality of the *Tracks*.

Add Track

Click *Add Track* to add an additional *Track* to the *Timeline*. New *Tracks* are added under the existing *Tracks*. You can always drag a *Track* to a different position.

View

Click *View* to open a submenu with various options for controlling how clips are displayed on the *Tracks*. Changes made to these settings automatically affect how clips are displayed on the *Tracks*.



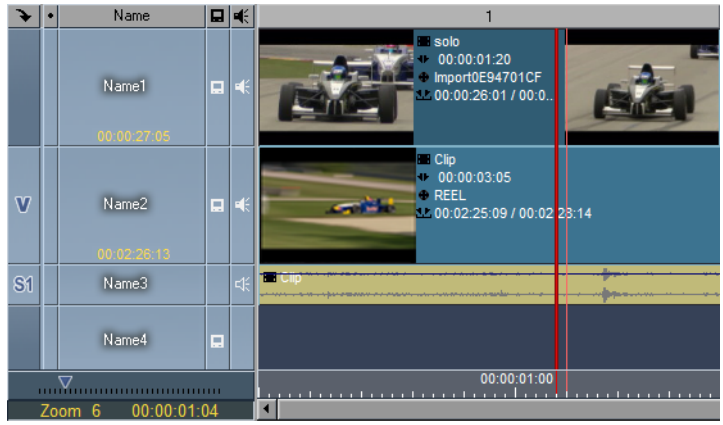
View submenu

- *Head* - displays the first frame of the clip as a *Picon* at the beginning of the clip.
- *Tail* - displays the last frame of the clip as a *Picon* at the end of the clip.
- *Index* - displays the index frame in the middle of the clip (see "*Set Index Picture*" on page 124).
- *Marker* - displays clip markers (if set). See also "*Setting Markers and Adding Comments*" on page 271.

- *Sync Break* - A red line at the bottom of a clip indicates that the audio and video portions of a clip are no longer synchronous.
  The number at the end of the clip indicates by how many frames you have to move the clip(s) so that they are synchronous again.
  However, this function only works if the video and audio were digitized synchronously and inserted ungrouped on the *Timeline*. See "*Source Track Mapping*" on page 375 and "*Synchronicity*" on page 463.
- *Recurrent Use* - indicates (based on the timecode information) whether a clip or parts of it are already contained in the *Sequence*. A red jagged line at the top edge of a clip shows what part of the clip has already been used.

If you are using two different clips with identical timecode in a *Sequence*, these clips (or parts of them) are registered as already being used (recurrent use), even though they may be of totally different content.

- *Speed* - indicates the speed factor (as a percentage) by which the clip was modified. A broken black line appears at the lower edge of the clip. An alternating red and black broken line indicates a timewarp effect.
- *FX* - displays the icons of the effects assigned to a clip. Activate this function to access an effect icon's shortcut menu. See also "*Effect Icon on a Timeline Clip*" on page 508.
- *Source Timecode* - when active, the timecode data of a *Timeline* clip will appear below the *Track* name.
  This refers to the position of the *Timeline Playline* covering a clip on the *Timeline*. Thus you know the clip's TC data, not only the master TC of the Timeline.
  The *Track* height must not be below 38 pixel (see "*Track Height*" on page 368).

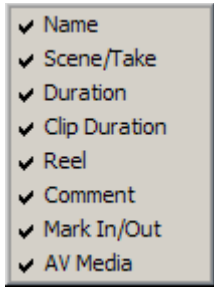


Source Timecode refers to the clip TC

Text

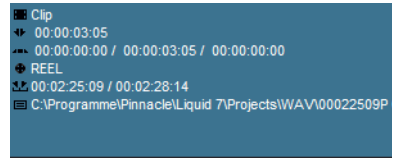
Click *Text* to open a submenu with various options for controlling the display of clip information. You can display all clip properties necessary for your work.
Click an item to select it (a checkmark appears next to it). Selected information is automatically displayed with the clip.

All *Text* options and some of the *View* options are included in a clip's *Properties* window. Click *Properties* in a clip's shortcut menu to modify the information. See also *"Object Information: Properties"* on page 281.



Submenu text

- *Name* - displays name of current clip.
- *Scene/Take* - displays the entry made when naming a clip, for example, in the *Logging Tool* or in *Clip Properties*.
- *Duration* - indicates the length of a clip in seconds between its mark-in and mark-out.
- *Clip Duration* - indicates the length of a clip in seconds before the mark-in, between the mark-in and mark-out, and after the mark-out.
- *Reel* - displays source *Reel* names.
- *Comment* - displays clip comments.
- *Mark-In/Out* - displays the timecode of the mark-in and mark-out.
- *AV Media* - displays the clip path, i.e. the name and location of the corresponding *Media File*.



Sample: clip with all text information available

These options only appear if clip display is large enough. The *Text* data also appears in the tooltip (activated by resting the mouse pointer on a clip for about one second).

Track Height

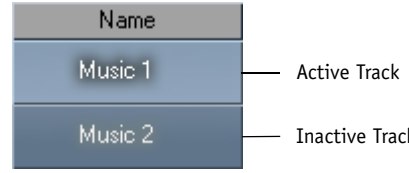
If you want all the *Tracks* to have the same height, click *Track Height*. From the pop-up that appears, specify a height of 14 to 122 pixels. To directly control the height of individual *Tracks* using the mouse, drag the line between two *Track Headers* up or down.



Control Track height using the mouse

Activate all / Deactivate all

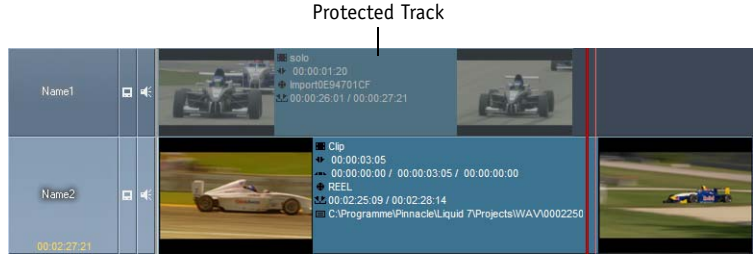
Select *Activate all* in the *Name Track Header* to toggle *Track* status between active and inactive. *Inactive Tracks* have a *Track* name with a dark background. To change the status of individual *Tracks*, click their *Track* name.
When a *Track* is not active, you can delete and move clips, but not add new clips using the *Insert Arrow* or *Send To* function. However, you can still drag clips to the *Timeline*.
See also *"Adding Objects"* on page 412.



Track active/inactive

Protect All

Click *Protect all* to protect all *Tracks* and hence all elements on the *Timeline* from being modified. When this function is activated, you cannot directly access the clips or other elements on the *Tracks*. *Protected Tracks* are played back normally during *Timeline* playback (when playback is activated).
The *Picons* of protected *Tracks* appear with a darker background.

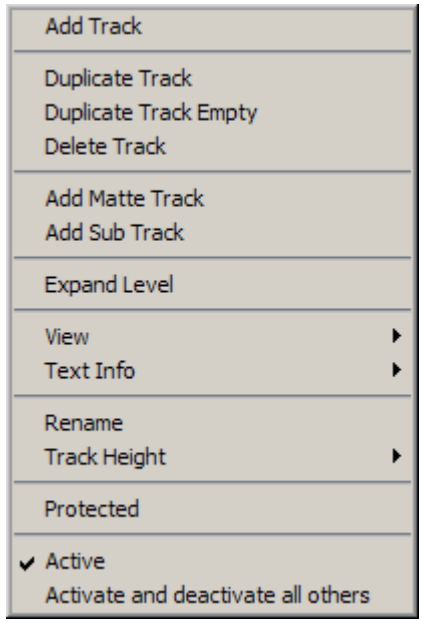


Protected and unprotected Tracks



You can delete protected *Tracks* (system prompts you for confirmation).

Adjusting Individual Tracks



Single Track shortcut menu

To adjust an individual Track, right-click a *Track* name to open a shortcut menu.

Some of the options in this menu are the same as in the *Track Name Header* shortcut menu. See also *"Adjusting All Tracks (Track Name Header)"* on page 365.
These options operate the same as those in the other menu, except they only apply to one selected *Track*. The differences are discussed in more detail below.

Duplicate Track

Click *Duplicate Track* to make a copy of the current *Track*, including all the objects it contains, and insert it below the current Track. The copy is assigned the same name and has the same settings as the original.

Duplicate Track Empty

Click *Duplicate Track Empty* to make a copy of the current *Track*, without its contents (i.e. just the settings). The copy is inserted below the current *Track* and assigned the same name as the original.

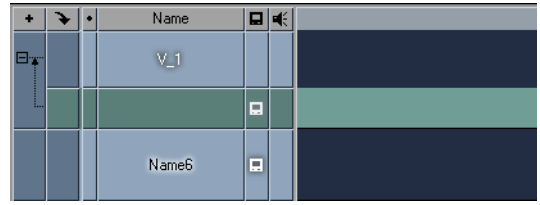
Delete Track

Click *Delete Track* to delete the current *Track* from the *Timeline*. The system prompts you for confirmation.

Add Matte Track

Click *Add Matte Track* to add a *Matte Track* as a subordinate track to an existing track (a special type of *Subtrack*). This function is used for *Track Matte* (alpha channel) effects. For a more detailed explanation, refer to: "*Matte Track and Track Matte*" on page 467.

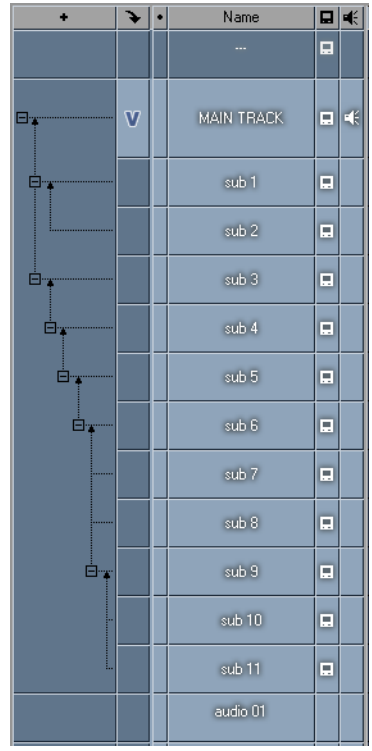
When *Matte Tracks* are used, another column is added to the *Track Header* area on the far left. The *Matte Track* itself is green. Click the *Plus* sign in the new column to display the track or the *Minus* sign to hide it.



Matte Track for V_1 Expanded; New Column on the Left

Add Sub Track

Subtracks are useful for setting up complex *Timelines* such as those used, for example, in multilayer compositing. They serve as *Containers* - although only on a *Track*-specific basis - and not as freely moveable objects. *Subtracks* have no other purpose than to achieve order and clarity, and thus differ from *Matte Tracks*. You can configure as many *Subtracks* as you wish.



Subtracks and Hierarchical Tree (on the Left)

Note the following:

- As soon as the first *Subtrack* is added, a new column is added on to the left of the *Mapping* column. As in the Windows Explorer, a system of *Plus* and *Minus* boxes and connecting lines allows you to show and hide the different hierarchical levels.
- Each new *Subtrack* is initially positioned on a subordinate level in the tree hierarchy, indicated by the arrow to the right of the minus box. In the screenshot above, for example, this is illustrated by "sub 1" and "sub 2".
  This means that when you click the minus sign, *Subtrack* "sub 2" will disappear. The same thing happens when you select *Collapse Tracks* from the shortcut menu.
  If you then click the plus sign, the subtrack will reappear.

- The shortcut menu for a *Subtrack* also contains the *Expand/Collapse Level* functions. When you collapse (raise) the *Subtrack* level, the *Subtrack* is shifted onto the same hierarchical level as the *Subtrack* immediately above it. In the screenshot above, this is illustrated by *Subtracks* 6 to 9.
- Objects on different *Subtracks* are independent of one another. For example, if you move an object to the "master" track while its *Subtracks* are collapsed, it will no longer be synchronous with the objects on the *Subtracks*.



To avoid undesirable consequences when objects are unintentionally moved, work with linked objects. See also *"Item Link"* on page 439.
You can also activate the *SyncLock* function (for *FilmStyle*). See also *"Sync Lock"* on page 437.

- Treat *Subtracks* and the objects they contain just as you would normal *Tracks* and objects. But also note: When you delete a (sub)track to which other *Subtracks* are attached, these subordinate *Subtracks* are also deleted.

Collapse / Expand Level and Tracks

See previous section.

Rename

Click *Rename* to rename a *Track*. In the edit dialog box that appears, enter a name of up to 31 characters. The default names given to *Tracks* are *Name1, Name2*, etc.



Track names help you maintain an overview of the various *Tracks* on the *Timeline*, but have no effect on a *Track's* functions - every *Track* on the *Timeline* has the same functions. Only activating video or audio playback influences a *Track's* functions. See *"Video Playback"* on page 363 and *"Audio Playback"* on page 363.

Activate and deactivate all others

This function lets you save a few steps when you just want to activate a single *Track*. All other tracks are deactivated.

View

See *"View"* on page 365.

Text Info

See *"Text"* on page 367.

Track Height

See *"Track Height"* on page 368.

Protected

See *"Protect All"* on page 368.

Active

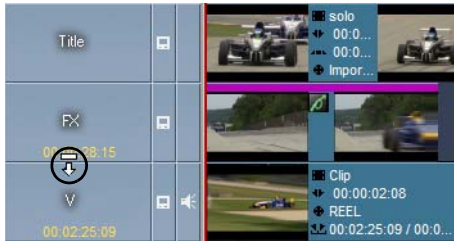
See *"Activate all / Deactivate all"* on page 368.

Vertical Track Priority

Track Priority is defined vertically (higher *Tracks* have higher priority). In other words, the higher *Tracks* overlay everything below them. This lets you apply effects at several levels (multi-layering).

You can insert any number of *Tracks* in order to create effects like keys, 2D/3D effects, etc.

To change a *Track's Priority*, drag its *Track* name in the *Track Header* to a different position. As you drag, the pointer changes to show where the *Track* will be inserted when you release the mouse (either above or below another *Track*).



Track priority changes with Track order

Track Priority plays an important role for example with keying. In a keyed clip, the clip underneath becomes visible.

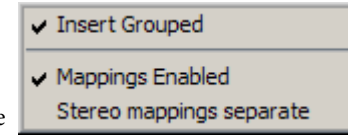
Track Priority does not apply to audio. All audio signals have equal priority, regardless of their vertical *Track* position.

Source Track Mapping

If you are working with the *Sequence Editor* (*page 391*), *Source Track Mapping* is important for inserting clips on the *Timeline*; it serves as a sort of "signpost" for the *Source Tracks*.
When you use the insert function to insert a clip from the *Source Viewer* on the *Timeline* or when you use the *Send To* > *Timeline* function in the *Project* window, the *Source Tracks* (i.e. video and/or audio *Tracks*) for the click are distributed over the *Timeline Tracks* in accordance with the *Source Track Mapping*.

Source Track Mapping Menu

In the shortcut menu for the *Source Track Mapping* column, you can begin by defining whether clips should be grouped or ungrouped on the Timeline or should be inserted "as a gap":



- Click *Grouped* (with/without checkmark) to define how *Source Tracks* should be positioned on the *Timeline Tracks*: completely grouped (*VA*), separately (*V;A#*) or video and stereo (*V,S#*).
- Click *Mappings Enabled* to deactivate (no checkmark) or activate (with checkmark) the mapping function. If mapping is disabled, any clips you insert on edit-active *Timeline Tracks* are represented by a gap with the length of the clip.
- Click *Stereo mappings separate* to insert stereo audio clips on the *Timeline* as two separate objects and at label positions *A1* and *A2* (instead of *S1* or *S2*).



When you drag clips to the *Timeline*, the defined mapping is either ignored (*Insert grouped* = active), or clips will be inserted with separate audio on the *Tracks* indicated by mapping (*Insert grouped* = inactive). This behaviour was introduced with version 7.0.

Source Track Labels

Source Track Labels in the *Source Track Mapping* column identify the *Timeline Tracks* on which the *Source Tracks* should be inserted. The following *Labels* are possible:



- "*VA*" means that a clip is positioned on a *Track* with video and audio grouped. *Tracks* labeled with "*A*" only contain audio (no video signal in clip).



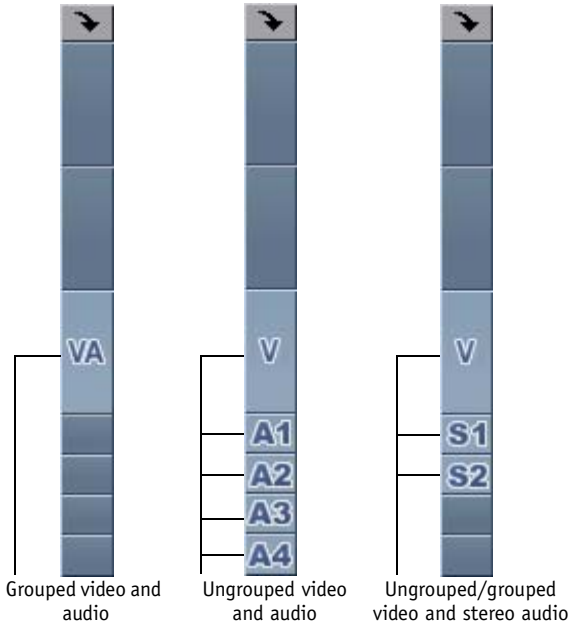
- "*V*" means that only a video signal is positioned on the *Track*.



- *Tracks* marked with "*A#*" (for audio A1-A4) are assigned audio clips from the corresponding *Source Track* (input channel).



- "*S#*" means that stereo audio is positioned on the *Track* (for example, A1/A2 for S1 and A3/A4 for S2).

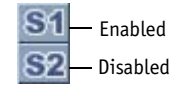


Mappings Disabled

Deactivate *Mappings Enabled* so that when you press the *Insert Arrow* instead of the clip itself a gap the duration of the clip appears on the *Timeline Tracks* (if they are edit-active) based on *Source Track Mapping*. This applies to both grouped and ungrouped clips.

Mapping Individual Tracks

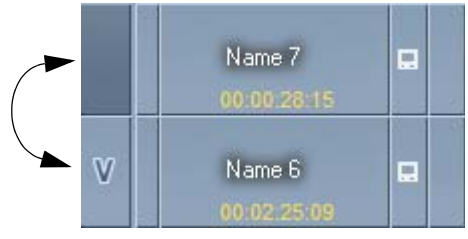
You can define mapping for each *Track*. To enable/disable mapping click the *Source Track Label* (toggle switch).



Mapping status

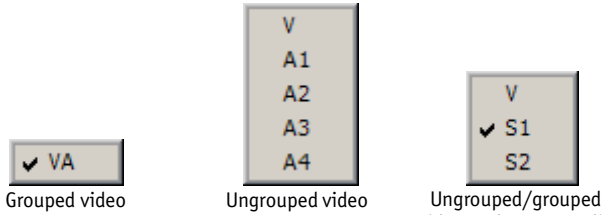
Moving Source Track Labels

To move the individual *Source Tracks*, drag the *V, VA, A# or S#* to the required *Timeline Track*. The edit status of the *Timeline Track* is also transferred with this action, meaning that the original *Track* is left edit inactive.



Moving source Track labels

You can also control mapping of the individual *Source Tracks* with the individual shortcut menus.
To activate mapping for a *Track*, click it (a checkmark appears next to it
To completely deactivate mapping for a *Track*, click the *Track* again so that the checkmark disappears.
Note: That does not activate or deactivate the edit status of the *Track*.



Which shortcut menu appears depends on mapping type

Edit Styles

Avid Liquid's two *Edit Styles* determine *how* objects are inserted on the *Timeline*, regardless of whether you use a mouse (drag&drop) or the *Insert Arrow* and *Source Viewer*:

Overwrite Style

Objects that are inserted overwrite any objects or gaps on the particular *Track (page 379)*.

Film Style

As at the film cutting table, here the material at the insertion point is "cut" and the clip is inserted between the "two parts". Subsequent objects and gaps are shifted accordingly (*page 380*).



Even when insertion is by drag & drop, the *Source Track Mappings* can be used. This behaviour can be switched off: In the *Source Track Mapping* menu, make sure that *Insert Grouped* is active. See "*Source Track Mapping*" on page 375.

Overwrite Style

When working in *Overwrite Style*, the inserted clip replaces an area on the *Timeline Track* equal in size to the clip's duration.



To activate *Overwrite Style*, click the tool button (between *Source* and *Master Viewer*). When *Overwrite Style* is active, a red square appears at the top center of the button.

Which *Timeline Tracks* are overwritten depends on which *Source Tracks* a clip contains and on *Source Track Mapping*. (See "*Source Track Mapping*" on page 375 for details.)

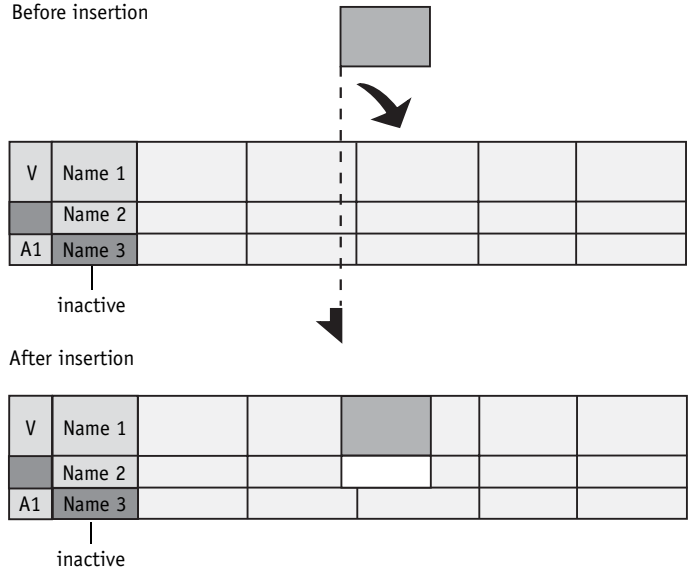


To insert an object with the *Insert Arrow* a *Track* has to be active and not protected (see *page 368*).

In the case of active *Tracks* that have no assigned *Source Tracks*, a gap which corresponds in length to the duration of the inserted clip is created and existing clips are overwritten when you insert objects with the *Insert Arrow*. See also "*The Insert Arrow*" on page 397.

Example

The following example illustrates an insert using the *Insert Arrow* with a clip that has one video *Source Track* and one audio *Source Track* mapped to a *Track* set inactive.





A transition in the area of the inserted clip is deleted.

Film Style

If you insert a clip with the *Insert Arrow* in *Film Style*, a cut is created at the insert point.



To activate *Film Style*, click the tool button (between *Source* and *Master Viewer*). When *Film Style* is active, a yellow square appears at the top center of the button.

Based on *Source Track Mapping* (see also *Source Track Mapping* on page 375), the *Timeline Tracks* are rippled by the duration of the clip.

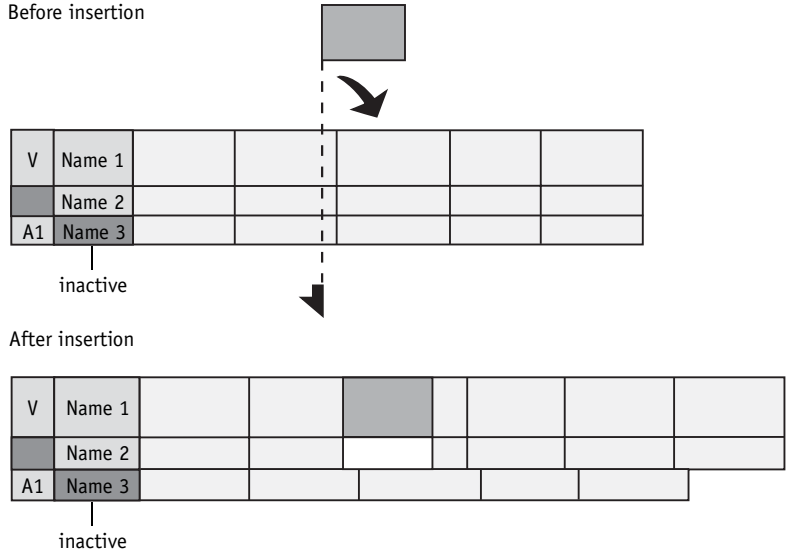


In order to insert an object with the *Insert Arrow* a *Track* has to be active and not protected (see *page 368*).

In the case of active *Tracks* that have no assigned *Source Tracks*, a cut is also created. Objects previously on the *Track* are shifted (rippled) to make room for the inserted clip and a gap is created (*page 397*).

Example

The following example illustrates an insert using the *Insert Arrow* with a clip that has one video *Source Track* and one audio *Source Track* mapped to a *Track* set inactive.





A transition in the area of the inserted clip is deleted.

Navigating on the Timeline

This section describes how you can find your way on the *Timeline*, set the *Playline* to specific points on the *Timeline*, and view/listen to video/audio.
The information below also applies to the *Playlines* in the *Clip, Source*, *Master* and all other *Viewers*.
The timecode display to the lower left of the *Timeline* refers to the current position of the *Playline*.

Zoom Control and Scroll Bars

The amount of a *Sequence* that you can view at one time on the *Timeline* depends on three factors:

- *Timeline* scale/zoom: Zooming the *Timeline* scale in and out (*page 356*).
- Scroll bars: Scrolling the *Sequence* to the left/right or up/down (*page 355*).
- Desktop view (*View Switcher*): Here you can select various *Timeline* views, such as horizontal over both monitors (if you work with two monitors; see *page 46*)

Mouse Navigation

"Mouse navigation" in Avid Liquid means moving the *Playline* (*page 355*).

Scrub Mode



In this case, the mouse pointer must be switched to *Scrub Mode*. Above the *Timeline*, the mouse pointer again appears as shown (white arrow accompanied by a line representing the *Playline*).



If the mouse pointer does *not* look like this, you are in *Edit Mode* (*page 411*). Click the *Edit Mode* button in the *Timeline* toolbar to switch to *Scrub Mode*.

Or to change modes temporarily, hold down the ALT key. When you release the key, the mouse pointer will return to the previous mode.

Moving the Playline

- In *Scrub Mode:* Click the point on the *Timeline* where you want to position the *Playline*.
- In *Edit Mode*: Click the desired position within the *Timecode Bar* (*page 355*).

Scrubbing

- Drag the *Playline* over the *Timeline*. Video is played back simultaneously. (Audio scrubbing: see *page 270*).
  If you reach the end/beginning of the *Timeline*, the system automatically scrolls the *Timeline* farther.



If you use a mouse with a mouse wheel: turn the wheel to move the *Playline* frame by frame, press the wheel to move 10 frames at a time.



You can also scrub with the mouse pointer in the video inlay of the *Master Viewer*. The *Playline* automatically follows.

Keyboard Navigation

You can also move the *Playline* using the keyboard:

Arrow Keys

- Use the LEFT ARROW/RIGHT ARROW keys to move the *Playline* one frame at a time.
- Simultaneously hold down the SHIFT key to move the *Playline* 10 frames at a time.

Default/Custom Key Assignment

You can also assign the function to another key. See also *"Assign Functions to Keyboard"* on page 993.

Shuttle Playback (JKL)

Shuttle Playback is a convenient way to play back *Sequences* (*page 275*).

Button Navigation

The toolbar is located at the top of the *Timeline* and contains buttons for navigating on the *Timeline*. This toolbar can be customized like any other Avid Liquid toolbar. (See "*Customizing Toolbars*" on page 990.)

GoTo Start



Jumps to the beginning of the *Sequence*/clip.

GoTo End



Jumps to the end of the *Sequence*/clip.

Step Back 1 Frame



Jogs backward one frame at a time.

Step Forward 1 Frame



Jogs forward one frame at a time.

Step Back 10 Frames



Jogs backward ten frames at a time.

Step Forward 10 Frames



Jogs forward ten frames at a time.

GoTo Mark-In



Jumps to the mark-in point, if set; otherwise to the start of the *Sequence*/clip.

GoTo Mark-Out



Jumps to the mark-out point, if set; otherwise to the end of the *Sequence*/clip.

GoTo Previous Marker



Jumps backward to the next *Marker* in that direction, if one is set.

GoTo Next Marker



Jumps forward to the next *Marker* in that direction, if one is set.

GoTo Previous Edit



Jumps backward to the previous *Edit*, if it exists.

GoTo Next Edit



Jumps forward to the next *Edit*, if it exists.



The system registers each point on the *Timeline* where a clip, *transition*, title, etc., ends or begins as an "*Edit*" and displays it as a *Slice*. These *Slices* are numbered and are displayed above the *Timeline Tracks*.

GoTo Previous Event



Jumps backward to an event before the current position, if one is set.

GoTo Next Event



Jumps forward to an event following the current position, if one is set.



Events include *Markers,* mark-ins, mark-outs and *Edits.*

GoTo Previous Gap



Click the *GoTo Previous Gap* button to position the *Playline* at the beginning of the closest previous *Gap* on any *Track*.

GoTo Next Gap



Click the *GoTo Next Gap* button to position the *Playline* at the beginning of the next *Gap* on any *Track*.



A *Gap* is defined as the space between two adjacent clips on a *Track*.

Timeline Markers /Cue Marker

Timeline Markers can be set anywhere on the *Timeline* and can be provided with a comment as needed. A *Marker List* allows you to jump directly to a specific *Marker*.
There is also a clip *Marker*. See also *"Setting Markers and Adding Comments"* on page 271.



Setting and Deleting Markers



Move the *Playline* to the *Marker* position and click the *Set Marker* function. The *Marker* symbol is inserted in the *Timecode Bar* and in the position bar of the *Master Viewer*. At the same time, it appears in the *Master Viewer* video inlay.



Position the *Playline* directly on a *Marker* in order to delete it using the *Delete Marker* function. You can select the *Marker* using the *Goto next/previous Marker* and *Goto next/previous Event* functions. (See also *"Button Navigation"* on page 383.)

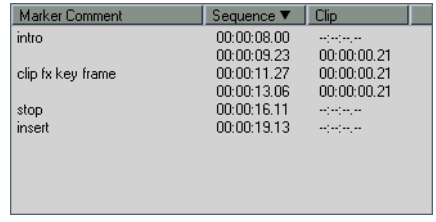
Attaching a Comment

Double-click a *Marker* to attach a brief comment (maximum 25 characters). Then click *OK* or press ENTER to close the editing field.
The comment is displayed when you rest the mouse pointer on the *Marker* for about a second.

Marker List



Click this button to open the *Marker List*. This window contains a list in chronological order of all the *Marker* set in the current *Sequence*.



Marker list

Double-click a marker entry to make the *Playline* move to the corresponding *Marker* position.

- *Marker Comment* - contains a *Marker* comment created by the user. To enter a comment, double-click the *Marker* and type in information in the field that appears.
- *Sequence* - shows the timecode position of a *Marker* on the *Timeline*.
- *Clip* - shows the timecode position of a *Marker* on a clip.

Right click in the *Marker* window to display a shortcut menu containing the following entries:

- *GoTo Marker* - Moves the Playline to the selected *Marker*, without closing the window in the process (as it does when you click the *Marker* entry).
- *Clear Selected Marker* - Deletes selected *Marker*.
- *Clear All Markers* - Deletes all *Marker*s in the current Sequence.
- *Clear All Sequence Markers* - Deletes all *Sequence Markers* of the current *Sequence*.
- *Clear All Clip Markers* - Deletes all clip *Marker*s in the current *Sequence*.

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Cue Markers



Cue-Markers trigger GPI impulses, for example to indicate the start or end of a *Sequence* playing on the *Timeline*. A GPI breakout box is available; please consult your Avid Technology, Inc. dealer.

Cue-Markers look like ordinary *Markers* on the position bar, but have the color yellow. Set and delete *Cue Markers* in the same way you set and delete ordinary *Markers*. The tool buttons *Set Cue-Marker* and *Delete Cue-Marker* show a lightning next to the *Marker* triangle:

If you don't find these tools on your default toolbar, check out the tool box of *Timeline/Master Viewer*.

Undo/Redo

In the default configuration, these two functions are available on the *Timeline* and *Master Viewer* toolbars.

Undo



Cancels the last edit action and returns the software to the state it was in before you performed that action. Avid Liquid saves the last 64 changes you made in any given module, permitting you to revert to practically any previous state.



The *Undo History* summarizes all available *Undo* steps in a list of edit actions. By clicking on a list entry you can reinstate the *Timeline* state prior to that specific action.
Call the *Undo History* by CTRL-SHIFT-clicking the *Undo* button. Hit ESC to close *Undo History*. A similar list of *Redo* steps can be displayed via CTRL-SHIFT-*Redo*.
Undo/Redo History is available in the *Source Viewer* and the *Clip Viewer* as well.

Redo



Cancels an *Undo* and returns the module to the edit state it was in before you used the *Undo* button.

ABCs of Effects

The simplest effects in Avid Liquid are video *Dissolves* and *Audio Cross Fades*. This section provides a brief description of these *Transitions*. For more information on video and audio effects, see "*Effects in Avid Liquid: The Basics*" on page 501.

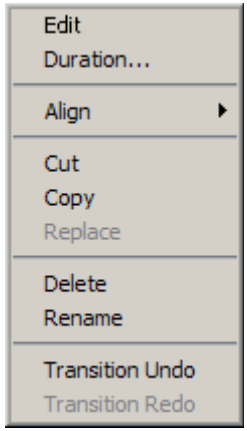
Add transitions

On the `Library` tab in the *Project* window, *Transitions* can be found in the *Rack Folder*s named *Classic Transition FX* and *Realtime Transition FX,* in the *Racks Editors, Presets* and *Audio,* respectively. There the dissolve is stored as *Dissolve*, and the cross fade as *Audio Crossfade*.

Drag the *Transition* you want to the edit or to the beginning or end of the clip to generate a fade-in/fade-out.

When a *Transition* or effect is being rendered, a pulsating sigma sign appears on the bottom right-hand side of the taskbar.

Transition Shortcut Menu



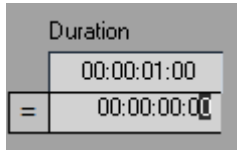
Transition effect shortcut menu

Like all the objects in Avid Liquid, a *Transition* has a shortcut menu. Here you can, for example, define the *Transition* duration or alignment:

Edit

To create or edit a *Transition*, click *Edit* to open the appropriate *Transition Effect Editor*.

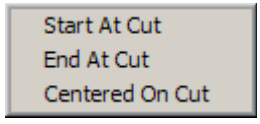
Duration



To change the default duration of a *Transition*, click *Duration* and enter the required duration in hh:mm:ss:ff.

To change the duration value, you can also subtract or add a certain duration. To do so, enter a "+" or "-" before a number. Confirm with ENTER.

Align



Use *Align* to define the point (mark-in, middle, mark-out) to position a *Transition* on the *Timeline*.

- Click *Start At Cut* to position the beginning of a *Transition* (mark-in) at the cut.
- Click *End At Cut* to position the end of a *Transition* (mark-out) at the cut.
- Click *Centered On Cut* to center a Transition on the cut.

You can also activate the *Align* function by repeatedly pressing the ALT button, while dragging the *Transition*. This allows you to toggle between the three positioning points.

Cut/Copy/Replace

- Click *Cut* to delete a *Transition* from the *Timeline* and transfer it to the clipboard. You can then insert the *Transition* elsewhere on the *Timeline*.
- Click *Copy* to create a copy of a *Transition* on the clipboard. You can then insert the *Transition* elsewhere on the *Timeline*, while keeping the *Transition* at its original position.
- Click *Replace* to change *Transition* type without changing basic parameters like duration, alignment, etc. You can use this function, for example, to replace a dissolve with a slide. To use *Replace*, you have to first copy the new *Transition* to the clipboard.

Delete

Click *Delete* to eliminate a *Transition* from the *Timeline*.

Rename

Click *Rename* to assign a different name to a *Transition* effect.

Transition Undo/Redo

These options allow you to cancel changes you made to *Transitions* or to cancel the undo(s) that you performed.

Replacing Transitions (Drag&Drop)

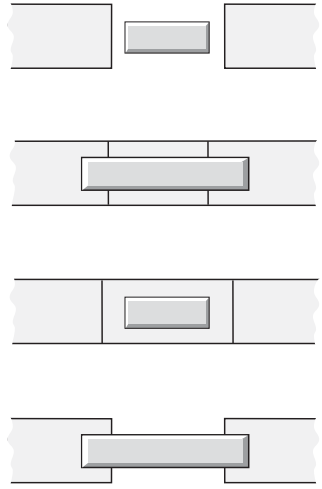
Transitions can be replaced with other *Transition* effects of exactly the same length and at exactly the same position. Just drag the replacement on the *Transition*. The new effect then takes the place of the older one.
Depending on the effect, effect parameters must be configured individually.

Leeway (Overlap)

A valid *Transition* appears as a grey bar. If the bar is red, this means that the clip does not cover the entire *Transition area*. This occurs if the end of the outgoing clip or beginning of the incoming clip has too little leeway (or "overlap" when you think in terms of A/B editing).
To remedy this situation, trim the clips or the *Transition*. See also "*Trimming Objects*" on page 417.

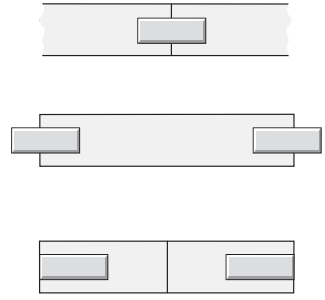
Valid and Invalid Transitions

If a *Transition* is not possible, you will not be allowed to set it. The examples below illustrate why this might happen:



Invalid Transitions

The pictures below illustrate how *Transitions* can be set.



Dissolve (top); fade-in/fade-out with leeway (middle); fade-in/ fade-out without leeway (bottom)



If you insert, delete or move a clip in the area of a *Transition*, the entire *Transition* is deleted.

Add (Auto) Dissolve

This function automates the insertion of *Dissolves* and *Cross Fades*: With a single click, the *Dissolve* or *Cross Fade* is in place. See also *"Add Dissolve"* on page 856.

Sequence Editor

The *Sequence Editor* combines the *Source Viewer* (“player”), *Master Viewer* (“recorder”) and *Timeline* (permits non-linear editing and the creation of *Sequences*). Clips are inserted on the *Timeline* by means of the *Insert Arrow*.

Source Viewer
Lets you view and define the clips that you will insert in the Sequence *page 393*

The Insert Arrow
For inserting clips on the Timeline *page 397*

Master Viewer
For controlling the Timeline and checking the master *page 398*

Sequence
Create, save as template, copy, start Timecode *page 402*

Three-Point Editing

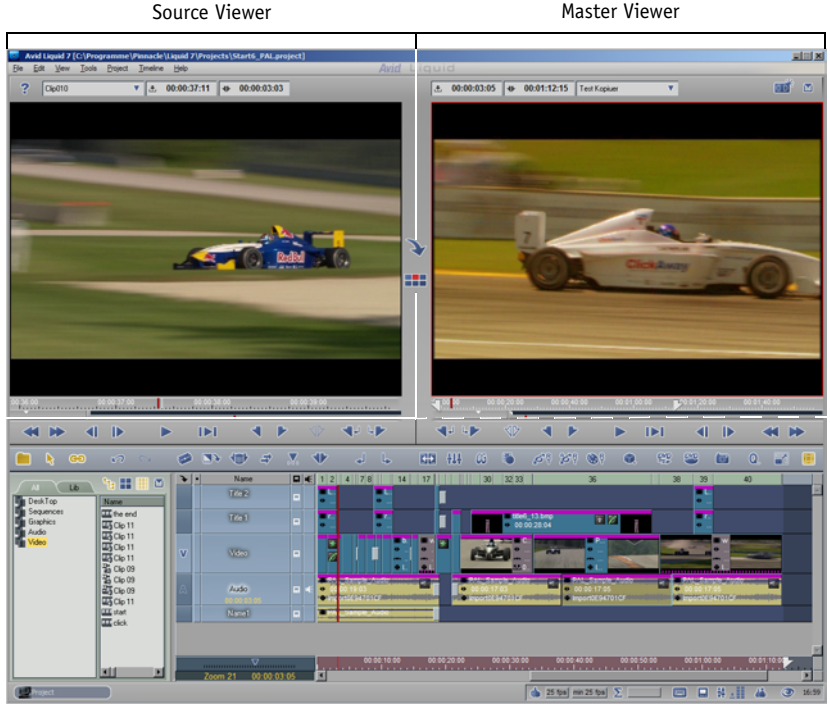
The ABCs of editing with the Sequence Editor *page 408*

Four-Point Editing

Fitting clips using the Timewarp effect *page 409*



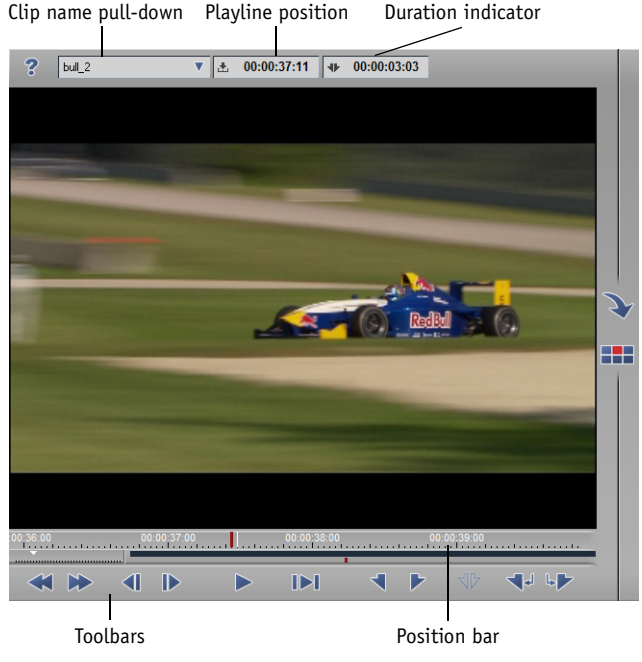
Use the *Sequence Editor* as an alternative or supplement to *Timeline* editing (*page 410*).



Sequence Editor and Timeline

Source Viewer

The *Source Viewer* is used to prepare clips for editing and insert them on the *Timeline*. It is equipped with the same functions as the *Clip Viewer (page 263)*, but also offers the *Insert Arrow* and the two *Edit Styles* (*page 378*).



Source Viewer

Loading Clips to the Source Viewer

There are various ways to load clips (and clip shortcuts) to the *Source Viewer*. Regardless of the method you use, a shortcut of the clip is created in the *Source Viewer*. Therefore, any changes you make to a clip always affect the original in the *Project* window.



When you insert a clip on the *Timeline*, a copy of the clip is created. Thus, the original clip is not affected. This copy can be transferred to the *Project* (with *Cut/Copy, Paste*).

The last 20 clips you loaded in the *Source Viewer* appear in the clip name list (see *page 395*).

Drag & Drop

You can drag clips from the *Project* window to the video inlay of the *Source Viewer*. When you drag several clips at once to the *Source Viewer*, they appear in the order they were in the *Project* window.

Send to...

You can transfer clips from the *Project* window to the *Source Viewer* by clicking *Clip shortcut menu* > *Send To...* > *Source Viewer*. (See also *"Transferring Storyboards (Send to)"* on page 291.)

Double-Click (Project)

Double-click a clip in the *Project* window to directly load it in the *Source Viewer*. For this to work, the appropriate settings must be made in *Project Properties* (see *page 222*).

Double-Click (Timeline Clip)

Double-click a *Timeline* clip to load the clip in the *Clip Viewer* (see *page 263*).

Dragging Clips from the Source Viewer

Of course, you can also drag clips from the *Source Viewer* to other areas.

To do so, CTRL+drag a clip to:

- the desktop (a shortcut is created).
- in a *Rack* of the *Project* window (a copy of the clip is created).
- the *Master Viewer* (a copy of the clip is created and inserted at the *Playline*).
- the *Timeline*.



When working in *Single Monitor View,* you can drag the clip from the *Source Viewer* inlay without pressing the CTRL key. In this view mode you can not scrub the *Source* inlay, however.

Clip Name List

The last 20 clips you loaded in the *Source Viewer* appear in the *Clip Name List*. The last loaded or selected clip appears at the top of the list. If you dragged several clips at once to the *Source Viewer*, they appear in the order they were in the *Project* window.



Clip Name List

Right-click *Clip Name List shortcut menu* > *Clear List* to delete all entries or individual entries. Other functions available in the shortcut menu:

- *Most recent always top/bottom* -
  Ensures that the last clip you edited will appear at the top or bottom of the list.
- *Sort by name/Unsorted* -
  Sorts the list alphabetically or leaves it just as it is (e.g. in the order in which the clips were loaded in the *Source Viewer*).

Setting Mark-Ins and Mark-Outs



To load a certain portion of a clip in the *Source Viewer* on the *Timeline*, first set a mark-in and a mark-out point. To do so, position the *Playline* where you want the mark-in (or mark-out) to be and click the *Mark In/Mark Out* button. Do the same for the mark-out (or mark-in). It does not matter whether you position the mark-in or mark-out first. If a mark-in or mark-out already exists, it is replaced.

Moving Mark-Ins and Mark-Outs

You can also move an existing mark-in or mark-out instead of setting new ones.
To do this, ALT+drag the mark-in or mark-out to the required position. The mouse cursor turns into a cross. The new position is reflected both in the video inlay and on the timecode indicator.

Mark-In/Mark-Out Frames are "Inclusive"



Frames with mark-ins or mark-outs are inclusive. This means they are used for insertions and *Timeline* playback.

Mark-In and Mark-Out Priorities

- The mark-in has priority over the mark-out, i.e. to match a clip to the *Timeline* mark-out, only set the mark-out in the *Source Viewer*.
- The *Timeline* mark-in and mark-out have priority over the clip mark-in and mark-out. For example, if a clip has a shorter duration (between the mark-in and mark-out) than the duration between the mark-in and mark-out on the *Timeline*, the *Timeline* mark-out prevails, and a slow motion effect is automatically added: see "*Four-Point Editing*" on page 409.

Additional Functions

The *Source Viewer* also provides the functions of the *Clip Viewer*, such as *Waveform Inlay*, *Shuttle Playback* (JKL), etc. (see also *Viewing and Editing Objects: the Clip Viewer* on page 263).

Fullscreen Display



You can scale the video in the *Viewer* to the size of your computer monitor. The toolbutton (pictured on the left) is found in the *Viewer's* Function Library (right-click > *Customize* > *Special* tab). Keyboard commands such as *Play/Pause* = SPACEBAR and scrubbing in the image continue to function as usual. Press ESC to exit fullscreen display.

Moveable TC Display

You can activate a freely scalable, moveable timecode display: see *page 483*.

The Insert Arrow

Single-click the *Insert Arrow* to transfer a clip defined in the *Source Viewer* to the *Timeline*. The button is located between the *Source* and *Master Viewers*.
If you use the *Insert Arrow*, make sure you have checked or set the following items before clicking it:

- Is (are) the *Timeline Track*(*s*) activated (*page 368*)?
- Are the *Source Tracks* correctly assigned (mapped; *page 375*)?
- Is the *Edit Style* correct (*page 378*)?
- Are the mark-in and mark-out points set on the *Timeline* or is the *Playline* positioned correctly?

If everything is correct...



... click the *Insert Arrow* to insert the clip. Afterwards, the *Playline* moves exactly one frame after the mark-out of the inserted clip so that you can insert the next clip.



If you work in *Single Monitor View,* the *Insert Arrow* and the *Edit Style* toggle buttons are obscured by the *Project* window. Workaround: Use the buttons shown here, or retrieve the *Insert Arrow* and the *Edit Style* symbols from the *Timeline* function library and place them on the *Timeline tool bar.*



An edit operation is actually complete after you set three mark-in/mark-out points. The fourth mark-in or mark-out is created automatically. For more information, read about "*Three-Point Editing*" on page 408 and about "*Four-Point Editing*" on page 409.

Master Viewer

The *Master Viewer* is used for displaying output of the *Timeline*. All actions performed in the *Master Viewer* have a direct effect on the *Timeline* and vice versa. All buttons are available for both areas and are used to activate the same functions.

The *Master Viewer* is similar in design to the *Source Viewer* and *Clip Viewer*. However, it is not used for processing and playing clips, but rather *Sequences*.



Master Viewer

Loading Sequences to the Master Viewer/Timeline

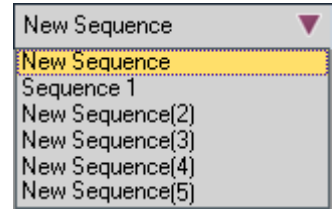
There are three ways to load *Sequences* to the *Master Viewer* (and thus onto the *Timeline*):

- You can double-click them in the *Project* window,
- use the *Send To...* option in the shortcut menu
- or drag them to the *Master Viewer's* inlay.

When you transfer several *Sequences* to the *Master Viewer* (from the desktop or a *Rack*), they appear in the *Sequence List* in their original order. The *Sequence List* is used for selecting *Sequences*.

Sequence List

The last 20 Sequences you loaded into the *Master Viewer* or created (see also *New Sequence* on page 403) appear in the *Sequence List*. The *Sequence* last loaded appears at the top of the list. By selecting a *Sequence* in the *Sequence List*, you can load *Sequences* onto the *Timeline* and into the *Master Viewer*. Other functions available in the shortcut menu:



Sequence List

- *Most recent always top/bottom* -
  Ensures that the last *Sequence* you edited will appear at the top or bottom of the list.
- *Sort by name/Unsorted* -
  Sorts the list alphabetically or leaves it just as it is (e.g. in the order in which the *Sequences* were loaded in the *Master Viewer*).

There is a difference between loading a *Sequence* in the *Master Viewer* and dragging one from the *Project* window to the *Timeline* or into the *Source Viewer*. For more information, see *"Nesting Sequences (Building a Container)"* on page 471.

Dragging Sequences from the Master Viewer

You can also drag *Sequences* from the *Master Viewer* to the desktop, *Racks* or *Source Viewer*. To do so, CTRL+drag the *Sequence*. Dragging a *Sequence* to the *Timeline* results in the creation of a *Container* (*page 471*).

Setting Mark-Ins and Mark-Outs



To define a specific insertion point or exit point on the *Timeline*, first set a mark-in or mark-out. To do so, position the *Playline* at the corresponding position on the *Timeline* and click the *Mark-In/Mark-Out* button. It makes no difference whether you position the mark-in or mark-out first. If mark-ins or mark-outs already exist, they are replaced.



Fit Sequence to Mark In and Mark Out

This button lets you toggle between displaying the entire *Sequence* for the entire available length of the *Timeline* and the area between the mark-in and mark-out. The *Timeline*'s zoom function always toggles between these two views.

Inserting at the Playline

If no mark-in or mark-out is set, the clip is inserted at the *Playline*.

Moving mark-ins and mark-outs

See *page 395*.

Mark-in and mark-out frames are "inclusive"

See *page 395*.

Mark-in and mark-out priorities

See *page 396*.

Additional Functions and Elements

The *Master Viewer* has many functions in common with the *Clip Viewer* and *Source Viewer*. The functions not listed here are described there (*page 263*).

Position Bar

To view a *Sequence*, scrub the position bar (you can also scrub in the *Master Viewer's* inlay like with all viewers). For general hints on how to use the position bar, see *"Navigation Using the Position Bar"* on page 265.
During scrubbing, the *Playline* moves and the *Timecode Bar* is adjusted to reflect the current timecode position. See also *"Mouse Navigation"* on page 381.

You can use the arrow buttons on the keyboard or the mouse wheel to jog the inlay frame-by-frame. Roll the wheel away from you to jog forward, roll it toward you to jog backward.

The position bar shows markers and the mark-in and mark-out points set on the *Timeline*.

Timecode Displays

The two timecode indicators at the top of the *Master Viewer* display information on current *Playline* position and duration between mark-in and mark-out. The display is in standard timecode format.



You can activate a freely scalable, moveable timecode display: see *page 483*.

Video Inlay

The video inlay displays *Timeline* output at the current *Playline* position.

A clip's mark-in/mark-out points are graphically displayed in the video inlay. Special icons mark frames that contain such points or markers:

- Frames with mark-in/mark-out points have an opaque triangle in the corner.
- *Timeline Markers* not only appear on the position bar, but are also represented in the video inlay through a marker icon at the top of the inlay.

Fullscreen Display



You can scale the video in the *Master Viewer* to the size of your computer monitor. The toolbutton (pictured on the left) is found in the *Viewer's* Function Library (right-click > *Customize* > *Special* tab). Keyboard commands (such as *Play/Pause* = SPACEBAR) and scrubbing in the image continue to function as usual. Press ESC to exit fullscreen display.

Shuttle Playback (JKL)

You can also operate the *Master Viewer* using *Shuttle Playback* (see *page 275*).

Sequence

The *Sequence* is the film that is edited on the Avid Liquid *Timeline*. This section tells you how to work with *Sequences*:

New Sequence *page 403*

Sequence menu *page 406*

→ Saving a copy of a Sequence *page 406*

→ Saving Timeline as template *page 406*

→ Saving Timeline as default template *page 406*

→ Setting start timecode *page 406*

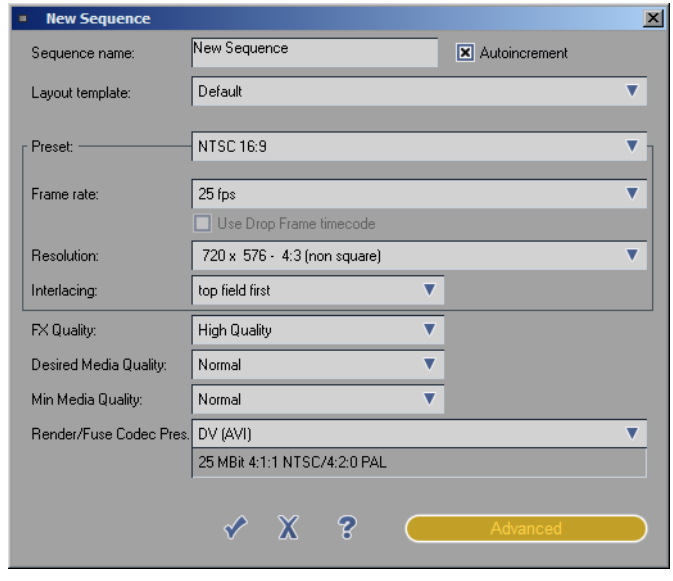
Playback Sequence *page 407*

Sequence as a clip *page 408*

New Sequence



The *New Sequence* button lets you create a new *Sequence* on the *Timeline* (also via *File* > *New* > *Sequence*).
The first step in the process is to empty the *Timeline*. The previous *Sequence* continues to be stored in the *Sequence Rack* of the *Project*. You can also reload a *Sequence* from the list of *Sequence* names to the *Timeline* (*page 399*).



New Sequence



When you reboot your computer after a system crash (e.g. due to a power failure), a new *Sequence* is automatically created. Avid Liquid's Instant Save ensures that you will not lose your data. The *Sequence* you were editing before the crash can be found in both the *Sequence List* and *Sequence Rack*.

Name and Template

Enter a name for the new *Sequence* here. The *Autoincrement* option adds a number to the file name (which is retained unchanged), always incremented by +1.

If a *Template* exists, you can select it from the list. For information on creating *Timeline* templates, refer to *page 406*.



STUDIO template: The *Template* provides Studio users with the familiar arrangement of *Timeline Tracks*, with one exception. Here, the overlay (effect) *Track* is located above the main video *Track*. In Avid Liquid, a vertical top-down hierarchy applies: A title or picture-in-picture effect must be positioned on a *Track* above the video so that the frames overlap at the output.

Sequence Parameters

(You can access the parameters below from *Timeline Properties* or in the *New Sequence* dialog.)

- *Preset* -
  Here you will find a long list of SD (standard definition, PAL/NTSC), high definition and multi-media formats. For more information on the latter two formats, see the chapter entitled *"High Definition"* on page 71.

When you select a specific format, the associated frame rate, resolution and field sequence are immediately displayed. As soon as you change one of these parameters, the preset changes (for example, from *NTSC 4:3* to *Custom Format*).

- *Frame rate* -
  The frame rate indicates the number of frames or fields played back per second ("fps" stands for frames per second).
  With some formats you have the choice to activate the *Use DropFrame timecode* option. This sets the *Timeline Master* to a dropframe TC system.
- *Resolution* -
  Indicates the active resolution as horizontal pixels times vertical pixels; the image's aspect ratio and the pixel shape (square or rectangular).
- *Interlacing* -
  The SD formats PAL and NTSC use interlacing (see Glossary), as do some HD formats. This parameter indicates which of the two fields is displayed first.



Create non-standard *Sequences* only at your own risk. Before doing so, check with your client or the recipient of the final data or product.

The following options relate to the playback of *Timeline* clips.

FX Quality

All effects will always be rendered in the best possible quality, without compromise. When you're editing and testing, however, sometimes speed takes priority over quality. For the purpose of a preview, this option lets you lower the quality a little.

Media Quality and Min Media Quality

IMPORTANT: These settings do not affect image quality. To avoid problems with "disappearing" media files, do not make any changes here - unless you have a concrete application for this function: see *"Quality Ranks"* on page 90.

By default, these are both set to *Normal* and should not be changed.
This means that only clips identified as *Normal* are played. For other clips, the screen remains black and their *Slices* turn dark red, indicating that no media files are available.

These two options act as a filter. You can use them to specify exactly which clip media files should be played back. Naturally, this is useful only if you assigned the clips specific quality levels, such as "Highest" or "Lowest", when they were captured in the *Logging Tool*. *Desired Media Quality* defines the top end of the scale and *Min Media Quality* defines the bottom.
Example: You assigned three quality ranks for capture: *Medium Low, Normal* and *Medium High*. To ensure that all these variants will remain playable on the *Timeline*, set *Media Quality to Medium High* and *Min Media Quality* to *Medium Low.* If you want to exclude clips of *"Medium Low"* quality, set the *Minimum Quality* to *Normal*.

Render/Fuse Codec Preset

This setting defines - for the current *Sequence* - the Render and Codec Preset to be used for rendering and fusing of files. The default selection matches the selected *Timeline* format and should not be changed, unless there is specific reason to do so.
See also *"Fuse"* on page 959.

Select Picon for a Sequence

Each new *Sequence* is initially stored with the *Picon* pictured below in the *Sequence Rack* (gray X on a black background). Later on, you can assign a meaningful frame from the *Sequence* to the *Picon*. To do so, position the *Playline* on the frame and execute the *Set Separate Index Picture* command using the toolbutton located shown here (if necessary, drag it from the timeline *Function Library*: right-click > *Customize*).

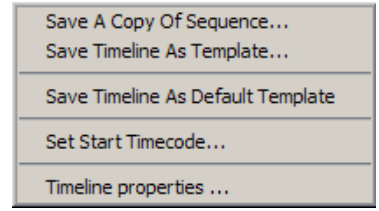


Empty Sequence Picon

Sequence Menu



Click the *Sequence Menu* button in the top right-hand corner of the *Sequence Editor* to open the *Sequence* menu. Use this menu to adjust settings for handling and displaying *Sequences* on the *Timeline*.



Sequence menu

Save A Copy Of Sequence...

Use this option to save a copy of a current *Sequence* on the *Timeline*. Enter a name for the copy so that it can be saved under this name in the *Project*'s *Sequence Rack*. The original *Sequence* on the *Timeline* maintains its original name and can continue to be edited.



Use this function to note "milestones" in your editing work, for example, to try out different versions of your *Project*.

Save Timeline As Template...

Use this option to save the current *Timeline Tracks* as a new *Template*. In the box that appears, enter a *Template* name. If you do not save the template in the *Template* folder or if you use a different file extension, Avid Liquid does not recognize it as a *Template* and does not display it in the *Template* list.

This function is useful for saving different templates for different tasks.



In contrast to *Project Template*s, *Timeline Template*s do not contain any clips or other objects. They only contain settings regarding how the *Timeline* and the objects it contains are displayed.

Save Timeline As Default Template

The *Default Template* is used for *Sequences* created with the *New Sequence* button or with *Template* > *Default* > *New Sequence* (*page 403*). Click *Save Timeline As Default Template* to define the current *Timeline* as the *Default Template*.

Set Start Timecode

Use this function to enter an initial timecode for a *Sequence* on the *Timeline*. In the field that appears enter a timecode value.

Consider how much leader you plan to leave before the *Sequence*. Set *Start-Timecode* = "*Sequence* start" minus "leader duration". Example: Sequence start (10:00:00.00) minus leader (00:01:30.00) = *Start Timecode* (09:58:30.00).



The timecode of the current *Timeline* is the master TC, because in non-linear editing the *Timeline* is the master.
Therefore, the recording tape (or master tape) needs a compatible timecode. For example: Your sequence

starts at 10:00:00.00 hours, but the tape has been striped (coded) starting at 02:00:00.00 hours - record to tape in insert mode will inevitably fail.
Solution: adapt the *Timeline* TC or stripe the tape accordingly (see *page 948*).
Also, when you use a precoded tape to perform an insert edit, *Timeline* TC and tape TC need to be compatible, and the corresponding clip(s) have to be placed at correct position(s) on the *Timeline*.

Playing Back a Sequence

You can play back a *Sequence* in the *Master Viewer/Timeline,* in the *Source Viewer* and using *Picon Play.* In the default configuration, the following buttons are available on the corresponding toolbars:

Start/Stop Playback



Plays back the *Sequence* from the current position to the end. To stop playback, click this button once again or click *Stop*.

Press the SPACEBAR (default assignment). For customized assignments, see: *"Assign Functions to Keyboard"* on page 993.

Play Around Position (Loop)



This button activates a 4-second playback loop around the actual *Playline* position, i.e. two seconds before and two seconds after. This gives you the opportunity to review an edit or a certain passage. Clicking on this button again or pressing the SPACEBAR stops the loop.

Press ALT+SPACEBAR (default assignment).

Play In to Out



Plays in a continuous loop from the mark-in to the mark-out, if both are set. If no mark-out is set, plays from mark-in to end. If no mark-in is set, plays from the beginning to the mark-out, if one is set, or to the end, if not.

Press SHIFT+SPACEBAR (default assignment).

To stop "in to out loop play," press the SPACEBAR on the keyboard, or click the *Play* or *Stop* button.

Play to Out



Plays in a continuous loop from the current position of the *Playline* to the mark-out, if one is set. If there is no mark-out, plays to the end.

Press CTRL+SPACEBAR (default assignment).

Shuttle Playback (JKL)

See *page 275*.

Sequence as a Clip

On the *Timeline*, a *Sequence* appears as a more or less complex collection of clips. In a *Rack* in the *Project* window, however, a *Sequence* is represented as a single object. This is why, like a clip, a complete *Sequence* can also be inserted in another *Sequence* or viewed, marked and inserted on the *Timeline* in the *Source Viewer*. You can also nest *Sequences* inside one another. See also *"Nesting Sequences (Building a Container)"* on page 471.



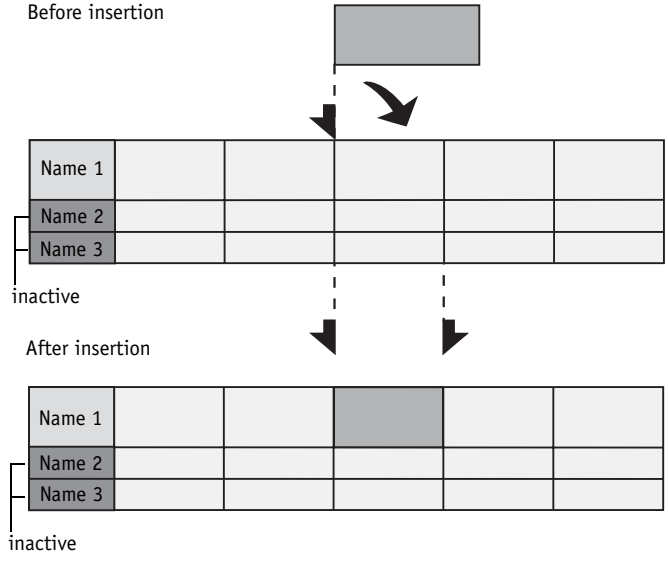
The length of a *Sequence* as a clip is determined by the mark-in and/or mark-out. In other words, if a one-minute *Sequence* contains a 30-second area bordered by a mark-in and mark-out, the *Sequence* as a clip then appears in the *Project* window with a length of 30 seconds. However, the *Sequence* may still be trimmed.

Three-Point Editing

Three-point editing is useful for subsequently inserting clips in *Sequences* and replacing clips. After you have defined three editing points, Avid Liquid sets the fourth. See also *"Mark-In and Mark-Out Priorities"* on page 396.

Replace an edit in an existing *Sequence* as follows (see example below ; the video clip is to be replaced, while the audio *Track* is to remain intact):

1. Select *Overwrite Style* since you want to overwrite the clip on the *Timeline* (*page 379*).
2. Set the audio *Tracks* inactive (using the shortcut menu or by clicking the *Track* name; *page 368*).
3. Define a mark-in and mark-out of the clip to be replaced with the mark-in and mark-out points on the *Timeline*.
4. Load the clip to be inserted in the *Source Viewer* and define the incoming point with mark-in or the outgoing point with mark-out.
5. Click the *Insert Arrow* button (*page 397*).
6. After you have set three edit points, the fourth is automatically defined, i.e. the clip is inserted based on the mark-in and mark-out of the *Timeline*.



Four-Point Editing

The fourth point is unnecessary for editing, unless you want to fit a clip into a specific gap, shorten it or lengthen it. In this case, the fourth point forces the system to edit the clip using the exact acceleration or deceleration required by means of the *Timewarp* effect. In other words, it automatically executes the *Fit to Fill* function of *Linear Timewarp*.

Example: In the *Source Viewer*, the clip between the mark-in and mark-out is five seconds long. On the *Timeline*, you have a gap of ten seconds between a mark-in and mark-out. When you click the *Insert Arrow*, the clip is fitted exactly into the gap and the line for the *Linear Timewarp* function appears below the clip. You can edit the *Timewarp* effect individually and it will be applied in realtime.

Timeline Editing

Whether you choose to edit with the *Sequence Editor* or work directly on the *Timeline* depends on the particular application and your personal preference. Both are possible in Avid Liquid. You can even use a combination of the two methods.

This section tells you how you can edit and trim directly on the *Timeline*. It describes the following areas in detail:

Timeline edit functions *page 411*

Adding objects

Drag&drop; Send To...; Transitions *page 412*

Replacing objects

Overwriting with drag&drop *page 413*

Selecting objects

With the mouse; keyboard; selecting objects after the Playline *page 413*

Repositioning objects

Positioning; moving and copying a range *page 414*

Trimming objects

With the mouse; keyboard; Extend and Slide tools *page 417*

Deleting objects

Deleting objects or ranges *page 418*

Timeline Edit Functions

The toolbar is located at the top of the *Timeline* and contains buttons for navigating on the *Timeline* and playing, marking and processing clips and *Sequences*. This toolbar can be customized like any other Avid Liquid toolbar. (See also *"Customizing Toolbars"* on page 990.)

Edit Button



Click this button to activate the *Edit Mode* of the mouse cursor. This mode permits you to access elements on the *Timeline* so that you can, for example, select, trim and delete objects.

Press the ALT key to temporarily switch between cursor *Edit Mode* and scrub mode.

When the *Edit Mode* is deactivated, you can scrub the *Playline* with the cursor.
To scrub on the *Timeline* when the *Edit Mode* is activated, drag the mouse pointer on the *Timecode Bar*.

Add Edit (Razor Cut)



Adds a cut to all active *Tracks* at the current position of the Playline. Adding a cut splits the affected clips into two separate clips with new mark-in and mark-out points.

The *Picons* at the new mark-in and mark-out points are updated automatically

Trash



Deletes a range between the mark-in and mark-out points (only on active *Tracks*). See also *page 419*.

Toggle Edit Style



Click this button to toggle between *Overwrite Style* and *Film Style*. *Film Style* is indicated by a yellow icon, *Overwrite Style* by a red icon. See also *page 378*.



If you work with the *Single Monitor View* layout, you'll probably find these two tools useful: *Insert to Timeline* in either *Film Style* or *Overwrite Style*.

Double-Click a Clip

Double-click a clip on the *Timeline* to open the *Clip Viewer* with the extended dialog.

Adding Objects

There are various ways to position objects on the *Timeline* in order to edit a *Sequence* (other objects already on the *Timeline* are overwritten or shifted depending on the *Edit Style* specified - see "*Edit Styles*" on page 378).

Drag&Drop

You can drag objects directly to the *Timeline* from the *Project* window, *Clip Viewer*, *Source Viewer* (hold down the CTRL key) and desktop. They are positioned where the object is when you release the mouse button.
With *Single Monitor View*: You don't need to press CTRL when dragging from the *Source* inlay to the *Timeline*.
When you drag a clip with *A1..A4* or *S1/S2* video and audio to the *Timeline*, the video and audio clips are placed separately on the *Tracks*.
Example:

Drag a *VA1A2* clip (stereo) to the *Track* labeled *V* in the *Track Header*.

As soon as you drag the clip across the *Track*, an outline of the associated audio clip appears below it on the *Track* labeled *S1*. In the case of a mono clip, two clips would appear on the *Tracks* labeled *A1* and *A2*.

- If you drop a clip on a *Track* not labeled *V*, video and audio remain grouped.
- If you do not want this to happen automatically, go to the *Track* header (column with the *Insert Arrow*) and activate the *Grouped* option (Insert Grouped). A video clip that has two audio tracks will then be inserted on the *Timeline* as *one* object. You can, however, *disband* such objects, meaning separate them into their individual clips: see "*Disband Clip*" on page 424.



You can use drag&drop in the same way to insert *Transitions*: For example, a *Dissolve* would be positioned on all the clips whose mark-ins or mark-outs were directly aligned from top to bottom.

Send To...

Using the *Send To...* option in the Object shortcut menu: objects are positioned on the *Timeline* at the *Playline* position.
With this method, *Source Track Mapping* is adhered to (see also *Source Track Mapping* on page 375).

Inserting and Replacing Transitions

Transitions (transition effects between two clips) can be replaced with other *Transition* effects of exactly the same length and at exactly the same position. Just drag the replacement and drop it on the *Transition*. The new effect then takes the place of the older one.
Depending on the effect, effect parameters must be configured individually.

Replacing Objects

To replace a clip on the *Timeline* with another clip, drag the "replacement clip" while pressing CTRL and drop it directly onto the clip to be replaced (not onto the *Track* above it). The mouse pointer changes to a symbolic representation of this replacement clip.

Two conditions apply, however: The replacement clip must be taken from a *Rack* (not from the *Timeline*) and must be at least as long as the clip to be replaced.

If appropriate, the replacement clip is trimmed (at the end) while its mark-in remains untouched. The overall length of the *Sequence* remains the same.
Clip effects and transitions stay where they are.

Selecting Objects

To process objects on the *Timeline*, for example, to copy, move or delete them, they first have to be selected.
Selected objects appear "recessed" on the *Timeline*.

Clicking Objects



Click the *Edit Mode* button on the *Timeline* toolbar to put the mouse cursor in the necessary mode for selecting objects (= *Edit Mode*).



To temporarily switch to *Scrub Mode*, hold down the ALT key.

The type of mouse pointer reveals what mode the system is in (*page 361*)

When the *Edit Mode* is activated, you can access objects on the *Timeline* and select them with a click of the mouse.



To select more than one object at once, CTRL+click the required objects. To select a number of objects (e.g. such located next to each other on the *Timeline*), SHIFT+click the first and last one of this row. The ones in between are automatically selected.
This function works with all *Tracks*.

Dragging a Lasso

You can also select several objects by dragging a *Lasso* around them with the mouse. To do this, begin dragging in an area of the *Timeline Tracks* that is not occupied by any objects and release the mouse button once the *Lasso* contains parts of all objects you require. It is sufficient that the *Lasso* line only touches objects to be selected.

Selecting Objects after Playline



Use this function to select clips of an active *Track* or of several active *Tracks* located after (= to the right of) the current *Playline* position.

If you want this selection to be valid for all objects (on all *Tracks*), activate all *Tracks* via *Activate All* in the *Track Header* of the name column. This selects also those objects over which the *Playline* is located.

Mark and Select Clip Under Playline

Clips which intersect with the *Playline* and are placed on active *Tracks* can be highlighted in two ways, using two functions:

- *Mark clip(s) under Playline* -
  Sets a mark-in and a mark-out at the first possible and the last possible range of the clip(s) involved. This can be, e.g. in the case of long sound clip, quite a big range. The clip(s) itself are not selected.
- *Select clip(s) under Playline* -
  Works the same way a single click on a clip works. No mark-in and mark-out are set.



These two functions can only be executed via the keyboard and are not part of the standard keyboard layout. If you want them, you have to set up the keyboard shortcuts: Go *Edit* > *Control Panel* > *User* > *Keyboard*. From the list in the upper left area select the *Timeline/Master Viewer* section, and then on the right of the tool box the *All others* tab. The "T special" down below in the list hides the two desired functions. Drag the Ts to a key of your choice (works also in combination with ALT or SHIFT or CTRL).

Repositioning Objects

To reposition objects on the *Timeline* they must first be selected (see also *Selecting Objects* on page 413). Once selected, objects can be repositioned in a variety of ways.

Positioning

Activate the *Edit Mode* to drag selected objects to a different *Track* or a different position on the same *Track*. Two functions help you position the objects, *Align* and *Snap Mode*.



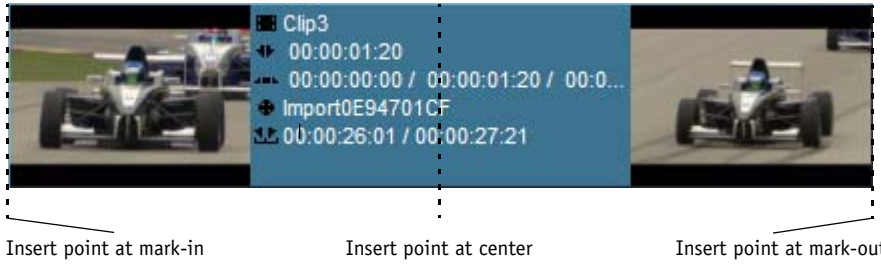
Nothing in the *Timeline* changes while you are dragging the object; only after you release the mouse button and the object can be inserted does the *Timeline* rearrange itself.
In other words, in *Film Style*, subsequent objects move to close the gap created by the movement. In *Overwrite Style*, the gap remains open. Clips are also rearranged behind the insertion point (in *Film Style*), while it is simply overwritten in *Overwrite Style*.
Also note this *Film Style* peculiarity: If, for instance, you want to move a clip one frame to the right, the clip has to be dragged over its full length plus one frame to the right. Otherwise the clip will revert to its original position when you release the mouse button.

If the area of the *Timeline* where you want to move an object does not currently appear on the screen, drag the object in the direction of this area until the *Timeline* has scrolled to it.

Align

Use the *Align* function to align clips: the default insert point for clips is at the left edge; for *Transitions*, the middle.

Press the ALT key repeatedly while dragging an object to toggle between the three available insert points: beginning (mark-in), middle and end (mark-out) of the clip/*Transition*.



Snap Mode

Another tool available for precision positioning is the *Snap Mode*. Use this function for frame-accurate alignment of objects.

Hold the SHIFT key while dragging a clip. A magnet symbol appears at the mouse pointer. On getting close to a possible *Edit* point, the clip will be positioned precisely at the *Edit*. *Snap* and *Align* can be used in combination: Hold the SHIFT key and, hitting ALT, toggle alignment modes.

The *Snap Mode* can be permanently disabled or enabled: see *"Timeline Properties"* on page 357.

Moving Objects with your Keyboard

- Vertically -
  to be able to move an object vertically, for example *Track* by *Track*, select it and press CTRL + ARROW UP/DOWN. The object keeps its exact horizontal position, an audio clip, for example, remains synchronous.
- Horizontally -
  Use CTRL + ARROW LEFT/RIGHT to move an object frame by frame to the left or right or SHIFT + CTRL + ARROW LEFT/RIGHT to move it ten frames at a time.

For additional and customized key assignments, see *"Assign Functions to Keyboard"* on page 993.

Copy/Cut and Paste

Use the *Paste* function to reposition clips from the clipboard (after *Copy* or *Cut*; see *page 416*). This information applies to actions within the same *Sequence*; otherwise, refer to the note below.

1 Position the *Playline* where you wish to insert the clip.

2 From a suitable *Track*, call the *Timeline* shortcut menu (right-click an empty area on the *Timeline*).

3 Click *Paste*.

While performing this operation, keep in mind the following:

- *Edit Styles* (*Overwrite* or *Film*)
- Available and free *Timeline Tracks*. If you insert several vertically arranged clips, the highest clip will be inserted in the *Track* from which you called the shortcut menu and the others will be inserted in the *Tracks* below it. If there are not enough *Tracks*, nothing is inserted.



When a clip is inserted in a different *Sequence,* the procedure is as follows: The clip (or clips) is (are) inserted in active *Tracks*. If nothing happens when you select the *Paste* command, check to be sure the destination *Tracks* are also activated for editing.

Move/Copy Range



You can use these two functions to quickly and easily rearrange sections on the *Timeline*. Use the following procedure:



- Activate the *Tracks* containing the affected objects.
- Use mark-in and mark-out points to mark the section.
- Position the *Playline* where you wish to insert the marked section.
- *Copy Range* inserts a copy of the section; *Move Range* transports the section from its original position to the new one.

The results vary according to the edit style:

- *Copy Range* overwrites (*Overwrite Style*) or moves the subsequent objects (*Film Style*).
- *Move Range* overwrites information (*Overwrite Style*), or moves the subsequent objects (*Film Style)*. In *Overwrite Style*, a gap remains at the original position. In *Film Style*, the subsequent objects move and fill the gap.

Trimming Objects

Trimming involves shortening and lengthening *Timeline* objects.

How trimming affects other objects on the *Timeline* depends on the *Edit Style* you have selected (see also *Edit Styles* on page 378)

If you are working in *Overwrite Style*, trimmed objects delete whatever was previously at a given position on the *Timeline* or create gaps.

If you are working with *Film Style*, trimmed objects shift other objects on the *Timeline* (objects are rippled or moved).

Tip: When trimming audio clips, press the SCROLLLOCK key to activate audio scrubbing and locate edit points more easily (see *page 804*.).

There are various ways to trim objects:

Trimming Using the mouse



You can use the mouse to trim objects on the *Timeline* if *Edit Mode* is activated for the mouse pointer (see *page 411*).

When the mouse pointer is near the mark-in or mark-out of a clip or *Transition*, the arrow is accompanied by a mark-in or mark-out symbol. This means that you can trim the object by pressing the left mouse button.

Trimming with the Keyboard

First select clip-in or clip-out, then:

CTRL + ARROW RIGHT/LEFT allows trimming by one frame each; SHIFT-CTRL + ARROW RIGHT/LEFT by ten frames each. As described above, several edits can also be selected and trimmed (*page 413*).

For additional and customized key assignments, see *"Assign Functions to Keyboard"* on page 993.

Extend Tool



The *Extend* function allows you to quickly trim (lengthen/shorten) one or more clips to a specific point:

1. Activate the *Track(s)* where the clip or clips are located.
2. If you specify the trim point using a mark-out, you can lengthen the previous edit by clicking on the *Extend* function.
   If you specify the trim point using a mark-in, the following edit will be given preference.
3. Mark-in and mark-out points of the affected edits are moved equally, thus ensuring that the *Extend* function does not affect synchronicity (as is the case with *Trim Both* in the Trim Editor).

If there is insufficient material to work with, *Extend* is only carried out to the extent allowed by the existing clip data. If mark in and mark out points are set, the last point to be set is taken into account.

Slide Tool



The Slide function allows you to move one or more clips on a *Track* without resulting in gaps to the left or right of the clip or clips. In other words, this function trims the mark out point of the clip located before the selection and the mark in point of clips located after the selection. You can activate the *Slide* function as follows:

1. Mark the clip or clips using the *Lasso* function or using CTRL+click or SHIFT+click.
2. Activate the *Slide* function by clicking on the icon, or call the function from the *Customize* list (right mouse-click on the toolbar of the *Timeline or Master Viewer*). If the function is not located on the toolbar, you can retrieve it from the function library using the *Customize* command.
3. Use the mouse to drag the clip or clips to the desired position. You can also use the keyboard to trim the clip (CTRL + LEFT ARROW/RIGHT ARROW).

Deleting Objects

When deleting objects, note the *Edit Style*:

- *Overwrite Style* -
  deleting an object does not affect the other objects on that *Track*. The deleted object just leaves a gap in the *Track* equal in size to its duration (*page 379*).
- *Film Style* -
  elements later on the *Track* ripple forward to fill in the gap left by the deleted object(s);
  see *page 380*



Transitions are deleted from the *Timeline* without affecting any other objects or leaving gaps. *Timeline* objects are removed from the *Timeline* only; deleting them does not affect *Media Files* or objects in the *Project*.

Delete Single Object

To delete an object from the *Timeline*, first mark it and then press the DEL key or select *Delete* from the shortcut menu.

Delete Several Objects

To select more than one object, CTRL+click or SHIFT+click the objects or drag a *Lasso* around them. Once selected, you can use the DELETE key to delete the selected objects. All *Transitions* connected with these clips are also deleted.

Delete Timeline Range



With mark-in and mark-out points set, click the *Trash* button to delete everything between the mark-in and mark-out, except elements on *Tracks* not active or protected. Elements that overlap the mark-in and mark-out points are trimmed and/or split into pieces.

Delete from Playline to Next/Previous Edit

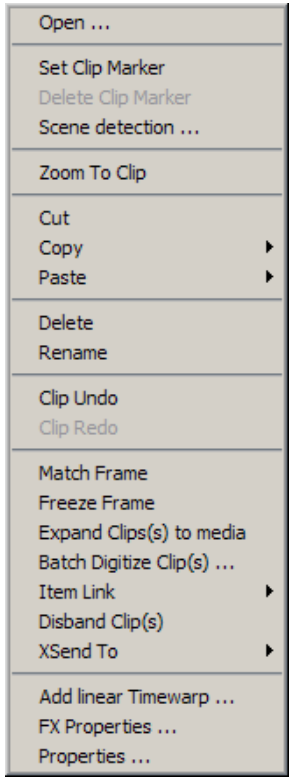


After positioning the *Playline* on a clip, you can click one of the two toolbuttons to create a gap (when in *Overwrite Style*/red) or immediately close up the gap by shifting the clips (when in *Film Style*/yellow).

The deleted area extends to the next or previous *Edit* (mark-out or mark-in). This function affects clips on active *Tracks*. It cannot be used to delete outside the gap.

These toolbuttons can be found in the *Timeline* Function Library on the *Edit* tab (right-click > *Customize* > etc.).

Objects on the Timeline



Timeline clip Shortcut menu

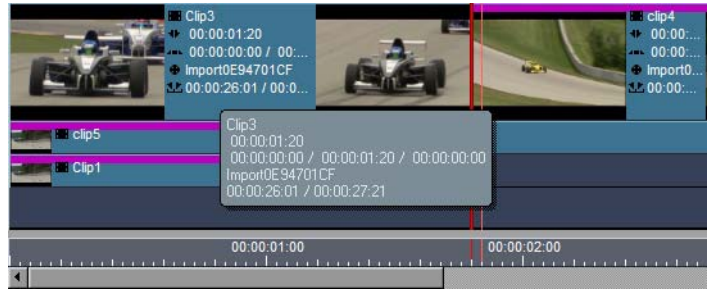
The objects on the *Timeline* are video clips, audio clips, *Containers* and *Transitions*. Like all other objects, they each have their own shortcut menu. (See also *"Object Information: Properties"* on page 281.) This section provides you with information on *Timeline*-specific functions, i.e. functions that are important for working with objects on the *Timeline*.

Right-click a clip to open its shortcut menu.

Clip Info

"Clips" refers to all objects that contain image and/or audio data.

When you rest the cursor on a clip for a second a pop-up with clip information appears. To control what information this pop-up contains, use the *Track Name* and *Column Headers* shortcut menus (see also *Adjusting All Tracks (Track Name Header)* on page 365).



Clip with clip information

Open (Double-click)

Calls the *Clip Viewer* with extended dialog (Attributes).

Set Clip Marker

Set Clip Marker inserts a clip marker at the *Playline*.

Delete Clip Marker

Delete Clip Marker deletes the clip marker at the *Playline*.

Zoom To Clip

Zoom To Clip zooms *Timeline* display to approximate clip length.

Cut

Cut deletes a clip from the *Timeline* and moves it to the clipboard.

As long as a clip is not inserted at another position, it appears on the *Timeline* with a grid over it.

Copy

Click *Copy* to open a submenu:

- Copy the selected clip(s) to the clipboard.
- Copy the volume/panning settings, if any.



If you hold down the CTRL key while dragging an object, a copy is created and a plus symbol appears next to the mouse pointer.

Paste

Click *Paste* to open a submenu:

- *Clip FX* - Click to insert a previously copied clip effect (from *Clip FX shortcut menu* > *Copy*)
- *Volume/Panning* - Select to insert the corresponding audio settings.

Delete

Delete eliminates a clip from the *Timeline*.

Rename

Use *Rename* to assign a different name to a clip.

Expand Clip (To Available Media)

Expand Clip is available only for subclips with individual clip-ins and clip-outs. Subclips are clips that have already been defined as such in the *Logging Tool* or have been digitized with a *Handle Length* in a *Batch Digitize* operation (*page 143*).

Select one or more clips and call the function from the shortcut menu.

Expand Clip makes the *media file* of the clip completely available for trimming the clip on the *Timeline*. Each clip can be trimmed to its clip-in and clip-out points, but not beyond. However, with a subclip, by definition, there is digitized material beyond these points available. *Expand Clip* lifts the initial limitation of the subclip by expanding the clip's boundaries to the *media file's* clip-in and clip-out.

Batch Digitize Clip(s)

Batch Digitize Clip(s) calls the *Batch Digitize* module (*page 292*) for the clip(s) selected and allows you to digitize one or more clips directly from the *Timeline* (capture).



Tip: What do you do if...

... you are editing and you notice that a clip you digitized is too short? Easily solved: Supply the source tape (*Reel*), select *Batch Digitize* from the clip shortcut menu to display the *Batch Digitize* dialog box and enter a generous *Handle Length*.

After digitizing is complete, return to the *Timeline* and select *Expand Clip(s)* from the clip shortcut menu. You can now extend the clip you just digitized at the mark-in and mark-out.

Clip Undo

Clip Undo cancels the last action(s) you performed on a clip on the *Timeline*. You can cancel up to 64 steps.

Clip Redo

Clip Redo cancels the last undo(s) you performed. You can cancel up to 64 undos.

Match Frame (To Tape, Project or Clip)

Match Frame To Clip

Loads the corresponding original of a *Timeline* clip into the *Source Viewer*.

1 Position the *Playline* on the desired image.

2 Right-click the clip to open the shortcut menu.

3 Select *Match Frame*.

The *Playline* position in the *Source Viewer* corresponds to the position of the *Playline* in the clip on the *Timeline*.
Optionally, a mark-in can also be set. See "*Timeline Properties*" on page 357.

You can use *Match Frame* e.g. to load a clip and to re-insert its audio source *Track* in case a clip audio *Source Track* was not inserted on the Timeline or if it is not in sync.

Match Frame to Project

Same procedure as *Match Frame to Clip*, but selects the original clip in its original *Project Rack*. Note: Does not select a clip in the *Timeline Project Browser*. Look in the *Project* window for the located clip.



Match Frame is not available for clips that have been copied from other *Project*s into the current *Project*.

Match Frame To Tape

Rolls a tape in the player to the same position that the *Playline* occupies on the corresponding *Timeline* clip.

1 Position the *Playline* on the desired image.

2 Insert the correct tape in the player, open the *Logging Tool*.

3 Right-click the clip to open the shortcut menu.

4 Select *Match Frame*.

The player now cues up to the defined position.



Match Frame to tape works on the assumption that clips were digitized (captured) with a tape-related timecode source. It works not with: imported or captured clips without a valid TC; clips captured from a non tape-based *Live* source; and *Containers*.

Easy Freeze Frame

Creates a freeze frame (still image) at the *Playline* position.

1 Move the *Playline* to the frame you want to freeze.

2 Right-click the clip to open the shortcut menu, select *Freeze Frame*.

3 The still now overwrites the remaining length of the clip. You can extend or shorten the freeze to any length.

At the end of a clip (last frame position), the resulting freeze will have exactly one frame of length. You can extend or shorten the freeze to any length.

Container

You can use the *Container* functions to nest *Sequences*; see *page 471*.

Item Link

You can group clips on different *Timeline Tracks*. See also *"Item Link"* on page 439.

Disband Clip

Clips that were inserted on the *Timeline* as a grouped or linked clip, including video and audio *Source Tracks*, are disbanded on the *Timeline* via a shortcut menu command. The underlying free *Tracks* are used for this. If there are objects on the underlying *Tracks*, additional *Tracks* are automatically created. One clip each can be disbanded in one process.



Disbanding a stereo-audio clip creates two mono clips whose panning is centered. The volume level increases by 6 dB.

Disband Several Selected Clips

If several clips are selected, they are disbanded in parallel. You can activate this function in the shortcut menu of any selected clip.



The objects created by disbanding are linked (or grouped) in the sense of the *Item Link* function. If you would like to unlink the items altogether (for example, in order to delete a clip), use the *Item Link* > *Unlink Items* function (*page 439*).

Regrouping Clips / Reactivating Source Tracks

As with any other action, you can undo the clip disbanding operation immediately afterwards. But you may also want to undo it at a much later point in time, after performing various editing steps. This is done by restoring the original clip unit. For example:

1. You have disbanded a clip originally grouped as *VA1A2*, thus creating three objects on the *Timeline*: One video clip and two audio clips.
2. Right-click, for example, the audio clip *A2* to open *Properties*. Under *Tracks*, only *A2* is activated.
3. Click *V* and *A1* and exit *Properties*.
4. Instead of the audio clip, the *Timeline* now contains the original *VA1A2* clip, which functions as a "full-fledged", grouped clip.
   You can delete the other components of the reanimated clip as appropriate.

Actually, a clip always retains the "memory" of its original, complete state. This characteristic also explains why disbanded audio clips carry the effect lines of video effects. Although you might at first wonder what an audio clip has to do with a video effect, it only takes a single click to turn it back into an effect video clip.

Adjust Audio

This menu option is visible only if the *Audio Editor* is open and the clip is an audio clip or contains audio. For a detailed description, see *"Global Modification of Volume and Panning (Adjust Audio Function)"* on page 855.

XSend to...

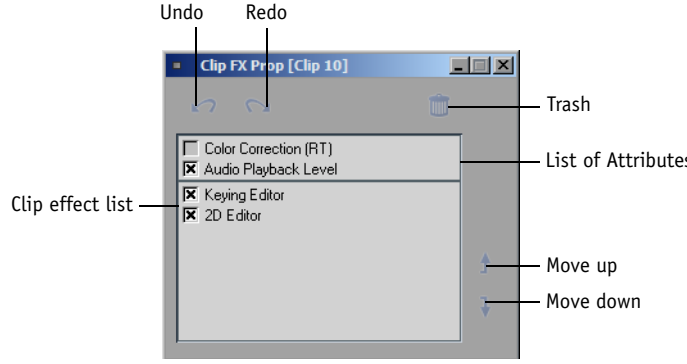
See *"XSend To..."* on page 175.

Add Linear Timewarp

This functions calls the *Add Linear Timewarp* dialog. Use it, for instance, to quickly create a slomo or a freeze. See *"Linear Timewarp"* on page 771.

FX Properties

The FX Properties provide information on and access to the effects applied to an object. You can activate and deactivate effect parameters and clip *Attributes*.
The effect editors are listed below the horizontal line, the attributes above the line.



FX Properties dialog box

- Activating and deactivating parameters and *Attributes*:
  Click the appropriate checkboxes. Double-click an entry to open the *Effect Editor* or *Clip Viewer*.
  The effects are not deleted; they are simply not applied. This allows you, for example, to prevent rendering.
  The colored line on the upper edge of the *Timeline* clip (indicating the effects and *Attributes* applied to a clip) appears interrupted if effects are deactivated.



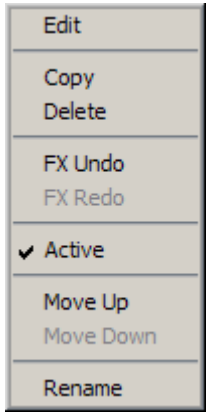
- The clip effect list contains all effects applied on a clip. You can control the order in which effects are applied to a clip by rearranging the order of the effects in this list. To move an effect, click it and then click *Move up* or *Move down*.



Order is important, for example, in the case of GPU and CPU realtime effects. Maximum system performance (maximum number of realtime effects) is achieved when CPU effects are applied before GPU effects (CPU at the top of the list; see *page 626*).

You can also change an effect's settings using the *FX Properties* shortcut menu:

Edit



FX Properties menu

Select *Edit* or double click the *Editor's* name to open a particular *Effect Editor* and edit an effect (*page 512*.)

Undo



Click *Undo* to cancel a change you made in the *FX Properties* (you can also do this by clicking the *Undo* button).

Redo



Click *Redo* to cancel an *Undo* action (you can also do this by clicking the *Redo* button).

Remove Effect



Click *Remove Effect* to delete an effect from a clip (you can also do this by clicking the *Trash* button).

Properties

Click *Properties* to open the *Clip Properties* box with information on the current clip. Most items (such as *Name, Source Tacks, Comments*, etc.) can be edited, even for multiple clips. (See "*Object Information: Properties*" on page 281.)

Refresh Media



Imported clips (such as graphics) are not automatically refreshed on the *Timeline* if they are subsequently edited in an external program (e.g. graphics software). *Refresh Media* updates a modified clip to the latest version.

This toolbutton can be found in the *Timeline* Function Library on the *Special* tab (right-click > *Customize* > etc.).

Transitions

Transitions (Transition effects such as dissolves) are also objects (see *page 387*).

Trim Editor

Of course, if you want to more precisely trim cuts once you have finished raw editing a *Sequence* on the *Timeline* or while you are inserting clips in a *Sequence*, you can do this with the *Timeline* or *Source Viewer*. However, if you want to see the mark-out frame of the outgoing clip and mark-in frame of the incoming clip side-by-side so that you can, for example, coordinate movement in the pictures for a perfect *Transition*, then you should use the *Trim Editor*.

Opening the Trim Editor/Basics *page 429*

Selecting a trim mode *page 430*

Customizing digital audio scrub *page 431*

Selecting multiple trimming points *page 432*

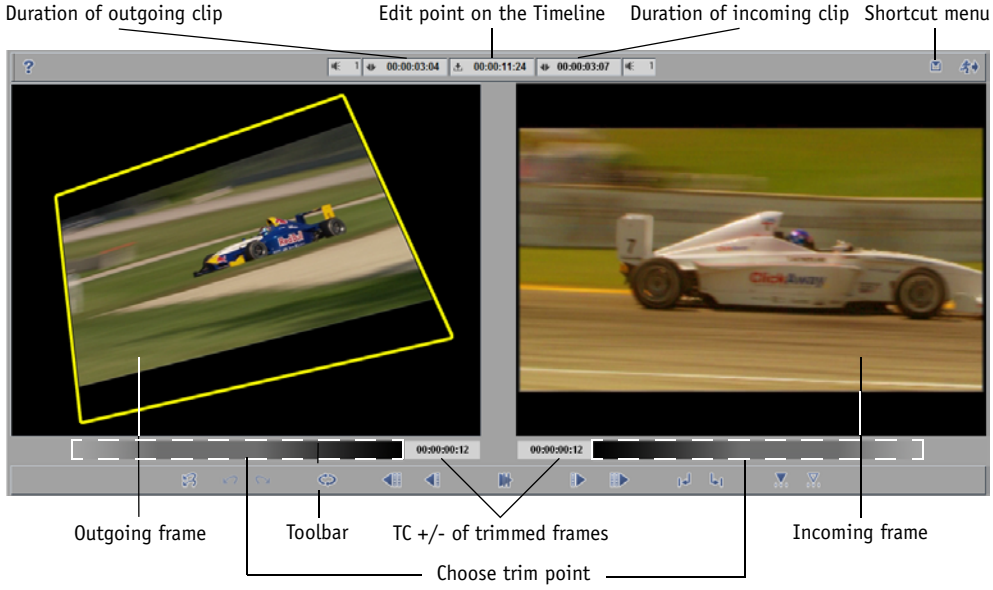
Trimming (examples) *page 433*

Selecting previous or next edit *page 435*

Trim Editor tool buttons *page 436*



`Avid Liquid Control` is an excellent addition to the *Trim Editor*. It will allow you to perform all your trimming functions with the fingers of one hand while giving your undivided attention to the image (*page 1000*).



Trim Editor

Opening the Trim Editor/Basics



To open the *Trim Editor*, click the *Open Trim Editor* button on the *Timeline's* toolbar (or F5).
The *Playline* automatically moves to the closest edit on an active *Track*. This edit and also edits on other active *Tracks* at the exact same timecode position are activated for trimming. Furthermore, yellow handles appear in the mark-in and mark-out areas to be trimmed on the *Timeline*.



Trim operations in the *Trim Editor* are always in *Film Style*.

Elements of the Trim Editor

The following are the most important functions and elements of the *Trim Editor*:

Previewing the Edit



In *Preview* mode, the video inlay plays an *Edit* in a continuous loop. You can use *Preview Range* in the shortcut menu to enter a duration (*page 436*).

Inlays

The *Trim Editor* consists of the left and right video inlay. The left inlay shows the mark-out of the outgoing clip; the right inlay, the mark-in of the incoming clip.

Timecode Displays below Inlay

The two timecode indicators below the video inlays show the current shift in the mark-in/mark-out since the edit point was selected. This indicator is reset to 00:00:00:00 with every new edit. For example, if you shortened the outgoing clip by 15 frames, - 00:00:00:15 appears in the timecode indicator.

Timecode Displays above Inlay

The three timecode indicators above the video inlays provide the following information (from left to right):

- current duration of outgoing clip
- timecode of editing point on the *Timeline* (master TC)
- current duration of the incoming clip

Protected and Inactive Tracks

Protected *Tracks* and inactive *Tracks* are handled differently during trimming (see also *Trimming with the Trim Editor* on page 453):

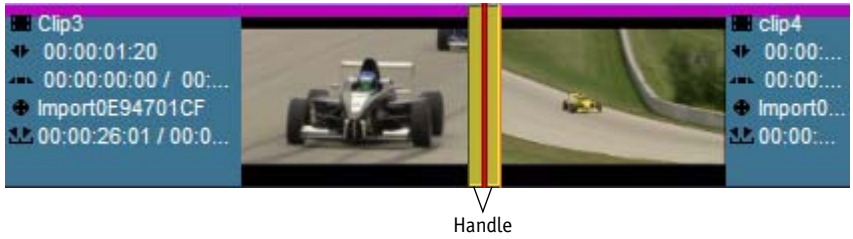
- If all *Tracks* are protected or edit-inactive, no edit is available. The *Playline* remains at its current position when you open the *Trim Editor*.
- If more than one *Track* is edit-active, when you open the *Trim Editor* the *Playline* moves to the next edit and deactivates all other *Tracks* for the current trim.
- If you open the *Trim Editor*, then switch an edit-inactive *Track* to edit-active, the closest edit on that Track is selected for trimming. The other *Tracks* are set edit-inactive.

Selecting a Trim Mode

When the *Trim Editor* is opened it is initially in *Trim Both* mode. Two other modes are also available: *Trim Outgoing Clip* and *Trim Incoming Clip*.

In the *Trim Editor* window, a bar below the inlays shows which of the clips is activated for trimming. In the default setting (*Trim Both*) a bar appears under both inlays.

- *Trim Both* means that both the mark-out of the outgoing clip and the mark-in of the incoming clip are trimmed. This is also indicated by the yellow handles in the mark-in and mark-out areas of the clips.



To select one of the three trim modes:

- *Trim Outgoing Clip*: Click the outgoing clip in the left video inlay.
- *Trim Incoming Clip*: Click the incoming clip in the right video inlay.
- *Trim Both*: Click the area between the video inlays to select both the outgoing and incoming clips.



You can also activate the trimming points on the *Timeline* by clicking a mark-in or mark-out point.

Customizing Digital Audio Scrub

To the left and right of the timecode fields, you will find editing fields in which you can enter the range (in frames) for digital audio scrubbing (*page 804*). These fields allow you to edit audio frame by frame in the *Trim Editor*.
Note the following:

1 You can activate or deactivate digital audio scrub by pressing the SCROLLLOCK key.

2 Scrubbing is then applied to the *Tracks* activated for audio scrubbing. To activate these tracks, hold down the SHIFT key and click the *Speaker* icon for the *Track*(s) containing the audio clips you want to scrub.
You can activate up to two *Tracks* for scrubbing. These *Tracks* are identified by the fact that their *Speaker* icon appears as a contour (not filled in).

3 Note that digital scrub is per default activated.
(Use the shortcut menu (right-click next to the *Audio Tool* icon on the *Taskbar*) to toggle scrub modes when editing in the *Timeline*. The *Trim Editor* features digital scrub only.)



D = Digital Scrub enabled

- The value entered defines the length of the playback loop. A value of 0 means that no frames are played back and a value of 4, for example, means that the audio for 4 frames is played back.
- The left-hand field applies to audio of the *Outgoing Clip* and the right-hand field to the *Incoming Clip*.

For more information, refer to *"Audio Scrubbing - Digital or Analog"* on page 804 and *"Audio Settings"* on page 862.

Selecting Multiple Trimming Points

You can simultaneously trim several edits on different *Timeline* Tracks. This is useful, for example, to trim audio on several *Tracks* at the same time.

Select several edits as follows:

- If the edit points are on different *Tracks*, but at exactly the same *Timeline* position, the *Trim Editor* will automatically select all edits at exactly this position on all active *Tracks*.
  The same thing happens when you use the *GoTo Next/Previous* buttons for moving to a certain edit.
- If the edits points are at different *Timeline* positions, SHIFT+click the mark-in and mark-outs on the *Timeline*. You can also select mark-ins and mark-outs on different *Tracks*.
  Tracks that are not active for editing are temporarily activated for this trim operation. Afterwards, they are deactivated again.

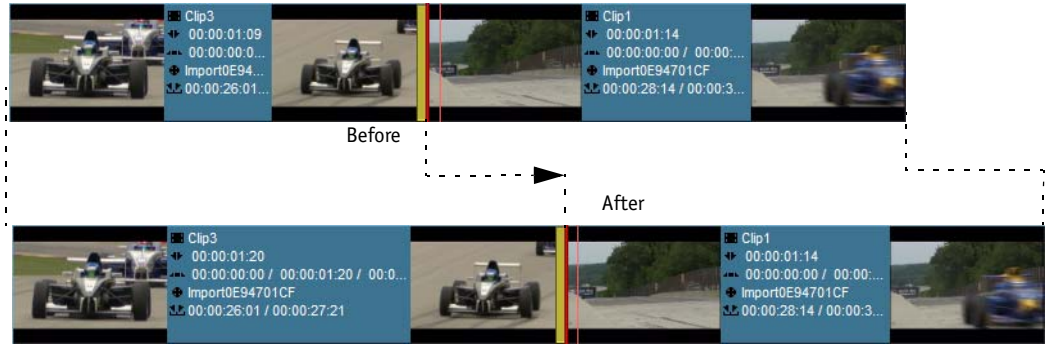
When you select multiple edits for trimming, the edit with the highest *Track* priority on the *Timeline* appears in the *Trim Editor* video inlays.

Trimming (Examples)

With single or multiple edits selected for trimming, you can trim the mark-in and mark-out point(s) with the tool buttons or by scrubbing the *Timeline* or video inlays. As you trim, the video inlays in the *Trim Editor* window are updated to display the current mark-in and mark-out points.
Scrub the mouse in the left inlay to trim the outgoing frame(s). Scrub in the right inlay to trim the incoming frame(s).

Single Trim

If you are only trimming the outgoing clips or incoming clips, the duration of the clips and the position of the subsequent clips change. For example, if you lengthen a clip by 15 frames, the subsequent clip is rippled by 15 frames and *Sequence* duration is increased by 15 frames.

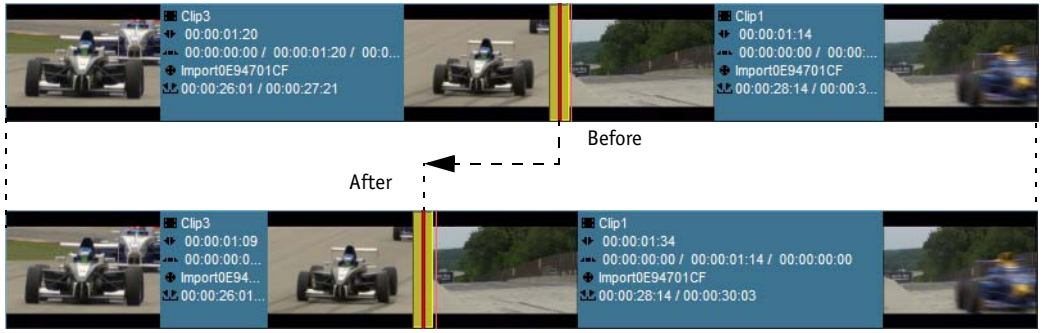


Single trim

Moving the *Playline* when the *Trim Editor* is open trims the selected clips.

Trim Both

When trimming both the outgoing and incoming clip, their duration change since the edit moves on the *Timeline*. However, the subsequent clips stay in the same position and *Sequence* duration remains unchanged.



Trimming both

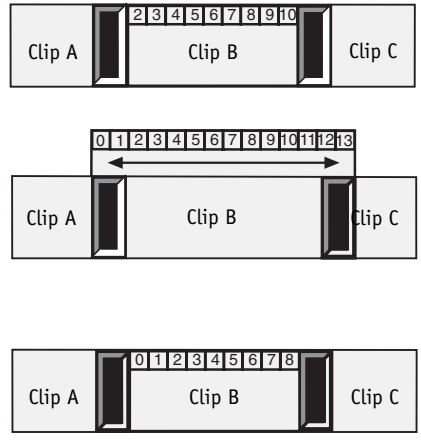
Slip Clip



Click the *Slip Clip* button to choose both the mark-in and mark-out of a selected clip.

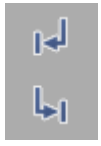
When *Slip Clip* is activated, both the mark-in and mark-out of one clip are trimmed and shifted by the same number of frames in the same direction. This means that the positions of the mark-in and mark-out of the clip are maintained on the *Timeline*, the positions of the mark-in and mark-out on the clip are shifted without changing the duration.

Since duration does not change, the *Slip Clip* mode has no effect on subsequent clips on the *Timeline*.



Slip clip moves the content of Clip B,
but not the mark-in and mark-out on the Timeline

Selecting Previous or Next Edit



To change edits, click *GoTo Next* or *GoTo Previous*. This causes the *Playline* to jump to the closest edit after or before the current edit, and the selected handles appear on the newly selected edit. The *Trim Editor* video inlays change to display the new outgoing and incoming frames.

- When you select a different edit, the system automatically deactivates the *Slip Clip* mode and returns to *Trim Both* mode.
- Edits on protected or inactive *Tracks* are ignored.

Trim Editor Tool Buttons

The *Trim Editor* has the following tool buttons:

Trimming Buttons

These tools move the currently selected mark-in/mark-out(s) back or forward on the *Timeline*. You can select the mark-out of the outgoing clip, the mark-in of the incoming clip, or both, for trimming.



Trim 1 Frame Back - moves the selected edit one frame back.



Trim 1 Frame Forward - moves the selected edit one frame forward.



Trim 10 Frames Back - moves the selected edit ten frames back.



Trim 10 Frames Forward - moves the selected edit ten frames forward.

Restoring an Edit



You can use the *Undo/Redo* buttons in the *Trim Editor* to undo/redo the steps you performed since opening the *Trim Editor*. To restore an edit to the state it was in before you opened the Trim Editor, click the *Restore Edit* button.

Options



Show only full result

With this option enabled both *Trim Editor* viewers will always show the complete, composited image, that is, including all effects and layered images from above and beneath the current edit point.
If disabled, initially and for about one second, only the source video from the left and the right of the edit will be displayed, and then the full composition. In the case of very complex compositions around a trim point, it can make good sense to disable this option. Trimming will then be a bit smoother.

Preview Range

Enter a value for the length of the preview loop.

Special Functions

This section describes the functions that are not needed every day but can be very useful for specific tasks.

Sync Lock



Sync Lock combines objects on different *Tracks* (and that's all objects on these *Tracks*) to prevent them from being moved relative to each other to avoid unwanted asynchronous audio. This, however, only makes sense in *Film Style* and has corresponding effects. A white dot in the column indicates if a *Sync Lock* is activated for a *Track*.

Activating Sync Lock

Click the *Sync Lock* column (to be found in the *Track Header* area at the beginning of the *Timeline*) to activate *Sync Lock* for the respective *Track*. Click *Sync Lock* again to deactivate it: the white dot disappears. *Sync Lock* can also be activated/deactivated in the respective shortcut menu. You can activate/deactivate *Sync Lock* for all *Tracks* in the *Sync Lock* column head via the shortcut menu.

Sync Lock has a direct influence on your work on the *Timeline* and in the *Trim Editor*.

Sync Lock in Film Style

In *Film Style* it is not possible to move an object on a synchronized *Track*. A *Quick Info* box appears: *This Object Cannot Be Moved*.
You can now check the intended operation, deactivate *Sync Lock*, if necessary, or change to *Overwrite Style* and perform the move.

Note that, when trimming in *Film Style*, object parts may be deleted or gaps be entered if *Sync Lock* is active. This is to guarantee the synchronicity of the following objects.

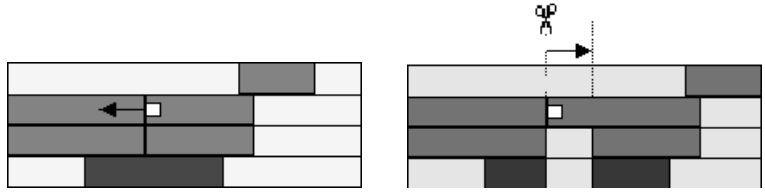
Sync Lock in Overwrite Style

Sync Lock is not active in *Overwrite Style*, since in that case trimming of objects does not cause the moving of other objects, and thus no asynchronicities.

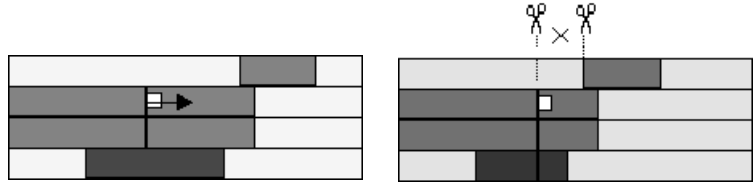
Sync Lock / Examples

All displayed *Tracks* are *Sync Lock*-active in the following examples:

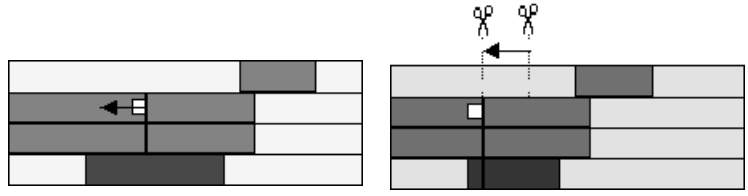
Trim Mark In to the Left (Lengthening)



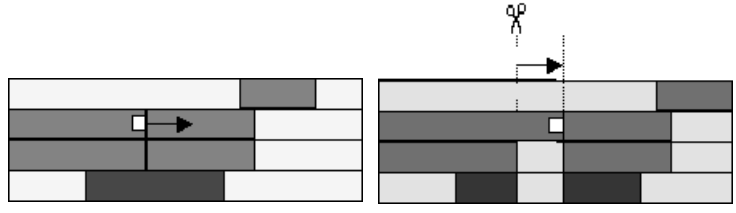
Trim Mark In to the Right (Shortening)



Trim Mark Out to the Left (Shortening)



Trim Mark Out to the Right (Lengthening)



Item Link

This function can be accessed via the shortcut menu of an object. It allows you to link several objects (clips to clips, Transitions to Transitions) to form one group. They remain linked until *Item Link* is deactivated.
As long as they are linked, their multiple components react just like a single object: clicking on one selects all items belonging to the group as well. If you move one, the other ones move as well. The same applies to the deletion of items.
Trim functions can be carried out with linked items as well.
The *ClipSync* function lets you synchronize objects based on various synchronous points such as timecode, mark-in or *Marker* (*page 306*).

Item Link Functions Vertically

Item Link functions vertically: you can link an object on one *Track* to any number of objects on other *Tracks*. These objects, however, need to be positioned on *Tracks* with a lower priority, that is, have to be on *Tracks* below the single object.

It is not possible to permanently link objects only to those on the same *Track*.

Link Items

1 Keep the CTRL key pressed and click on the objects you wish to link.

2 Open the shortcut menu of one of the objects involved and select the option *Item Link* > *Link Item* to link the objects. If the option is grayed out in the menu (meaning it cannot be selected), the objects are probably already grouped (at least in part), or you are attempting to link objects on the same *Track*.

Unlink Items

1 Click any object of the linked group

2 Select *Item Link* > *Unlink Item* from the shortcut menu to unlink the group; all objects are now independent again.

Autoselect Linked Items



The effect of *Item Link* can be activated/deactivated for the entire *Timeline*. You can, for example, edit an individual object without having to unlink and relink again the items. This function is mainly used to temporarily unlink objects.
Click the icon which also indicates whether the *Item Link* status is active (icon is highlighted) or not (icon is grey).

Deselect Individual Items

To temporarily remove an object from a group, select the entire group and then the respective object while keeping the CTRL key depressed.

This option is not a substitute for *Autoselect Linked Items*: the group itself with all the links remains.

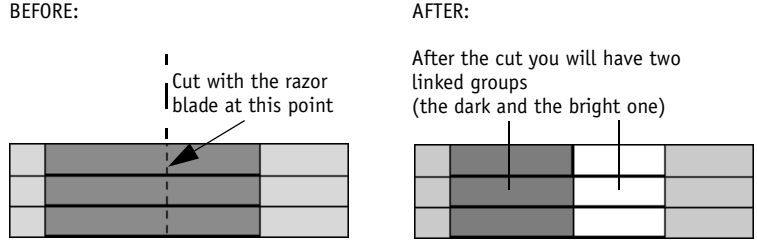
Add Item to Linked Items

Click the object of the group and then (while keeping the SHIFT key depressed) on the following object(s). Select the function *Item Link* > *Link Item* from the shortcut menu of one of the respective objects. Note that additional objects from *Tracks* must have lower priority.

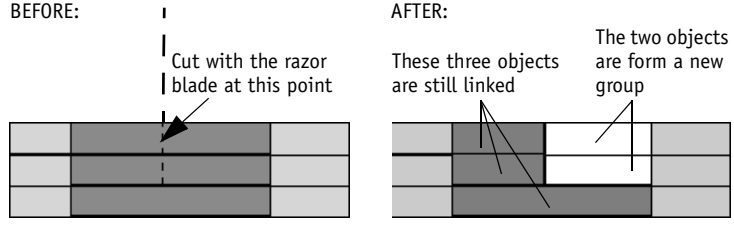
Edit of Linked Items

Below, you will find some examples showing the effect certain operations have on linked objects:

Cut linked objects with the razor blade (Add Edit)



Cut linked objects with the razor blade (protected Track)

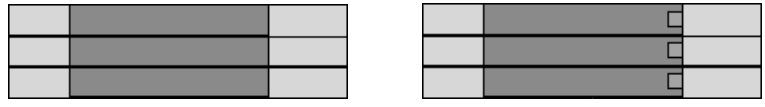


Select a handle of a linked object

BEFORE:

AFTER:

If in this group the Mark Out of one object is selected, all Mark Outs of the objects of this group are selected automatically as well.



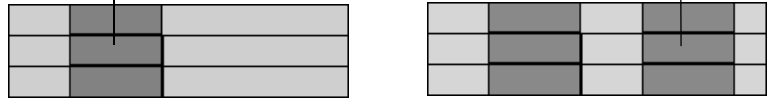
Consequences of Cut/Copy/Paste

BEFORE:

Copy of these linked objects

AFTER:

After pasting these objects remain linked



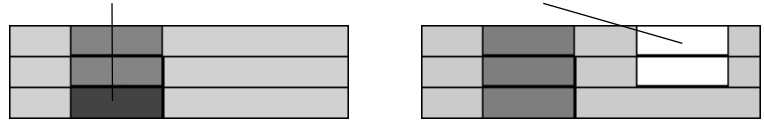
Copy/Paste of deselected objects

BEFORE:

The lowest object is deselected by mouse click + Ctrl

AFTER:

The two copied objects are forming a new linked group



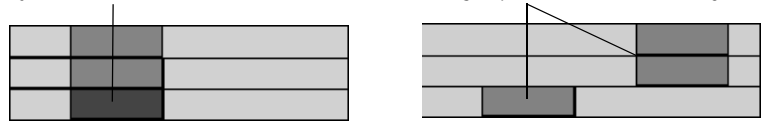
Cut/Paste of deselected objects

BEFORE:

The lowest object is deselected by mouse click + Ctrl

AFTER:

The two pasted objects are forming one group with the deselected object



Editing - Examples and Illustrations

This section again summarizes the various editing options available in Avid Liquid. Certain editing procedures are illustrated with examples.

Creating a Sequence *page 442*

Overwrite and film styles illustrated *page 443*

Timeline trimming *page 448*

Trimming with the Trim Editor *page 453*

Creating a Sequence

In order to create a *Sequence*, you should already have a rough idea of the course of the editing job. A proven procedure for non-linear editing is to begin by roughly putting together the *Sequence* based on contents and appearance, for example using a *Storyboard*, or by arranging the clips in a *Rack*.

You can then choose one of three methods for inserting clips on the *Timeline*:

- via the *Insert Arrow* using the *Sequence Editor (page 391),*
- via *drag&drop* (*Timeline* editing, see *page 410),*
- via *Send To* (Storyboarding, see *page 291*).

Overwrite and Film Styles illustrated

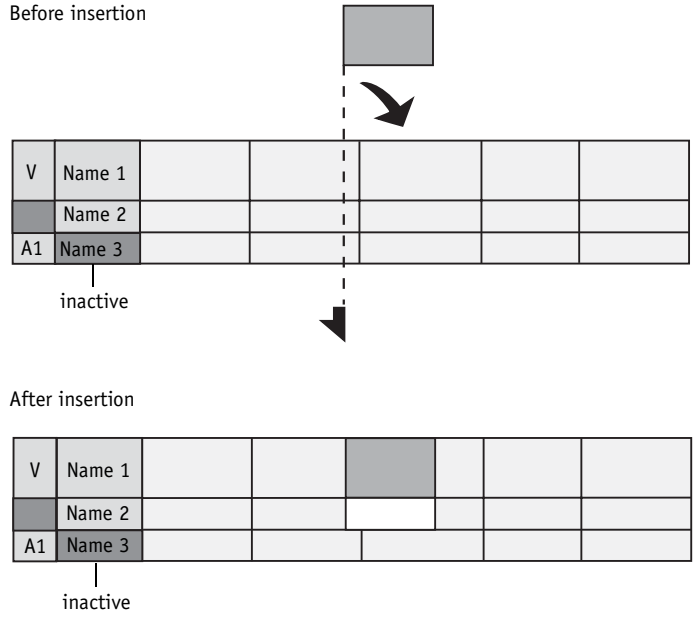
The two *Edit Styles* (*page 378*) define how the insertion or deletion of a clip or gap will affect the other objects on the *Timeline*:

Inserting a Clip in Overwrite Style

When working in *Overwrite Style,* the inserted clip replaces all objects in the insert area on the *Source Tracks* specified in *Source Track Mapping*.

Editing with the Insert Arrow

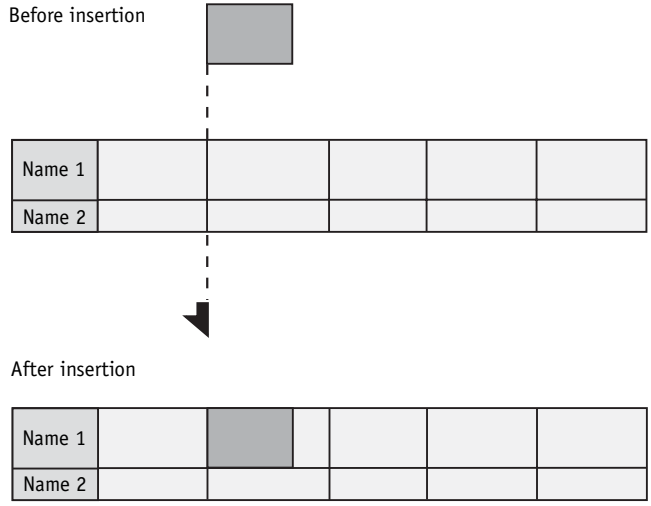
When inserting with the *Insert Arrow*, the clip in the *Source Viewer* is inserted on the mapped *Source Tracks*. See "*Source Track Mapping*" on page 375 for details.



Example of inserting a video clip (V and A1 Source Tracks).

Editing with Drag and Drop

When inserting a clip with drag&drop, you can insert objects on the *Timeline* from, for example, the *Project* window or desktop.

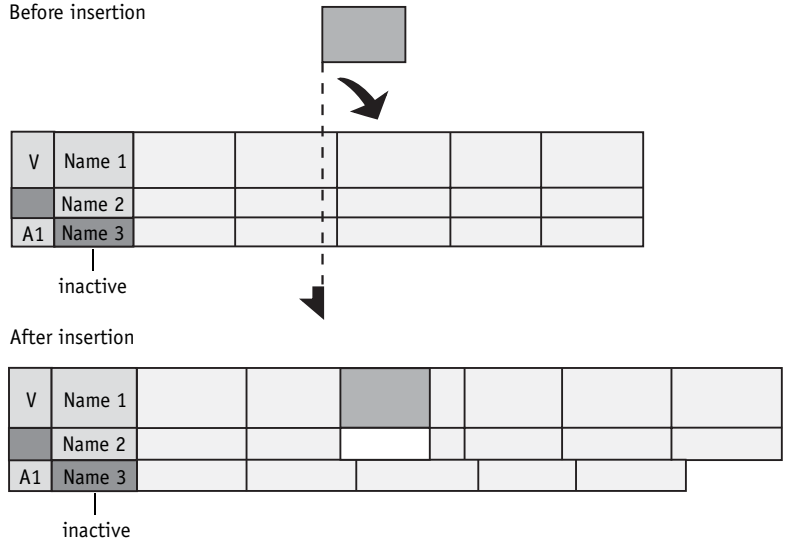


Inserting a Clip in Film Style

When you insert a clip in *Film Style*, existing parts of a *Sequence* are not deleted by the inserted clip. Instead, a cut is made at the insert point and the second "piece of film" is attached to the mark-out of the inserted clip.

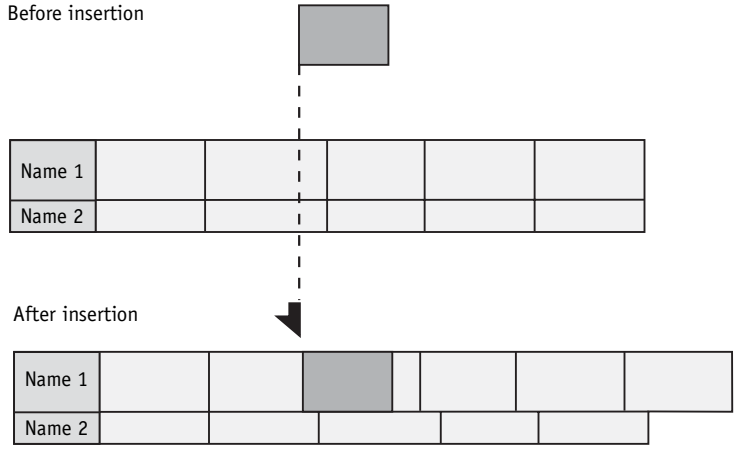
Editing with the Insert Arrow

When inserting with the *Insert Arrow*, the clip in the *Source Viewer* is inserted on the mapped *Source Tracks*. See "*Source Track Mapping*" on page 375 for details.



Editing with Drag and Drop

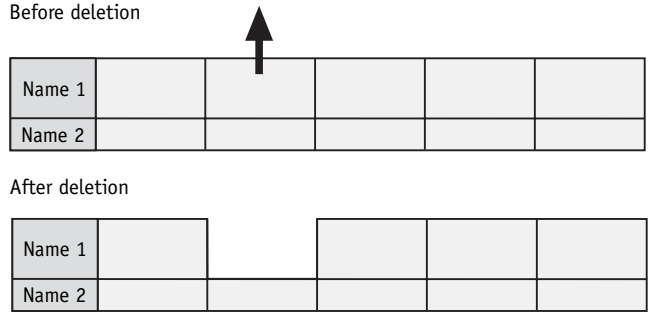
When inserting a clip with drag&drop, you can insert objects on the *Timeline* from the *Project* window or desktop.



Deleting Clips

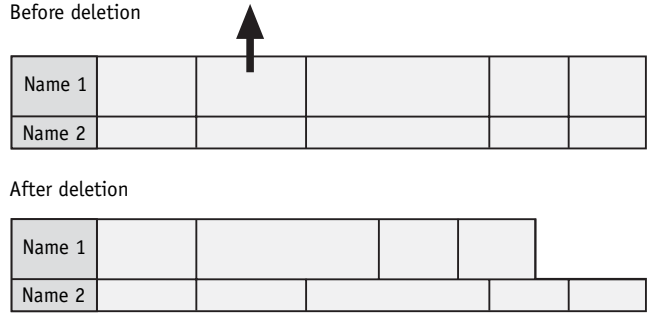
Deleting a Clip in Overwrite Style

When deleting a clip in *Overwrite Style*, the objects which followed the deleted clip are not rippled and a gap which corresponds in length to the duration of the deleted clip results.



Deleting a Clip in Film Style

When deleting a clip in *Film Style*, the objects which followed the deleted clip are rippled to fill the space (no gap results).



Deleting Gaps

There are two ways to delete a gap:

- Trim the gap on the *Timeline* until it disappears
- Set a mark-in and mark-out on the *Timeline* at the beginning and end of the gap. Click the *Trash* button to delete the gap. Make sure you are in *Film Style* so that the subsequent objects are rippled to fill the gap.

Timeline Trimming

You can perform the following trimming operations via the mouse or keyboard.

Trimming clips *page 448*

Trimming Transitions *page 452*

Simultaneously trimming several objects *page 452*

Trimming Clips

The effect of trimming on other objects on the *Timeline* depends on which edit style you specified.

The simplest type of trim is the single trim. To perform a single trim, click the trim area at the beginning or end of a clip and drag the clip in the desired direction. This can also be done in the *Trim Editor*.

CTRL + ARROW RIGHT/LEFT allows trimming by one frame each; SHIFT + CTRL + ARROW RIGHT/LEFT by ten frames each.

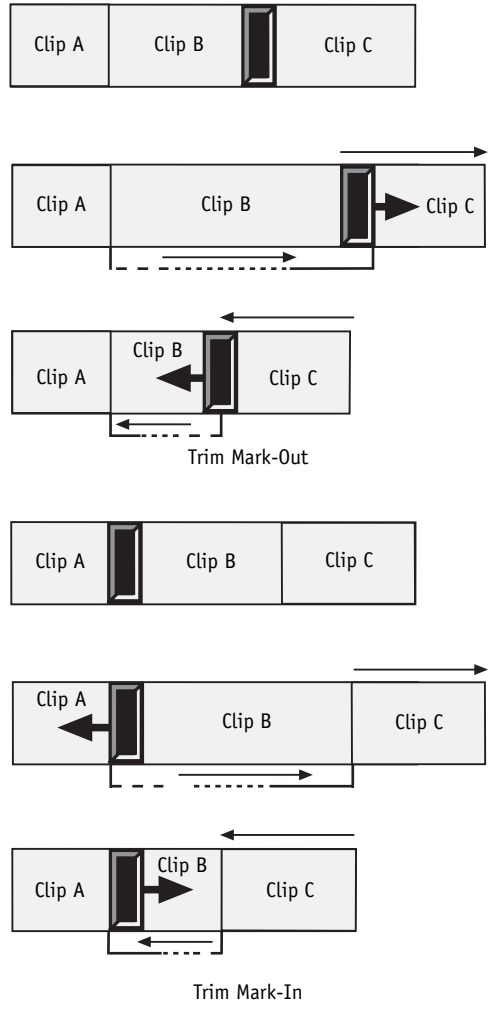
Single trim in film style *page 449*

Single trim in overwrite style *page 450*

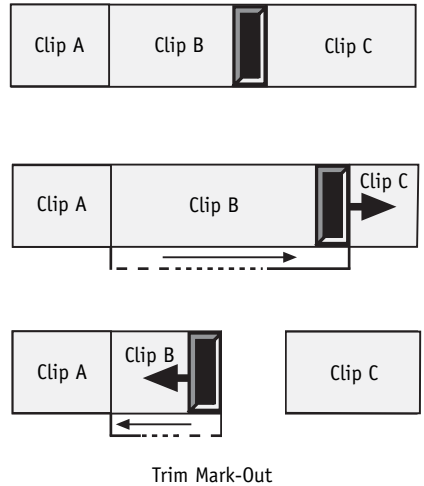
Trim both *page 451*

Slip clip *page 451*

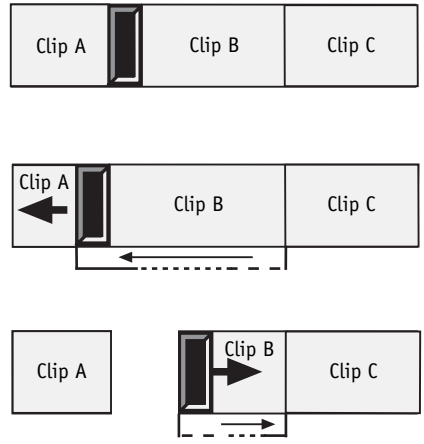
Single Trim in Film Style:



Single Trim in Overwrite Style:



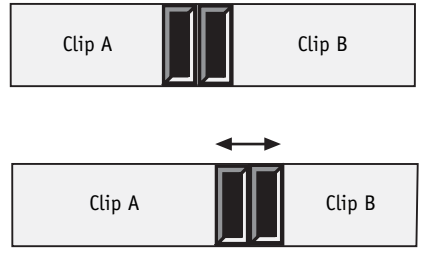
Trim Mark-Out



Trim Mark-In

Trim Both

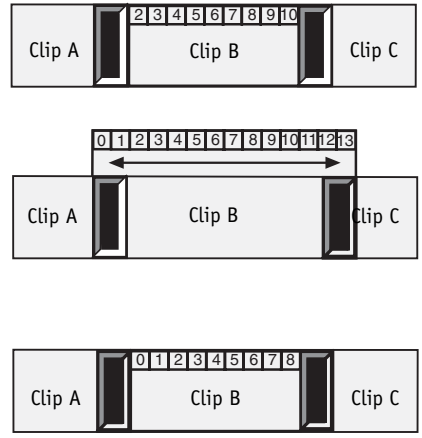
The *Trim Both* option trims two clips - the mark-out point of the outgoing clip and the mark-in point of the incoming clip. The total duration of both clips remains unchanged.



When using *Trim Both*, it makes no difference which edit style is activated.

Slip Clip

The *Slip Clip* option modifies the content of a clip on the *Timeline* by moving the mark-in and mark-out the same distance in the same direction. Both duration and position on the *Timeline* remain unchanged.



Trimming Transitions

Drag the beginning or end of a *Transition* to move its mark-in or mark-out point.

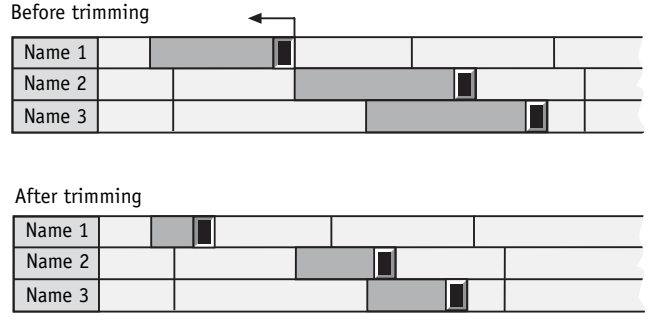


Simultaneously Trimming Several Objects

To trim several clips on the *Timeline* at once, mark the different trim points by holding down the CTRL KEY and clicking them. (The selected clips can be at different positions on the *Timeline*.) Drag one of the handles to trim the clips.



Overwrite style



Film style

Trimming with the Trim Editor

Basics *page 453*

Opening the Trim Editor in different Timeline situations *page 454*

Going to next/previous edit *page 456*

Simple trim with the Trim Editor *page 457*

Adding trims by activating additional Tracks *page 459*

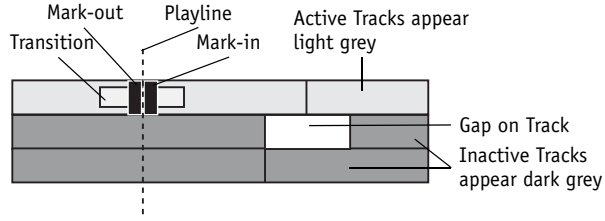
Manually changing selected trims *page 460*

Slip clip mode *page 461*

A trim with Transition *page 462*

Basics

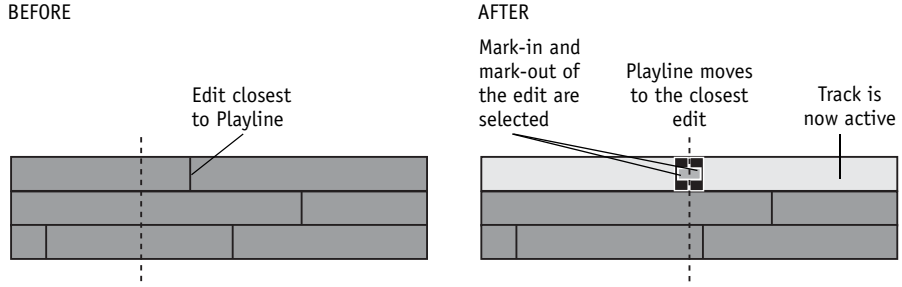
- The default trim mode is *Trim Both*. To select a different mode, click either the outgoing or incoming clip in the *Trim Editor*. To reactivate *Trim Both*, click the area between the two viewers. The trim mode is applied to all the edits involved.
- Trimming is always done in film style.
- Click the outgoing viewer to trim the mark-out of the outgoing clip.
- Click the incoming viewer to trim the mark-in of the incoming clip.



Opening the Trim Editor in Different Timeline Situations

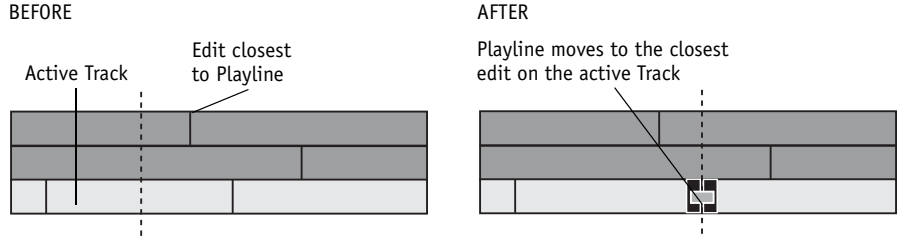
This section describes the effects of activated/deactivated *Tracks* and overlapping *Edits*.

No Tracks Active



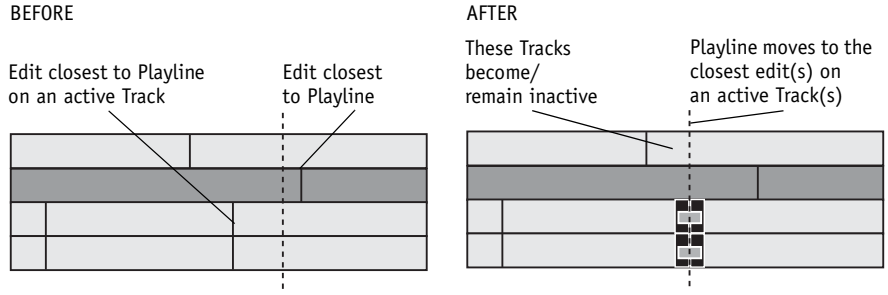
- The *Playline* automatically moves to the closest previous/next edit.
- The *Track* with the edit is set active.
- *Trim Both* is activated.

One Active Track



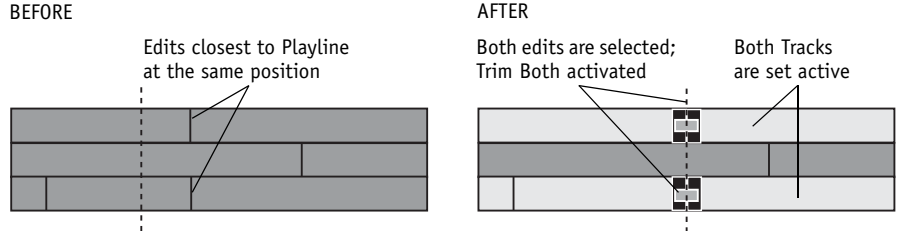
- The *Playline* jumps to the closest previous/next edit on the active *Track*.
- *Trim Both* is activated.

Two or More Active Tracks



- The *Playline* jumps to the closest previous/next edit on an active *Track*(s).
- All active *Tracks* which do not have an edit at this position become inactive.
- All edits at same position are selected and *Trim Both* mode activated.
- All *Tracks* involved are active.

Two or More Edits at the Same Position

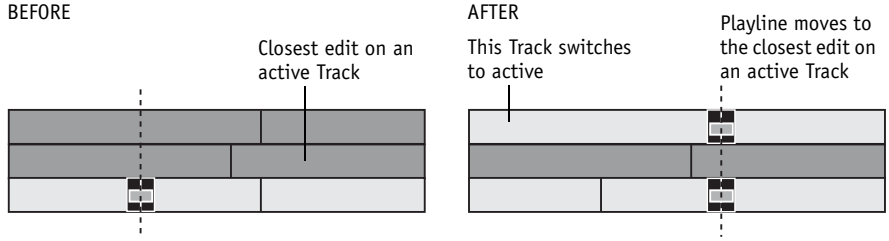


- All edits are selected; *Trim Both* activated.
- All *Tracks* involved are set edit-active.
- *Tracks* that were previously edit-active but do not have an edit at this position are set inactive.

GoTo Previous/Next Edit in Different Edit Situations

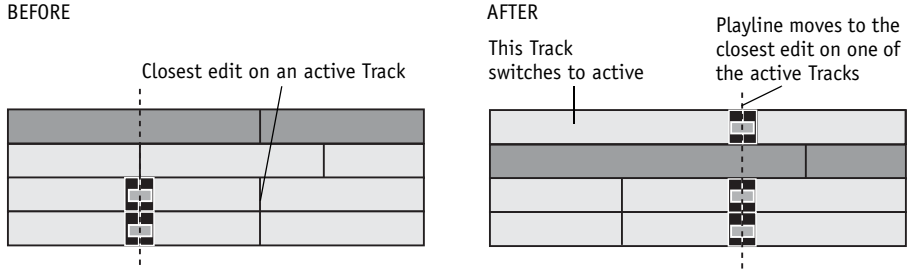
These situations occur if the *Trim Editor* is already opened and you are using the *GoTo Previous/Next Edit* function.

One Track Active



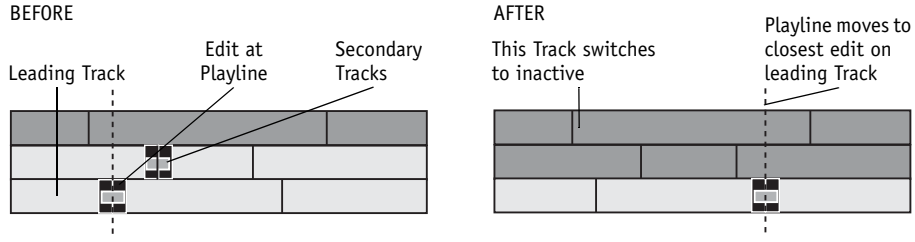
- The *Playline* jumps to the closest edit on an active *Track*.
- If there is another edit on a different *Track* at this position it is also selected and the given *Track* is set to active.

Two or More Tracks Active



- The *Playline* moves to the closest edit on an active *Track*.
- All active *Tracks* which do not have an edit at this position are set inactive.
- All *Tracks* that have an edit at this position are set active; *Trim Both* mode is activated.

Manually Selecting Trims

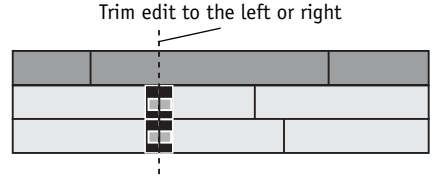


- The active *Track*(s) with the *Playline* exactly at the edit we call "leading *Track*(s)" for that trim. The active *Tracks* with manually selected edits we call "secondary *Tracks*."
- Click *Goto Next/Previous Edit* to move the *Playline* to the closest edit on one of the leading *Tracks*.
- All active *Tracks* which do not have an edit at this position are set inactive.
- All *Tracks* that have an edit at this position are set active and the *Trim Both* mode is activated.

Simple Trim with Trim Editor

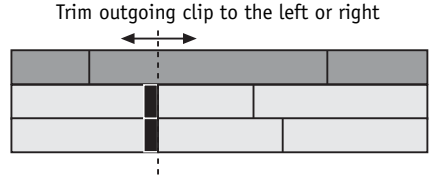
Cases that frequently occur:

Trim Both



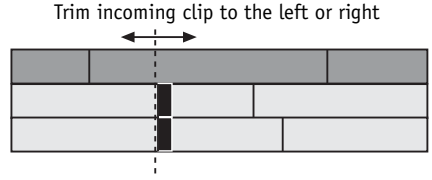
- *Trim Both* is the *Trim Editor's* default mode.
- Trimming the edit to the left shortens the outgoing clip and lengthens the incoming clip by an equal number of frames. This means the length of the trimmed *Track* does not change, only the edit point is moved. If you move the edit point to the right, the opposite happens.

Trim Outgoing



- Trimming to the left or right, shortens or lengthens the outgoing clip.
- Every object to the right of the trimmed edit(s) on the trimmed *Track*(s) is rippled. As a result, the *Track*(s) gets shorter or longer.

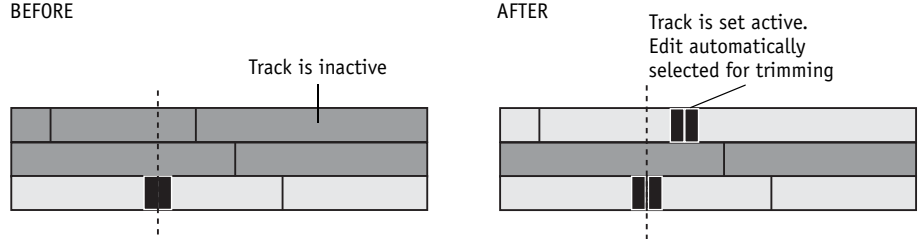
Trim Incoming



- Trimming to the left or right, shortens or lengthens the incoming clip.
- Every object to the right of the trimmed edit(s) on the trimmed *Track*(s) is rippled. As a result, the *Track*(s) gets shorter or longer.

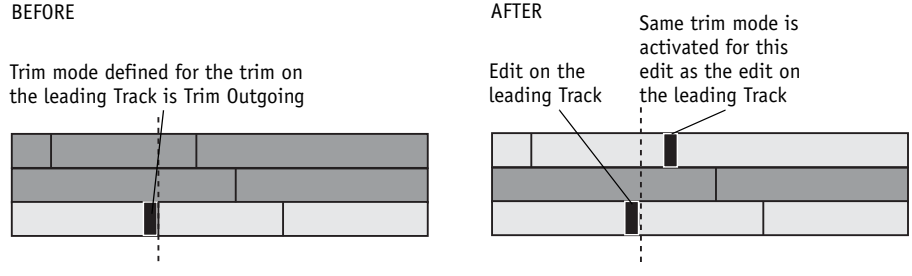
Adding Trims by Activating Additional Tracks

By manually setting a Track active (by clicking on the *Track* name in the *Track* header area), the edit on the *Track* closest to the *Playline* of the leading *Track* is selected for trimming.



Trim State

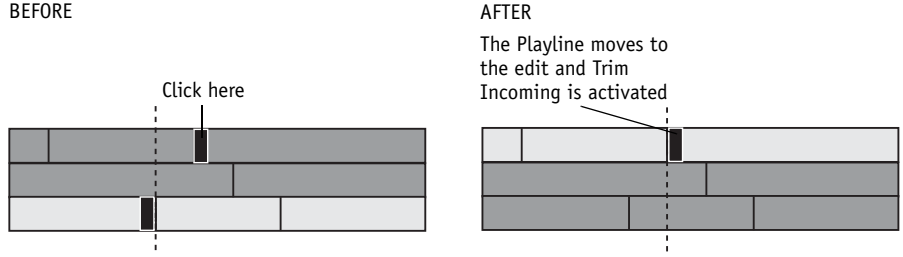
The edit on the additionally selected *Track* is assigned the activated trim mode.



Manually Changing Selected Trims

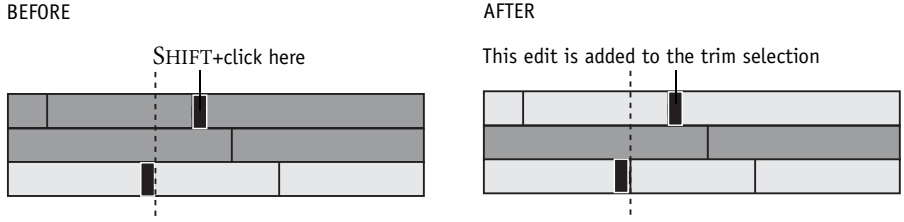
Click a mark-in or mark-out directly to change selected trims. The type of mouse pointer indicates whether *Trim Outgoing* or *Trim Incoming* is activated.

Selecting a Mark-In on an Inactive Track



- The *Track* becomes active.
- *Tracks* that do not have an edit at this position become inactive.
- The *Playline* moves to the selected edit.
  Depending on which part of the edit you have clicked (left side - center - right side) *Trim Outgoing, Trim Both* or *Trim Incoming* is activated. You can change the trim mode of an already selected edit the same way.

Selecting Additional Edits



SHIFT+click a mark-in and/or mark-out to add an edit to the already selected edits. In this case the *Playline* stays at its actual position. You cannot select more than one edit on the same *Track*.

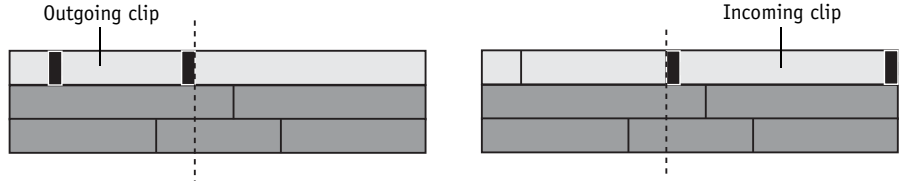
Trimming Mark-In and Mark-Out Simultaneously

It is possible to activate different trim modes for the same group of selected edits (for example, *Trim Outgoing* and *Trim Incoming* at the same time).

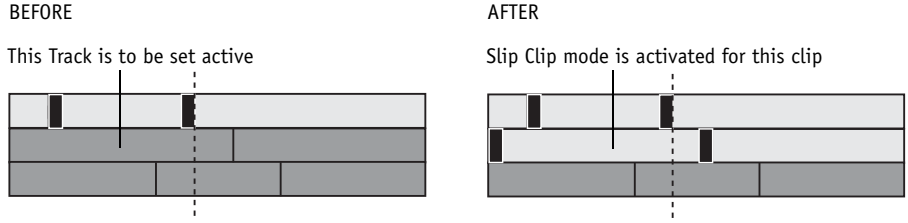
In the example above, when the outgoing clip is trimmed to the left it becomes shorter and when the incoming clip is trimmed to the right it also becomes shorter.

Slip Clip Mode

Activate the *Slip Clip* mode in the *Trim Editor* to slip clips. Click the outgoing viewer to slip the outgoing clip; click the incoming viewer to slip the incoming clip.



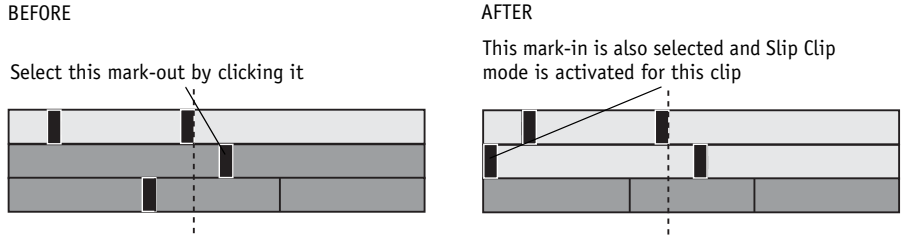
Activating Additional Tracks



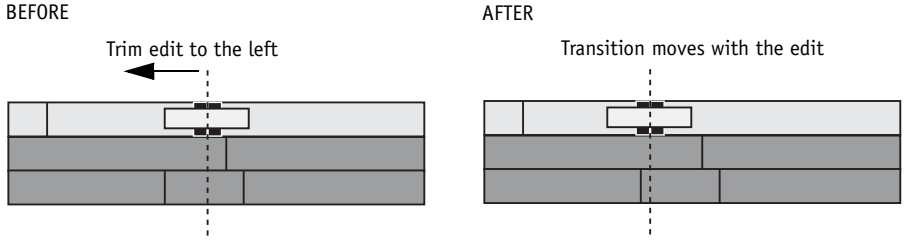
It is possible to work with slip clips on different *Tracks* by activating another *Track* or by selecting additional edit points directly on the *Timeline*.

The clip which overlaps most of the leading clip (the one which is already loaded in the *Trim Editor*) and which is closest to the *Playline* will be selected for slip clipping.

If the leading clip gets slipped, all other clips involved are also slipped. Slipping and trimming at the same time is not possible.



A Trim with Transition



The *Transition* moves with the edit and remains at the same position in relation to the edit itself.

You can only trim until the *Transition* of the trimmed edit reaches the next/previous edit or another *Transition*. Otherwise you have to shorten the duration of the *Transition*.

Audio in the Timeline

This section contains information on audio editing on the Avid Liquid *Timeline*. Audio clips basically behave the same as any other object, whether in the *Clip Viewer*, *Source Viewer*, *Master Viewer* or on the *Timeline*. Nevertheless, there are a few special points that you should note. (For more information on the subject of audio, see the section on *"Audio Postproduction and Audio Effects"* on page 794).

"Audio" Tracks

Because in Avid Liquid there is no such thing as an "Audio *Timeline Track*", it is important to think about how you will position the audio before you begin editing. A correctly configured *Timeline* containing clear assignments will help you maintain an overview. By the time you reach postproduction, you will be glad you took the time get organized. See *"Configuring Tracks"* on page 364 and *"Audio Playback"* on page 363.

Synchronicity

In Avid Liquid, two or more clips are "synchronous" if they have been digitized together. If they are then moved with relation to one another, the clips become asynchronous. This can happen, for example, if you insert a clip on the *Timeline* in *Film Style* when not all of the *Tracks* are active. In order to avoid this, check the following when inserting clips:

- *Edit Style - Film Style* (objects are moved) or *Overwrite Style* (*page 378*)?
- *Active Tracks* - When inserting in *Film Style*, only objects on active *Tracks* are moved (*page 368*).

Grouped video and audio clips (i.e. video and audio *Source Tracks* integrated in one clip) are less likely to become asynchronous because the audio and video are linked, being embedded in one single object. Two methods are available:

- Drag&drop: If you insert grouped clips on the *Timeline* using the mouse, the audio and video remain linked within these clips, meaning that they remain synchronous. For details, see the section on "*Timeline Editing*" on page 410.
- Switch *Source Track Mapping* to *Grouped*: Then audio and video clips will also be grouped when you insert them on the *Timeline* using the *Insert Arrow*. See "*The Insert Arrow*" on page 397 and "*Source Track Mapping*" on page 375.



You will always have the option of disbanding linked clips later on, for example for audio postproduction (see *page 424*).

Other functions in Avid Liquid related to synchronicity:

- *Sync Break* - Indicates a loss of synchronicity both visually and numerically (*page 365*).
- *Item Link* - Individual objects on different *Tracks* can be combined in groups to prevent them from being moved relative to one another (*page 439*).
- *Sync Lock* - All the objects on all or specific *Timeline Tracks* can be linked together (*page 437*).
- *ClipSync* - This function lets you synchronize objects based on various synchronous points such as timecode, mark-in or *Marker* (*page 306*).



In the case of complex *Sequences*, a loss of synchronicity may at first go unnoticed. It is then difficult later on to reconstruct the cause. Naturally, you can repeatedly apply the *Undo* function on the *Timeline* but this will also undo any work that you have done since synchronicity was lost. Often the fastest remedy is to recreate the audio or video clips. Then use the *Match Frame* function to quickly find the synchronous point (*page 422*).

Volume and Panning

Audio clips have a specific volume (level) and a specific left/right alignment, called panning or balance, depending on stereo or mono properties. This information is defined when the clips are digitized or imported, along with their stereo or mono characteristics (*"Stereo and Mono, Panorama and Balance"* on page 801). Nevertheless, you can also change these parameters later on.



Note that the volume and panning are not set globally for a *Timeline Track*; these properties belong to the clip rather than the *Track*. For this reason it makes sense, for example, to position all loud ambient sound clips on the same *Track*. The *Tracks* can then be deactivated all at once (See also *"Audio Playback"* on page 363.) You can also quickly select these clips (*"Selecting Objects after Playline"* on page 414) and adjust the levels en bloc (*"Global Modification of Volume and Panning (Adjust Audio Function)"* on page 855).

Fade-In and Fade-Out

In order to achieve somewhat smoother audio *Transitions* before the final mixing, you can use temporary audio fades that can then be edited later on. The following options are available:

- *Cross Fade* - You can insert a *Cross Fade* either manually (*"ABCs of Effects"* on page 387) or automatically (*"Add Dissolve"* on page 856).
- *1-Click FadeIn/Out* - To use this option, the *Audio Editor* must be open (see *page 810*).

Output and Monitor

What you hear when you play the audio on the *Timeline* depends on a number of factors.

- The panning or balance (left/right/center) is primarily a clip property (*page 797*) but can also be influenced in the *Audio Editor*. It can even be affected by subsequent mixers and switch panels.
- The volume can be influenced by the *Audio Tool* (output; *page 806*) and by clips that have been adjusted individually. Audio clip effects can also affect the volume level.

Special Functions

Matte Track and Track Matte

Matte effects created on a special *Timeline Track page 467*

Consolidate and Condense (Building a Rack from a Sequence)

The *Condense* function combines all the clips of a *Sequence* to form a new *Rack (page 304)*; *Consolidate* creates copies of required Media Files *(page 300)*

Nesting Sequences (building a Container)

Sequences can be nested on up to ten levels *page 471*

Fullscreen

Display video so it fills the computer monitor *page 476*

Maximize Inlay Size (Master Viewer)

Change to maximum/quarter size inlay *page 477*

Inlay Quality Menu

Set up the display *page 479*

Snapshot

Freeze a Sequence image and save it as BMP file *page 482*

Scalable and Moveable Timecode Display

Easier on the eye... *page 483*

Multicamera Editing

Conveniently cut between two different synchronous sources *page 484*

Matte Track and Track Matte

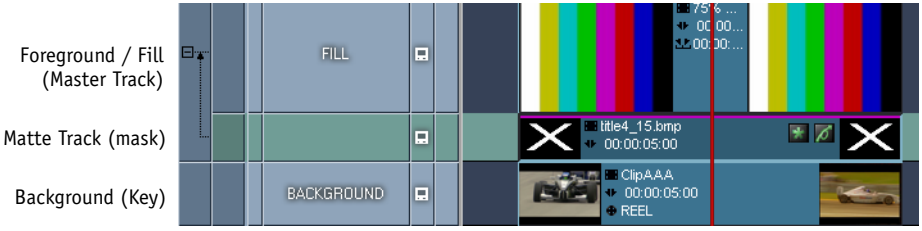
The *Matte Track* lets you very easily set up a track matte effect. These effects are key or mask effects, which can also be animated.

Step 1: Set up Matte Track *page 469*

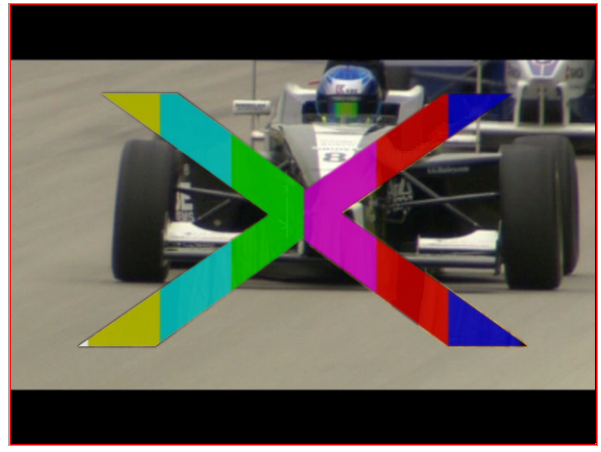
Step 2: Create a track matte (mask) *page 470*

Step 3: Set up Track Matte effect *page 470*

A *Matte Track* is a special *Timeline Track* that acts like subtrack. See the example:



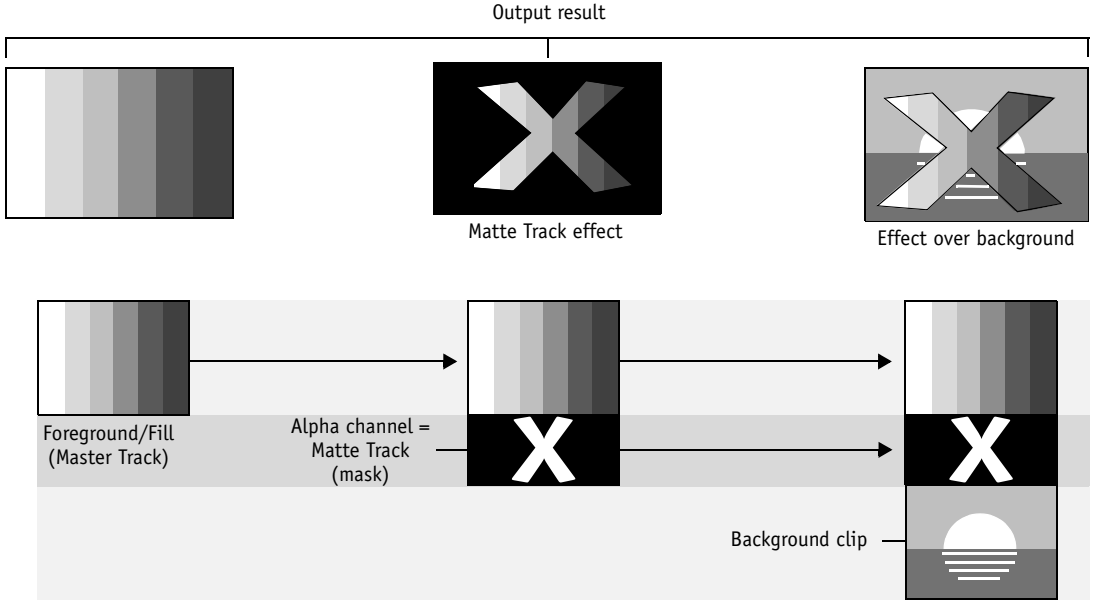
And this is the image created by this composition:



Resulting image created by the Matte Track effect

How can this result be explained?
The white X is filled in with the color bar pattern - that's why the clip above the *Matte Track* is called "Fill" or "Foreground".
The black area around the X is replaced by the background, provided by the clip beneath the *Matte Track*. This is a standard-issue key effect.
The X itself is a title clip created in TitleDeko. It's just the letter X, color white, horizontally stretched, on a black = transparent background. This clip provides the alpha plane. The *Matte Track* detects the alpha plane automatically.

Here is another way of explaining the *Matte Track* effect:

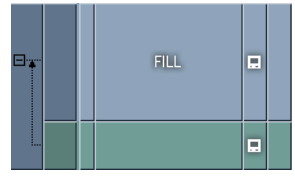


Matte Track: how it works

Step 1: Set up Matte Track

A *Matte Track* can be created on any *Timeline Track*.

1 Right-click the *Name* area of a *Timeline Track* and select *Add Matte Track*.



2 The *Matte Track*, in a greenish tint, is added just below the *Track*. A new column appears. By clicking the *Minus* sign inside the little box you can collapse the *Matte Track*.
To delete a *Matte Track* click the *Name* area and select *Delete Track*.
Also note:

- The system automatically detects the presence of an alpha plane in clip placed on the *Matte Track*. If yes, you do not need to add another *Track Matte* effect. Key and fill will be assigned automatically as well.
  If no alpha plane is present, the *Track Matte CPU* effect in its default state is applied. This, however, becomes not visible for the user, no effect line or effect icon appears. If you want to edit the effect, you'll have to drag the editor from the *Rack* and drop it on the clip.
- *Matte Tracks* follow their *Master Tracks* - if moved vertically as well as when the *Master Track* is deleted.
- Clips on Master Track, *Matte Track* and background *Track* are not automatically linked or grouped. We recommend that you link relevant clips together to avoid accidental derangements of your carefully constructed effects (see "*Item Link*" on page 439).
- The *Matte Track* cannot be named, but otherwise it is a *Track* like all other *Timeline Tracks*.
- You can set up as many *Matte Tracks* as you like.
- Clips on *Matte Tracks* cannot be integrated in *Containers*.

Step 2: Create a Track Matte (Mask)

For a first tryout we recommend the creation of a simple geometric pattern or just even a letter, like in our example. You can use TitleDeko to produce that clip, but any other image or video, with or without an alpha plan, will do.

Step 3: Set up the Track Matte Effect

The order of events is not really important. We'll proceed top-down. Make sure that *Video Playback* (monitor symbol) is active on all three *Tracks*.

1 Place the fill clip above the *Matte Track* which you have created in Step 1. This is the image that is going to fill in the area defined by the mask.

2 Place the *Track Matte* clip (mask) from Step 2 on the *Matte Track*, just below the fill clip.

3 Place the background clip on the *Track* below the *Matte Track*.

In many cases that should be sufficient. But - if your *Track Matte* clip has no alpha, or if you plan to animate the mask, the process continues:

4 Drag the *Track Matte CPU* effect from its *Rack Realtime Clip FX > Editors* to the clip on the *Matte Track*.

5 Open the effect editor, select a *Keyer Type*.
Linear Luma is suitable for clips without alpha plane but with a distinct contrast between the dark and the lighter parts of the image.
Linear Alpha creates the key effect based on the alpha plane information already contained in the clip (if that is the case).
Invert swaps what is considered background and foreground. All other parameters are described on *page 636*.

6 On to the animation of the mask (we'll make it move):
Apply, e.g., the *2D Editor GPU* to the matte clip. Taking our example, we could move the X from the left side to the right side across the image.

7 If you want the fill (foreground) image to move with the mask, you have to apply the identical motion effect to this clip as well (first copy the effect, then use clip shortcut menu > *Paste* > *Clip FX*).

8 Add more effects.

Instead of *Track Matte CPU* you can use other key effects, a *Blue Screen Key*, for example.

Nesting Sequences (Building a Container)

If you want to include *Sequences* as objects on the *Timeline*, drag them from the *Project* window to the *Timeline* or the *Source Viewer* (or use *Send To* command from the shortcut menu). You can now edit the *Sequence* just like a clip, e.g. include it in another *Sequence* (building *Containers*), apply effects or trim it.



When inserting *Sequences*, pay attention to possibly set mark-ins and mark-outs since this defines the length of the resulting *Container* clip.

What are Containers? *page 471*

Building a Container *page 472*

Stepping into a Container *page 473*

→ Inserting further containers *page 474*

Editing Containers *page 475*

Dismantling Container *page 476*

→ Dismantle or step into containers? *page 476*

Containers are copies of Sequences *page 476*

What Are Containers?

In Avid Liquid, *Containers* are *Sequences* that were integrated in another *Sequence*. Complete *Sequences* containing an unlimited number of clips and edits can be embedded like objects (i.e. clips) in another *Sequence*. Avid Liquid allows you to edit these *Sequences* on the *Timeline* within the main *Sequences* and to move back and forth from the container(s) to the main *Sequence* with just one mouse-click. This main *Sequences* are the main level; up to ten levels (layers) can be created with this *Container* method.

Build Container



You can use the *Build Container* function to combine a specific segment of a *Sequence* (or a complete *Sequence*) into a container from within the *Timeline*. This function can be activated via the toolbar shortcut menu or the function icon shown here; it may be necessary to copy the latter from the function library to the Toolbar.

Define the area to be included in the *Container*:

- horizontally through the use of mark-in and mark-out points
- vertically by activating or deactivating *Timeline Tracks*. Only objects on activated *Tracks* are included in the *Container*.

Afterwards, click on *Build Container*. This function inserts a clip of the corresponding length into the next-higher *Timeline Track* that is available.

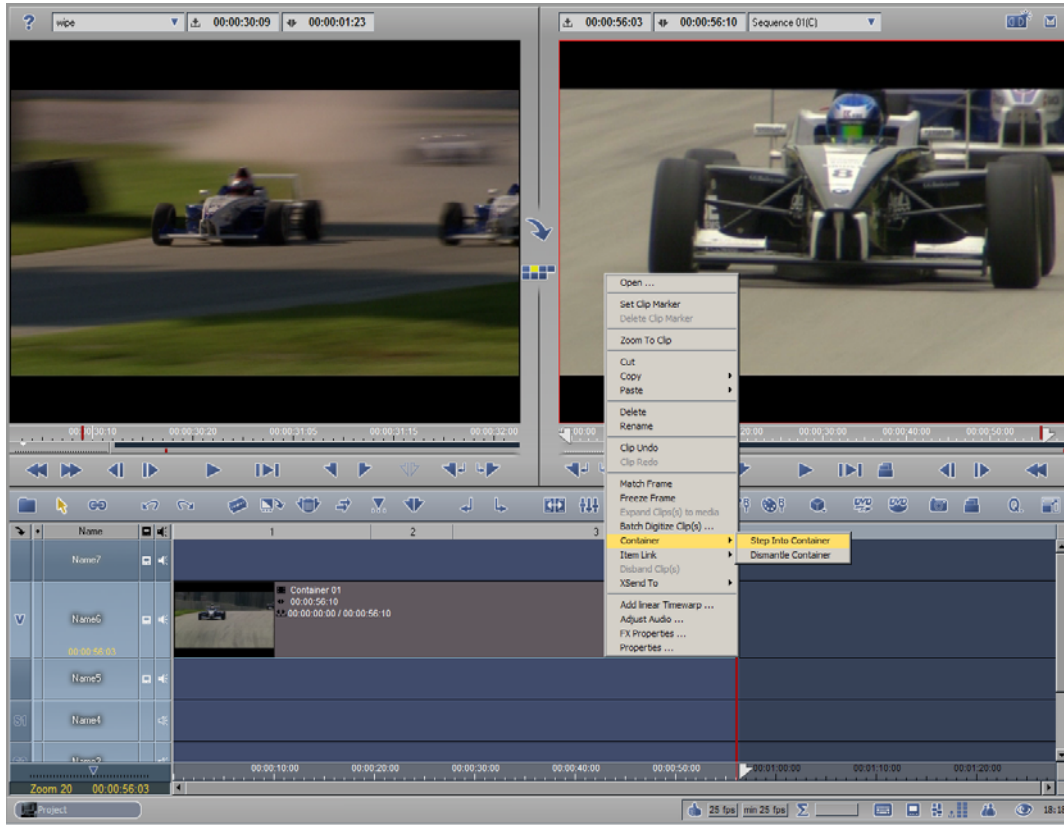


Make sure that there are no inactive *Tracks* located between the active *Tracks*. If there are, no *Container* will be built.

Reason: *Container* building can change the priority of the *Timeline Tracks*. This is because the *Container* is always stored above the *Tracks* it serves to combine. If you exclude one or more *Tracks* (because they are deactivated), the *Container* that was built can now contain clips that are located above the *Track* that was excluded. This means that those clips that were previously located below the clips of the excluded *Track* (i.e. that had a lower priority) would be located above them and could result in unexpected effects for multilayering. (See also *"Vertical Track Priority"* on page 374.)

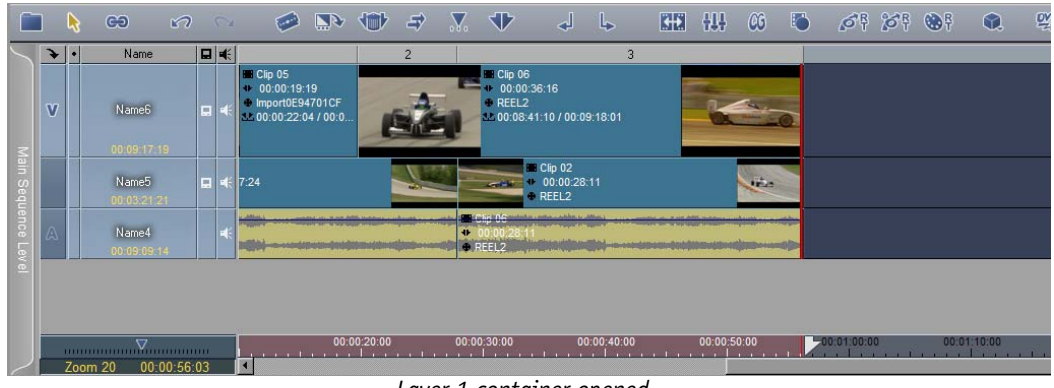
Step Into Container

First insert a *Sequence* (*Container*) within the *Sequence* (*Top Sequence*) currently being edited. Then open the *Container's* shortcut menu and select *Container* > *Step Into Container*.



Opening the container

The opened *Container* is now located on the *Timeline* including all individual objects. A tab indicating that the current *Container* is "stepped into" (opened) appears left of the *Track Headers*. By clicking this tab, you reach the higher *Sequence*, i.e. you close the *Container*.



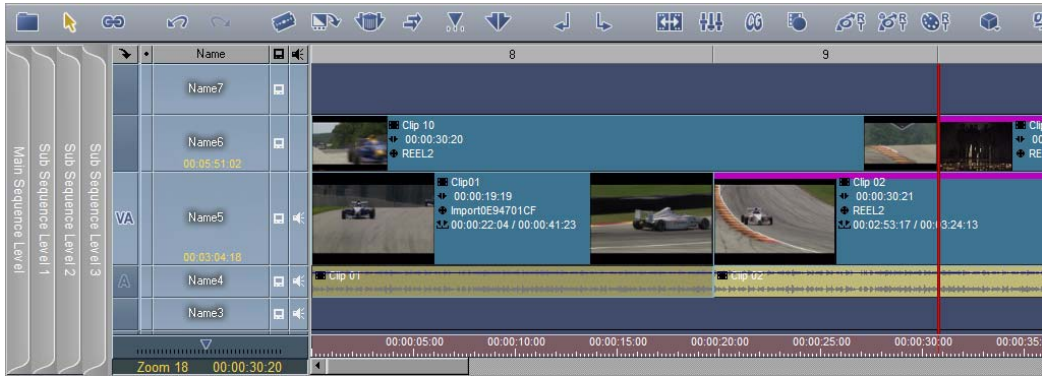
Layer 1 container opened

An area is highlighted in color on the *Timecode* bar and is limited by mark-in and mark-out points. This area corresponds to the length of the *Container* in the higher *Sequence* (in this case the main *Sequence*). The indicated timecode refers to the *Container* currently open. Also the *Timeline* layout corresponds to the current *Container*.

See *"Dismantle Container"* on page 476.

Insert Further Containers

Insertion of further *Containers* leads to an increase in tab pages.



Multiple nested containers

You reach the lower levels within a main *Sequence* by repeated *Step Into Container* (which adds a tab each time you do so). This corresponds to the option "Step Out Of Container". The *Sequence Editor* always displays the name of the main *Sequence*.

Edit Containers

You can edit an opened *Container* just like any other *Sequence*. When changing the length of clips within the *Container*, thus changing the entire length as well, note that lengthening/shortening the *Container* does not automatically affect the next higher level(s). This means that the actual length of the *Container* placed as a clip on the *Timeline* remains unchanged, so:

- if you shorten an opened *Container*, the shortened area shows as "black" at the video output in the next higher level during playback. You therefore have to trim or delete this area of the *Container* clip.
- if you lengthen an opened *Container*, you have to lengthen the *Container* clip by trimming it in the next higher level after closing the *Container* to make sure the clip is played back in its new length.

Dismantle Container

Similar to *Disband Clip(s)*, this function in a *Container*'s shortcut menu breaks down a *Container* into its components.
Unlike *Step Into Container*, a separate subsequence is not opened on the *Timeline* and the *Layer* tabs do not appear on the left side of the *Timeline*. If they do not already exist, the necessary *Tracks* are created below the *Container*. Clips that are located directly below the *Container* to be dismantled are moved downwards accordingly.



A *Container* with one or more Clip FX applied to it cannot be dismantled. Use the *Step into Container* function instead.

Dismantling or Opening a Container?

- You can click on an *Opened Container* to close it again. In the case of nested containers, you will obtain a better overview if you strictly separate the levels.
- A *Dismantled Container* can change the *Timeline* layout if *Tracks* are added. If may also be necessary to regenerate a dismantled file using the function *Build Container*.

Containers are Copies of Sequences

Containers are copies of *Sequences* and function on the *Timeline* just like all other clips. This means that changes made in *Container* do not affect the original *Sequences* in the *Rack* and vice versa.

You should take this into consideration when repeatedly using the same *Sequence* in case a change becomes necessary. Instead of changing ten individual *Container*, it is far more useful to edit the original *Sequence* and to exchange the *Container* afterwards.

Fullscreen Display



You can scale the video in the *Master Viewer* to the size of your computer monitor. This function (pictured on the left) is found in the *Master Viewer's* Function Library (right-click > *Customize* > *Special* tab). Keyboard commands (such as *Play/Pause* = SPACEBAR) and scrubbing in the image continue to function as usual. Press ESC to exit fullscreen display.



Double-click the inlay to toggle between fullscreen display and standard view.

You can, for example, view HD without a special HD video monitor.
Tip: Assign this function to a key for rapid toggling between edit and view modes.

Maximum Inlay Size

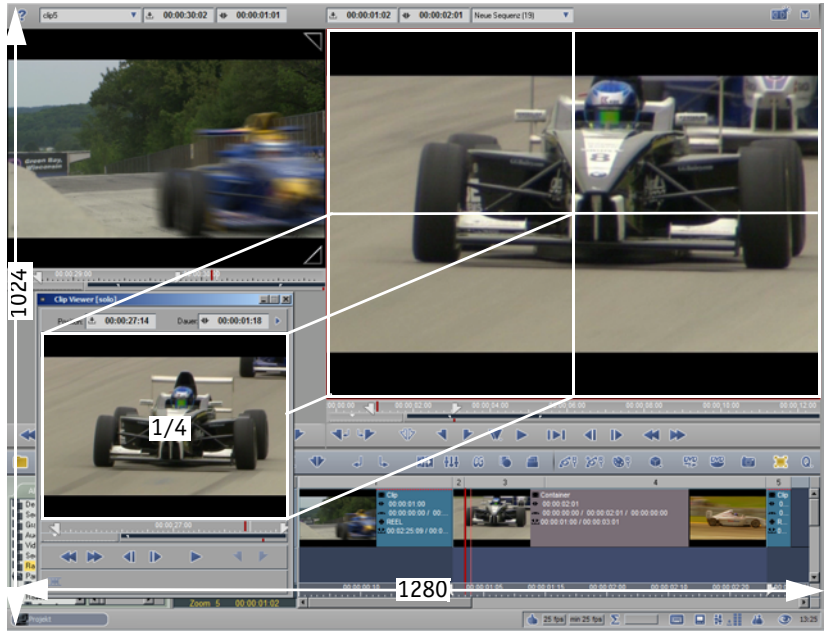


This toggle button lets you switch the *Master Viewer* to full resolution and display it at its maximum size, i.e. 640*480 pixels for NTSC and 768*576 pixels for PAL (square pixels). However, this may simultaneously reduce the size of the *Source Viewer*.
This function is available only with a desktop (computer monitor) resolution of at least 1280*X because if the desktop resolution were too low, the enlarged *Viewer* would not leave enough space for the *Timeline*.



Whether you can display larger HD formats such as 1920x1080 in the maximum inlay mode depends on your computer monitor's resolution. Or you can also use the *Fullscreen Display* described on *page 476*, especially if you work with two monitors.

When this mode is deactivated, the *Master* inlay is displayed at one-quarter resolution (half height, half width). However, it is scaled (i.e. adapted to the space available) depending on the desktop resolution used, as demonstrated by the following figure:



Full-size mode: How resolution relates to inlay size...

In this example, the desktop is set to 1280 * 1024 (width * height) and the videos inlays are displayed in PAL format.

- The *Clip Viewer* displays its image at the default size and resolution, which is one quarter of the PAL or NTSC resolution.
  The *Full-size* button has no effect on the *Clip Viewer*.
- The *Master Viewer* is set to its full resolution and size:
  PAL = 768 * 576 (square pixels)
  NTSC = 640 * 480 (square pixels)
  As you can see, the *Clip Viewer* inlay fits into the full screen four times.
- The *Source Viewer* (also at one-quarter resolution) is scaled to fit the remaining width with its height adjusted to the corresponding aspect ratio.

The following table describes the variants (NTSC/PAL):

Resolution (horizontal)	Full-size mode	Possible for
1024	No	-
1280	Yes	*Master Viewer*, some *Effect Editors* (esp. realtime editors)
1600	Yes (automat.)	All *Viewers* (except for some *Effect Editors*)

The *Clip Viewer* and *Render Viewer* are not currently full-size-capable.



If you change the desktop resolution for your operating system (for example, to a higher resolution such as 1280 x 1024), you may have to reinstall Avid Liquid to adapt the interface.

Inlay Quality Menu / Inlay Size



This function lets you change the size and display quality of the video inlays in Avid Liquid.
Important: These options apply only to the inlay display (preview), not to rendering or output to tape.
Click the button to open the selection menu.

High/Low Resolution



When set to *Low*, the image appears a little flatter or softer but the comb artifacts caused by video interlacing and often visible with the *High Quality* setting are eliminated.
The *Low* option reduces the image resolution to quarter size and enables field-doubling. Therefore the usual flickering display of a still image on a video monitor is suppressed.
The button shown provides direct access to the level of quality.

Both Fields/1st/2nd Field

- This option has no effect on progressive video formats because there are no fields. -

This option lets you select the still display.
A video frame comprises two fields whose lines alternate in an interlaced pattern. This technology permits de facto 50 (PAL) or 60 (NTSC) frames per second, which reduces the flickering of a TV image (it has no impact on the computer monitor inlay).

A still that has two very different fields (for example, from a scene with a great deal of movement) may appear blurred or flicker if both fields are displayed.

This option may be inaccessible depending on product and/or hardware setup.

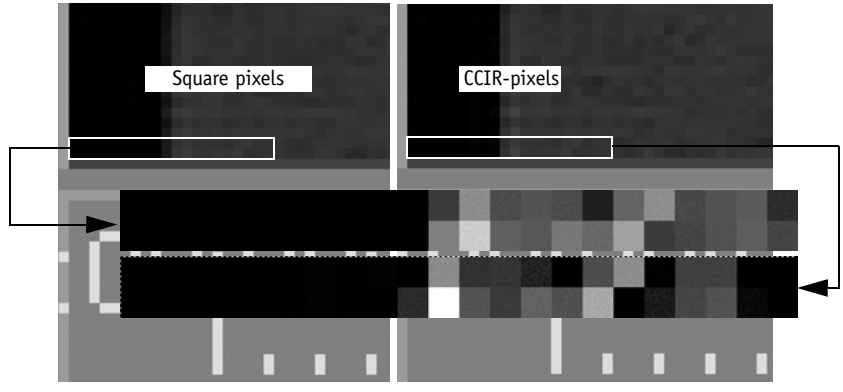
Full Screen: CCIR Pixels/Square Pixels

- Only in *Fullscreen Mode* and only for PAL/NTSC -
Computer monitors, whether LCD or CRT, can only display square pixels. The same is not true of video. The CCIR (ITU) Standard stipulates rectangular pixels for NTSC and PAL. Normally, all the inlays in Avid Liquid run based on square pixels. The signal for the monitor display is interpolated for this purpose.
When you switch to *CCIR*, the image narrows slightly and its contents are somewhat squashed in the horizontal direction, as shown in the example below. (In NTSC, the exact opposite occurs. PAL pixels are wider than square computer pixels whereas NTSC pixels are taller.)



Left: Square pixels (round section); center: CCIR PAL (vertical oval); right: CCIR NTSC (horizontal oval)

The TV resolution is converted for display on a computer monitor (see table below). The advantage is that playback is laterally correct and undistorted; the disadvantage is that the pixels are no longer identical, which is particularly important in the case of exact, pixel-by-pixel effect editing. For example:



Same section from same video frame, different pixel patterns

Identical areas were cut from the bottom left-hand corner of the same video frame, once with the *square* setting and once with *CCIR pixels.* As you can see in the enlargement, the pixels at the same locations are not identical.
Why is this? Because in the one case the lines (i.e. the horizontal rows of pixels) in the frame are 720 (CCIR) pixels wide and in the other case are 768 (square) pixels wide (according to PAL specification). The image contents in the square-pixel display are distributed over different pixels than in the CCIR recording:

TV standard	CCIR (TV monitor)	Square (computer)
NTSC	720 * 486 (DV: 480)	640 * 480
PAL	720 * 576	768 * 576

As the figure shows, the pixels themselves are always square, including the CCIR pixels. The CCIR pixels should actually be rectangular but because they cannot be rectangular on a computer monitor, the image appears narrower in PAL and flatter in NTSC.

Quarter/Maximum/Default Inlay Size

This option scales the inlay to the largest (default/quarter) size currently possible. As a result, toolbars may be suppressed or rearranged.

Snapshot



It's called snapshot and that's exactly how it works. Point and shoot: place *Playline* on image, click the button shown here.

The image is then placed in the active *Rack* and carries the temporary name "Snapshot". The corresponding media file (*.bmp) is saved to the directory *ImportedStills*.[ProjectID] in the current media directory. If you want to know the exact path, open the snapshot clip's *Properties.*

Snapshot is ideal to quickly create a freeze.

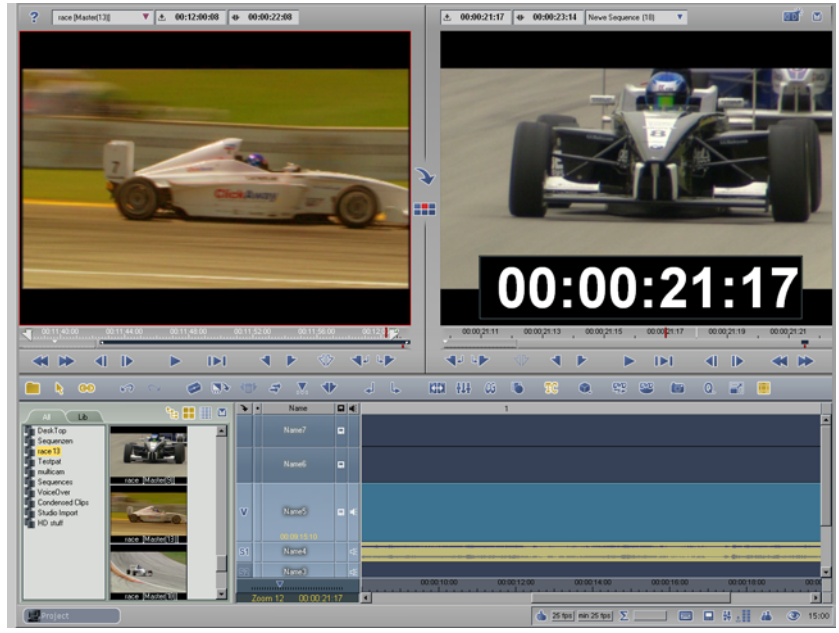
If the tool symbol is not on the *Timeline* tool bar: right-click the tool bar, *Customize* > *Special*, and drag the symbol to a tool bar position.

Scalable and Moveable Timecode Display



If visitors to your editing suite are straining their eyes because they can hardly read the timecode data, it's time for you to activate the large TC display:
This toolbutton is found in the *Function Library* of the *Timeline* toolbar (right-click > *Customize* > *Special*).

The TC window is freely moveable. To resize it, drag the window frame with the mouse. Right-click on the field to open a shortcut menu. You can then select either the *Master Viewer (Timeline*) TC or that of the *Source Viewer*.



Eye-Saving Timecode Display

Multicamera Editing

When recording events using multiple cameras simultaneously (often with linked identical timecodes), you also want to view the images simultaneously and cut directly from one source to another. The multicamera function from Avid Liquid makes this possible. The procedure involves three stations:

1 Synchronize up to 16 video clips based on individually defined sync points (such as *Markers*) or identical timecodes (*page 485*), using the *MulticamSync* command in the *Project Rack* (continue with steps 2 and 3)

or:

1 *Logging Tool*: Capture the sources, i.e. the tapes (preferably already equipped with identical timecodes, see *page 494*).

2 *Source Viewer*: Load multicam clips (up to 16) for a simultaneous display of the synchronous video, ganged playback of all clips, selection of cameras (rough cut); insertion on the *Timeline.* (see *page 489*).

3 *Timeline*: Right-click to cut from *CameraX* to *CameraY.* Only one *Track* is used (*page 492*).

Contents of this section:

Determining sync points in clips *page 485*

Synchronizing using MulticamSync *page 486*

Multicamera clips in the Source Viewer *page 489*

Multicamera editing on the timeline *page 492*

→ Synchronizing the Source Viewer and Timeline *page 492*

Multicamera capture in the Logging Tool *page 494*

Multicamera: Shooting tips *page 497*

Determining Sync Points in the Clips

If you don't have any synchronous tapes, two methods are available for synchronizing clips or setting them to identical timecodes:

→ Synchronize captured clips using *MulticamSync* (recommended method);

→ Synchronize using the *TC Shift* command (in the *Logging Tool*); for more information, see *page 495*.

If you have clips that have already been captured, you first need to determine the sync points in the relevant clips, meaning the point in time at which all the clips (should) match. For example, you may have filmed with a clapper, or oriented yourself by a flash or significant audio event that is visible or audible in all the clips.

1 Combine all the clips you want to synchronize in one *Rack*.



These clips must all have the same format, meaning an identical horizontal by vertical resolution (such as 1280x720) and an identical frame rate (such as 30 fps). If you have material that differs, use a *Fuse* process to change the deviating clips to the required standard before synchronization.

2 Mark the sync point you've decided on in the same way in all the clips using:

- The clips' mark-in or mark-out, or
- The clips' clip-in or clip-out, or
- The first *Marker* in the clips.

It's easiest to do this in the *Clip Viewer*. We recommend that you set the mark-in at the sync point in each clip so they all start at the defined moment.



If your clips have identical timecodes (i.e. they were already recorded synchronously), synchronize them by the *Timecode* (as described below) using the *MulticamSync* command.

3 Arrange the clips in the *Rack* in the desired order. The first clip in the list becomes *Camera1*, the next becomes *Camera2*, etc.
Select the clips you want to synchronize.

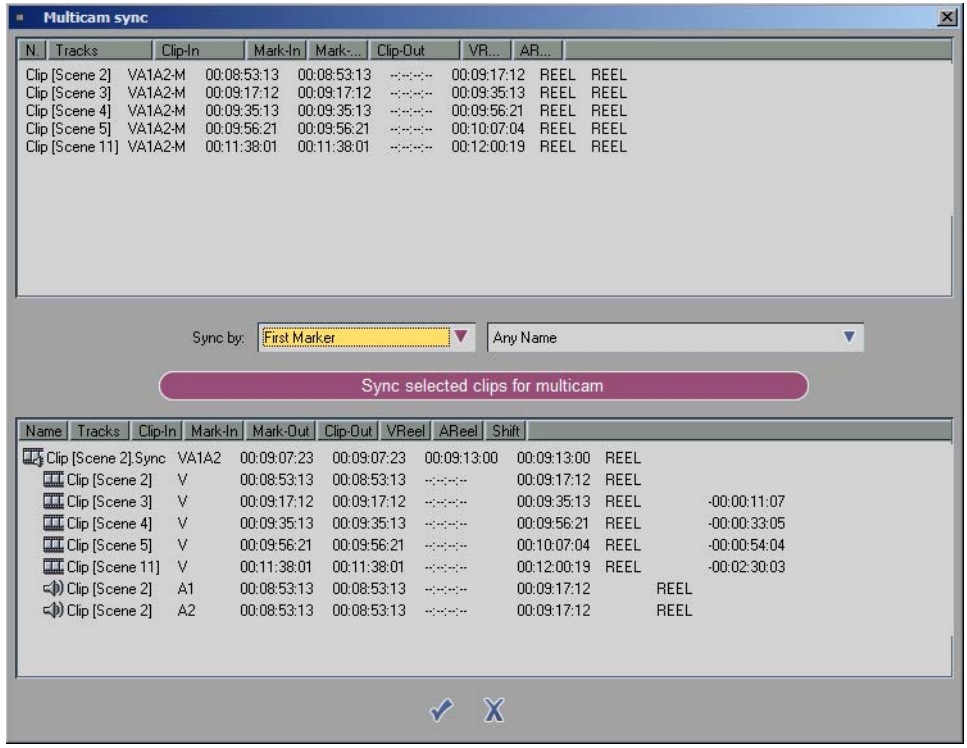


The *Multicam* clip adopts its audio from the *Camera1* clip. Keep this in mind when making your selection. In other words, *Camera1* should contain the "master audio".

Synchronizing Clips Using MulticamSync

4 Call the *MulticamSync* command from the *Rack*'s shortcut menu or by selecting Menu Bar > *Project* > *MulticamSync*.

5 The top section displays the list of clips (max. 16) that will form the *Multicam* clip.
In the middle section, select the previously defined sync point (you can ignore the second list box).



MulticamSync: Five video clips form one five-camera multicam clip.

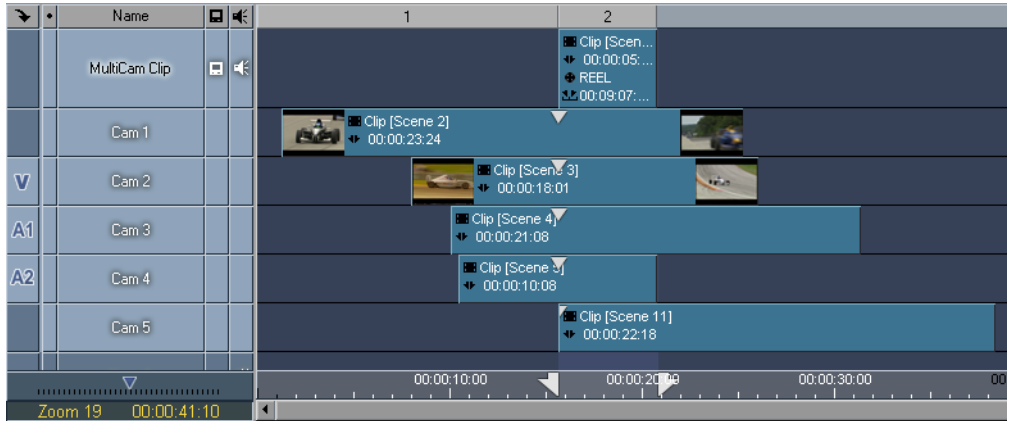
6 Click *Sync selected clips for Multicam*.

7 The bottom section now contains a list.
The top entry is the *Multicam* clip that was generated, followed by its components. Make sure it meets your expectations and then click *OK* (checkmark).
If one or more clips are not included in the *Multicam* clip, something is wrong with the sync points.

8 The *Rack* now contains the *Multicam* clip, identified by the extension **.Sync*.
You can, of course, rename this clip.
9 Load this clip in the *Source Viewer* or drag it directly to the *Timeline* (or do both).
10 Continue reading as of "*Multicamera Clips in the Source Viewer*" on page 489 or "*Multicamera Editing on the Timeline*" on page 492.

If You Have Questions about the Length of the Multicam Clip ....

... look at the following figure:



Multicam clip (top) formed from five clips

The five clips were synchronized by a *Marker* and positioned on the *Timeline* with all the *Markers* lined up exactly, one above the other. The *Multicam* clip, which is located on the top *Track*, is only as long as the area in which all the other clips overlap (indicated by a *Mark-In* and *Mark-Out*).

Thus, you also need to define the sync point in such a way that the clips form the longest possible *Multicam* clip. Ideally, all the clips used should be of about equal length and the sync points should be set at the start of each clip.
See also "*ClipSync*" on page 306.

Properties of the Multicam Clip

A *Multicam* clip is actually many clips. The *Properties* dialog box for a clip contains a *General* tab with a *Camera* list box where you can switch the *Multicam* clip to any of its *Camera* clips.

You can also create copies of the *Multicam* clip and assign each copy to a specific camera, resulting in one clip per camera.

"Camera" and "Camera Count" Columns in the Rack

In the *Detail* (list) view, the *Rack* has columns listing the number of active *Cameras* for *Multicam* clips and the number of *Cameras* belonging to the *Multicam* clip.
(These columns are not displayed in the standard layout. To display them, open the *Rack* shortcut menu and select *Detail View*. In the dialog box displayed, select *Edit View*. At the bottom you will find the two entries that you need to activate and which you can move higher up in the column if desired (select and use the up-arrow)).

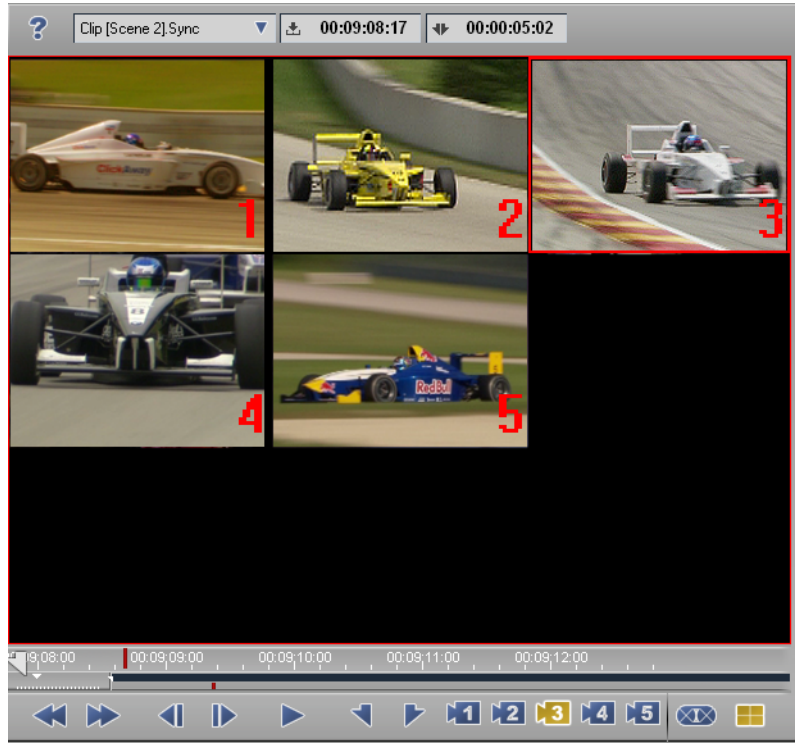
Multicamera Clips in the Source Viewer

In the *Source Viewer*, a *Multicam* clip is displayed with all its camera images. All the clips remain synchronous. If you scrub one clip, all the others follow.



1 In preparation: Drag the two tool buttons pictured from the *Source Viewer's* function library to the toolbar. Activate the *Multicam* display. We'll discuss the other command later on.

2 Transfer the *Multicam* clip to the *Source Viewer* (for example, using drag & drop). It might then appear as follows:



A five-clip multicam clip in the Source Viewer, 3 x 3 view; the toolbar contains camera buttons for changing from one camera to another

3 The numbers of the camera clips are highlighted in yellow. The active camera has a yellow border (Camera3 in the figure).



Are one or more camera images missing from the *Viewer*? Right-click in the inlay and select a display that shows all the cameras (*2x2, 3x3, 4x4*).

4 Click an image to activate the clip or camera.

5 Each time you click an image, a *Multicam Marker* is set on the position bar. The number in the *Marker* refers to the camera that is being cut to. (You can disable this option: Right-click in the image area and disable the *Markers* as desired.)
You can also use the camera buttons from the library.



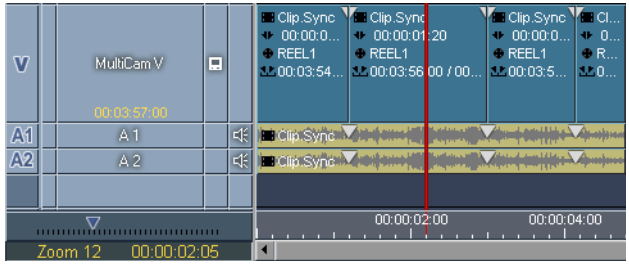
Multicam Markers indicate cuts from one camera to another

6 Start playback and click the images or camera icons to cut back and forth between available images.
You can also scrub in the inlay or on the position bar.
All the images play simultaneously (more or less fluently, depending on the number of cameras and your system's capacity).

You can also assign the *Camera* icons to the keyboard (*Edit* > *Control Panel* > *User* > *Keyboard Properties)*. Select the *Source Viewer* as a module.



7 When you're done with the clip, click the *Insert Arrow* to insert it on the *Timeline*. Pay attention to *Source Track Mapping* and active/inactive *Timeline Tracks*.
At the points identified by the *Multicam Markers*, the image cuts to the specified camera.
Audio is always inserted from *Camera1* (continuously, without edits - see figure below):



Edits in the video clip where Multicam Markers are located.
In the audio clip, only the markers are set.

You can, of course, work with mark-ins and mark-outs as usual. In this case, however, you should gang the *Source* and *Master Viewers* so the cuts will remain synchronous. It is also a good idea to disable the *Multicam* markers.

For more information, see "*Multicamera Editing on the Timeline*" on page 492.

Tips and additional functions



- Get the tool buttons pictured on the left from the function library and place them on the *Source Viewer* tool bar:
  The *Marker List* provides an overview of the *Multicam Markers*. Right-click the marker list to open a shortcut menu, which also contains an option for deleting the *Markers*.
  The *Goto previous/next marker* option can be used for easy and precise navigation.
- To move the *Multicam Markers* on the *Position Bar*, drag them with the mouse while holding down the ALT key.
- To overwrite *Multicam Markers*, position the mouse pointer on a specific camera (i.e. over the image) while playing and hold down the left mouse button.
- A *Multicam* clip is automatically recognized in the *Source Viewer*. Click the *Multicam* icon to toggle between a full and split screen.
- If one or more images in the *Source Viewer* unexpectedly run into the black, it might be because synchronization has been compromised. See *"Synchronizing the Timeline and Source Viewer"* on page 492.



- With many (more than four) cameras, the individual images are very small. Drag the *Fullscreen* toolbutton pictured here to the *Source Viewer's Toolbar* (right-click > *Customize*). It will allow you to use the entire computer monitor to display the inlay. The keyboard selection and control commands continue to be available. Press ESC to exit *Fullscreen* mode.
- Right-click in the *Source Viewer's* inlay to open the shortcut menu and select the *Multicam* view grid (*2x2, 3x3* or *4x4*). The grid is more or less filled, depending on the number of cameras. From this menu, you can also determine the camera locations. Click an image and select the camera you would like to see at this point.
  You can also deactivate (uncheck) a camera to eliminate it altogether.

Multicamera Editing on the Timeline

The method described here is recommended especially for *Multicam* clips that have not already been edited in the *Source Viewer* by means of *Multicam* markers ("*Multicamera Clips in the Source Viewer*" on page 489).

Preparation

1 Position the *Multicam* clip (*.Sync) or *Camera1* clip generated in the *Logging Tool* on the *Timeline*.



2 Transfer the *Multicam* clip (*.Sync) or *Camera1* clip generated in the *Logging Tool* to the *Source Viewer*. Select the appropriate *Multicam View* (such as *3x3*; see *page 491*), if necessary.

3 Disband the *Timeline* clip so that the audio clips are positioned on separate tracks (*Shortcut menu > Disband Clip(s)*). This will prevent the audio from being edited with subsequent edits.

Synchronizing the Timeline and Source Viewer

4 Position the *Playline* anywhere in the *Multicam* clip on the *Timeline*, right-click to open the shortcut menu and select *Match Frame*.
You should now see the same image in the *Master Viewer* and *Source Viewer* (Camera X).



5 Click the *Multicam ganging of Source and Master Viewer* button (must be highlighted in yellow). (If you don't see this button on the *Source Viewer* toolbar, right-click the toolbar and drag the tool button from the *Special* tab to the toolbar.)
This links the *Timeline's Playline* to the *Source Viewer's Playline*.

Cutting to Camera X

6 Play the *Timeline* clip. Stop at the point where you want to cut to another camera.

7 The camera images in the *Source Viewer* jump to the sync point at the *Playline* position on the *Timeline* clip.
When you scrub, the camera images follow. The frame rate depends on the number of cameras and your system's capacity.

8 Right-click the *Timeline* clip to open the shortcut menu and select *Cut to camera: > Camera X* (whichever is appropriate).
An edit is inserted at the *Playline* position. The audio clips are not affected.

9 Find the position for the next cut to another camera ... and so on.

Tips and Variations

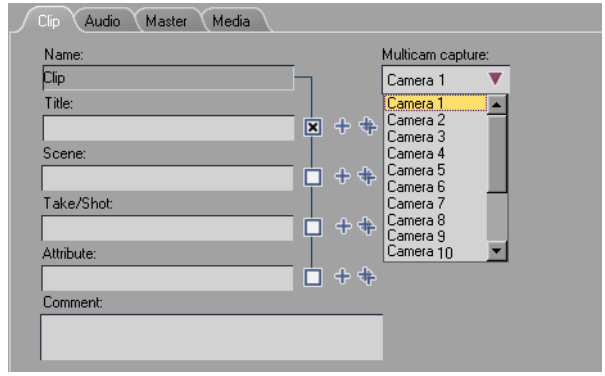
- Whenever you move the *Multicam* clip on the *Timeline* or insert another clip, it is necessary to resynchronize the *Source Viewer* and *Timeline*.
  First select *Match Frame* and then reactivate ganging. The button must be highlighted in yellow.
  A good way to check synchronization is to compare the *Source timecode* and the *Source Viewer* timecode: If synchronization is correct, they will be identical (see *Source Timecode*, *page 366*).
- When the *Timeline* and *Source Viewer* are linked,
  - Playing the *Timeline* serves to play *Timeline* audio (*Source Viewer* mute);
  - Playing the *Source Viewer* serves to play both *Source Viewer* and *Timeline* audio. Naturally, you can also disable *Source Viewer* audio if you find the combined playing irritating.
- The *Trim Editor* is ideal for precisely trimming a *Multicam Sequence*. With it you can easily jump from edit to edit and optimize the transitions.
  Pay attention to synchronicity with the audio: The relationship between image and sound changes in the *Slip Clip*, *Trim Outgoing* and *Trim Incoming* trim modes. *Trim both* has no effect on synchronicity.
- If you want to completely replace a camera clip on the *Timeline*, right-click the clip to open the shortcut menu and select *Switch to camera: Camera X*.

Multicamera Capture in the Logging Tool

You need at least two tapes with an identical timecode.

1 Load the first tape, open the *Logging Tool*, assign a *Reel* name, and select a *Rack* for the clips as well as the media format (Codec). So far, this is the standard procedure in the *Logging Tool*.

Audio must be taken from one of the synchronous tapes. This tape will become the *Camera1* tape and the *Multicam* clips will be formed from it. The other tapes, from *Camera 2* to *Camera 16*, are recorded without audio tracks. If in doubt, use the tape containing the best original sound as *Camera1*. In the example, we assume that tape 1 will also be *Camera1*.
If you want to keep the audio from the other tapes, digitize it normally and then synchronize it later on by means of *Multicam sync* (see *page 486*).



Multicam: Cameras 1 to 16

2 *Camera1* is the default. *V, A1* and *A2* should already be activated. Define and capture the clip(s) from this tape.

3 As soon as you've finished the tape, load the next tape in the player. Drag the first clip from the *Rack* to the *Logging Tool* inlay or reenter a mark-in and mark-out.



Do not change the *Reel* name transferred from the previous tape. Media Management automatically appends a camera ID. All the tapes in a synchronous set must have the same *Reel* name - otherwise the process won't work.
However, this applies only in the *Logging Tool*. Clips subsequently synchronized can come from any number of different *Reels*.

4 Now select *Camera2*. The *Audio Source Tracks* can no longer be activated.

5 Capture this clip with the same TC values for the mark-in and mark-out (if possible; at the very least, make sure you have a long TC area that overlaps, i.e. is synchronous).
This creates a video-only clip with the same TC data as the *Camera1* clip.

6 Repeat Steps 3 and 5 until all the tapes and clips have been processed, each time incrementing the *Camera* number by 1 (n+1).

Continue as of "*Multicamera Clips in the Source Viewer*" on page 489.

Tips:

- Carefully name *Reels* and clips so you can keep track of them.
- All the tapes used must have a continuous timecode (no interruptions or breaks). It is not possible to synchronize clips across TC breaks.

Synchronizing with the TC Shift Command (in the Logging Tool)

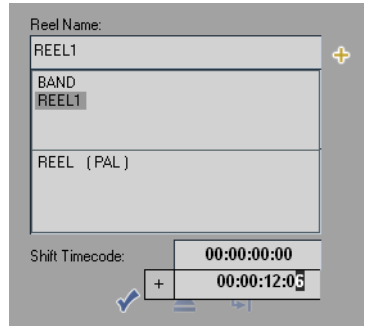
The *TC Shift* command lets you add or subtract a value from a tape's actual TC so that you can record clips with the desired timecode.
If activated ([*Edit* > *Control Panel* > *User* >] *Logging Tool* > *Properties* > *General* > *Activate TC Shift mode*), *TC Shift* appears as a TC input field in the *Change Reel* dialog box.
The *Change Reel* dialog box opens every time you change a tape.

1 Select one tape as a reference tape; the other tapes will be adapted to its timecode.

2 Based on a sync point (clapper, flash, sound, etc.), determine the extent to which the other tapes deviate from the reference tape. Note the values to the exact frame (such as 00:00:06:12) and note whether they run ahead or behind.

3 Capture the reference tape without a timecode shift as *Camera1* as described above ("*Multicamera Capture in the Logging Tool*" on page 494).

4 Capture the remaining tapes using the TC shift calculated for each and as *Camera 2*, *Camera 3*, etc. Enter the shift with a plus or minus sign, as appropriate.



Synchronizing by entering a TC shift

5 All your clips should now have a synchronous timecode. You can easily verify this at the sync point.

Multicamera: Shooting Tips

Improvised Multicamera

If it isn't possible to link the TC generators of the cameras being used, synchronization will have to be done manually. To simplify the process, note the following:

- Record on tapes of the same length. All cameras should have enough battery power to record the event in one go. Every time you change a tape or battery, you lose synchronicity.
- When recording events where a tape or battery change cannot be avoided (such as theater or sporting events), schedule the changes for each camera beforehand. Only one camera should be temporarily out of operation at any one time.
- Sync point: If the recording does not include any "natural", obvious audio or video events, you can, for example, use a clapper, set off a flash, clap your hands or simultaneously film the same digital clock with all the cameras.
- There is no guarantee that HDV/DV camcorders will run exactly in sync over a longer period of time, especially if you use different makes and models. After a certain period of time, you may have to establish a new sync point.
- White balance: White balance the cameras to the same white object before recording. Otherwise each camera will provide a different rendering of „white". Deactivate automatic white balance.
- Use cameras that are as alike as possible to achieve a uniform visual impression. Best of all, use identical camera models.
- Make sure that one camera records the master sound, preferably without interruption and, depending on the event, directly from a mixing console.

Professional Multicamera

Professional video cameras usually provide the option of linking your built-in timecode generators so that an identical TC is written to the different tapes.
For live recording using multiple recorders, a TC generator is employed that supplies all the recording devices with identical TC data.
If you have tapes from these types of sources, you can digitize them in the *Logging Tool* as *Camera1* to *Camera16* (maximum).

Chapter 10

Finish

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This chapter contains basic information on video effects. Note that these descriptions apply to *Classic* editors and effects (Clip FX and *Transitions)*.

If you're working with Avid Liquid effects for the first time, read the following sections of this chapter.

Effects: The basics *page 501*
Overview of the effect families in Avid Liquid

Detailed description of the Classic Effect Editors *page 541*
Direct links to chapters covering the following topics:

→ Software-based realtime effects (CPU/GPU) *page 599*

→ Commotion Clip FX *page 643*

→ Special FX (Color Correction Editor, Timewarp Editor, Linear Timewarp) *page 723*

→ Audio effects *page 868*

Effects in Avid Liquid: The Basics

In their broadest sense, effects are used to modify, distort, and optimize digitized video and audio. Avid Liquid provides effects for both video and audio clips.
Among them you will find ready-made effects and effect editors that can be used immediately, some of which can also be played back in real time (depending on the hardware combined with Avid Liquid or the product version). Effect editors allow you to create your own complex, customized effects.

Guide to Effects: What is Available?

This is a short overview of all available types of effects in Avid Liquid.

- *Classic* Effects -
  Editors for Clip and Transition Effects;
  Render effects;
  Rack Folder: *Classic Clip FX* and *Classic Transition FX;*
  Special features: suitable for oversized graphics (pan&scan effects); zoomable *Canvas*; excellent quality;
  Reference manual: in this chapter (“Finish”).
- Realtime Effects software-based (*CPU* and *GPU*) -
  Clip and Transition effects, performed by software utilizing CPU or GPU of graphic card, in real-time;
  Rack Folder: *Realtime Clip FX* and *Realtime Transition FX;*
  Special feature: *Keyframe curve* (parameter based editing);
  Reference manual: chapter “Realtime FX”.
- *Hollywood FX* (realtime) -
  Clip and Transition Effects; *Hollywood-FX-Editor*;
  Realtime (GPU);
  Rack Folder: *Realtime Clip FX* and *Realtime Transition FX > Hollywood FX;* and under *Presets.*
  many spectacular and imaginative effects;
  Manual: see Hollywood FX online help.
- *Commotion Clip FX* -
  Clip Effect Editors,
  Render effects;
  Rack Folder: *Commotion Clip FX;*
  Compositing and special key and matte effects;
  Reference manual: chapter “Commotion Clip FX”.

- *Alpha Magic Wipes* -
  Collection of alpha wipe patterns; feature of *Gradient Wipe* and *Gradient Wipe with Border* editors;
  Realtime (GPU);
  Rack Folder: Realtime Transition FX > Editors.

Effect Basics

This section provides basic information on the effects available from Avid Liquid. Be sure to read this section if you have not yet worked with Avid Liquid effects.

What are clip effects? *page 503*

Priority for multilayering *page 503*

What are Transitions? *page 503*

Where are the Avid Liquid effects? *page 504*

Register FX for effects you create yourself *page 505*

Applying effects to clips *page 506*

Activating/deactivating effect parameters *page 507*

Deleting and removing effects *page 507*

Effect icon on a Timeline clip *page 508*

Effect symbol in a Picon view *page 509*

FX Properties *page 509*

What Are Clip Effects (Filter)?



Example of a clip effect

Clip effects only involve a single clip. Another commonly used expression for Clip effect is "filter". By applying one or more clip effects to clips, you can manipulate them in a variety of ways.

Certain clip effects, such as color or keying effects, only influence the appearance of a video - they do not alter a clip's position. In contrast, effects like 2D effects alter size, position, rotation, etc. (See also *"Classic Clip Effect Editors (Filters)"* on page 510.)

Priority for Multilayering

Many clip effects (for example, key effects) are based on an overlapping of images on two or more effect layers (mulitlayering). The following general rule applies: a clip on a higher *Timeline Track* (higher = closer to the top) normally overlaps all the clips below it, meaning that it has a higher priority.
Priority also plays a role in transition effects (see also *Background/Foreground* on page 543).

What Are Transitions?



Example of a transition effect

Transition effects are used for defining transitions between clips, or transitions between "black" and a clip (like in fade-out). They appear as separate objects on the *Timeline* and always involve two consecutive clips (or a clip and "black") on one *Track*. Examples of transition effects are dissolves, wipes, zooms, slides, etc.

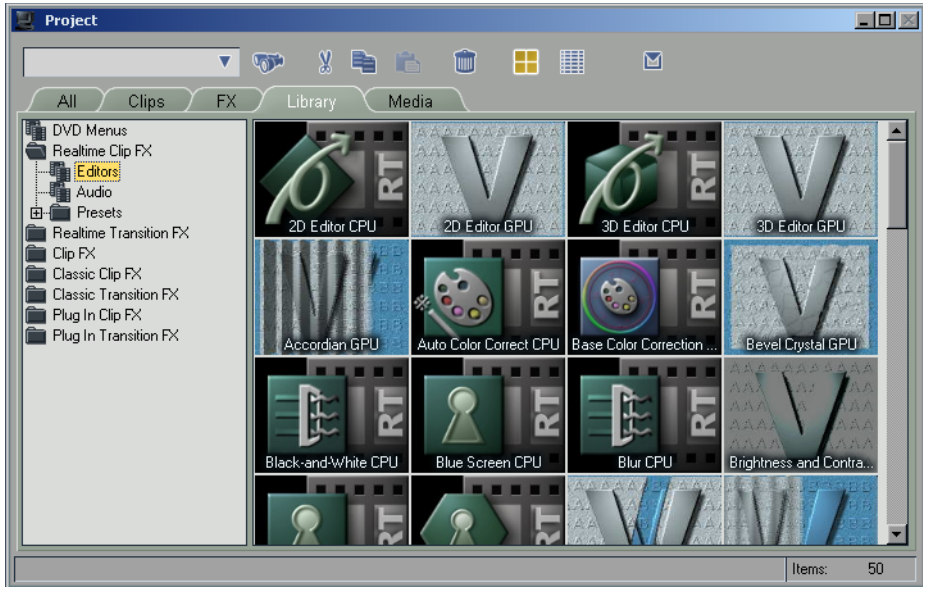
Just like clip effects, you can also trim and move transition effects to control their duration and position (see also *ABCs of Effects* on page 387).

Replacing Transitions

Transitions can be replaced with other *Transition* effects of exactly the same length and at exactly the same position. Just drag the replacement to the *Transition*. The new effect then takes the place of the older one.
Depending on the effect, effect parameters must be configured individually.

Where are the Avid Liquid Effects?

The `Library` tab in the *Project* Window contains the following Avid Liquid effects:



Realtime Clip FX Rack in Avid Liquid (sample illustration)

- *DVD Menus* - Templates for DVD menus.
- *Smartsound* - blank Smartsound clip.
- *Realtime Clip FX* - This folder contains realtime clip (filter) effects with separate editors.
  The *Presets Rack* contains ready-to-use effects.
  The audio effects are also located here.
- *Realtime Transition FX* - Realtime-capable *Transition* effects with separate editors.
  The *Presets Rack* contains ready-to-use effects.
- *Commotion Clip FX* - contains the Commotion plug-in effects (see separate chapter *Commotion Clip FX*).
- *Classic Clip FX* - This *Folder* contains clip effects and effect editors from Avid Liquid that you can use to create and edit your own clip effects (basics and *page 560*).
  The *Presets Rack* contains ready-to-use effects.
  All *Classic* FX are rendered.

- *Classic Transition FX* - This *Folder* contains *Transition* effects and effect editors from Avid Liquid that you can use to create and edit your own transition effects.
  The *Presets Rack* contains ready-to-use *Transitions*.
- *Plug In Clip FX* - These *Folders* and *Racks* contain effects from third-party vendors. These *Racks* show up only after PlugIn FX were installed.
  To add more plug-in effects, select *Control Panel* > *Site* > *PlugIn Settings*.
- *Plug In Transition FX* - Same as above.

FX Tab

Available in addition to the `Library` tab is the FX tab which is used for saving effects you created yourself (and all other objects).

- The function *Import* > *Media* or *Title Clip* is not available on this tab. To save something in *FX*, use *Copy/Paste* or *Drag & Drop*.
- If you want to create or modify an effect and then save it for later use in other applications, make a copy of the effect (or *Effect Editor*) in a *Rack*, assign it a name, edit it and use it like any other effect.

Too Many Effects to Keep Track? A Few Tips:

Because Avid Liquid offers so many effects, it isn't easy to keep track of them all. One option is to work with a reduced selection of your favorite effects and always have your own effects available in your *Projects*.

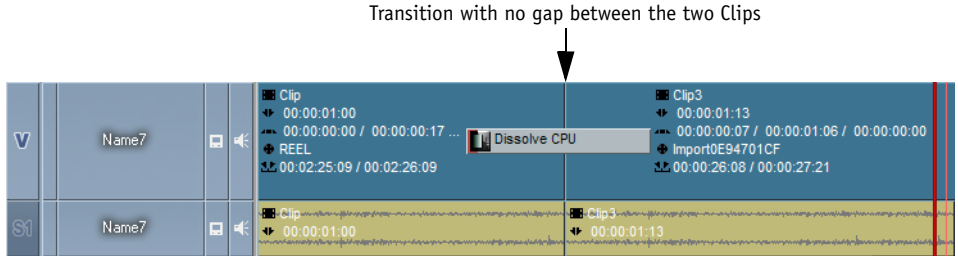
- You can copy any effect from the *Library* tab to a *Rack* on the *FX* tab and keep it in a customized structure of *Rack Folders* and *Racks* - simply press CTRL-C and CTRL-V as many times as necessary.
- There you can rename the effects any way you want.
- You can save this structure with a *Project Template* and reload it for each new *Project* (see "*Project Template*" on page 209).

Applying Effects to Clips

When using effects, remember that clip effects can be used for individual clips, while *Transitions* involve two clips (or, more generally, two video signals) and are independent objects.

Transition effects

To apply *Transition* effects, drag them from the *Project* window to the edit point between two clips on the *Timeline*, or in the case of a fade-in or fade-out to the beginning or end.



That's how to apply a transition correctly: across the edit, with no gap between the two clips

For a description of how to proceed further: *page 512*.

Use the *Align* function to select the insert point of a *Transition*. While moving the *Transition* closer to an edit, repeatedly press the ALT key to toggle between the beginning (mark-in), middle and end (mark-out).

When several clips have mark-ins or mark-outs exactly aligned one above the other: If the *Ungroup* insert mode is activated, *Transitions* are inserted at all the mark-ins or mark-outs. Also see "*Drag&Drop*" on page 412.

Clip effects

To apply ready-made clip effects, drag them from the *Project* window to clips on the *Timeline*. Once one or more effects have been applied to a clip, the clip appears with a purple line at the top and with one (or more) effect icon(s). For a description of how to proceed further: *page 512*.

The *Timeline Track* of the clip to which an effect is applied must be activated for video playback. (See also "*Video Playback*" on page 363.)

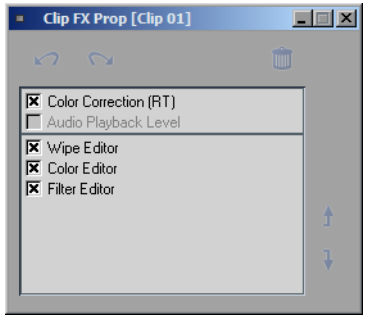
A *Timeline Slice* above a segment that contains non-rendered render effects is displayed in red. From left to right, this area gradually disappears from the *Slice* as rendering progresses.

"Track Effects"

You can apply a clip effect to an entire *Timeline Track* (in other words, to all the clips on this *Track*). To do so, drag the effect to the *Track*'s name field. A colored line appears. As a result you can, for example, change all the video clips on a *Track* to black and white, reduce their size - or both, because you can also apply multiple effects.

Because this type of *Track* effect does not apply to individual clips, you will not be able to provide the effect with *Key Frames*.

Activating/Deactivating Effect Parameters



FX Properties: Activating and deactivating

You can activate or deactivate the effect parameters and clip attributes. The *FX Properties* dialog box provides information on and access to the effects applied to an object. Open the *FX Properties* dialog box from the clip's shortcut menu.
The *Effect Editors* are listed below the horizontal line and the *Attributes* are listed above it. Right-click an effect to open its shortcut menu and select *Edit* to access the *Effect Editor*.

- To activate or deactivate effect parameters and *Attributes*, click the appropriate checkboxes. The effects are not deleted; they are simply not applied. This allows you, for example, to prevent rendering.
  Double-click an entry to open the *Effect Editor* or *Clip Viewer*.

- You can change the order in which the effects are rendered. To do so, select an effect and click the *Arrow* buttons to move it to the required position.
- To remove an effect from the list, select it and then click the *Trash*.

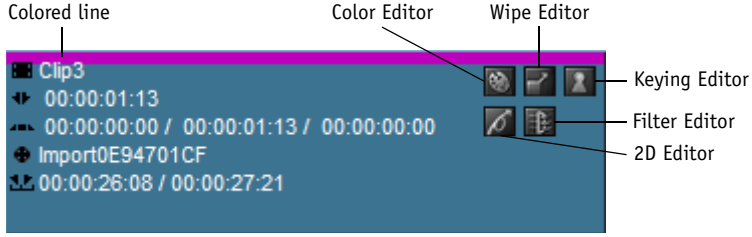
Deleting and Removing Effects

- *Transitions* - Click the *Transition* and press DEL or right-click the *Transition* and select the *Delete* function from the shortcut menu.
- Clip effects - If you want to remove an effect from a clip, open the shortcut menu by right-clicking either the colored line or the effect icon (see also *Effect Icon on a Timeline Clip* on page 508) or via the clip's FX properties. (See also "*FX Properties*" on page 425.)

Effect Icon on a Timeline Clip

If one or more effects have been applied to a clip, the clip appears with a colored line at the top and with one or more effect icons. The *Timewarp Editor*, however, is indicated as a broken line along the bottom edge of the clip.

If the line at the top loses its intense color and appears more pale, this means that the effect(s) or *Attributes* are deactivated. See also *"Activating/Deactivating Effect Parameters"* on page 507.



Clip with several effect icons and colored line (top)

Depending on the *Track* height and *Timeline* scale selected, the effect icon might not appear. However, the colored lines are always visible.

If you disband a grouped VA clip that has video effects (*Disband Clip(s) function*), the audio clips also carry the effect line. Basically, they are still full-fledged clips with video, since all you have to do is reactivate the *Video Source Track* in the *Clip Properties* to restore the original clip (see *page 424*).

Accessing Effects via a Line or Icon

Right-click either a line or an icon to display a shortcut menu with two levels. The top lists the effects applied to the clip and the bottom lists the options relating to the particular effect.

- *Edit* - this option opens the editor for the effect (*page 510*).
- *Copy/Delete* - See also *"Saving Individually Created Effects"* on page 540.
- *FX Undo/Redo* - these options relate to changes made to the effect.
- *Active* - this option is activated in the default configuration; click the check mark to remove it and prevent the effect from being applied (also see *"Activating/Deactivating Effect Parameters"* on page 507).
- *Move up/down* - in the case of multiple effects, these options let you change the order of application. They move the effect up or down one position.
- *Rename* - this options lets you identify specially configured effects by name.

Effect Symbol in Picon View



Picon with effect symbol and attributes symbol in the upper right-hand corner

If you apply one or more effects to a clip, a white five-point star appears in the upper right-hand corner of the *Picon* displayed in the *Picon View* in the *Project* window or on the desktop. The blue star represents active clip *Attributes*.

FX Properties

FX properties provide information on and access to the effects that have been applied to an object. See also "*FX Properties*" on page 425.

Effect Editors (Basics)

In addition to the ready-made effects supplied, *Effect Editors* are provided that allow you to individually create and adapt clip effects and *Transitions*. This section provides you with basic information and an overview of the *Effect Editors* in Avid Liquid.

What is an Effect Editor?

An *Effect Editor* is a workshop for creating effects whose parameters you yourself modify. An effect created in this way is an object similar to many other objects in Avid Liquid; it is applied like a ready-made effect, can be copied, deleted, moved, shortened, lengthened, etc. - and even edited.
There are several types of *Effect Editor*:

Classic Clip Effect Editors (Filters)

A number of *Effect Editors* is available for generating clip effects (video). This type of *Effect Editor* is also commonly referred to as a "filter". Below is a brief description of the standard editors provided in Avid Liquid. The figures show the tool buttons you can use to call the editors or the icons under which you will find the editors in the *Project* window.

Information on software-based realtime effects can be found in a separate chapter starting on *page 599*.

Keying Editor



You can use this editor to remove areas of an image which are a certain color or brightness and replace them with a different image.

For details, see *"Keying Editor"* on page 581.

Filter Editor



Use this editor to create alienation effects with clips without altering their size, position, etc. For details, see *"Filter Editor"* on page 593.

Color Editor



Use this editor to adjust the color, contrast, brightness, gamma etc. settings of clips. In this way you can correct color and create color alienation effects. Example: white balance correction, color matching. For details, see *"Color Editor"* on page 578.

Wipe Editor



Use this editor to create wipes. The *Wipe Editor* is equipped with an alpha channel, making it possible to define transparent parts of a clip so that another clip can show through. The appearance of this mask can be controlled with many different parameters, including *Pattern, Position* and *Size*. For details, see *"Clip FX Wipe Editor"* on page 577.

2D Editor



Use this editor to control, for example, size, position, rotation and border to create effects such as picture-in-picture. For details, see *"Clip FX 2D Editor"* on page 560.

3D Editor



This *Effect Editor* allows you to create three-dimensional effects. It also contains a complex *Pageturn* function.

Color Correction Editor



Primary, Six Vector and *Selective Color Correction* plus a wide variety of additional functions (such as *Tone Balance*, *Histo Match* and subsequent *White-Balancing*) and diagnostic displays (vector, waveform, histogram, etc.) make this editor a powerful tool (*page 725*).

Timewarp Editor

The *Timewarp Editor* lets you create dynamic motion effects (DME), ranging from a simple linear slow motion to complex effects involving *Key Frame* controlled changes in speed and playback direction of video (*page 776*).

Classic Transition Effect Editors

Use these editors to create transitions between clips. Since these effects always involve two clips (an incoming and an outgoing clip), they can be rather complex. The functionality is basically the same as for the corresponding *Clip FX Editors*.



- *2D Editor* for transitions *page 544*





- *3D Editor* for transitions *page 554*





- *Wipe Editor* for transitions *page 555*
-
-



Opening Effect Editors and Editing Clips (= Applying FX Editors)

In the default configuration, an open *Effect Editor* takes the place of the *Sequence Editor*. You can open an *Effect Editor* in many ways:

Selecting an Editor from a List



(applicable to Clip FX:)

1 Click the button shown and select the *Effect Editor* you want from the menu displayed.

2 Then click the clip that you want to edit.

Retrieving an Effect Editor from the Rack

1 In the *Project* window, click the `Library` tab and drag the *Effect Editor* you want from one of the *Folders/Racks* to a clip in the *Timeline*.

2 Continue with “Opening via an Effect Icon or Line”:

Opening via an Effect Icon or Line

- Effect Icon - right-click the effect icon to open the shortcut menu, select the Editor and then *Edit*.
- Colored line - right-click the colored line to open the shortcut menu, select the Editor and then *Edit.*

Opening an Effect Editor via FX Properties

1 Open the shortcut menu for the clip on which the effect(s) is/are located.

2 Select *FX Properties*.

3 Right-click or double-click the effect name to open the shortcut menu and select *Edit* to open the editor with the clip

Opening an Effect Editor in the Rack

(applicable only to *Effect Editors* that were copied to the *FX* tab:)

1 Double-click the relevant *Effect Editor* icon.

2 Then click the clip that you want to edit.

Opening Transition Effect Editors

Transition Effect Editors appear as separate objects on the *Timeline* because they are positioned on the edit between two clips or at the beginning or end of a clip.

1 Drag the desired *Effect Editor* from the *Rack* to the interface between two *Timeline* clips or the beginning or end of a clip.

2 Right-click the *Transition* to open its shortcut menu and select *Edit*,

or

3 Simply double-click the *Transition*.

Applying an Effect Editor to a Clip in the Project

A clip does not have to be located on the *Timeline* in order for a (clip) effect to be applied to it:

1 Open the desired clip *Effect Editor* using one of the methods described.

2 Click the clip located in a *Rack* in the *Project* window or on the desktop.

The clip is loaded in the editor and the clip *Picon* appears with a five-point star.



The rendering process does not begin until the clip has been placed on the *Timeline*.

Working with the Preview Image

Instead of loading a clip in the *Effect Editor*, you can work with the preview images (the gray and blue panels that appear in the *Editor Inlay* when no clip is currently loaded). This can be helpful for preparing and trying out effects because the volume of data to be calculated is much smaller, thus speeding up the preview. (See also *"Effect Viewer"* on page 516.)

Effect Editor Full Screen Mode

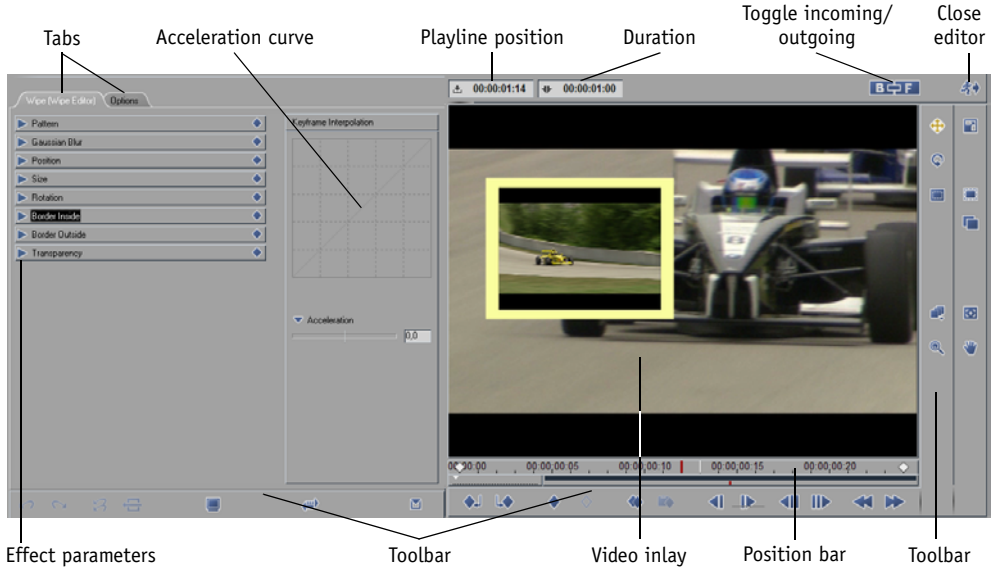


Especially if you work with a dual monitor setup, it makes sense to set the *Effect Editors* to *Full Screen Mode*. The left monitor now displays the video inlay in almost complete full page size; the tool buttons are arranged in freely movable windows on the right screen.
To switch to *Full Screen Mode*, click the indicated tool symbol in the toolbar of the active *Effect Editor*. To leave the *Full Screen Mode*, click the symbol again.



Full screen mode is not usually available for realtime effect editors.

Elements and Functions of the Effect Editors



Example of an Effect Editor (normal view): 2D Editor for Transitions

This section describes the various elements of the *Effect Editors* and explains how they are used. All *Effect Editors* are organized in the same way and even have some of the same parameters. For a more detailed description of the effect parameters, see the sections on the particular *Effect Editors*. This section covers the following topics:

Effect Viewer *page 516*

Position bar *page 517*

Timecode displays *page 517*

View RGB Channels and Alpha Channel *page 518*

Key Frames *page 518*

Additional Key Frame functions *page 521*

Acceleration curve (Key Frame interpolation) *page 522*

Effect parameters and options *page 529*

Effect Editor shortcut menu *page 532*

Deactivating modified settings *page 535*

Copying settings to Key Frames *page 535*

Closing Effect Editors *page 535*

Effect Viewer

The editor's *Effect Viewer* lets you preview effects. When you open an *Effect Editor*, the default graphics appear.

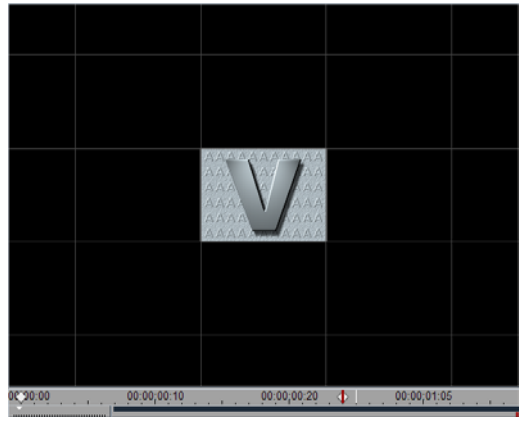


Effect Viewer with default image



Click the *Zoom* button to zoom in and out on the *Effect Viewer's* video inlay. Also, with any effect tool selected you can temporarily enable the *Zoom* tool by pressing the right mouse button.
Drag up to zoom in on the inlay, drag down to zoom out. Zooming out of the inlay lets you see the area around the standard screen area, and a grid pattern appears.

This is the "canvas" view. Each rectangle on the canvas corresponds to a full screen. To toggle between full-screen view and the standard grid-pattern view of 325%, double-right-click the video inlay.



Effect Viewer with canvas and grid pattern

The *Canvas* is useful for maintaining an overview of moving effects such as 2D and 3D effects. It lets you view clips and parts of an image that are outside the actual screen area, for example, in the case of zoom and other 2D/3D effects.

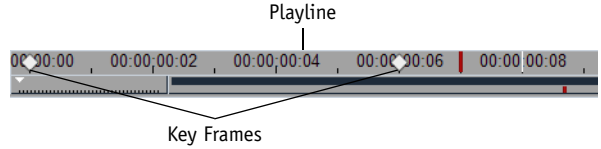
The *Canvas View* is merely a viewing mode - it has no influence on the effect itself.
This is an exclusive feature of the Classic Effect Editors.

Position Bar

The position bar, located below the video inlay, can be used for scrubbing. As you drag the *Playline*, the timecode value also changes to reflect current position and duration. For more information on how the position bar works: *"Navigation Using the Position Bar"* on page 265.

Press the LEFT or RIGHT ARROW key to move the *Playline* one frame.

Key Frames and clip *Markers* also appear on the position bar.



Position bar with Key Frames, markers and Playline

When opening an *Effect Editor*, the *Playline* can be on different locations on the position bar depending on the *Playline's* position on the *Timeline* at the moment of opening. If it is located in the clip/*Transition*, it keeps its position. If it is located before or after the clip/*Transition*, it jumps to the beginning or the end of the position bar in the *Editor*, that is, the first or last frame of the clip or *Transition*.

Timecode Displays

Two timecode fields are located above the video inlay.

Playline Position

The left field displays the timecode of the current *Playline* position on the timecode bar.

Clip Duration

The right field displays effect duration. In the case of transition effects, the duration of the *Transition* appears; in the case of clip effects, the duration between mark-in and mark-out of clip appears.

View RGB Channels and Alpha Channel



In some cases it is very useful to view a clip's color channels (red, green, blue), its luminance channel, or its alpha channel - if available.
Click the button shown here and select from the menu:

- *Normal* - all channels are displayed, including an existing alpha channel.
- *Alpha Overlay* - visualizes the alpha channel by a red overlay, where solid red indicates full transparency which blocks out the RGB channel background. Useful, for instance, to check a key effect especially around the edges of the foreground image.
- *Color only* -red, green and blue together, without alpha.
- *Red-green-blue* - either-or-or. Useful for *Color Gain* or *Gamma* modifications (functions in the *Color Editor).*
- *Luminance* - Brightness (gray scale; Y) only.
- *Alpha* - displays an alpha channel as black & white pattern. White indicates opaque (non transparent), black indicates completely transparent areas, levels of gray varying degrees of transparency.
- *Inverted Alpha* - same as above, only inverted.



Not all *Effect Editors* feature these options. Please note also: They are not settings, but rather view modes.

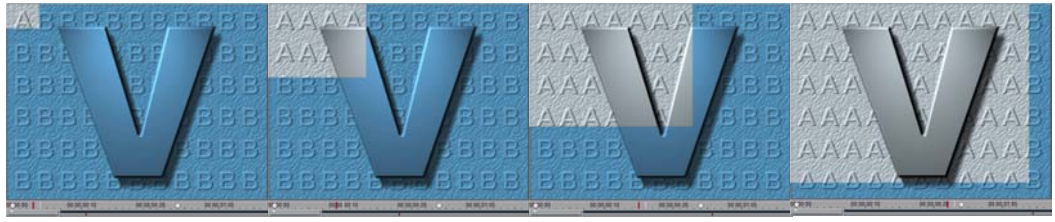
Key Frames

Avid Liquid uses *Key Frames* to precisely define the chronological stages of an effect. *Key Frames* mark specific frames within an effect where effect parameter settings are changed. *Key Frames* are used in all *Effect Editors* for defining effects.

Why Use Key Frames?

Every *Key Frame* contains information on the settings of all effect parameters that are manipulated at the given position (such as image size, rotation, key settings, wipe pattern, etc.).
When you run a key-framed effect, Avid Liquid interpolates between the different settings in successive *Key Frames*. You can think of *Key Frames* as "steps" in an effect and use them to define image movement, new wipe settings, etc. Any time you change a setting in an *Effect Editor*, Avid Liquid automatically inserts a new *Key Frame* (if the use of this feature has not been turned off).

- For example, a picture which passes over another picture can be defined with just two *Key Frames*. The first *Key Frame* positions the image in the top, left corner of the screen; size is set to 0. The second *Key Frame* increases the size of the image to 100% and centers it. When you run the effect, Avid Liquid interpolates between the different settings in the two *Key Frames*.



Appearance of a 2D effect with two Key Frames

- By using the Curve function, you can set an acceleration spline for each *Key Frame* (see also *page 522*).
- By default, Avid Liquid effects have two *Key Frames*: one at the beginning and one at the end. Both *Key Frames* have the default settings: no image manipulation. You can modify default *Key Frames* and insert new *Key Frames* wherever needed on the position bar.



You can also deactivate the use of *Key Frames* by clicking *Options tab* > *Do not use Key Frames* (default in *Color Editor* and in *Keying Editor*). In this case, the effect has only one parameter setting, in other words, the effect does not change over time (see also *page 530*).

Setting Key Frames



Any time you change a setting in an *Effect Editor*, Avid Liquid automatically inserts a new *Key Frame* at the given point on the position bar (located below the *Effect Viewer's* video inlay). Click this button to manually add a *Key Frame*, with the current settings, at the current point in the effect.

Copying Key Frames



Use this button to copy a *Key Frame* to the clipboard, without deleting it from the effect.



CTRL + C to copy *Key Frames*.

Paste Key Frame



Use this button to paste a copied *Key Frame* elsewhere in an effect.

CTRL + V to paste *Key Frames*.

The tabs to the left of the *Effect Viewer* offer drop-down menus with controls grouped by type. To apply settings to a particular *Key Frame*, drag the diamond in the tab item bars to the *Key Frame* in the position bar. This is useful, for example, if you want to apply the same border settings to certain *Key Frames* in an effect and do not want to move the *Playline* to each one.

You can also apply settings to a whole effect by dragging the diamond to the video inlay.

Deleting Key Frames



To delete a *Key Frame*, click the *Goto Next/Previous* button to move the *Playline* to the *Key Frame* you want to delete. Click the *Delete Key Frame* button to eliminate the *Key Frame*.

DELETE

CTRL + X to delete and copy to clipboard.

Moving Key Frames

Hold the ALT key and drag the *Key Frame* with the mouse (left button pressed) to the desired position.

Commenting on Key Frames

Key Frames, just like *Markers*, can be commented on. Double-click a *Key Frame* to open an entry field. You can enter comments of up to 25 characters. Confirm your entry with OK. The *Key Frame* comment becomes visible if the mouse pointer remains on the *Key Frame* for more than one second.

Additional Key Frame Tools

You can use the toolbar below the video inlay to control the sequence of an effect. In addition to the default functions, the function library tab in the *Effect Viewer* contains special functions for editing effects. For more information, see: *"Customizing Toolbars"* on page 990.

Previous Key Frame



Moves the *Playline* back to the previous *Key Frame*.

Next Key Frame



Moves the *Playline* forward to the next *Key Frame*.

Goto Previous Marker



Moves the *Playline* back to the previous *Marker*.

Goto Next Marker



Moves the *Playline* forward to the next *Marker*.

Move Canvas



Click this button to move an image on the *Canvas*. This function only works if you have zoomed in (*page 516*) on the *Canvas*. You can now drag the image within the video inlay. Right-double-click the video inlay to restore the default *Canvas* size.

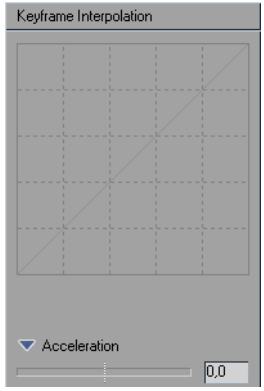
Safe Action Area/Title Marks



Click this button to superimpose *Safe Action* and *Title Marks* on the image visible in the *Effect Viewer*. (This has no influence on image output.)
Position all the parts of the motif that are important for the picture statement inside the outer frame. The inner frame (dotted line) encloses the area recommended for titles.

Acceleration Curve

The acceleration curve, located to the left of the *Effect Viewer*, is used for defining the rate of change between two *Key Frames*. Clip images are interpolated based on the set curve. The x-axis of the grid represents time; the y-axis, change.



Default acceleration curve

For example... *page 523*

Linear acceleration *page 523*

Splined acceleration *page 524*

Default acceleration curve *page 525*

Accelerate - decelerate *page 527*

Acceleration range *page 528*

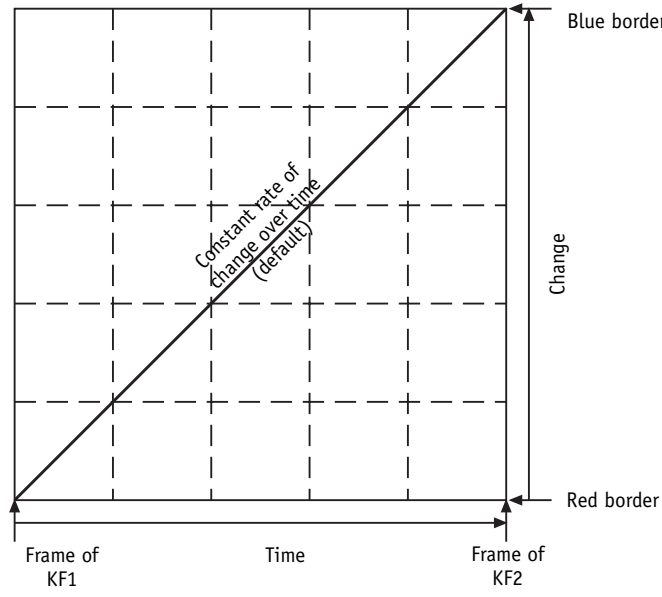
For Example...

For example, you have an effect with two *Key Frames*. The first *Key Frame* is called KF1; the second, KF2. To keep things simple, the only difference between KF1 and KF2 is the color of the clips' borders: With KF1, the image has a red border, while with KF2 it has a blue border.

The beginning of the effect is represented by KF1 (red border). KF1's values are positioned at the bottom left-hand corner of the grid. KF2's values are in the top right-hand corner (blue border). The horizontal axis between KF1 and KF2 is the time axis; the vertical axis represents the change in the effect, in this case, the color of the border.

Linear Acceleration

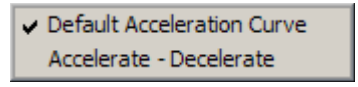
The diagonal line through the grid shows that there is a steady rate of change over the duration of KF1: border color changes steadily from red to magenta to purple to blue as you run the effect. This is linear acceleration, the rate of change is constant from beginning to end.



Linear acceleration

Splined Acceleration

You can also set a splined acceleration so that the rate of change varies over time. Splined acceleration is displayed as a curve. There are two types of acceleration splines you can use on an effect: *Default Acceleration Curve* or *Accelerate - Decelerate*. These options are available in the shortcut menu.



You can set an acceleration curve three ways:

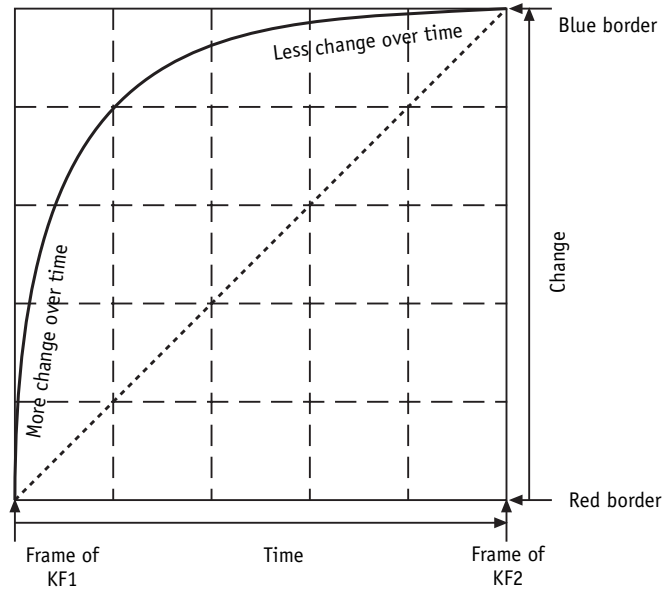
- Drag the acceleration line with the mouse.
- Drag the slider under the *Acceleration* field at the bottom of the box.
- Enter a value in the field next to the slider.
  All three displays reflect the defined acceleration curve.



You can define a different acceleration curve for each *Key Frame* in an effect, but you can only assign one curve to each *Key Frame*. This means that the same acceleration curve applies to all the changes which occur between two given *Key Frames*. In other words, if the *Key Frames* change both image size and border color, the same acceleration curve applies to both size and color interpolation.

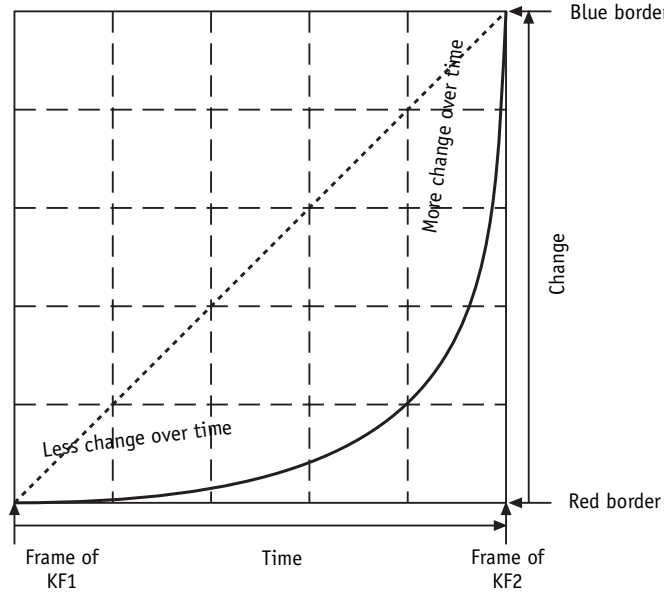
Default Acceleration Curve

The figure below shows a positive acceleration setting in default mode. In the case of positive function curves, the rate of change is high directly after the first *Key Frame* at the beginning of the effect (KF1) and lower towards the end of the effect (KF2). With an acceleration setting of 85, for example, border color may change from red to magenta to purple all in the first half of the effect. The change from purple to blue would then be much slower and occur in the second half of the effect.



Positive acceleration

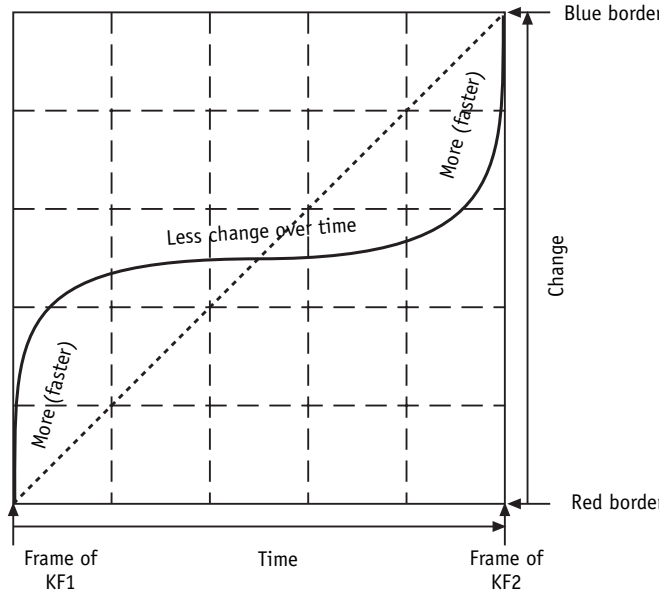
The figure below is an example of a negative function curve in default mode. In the case of negative function curves, the rate of change is low directly after the first *Key Frame* at the beginning of the effect (KF1) and increases towards the end of the effect (KF2). With an acceleration setting of -85, for example, border color may take the first half of the effect to change from red to magenta. The change from magenta to purple to blue is much quicker, and occurs in the second half of the effect.



Negative acceleration

Accelerate - Decelerate

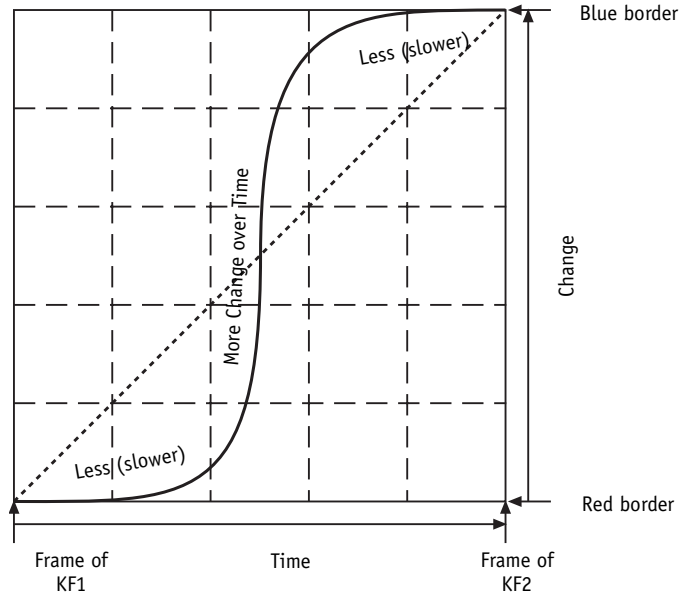
The other mode for splined acceleration is *Accelerate-Decelerate*. In this mode, the rate of change varies twice. The figure below illustrates an example of a positive setting in this mode.



Positive accelerate-decelerate curve

Rate of change is higher at the beginning and end of the effect, and lower in the middle.

With negative accelerate-decelerate settings, the rate of change is lower at the beginning and end of the effect, as shown in the figure below.



Negative accelerate-decelerate curve

Acceleration Range

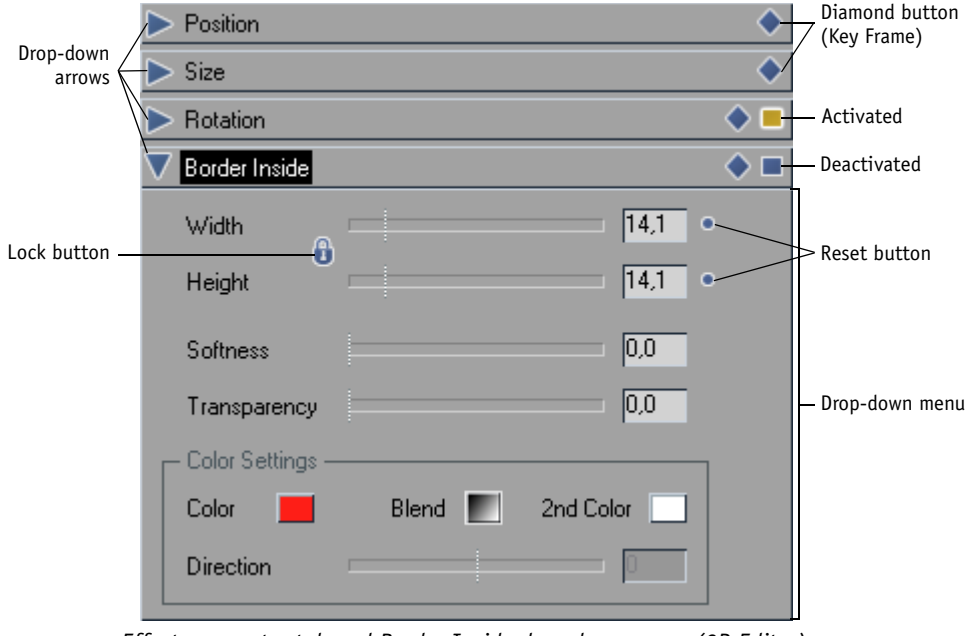
In both splined modes, the acceleration range is +/- 100; 0 is the default setting and corresponds to linear acceleration. At 100, the acceleration path is a right angle: all changes between *Key Frames* occur at KF1. In our example, the border color would change from red to blue immediately, then stay blue for the rest of the effect. With a -100 setting, no change would occur until KF2: the border stays red for all of KF1, then instantly changes to blue at KF2. In both cases, there are no intermediary steps; the color changes instantly without the magenta and purple transition stages. This is similar to a cut, as opposed to a dissolve: the *Key Frame* settings "jump" without interpolation.

Effect Parameters and Options

Using the two tabs to the left in the *Effect Editor*, you can customize the effect parameters and other options.

Effect Parameters Tab

The left-hand tab contains in its drop-down menus all parameters for the given effect.



Effect parameter tab and Border Inside drop-down menu (2D Editor)

When generating effects, there are several ways of adjusting the *Effect Editor* parameters:

- by selecting an item from a drop-down menu,
- using a slider or knob,
- entering a numeric value,
- activating a tool button and moving the mouse within the video inlay,
- selecting colors in a color selector.

Certain related functions that are set using a slider (such as width and height) can be linked together by clicking the *Lock* button (*Lock* icon closes). In this case, any changes made to one parameter directly affect the other. If the *Lock* icon is open, parameters can be set separately.

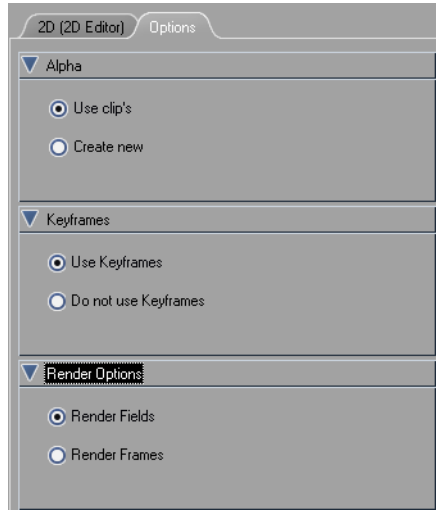
To fine-tune effect parameters, it is recommended that you use the mouse wheel on your wheel mouse.

Options

The *Options* tab contains three drop-down menus:

- *Alpha* - lets you deactivate an existing alpha channel and create a new one, e.g. for title graphics.
- *Key Frames* - lets you define whether *Key Frames* are to be used in the effect.
  It is advisable not to use *Key Frames* if the effect maintains constant parameters throughout the time sequence.
- *Render Options* - lets you define whether the effect should be computed in fields or frames.

Normally, the *Render Fields* option should be selected. The *Render Frames* option is useful only for certain effects (for example, for some key effects it helps obtain better key results). However, if the end product is “film” -- which also includes AVI and Quicktime movies -- the frame setting is helpful because the editors then render in frame mode.



Options tab

Toolbar

The toolbar located below the tabs and acceleration curve contains special effect editing buttons. To customize the buttons on this toolbar, drag them from the *General* tab in the *Customize* window. (See also *"Customizing Toolbars"* on page 990.)



Restore Initial State



Restores initial state (to when editor was first opened).

Restore to Default



Resets all parameters to the default factory settings.

Swap Sources



Use this button to toggle between the incoming and outgoing clips of a *Transition* effect in order to apply the given effect to the other clip.

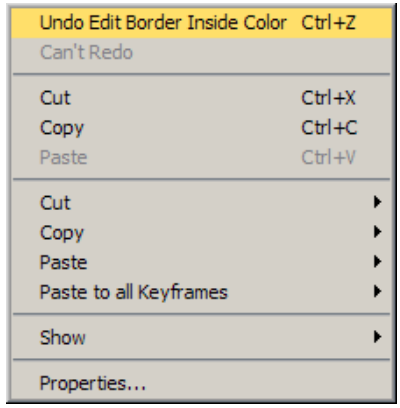
Revert Direction of Effect



Click this button to reverse the direction of the effect.

Effect Editor Shortcut Menu

An *Effect Editor's* shortcut menu contains options for adjusting effect settings.



Effect Editors shortcut menu

Undo

Click *Undo* to cancel the last action you performed and return the effect to the state it was in before you performed that action. Avid Liquid notes the last 64 changes you made during any given effect editing session, permitting you to revert to practically any previous state.

CTRL + Z

Redo

Click *Redo* to cancel the last undo action you performed and return the effect to the state it was in before you used the *Undo* function (up to 64 steps).

CTRL + Y

The *Undo* and *Redo* buttons are available on the toolbar under the tabs and pop-ups.

Cut

Click *Cut* to delete the *Key Frame* at the *Playline* from the effect and copy it to the clipboard. You can then use *Paste* to insert the cut *Key Frame* elsewhere in the effect.

CTRL + X

Copy

Click *Copy* to copy the *Key Frame* at the *Playline* to the clipboard, without deleting it from the effect. You can then use *Paste* to insert the copied *Key Frame* elsewhere in the effect.

CTRL + C

Paste

Click *Paste* to insert a cut or copied *Key Frame* from the clipboard into the effect at the position of the Playline.

CTRL + V

Cut > (with submenu)

Click *Cut* > to open a submenu for specifying which properties you want to remove from a given *Key Frame*. For example, you can clear the rotation values of the *Key Frame* while maintaining its current size. The cut properties are placed on the clipboard in case you want to paste them into other *Key Frames*.

Copy > (with submenu)

Click *Copy* > to open a submenu for specifying which properties you want to copy to the clipboard from a given point in an effect. This lets you, for example, copy a setting that can then be pasted into several *Key Frames*.

Paste > (with submenu)

Click *Paste* > to open a submenu for specifying which properties in the clipboard you want to apply to a given point in an effect. For example, if you cut or copied an entire *Key Frame* to the clipboard, you can apply only its size settings to one *Key Frame* and its rotation settings to another.

If you paste a property that you have not previously copied or cut, Avid Liquid uses the property's default settings. For example, if you paste size without an existing size setting in the clipboard, Avid Liquid sets *Key Frame* to size 100%.

Paste to all Key Frames

Click *Paste to all Key Frames* to apply the contents of the clipboard to all *Key Frames* in the effect.



You can also use the diamond icons on the tab item bars to copy and paste *Key Frames*. To do so, drag the diamond icon of the particular parameter to a *Key Frame* on the position bar to copy these settings or drag it to the inlay to copy the settings to all *Key Frames*.

Show

Click *Show* to open a menu for controlling the display of the preview in the *Effect Viewer*. These settings do not affect the effect itself; they are merely display options for customizing the appearance of the clip in the preview. You can enable and disable the following functions (a check mark next to an item means that it is enabled):

- *Background*
  - when enabled, the lower-priority video on the *Timeline* (background image) is visible when you move, key, or resize the foreground image. When disabled, or if there are no lower priority layers on the *Timeline*, the background is black.
- *Foreground 100%*
  - makes the foreground image completely opaque. No background is visible in areas in which foreground and background overlap.
- *Foreground 75%*
  - makes the foreground image partially transparent. The background shows through the foreground image.
- *Foreground 50%*
  - makes the foreground image semi-transparent.
- *Foreground 25%*
  - makes the foreground image very transparent. Use this setting when the 75% or 50% settings are not transparent enough to let you see details in the background.

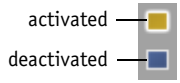


If you are creating a transition effect in which you are modifying the background as well, use this function to be able to edit the background image if it is fully covered by the foreground image.

Properties

Click *Properties* to open the *Properties* dialog box which contains three tabs for adjusting effect and preview quality. For more information on this subject, see *"Rendering and Preview Quality (relevant only for Classic Effects)"* on page 539.

Deactivating Modified Settings



A yellow square on the tab item bar indicates that the settings in that drop-down have been modified (i.e. are no more the default settings) and are activated.

To deactivate all the values in a drop-down menu, click the square so that it appears normal. Note that this does not reactivate the default settings - it merely prevents the settings from being applied to the effect.

Copying Settings to Key Frames



Drag the diamond in the tab item bar to a *Key Frame* on the position bar to apply the drop-down menu settings to that *Key Frame*. You can also apply settings to a whole effect by dragging the diamond to the video inlay.

Closing Effect Editors (Start Rendering)



Click this button to close the *Effect Editor*.

If necessary, Avid Liquid begins rendering the changes made without asking for further confirmation. If no changes were made, nothing is rendered.



You can define how long it will be from the time you close the editor until rendering begins. (See also *"Rendering and Preview Quality (relevant only for Classic Effects)"* on page 539.)

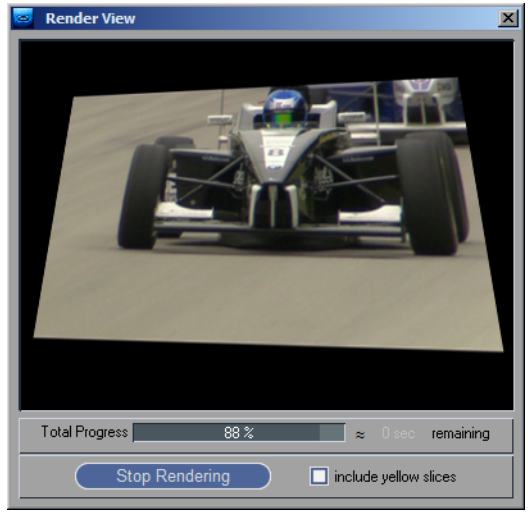
Effect Rendering

Resident programs (meaning programs that run in the background, such as antivirus programs) may block or interfere with rendering. Internet firewalls can also cause problems. Be sure to deactivate these programs while working with Avid Liquid.

Render Viewer

Rendering occurs automatically in the background. During rendering a pulsating Sigma symbol appears on the taskbar. To monitor the rendering process, click the *Sigma* button to open the *Render Viewer.*

Avid Liquid also plays partially rendered transitions or clip effects on the *Timeline*. Where no rendered data is available, a gray exclamation mark on a black surface becomes visible in the inlay while the *Playline* is over a section not yet rendered.



Render Viewer

The *Render Viewer* displays the video image being rendered. Underneath the video inlay is a rendering status display:

- Click *Stop Rendering* to stop the rendering process.
- Click *Start Rendering* to start or resume rendering.
- Click the box to activate or deactivate rendering of the yellow slices (this enables/disables the background rendering of realtime effects). For more information, see "*Render Management of Realtime Software Effects*" on page 605.



Any rendering process that has been stopped manually must also be restarted, otherwise no further rendering will take place.

- Click *Close* to exit the *Render Viewer* (the pulsating Sigma signal indicates that rendering is continuing in the background).
- "*Idle*" indicates that there is nothing to render.
- During rendering, a display appears with information on the rendering status (remaining time, number of frames rendered, etc.).



A *Timeline Slice* above a segment that contains non-rendered effects is displayed in red. From left to right, this area gradually disappears from the *Slice* as rendering progresses.

Deleting Render Files

Render files, i.e. files created when effects or timewarp clips are rendered, can be deleted selectively. It may become necessary to delete render files; for example, after a *Batch Digitize* operation you may want to perform a manual re-rendering of effects on the basis of the newly digitized material. Or you may want to delete files you no longer need in order to make room on the storage media. The following options are available:

Delete Functions in the Desktop Trash Icon

The shortcut menu for the *Trash* icon on the desktop contains a number of options for deleting render files that apply to the current *Project*. Select:
Delete Render Files Of Project:...

- *Not used by any Sequence* -
  This option deletes render files that do not reference any existing *Sequences* in the *Project*.
- *Not used by current Sequence* -
  This option deletes all render files except those used in the *Sequence* currently located on the *Timeline*.
- *Not used by Sequence(s) selected in Project window* -
  This option deletes all render files except those belonging to the *Sequences* selected in the *Project* window.

Delete Functions in the Timeline Shortcut Menu

These delete functions are applied to render files belonging to the *Sequence* currently located on the *Timeline*. Select:

Delete Render Files...

- *between Mark-In/Out* -
  to delete files selectively or
- *of current Sequence (all)* -
  to delete all the render files of the *Sequence*.

Rendering and Preview Quality (relevant only for Classic Effects)

Use an effect's *Properties* window to control rendering and preview quality. There are two ways to open this window:



- On the *Effect Editor's* toolbar, click the *Effect Editor's Shortcut Menu Button* > *Properties.*
- Click *Edit* > *Control Panel* > *Site* > *FX Editor Properties.*

Render Quality

Use the *Render Quality* tab to adjust rendering quality settings. You can choose between *Best Quality, High Quality* and *Preview Quality.* Use the *Best Quality* option for creating masters.



Avid Liquid renders effects in the YUV color space, in uncompressed YUV quality and on a subpixel basis.

Preview Quality

Use the *Preview Quality* tab to control preview quality. You can choose between *Best Quality, High Quality* and *Fast Preview.* So that results appear more quickly during previewing, use the *Best Quality Last* and *Fast Preview First* functions. For example, use both *Best Quality* and *Fast Preview First* so that when you are editing a fast preview is shown and afterwards the best quality appears. Use *High Quality* with *Best Quality Last* and *Fast Preview First* for an additional quality step.

System

The *System* tab lets you optimize your computer system for Avid Liquid effects. See your product manual for details.

Saving Individually Created Effects

An effect which was created using one of the *Effect Editors* may be saved and renamed for later use. That's how to proceed:

1. Create the effect, insert it on the *Timeline* either as clip effect or *Transition*.
2. Open the shortcut menu of the effect by clicking the colored line or the effect icon (Clip FX only), or in case of a *Transition* open the shortcut menu of the *Transition*.
3. Select *Copy*.
4. In the *Project* choose any *Rack* other than `Library` and add the effect selecting *Rack* shortcut menu > *Paste*.
   The same menu also features the *Rename* option.

Detailed Description of Classic Effect Editors

This section provides detailed descriptions of the *Effect Editors* available in Avid Liquid as well as step-by-step examples for creating transitions and clip effects. It covers the following topics:

Transition Effect Editors: Basics *page 542*

2D Editor for Transitions *page 544*

3D Editor for Transitions *page 554*

Step-by-step: Creating a Transition 2D effect *page 550*

Wipe Editor for Transitions *page 555*

Step-by-step: Creating a Transition wipe effect *page 557*

Clip FX 2D Editor *page 560*

3D Editor for clip effects *page 561*

Clip FX Wipe Editor *page 577*

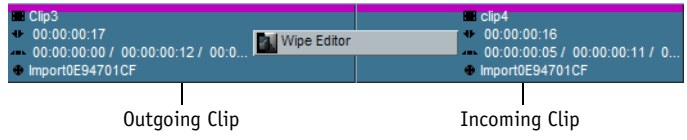
Color Editor *page 578*

Keying Editor *page 581*

Filter Editor *page 593*

Transition Effect Editors: Basics

Transitions always require two video signals. The simplest type of transition effect is a *Dissolve* in which the clip to the left of the *Transition* on the *Timeline* (outgoing clip) is mixed with the second clip (incoming clip). This involves two video signals. The parameters of these signals can be controlled in the *Effect Editors*.

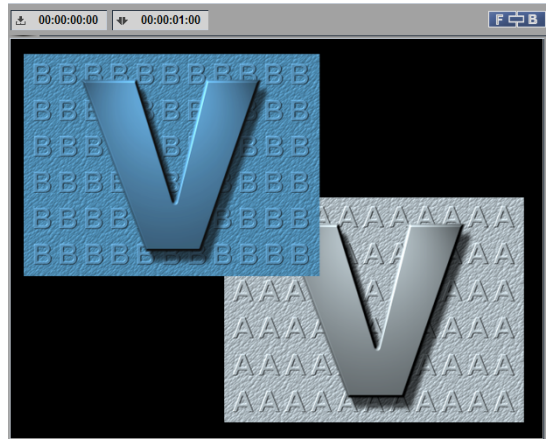


Transition Wipe Editor

One of the participating signals can also be “black”. This is the case if the *Transition* is positioned at the beginning or end of a clip and thus touches an empty position (= “black”) on the *Timeline*. Examples: fade-in, fade-out. See also ““*Empty*” *Timeline*” on page 355.

Outgoing/Incoming Clip

Transition effects are often much more complex than clip effects since they involve two clips in one editor. At some point in the *Transition* the clips are either in the foreground or background, as in the case of a wipe or slide.



Incoming clip in the foreground

When you open the *2D Editor for Transitions*, on the right-hand side above the inlay the following button appears. Represented on the button are the two clips involved in the *Transition* effect:



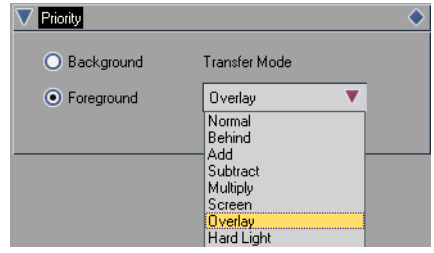
When editing a *Transition* effect you have to distinguish between the outgoing and incoming clip. Click the left or right area of this button to define which clip is active for modifying. In the screenshot above, the incoming clip can be modified. Regardless of which tool you now use, any changes you make are applied to the incoming clip. To make changes to the outgoing clip, the other side of the button has to be clicked.

The button also shows which clip is in the foreground and which is in the background.

Background/Foreground

Whether a clip is in the foreground or background determines when and how this clip partially or fully covers the other clip during the transition. Foreground/background defines “priority”.

There are two ways of defining background and foreground for the selected clip:





- click the *Send Clip to Foreground/Background* button on the right-hand side of the toolbar in the Effect Editor
- click the *Priority* drop-down menu, *Background* or *Foreground:*

Click *Background* if you want the clip to remain in the background and be fully or partially covered by the foreground clip, depending on the effect.

Transfer Mode (Compositing Operation)

In the case of a foreground clip, various functions (Transfer Modes, formerly compositing operations) are available for defining how it covers the background clip.

The options available are more or less the same as those available in advanced graphics software.

Use the *Send Clip to Foreground/Background* button to toggle between the background and the foreground option specified in the *Priority* dialog box. Remember that this function has an influence on the effect. To process a background clip that is not visible, either decrease *Canvas* size (using the *Zoom* button or right-dragging the area) or adjust the transparency of foreground clip display (*Effect's shortcut menu* > *Show* > *Foreground #%*).

2D Editor for Transitions

The *2D Editor for Transitions* is used for generating 2-D effects. Since these effects consist of two clips they can be rather complex. *Key Frames* are used to define the dynamics of such effects.

Opening the Effect Editor

There are several ways to open the *2D Editor for transitions*:

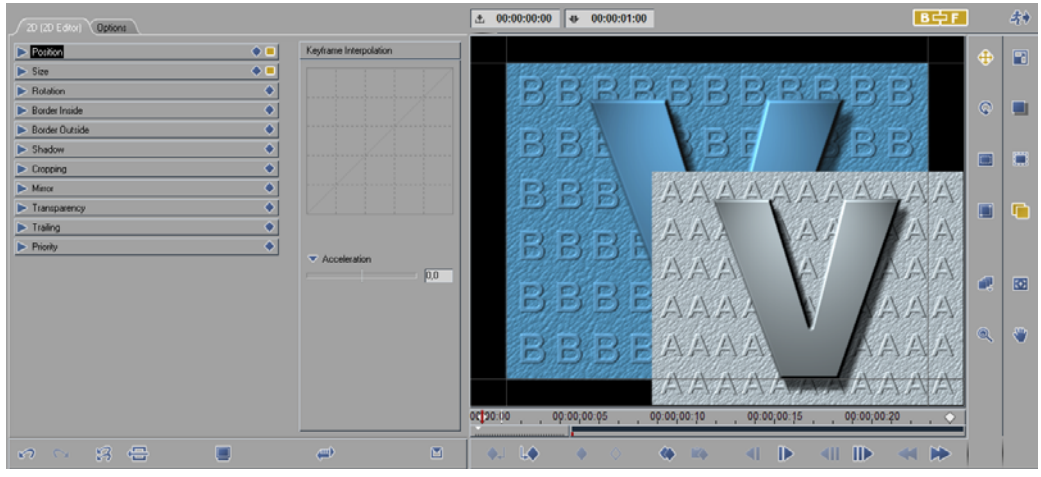
- In the *Project* window, click `Library` > *Folder Classic Transition FX* > *Editors*. Drag the *2D Editor* from the content area to a cut on the *Timeline*. Right-click the effect, then click *Edit* in the shortcut menu to open the editor with the corresponding clips.



If you have already created a copy of the editor in a *Rack* other than `Library`:
Click *Open* in the shortcut menu or simply double-click the effect.
In the *Effect Viewer,* the default graphics appear. In general, an effect preview runs more quickly and smoothly with these test graphics than with video clips, so it is advisable to use this method to open the 2D Editor if you only want to test effects.

Most of the functions in the *2D Editor* can be controlled both by mouse, button, slider and/or edit field. Working with the drop-down menus often permits you to be more precise, since you can enter exact numerical values and fields can be controlled manually (see also *Effect Parameters and Options* on page 529).

Double-click the video inlay to restore the default settings of the activated button.



2D Editor for Transitions

Position



Use this function to control the horizontal and vertical positioning of the incoming and/or outgoing clip.

- Adjusting settings in menu:
  Move the sliders to a particular position/value between +/- 400 % (four times the image width or image height). Click *Center Image* to position a clip in the middle of the video inlay.
- Adjusting settings directly in video inlay:
  Click the *Position* button. Drag clips directly in the *Effect Viewer* for rough positioning.



If you hold down the CTRL key and drag the mouse, the vertical axis will change with respect to a fixed horizontal axis. If you hold down the SHIFT key, the horizontal axis will change while the vertical axis remains fixed.

Size



Use this function to control image size.

- Adjusting settings in menu:
  Move the *Width* and *Height* sliders to a particular position/value between 0 and 400 %. If you want width and height to be controlled simultaneously (aspect ratio), click the *Lock* button. Click *Original Size* to restore the object in the *Effect Viewer* to its original size. Click *Fit to full Size* to adjust a smaller or larger image to the size of the *Effect Viewer*.
- Adjusting settings directly in video inlay:
  Click the *Size* button. Drag clips directly in the *Effect Viewer* for rough sizing.



SHIFT+click to disable the *Lock* function and modify width and height by dragging the mouse up/down or left/right.

Rotation



Use this function to control rotation.

- Adjusting settings in menu:
  Move the *Angle* knob to a value between 0° and 360° to set the spin angle. With *Spins* specify the required number of rotations within the course of the effect (0-100). Activate either *Clockwise* or *Counter Clockwise* rotation.
- Adjusting settings directly in video inlay:
  Click the *Rotation* button. Drag clips directly in the *Effect Viewer* to define rotation.



Hold CTRL or SHIFT keys while dragging to rotate the image in 90 or 45 degrees increments.



With a *Spin* of 0, a clip rotates until it reaches the position specified under *Angle*. To spin a clip more than one full rotation, but less than an additional full rotation, set the required additional amount under *Angle*. For example, if you start with an angle of 0° and set *Angle* to 180° and *Spins* to 3, the clip will rotate three and a half times (3 x 360° and 1 x 180°).

Border Inside



Use this function create a border within a clip's area and control its dimensions. An inside border reduces the dimensions of a clip.

- Adjusting settings in menu:
  Move the *Height* and *Width* sliders to values between 0 and 100% (in relationship to the clip's dimensions).
  Click *Softness* to create a soft edge along the inside edge of the border.
  Set *Transparency* to 0 to 100 to define border transparency.
  Under *Color*, specify a border color; specify a second color under 2nd Color to create a color gradient within the border.
  If you selected a gradient under *Blend*, move the *Direction* slider to specify the angle of a gradient (0-180°).
- Adjusting settings directly in video inlay:
  Click the *Adjust Inside Border* button. Drag the mouse pointer on the video inlay to define border size.

Border Outside



Use this function to create a border along the outside edge of a clip. Adding a border increases the dimensions of a clip.

- Adjusting settings in menu:
  All functions operate the same as those described under *Border Inside*. The only difference is the small square in front of the *Softness* slider, which can be used to specify rounded or right-angled border edges.
- Adjusting settings directly in video inlay:
  Click the *Adjust Border Outside* button. Drag the mouse pointer on the video inlay to define border size.



When you change the size of a clip, border width is automatically scaled up or down to maintain the original ratio of border width to clip size.

Shadow



Use this function to create a shadow.

- Adjusting settings in menu:
  Set *X* and *Y Offset* to specify a clip-to-shadow distance (= offset) of +/- 50% (in relationship to clip width and height).
  Specify a value under *Softness* to define shadow edge softness;
  specify a value under *Transparency* to define shadow transparency. To create a colored shadow, specify a color under *Color*.
- Adjusting settings directly in video inlay:
  Click the *Shadow* button. Drag the mouse pointer on the video inlay to define a shadow.

Cropping



Use this function to crop a clip.

- Adjusting settings in menu:
  Move the *Top, Bottom, Left* and/or *Right* sliders to crop the different sides of a clip between 0 and 100% (in relationship to clip dimensions).
- Adjusting settings directly in video inlay:
  Click the *Cropping* button. Drag the mouse pointer on the video inlay to crop the picture.
  At the edges of the picture the mouse pointer changes its form to indicate the cropping direction (from top, bottom, left, right).

Mirror

Use this menu to mirror clips horizontally and/or vertically.

Trailing

Use this function to create a trail. A “trail” is an effect in which a clip is followed by a series of several copies of itself.
To create a trail, click this button. In the dialog box that appears, move the *Frame* slider to specify the number of frames that should follow (maximum of 20). Move the *Offset* slider to define the distance between the individual copies. With the maximum setting of 100, only one trail frame appears in the *Effect Viewer*. The smaller the value, the tighter/denser the trail. Under *Transparency* specify trail transparency - the last frame has the specified transparency. Click *Foreground* or *Background* to instruct the system to display the trail in front (on top) of the clip or behind (underneath) it.

Transparency

Use this function to define the transparency of a clip in front of a background.

You can enter a value between 0 and 100 (completely transparent). With *Edge Softness* you can create a transparency gradient, in which transparency increases towards the edge of the clip. With an edge softness of 100 (maximum setting), clip contours practically disappear. *Edge Softness* also alters a clip's outside border.

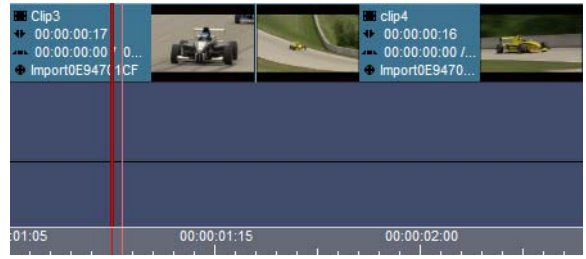


Transparency values in overlapping areas of a clip are handled cumulatively. For example if you specified a transparent inside border, this transparency is added to the transparency of the overall clip or to that of *Edge Softness*.

Step by Step: Creating a Transition 2D Effect

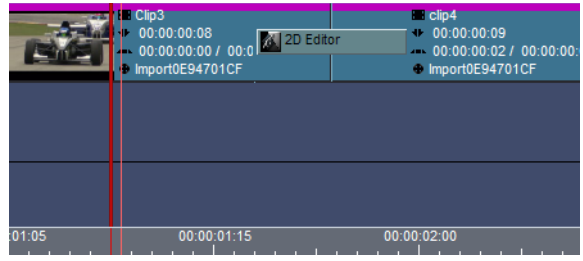


1 Position the two clips between which you plan to create a *Transition* on the *Timeline*. In this example, the *Outgoing Clip* contains a racecar heading toward the camera and the *Incoming Clip* shows a yellow racecar coming from the left. In the *Transition* effect, the incoming clip starts out as a small picture in the top right-hand corner and, after a few rotations around its own axis, expands to fill the entire video inlay. The clip with the racecar heading toward the camera should also have a transparent border.

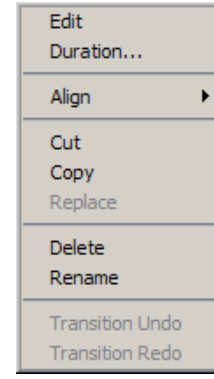


Outgoing clip (left) and incoming clip (right) still without transition

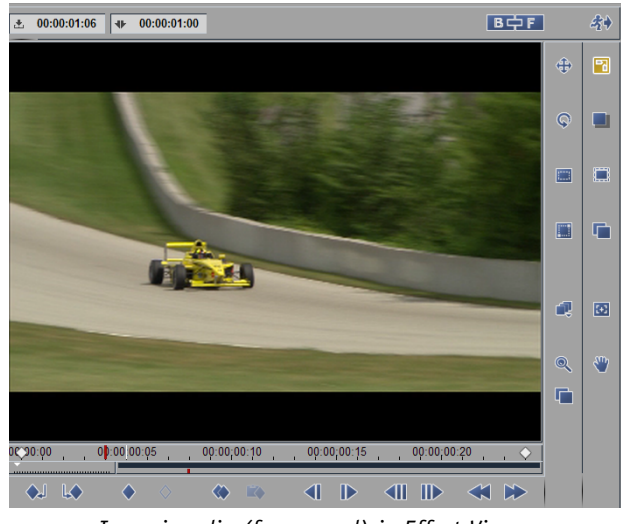
2 In the *Project* window, click `Library` *Tab* > *Folder Classic Transition FX* > *Editors* in the tree area. Drag the *Classic Transition FX 2D Editor* to the cut between the two clips.
If the transition is not completely gray (i.e. fully or partially red), insufficient leeway was provided on either the start, end or both sides of the *Transition*. In this case, trim the mark-in and/or mark-out of the clip(s) until the red disappears (See also *"Leeway (Overlap)"* on page 389.)



3 Right-click the *Transition* to open the *Effect Editor's* shortcut menu. Click *Edit* to open the *2D Editor.*



4 The *2D Editor* appears above the *Timeline* (that is, if the specific view is activated). The incoming clip appears in the *Effect Viewer.* The E*dit Outgoing/ Incoming Clip* button above the *Effect Viewer* on the right shows that the incoming clip is defined as the foreground clip (hence, as the "priority" clip it can be edited) and the outgoing clip as the background clip. This is the default setting: incoming clip = foreground.
The effect is one second long as can be seen in the timecode display on the right (the duration can also be changed here). Two *Key Frames* at the beginning and end of the effect appear on the position bar. The *Playline* is located at the beginning of the position bar at the first *Key Frame*.



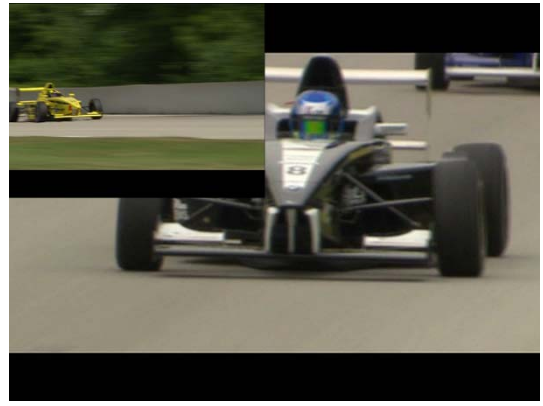
Incoming clip (foreground) in Effect Viewer



5 Now you can edit the effect. First define its initial state at first *Key Frame*. To do so, click the *Size* button to reduce the size of the rose-being-dipped clip (you can make the clip as small as you like, even so small that you cannot recognize the image it contains).

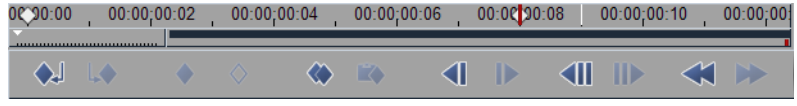


Click the *Position* button to move the clip to the top right-hand corner (see below). Make sure the *Playline* is located at the first *Key Frame*.



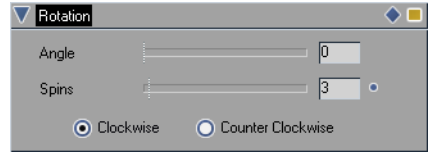


6 Now define the final state of the effect. To do so click the *Goto Next Key Frame* button to move the Playline to the *Key Frame* at the end of the position bar. Set *Size* and *Position* to default to adjust the clip so that it fills the entire inlay as the foreground image.



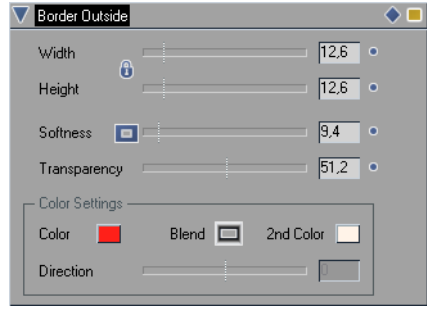
Jump to second Key Frame

7 In the drop-down menu on the left of the editor, click *Rotation*. Set the *Spins* slider to 3 full rotations. Activate *Counter Clockwise*.



Set Spins to 3

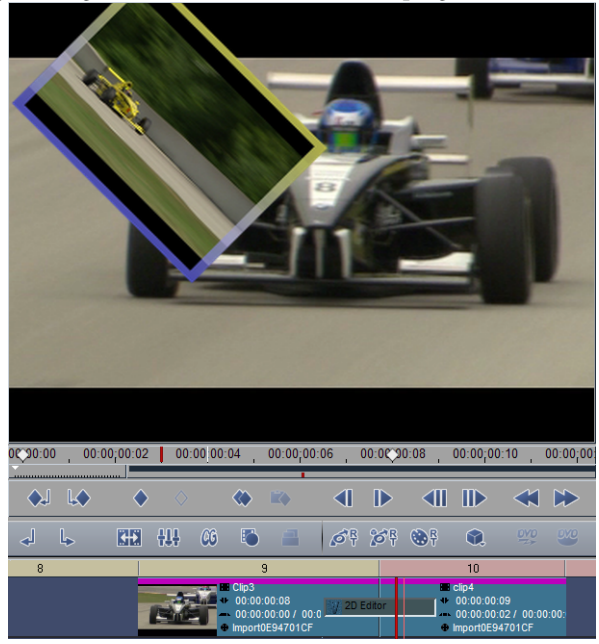
8 To define a narrow, transparent blue outside border for the incoming clip, open the *Border Outside* drop-down menu.



Specify an appropriate border width for the small picture under *Width*; adjust *Softness* and *Transparency*. To define a color either click the *Color* box to open the color selector and select a color or click anywhere on the desktop. All changes you make to settings are automatically reflected in the object.

9 Start a "preview" of the effect by shifting the *Playline* from left to right. As the small picture moves away from the corner, it rotates three times and at the same time the blue border and the other attributes appear, until it fills out the entire *Effect Viewer*. An intermediate stage appears in the screenshot below.

10 Close the editor by clicking the *Close Editor* button in its top right-hand corner. Background ren-



dering of the effect begins immediately. You can monitor this process in the *Render Viewer*. To do so click the *Sigma* button. See also *"Render Viewer"* on page 536.

3D Editor for Transitions



The *3D-Editor* for *transitions* is used for generating 3D effects between two clips.

The *3D Editor* has four drop-down controls in addition to those of the *2D Editor*. They are:

- *Rotation* - Defines rotations of the image in space (*"Rotation"* on page 564).
- *Camera* - Defines the position of the virtual camera in space (*"Camera"* on page 569).
- *Shear* - Distorts the image along the edges (*page 572*).
- *Pageturn* - Contains the parameters for the *Pageturn* effect (*"Pageturn"* on page 574).

For a comprehensive description of all 3D features please turn to *"Clip FX 3D-Editor"* on page 561 pp.

Wipe Editor for Transitions

The *Wipe Editor* creates an alpha channel. This channel operates like a mask placed on top of a clip which causes only parts of the clip to appear. In the case of a transition wipe effect, the image data of the other clip (incoming or outgoing clip) can be adjusted at the same time.

Opening the Wipe Editor for Transitions:



There are three ways to open the *Wipe Editor* for *Transitions*:

- In the *Project* window, click `Library` *Tab* > *Folder Classic Transition FX* > *Editors*. Drag the *Wipe Editor* from the content area to a cut on the *Timeline*. Right-click the effect, then click *Edit* in the shortcut menu to open the Editor with the existing clips.
- If you have already created a copy of the editor in a Rack other than `Library`: Click *Open* in the shortcut menu or simply double-click the effect.
  In the *Effect Viewer,* the default graphics appear. In general, an effect preview runs more quickly and smoothly with these test graphics than with video clips, so it is advisable to use this method to open the *Wipe Editor* if you only want to test effects and view them in the editor or if you would like to create your own standard effects that are not meant for any particular clips.

The *Wipe Editor's* functions are essentially identical to those of the *2D Editor,* the only difference being the addition of the *Pattern* and *Gaussian Blur* menus (*page 597*).

For a description of all other *Wipe Editor* functions, see "*2D Editor for Transitions*" on page 544.



Wipe Editor for transitions

Pattern

- First select the shape of the *Wipe* areas: *Rectangle* or *Circle*.
  You can select a gradient (see *Transparency > Softness)*.
- Use the *Repeat X* and *Repeat Y* sliders to define how many wipe areas you want to create ("wipe areas" refer to the individual elements of a pattern).
- *Repeat X* divides a picture up into a number of areas along the horizontal axis; *Repeat Y* does the same along the vertical axis. In the above screenshot, Both *Repeat X* and *Repeat Y* are set to 3, thereby resulting in 9 wipe areas. These areas were then rotated with the *Rotate* button.
- Use the *Mirror X Repetition* and *Mirror Y Repetition* functions to mirror wipe area rows or columns along the center axis. See examples below:



No mirroring (left), mirrored Y repetition (center) and mirrored X repetition (right)



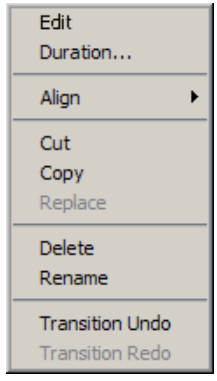
It is not possible to make changes to the individual areas of a wipe - they can only be changed collectively. In other words, any change you make to a border, rotation, transparency, etc. is applied to all wipe areas in the same ma1nner.

Step-by-Step: Creating a Transition Wipe Effect

1 Position the two clips between which you plan to insert a wipe transition on the *Timeline*. In the *Project* window, click `Library` *Tab* > *Folder Classic Transition FX* > *Editors* in the tree area. Drag the *Transition FX Wipe Editor* to the cut between the two clips.



If the transition is not completely gray (i.e. fully or partially red), insufficient leeway was provided on either the start, end or both sides of the transition. In this case, trim the *mark-in* and/or *mark-out* of the clip(s) until the red disappears (See "*Trimming Objects*" on page 417.)



Effect Editor's shortcut menu

2 Right-click the transition to open the Effect Editor's shortcut menu. Click *Edit* to open the *Transition FX Wipe Editor*.

In this example, the *Incoming Clip* shows a yellow racecar in the foreground. Hidden underneath it is the *Outgoing Clip* (a blue racecar). The effect is as follows: The yellow racecar is located in a grid of 16 rotating fields (*Wipe* areas) that slowly become larger and gradually cover the blue racecar.



3 Make sure the incoming clip is in the foreground and that the Playline is on the first (left) *Key Frame*. First you have to define the initial state of the incoming clip.

4 To do so, open the *Pattern* drop-down menu and set both *Repeat X* and *Repeat Y* to 4.



5 Open the *Size* drop-down menu and set both *Width* and *Height* to 0% to reduce the size of the clip to nothing. This can also be done with the *Size* button.



6 Open the *Rotation* menu and set *Rotation* to 90 degrees. This can also be done with the *Rotation* button.



Example of a transition wipe



7 Close the editor by clicking the *Close Editor* button in its top right-hand corner. Background rendering of the effect begins automatically. You can monitor this process in the *Render Viewer*. To do so click the *Render Viewer* button (Sigma).

Clip FX 2D Editor

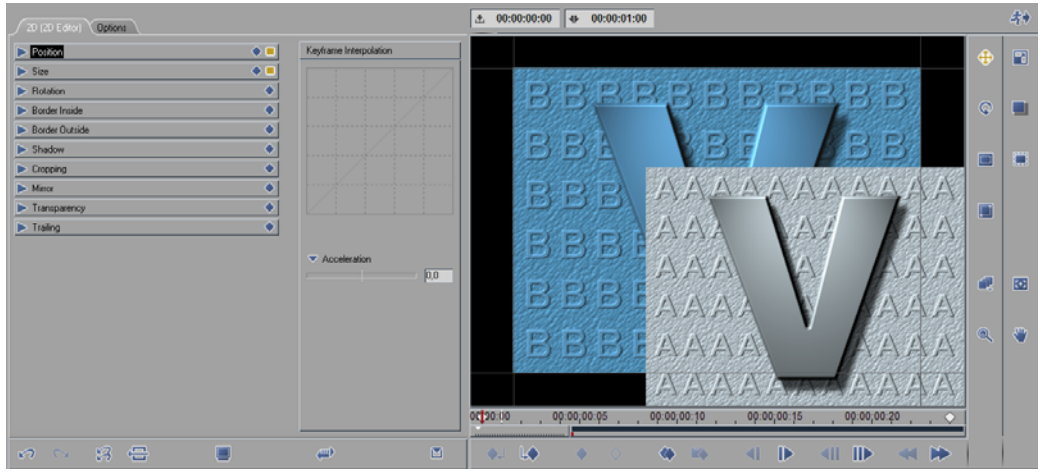
In contrast to the *Transition FX 2D Editor*, the *Clip FX 2D Editor* exclusively works with individual clips.

Opening the Clip Effect 2D Editor

There are several ways to open the clip effect *2D Editor* and load a clip for editing (see also *Opening Effect Editors and Editing Clips (= Applying FX Editors)* on page 512):

- If you have already created a copy of the *Editor* in a *Rack* other than `Library`: Click *Open* in the shortcut menu or simply double-click the effect.
  Click a clip to load it into the *Editor*.
- In the *Project* window, click `Library` *Tab* > *Folder Classic Clip FX* > *Editors* in the tree area. Drag the clip effect *2D Editor* from the content area to a clip on the *Timeline*. Right-click the effect. In the shortcut menu that appears, click *Edit*.





Clip effect 2D Editor

Unlike the *Transition FX 2D Editor*, this editor does not have *Foreground/Background* and *Incoming/Outgoing* functions since clip effects always only involve one clip. The background is always filled with a clip on a *Track* underneath it on the *Timeline* (if applicable).

Otherwise the functions of the *2D Editor* for clips are identical to those of the 2D Editor for transitions and are described there: "*2D Editor for Transitions*" on page 544).

If you want the *Key Frame* effect to have a color background, simply position a color clip underneath the effect clip on the *Timeline*. (See "*Vertical Track Priority*" on page 374.).

Clip FX 3D-Editor

The *3D Editor* provides you with a further effect dimension; in addition to the x (horizontal) and y (vertical) axes, you can now work with the z axis. This axis creates the impression of space that adds "depth" to the direction of effect.

This section describes the 3D functions for both clips and *Transition* effects.

For information on the general operation of the *Effect Editors* (*Key Frames*, *Key Frame* interpolation, frame mode, etc.), please refer to "*Effect Editors (Basics)*" on page 510 and "*Clip FX 2D Editor*" on page 560.

Opening the 3D Editor/Overview

There are several ways to open the *3D Editor* and load a clip for editing (see also *Opening Effect Editors and Editing Clips (= Applying FX Editors)* on page 512):

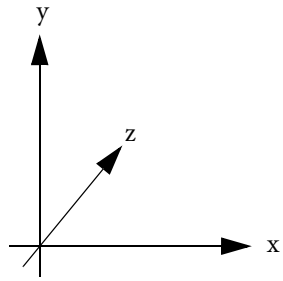
- Drag the *3D Editor* from the `Library` tab to a clip or a *Transition* between two clips. The *Transition 3D Editor* in the default configuration it is located in the *Folder Classic Transition FX > Editors*.
  Then open the *Editor* shortcut menu by right-clicking either the effect button for the clip or the colored line that appears at the upper edge of the clip. Select *Edit* to open the *3D Editor*.



If you use the *3D Editor* for a transition effect, open the *Transition* shortcut menu and click *Edit*.

Special Feature of the 3D Editor: The Z Axis

In the default configuration, the Z axis is perpendicular to the monitor surface and extends into the depth of an imaginary space. The three axes x, y, z are at right angles to one another.



3 Axes: x, y, z

For better orientation and handling, the three axes are superimposed on the image in the viewer. The axes become visible when you start editing parameters.

You can continue to apply effect parameters such as *Size, Borders, Transparency and Trailing* with the *3D Editor* because it also contains the standard functions of the *2D Editor* for both clips and transitions.

Differences from 2D Editor

The *3D Editor* has four drop-down controls in addition to those of the *2D Editor*.

- *Rotation* - Defines rotations of the image in space.
- *Camera* - Defines the position of the virtual camera in space.
- *Shear* - Distorts the object in two dimensions.
- *Pageturn* - Contains the parameters for the pageturn effect.

You can move the slider with the mouse, enter values in the text boxes, or use the function buttons.

Position

This option lets you define the movement of the image along the two spatial axes:

- Position *X* - Horizontal movement (left/right; range of slider +/- 400 percent).
- Position *Y* - Vertical movement (up/down; range of slider +/- 400 percent).
- Position *Z* - Movement into the depth of the space (“backward”/“forward”, range of slider +/- 400 percent).

A shift of 100 percent corresponds to one full image width or frame height (NTSC: 720/486 pixels; PAL: 720/576 pixels).

Setting parameters in the video inlay:



Click the *Position* button and drag the image to the desired position. Hold down the

- CTRL key while dragging to move the image exactly vertically.
- SHIFT key while dragging to move the image exactly horizontally.
- ALT key while dragging to move the image exactly along the z axis.

Rotation

This option lets you set image rotation around the central horizontal axis (x), the central vertical axis (y) and the axis perpendicular to the center point of the image section (z). You can also move the pivot point.

Axes of rotation *page 569*

Pivot point *page 571*

Setting parameters in the inlay *page 570*

Backside image *page 575*

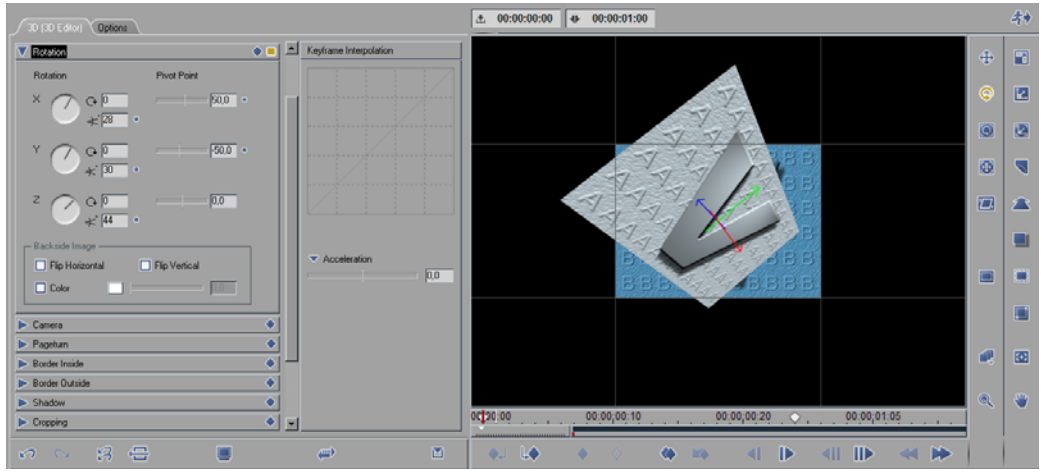


"Center point" and "central axis" refer to the geometric center of an existing image object (actual pixel size of the clip) whose pivot point (see below) has not been moved.
When a clip is cropped, the geometric center changes accordingly.

Axes of rotation



A *Spin* control with two edit boxes is provided for each axis of rotation. The following general rule applies: If you change only one value, the image is rotated around an axis. If you change two or three parameters, it is rotated around a point.



Rotation Menu

359° spin control

Hold down the mouse button and turn the knob by dragging the indicator. One full rotation corresponds to 360°. With each complete rotation, the value in the *Spins* editable box (see below) is raised or lowered, i.e. the rotation counter changes each time you pass the 359° mark.

Spins and Angle edit boxes

If you wish to program several full spins over the effect duration, enter a value in the top box. Use the bottom *Angle* box to define a starting angle and/or to define an exact end position. For example:

To execute three three-quarter rotations from an upside-down starting position:

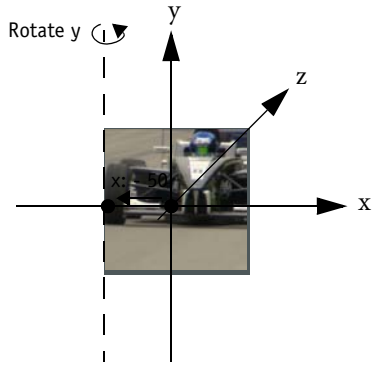
1 Start of effect (*Key Frame* 1)- Enter: “0” *Spins*, *Angle* “180” (or use the spin control)

2 End of effect (*Key Frame* 2) - Enter: “3” *Spins*, *Angle* “90”.

Pivot point

The *Pivot Point* is the point at which the rotations begin. In the default configuration, the *Pivot Point* is located at the geometric center of the image or nodal point of the camera (see below). In other words, the rotational axes intersect at this point.

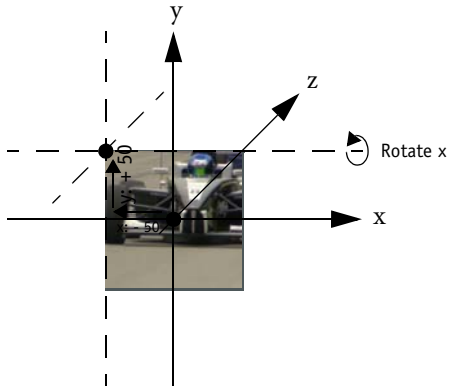
You can move this *Pivot Point* along the individual axes and thus move the center of rotation, as illustrated by the following example:



Move x pivot point to the left

If you wish to rotate the image around the left-hand vertical edge, set the x *Pivot* point to -50 percent (half the image width). The *Pivot Point* moves from the center to the left-hand edge. Now set the y *Spin* control: The image opens up like a window shutter.

Now shift the y *Pivot* point to +50 percent: the point is shifted upward by half the image height to the upper left-hand corner of the image.



Pivot point at top left-hand corner of image

Turning the y *Spin* control further has no effect other than what was described above because the *Pivot Point* is simply moved upward on the y axis. If you change the x *Spin* control, however, you will see a difference. When x and y are both changed, the image visibly rotates around a point - the upper left-hand corner. In actual fact, however, the intersection of the x-y-z axes is only diagonal in space.



The gridlines on the *Canvas* (the *3D Editor* work space) are excellent orientation aids for programming effects in three-dimensional space, especially when the *Pivot Point* is not located at the center of the image.



The *Zoom* function allows you to view a larger work space. The plane spanned by the gridlines describes the default location of the z *Pivot Point*. If it was moved, its location is behind or in front of the plane, if not, it is exactly on that plane.

Setting parameters in the video inlay

Activate the *Rotation* or *Pivot Point* function and, inside the video inlay, drag the mouse pointer while holding down the:





- SHIFT key to rotate the image on the x axis/to move the *pivot point* to the left/right;
- CTRL key to rotate the image on the y axis/to move the *pivot point* up/down;
- ALT key to rotate the image on the z axis/to move the *pivot point* forward/backward;
  CTRL and ALT simultaneously serve to rotate the image in 45-degree increments;
- No key to edit the x and y axes simultaneously.

Backside Image

If you rotate an image so that the back is visible, the same image appears but reversed left to right (default setting). The area below the *Spin* control contains several functions for editing the appearance of the back.

Flip horizontal/vertical

Activate the appropriate checkboxes to flip the back of the image horizontally and/or vertically.

Color

To create a single-color backside, activate *Color*, click on the highlighted square, select a hue and, if desired, define a degree of opacity. If you set the color opacity to "100", the color completely covers the back of the image. To adjust this setting, you can either use the slider or enter a value in the box.

You can also use the *Eyedropper* (*Pipette*) function in the *Color Picker* dialog box to select a hue from any position on the desktop and apply it to the back.

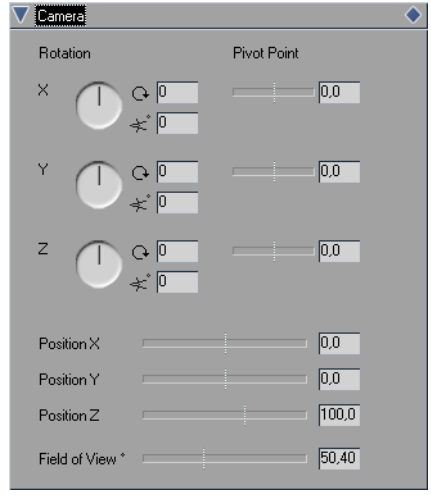
Camera

The sliders in the *Camera* drop-down menu apply to a virtual camera whose "viewfinder" is represented by the fixed dimensions of the *Effect Viewer*. As with images, you can rotate the camera on three axes and change its *Pivot Point*. In addition, you can move the camera in space, and it is equipped with a function that allows you to change its field of view. Thus, you can change the examiner perspective.

Rotation *page 569*

Pivot point *page 571*

The menu has the same layout as the *Rotation* menu.



Drop-down Camera

Rotation

As long as the *Pivot Point* is not moved in any of the three directions, the virtual camera's pivot point is located exactly at its nodal point.

- *X* and *Y* correspond to the tilt and swivel movements possible for a camera mounted on a tripod.
- *Z* permits a rotation on the image axis, i.e. it basically has the same effect as rotating the image itself on the z axis.

359° spin control

Hold down the mouse button and turn the knob by dragging the indicator. One full rotation corresponds to 360°. With each complete rotation, the value in the *Spins* editable box (see below) is raised or lowered, i.e. the rotation counter changes each time you pass the 359° mark.

Spins and Angle text boxes

If you wish to program several full spins over the effect duration, enter a value in the top box. Use the bottom *Angle* box to define a starting angle and/or to define an exact end position.

Setting parameters in the video inlay:



Activate the *Rotation* function for the camera (indicated by the four "viewfinder edges") and, inside the video inlay, drag the mouse pointer while holding down the:

- SHIFT key to rotate the camera on the x axis;
- CTRL key to rotate the camera on the y axis;
- ALT key to rotate the camera on the z axis;
  CTRL and ALT serve to rotate the image in 45-degree increments.
- No key to edit the x and y axes simultaneously.

Pivot Point

The *Pivot Point* is the point around which the camera rotates. In the default configuration, the *Pivot Point* is located at the camera's nodal point. In other words, the rotational axes intersect at this point. If you move the *Pivot Point* off center, the camera describes a circular movement around the actual center with each rotation, making it possible, for example, to circle the image with the camera. In the real world, this shift in the *Pivot Point* represents a revolution around a center point, which can also be located inside the object.

X, Y, Z Position

These sliders allow you to change the position of the camera relative to the image plane.

- X - moves camera horizontally (range of slider +/-400 percent).
- Y - moves camera vertically (range of slider +/- 400 percent).



- Z (distance) - moves camera forward or backward along an axis. This procedure is roughly the same as enlarging or shrinking the image; at the same time, however, the image position remains fixed on the image plane. Values below 100 move the camera closer to the image (0 is "inside the image") and values above 100 move the camera further away (max. 1000).

Field of View

This parameter allows you to enlarge or shrink the image section (range: 1.0 to 135.0°)

The default value is 50.4°. This is almost exactly the field angle achieved in still photography using a lens with a 50 mm focal length. This lens creates a perspective corresponding to the field angle of the human eye.

Setting parameters in the video inlay:



Activate the *Pivot Point* function for the camera (indicated by the four "viewfinder edges") and, inside the video inlay, drag the mouse pointer while holding down the:

- SHIFT key to move the *pivot point* to the left/right;
- CTRL key to move the *pivot point* up/down;
- ALT key to move the camera *pivot point* forward/backward;
- No key to edit the x and y axes simultaneously;
- CTRL and ALT serve to rotate the image in 45-degree increments.

Shear Function

Shear distorts the image along the x, y and z axes.

- *X* and *Y* - Distorts the image around the x or y axis on the z plane, i.e. in two dimensions. A rectangular image becomes a parallelogram.
- *Zx* and *Zy* - Combines *Shear X* or *Shear Y* with rotation around the *Z* axis.

Operation is the same as for the other 3D functions.

3D Transition Effects and Multilayer 3D Clip Effects

As with the *2D Editor*, the *3D Editor* makes a distinction between *Incoming/Outgoing clip* and *Foreground/Background* when you apply the effect to two clips, i.e. use the effect as a *Transition*. The corresponding function button for switching between clips for editing can be found in the same location as in the *2D Editor*, above the inlay.

Z Position

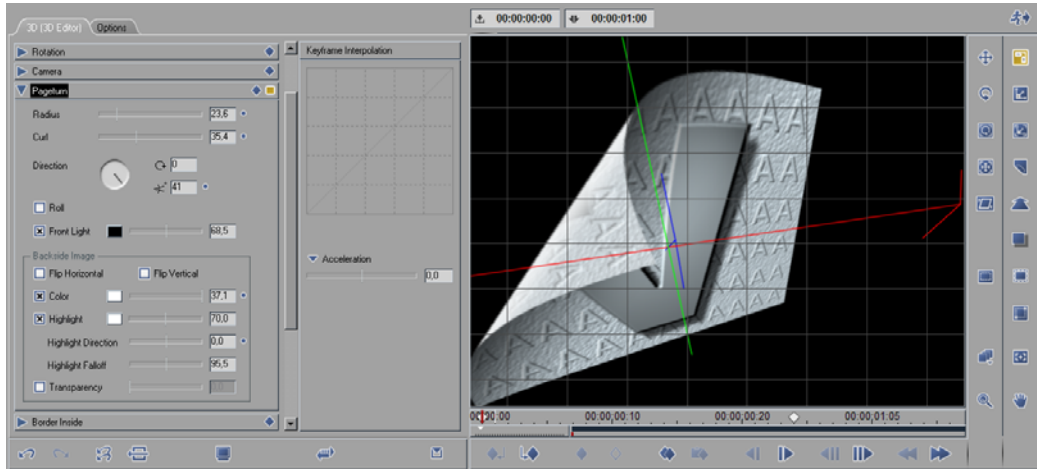
The Z position must be applied separately to the two clips belonging to a *Transition*. Because both clips exist in the same "z environment", however, an overlapping is possible if the clip planes are modified accordingly.
When several clips are layered on top of one another (multilayer composite), the *Track* priority continues to apply, i.e. a clip on a higher *Track* superimposes images on lower *Tracks* regardless of the particular z positions. There are no intersections, nor are there gradual changes in the layering.

Camera Perspective

A 3D transition involves two *Cameras*, one for each of the two clips. Multilayer composites retain their *Camera* settings when the *3D Editor* is used.

Pageturn

Pageturn generates an effect that is similar to the turning of a page in a book. You can set the page-turn direction, back-of-image display, light accents and other parameters presented individually below:



Pageturn (some parameters not visible)

Radius



Defines the bend radius with which the image is uncurled. The higher the value, the further the bend.

Curl

Defines how far the image should be curled or the status at the start of the effect. For example, an image can already be partially curled at the start of the effect.

Direction

Defines the direction of the page turn, for example from the bottom left-hand corner toward the upper right-hand corner. With the default setting 0°, the left-hand edge of the image is turned exactly horizontally toward the right, meaning that the *Curl* axis around which the image winds is parallel to the left-hand edge of the image.

When you change the angle during the effect or enter several spins (via the keyboard or by rotating the *Spin* control several times), the image uncurls several times over the four corners, i.e. the *Curl* axis rotates around the image center.

Roll

When *Roll* is activated, the image is rolled up into a spiral, tighter or looser depending on the radius selected. When *Roll* is not activated, the image corner always remains visible when curled.

Front Light

Sets a light accent on the inside of the bend (i.e. the front of the image). To define a color, click the *Color* box and select a color. Use the slider to set the intensity of the accent. You can also enter a value in the text box or use the *Eyedropper (Pipette)* in the *Color Picker* dialog box to select a color from anywhere on the desktop, including from the inlay.

Setting parameters in the video inlay



You can apply the *Curl, Radius* and *Direction* functions directly to the Video Inlay. To do so, click the tool button and drag the mouse pointer inside the inlay while holding down one of the following keys:

- No key*: Curl (*drag downward to lower the value and upward to raise it).
- CTRL key*: Radius (*drag downward to lower the value and upward to raise it).
- ALT key*:* Changes the *Direction* when you drag the mouse pointer in a circle around the center of the inlay. Drag counter-clockwise to lower the value and clockwise to raise it (0 to 360°).

Backside Image parameters

The parameters in this group define the how the back of the turned page will be displayed. In the default configuration, the back of the image is the same as the front but reversed left to right.

Flip horizontal/vertical

Activate these functions to flip the back of the image vertically and/or horizontally.

Color

You can also apply a color to the image back. Click the highlighted square next to the slider to open the *Color Picker* dialog box. The slider alters the opacity of the color layer: 0% is transparent, 100% is opaque. Here, too, you can select a color using an *Eyedropper* (see description under *Front Light*).

Highlight

Select this option to activate a light accent on the outside (back) of the bend and use the slider to adjust the intensity of the accent. Again, you can determine the color of the light (see description under *Front Light*).

Highlight direction

Changes the position of the highlight on the outside of the bend. Move the slider to shift the highlight closer to or away from the corner of the image (default = 50).

Highlight falloff

Changes the softness of the highlight´s edges. A value of 0 creates a very broad and soft transition (default = 50).

Transparency

Activate the checkbox and then either use the slider or enter a value to define the transparency of the turned page corner with relation to the image beneath it (front side of image).

Clip FX Wipe Editor

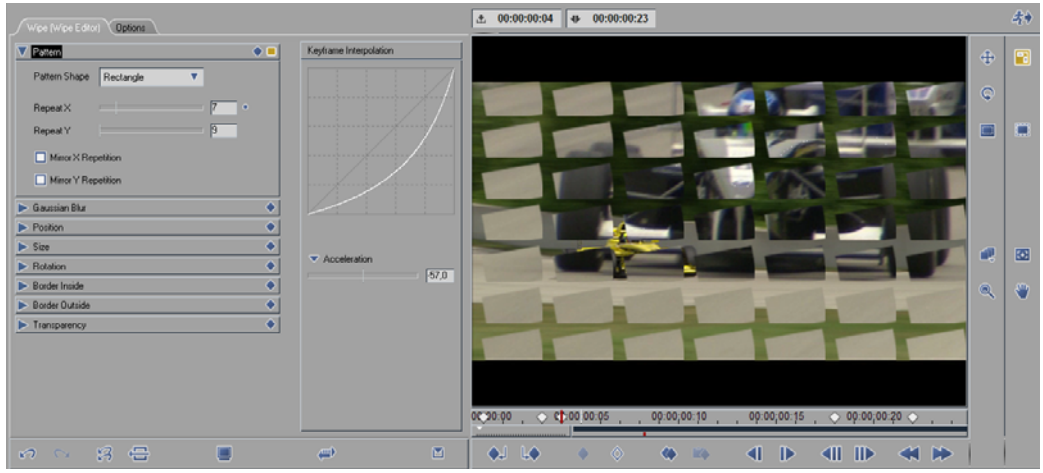
When you create a wipe, an alpha channel is added to the clip. This channel operates like a mask placed on top of a clip which causes only parts of the clip to appear. The mask can take on many forms, and it can be animated.

Opening the Clip FX Wipe Editor:

There are several ways to open the *Wipe Editor* for clip effects and load a clip for editing (see also *Opening Effect Editors and Editing Clips (= Applying FX Editors)* on page 512):

- If you have already created a copy of the editor in a *Rack* other than `Library`: Click *Open* in the shortcut menu or simply double-click the effect.
  Click a clip to load it into the editor.
- In the *Project* window, click `Library` *Tab* > *Folder Classic Clip FX* > *Editors*.
  Drag the clip effect *Wipe Editor* from the content area to a clip on the *Timeline*.
  Right-click the effect. In the shortcut menu that appears, click *Edit*.





Clip effect Wipe Editor

Unlike the *Transition FX Wipe Editor*, this editor does not have *Foreground/Background* and *Incoming/Outgoing* functions since clip effects always only involve one clip. In this case the priority is important because the wipe effect uncovers the image contents that are underneath the clip with the wipe effect.

Otherwise the functions of the *Wipe Editor* for clip effects are identical to those of the *Wipe Editor* for *transitions* and are described there: "*Wipe Editor for Transitions*" on page 555).

Color Editor

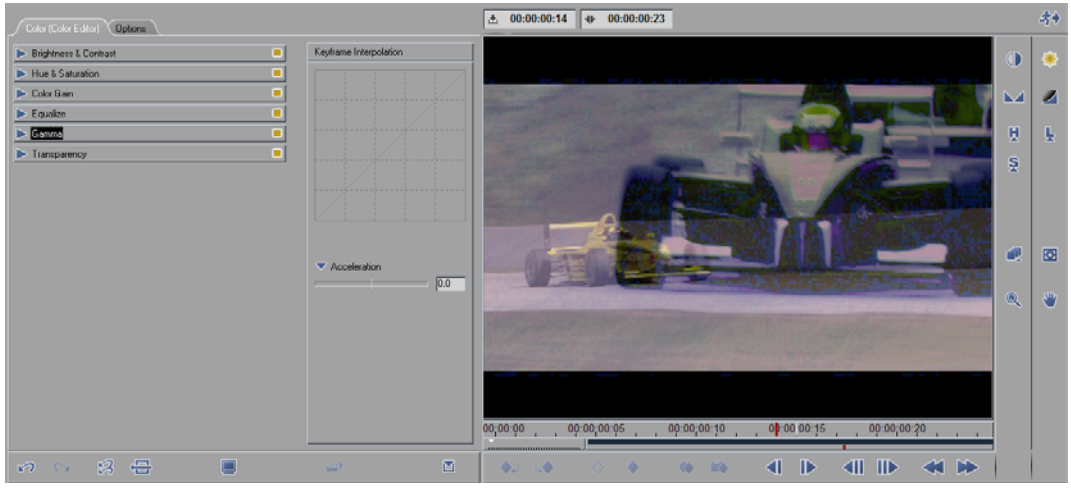
The *Color Editor* is used for controlling a clip's coloring. *Key Frames* permit dynamic effects to be created.

Opening the Color Editor

There are several ways to open the *Color Editor* for clip effects and load a clip for editing (see also *Opening Effect Editors and Editing Clips (= Applying FX Editors)* on page 512):



- If you have already created a copy of the editor in a *Rack* other than `Library`:
  Click *Open* in the shortcut menu or simply double-click the effect.
  Click a clip to load it into the *Editor*.
- In the *Project* window, click `Library` *Tab* > *Folder Classic Clip FX* > *Editors*.
  Drag the clip effect *Color Editor* from the content area to a clip on the *Timeline*.
  Right-click the effect. In the shortcut menu that appears, click *Edit*.



Color Editor

When you first open the *Color Editor*, the Avid Liquid default graphic appears in the *Effect Viewer*. Once you select a clip this graphic is replaced by the clip. As with the other *Editors*, functions can be activated either by clicking the appropriate button or by selecting an option from the drop-down menus.

Brightness and Contrast



Use this function to control brightness, contrast and chroma.

- Adjusting settings in menu:
  Adjust the *Brightness*, *Contrast* and *Chroma* sliders to the required position.
- Adjusting settings directly in video inlay:
  Click either the *Brightness* or *Contrast* button and drag the mouse pointer up and down in the inlay.

Hue and Saturation



Use this function to control hue, saturation and lightness.

- With the menu:
  Move the sliders to set each parameter.
  Hue modifies color in the range of -180 to 180 ° in the spectrum from red to green and blue to magenta.
  Saturation is used for controlling the intensity of a particular color (maximum value = 100%).
  Brightness is used to control gray scale values. Black has a brightness of -100, while white has a brightness of +100.
- Working with the buttons:
  Click the appropriate button. When controlling the settings directly in the video inlay, the mouse pointer is accompanied by an *H*, *S* or *L*, depending on which function is activated.

Color Gain



Use this function to control the color gain of each of the three basic colors red, green and blue.

- Working with the menu:
  Move the appropriate slider to control color gain.
- Working with the buttons:
  Click the *Color Gain* button. Now when you move the mouse pointer on the *Effect Viewer*, the color mouse pointer appears. Drag the mouse pointer up and down in the left-hand third of the inlay to control the red channel, in the middle of the inlay to control green and on the right-hand side to control blue. CTRL+drag the mouse pointer to adjust all three channels simultaneously.

Equalize

Use this function to equalize the color channels and luminance channel.

- Adjusting settings in menu:
  Select the channel you wish to control in the *Channel* list box. You can control red, green and blue either individually or simultaneously for all three. Move the *Amount* slider to choose a value between 0 and 100. With 100, the particular color or luminance is distributed equally throughout the entire image. With 0, the original image appears. With settings between 0 and 100, an intermediary value between these two extremes is interpolated. In the case of dynamic effects, this function can be used to create a wipe or dissolve between the original image and the image manipulated with the *Equalize* function.

Gamma



Use this function to control an image's gamma curve. Differences in brightness are most noticeable in the middle brightness range. Bright areas in an image can be made to appear flatter or have more depth.

- Adjusting settings in menu:
  Slide the *Red Gamma, Green Gamma* and *Blue Gamma* sliders to control gamma. Use *Black Stretch* to adjust the gamma curve for black, independent of the color channels. With this function you can specifically stretch (or compress) the bottom range of the gamma curve in order to increase (or decrease) details in shadowed areas, without effecting the actual black value.
- Adjusting settings directly in video inlay:
  Click the *Gamma* button. Now when you move the mouse pointer on the video inlay, the color of the mouse pointer changes. Drag the mouse pointer up and down in the left-hand third of the inlay to control the red channel, in the middle of the inlay to control green and on the right-hand side to control blue. CTRL+drag the mouse pointer to adjust all three channels simultaneously.

Transparency

Use this function to control transparency.

To do so, move the *Transparency* slider to control clip transparency (fully transparent = 100, maximum value). Click/slide the *Edge Softness* button/slider to control the transparency of a clip's outer edges. The higher the value, the larger the transparent area.

Keying Editor

A key effect is used to make a certain area of an image transparent (for example, areas with the same brightness or color) in order to then replace this area with another image.

Opening the editor *page 582*

Key types (overview) *page 583*

Key Mask *page 583*

→ Invert *page 583*

→ Softness *page 583*

→ Show mask *page 584*

Transparency *page 584*

Luminance Key/parameters *page 584*

Chroma Key/parameters *page 587*

Blue screen Key/parameters *page 589*

Green screen Key parameters *page 589*

RGB difference Key/parameters *page 592*

Opening the Keying Editor

There are several ways to open the *Keying Editor* for clip effects and load a clip for editing (see also *Opening Effect Editors and Editing Clips (= Applying FX Editors)* on page 512):

- If you have already created a copy of the editor in a *Rack* other than `Library` Click *Open* in the shortcut menu or simply double-click the effect.
  Click a clip to load it into the editor.
- In the *Project* window, click `Library` *Tab* > *Folder Classic Clip FX* > *Editors*. Drag the clip effect *Keying Editor* from the content area to a clip on the *Timeline*. Right-click the effect. In the shortcut menu that appears, click *Edit*.



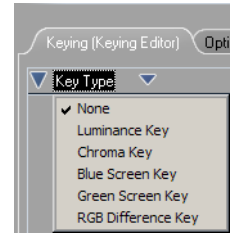


Keying Editor

When you first open the *Keying Editor*, the Avid Liquid default graphic appears in the *Effect Viewer*. Once you select a clip this graphic is replaced by the clip. As with the other editors, functions can be activated either by clicking the appropriate button or by selecting an option from one of the drop-down menus.

Key Types

Avid Liquid offers five different types of keys.



- *Luminance Key* - Used for keying areas with a certain brightness (i.e. affects the luminance signal).
- *Chroma Key* - Allows certain colors or color ranges to be keyed.
- *Blue Screen Key* - Used for keying a defined blue for creating the blue-screen effect.
- *Green Screen Key* - Used for keying a defined green (*page 589*).
- *RGB Difference Key* - Used for keying specifically defined monochrome color areas. This is primarily used for graphics.
- *None* - Deactivates all keys. However, with this function clip transparency or a mask can be defined.

Key Mask



For all the key types, the *Key Mask* lets you select image areas that should be keyed or excluded from the key function. If no *Mask* is defined, the key function is applied to the entire image. Options:

- *Mask* shape -
  Lasso (Free Form).
- If you want to define several areas, press and hold the SHIFT key. A plus (+) sign appears next to the mouse pointer.
- If you press and hold the ALT key, a minus (-) sign appears next to the mouse pointer. In this case you can cut out one or more additional areas within an area.
- If you press and hold the ALT and SHIFT keys, you can select the overlap area of intersecting *Mask* areas.

Invert

Activate this to reverse the *Key Mask* function. Now the selected area is excluded from the key function and everything else around it is added to the key.

Softness

Here you set a soft transition at the edges of the *Key Mask*.

Show Mask



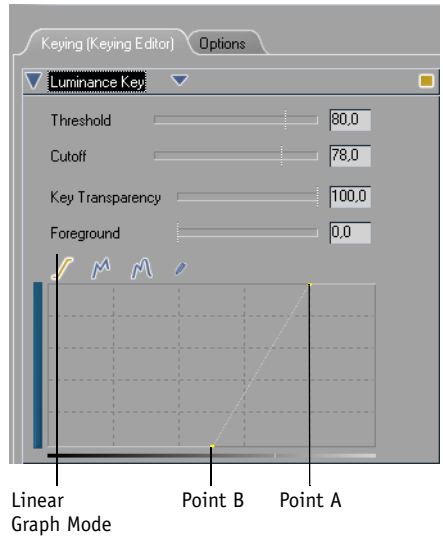
This function makes the *Key Mask(s)* in the image more visible by providing a uniform gray area.

Transparency

Here you set the transparency of the key area.

Luminance Key

The *Luminance Key* operates with an image's luminance signal, i.e. the various gray scales of a picture. Luminance keying is not only useful for gray-scale and b/w graphics and pictures, but also for images with high brightness contrasts.



Luminance Key



The *Threshold*, *Cutoff*, *Key Transparency* and *Foreground* sliders described below are only active if *Linear* is selected under *Graph Mode* (see *Graph Mode* below).

The following controllers are used for defining both points of the curve in linear graph mode. When you move one of the sliders, the curve is automatically adjusted.

Threshold

Threshold and *Key Transparency* are functions of one another. The value set under *Threshold* defines the luminance range for *Key Transparency* and vice versa. *Key Transparency* defines the level of transparency for the luminance levels specified under *Threshold*. To set threshold, either enter a numerical value in the *Threshold* field or drag *Point B* to the right or left in the graph. *Threshold* range is 0 (black) to 100 (white).

Cutoff

Cutoff and *Foreground* are functions of one another. The value set under *Cutoff* defines the luminance range for *Foreground* and vice versa. *Foreground* defines the level of transparency for the luminance levels specified under *Cutoff*. To set cutoff, either enter a numerical value in the *Cutoff* field or drag *Point A* to the right or left in the graph. *Cutoff* range is 0 (black) to 100 (white).

Key Transparency

Key Transparency and *Threshold* are functions of one another. The value set under *Key Transparency* defines the luminance range for *Threshold*. To set *Key Transparency*, either enter a numerical value in the *Key Transparency* field or drag *Point A* up or down in the graph. *Key Transparency* range is 0 (opaque) to 100 (transparent).

Foreground

Foreground and *Cutoff* are functions of one another. The value set under *Foreground* defines the transparency for the luminance range defined under *Cutoff*. To set *Foreground*, either enter a numerical value in the *Foreground* field or drag *Point A* up or down in the graph. The *Foreground* range is 0 (opaque) to 100 (transparent).

Creating a Luma Key

The luminance axis represents an image's luminance values from black to white. The transparency axis represents transparency from opaque to totally transparent.

Initially an image is totally opaque (i.e. the curve is completely flat). In order to key, specify which part of the image should be transparent (i.e. define a luminance value). Specify how soft the transition between opaque and transparent should be (i.e. the steepness of the curve between *Point A* and *Point B*).Two points define the curve: *Point B* is defined by cutoff and foreground, *Point A* by threshold and key transparency.

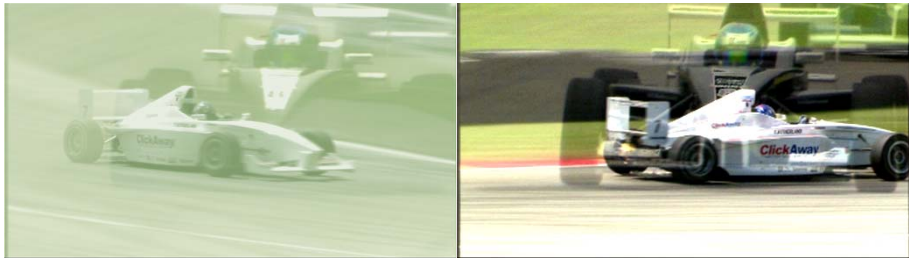
The settings for a simple luma key could be:

- *Threshold* = 80 (everything "lighter" than the value 80 is keyed)
- *Cutoff* = 78 (everything "darker" than 78 remains opaque).

Key Transparency defines how transparent the keyed area should be. Foreground defines the transparency of the "unkeyed" area.

The luminance difference between the two points in the curve defines the hardness or softness of the transition in between.
A value of 2 would create, for example, a hard transition. To soften it, either raise *Threshold* (move *Point A* to the right) or reduce *Cutoff* (move *Point B* to the left).

To increase or decrease keying with both points simultaneously, drag the line between the points. This maintains the transition softness and makes it easy to specify which part of the frame to key.

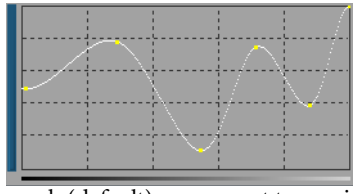


Luminance Key: a different image signal is superimposed over areas with the same luminance

Other Graph Modes

Luma keys can be created by specially adapting the luminance graph.

In the graph above, the horizontal axis is for luminance, with black being on the left and white on the right. The vertical axis represents transparency, with opaque being at the bottom and full transparency at the top. Drag the points on the graph to set clip luminance to any level of transparency. Four modes are available for drawing graphs:





- *Linear* - in the linear luma key graph (default) you can set two points (see above).



- *Multi Line* - in this graph, you can add as many points as needed to assign different transparency settings to the various luminance values. The lines between points are straight. To add a point, click or drag a line.



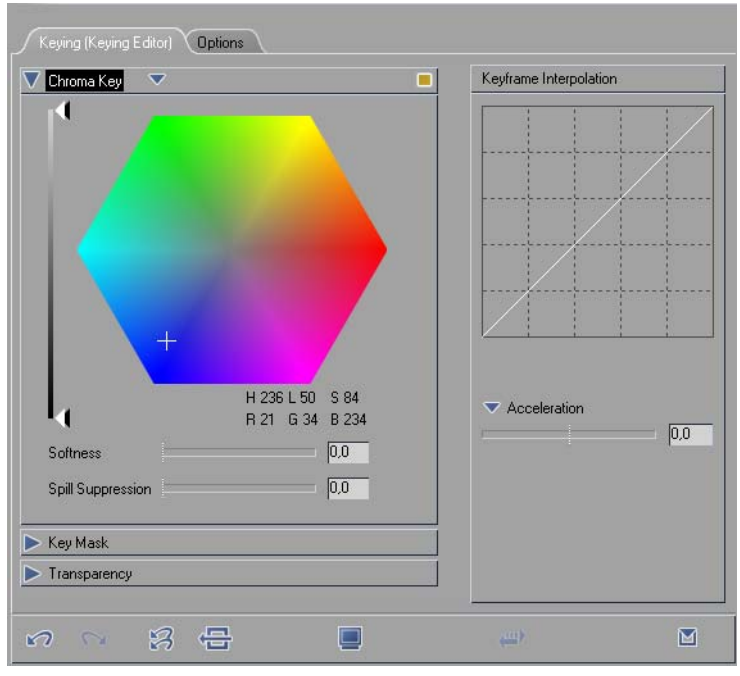
- *Curve* - same as *Multi Line*, except that the line curves through each point. Curve shape depends on the relative location and distance of the current point to those on either side of it.



- *Freestyle* - lets you draw lines "by hand" by dragging the mouse in the graph.

Chroma Key

Using *Chroma Key* you can key a color or color range in a specified luminance range. The color to be keyed in a picture can thus be defined precisely.



Chroma Key

Selecting a Color Area with the Pipette



The most direct way of defining a color range is to use the pipette pointer. To do so, click the *Pipette* (Eyedropper) button and then the area of the picture you want to key. The selected color is indicated by a small point in the color wheel.
Use multiple clicks or dragging to select several areas.
Press and hold down the SHIFT key to select a larger color area. Then larger circular ranges of the selected color range appear in the color wheel.

Selecting a Color Area in the Color Wheel

The mouse pointer turns into a cross when it is in the color wheel. Drag the mouse pointer in the color wheel to create a frame of any shape in it. After you release the mouse button, the area enclosed by the line is then the selected color area. The following options are also available:

- Increase/add area:
  SHIFT+drag the cursor to define more than one area or increase the size of an existing area. A plus sign appears next to the mouse pointer. Simply encircle the area to be included keeping the mouse button pressed.
- Reduce area:
  If you press ALT, a minus sign appears next to the mouse pointer. To cut out one or several areas within a color selection, simply encircle the area to be deleted keeping the mouse button pressed.
- Select subset:
  With the ALT and SHIFT keys pressed, you can specify the overlap of two intersecting areas.
- Delete selection:
  Double-click the color wheel to delete a color selection, or simply define a new area.



The current color (at the mouse pointer) appears in numeric format as an RGB (red-green-blue) and HLS (Hue-Lightness-Saturation) value below the color wheel.

Luminance Range

The vertical line on the left of the spectrum is used for setting the luminance key. Values in the range of the white sliders are in the key range; those outside the range of the black sliders are outside of the key range. The areas between the white and black sliders represent transitional areas. The closer the sliders are together, the narrower the luminance area that will be keyed.
A double-click on or close to the vertical line resets the sliders to their initial positions.

Softness

Use *Softness* to create a soft transition between key and foreground.

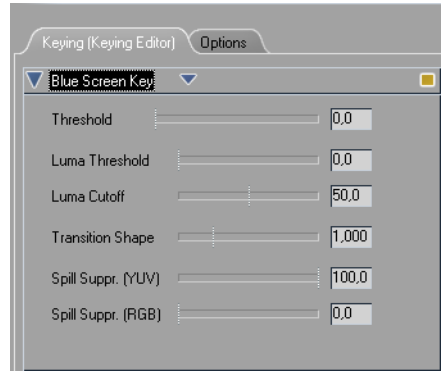
Spill Suppression

Use *Spill Suppression* to desaturate and thus make less visible any existing color values of the key color, especially at the edges of the foreground.

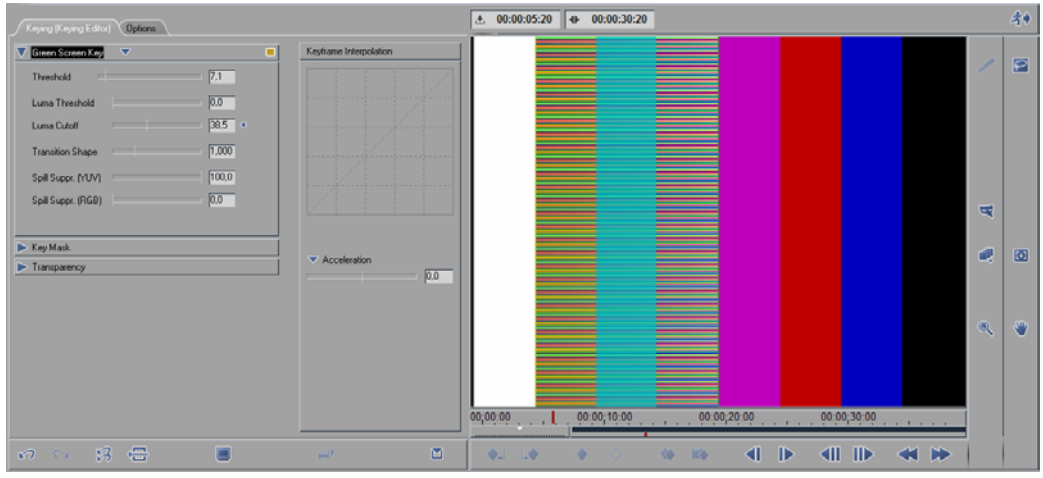
Blue Screen Key/Green Screen Key

Blue-screen keying is used for recordings in front of a blue background. For best results the background should be in the standard blue-screen color (approximately corresponds to Pantone 2735) and have even lighting.
The parameters described here operate in the same way for the *Green Screen Key Editor.*

When working with material originally created in DV, you should use a green background and the *Green Screen Key Editor*. Due to the chroma sampling of 4:2:2, or of 4:2:0 or 4:1:1 (depending on the format), the green channel for DV has a much greater luminance than the other colors. For this reason, keying to green works best for DV.



Blue Screen Key



Blue/Green Screen Key Editor

Threshold

The value you set here determines the size of the key range on the UV level (i.e. the two color difference signals R-Y and B-Y). The key center point is calculated from all the UV values for the image. The slider allows you to set the environment to be keyed to the calculated average value.

Luma Threshold and Luma Cutoff

These parameters affect the range of luminance (brightness) to which the key should apply. The key center point in the image is again the point of reference, except that it is on the y level (luminance signal). *Luma Threshold* defines the point (y value) the start key range and *Luma Cutoff* determines the other end of the range to be keyed.

The value is specified as a percentage of the possible dynamic range. If a pixel's luminance distance from the luminance center point is less than the threshold value, the luminance has no effect on the key. If it is greater than the cutoff value, the pixel becomes opaque. The area in between is the range defined by these two parameters.

Transition

Normally the transition from keyed to non-keyed ranges in the image is linear. *Transition* presents the transition in the form of an acceleration/deceleration curve as used for *Key Frame* interpolation by the Avid Liquid Effect Editors, although in this case it has a chronological dimension. Here you can use the function, for example, to optimize the key to the edges of foreground objects.

YUV Spill Suppression

This function suppresses smaller impurities in the image foreground by de-saturating the interfering color values. This type of *spill suppression* works in the YUV color space. It precedes *RGB spill suppression* in the calculation Sequence.

RGB Spill Suppression

This function suppresses smaller impurities in the image foreground by de-saturating the interfering color values. This type of *spill suppression* works in the RGB color space. It follows *YUV spill suppression* in the calculation Sequence.



Foreground frame with blue screen background



Background

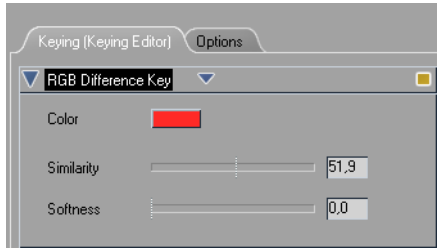


Keying result

Blue Screen Key

RGB Difference Key

Use the *RGB Difference Key* to specify which color you want to make transparent in the clip.
The difference between a chroma key and an RGB difference key is that a chroma key lets you adjust the chroma and the gray values independently, while the RGB difference key adjusts these components together.



RGB Difference Key

Color

Click this field to open the color palette. To specify the color you want to use, click a color in this color spectrum.

Pick a color



You can also use the *Pipette (Eyedropper)* to specify the key color. Simply click the *Pipette* button and continue to hold down the mouse button, then release the mouse button anywhere in the software interface or desktop. This action selects the color value at precisely the location where the mouse button was released. The color is automatically displayed in the color field.

Similarity

Use *Similarity* to specify a range of similar colors to be transparent. To select a range, drag the *Similarity* slider between values 0 and 100. The higher the setting, the broader the range of similar colors selected.

Softness

Use *Softness* to soften the edges of the superimposed (foreground) clip.

Filter Editor

The *Filter Editor* contains a wide range of effects used for alienating video material.

Opening the Filter Editor

There are several ways to open the *Filter Editor* for clip effects and load a clip for editing (see also *Opening Effect Editors and Editing Clips (= Applying FX Editors)* on page 512):



- If you have already created a copy of the editor in a *Rack* other than `Library`: Click *Open* in the shortcut menu or simply double-click the effect. Click a clip to load it into the *Editor*.
- In the *Project* window, click `Library` *Tab* > *Folder Classic Clip FX* > *Editors*. Drag the *Filter Editor* from the content area to a clip on the *Timeline*. Right-click the effect. In the shortcut menu that appears, click *Edit*.



Filter Editor

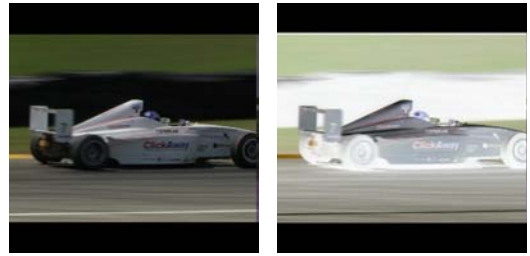
When you first open the *Filter Editor*, the Avid Liquid default graphic appears in the *Effect Viewer*. Once you select a clip this graphic is replaced by the clip. As with the other editors, functions can be activated either by clicking the appropriate button or by selecting options from the drop-down menus.

Invert



Use the *Invert* function to use the color or lightness which is complementary to the one you originally specified.

- *Channel* - Use the *Channel* list box to select a color, luminance or alpha channel to which you want to apply a function. The following channels are available: *None, RGB, Red, Green, Blue, Luminance, Alpha*.
- *Blend with Original* - Use this transparency slider to create a transition between the inverse of an original image and the original image itself. Move the slider to 0 for a opaque inverted image; move it to 100 for a opaque original image.



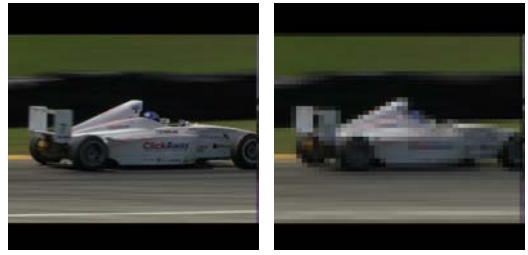
Original clip and negative effect

Mosaic



Use the *Mosaic* function to create a mosaic effect.

- Move the two sliders to define the number of horizontal and vertical divisions in an image (to create blocks).
- Click the *Sharp colors* check box if you want the system to base color on the color in the middle of each block. Leave this check box deactivated if you want the system to base color on the average value of the colors.



Original clip and clip with mosaic effect

Posterize

Use the *Posterize* function to limit the number of colors in a picture. The system maps the image's pixels based on the colors that are the closest match. Use this filter to create large, flat areas in an image.

- *Channel*- Use the *Channel* list box to select a color, luminance or alpha channel to which you want to apply a function. The following channels are available: *RGB, Red, Blue, Green*.
- *Amount* - Use the *Amount* option to limit the number of colors used for posterizing.

Solarize

Solarize acts as a filter between a positive and negative image.

Use the *Threshold* slider to specify the brightness value at which inversion should begin. A value of 0 corresponds to the original image; with a value of 100 all brightness levels are inverted.

- Click *Negative* to subtract color and brightness values.
- Click *Positive* to add color and brightness values.

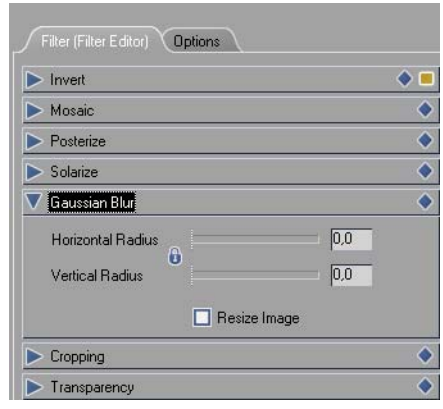


Original clip and clip with solarize effect

Gaussian Blur

This filter lets you add a controllable blur to the image.

Radius defines the degree of the blur. *Both Directions*, *Vertical* or *Horizontal* determines the visual impression of the filter.



Gaussian blur

Cropping

See also *"Cropping"* on page 548.

Transparency

See also *"Transparency"* on page 549.

Chapter 11

Realtime FX

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This chapter provides information on the realtime effects in Avid Liquid. With realtime effects, you can preview effects immediately, without having to wait for them to be rendered. For basic information on effects, see the "Finish" chapter in the section on *"Effect Editors (Basics)"* on page 510.

Realtime effects: always maximum performance *page 601*

Rendering and realtime *page 602*

Realtime and preview *page 603*

Functions and parameters of the Effect Editors *page 609*
... for CPU and GPU effects, and for the Commotion Clip FX (non-Classic FX)

Effects and Effect Editors *page 625*
Overview of all the CPU/GPU effects

Additional realtime capabilities *page 641*

→ Realtime color correction (primary)

→ Titles and graphics with alpha

→ Audio effects

Always Maximum Performance

Avid Liquid realtime effects need no special hardware. The effects use all your computer's existing capabilities. That's the reason they're called "host-based" effects, the host being your computer with the combined power of all its components, most prominently the microprocessor and the graphics card. If you upgrade your system to, say, a faster CPU, the performance gain directly results in more realtime: more video layers, more effects simultaneously, more creativity for you. When you exceed the limits of your system, performance will degrade smoothly, in a way that lets you still preview and experiment with a high degree of interactivity. It is not a question of "either render or realtime".

Some of the Avid Liquid realtime effects were optimized for the computer's main processor(s) (central processing unit, CPU), and others for the graphic card's graphics processor (graphics processing unit, GPU). Each one is a specialist for certain tasks. Therefore, all realtime effects are assigned to either the CPU(s) or the GPU and accordingly marked, such as *Magnify GPU*. Avid Liquid is the first editing solution to offer consequent use of modern, off-the-shelf high-performance graphics cards. The realtime capabilities combined with Avid Liquid's exclusive background rendering give you unmatched creativity and efficiency: instant preview, and, when you're done editing, everything's ready for playout.

Your computer system's performance capability depends on many factors, which means it's almost impossible to predict which effects will play back in preview smoothly (at full frame rate) and in what combinations. The CPU, main memory, graphics card, hard disk(s), the disk(s)' degree of fragmentation, the software running in the background, the BIOS settings and the drivers used all play a part. Anyway, Avid Liquid always attempts to provide optimal playback. Plus, Avid Liquid is a safe investment, because its effects and video stream performance scale perfectly with the power of its computer system, perfectly using the performance growth curves the high-tech industry has to offer.

Rendering and Realtime

This section provides you with information on when effects are realtime-capable and when they have to be rendered, as well as what this means for the *Timeline* playback (preview).

When to render, when to use realtime? *page 602*

Realtime and the effect preview *page 603*

Render management of software effects *page 605*

Optimizing realtime preview *page 606*

The Render Viewer *page 607*

Working with render files *page 608*

When Render, When Realtime?

Avid Liquid distinguishes among two types of effect:

- Realtime effects ("host-based" or software-based) -
  These effects require no special hardware. All the effects are computed by the host PC CPU or the graphics processor (GPU).
  For detailed information on these effects, see: "*Effects and Effect Editors*" on page 625.
- Render effects -
  These are effects that are always rendered.
  This type includes *Classic Effect Editors* of Avid Liquid and third party plug-in effects.

Realtime and the Effect Preview

On the *Timeline*, the above-mentioned effect types are indicated in the *Slices* (the numbered segments above the *Timeline*) by means of defined colors. In this way, the system provides information on the effect preview or playback behavior:



Slices above the Timeline

- Green -
  These segments will certainly be played back at the full frame rate (for example, PAL: 25 fps/ NTSC: 30 fps) because the *Slices* have already been rendered (fps means frames per second).
  A green *Slice* indicates that a render file was created for this segment. The file is used to play the *Slice*.
- Yellow -
  These segments may jitter when played back (i.e. played back at less than the standard fps rate), meaning that frames are dropped. Realtime software effects are always “yellow” because the system cannot supply exact information before the actual playback.
  A yellow *Slice* always indicates that the system will attempt to play the segment in realtime, even it has to reduce the frame rate (drop frames). Audio remains synchronous.
  Preview is possible in the *Master Viewer* video inlay and via an analog monitor output (optional); but not via IEEE/DV out.
- Red -
  These segments must always be rendered.
  Where no rendered data yet exists, a gray exclamation point on a black surface becomes visible in the inlay as soon as the *Playline* touches the section not yet rendered.
  A deep, intense red indicates a render problem (or a missing media file). Remove the effect(s) that caused the problem.
- Gray -
  Everything that is not green, yellow or red, i.e. normal video and graphics, is played back at the full frame rate.

Sometimes, however, even realtime effects have to be rendered before a usable "preview" or view of the effects becomes possible. Such scenarios include, for example:

- A software-based realtime effect combined with render effects.
- A software-based realtime effect combined with other software-based realtime effects. In this case, host PC performance plays a decisive role.
- A software-based realtime effect with multiple streams of HD video. Again, host PC performance plays a decisive role.
- Realtime effects applied to stills above a certain file size. This limit applies, for example, to digital photos with approximately 2 megapixels of resolution. Use the following formula: Height x width x 4 < 8 Mbytes. The factor "4" represents the three color channels (RGB) and the alpha channel.
- A hardware-based realtime effect combined with render effects or combined with other hardware-based realtime effects.



Avid Liquid starts playing the rendered passages of a clip before the entire clip has been rendered. The exclamation point, which always indicates a lack of media data, does not become visible in the inlay until the *Playline* enters the red section of the *Slice*.

General Preview: Familiarizing Yourself with Effects

You can test any effect (editor) on a clip before actually applying it.

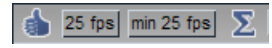
In a *Rack*, you can open any editor by double-clicking it. A standard graphic is then displayed in the inlay on which you can test the effect. You can copy some or all of the Effect Editors to various racks on the *FX* tab and start them from there.

- *Classic* effects -
  Preview by scrubbing the *Playline*.
- *CPU/GPU* realtime effects -
  Preview by scrubbing or using the *Play* function.
- *Hollywood FX* -
  Preview (and select additional effects) in the *Hollywood FX Editor.*
- *Commotion Clip FX* -
  Preview by scrubbing and playback (depending on the particular effect).
- *Other PlugIns* -
  Preview options depend on the type of PlugIn.

Render Management of Realtime Software Effects

The yellow *Slice* marking above a realtime *Transition* or a clip that was edited using a realtime filter indicates that:

- This segment can be played back immediately without waiting for rendering.
  However: When the segment is played back, individual frames may be dropped, depending on the complexity of the effect(s) and on computer performance. If frames must be dropped, an error message will appear to the bottom right in the taskbar (*page 43*).



Also see *"Optimizing Realtime Preview"* on page 606

Enable Background Rendering / Render Yellow Slices



The rendering of yellow *Slices* can be enabled and disabled; which basically means to switch on or off the background rendering. To select this option, right-click the render button (Sigma) in the taskbar to display the shortcut menu or un-check the box in the *Render Viewer*. In other words, the system uses available resources to render realtime passages. This has certain advantages:

- You don't lose time since you do not have to wait for the rendering to finish.
- Rendered *Slices* can be output via i.Link DV; the preview is possible only in the video inlay of the *Master Viewer* or via analog outputs (optional).
- Additional effects can be applied without having to perform a complete rendering of the segments. This is especially advantageous in the case of complex multilayer effects.



As long as the *Slice*(s) above the rendered section is (are) yellow, the system attempts realtime playback. Only after the *Slice*(s) have turned green, the render file is played.

Render specific slice(s)

Provided that they contain clips with realtime effects, *Slices* can be rendered individually or in groups. This means that you can generally disable background rendering (*Render yellow slices*) and then render specific segments. Right-click a *Slice* to open the shortcut menu and select *Force rendering for slice(s) [n] -> [m]*. Hold down the SHIFT key while clicking to select a sequence of *Slices* (and thereby include *Slices* without effects at well; those will just be skipped).

Optimizing Realtime Preview

Some tips on enhancing your system's realtime performance.

First CPU, then GPU (in effect editing)

You can apply all realtime effects in all combinations imaginable to a clip. But: The best performance is achieved when CPU effects are applied first, and GPU effects last.
The processing order of effects applied to a clip can be viewed and changed in the clip's *FX Properties*: The list reflects the order in which effects were initially applied. The first effect in the list is processed first, the last effect is the final. (Right-click a clip and select *FX Properties* from the shortcut menu.)



The explanation lies in the way CPU and GPU cooperate. The CPU mainly does basic video processing, e.g., it decodes a frame, and works on certain effects. It then passes on the data to the GPU, which takes care of additional effects and displaying the image, among other things. But if the GPU has to pass data back to the CPU, there's a bottleneck because bandwidth in the direction from GPU to CPU is much smaller than vice versa.Therefore it is recommended to process all CPU effects before data is passed to the GPU. And, as a rule of thumb if maximum performance is called for, use GPU effects - the CPU is busy with a host of other tasks.

Reduce Preview Quality



If the realtime preview did not flow smoothly enough, you can un-click the button shown to reduce the display quality of the video inlay. The yellow glow around the button to indicate full quality must not be visible. If this button is not on your *Timeline* toolbar, right-click *Customize* to open the function library and drag the button to the toolbar.
A different procedure to get the same result: Click the *Inlay Quality* button and select *Quality Low*.

The preview image becomes a little blurrier and softer. Rendering and output continues to be performed at the maximum resolution and quality.

Reduce Preview Quality

The *Timeline Properties* include an option for reducing *FX Quality* in the preview. This serves to reduce system utilization slightly and increase the frame rate at which effects are played back. Final quality for the master is not compromised.

Turn Off Audio Playback Temporarily

In certain borderline cases, deactivating timeline audio (*Playback Off*) can help prevent "dropped frames", i.e. frames omitted during playback. This is always the case when your system is operating near or beyond the limits of its performance capability. Deactivating audio takes off a little of the strain.

The Render Viewer



The *Render Viewer* is an inlay in which you can monitor the current render process. In the taskbar, click the symbol shown to open this view.

Although the sequence of frames in the *Render Viewer* may appear to be mixed up (especially if you combined realtime and render effects), it isn't; Render Management, which is working in the background, distributes specific resources to the different effects.

- The *Render Viewer* contains a checkbox that lets you enable or disable the rendering of "yellow slices".
- *Stop Rendering* -
  This option prevents all rendering. If you stop rendering, don't forget to reactivate it.



Render Viewer

Working with Render Files

As a user of realtime effects, you will not normally have to deal with render files, but sometimes they do come up. If this happens, read the appropriate sections in the "Finish" chapter on *"Deleting Render Files"* on page 538 and *"Rendering and Preview Quality (relevant only for Classic Effects)"* on page 539.

Functions and Parameters of the Effect Editors (Non-Classic)

The Realtime Effect Editors of Avid Liquid have a different interface from that of the classic editors, as well as expanded functions, such as *Key Frames* for each parameter. All GPU effects and CPU effects, also the Commotion Clip FX use the expanded Effect Editor.

This section describes the parameters and functions of these Effect Editors.

Brief overview *page 609*

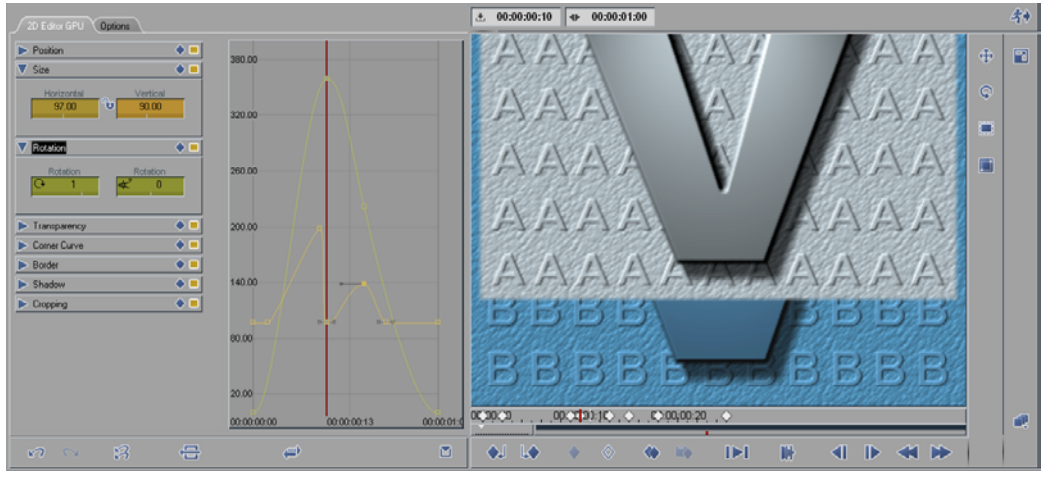
Setting parameters *page 613*

Key Frame curves *page 615*

Additional options *page 624*

Brief Overview

Drag any Effect Editor from the *Realtime Clip FX Rack* and drop it on a *Timeline* video clip, or double-click the name of the Effect Editor in the *Rack*. The editor is then opened in place of the *Source* and *Master Viewers*:

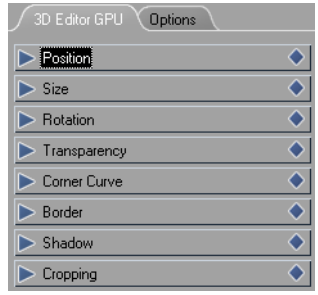


Effect Editor - full-screen view

Below is a description of the functional areas, from left to right.

A: Parameter Menus

These menus list the parameters of the Effect Editors. Most parameters are combined in groups, such as *Position, Size*, etc., as seen here:

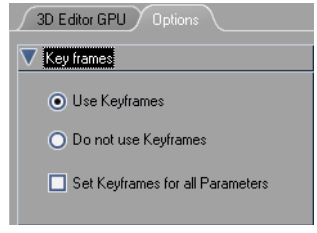


Parameter groups of the Effect Editors

Parameters are the variables of an effect that can be modified (e.g. *Position, Transparency, Border*, etc.). Many of these parameters are subdivided into further categories. For example, *Size* is divided into *Horizontal* and *Vertical*.
For detailed instructions on setting and modifying parameters, see the section on "*Setting Effect Parameters*" on page 613.

B: Options - with or without Key Frames?

This is an important option. It determines whether or not you will work with *Key Frames*.



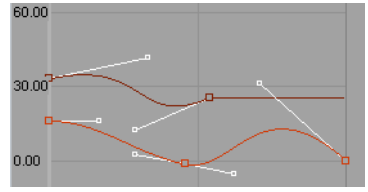
You have two choices:

- Without *Key Frames*, you cannot make dynamic changes to clips. For example: If all you want to do is to reduce the size of the clip and move it, and you want to do this for the entire length of the clip, you will find it faster and easier to deactivate *Key Frames* here. In other words, static effects do not require *Key Frames.*
- With *Key Frames*, all types of change are possible. If you want an image to start out in color and end up in black and white, you must use *Key Frames*. You will need at least two of them, one at the beginning of the clip and one at the end, but you are free to use as many as you want. *Key Frames* are said to "animate" an effect, meaning that they "bring it to life".

This option is applied to all the parameters of an Effect Editor. For more information on *Key Frames*, see the section on *"Parameter Curves"* on page 615.

C: Parameter Curves

You can provide each parameter with its own *Key Frames*, thereby assigning *Size* independently of *Rotation* independently of *Cropping*, etc. This is illustrated in the *Parameter Curves* area:



Each parameter has its own curve

For more information, see the section on *"Parameter Curves"* on page 615.

D: Effect Viewer and Its Surroundings

The Effect Viewer contains either the image of the clip that is currently being edited or a preview graphic (if you loaded the editor without a clip).

The *Position Bar*, playback buttons and *Key Frame* buttons are located below the video inlay.

The timecode fields above the video inlay indicate the current position of the *Playline* and the duration of the effect (transition or clip).

To the right of the inlay, tool buttons are arranged in vertical rows for directly editing the image. With these buttons you can, for example, precisely position a miniaturized clip "on sight".

E: Effect Management - Undo, etc.

To the left in the toolbar below the video inlay, you will find the same functions in all the editors - for example, an Undo button for canceling the last step performed and a Redo button for restoring the original state. (See also *"Key Frames"* on page 518.)

F: Exiting an Effect Editor



Click the *running man* to follow him to the exit. If a clip was loaded in the Effect Editor, it is now available for playback on the *Timeline*. If rendering is required, this is initiated now.

If you opened the editor directly from its root directory by double-clicking it, a query will appear when you exit asking whether you want to save a copy of the effect you edited. If you click *Yes*, a copy is created on the *FX* tab in a *Rack* named *New FX*. It is placed here because the effects on the *Library* tab cannot be modified further.

Setting Effect Parameters

There are four ways to modify parameters:

→ Using a slider or knob.

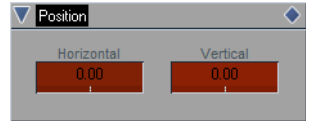
→ Entering a value on the keyboard.

→ Directly in the inlay using tool buttons.

→ Using the *Parameter Curve* of the particular parameter.

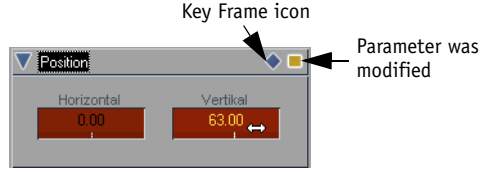
First select a specific parameter, such as *Position*:

Then click the triangle or title bar to open the drop-down menu:



Modifying Parameters Using Sliders and Knobs

Using the mouse, drag one of the sliders to the desired position, including outside the field and drop it when you reach your destination. You can also use the mouse for fine-tuning. The numeric value changes as you move the slider, in some cases only up to a maximum value.



Click in the field and drag to the left or right

Modified Parameters

As soon as you modify a parameter, a yellow box appears to the far right in its title bar. This lets you know that at least one parameter was modified, even when the menu is collapsed.

Disabling Parameters

Click the yellow box. It then changes to blue, indicating that parameters were modified but are currently disabled. Click the box again to enable the parameters. This is a convenient way to enable and disable parameters, which often makes it easier to assess the course of an effect.

Key Frame Icons

The parameter settings from the menus are stored in the *Key Frame* icons. For the *Size* menu, for example, the *Key Frame* contains the values for *Horizontal* and *Vertical*. When you drag the *Key Frame* icon and drop it on a *Key Frame* on the *Position Bar* below the *Effect Viewer*, this *Key Frame* takes on the stored values (in addition to its own values declared up until this point).

To Reset:

Right-click in the parameter field to reset the value to zero.
When the last parameter has been reset to zero, the yellow box disappears.

Entering Parameter Values from the Keyboard

1. Double-click in the particular field.
2. Enter a value.
3. Confirm your entry by pressing ENTER or TAB (jumps to the next field). If you entered a value that exceeded the maximum value permitted for the parameter, your entry changes to the maximum value allowed.



Some values should be entered in any case, including all integer values, such as the number of rotations for the *Rotation* parameter or the number of *Replications* for the replicating effect (*Replicate GPU*). In such cases, it's faster and easier to enter the value.

To Reset:

Right-click in the parameter field.

Modifying Parameters in the Inlay Using Tool Buttons

Some parameters are assigned a tool button. For example, you can change the *Position* of a clip directly in the inlay using the mouse. (If you don't recognize a button, rest the mouse pointer on it for just a moment to display the tool tip stating its function.)
The tool buttons are located to the right of the inlay.



1. For example, click the *Position* button (shown here).
2. Move the mouse pointer across the image, holding down the left mouse button.
3. Drop the image at the desired position.

The values and sliders in the associated parameter menu follow your movements, which means you can also use this method to change numerical values.

To Reset:

Double-click in the video inlay to reset it to its original state.

Parameter Curves

You can use as many *Key Frames* as you want for editing each parameter of an Effect Editor. All these *Key Frames* are then linked by means of a *Parameter Curve*. This curve demonstrates how the value of a particular parameter changes over the course of the effect (for example, how an image becomes larger or smaller). You can edit the *Key Frames* directly in the curve, as well as modify the curvature itself. However, the term "curve" isn't meant to be taken too literally: In the case of a linear change, the "curve" can also be a straight line.

Overview *page 616*

Working with curves

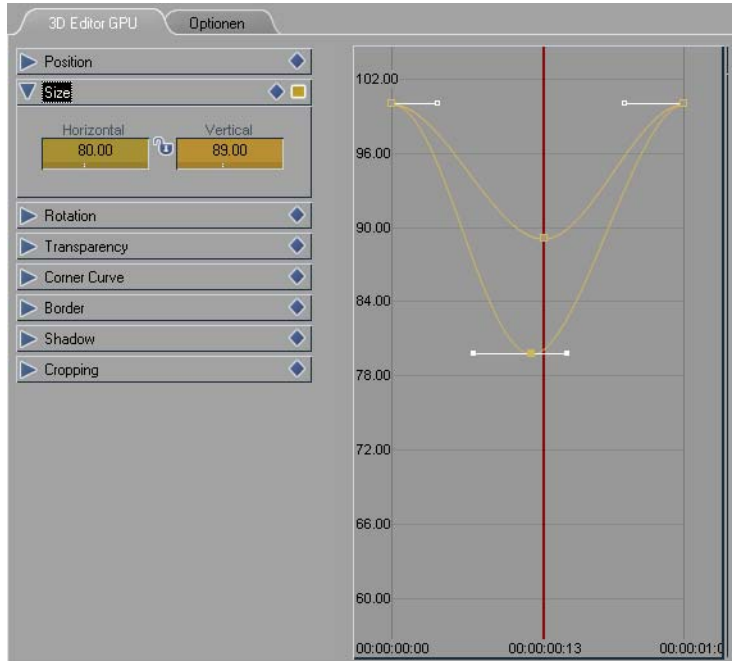
→ Linear and constant *page 620*

→ Bezier curves *page 621*

Additional key frame functions *page 623*

Overview

The first time you open an Effect Editor, the curve field is empty. The first curve(s) don't appear until you open a parameter menu. The screenshot below contains two curves, one representing *Size Horizontal* (= width) and one representing *Size Vertical* (= height). If these parameters were linked, you would see only one curve.



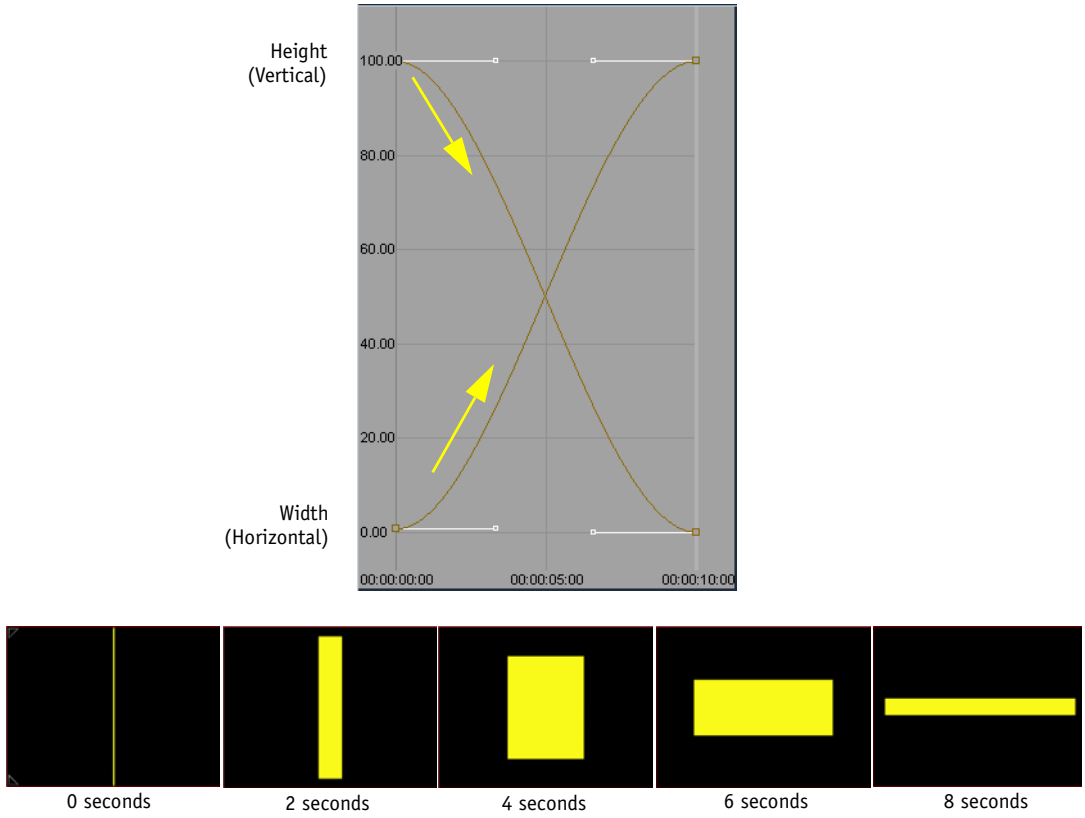
Key frame curve for the Size parameter

Also note: If *Key Frames* are globally disabled for an effect (*Options > Keyframes > Do not use Keyframes*), you will see only straight horizontal lines instead of curves. You can only move these lines up and down.
Here are the most important points regarding *Parameter Curves*:

- Color coding -
  The lines are the same color as their parameter fields, thus making it easier to assign multiple curves.
- *Position Bar* -
  A *Position Bar* runs horizontally along the bottom of the curve view that is the same as the *Position Bar* below the video inlay and represents the duration of the effect. The effect starts on the left and ends on the right.

- Value scale -
  This vertical scale is purely a quantitative measure. It has nothing to do with the units of size, it only indicates “more” or “less”. This scale must retain its relevance even when different parameters, such as *Size* and *Rotation*, are displayed simultaneously. Because *Size* is specified as a percentage (+/-400) and *Rotation* is specified as a degree (0-360), the two cannot be measured against the same ruler. For example, the *Rotation Key Frame* might be located at position 300 (for 300°), *Size* at 25 (for the percentage) and some other parameter at 231 (for example, pixels). (See also *“Functions of the Parameter Scale and Position Bar”* on page 622.)
- *Playline* position -
  The *Playline* position is indicated by a red vertical line. When you modify a parameter, the *Key Frame* is set at the point where the *Playline* intersects this parameter’s *Parameter Curve*. A *Key Frame* is also inserted on the *Position Bar* below the video inlay.

Here is another example. You are working with a ten-second color clip with unlinked *Horizontal* and *Vertical* parameters. The clip is transformed from a narrow, vertical line to a narrow, horizontal line (it has completely disappeared by the last frame, which is why this frame is not shown below).



Unlinked parameters: The height decreases to zero percent and the width increases to 100 percent (the last image at 10 seconds not shown)

Working with Curves

In its original state (parameters not yet modified, *Key Frames* enabled), the curve appears as a straight horizontal line at the zero level. A *Key Frame* (small box) is visible at each end point. The handles for the Bezier function are parallel and horizontal (see "*Bending Bezier Curves*" on page 621).

- When you bring the mouse pointer near the curve, the pointer changes shape (pointing index finger) and the curve is highlighted to indicate that it is now selected.
- When two lines initially overlap (for example, the *Horizontal* and *Vertical* lines for the *Size* parameter), you can select one of the two lines by clicking in the parameter field and then edit it with the mouse.
- Setting and moving a *Key Frame* on the curve -
  Wherever you click, a *Key Frame* is set on the curve. You can then move the *Key Frame* wherever you want (not entirely: some parameters have maximum values). An info box indicates the TC value and parameter value.



no key: *Key Frame* can be moved vertically (changes value);
hold ALT key: *Key Frame* can be moved horizontally (changes position);
hold CTRL key: *Key Frame* can be moved vertically and horizontally.

- Moving multiple *Key Frames* simultaneously -
  Drag a lasso around the *Key Frames* that you want to move simultaneously and then drag one of the *Key Frames* selected. You know which *Key Frame*s are selected because the small boxes are filled in.
- Moving the curve segment between two *Key Frames* -
  This causes the curve (line) to move, including the two *Key Frames*. Clicking one *Key Frame* affects the curve segment to its right, up to the next *Key Frame*.



hold SHIFT key: segment can be moved vertically (changes values);
hold ALT key: segment can be moved horizontally (changes positions);
hold CTRL key: segment can be moved vertically and horizontally.

The shortcut menu for *Key Frames* on a curve contains the following options:

- *Copy Key Frame(s)* -
  Copies the *Key Frame(s)* (use a lasso to select multiple *Key Frames*).
- *Cut Key Frame(s)* -
  Deletes *Key Frame(s)* from their original locations.

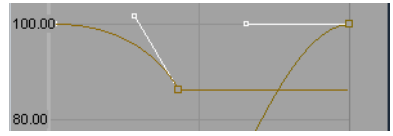
- *Paste Key Frame(s)* -
  Inserts previously cut or copied *Key Frame(s)* at the *Playline* position or, in the case of multiple *Key Frames*, at the *Playline* position and to the right of it.
- *Delete Key Frame* from the curve -
  Right-click *Key Frame* > *Shortcut Menu* > *Delete key frame(s)*.

Interpolation

Each *Key Frame* on a curve has an *Interpolation* option in its shortcut menu. Interpolation describes the way in which parameters change between two *Key Frames*. Right-click a *Key Frame* on a curve to display a shortcut menu containing the *Hold, Linear* and *Bezier* options.

Hold

This option sets the parameter value to the right of the *Key Frame* to the *Key Frame's* constant value. In other words, there are no more changes.

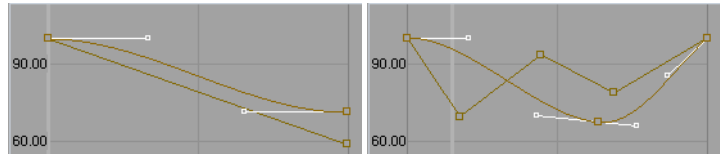


Hold maintains the parameter value up to the next Key Frame

In the figure above, for example, the *Size* is initially reduced but then remains constant: After a sharp bend, the curve becomes a straight, horizontal line.

Linear

This option causes a steady change from one *Key Frame* to the next. *Linear* transforms a curve into a straight line that rises or falls at a steady rate. The steeper the angle, the more drastic the change; the flatter the angle, the less drastic the change.
Linear Interpolation permits sudden transitions, such as a movement that instantly shifts to the opposite movement.



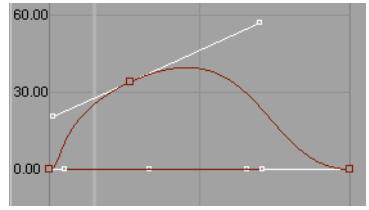
Left: Parameter drops steadily (bottom line with Bezier above it)
Right: Sharp bends indicating sudden changes

Bezier

These are the actual curves. A *Bezier* curve is initially set for every *Key Frame* by default and permits dynamic changes, such as soft transitions between states or accelerated and decelerated changes. The same rule applies as above: the *Bezier* curve starts to the right of the *Key Frame*. You will find more information in the next section.

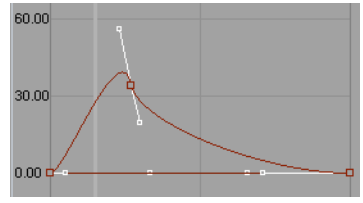
Bending Bezier Curves

You may already be familiar with this type of curve from vector graphics programs. Each Bezier curve has small handles attached to each of its *Key Frames*, with *Control Points* at the ends of the handles. When you drag these points, it changes the bend of the curve. Basically, however, the same applies as for straight, linear lines: The steeper the angle of the curve, either up or down, the faster the parameter value rises or falls; the tighter the radius of the curve, the more drastic the change.
The *Control Points* are always linked by a line. The gradient of this line indicates the angle at which the curve passes through the *Key Frame* between the *Control Points*. In the figure below, the line is relatively horizontal:



Bezier curve with "handles" and control points

In the next figure, the curve passes through the *Key Frame* at a fairly steep angle, so that the line linking the *Control Points* is also very steep:



A sharp bend in the curve indicates a rapid change

The *Control Points* also act like magnets: They attract the zeniths of the curves, but the further they are from a curve, the greater their magnetic effect.
It takes only a moment to acquaint yourself with the basics of Bezier curves. You'll soon find that you intuitively achieve the desired results.

Functions of the Parameter Scale and Position Bar

For greater clarity, the parameter scale and position bar (time scale) can be:

- Moved vertically or horizontally -
  Drag theparameter scale up or down, or to the left or right. The *Position Bar* beneath the curve view is linked to the *Zoom* control of the *Effect Viewer*.
- Zoomed in/out -
  Drag the scale while holding down the CTRL key.

You can undo these changes by opening the shortcut menu for the curve view and selecting the appropriate options. The display will be set so that *Key Frames* are again visible. Click anywhere (except on a curve or *Key Frame*) and select one of the following options:

- *Reset scales* -
  Resets the parameter scale and the position bar.
- *Reset parameter scale* -
  Resets the scale only.
- *Reset time scale* -
  Resets the position bar only.

Show/Hide Parameter Curves

This option also serves to improve clarity. You can hide specific *Parameter Curves*, or even all *Parameter Curves*. You will find these functions in the shortcut menu for the curve view.

Additional Key Frame Functions

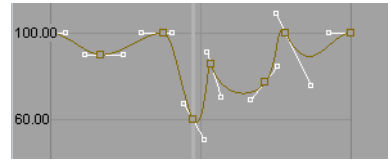
Select All Key Frames on a Curve

Right-click anywhere on the curve line to open the shortcut menu and select *Select all Key Frames of parameter*).

Assign Identical Values to Multiple Key Frames

It is often necessary that all or part of the *Key Frames* share identical parameter values. To avoid the tedious task of setting the values for each individual *Key Frame*, follow the procedure below:

1 Set one of the *Key Frames* to the desired value and position the *Playline* exactly on this *Key Frame* (for example, use the Q and Z keys to jump from *Key Frame* to *Key Frame*).



Set one Key Frame to the desired value

2 Drag the *Key Frame Icon* (◆) from the parameter's title bar and drop it in the effect inlay. All *Key Frames* for this parameter will automatically be assigned the selected value and the curve will be flattened out to a horizontal line.

Curve Key Frames and Position Bar Key Frames

Whenever you insert a *Key Frame* on a *Parameter Curve*, a corresponding *Key Frame* also appears on the *Position Bar* (although this is not visible when curve *Key Frames* overlap). The two *Key Frames* thus created are linked; when you delete one, the other is also deleted.

Show Key Frames of other effects

(In the effect shortcut menu) This options makes visible all the *Key Frames* of all the effects on the same clip. The *Key Frames* of the current effect are diamond-shaped and the rest are displayed as light red triangles. A tooltip indicates the effect from which they originate.
To include the "other" *Key Frames* in the *Goto next/previous Key Frame* commands, hold down the CTRL key; the *Playline* jumps from triangle to triangle.

Set Keyframes for all Parameters

(*Options* tab > *Key Frames*.) If this option is activated, all the parameters of an effect are assigned a *Key Frame* at the same timeline position. This can be useful if you want processes to start or end synchronously.

Additional Options

Channel Processing

In Effect Editors for which it is relevant, the *Options* tab contains an area entitled *Channels*. Here you can select the channels to which the effect modification should be applied (*Red, Green, Blue* and/or *Alpha*). In the default configuration, the effect is applied to all channels (even if none are activated here). Effect Editors offering this option include, for example, *Posterize* and *Base Color Correction*.

Effect Quality

- This option is available for clip FX and transitions and only with the 2D and 3D Editors (CPU) -

Click *Custom/Manual t*o open an extended field. These options let you optimize effect quality, depending on the material available. However, some previous knowledge is required (or a lot of patience while you experiment).

Effects and Effect Editors

This section contains a complete listing of all the software-based realtime Effect Editors in Avid Liquid. We have not attempted to list all the standard effect parameters, such as *Size* and *Position*, or other parameters that are self-explanatory.

- All CPU/GPU realtime effects can be found on the *Library* tab, in the *Realtime Clip FX* and *Realtime Transition FX* folders.
  These folders contain the *Racks Editors* (all effect editors), *Presets* (editor fx with certain predefined settings) and *Audio* (realtime audio fx).
- Realtime-capable Pinnacle Hollywood FX Editors are stored in the *Realtime FX* folders; HFX presets can be found in the *Realtime Transition FX> Presets* folder.
- Commotion Clip FX (non-realtime; described under *"Commotion Clip FX"* on page 643) are located in the *Commotion Clip FX* folder.

For a detailed description of the basics of applying effects and setting parameters, see the preceding section and the "Finish" chapter on *page 502*. This section provides a quick introduction.

Preliminary remarks *page 626*

Realtime Clip FX *page 630*

Realtime Transition FX *page 638*

PlugIn FX *page 641*

Preliminary Remarks

This section contains information on realtime effects and a quick introduction to the correct application of these effects.

GPU and CPU

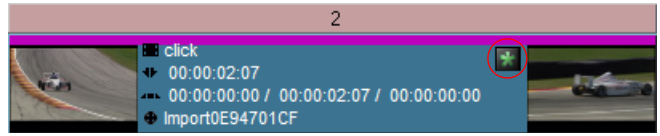
Avid Liquid's software based (or host-based) realtime effects have been optimized for either the graphics card processor (GPU) or the computers's central processing unit(s) (CPU). To facilitate identification of these effects, all realtime effect editors are marked either "GPU" or "CPU", such as "2D GPU". Realtime effects can be found in the *Library* tab, in the *Racks* named *Realtime Clip FX* and *Realtime Transition FX*.



Always apply CPU effects before the GPU effects. Check the *FX Properties* of a clip: CPU effects should lead the list, and GPU effects should be down the list. (Right-click a clip to call *FX Properties*.) See also *"Optimizing Realtime Preview"* on page 606.

Effect Icon

The small icon visible in a clip on the *Timeline* indicating that a clip effect has been applied is green when it designates a realtime effect. This allows you to distinguish it from render effects.



Effect Preview in the Editor



You can already test realtime effects in the corresponding Effect Editor. Click the button shown for *Play In to Out* to play the effect from start to finish. In the case of long clip effects (filters), it's best to set the *Playline* manually whenever possible and view subsections of the effect.

"Progress" Effect Parameter

Some realtime Effect Editors include the *Progress* parameter, which allows you to determine how fully developed the effect should be at a specific point in time. For example, you can define that a *Clock Wipe* should already be 25 percent completed when the *Transition* begins.
In the default configuration, *Progress* is *0%* at the start of a transition and *100%* at the end.

Discrete Parameters

Some effect parameters (for example, the number of sides for *MultiShape Crop*) can be set only in whole-number increments (thus making them "discrete"). If you want to change discrete parameters between the beginning and end of an effect, the change occurs in abrupt steps. For example, every few frames an additional side suddenly appears in the effect image. Intermediate steps are not possible.

Quick Introduction to Effects

If you can or prefer to skip over all the details of effect processing at this time, read the following quick introduction. For more details, see the section on effects under "*Effect Basics*" on page 502 ff.

1 Where are the effects?

All effects and Effect Editors are located in the *Project* window or *Project Browser* on the *Library* tab. The realtime effects can be found in the folders called *Realtime...*; the Pinnacle Hollywood FX are also real-time-capable and can be found under *Plug In Transition FX*, *Plug In Clip FX*.

2 What is an Effect Editor?

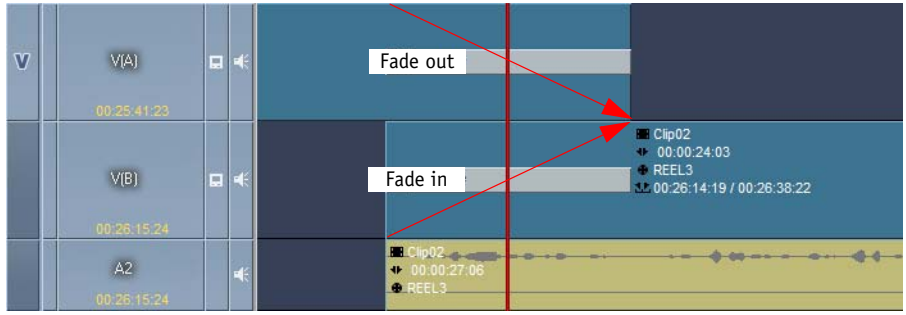
Actually, an Effect Editor is also an effect, but one that you can fine-tune. Some effects are immediately visible when you apply them to a clip; the *Black-and-White Effect*, for example, instantly removes all color from the image (this effect can not be edited, however). A *2D Editor*, on the other hand, requires a few settings before the effect is applied (for example, a change of *Position*). Each *Editor* has a certain number of parameters, e.g. *Size* or *Rotation* to affect the image's appearance.

3 What is the difference between a clip effect (filter) and a transition?

A *Transition* requires two consecutive clips on the *Timeline*:

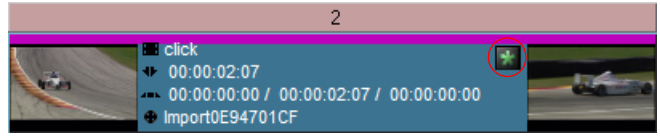


Position the *Transition* across the edit between clips. A *Transition* always requires two images (even if one of them is "black", or blank *Timeline*) and, therefore, always requires "leeway", i.e. material extending beyond the displayed clip length. With A/B editing, the same clip would look like this:



The two red arrows indicate the extra "leeway".
If there isn't enough leeway, the *Transition* turns completely or partially red.

A clip effect (often called a "filter") is generally applied for the entire length of a clip. The effect can change during the course of the clip but doesn't have to. In the one case, the effect would be static (e.g. a consistent and uniform saturation) and, in the other, dynamic (e.g. a 2D motion effect).
A clip effect is indicated by an effect icon and a colored line along the top of the clip:



Clip effect with icon and colored line

You can apply a clip effect to the entire *Timeline Track* (i.e. to all the clips on the *Track*). To do so, drag the effect to the *Track*'s title bar. This will cause a colored line to be displayed there. Using this procedure you can, for example, change all the video clips on a *Track* to monochrome or reduce their size - or both, since you can also apply multiple effects.
Pay attention to the sequence of CPU and GPU effects.

4 How do I apply a clip effect?

The easiest way is to drag the effect you want from the *Rack* and drop it on a clip.

Please note: for maximum performance apply CPU effects before you apply GPU effects.
(But there are also other options: see "*Opening Effect Editors and Editing Clips (= Applying FX Editors)*" on page 512.)

5 How do I apply a transition?

Drag the desired *Transition* to the edit between two clips. Important: Even if there is only one frame between the clips, you won't be able to drop the *Transition*. Make sure you have enough "leeway" (*page 627*).

6 How do I edit effect parameters?

First you have to open the Effect Editor. In the case of Clip FX, right-click the colored effect line along the top of the clip or the effect icon to display the shortcut menu. Then select the editor (if more than one effect has been applied), followed by *Edit*.
For *Transitions*, just double-click the *Transition*.
Now change the parameters using the sliders on the left-hand side (e.g. for *Size* and *Position* in the *2D Editor*). Or you can use the tool buttons on the right-hand side, which will allow you to change parameters directly in the inlay (click and drag).

7 What are Key Frames and what do I need them for?

You do not always need *Key Frame*s. Static Clip FX don't require *Key Frames*. If you don't want to continuous or dynamic change during the clip's duration, open the editor, go directly to the *Options* tab and click *Do not use Keyframes*. Any modification is then applied equally to each individual frame of the clip.

Motion, change and dynamic effects, however, require at least two *Key Frames*. The first *Key Frame* contains the initial state and the second contains the end state. The change takes place between the two, all intermittent states are interpolated.
Do not deactivate the *Key Frames* in a *Transition*.
Also see "*Key Frames*" on page 518 or the section in this chapter on "*Parameter Curves*" on page 615.

8 Can I save effects I created myself?

Yes, on the *FX* tab in the *Project* window. The *Library* is reserved for the effects supplied with the product. Right-click the effect (either a *Transition* or Clip FX on the *Timeline*) to display the shortcut menu and select *Copy*. In the *Project*, go to the *FX* tab, create a new *Rack* and insert your effect there. You should also name the effect to make it easier to identify for later use.

When you call an effect by double-clicking it and you then edit and close it, a query is displayed asking whether you want to save this effect permanently. If you click *Yes*, the effect is stored on the *FX* tab in a *Rack* named *New FX*, where you should then assign it a unique name.



You can copy effects, *Racks* and *Rack Folders* from the *Library* tab to the *FX* tab, thereby creating your own selection of favorite effects, individually named and edited.

9 How do I delete effects?

Transitions: Click to select and press DEL.
Clip FX: Right-click the effect icon or the effect line to open the shortcut menu and select *Delete*.

Realtime Clip FX

Editors

Lens Flare

This effect generates an optical reflection that radiates outward in all spectral colors just as it would appear if light hit a camera lens from the side.

Magnify

This effect generates a magnifying glass that can be moved across the image.

2D Editor (GPU)



Editor for two-dimensional effects (XY) including parameters for borders and shadow. For individual slide effects, enlarging/reducing image size.

2D Editor (CPU)

The *Classic 2D Editor* is also available on the CPU realtime platform with an identical set of parameters. The only options not available are superimposing the *Title Safe Area* and displaying gridlines when zooming into the *Canvas*.

The *Options* tab contains the *Quality* settings. Click *Manual* to access advanced parameters.

3D Editor (GPU)

Editor for three-dimensional effects (XYZ); for example, individual tumble effects.
You can also open the *2D* and *3D Editors* using the Effect Editor icons next to the *Master Viewer*.

3D-Editor (CPU)

The *Classic 3D Editor* is also available on the CPU realtime platform with an identical set of parameters. The only options not available are superimposing the *Title Safe Area* and displaying gridlines when zooming into the *Canvas*.

For information on quality settings, see *page 624*.

MultiShape Crop

This editor lets you crop an image from multiple sides and at all possible angles.
In the initial configuration, the image is displayed as an octagon. Using the parameters for *Radius* and number of *Sides* you can, for example, create a many-pointed star.

Note: Naturally, when discrete parameters such as the number of sides are used with dynamic effects (with Key Frames), it is only possible to jump from one state to the next - two sides to three sides to four sides, etc. This applies to all editors with discrete parameters.

MultiShape PIP

This effect is used for overlapping (multilayering) individually shaped images.

MultiShape SpotLight

This effect generates an area on the image that resembles the lighted field of a spotlight; you can define its size, position, color and shape.

Replicate

This effect multiplies the image by replicating and miniaturizing it, and also by scaling if you entered different values for horizontal and vertical replication.

Water Drop

This effect simulates the impact of a droplet falling onto the surface of water, producing expanding, concentric waves.

Water Wave

This effect is similar to Water Drop except that a straight wave approaches from different directions and rolls over the image.

Brightness and Contrast

This effect provides a simple brightness and contrast slider. In the default configuration, the RGB color channels are linked together but they can also be adjusted individually.

Full Crop

This effect is used for cropping the image on four sides - top, bottom, right and left.

Page Curl

This effect causes the image to roll up like a sheet of paper in a tighter or looser roll. The back of the page shows either the mirror image or a user-definable color.

Page Peel

Same as *Page Curl* except that the image is not rolled, i.e. the edge is always visible.

Accordion

This effect folds up the image in a series of parallel folds like an accordion.

Bevel Crystal

This effect generates the impression that you are viewing the image through a polished crystal. You can modify the pattern, the number and alignment of edges, and the refraction.

Cracked Slab

This effect produces a jagged crack through the image and divides it into two halves. You can edit the color, direction and shape of the crack.

Falling Crystals

This effect shatters the image into many pieces that slowly fall downward.

Curtain

This effect projects the image onto a curtain that can be pulled open to the left or right. The *Wind* parameter causes the curtain to wave in the wind more or less gently.

Cylinder

This effect projects the image onto a cylindrical surface.

Explosion

This effect breaks the image into many pieces so as to resemble an explosion.

Reflection

This effect is like viewing a motif across a pond and seeing it reflected in the water, with waves if desired.

Stained Glass

This effect is like viewing the image through glass with an irregular surface, causing distortion and magnification effects.



Base Color Correction

This effect lets you set the luminance (*Y correction* in the *Black, Gain* and *Gamma* brightness ranges), the individual color channels (red, green, blue), *Saturation* (Chroma) and *Hue*. *Brightness* and *Contrast sliders* are also available.
The *Colorspace Settings* help you avoid unreliable colors or stay within the CCIR standard. For more information, see *page 276*.

Auto Color Correct

This effect helps you repair a faulty white balance. As soon as it's dropped on the clip, the effect analyzes the video and immediately corrects it. If you want to help the correction process along, open the Editor to access the *Reference color*, *Contrast Gamma* (brightness) and *Color shift* parameters.

The *Reference color* is preset to white (because of the expected white balance). If you want to focus correction on another color that you believe was not correctly reproduced, select this *Reference color* as precisely as possible (the *Color Picker* dialog box also contains a *Pipette*).

However, these manual interventions require that you open the *Advanced settings* menu and shift the *Auto portion* slider to the left. This reduces the portion of fully automatic correction in the result and makes your changes more visible.

Blur

Blur is an adjustable defocusing. The blurred area can be enclosed.
This *Blur* is much closer to what a real-world camera lens would achieve and in that respect better than the *Gaussian Blur* (*Classic Filter Effect Editor*). On a dual CPU system, both processors will be utilized. You can switch of this option in the *High performance* menu. In single CPU systems, this option is inactive.

ChromaKeyer YUV

The Chroma Key lets you make specific areas of an image transparent to reveal the image underneath. The transparent image areas are defined by their color, which is why this is called a Chroma Key.

Defining a color

You can select the *Hue* angle (as designated by the center of the "pie piece", which you can also rotate by means of the mouse), a certain area around the selected hue center (modify *Discrimination* to make the slice bigger or smaller), and you can limit your selection by defining the *Saturation* (regions most saturated are at the edges of the color field).

Key Gain and Key Offset

Key Offset specifies the amount that is to be added or subtracted from the key image. *Gain* specifies the value by which the key image is multiplied. Higher gain provides higher contrasting keys with sharper edges.

Invert Key

reverses the region that is keyed out.

Spill Suppression

Spill Suppression is the mechanism for removing a color cast from the foreground image. Spill is usually caused by light bouncing off a monochrome background (such as a blue screen). The *Spill Suppression Angle* is normally set to the same or nearly the same value as the *Hue* angle. Therefore this value is set as an offset. Example: *Hue* angle = 340, *Angle Offset* = 10, the resulting *Spill Suppression Angle* is 350. *Gain* specifies how much of the spill hue to suppress. When set to 1, then full strength *Spill Suppression* is performed.

Helpers

Split Screen controls how much of the resulting image will show the key image. You can show the key in the lower or upper half of the image.

Invert

This effect maps the signal components on their opposite values - either all three simultaneously or one at a time: *Y* (brightness/luminance signal) and the *Cb* and *Cr* color difference signals.
It's best to view the results in a color bar. *Invert Y* exchanges black and white bars. Inverting *Cb* and *Cr* components maps a color on the color that is more or less directly across from it on the color wheel (for example, yellow on blue).
If there is an alpha channel, it can also be inverted.

RGB Difference Key CPU

This key works with similar hues, such as "blue" and a defined area surrounding this "blue". What is special about this editor is that you can select a key area of a specific size and shape (square, rectangular, circle, oval). The area is moveable. Important: To access square and rectangular shapes, open the *Shape* menu and set the *Transform* parameter to *0,0*. Raising the values makes the area rounder.

Luma Keyer

With a luminance key, only those areas of an image that have a specific brightness (Y) are made transparent. The brightness range around a middle value can also be provided with a soft transition to an unkeyed area. Parameters:

- *Center* -
  sets the center luma value that will generate a full key.
- *Radius* -
  sets the radius around the center value that will generate a full key.
- *Softness* -
  softens the transitions from key to non-keyed regions.
- *Gain* -
  multiplies the key value by the *Gain* constant
- *Offset* -
  adds or subtracts a constant value of an offset from the key.
- *Invert Key* -
  the pixels that were keyed out will become not keyed out, and vice versa.

Roll / Crawl

This editor has only two parameters: horizontal position and vertical position. It has been specially optimized for animating roll and crawl titles and is automatically applied when you create an animated title in TitleDeko.

Posterize

Posterize reduces the number of different colors in an image to produce a flatter effect resembling a poster.

Black-and-White

Removes all color information from the clip. Not editable.

Old Film CPU

If you want to give your video the look of an oldtime, worn-outfilm reel: Set parameters such as *Grain Amount, Scratches, Dust Amount* and *Trapped Hair*. Important: This effect results in a very high system utilization.

Sepia

Superimposes the monochrome, reddish-brown tint of a very old photograph onto the image.

Track Matte CPU

With *Track Matte CPU* it is possible to create a tailor-made, even animated alpha plane. An example of a track matte (also known as a travelling matte) is the view seen through the gun barrel in the opening credits of James Bond movies: You're looking out through the muzzle and following the movements of the actors in the background - until the shot rings out and blood runs down the screen.
You can now do this at home.

Set this effect using the *Timeline*'s *Matte Track* function (see the detailed description starting on *page 467*).

Parameter

- *Keyer Type* -
  Here you can define the source of the key information: *Luma* means that the key information (or alpha channel) will be generated from the luminance signal of the key clip; *Linear* means that the existing alpha channel of the key clip will be used. Title generators usually create clips with an alpha channel.
- *Center Value* -
  Defines the exact luminance value beyond which the foreground clip will become visible.
- *Radius* -
  Defines a range of values around the value defined as *Center value*.
- *Softness* -
  Creates a soft transition between the *Center Value* and the zero value.
- *Gain* -
  Multiplies the alpha channel created by the *Track Matte* effect by this value.
- *Invert key* -
  Inverts the alpha channel that *Track Matte* generates.
- *Transparency* -
  Controls the transparency of either the foreground image or the background image (depending on *Invert key* setting).

Swirl

Superimposes a whirlpool (as you see in your bathtub) over the image. Can be edited in several categories (*Size, Position, Angle*, etc.)

Sphere Section

Projects the image on a cone- or rhombus-shaped three-dimensional body, whose appearance can be altered with several controls.

Shards

The image disintegrates into many triangular pieces (roughly resembling shards). The shards can, among other things, be rotated and, similarly to the explosion effect, disappear beyond the image frame.

Tiles

The image disintegrates into a definable number of rectangles. You can influence the distribution as well as some other parameters.

Reverse CPU

Reverses the playback direction (video only).

Interframe is the preset and should primarily be used for interlaced video (meaning video comprising two fields, such as NTSC and PAL). In the case of progressive video, *Intraframe shift* can improve performance.

Stabilize

This effect attempts to stabilize a shakey recording. However, it works only up to a point. It can compensate horizontal and vertical movements but not rotating movements (around the Z-axis). Do not use this effect for long pan shots. The image is enlarged slightly to create leeway for stabilization.

Presets

In these *Racks* you find predefined effects, arranged by GPU and CPU. It's a good idea to turn to *Picon* view to get an idea of what these effects do.

Audio FX

See *"Audio Effects"* on page 868 and *"Avid Liquid Plugin Audio Effects (VST)"* on page 875.

Realtime Transition FX

Editors

2D/3D GPU

These two editors differ only with regard to the 3D parameters (Y and Z Rotation). Both are processed by the graphics processor.

2D/3D CPU

The *Classic 2D Editor* is also available on the CPU realtime platform with an identical set of parameters. The only options not available are superimposing the *Title Safe Area* and displaying gridlines when zooming into the *Canvas*.

Dissolve CPU

Standard transition

Cross Dissolve GPU

Standard transition

Dissolve Through Color

Dissolves from an image to a selectable color and from there to the next image: Or the dissolve can be set so that it becomes increasingly transparent (alpha) to reveal the clip underneath.

Gradient Wipe

This transition provides over 400 gradient patterns for designing the transition.
Note: Alpha Magic Wipes are part of the *Classic Transition FX Gradient Wipe Editor*.

Gradient Wipe with Border

This transition provides additional parameters for designing a border.

Page Curl and Page Peel

As described under filters, but for transitions.

Band Wipe

The new image advances across the old image from both sides and in a definable number of bands, like the teeth of a comb.

Barn Doors

The new image advances across the old image from both sides like the two wings of a barn door. Parameters such as direction and colored border permit variations on this theme.

Clock Wipe

The new image covers the old image in a growing, round segment like the sweep of a hand of a clock.

Gradient Wipe

This is a wipe effect with 400 *wipe* patterns.

Inset

This is a wipe effect in which the new image starts in one of the four corners and gradually covers over the old image until it is completely hidden.

Iris Cross

This is a wipe effect in which the image is divided horizontally and vertically into four square segments; depending on the effect direction, these segments gradually become smaller to reveal or hide the new image.

Iris Diamond

This wipe effect forms an overlap in the shape of a diamond (square standing on a corner).

Iris Round

This wipe effect forms a round overlap.

Iris Square

This wipe effect forms a square overlap (edges parallel to image).

Push

One image pushes the other either to the side or upward or downward.

Radial Wipe

The previous image is tipped out of the visible area via one of the four corners, revealing the new image.

Slide

Slides the new image over the previous one.

Wedge Wipe

Same as the *Clock Wipe* except that the segment grows in both directions (with the *Clock Wipe*, one of the two "hands of the clock" remains fixed).

Wipe

Same as *Slide* but with two additional parameters (*Edge Softness* and *Border*).

Presets

In these *Racks* you find predefined effects, arranged by GPU and CPU. It's a good idea to turn to *Picon* view to get an idea of what these effects do.

Audio FX

- *CrossFade* -
  Standard audio cross fade

Hollywood FX

The Pinnacle Hollywood FX included with Avid Liquid are also realtime-capable. Hollywood FX count among the GPU effects.
The *Hollywood FX Editors* are located on the *Library* tab in the *Realtime Transition FX* and *Realtime Clip FX Racks.* The *Transitions* have a number of *Presets* that can be found in the *Presets* folder.

Additional Realtime Capabilities

In addition to effects, the realtime capabilities of Avid Liquid come into play in other areas as well.

Realtime Color Correction in the Clip Viewer

The *Clip Viewer's* extended dialog box contains functions for primary color correction. These include luminance, red-green-blue in the black, gamma and gain ranges, and control by means of hue and saturation.

For more information, see the section entitled "*Primary Color Correction, Playback Level and Scene Detection*" on page 276.

Titles and Graphics with Alpha

Still, roll and crawl titles are played across a video in realtime. The number of layers possible (i.e. the number of titles you can place on top of one another) depends on your system's performance capability.

Audio Effects

Avid Liquid's standard audio effects as well as all VST plugins continue to be realtime-capable. See "*Audio Effects*" on page 868.

Chapter 12

Commotion Clip FX

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Avid Liquid's Commotion Clip FX are sophisticated clip effects aimed at high-end compositing and image touch-up. They provide all tools needed for superior keying and matte effects as well as stunning particle effects.

Please also refer to the Acrobat PDF version of this Reference Manual (accessible via the Online Help). Most of the figures are represented in color, which in many cases makes understanding the effects a little easier.

Avid Liquid's Commotion Clip FX were originally programmed for Pinnacle Commotion Pro. Commotion Clip FX are stored in..*[Avid Liquid program directory]*\PlugIns\RTFx\AE and have the *.AEX extension.

Common effect elements *page 645*

Description of all Commotion Clip FX *page 649*

Common Effect Elements

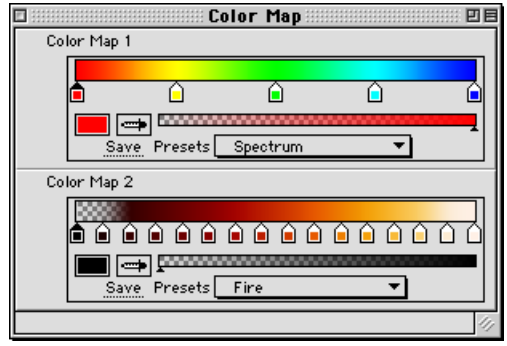
Many of the effects share several common parameters. To save space, we're describing these parameters in detail here, rather than explaining them for every effect that uses them.

The Color Map

The *Color Map* is a powerful map generator that gives you precise control over color and transparency transitions throughout the map.

Several of the Commotion Clip FX in Avid Liquid use the color map controls, including *Color Map*, *Fractal Fire, Fractal Clouds, Fractal Brimstone,* and *Fractal Tunnel*.

The *Color Map* dialog box is an intuitive gradient designer like those in Adobe Photoshop and similar programs. You can add up to 32 colors to the gradient, edit any marker by using the eyedropper or the color picker, and even adjust transparency.



Color Map dialog box (actual implementation may differ)

Much of the power and realism of effects like *Fractal Clouds, Fractal Fire, and Fractal Brimstone* comes from using the color map effectively and understanding how functions like *Gain* interact with it.

We encourage you to become familiar with the color map functions of Avid Liquid Commotion Clip FX so you will have the maximum designing power at your fingertips.

Using the Color Controls

The color controls consist of the following:

- *Color bar* -
  This strip along the top illustrates the color mapping in effect.
- *Color markers* -
  These markers specify the color and transparency at the point where they touch the map gradient. The triangle at the top of a marker is black when it is selected.
- *Transparency bar* -
  Click in the lower bar to set the transparency (alpha) of the selected marker. The little triangle under the transparency bar identifies the setting of the current marker.
- *Color swatch* -
  click this swatch to open the standard system color picker, where you can specify the color of the current marker.
- *Save button* -
  Click *Save* to save the current color bar as a preset. A standard *Save* dialog box will open with the *Color Map Presets* folder selected. Type a name for the preset and save. The preset will immediately be available to the other color controls.
- *Presets menu* -
  Choose a preset from this menu to load it into the color bar.

Editing Markers

You can change a marker's position, color, or transparency; create new markers; and delete markers.

- Click a marker to select it. The tip of the selected marker will be black.
- Set a marker's position by clicking it and dragging it sideways.
- Change the color of the selected marker by clicking the color swatch on the left side of the control.
- Change the transparency of the selected marker by clicking the transparency bar. The left side is completely transparent, and the right side is completely opaque.
- Create a new marker by clicking in the color bar. The new marker will start with the color at that point.
- Delete a marker by clicking it and dragging down until the marker pops off the color bar. Release the mouse button.

Managing Presets

Presets are small files stored in the *Color Map Presets* folder, which must be in the same folder as the active copy of Avid Liquid. If you have more than one copy of Avid Liquid, you can share a presets folder by putting an alias to it in the other folder.

The preset names in the presets pop-up menu are the same as their file names, so you can use the Windows Explorer to copy, rename, and delete presets. Any changes are immediately reflected in the color controls.

You can share presets with other people by placing a copy of the preset files in their copies of the *Color Map Presets* folder.

Note that the *Color Map Preset Manager* file exists only to provide icons to the preset files. It is not an application. Double-clicking a preset file will not do anything useful.

Blend With Original

All Commotion Clip FX include the *Blend With Original* (*Blend*) control. Use this control to set the amount of the effect applied, or to have the effect gradually fade in or fade out. If you set *Blend With Original* to 0, the effect is applied without any fade-in or fade-out; if you set it to 100, the effect does not appear to have been applied at all.

RGBA Channels

In many of the effects, you can designate a specific channel or channels to which the effect will be applied. These channels are as follows:

- *RGBA* -
  includes the red, green, blue, and alpha channels of the clip.
- *RGB* -
  includes the red, green, and blue channels only.
- *Red* -
  affects the red channel only.
- *Green* -
  affects the green channel only.
- *Blue* -
  affects the blue channel only.
- Alpha -
  affects the alpha channel only.

YIQ Channels (NTSC Color Space)

Many effects also allow you to apply effects in the NTSC standard chrominance and luminance color space known as YIQ. The YIQ channels are as follows:

- *Luminance* -
  represents the luminance channel, designated by the letter *Y*.
- *Chrominance* -
  represents the chroma channels, designated by *I* and *Q*.
- *In Phase Chrominance* -
  represents the in-phase chrominance channel, which is designated by the letter *I*.
- *Quadrature Chrominance* -
  represents the quadrature chrominance channel, which is designated by the letter *Q*.

Preview Alpha Only

Many of our Commotion Clip FX include a *Preview Alpha Only* check box that lets you see the alpha channel more clearly by replacing the RGB channels of the image with white. This has the same effect as viewing the alpha channel in the effect windows, but provides a convenient toggle. Note that this shows only the current layer's alpha channel as produced by the effect. Successive effects and layers may obscure the alpha channel preview.

Description of all Commotion Clip FX

What they are

Commotion Clip FX are all Clip Effects (as opposed to *Transitions*).
Although clips with *Commotion Clip FX* are displayed with a yellow *Slice* on the *Timeline* and are immediately played back at a low frame rate, the effects must in fact be rendered (in the background) to obtain a clear impression.

How they work

Commotion Clip FX share the standard RT Effect Editor interface. For basic information on how to select parameters, *Key Framing* and time curve editing please refer to chapters “Finish” or “Realtime FX”.

Where they are

Commotion Clip FX can be found in the *Library* tab of the *Project* window or *Project Browser*, in a *Rack Folder* called *Commotion Clip FX*. The folder contains the following *Racks*:

Blur and Sharpen *page 650*

Channel *page 656*

Color Correct *page 656*

Distort *page 661*

Image Control *page 674*

Keying *page 677*

Matte *page 687*

Noise *page 699*

Particles *page 702*

Stylize *page 712*

Video *page 721*

Blur and Sharpen

The *Blur* and *Sharpen* effects contain Commotion Clip FX routines for blurring and sharpening clips.

Blur *page 650*

Channel Blur *page 650*

Edge Blur *page 651*

Edge Blur EZ *page 652*

Motion Blur *page 652*

Radial Blur *page 653*

Sharpen *page 654*

Super Blur *page 654*

Unsharpen *page 655*

Blur

Blur is a general-purpose blurring effect that softens image detail; sharp edges are lost while large features remain. It gives you precise control over blurring in the horizontal or vertical directions and allows separate blur amounts in individual channels in both YIQ and RGBA spaces.

- *Type of Blur* -
  determines whether the blur is *Gaussian* or *Box*.
- *Channels* -
  determines the channel or combination of channels to which you apply the blur effect. You can choose from RGB or YIQ channels.
- *Link Vertical* -
  links the vertical blur to the amount of horizontal blur.
- *Horizontal* -
  controls the amount of horizontal blur.
- *Vertical* -
  controls the amount of vertical blur.

Channel Blur

Like *Blur, Channel Blur* is a general-purpose blurring effect that softens image detail; sharp edges are lost while large features remain. It also gives you precise control over blurring horizontally and vertically, but it allows separate blur amounts only in the red, green, blue, and alpha channels. Parameters:

- *Type of Blur* -
  determines whether the blur is *Gaussian* or *Box*.
- *Link Vertical* -
  links the vertical blur to the amount of horizontal blur.
- *Red, Green, Blue, and Alpha Horizontal* -
  control the amount of horizontal blur for each specific channel.
- *Red, Green, Blue, and Alpha Vertical* -
  control the amount of vertical blur for each specific channel.

Edge Blur

Edge Blur applies a blur to the edges of your image, as defined by the alpha channel. You can use this type of edge treatment to composite multiple images to correct ragged edges; make computer-generated graphics, animations, and text look more organic and photorealistic; and to more convincingly blend and integrate multiple images.

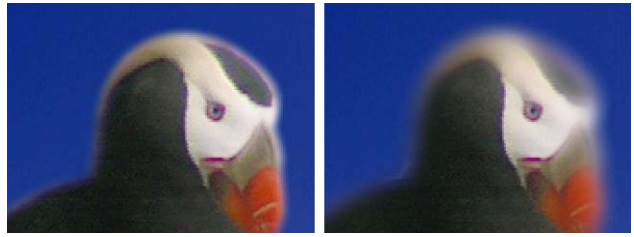
To treat edges, *Edge Blur* uses the "Super Blur" algorithm, which quickly and easily produces high-quality blur effects. It finds the edge of the composite element and blurs the edge pixels outward.



Key frame the *Edge Width* to compensate for perspective changes. For example, the width of the edge should decrease as someone recedes out of a frame closeup in a keyed composite, so the whole layer does not blur out.

- *Blur Amount* -
  specifies the amount of blur that is applied to the edge in the alpha channel. Higher numbers create more blurring.

- *Edge Width* -
  controls how wide the blurred area will be based on the edge in the alpha channel.



Edge Width

Edge Blur EZ

Edge Blur EZ is a simplified version of *Edge Blur* that controls the blurring and edge size with one *Blur Amount* value.

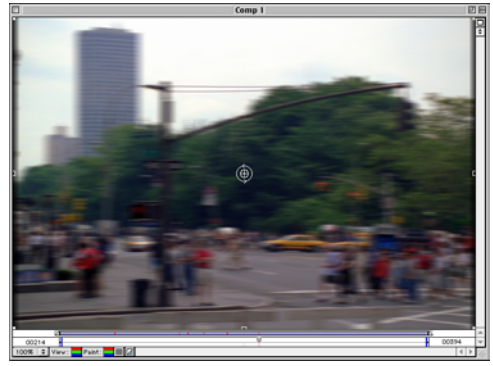
- *Blur Amount* -
  specifies the amount of blur that is applied to the edge in the alpha channel. Higher numbers create more blurring.

Motion Blur

Motion Blur blurs the image in any direction to simulate the blur that occurs naturally when objects move on film. Using this effect, you can simulate motion blur without having to add keyframes or move a layer. The effect blurs an image along the vector you specify, at any angle.

- *Angle* -
  specifies the angle of the blur.
- *Blur Length* -
  specifies the distance covered by the blur.

- *Start Angle* -
  determines where the blur begins. By default, the *Start Angle* value is 180°, causing the blur to radiate from the center. Higher values offset the blur to the left; lower values offset them to the right.



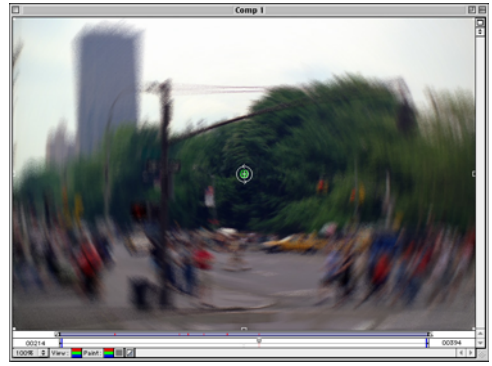
Motion blur

Radial Blur

You can use the *Radial Blur* effect to create two types of blurs: zoom and spin. *Zoom* blurs create blurs in depth. *Spin* blurs appear to spin about the center, defined by the *Center* point parameter.

- *Channels* -
  determines the channel or combination of channels to which you apply the blur effect. You can apply it to the red, blue, green, of alpha channel individually, RGB, or RGBA.
- *Center* -
  determines the position of the blur by specifying its center on the *x* and *y* axes.
- *Type* -
  determines whether the blur is a *spin* blur or a *zoom* blur.
- *Amount* -
  determines the amount of blur and spin.

- *Quality* -
  determines the quality of the blur. Higher quality results in smoother blurs; low-quality blurs settings will appear grainy.



Spin type of radial blur

Sharpen

Sharpen increases the contrast of the color edges in an image, making these edges more distinct. The *Sharpen* effect also enhances noise or graininess. The effect is very local, mixing only adjacent pixels.

- *Channels* -
  determines which channel or combination of channels will be sharpened. You can choose from the individual channels of the RGB color space or sharpen all the channels at once.

Super Blur

Super Blur creates two attractive blur types.

- *Blur Type*
  controls the type of blur: *Faster* or *Better*:
  - *Faster* creates a Box blur effect at an extremely high speed.
  - *Better* creates a better-looking Gaussian blur. It is slower than the *Faster* setting.
- *XY Control* -
  determines whether the *x* blur and *y* blur are independent or change together.
- *X Blur Amount* -
  sets the amount of horizontal blur from 0 to 100.

- *YBlur Amount* -
  sets the amount of vertical blur from 0 to 100.

As with most other Commotion Clip FX, double-clicking the numeric value opens an edit field where you can type in the value directly. This dialog box also displays the maximum and minimum allowable values, which in most cases are beyond the values displayed on the slider.

- *Alpha Channel: Blur Alpha* -
  applies the blur effect to the alpha channel as well as to the RGB channels. Disabling *Alpha Channel: Blur Alpha* blurs the image while keeping the alpha channel's edge, giving you additional control when making complicated composites.

Unsharpen Mask

Unsharpen Mask increases the contrast between colors that define an edge while adjusting the edge detail to make the image appear sharper.

- *Channels* -
  determines the channel or combination of channels to which you apply the effect. You can choose from the individual channels of the RGBA color space.
- *Amount* -
  controls the degree by which the brightness of edge pixels is increased.
- *Link Vertical* -
  links Vertical radius to Horizontal radius.
- *Horizontal and Vertical Radius* -
  define the number of pixels surrounding the edge to which the sharpening effect is applied. If you specify a high value, more of the pixels surrounding the edge are adjusted for contrast. If you specify a low value, only pixels at the edge are adjusted.
- *Threshold* -
  specifies a tolerance to define edges and to prevent overall contrast adjustment that might generate noise or cause unexpected results. The *Threshold* value defines the range of contrast between adjacent pixels before contrast is adjusted. A lower value produces a more pronounced effect.

Channel

This is currently a one-member group:

Shift Channels

Shift Channels replaces the alpha, red, green, and blue channels of a clip with other channels.

To replace one channel with another, select the new channel from the list menu next to the name of the channel being replaced. The menu contains 10 choices: *Alpha, Red, Green, Blue, Luminance, Hue, Lightness, Saturation, Full On,* and *Full Off*. (*Full On* provides 100% of the color, such as 100% blue; *Full Off* results in 0% of the color, so blue set to *Full Off* might result in yellow.)

Color Correct

The Color Correct group of effects contains effects for correcting the color in clips and other elements.

Color Balance HLS *page 657*

Color Balance RGB *page 657*

Color Map *page 657*

Replace Color *page 659*

Tint *page 660*

Color Balance HLS

Color Balance HLS changes the color of your clip by independently adding to or subtracting from the *Hue, Lightness,* and *Saturation* (HLS) values.

- *Hue-*
  controls the image's color scheme, represented by an angular control.
- *Lightness -*
  controls the lightness or darkness of the image.
- *Saturation -*
  controls the color intensity of the image.

Color Balance RGB

Color Balance RGB changes the color of a clip by independently adding to or subtracting from the *Red, Green,* and *Blue* values.

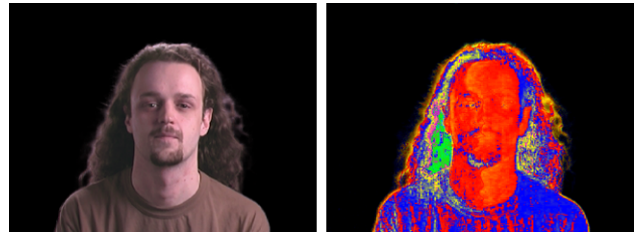
- *Red -*
  controls color balance in the red channel.
- *Green -*
  controls color balance in the green channel.
- *Blue -*
  controls color balance in the blue channel.

Color Map

Color Map colorizes an image using a pair of sophisticated color blend ramps. Stylize your footage with bold color treatments, add duotone and tritone style colorization, or recolor an image dramatically to create editorial transitions. *Color Map* can be used for fine control of monochrome images, spot matting using transparent bands, and psychedelic color transformations. The custom color controls include up to 32 markers, each specifying a color and transparency. A preset pop-up menu lists saved color maps, making it easy to copy them from one color control to another.

Important: please read also "*The Color Map*" on page 645.

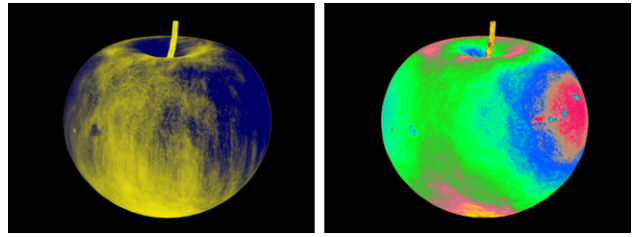
The figure below shows a color map for an image.



Color Map

Custom controls in Avid Liquid cannot be animated, so *Color Map* provides two color controls and the *Map 1 <-> Map 2 Blend* percentage to blend between them.

- *Attribute to Map-*
  specifies which channel of the layer is to be mapped. This image shows color maps based on saturation and brightness:



Color Maps based on saturation and brightness

- *Alpha: Preserve Alpha -*
  prevents Color Map from exposing the image outside the layer's alpha channel or mask. Transparent areas in the color blend can still punch holes in the existing alpha channel.
- *Colors: Premultiply Colors -*
  treats areas with a low alpha value as dark. Disable this option to avoid color fringing on anti-aliased images.
- *Color Map 1 -*
  specifies how the selected channel will be colored. The left side of the color bar sets the color of the channel's 0 value, and the right side maps the channel's 255 value. The rest of the control is used for editing.

- *Color Map 2* -
  is identical in function to Color Map 1.
- *Map 1 <-> Map 2 Blend* -
  blends the effects of the two color maps. At 0%, only the top map has an effect. At 100%, only the bottom map is used. Use this percentage to produce the effect of an animated color map, or key-frame it to produce animated blends and transitions. The picture here shows a twenty-dollar bill with remapped colors.



Twenty-dollar bill with remapped colors

Using the Color Controls

The color controls are described in detail in "*The Color Map*" on page 645.

Replace Color

Replace Color replaces one color with another or keys out the selected color to make the areas that contained it transparent. You define criteria based on hue, lightness, and saturation tolerance. A color matching scheme then uses those criteria to replace or key a color, using the hue, lightness, and saturation transforms you define.

View

specifies a view of the layer for which the color is to be manipulated. The *View* menu contains two choices:

- *Corrected Layer* -
  shows the layer with *Replace Color* applied.
- *Color Correction Mask* -
  shows a grayscale representation of the area to which the effect will be applied.
- *Key Selection* -
  keys out the color specified in *Source/Key Color*.

- *Source/Key Color* -
  specifies the color for the *Source/Key Color*. Use the eyedropper to sample a color from the Effect window, or click the color tile to open the color picker.
- *Hue Tolerance* -
  controls the range of hues that match the color to be replaced.
- *Lightness Tolerance* -
  controls the range of lightness values that match the color to be replaced.
- *Saturation Tolerance* -
  controls the range of saturation of colors that match the color to be replaced.
- *Match Softness* -
  controls the match criteria. As *Match Softness* approaches 0, all colors within tolerance are more completely affected, with a value of 0 resulting in a hard match and all matching colors being completely affected. A value of 100 causes colors that match exactly to be completely affected and nearby colors to be partially affected.
- *Invert Selection* -
  causes the opposite of what is specified to occur. For example, colors that did not match before now do, and colors that did match before no longer do. Partial matches are also inverted.
- *Hue Transform* -
  controls the angular progression of the hue of the replacement color.
- *Lightness Transform* -
  controls the lightness, or brightness, value of the replacement color.
- *Saturation Transform* -
  controls the saturation value of the replacement color.

Tint

Tint changes the color information for your clip. You control these changes by specifying the colors to which black and white pixels are mapped.

- *Map Black To* -
  controls the colors to which black is mapped.
- *Map White To* -
  controls the colors to which white is mapped.
- *Amount to Tint* -
  controls the amount of tinting.

Distort

This group contains a variety of distortion effects.

Corner Pin *page 661*

Hall of Mirrors *page 662*

Mirage *page 664*

Turbulence *page 668*

Turbulence EZ *page 671*

Turbulent Edges *page 672*

Corner Pin

Corner Pin slants, scales, or applies perspective to a clip. Basically, you treat the clip as if it were a sheet of rubber—stretch any corner and pin it in place.

Top Left, Top Right, Bottom Left, and Bottom Right

These four reference points represent the corners of a distortion grid for the image. By moving the reference points, you can slant the image or apply different scaling at each corner.

In addition, a custom control allows you to visually scrub.

- *Perspective* -
  adds a sense of perspective to the clip with *foreshortening*. Imagery toward the top of the clip is compressed; imagery toward the bottom is expanded. Foreshortening gives viewers the sense that the higher portion of the image is more distant.
- *Inverse* -
  causes each corner of an image to move in the inverse direction from where it is placed. Dragging a corner point down and to the left will cause the corner to move up and to the right.

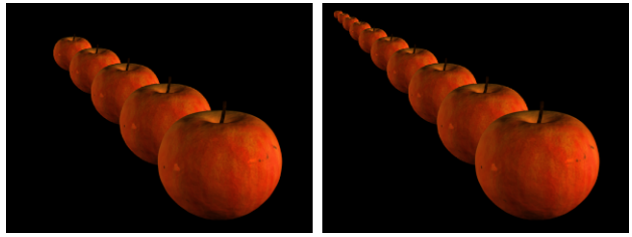
Hall of Mirrors

Hall of Mirrors creates multiple reflections of the layer and provides controls to affect the reflections. *Hall of Mirrors* can create myriad design effects, from simulating infinite mirror reflections to creating visual echoes and motion trails. The image below shows an example of the *Hall of Mirrors effect*.



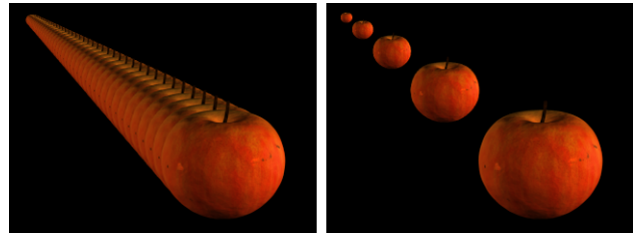
Hall of Mirrors example

- *Images* -
  specifies the number of object reflections.



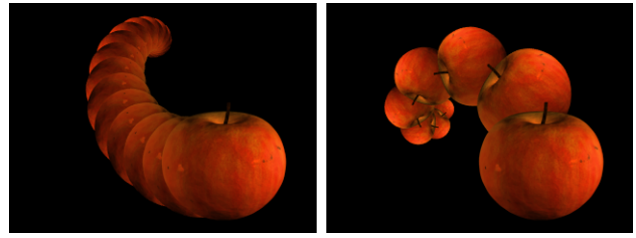
Five and 10 images

- *Scale* -
  determines the scale relationship between iterations. This setting controls the relationship between iterations, so anything less than 1.0 will yield reflections shrinking into the distance:



Fifty images at 0.95 scale; five images at 0.55 scale

- *Rotation* -
  controls the rotational relationship between iterations. The setting is applied to each reflection relative to the one before it:



Rotation examples

- *Offset* -
  specifies an offset from the original layer that is applied between each reflection. If you like, you can drag the offset producer point beyond the edge of the composite.

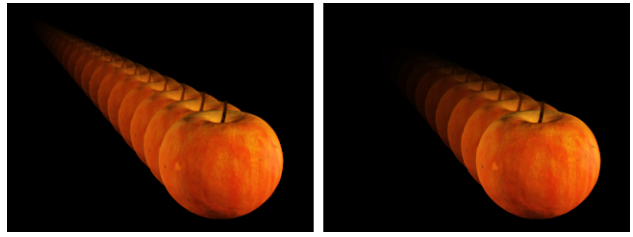
Transfer Mode

controls how the mirror effect is applied.

- *Behind* -
  draws the reflections behind the original layer.
- *In Front* -
  draws the reflections in front of the original layer.

The other transfer modes are the standard transfer modes.

- *Fade* -
  controls the fade relationship between reflections. Each time a reflection is rendered, this setting determines how much more it should fade than its predecessor (see below).



Fade examples

Mirage

Mirage simulates mirages, heat waves, jet wash, and other thermal currents that may cause distortion patterns within your effect shot.

Mirage can be used as a central design theme within an animation, or it can be used as a realism-enhancing touch to elements of fire, light, explosions, or other hot properties within your effect shot. This image shows an example of the mirage effect:



Apple mirage

View Mode

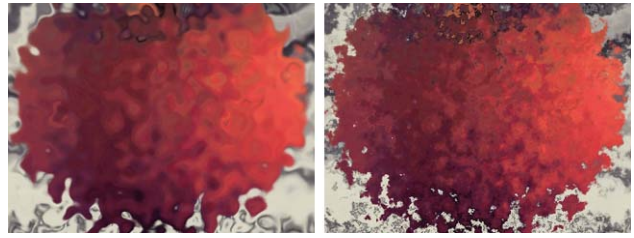
determines what is shown in the Composite window.

- *Normal-*
  shows the composite with the mirage effect applied.
- *Distortion Field -*
  shows a graphical representation of the area that will be affected by the mirage effect.
- *Gain -*
  controls the amount of distortion in the mirage effect. Higher numbers distort the underlying image more:



Gain examples

- *Detail -*
  determines how much high-frequency distortion is visible in the mirage:



Detail examples

- *Scale* -
  specifies the size of the waves within the mirage. Higher numbers make more waves:



Scale examples

- *Aspect Ratio* -
  values above 50% stretch the mirage horizontally; negative values stretch the mirage vertically:



Aspect Ratio examples

- *Blur* -
  controls how much blur is added to the distortion. More blur creates hot, close, jet-wash type images; images with little or no blur more closely resemble distant distortions like desert mirages:



Blur examples

- *Velocity* -
  determines the speed of the distortion field. Higher numbers make faster distortions.

- *Mutation Rate* -
  controls the speed at which the distortion field ripples and changes. Higher numbers create faster mutations.
- *Mutation Offset* -
  controls where in the fractal space the mirage is positioned. With *View Mode* set to *Distortion Field*, use *Mutation Offset* to view the fractal texture of the distortion effect. After you find a texture you like, mutate it with Mutation Rate. *Mutation Offset* can also be animated for nonlinear mutation effects.

- *Field Edge Scale* -
  specifies the size of the edge treatment of the distortion field. Larger numbers create a larger, less detailed edge.
- *Field Edge Amplitude* -
  controls the variation in the edge pattern turbulence. Higher numbers create stronger turbulence at the edge.
- *Field Side Feather* -
  determines the transition between the edges of the distortion field and complete transparency. With higher numbers, the transition is feathered more gradually, yielding a softer look.
- *Field End Feather* -
  sets the transition feathering at the tip of the distortion field. As with *Field Side Feather*, higher numbers create a more gradual fade-out.
- *Bend* -
  causes your distortion effect to bend to one side or the other, with negative numbers causing a leftward bend, and higher numbers causing a bend to the right (see below).



Bend examples

- *Wind-*
  specifies a vector, perpendicular to the distortion field, that bends the field to one side like wind. The direction of the vector is controlled by positive and negative values, and the strength is controlled by the amount of the value relative to 0.

For a realistic look, try keyframing gusts in this parameter.

Turbulence

Turbulence quickly and easily distorts images with turbulent noise.

Create water distortion, heat waves, and many other effects in your images. Create powerful organic distortions and exciting style effects, with maximum control:



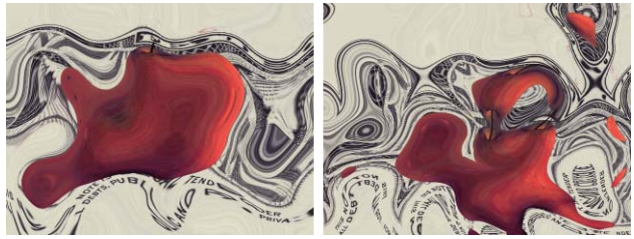
Turbulence example

Note that because the controls are identical for horizontal and vertical distortion, we've only explained them once.

Appearance

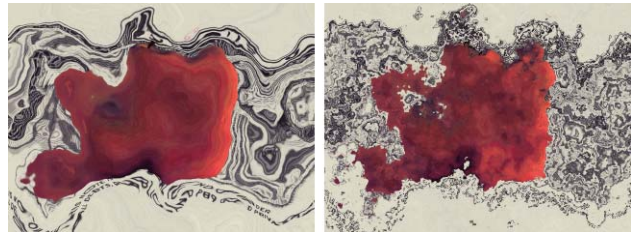
lets you choose between two different textures for the turbulent distortion field, giving you even more variety and control over the distortion effect.

- *Uniform -*
  returns a texture that looks more like distortions in water, heat waves, and reflections.
- *Turbulent -*
  more closely resembles turbulent fluid, as you can see here:



Uniform versus Turbulent

- *Detail* -
  determines how much detail is in the distortion field; it is similar in function to a focus or sharpness control. Increasing sharpness in the distortion field creates more abrupt transitions between distorted and unaffected areas of the image:



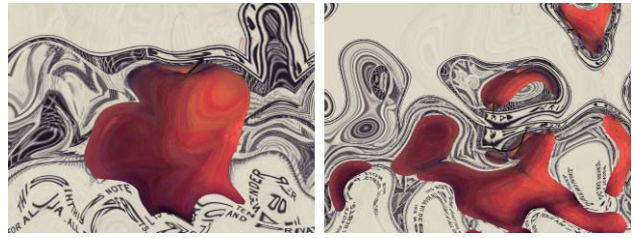
Detail examples

- *Scale* -
  controls how big the distortion field is. Bigger field sizes create bigger distortion areas and smaller sizes create smaller, busier, more detailed areas of distortion:



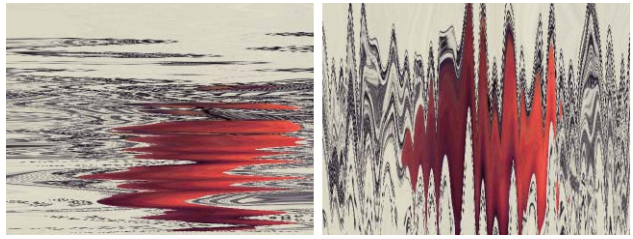
Scale examples

- *Gain* -
  controls the strength of the distortion field over the target layer. If you think of the distortion field as a wave pattern, *Gain* controls the overall amplitude of the wave:



Gain examples

- *Aspect Ratio* -
  stretches the distortion field horizontally when positive; negative values stretch the distortion field vertically:



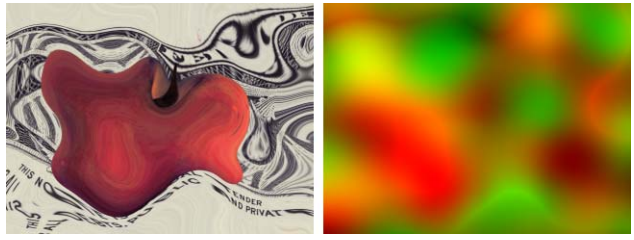
Horizontal and vertical Aspect Ratio values

- *Position* -
  controls where in the turbulent noise field the distortion field is centered. Animate this point to create drifts or eddies.
- *Mutation Rate* -
  controls the speed of the distortion field's change over time. Higher numbers create faster changes.
- *Mutation Offset* -
  controls where in the fractal space the distortion, and therefore the texture, is positioned. Use this control to find a texture you like, and then mutate it using *Mutation Rate*. *Mutation Offset* can also be animated for nonlinear mutation effects.

View

determines what is in the effect window.

- *Distorted Layer* -
  displays the target layer after distortion.
- *Distortion Field* -
  displays the distortion field as a red and green image. Red controls the horizontal distortion, and green controls the vertical distortion.



Distorted layer and corresponding distortion field

Turbulence EZ

Turbulence EZ is a simplified version of *Turbulence*.

- *Detail* -
  determines how much detail is in the distortion field; it is similar in function to a focus or sharpness control. Increasing sharpness in the distortion field creates more abrupt transitions between distorted and unaffected areas of the image.
- *Scale* -
  controls how big the distortion field is. Bigger field sizes create bigger distortion areas and smaller sizes create smaller, busier, more detailed areas of distortion.
- *Gain* -
  controls the strength of the distortion field over the target layer. If you think of the distortion field as a wave pattern, *Gain* controls the overall amplitude of the wave.
- *Aspect Ratio* -
  stretches the distortion field horizontally when positive; negative values stretch the distortion field vertically.
- *Position* -
  controls where in the turbulent noise field the distortion field is centered. Animate this point to create drifts or eddies.
- *Mutation Rate* -
  controls the speed of the distortion field's change over time. Higher numbers create faster changes.
- *Mutation Offset* -
  controls where in the fractal space the distortion, and therefore the texture, is positioned. Use this control to find a texture you like, then mutate it using *Mutation Rate*. *Mutation Offset* can also be animated for nonlinear mutation effects.

Turbulent Edges

Turbulent Edges modifies the edge of a layer's alpha channel to give an organic, rippling look. *Turbulent Edges* can add natural, chaotic edges to any layer. You can use this effect for a stylistic effect or an organic one.

- *Mutation Rate* -
  controls the speed at which the turbulence changes, where 0% creates no change, and 100% creates substantial changes on each frame.
- *Scale* -
  determines the size of the edge disturbance. Higher numbers produce more turbulence.



Scale examples

- *Sharpness* -
  sharpens the edges following disturbance. Higher numbers sharpen the image more:



Sharpness examples

- *Gain* -
  specifies how much of the effect will be applied. Higher numbers make the effect stronger:



Gain examples



Turbulent Edges works best with soft-edged alpha channel layers and masks. If you have a hard-edged layer or mask, you may need to increase *Gain* to see the effect. High *Gain* values can produce artifacts in deep concave edge corners. Applying an alpha bevel to the source image prior to applying *Turbulent Edges* may produce a more even result.

Image Control

Effects in the Image Control submenu affect standard image characteristics, such as brightness, contrast, black and white levels, and posterization.

Brightness and Contrast *page 674*

Invert *page 674*

Levels *page 674*

Posterize *page 676*

Threshold *page 676*

Brightness and Contrast

Brightness and Contrast adjust the brightness and contrast characteristics of your clip independently.

- *Brightness* -
  increases and decreases the lightness of the pixels in the clip.
- *Contrast* -
  increases and decreases the contrast of the image by mapping the pixel values of the clip to new values. Increasing *Contrast* makes light pixels lighter and dark pixels darker.

Invert

Invert reverses (inverts) the color information of a layer.

- *Channels* -
  determines the channel(s) to which the invert effect applies. You can choose from the individual channels of RGB or YIQ color space.

Levels

Levels changes the gamma of a clip, so you can redistribute the colors in a clip. The *Levels* effect has five distinct controls for the red, green, blue, alpha, and RGB channels.

Using the Levels effect on more than one channel at once, rather than repeating the effect for each channel, provides more accurate color correction and preserves the quality of the image.

Histogram

The histogram displays the number of pixels in the channel at values ranging from 0 to 255. This shows whether the values of pixels are distributed throughout the possible range; if not, you may be able to improve the quality of the image by remapping the pixels' values to make better use of the available range.

Input Black and Input White

The triangle sliders on the first line under the histogram represent the lower and upper ends of the range of input values included in the remapped output. The middle sliding triangle on the Input slider (top slider) represents the gamma curve. This curve controls the distribution between the lower and upper ends of the input values (as set by the left and right sliding triangles on the Input slider).



Moving the Input sliders toward the middle increases the contrast in the image, and moving the Output sliders in decreases the contrast of the image. Using the Levels effect is different from changing the contrast with the Brightness and Contrast effect because the Levels effect can weight changes toward the highlights or the shadows. You can also adjust the gamma curve with the Levels effect.

Output Black and Output White

The black left and white right sliding triangles under the gradient show the output values to which the input range is remapped. To change dark—but not black—areas to black, drag the left *Input* slider to the right and leave the left *Output* slider all the way to the left of the *Output* slider bar. To lighten black areas, making them gray, drag the left *Output* slider to the right and leave the left Input slider all the way to the left. To change light—but not white—areas to white, drag the right *Input* slider to the left and leave the right *Output* slider all the way to the right of the *Output* slider bar. To darken white areas, making them light gray, drag the right *Output* slider to the left and leave the right *Input* slider all the way to the right.

- *Input Min and Input Max* -
  specify the minimum and maximum input values for the channel.
- *Output Min and Output Max* -
  specify the minimum and maximum output values for the channel.
- *Gamma* -
  specifies the gamma value for the channel.

Posterize

Posterize changes the number of tonal levels (or brightness values) for each channel in an image. The effect then remaps each pixel to its closest matching level.

- *Level* -
  designates the number of tonal levels in the image. For example, the default value of seven tonal levels in an RGB image gives you seven tones for red, seven tones for green, and seven tones for blue.

Using the Posterize effect

While the effect generated by the *Posterize* effect is most evident when it is applied to a grayscale image, *Posterize* also produces interesting and unusual effects in RGB images. Using the *Levels* effect in conjunction with *Posterize* allows you to adjust the number of tonal levels in each channel to which the *Posterize* effect will remap existing colors.

Threshold

Threshold converts color or grayscale clips to high-contrast, black-and-white clips.

- *Threshold* -
  sets the median threshold value for the effect. All pixels lighter than the *Threshold* value are converted to white, and all pixels darker than the *Threshold* value are converted to black.

Keying

This group contains a number of keying effects.

Blue Screen Key *page 677*

Color Key *page 679*

Green Screen Key *page 680*

LumiKey *page 680*

Smooth Screen *page 682*

Spill Killer *page 684*

Spill Killer EZ *page 686*

BlueScreen Key

BlueScreen Key compares the blue channel to the red and green channels and creates a matte based on the differences.

- *Min and Max* -
  specify the minimum and maximum threshold values. Values below the minimum are black; values above the maximum are white; and everything in between is a gradation of grays between the two.

While it is possible to set a minimum value higher than the maximum value, Avid Liquid always treats the lower value as the *Min* value and the higher as the *Max* value. For example, values of *Min* 40 and *Max* 60 will be treated the same as *Min* 60 and *Max* 40.

- *Suppress Blue Spill* -
  makes the value of the blue channel the same as the *Min* value to remove blue spill. When footage is filmed against a bluescreen, a blue tint, or *spill*, may appear on the foreground image. Linking the blue channel to the *Min* value removes this blue from the foreground.
- *Invert Matte* -
  reverses the black and white areas of the matte.

Merge Matte

combines the matte created by the keyer with any pre-existing matte in the alpha channel of the image. This can be used to build up a complex matte.

- *None* -
  ignores the alpha channel and replaces it with the keyed matte.
- *Darker* -
  compares the values of corresponding pixels in the alpha channel and in the keyed matte and keeps the lower (darker) value.
- *Lighter* -
  compares the values of corresponding pixels in the alpha channel and in the keyed matte and keeps the higher (lighter) value.

View

determines what you look at while creating your matte.

- Comp -
  displays the composite that results from the current settings.
- Matte -
  displays the resulting matte.
- Source -
  displays the original, unkeyed footage.



Moving the *Input* sliders toward the middle increases the contrast in the image, and moving the Output sliders in decreases the contrast of the image. Using the *Levels* effect is different from changing the contrast with the *Brightness* and *Contrast* effect because the *Levels* effect can weight changes toward the highlights or the shadows. You can also adjust the gamma curve with the *Levels* effect.

Using the BlueScreen Key effect

The easiest way to use this effect is as follows:

1. Set the *View* mode to Matte and adjust the *Min* and *Max* values. The results become visible quickly.
2. Keep adjusting until the pure blue areas of the background are solid black and the foreground elements are solid white. The closer the *Min* and *Max* values are to each other, the harder the matte, so try to keep the values apart to get a smooth transition.
3. Set the *View* mode back to *Comp* and make final adjustments to get a perfect matte.

Color Key

Color Key creates a matte by keying out all the pixels in your clip that are similar to a color you specify.

- *Color* -
  specifies the color from which the matte is created. Use the eyedropper to select a color from anywhere on your image or screen, or click the color tile to bring up the color picker and select a specific color.
- *Min and Max* -
  specify the minimum and maximum threshold values. Values below the minimum are black, values above the maximum are white, and everything in between is a gradation of grays between the two.
  If you set a minimum value higher than the maximum value, Avid Liquid will treat the lower value as the *Min* value and the higher as the *Max* value. For example, values of *Min* 40 and *Max* 60 will be treated the same as *Min* 60 and *Max* 40.
- *Invert Matte* -
  reverses the black and white areas of the matte.

Merge Matte

combines the matte created by the keyer with any pre-existing matte in the alpha channel of the image. This can be used to build up a complex matte.

- *None* -
  ignores the alpha channel and replaces it with the keyed matte.
- *Darker* -
  compares the values of corresponding pixels in the alpha channel and in the keyed matte and keeps the lower (darker) value.
- *Lighter* -
  compares the values of corresponding pixels in the alpha channel and in the keyed matte and keeps the higher (lighter) value.

View

determines what you look at while creating your matte.

- *Comp* -
  displays the composite that results from the current settings.
- *Matte* -
  displays the resulting matte.
- *Source* -
  displays the original, unkeyed footage.



Moving the *Input* sliders toward the middle increases the contrast in the image, and moving the *Output* sliders in decreases the contrast of the image. Using the *Levels* effect is different from changing the contrast with the *Brightness* and *Contrast* effect because the *Levels* effect can weight changes toward the highlights or the shadows. You can also adjust the gamma curve with the *Levels* effect.

Using the Color Key effect

The easiest way to use this effect is as follows:

1 Click the eyedropper and select the color from which to create the matte.

2 Set the *View* mode to *Matte* and adjust the *Min* and *Max* values.

3 Keep adjusting until the pure blue areas of the background are solid black and the foreground elements are solid white. The closer the *Min* and *Max* values are to each other, the harder the matte, so try to keep the values apart to get a smooth transition.

4 Set the *View* mode back to *Comp* and make final adjustments to get a perfect matte.

GreenScreen Key

GreenScreen Key compares the green channel to the red and blue channels and creates a matte based on the differences.

It is functionally identical to *BlueScreen Key*, except it is designed for footage shot against green. For information on the use of this effect, see "*BlueScreen Key*" on page 677.

LumiKey

LumiKey creates a matte based on the luminance values of an image. While the other keyers base their mattes on a particular color channel, *LumiKey* uses luminance, which is a color space variable.

- *Min and Max* -
  select the minimum and maximum threshold values. Values below the minimum are black; values above the maximum are white; and everything in between is a gradation of grays between the two values.

While it is possible to set a minimum value higher than the maximum value, Avid Liquid will always treat the lower value as the *Min* value and the higher as the *Max* value. For example, values of *Min* 40 and *Max* 60 will be treated the same as *Min* 60 and *Max* 40.

- *Invert Matte* -
  reverses the black and white areas of the matte.

Merge Matte

is used to combine the matte created by the keyer with any preexisting matte in the alpha channel of the image. This can be used to build up a complex matte.

- *None* -
  ignores the alpha channel and replaces it with the keyed matte.
- *Darker* -
  compares the values of corresponding pixels in the alpha channel and in the keyed matte and keeps the lower (darker) value.
- *Lighter* -
  compares the values of corresponding pixels in the alpha channel and in the keyed matte and keeps the higher (lighter) value.

View

determines what you look at while creating your matte.

- *Comp* -
  displays the composite that results from the current settings.
- *Matte* -
  displays the resulting matte.
- *Source* -
  displays the original, unkeyed footage.



Make sure to restore the *View* setting to *Comp* before rendering, or you will render either the *Matte* or the *Source* footage instead of the finished composite.

Using the LumiKey effect

The easiest way to use this effect is as follows:

1. Set the *View* mode to *Matte* and adjust the *Min* and *Max* values.
2. Keep adjusting until the background areas are solid black and the foreground elements are solid white. The closer the *Min* and *Max* values are to each other, the harder the matte, so try to keep the values apart to get a smooth transition.
3. Set the *View* mode back to *Comp* and make final adjustments to get a perfect matte.

Smooth Screen

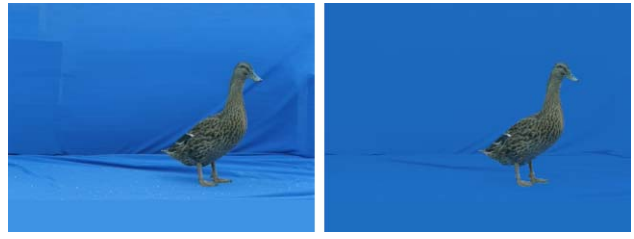
As video and film production becomes increasingly digital, bluescreen and greenscreen footage is frequently required to meet production needs. However, few people realize that filming bluescreen or greenscreen footage is a science, and often a shoot will take place with a dirty, poorly lit, or creased screen. As a result, compositors are often given horrible footage and then are expected to extract a perfect matte.

Smooth Screen corrects uneven bluescreen or greenscreen footage caused by lighting or surface problems by first comparing RGB pixels in the unkeyed foreground image to a sampled screen color and then adjusting the screen pixels accordingly, smoothing out the background before keying. This produces superior results from even the simplest of color keyers by easily eliminating shadows, hot spots, creases, and other anomalies that would create problems for the keyer.

- *Screen Color* -
  specifies the desired screen color—either select a color from the color picker or sample the background with the eyedropper. Any pixels close in value to the screen color will be corrected toward that color. The easiest way to use *Smooth Screen* is to click the eyedropper on a backing area that is well lit and close to the foreground subject.
- *Hue Tolerance* -
  controls which pixels are corrected according to hue variation. Lower settings correct only pixels with hues very similar to the sampled color, while higher settings also correct hues that are less similar.
- *Lightness Tolerance* -
  specifies which pixels are corrected by lightness variation. Lower settings correct very similar pixels, and higher settings correct pixels that are less similar. Typically, you will set *Lightness Tolerance* much higher than *Hue Tolerance*, as screen anomalies usually come from bright and dark spots.
- *Flattening* -
  specifies how much correction to apply to pixels. As more correction is applied, you may see artifacts such as choking of the foreground image in spill areas.

Using the Smooth Screen effect

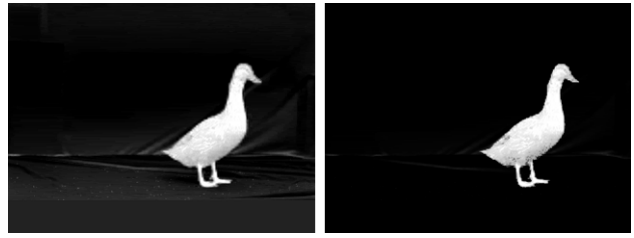
The figure below shows a bluescreen image before and after applying *Smooth Screen*.



Uncorrected bluescreen; smoothed screen

Note that the areas of light and dark blue in the left image are removed, leaving a field of relatively solid blue.

The effect that *Smooth Screen* can have on matte creation is astounding. The image below shows two examples of a standard color key. In both examples, the keyer is using identical settings. In the right image, however, Smooth Screen was applied, resulting in a substantially cleaner matte.



Matte before and after applying smooth screen

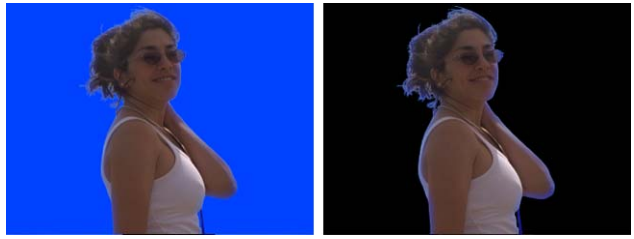
Spill Killer

Spill Killer mathematically analyzes and corrects for colored spill, caused by bounced light from the surface of a bluescreen or greenscreen. When a foreground element is contaminated by reflected spill light, *Spill Killer* removes the spill from the contaminated pixels without harming their original colors. It will also correct many spill situations that other spill suppressors cannot, including fringe and motion blur areas.

- *Screen Color*
  specifies the color of the spill.
- *Lower Limit* -
  specifies the lower value of selected pixels. The lower the number, the wider the selected range. When *Lower Limit* is set to 100% and *Upper Limit* is set to 0%, the smallest possible range of pixels is affected.
- *Upper Limit* -
  specifies the upper value of selected pixels. The higher the number, the wider the selected range. When *Lower Limit* is set to 0%, and *Upper Limit* is set to 100%, the largest possible range of pixels is affected.
- *Target* -
  controls the absolute maximum color level to which the screen can be corrected; 0% allows total removal of the screen color, and 50% sets the target to midway between the other two channels' values.
- *Color Suppression* -
  specifies an amount of suppression to apply, ranging from none (0%) to all the way to the *Target* value (100%).

Using Spill Killer

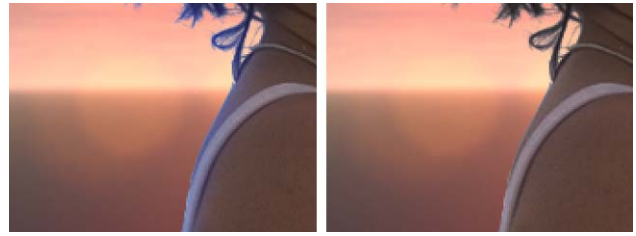
The image below shows an actress filmed against a bluescreen. You can easily see the effect that blue spill has on the foreground layer when the shot is composited against black. Blue tint is visible on her shirt, arms, and hair.



Blue spill

Start with a *Target* of 0% and *Suppression* at 100% to create a saturated correction you can see easily. Then adjust *Lower* and *Upper Limits*—you'll see clearly what parts of the image you're affecting. Finally, adjust *Target* and *Suppression* to create an acceptable color shift.

The following image shows a close-up view of the blue spill on the side of the actress. *Spill Killer* quickly and easily removes the blue tint while leaving the shirt its natural color.



Spill Killer before and after

The figure below shows the final composite, with the blue spill removed and the color adjusted by *Composite Color Matcher* and *Light Wrap*.



The completed composite

Spill Killer EZ

Spill Killer EZ is a simplified version of *Spill Killer*. Depending on the color relationship between the foreground and background elements, you'll occasionally need to use *Spill Killer* to correct some spill situations that *Spill Killer EZ* cannot. *Spill Killer* provides more specific control than *Spill Killer EZ* but is more demanding.



If you're correcting bright fringing around edges, rather than a soft, reflected spill, set the *Range* value high and the *Tolerance* value low. Conversely, to affect as much of the image as possible, set *Range* low and *Tolerance* high.

- *Screen Color* -
  specifies the color of the spill.
- *Range* -
  specifies the lower value that determines which pixels will be corrected. The lower the setting, the more pixels that will be affected. *Range* also defines the limit of spill suppression. The lower the setting, the more correction that will occur.
- *Tolerance* -
  controls the upper value defining which pixels will be corrected. The higher the setting, the more pixels will be affected. In most cases, 100% tolerance is recommended.
- *Color Suppression* -
  determines how much of the screen color is suppressed. Although 100% suppression works in many cases, results can vary substantially based on source footage.

Matte

This section comprises several matte-related effects.

Edge Finder *page 687*

Edge Finder EZ *page 689*

Matte Feather *page 691*

Matte Feather EZ *page 693*

Matte Feather Sharp *page 693*

Miracle Alpha Cleaner *page 696*

Edge Finder

Edge Finder creates a precise border for a layer's alpha channel. You can use the resulting alpha channel to limit effects to the edge areas of a clip, and to precisely control the exposure, color balance, sharpness, blurriness, and transparency of the edge of composited elements.



Anti-aliasing can cause mirage ripples in moving layers. Adding blur can reduce this problem. In extreme cases, you may find that using *Edge Finder EZ* is less problematic.

View

This pop-up menu specifies the results displayed.

- *Composite* -
  creates a border around the area defined by the alpha channel and then displays the RGB layer overlaid with the edge effect. This is useful for determining border settings in interlayer blurring and shows how much of the edge will be affected relative to the RGB layer.
- *Border* -
  creates a border around the area defined by the alpha channel and makes the inside of the layer totally transparent. This view is useful when you use interlayer blurring with transparent objects.
- *Border Mask* -
  creates a border around the area defined by the alpha channel and fills the layer with black.

When using *Border* or *Border Mask* view modes, make sure that there is no background element in the composition—these are designed to work over a black background and be used as a control layer in another composite.

- *Edge Threshold* -
  specifies where the center of the border will be drawn, relative to the edge of the alpha channel. Higher numbers pull the border inside the alpha channel edge.

- *Border Width* -
  controls the width of the border and therefore the width of the final edge blur (see figure below:)



Border widths of 4 and 16

- *Border Color* -
  controls the color of the border. For interlayer blurring, leave the blur white. For halo or glow effects, you can use other colors.
- *Border Blur Amounts* -
  blurs the border to soften anti-aliasing caused by complex alpha channel shapes:



Border blurs of 0 and 2.9

You can easily create glows and halos with *Edge Finder* in *Composite View* mode:



Radioactive puffin

Edge Finder EZ

*Edge Finder EZ i*s a simplified version of *Edge Finder* that controls the edge with a simple *Border Width* value.

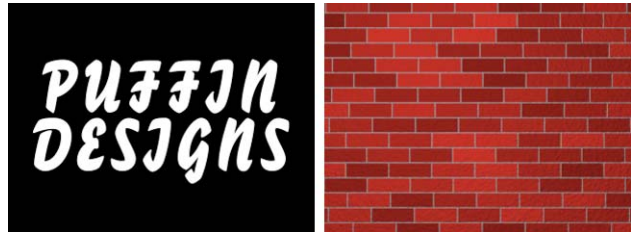
- *Border Width* -
  controls the width of the border around the alpha channel. The effect handles blurs and smooths automatically. This is the fastest, easiest way to define the edge-blur region. *Edge Finder EZ* can create some interesting effects, especially used with text:



Puffin Designs neon sign effect

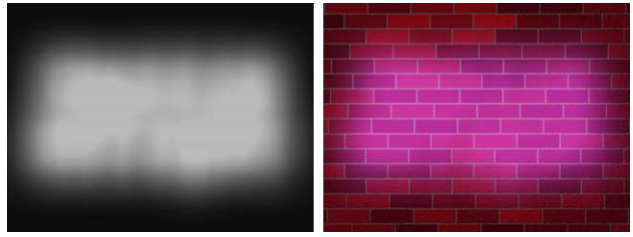
Using Edge Finder EZ

Using a text alpha channel, an image of a brick wall, and a few solid layers, the text image was used as the source for multiple layers of track mattes generated by *Edge Finder EZ*.



A text alpha channel and an image of a brick wall

After creating the neon tube effects, we used the effect, with a blur value of 100 pixels, on the text layer to generate the glow matte for the wall. *Composite Color Matcher* was used to tint the wall the same color as the neon:



Blur used as a glow matte

We created a few more layers using colored solids and track mattes to generate layers for highlights, darker glows, shadows, and the like.

After some final touch-up work on a couple of layers using the *Levels* effect, the final neon sign effect was complete:



Puffin Designs neon sign complete

Matte Feather

Matte Feather creates a gradual change (feathering) from opaque to transparent at the edge of a layer's alpha channel. You can use it to correct dirty or ragged layer edges where the keyer wasn't precise enough. It can also soften a hard edge on a computer-generated object to help make the object fit into an organic scene.



Approximately 70% of all layers can be fixed using just *Feather Width, Edge Threshold,* and *Edge Post Blur.* If *Edge Post Blur* is not subtle or precise enough, set it to 0% and follow your *Matte Feather* effect with an *Edge Blur* effect. Very high *Feather Width* settings can create edge-density effects that make clouds or glass objects appear more real.

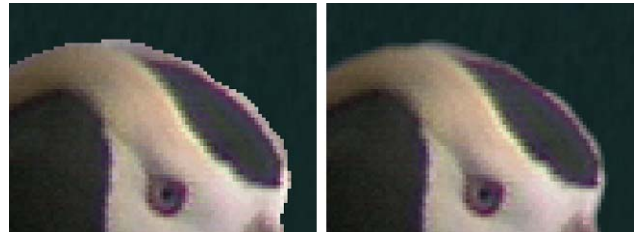
Matte Feather may appear to have the same effect as such effects as *Edge Blur*, but feathering and blurring are two different things. Edge blurring can produce a feathered edge, but an edge feather modifies only the alpha channel and doesn't directly affect the RGB channels. This makes it the better choice for feathering rough or jagged matte edges.

Matte Feather gives you a great amount of control over where and how the matte feather is applied. This feature is very useful when you are compositing problematic layers.

- *Edge Pre-Blur-*
  blurs the edge of the alpha channel before the feathering effect is applied, helping to eliminate jaggies. We recommend that you use low settings, because this control changes the shape of the edge and may cut into the layer in ways you don't want if it is set too high.
- *Edge Smoothing -*
  smooths the edge of the alpha channel into a rounder shape. This control is good for making the overall edge profile softer. We recommend you use low settings.
- *Edge Threshold -*
  determines where the edge begins to become transparent relative to the absolute edge of the alpha channel. Higher numbers move the edge threshold inward. A setting of 0 places the feather edge right at the actual edge of the alpha channel.
- *Feather Width -*
  controls the width of the area affected by the feathering.
- *Feather Slope -*
  specifies the abruptness of the transition from opaque to transparent. Lower numbers make the transition more gradual.
- *Edge Post Blur -*
  adds a blur effect to the edges using the *Super Blur* algorithm, removing any remaining edge hardness.

Using the Matte Feather effect

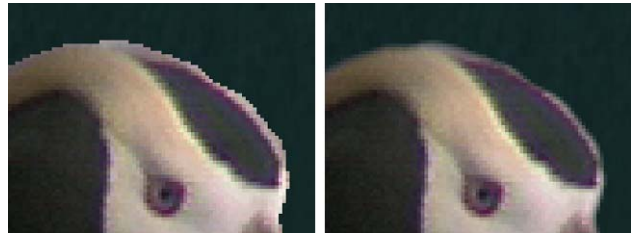
Matte Feather can be effective on even the roughest of mattes. The following image shows an element with an extremely rough alpha channel.



Jaggy puffin alpha channel

In a compositing environment, this kind of matte is completely unacceptable, but these are the results you get sometimes when using certain chromakeyers or when generating lumakey mattes.

The next image shows the same image in a composite scene, both before and after applying *Matte Feather*. The effect of *Matte Feather* on the final composite is obvious.



Jaggies smoothed

Matte Feather EZ

Matte Feather EZ is a simplified version of *Matte Feather* that controls the blurring and edge size with a simple *Feather Size* value. It is designed to be fast, easy, and intuitive. Many times, you can correct an edge with one simple adjustment.



Feathering can be used as a soft matte choker, to eliminate unwanted fringe and chatter caused by low-quality keying or source footage.

- *Feather Size* -
  controls how much the edge is feathered, gradually reducing the alpha channel while fading the edge to total transparency.

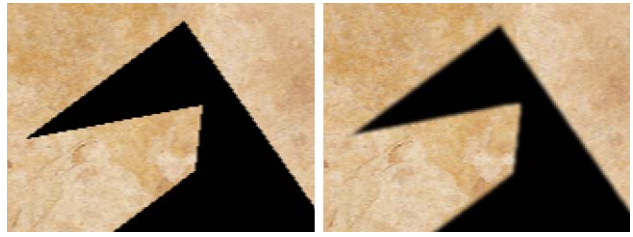
Matte Feather Sharp

Matte Feather Sharp blurs and feathers the edge of the alpha channel using a process optimized for complex, hard-edged shapes. Other blur or feather effects usually soften hard angles, but *Matte Feather Sharp* uses algorithms that maintain hard edges while feathering them.

- *Feather Width* -
  controls the width of the feathered edge. Higher numbers create wider edge feathering.
- *Feather Slope* -
  specifies the abruptness of the transition from opaque to transparent. Lower numbers make the transition more gradual.
- *Alpha Blur* -
  blurs the entire alpha channel, adding a uniform softness while maintaining geometric characteristics.

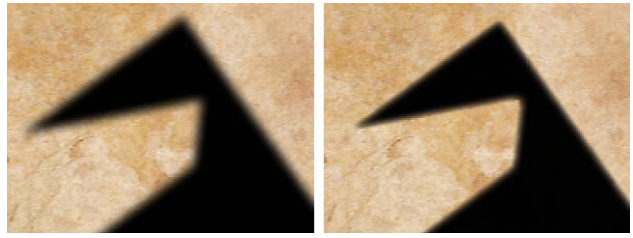
Using Matte Feather Sharp

The left image in the following figure shows a stone texture masked by an incredibly jaggy alpha channel and composited over solid black. The right image shows the effect that *Matte Feather Sharp* has on the matte. While the rough edges have been smoothed away, the sharp points and corners of the matte remain pristine.



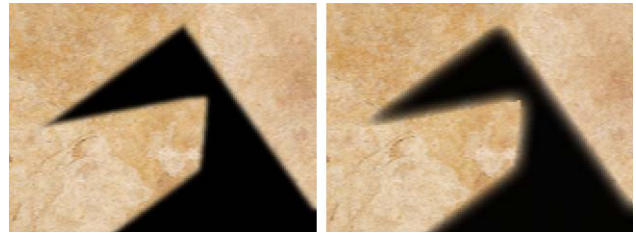
Matte Feather Sharp effect applied

For comparison, the next figure shows the same composite with *Edge Blur EZ* and *Matte Feather EZ* effects applied to smooth the edges. The *Matte Feather Sharp* operation in the image below used a feather width of 5 and the same value is used here:



Edge Blur EZ and Matte Feather EZ

In the left image, using *Edge Blur EZ*, a great deal of the sharpness is lost. The right image, using *Matte Feather EZ*, retains much more detail in the points and corners. However, as the next image shows, if we increase the blur value to 10 and then compare the image to a version using *Matte Feather Sharp*, the difference becomes clear.



Matte Feather Sharp and Matte Feather EZ

Even at very high amounts, the feathering by *Matte Feather Sharp* is far superior to that of other methods in composites containing sharp points and corners.

Miracle Alpha Cleaner

When you extract alpha channels using procedural keyers such as traditional bluescreen, luminance, or difference keyers, there can sometimes be a trade-off between acceptable edge detail and foreground noise in the resulting alpha channel, otherwise known as *chatter.*

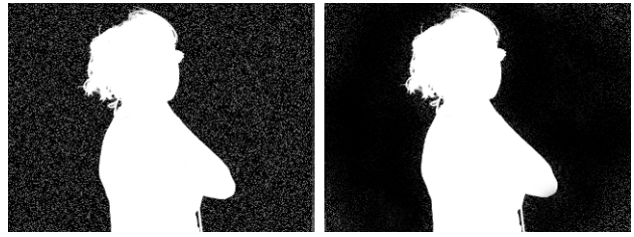
Miracle Alpha Cleaner lets you zap grain, break away holes in the matte, and fix many other problem areas that would otherwise require a separate manual matte touch-up.

Miracle Alpha Cleaner is like a detergent that applies a cleanup pass to your alpha channel, identifying dirt and other artifacts based on a combination of their size, alpha channel level, and proximity to the principal element in your alpha channel.

- *Size Threshold* -
  determines which pixels will be removed from the alpha channel, based on their proximity to each noise, or *chatter,* area. The value controls the size of the cleanup area, with 100% representing the largest cleanup area, or about one-fifth of the screen, and 0% representing no cleanup area. Increase this value to get rid of larger noise patches in the alpha channel. Noise or chatter pixels outside the size threshold are left unaffected.
- *Alpha Threshold* -
  determines which pixels will be removed from the alpha channel, based on pixel luminance or alpha channel opacity. Noise or chatter pixels (inside the *Size Threshold* area) with a luminance value below the *Alpha Threshold* value will be set to 0. The higher the percentage, the more pixels in the alpha channel will be cleaned up. Note that *Connection Threshold* also contributes to the selection process.
- *Connection Threshold* -
  determines which pixels to remove from the alpha channel based on their proximity to major objects in the alpha channel. The higher the number, the more nonessential pixels will be removed. Increase the *Connection Threshold* value if you find your alpha channel growing tendrils after you clean it.

Using Miracle Alpha Cleaner

The figure below is an example of a matte pulled from a noisy bluescreen, which produced an alpha channel with quite a bit of background noise. Applying *Miracle Alpha Cleaner* removes a lot of that noise, even with the default settings.



Miracle Alpha Cleaner before and after

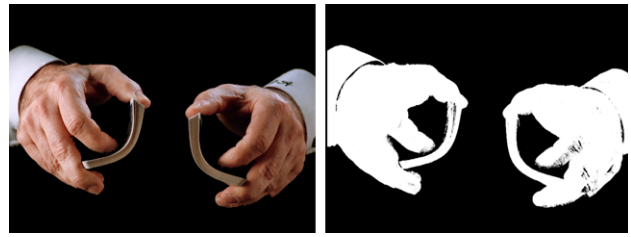
To try to remove the remaining noise at the sides and corners of the matte, we can increase the *Connection Threshold* value. However, when it is high enough to remove all the unwanted edge noise, it also removes fine detail, such as hair and eyelashes. The next image shows this effect; pay attention to the wisps of hair coming off the top of the woman's head.



Fine detail can be lost

Now that we have seen how *Miracle Alpha Cleaner* can reduce noise, let's see how it fills holes.

The following illustration shows a matte created with the *LumiKey* effect. Note the black areas in the matte around the edge of the magician's cuffs and on the wrinkled areas of the fingers on his left hand:



LumiKey matte

After we apply *Miracle Alpha Cleaner*, the black areas simply disappear:



Filling holes

To finish the composite, we can use *Matte Feather EZ* to soften the edges a little bit and *Composite Color Matcher* to alter the foreground colors, as seen here:



Finishing the shot

Noise

The *Noise* section contains four effects:

Channel Noise *page 699*

Median *page 700*

Min/Max *page 700*

Noise *page 701*

Channel Noise

Channel *Noise* adds noise to the red, green, blue, and alpha channels of your clip.

- *Red, Green, Blue and Alpha Noise* -
  control the amount of noise to be added to each specific channel.
- *Seed* -
  determines the noise pattern. Specify a different *Seed* value each time you apply the effect to ensure that you don't generate the same pattern each time.
- *Channel Noise* -
  randomly changes the red, green, and blue values of the noise effect's pixels.
- *Clipping* -
  determines whether the noise will cause pixel colors to wrap around when the color reaches its maximum value.

Each pixel has a value of 0 to 255. When the color of a pixel gets to 255, clipping makes it stay at that value. With clipping disabled, noise lets the color value wrap around, or start again at a low value. For example, assume the effect generates a noise value of 275. The value can either be clipped to 255, or it can wrap around to 20. When *Clipping* is selected, even 100% noise leaves a recognizable image. If you want a completely randomized image, deselect *Clipping* and select *Channel Noise*.

Median

Median replaces extreme pixel values with the median RGB values of adjacent pixels within a given radius, softening the look of a clip. Median removes small flaws such as those due to dust particles or film scratches, and at higher values it can create abstract painterly looks.

- *Channel* -
  specifies the channel(s) to which the effect is applied.
- *Link Vertical* -
  links the *Vertical Radius* to the *Horizontal Radius* amount.
- *Horizontal Radius* and *Vertical Radius* -
  each specify a radius for how many pixels to apply the *Median* effect to.

Min/Max

Min/Max assigns to each pixel in your clip the minimum or maximum pixel value found within a specified radius. For example, a white solid layer with a square mask shrinks one pixel on each side using *Minimum*, a *Horizontal Radius* value of 1, and a *Vertical Radius* value of 1. The layer's quality setting does not affect the *Min/Max* effect.

- *Channel* -
  specifies the channel(s) to which the effect is applied.

Operation

specifies which operation to perform.

- *Minimum* -
  replaces a pixel with the smallest pixel value specified within the *Horizontal* and *Vertical Radius* settings.
- *Maximum* -
  replaces a pixel with the largest pixel value specified within the *Horizontal* and *Vertical Radius* settings.
- *Minimum Then Maximum* -
  performs the *Minimum* operation on the layer followed by the *Maximum* operation using the *Horizontal* and *Vertical Radius* settings.
- *Maximum Then Minimum* -
  performs the *Maximum* operation on the layer followed by the *Minimum* operation using the *Horizontal* and *Vertical Radius* settings.

- *Link Vertical* -
  links the *Vertical Radius* to the *Horizontal Radius* setting.
- *Horizontal Radius* and *Vertical Radius* -
  specify how many pixels to examine for the Minimum or Maximum operation.

Noise

Noise randomly changes the pixel values throughout the clip. Adding noise creates a sensation of graininess, which obscures fine details.

- *Channels* -
  specifies the channel(s) to which the effect is applied.
- *Noise* -
  controls the amount of noise added to the clip.
- *Seed* -
  determines the noise pattern. Specify a different Seed value each time you apply the effect to generate a different pattern each time.
- *Channel Noise* -
  randomly changes the red, green, and blue values of the noise effect's pixels.
- *Clipping* -
  determines whether the noise will cause pixel colors to wrap around when the color reaches its maximum value.

Each pixel has a value of 0 to 255. When the color of a pixel gets to 255, clipping makes it stay at that value. With clipping disabled, noise lets the color value wrap around, or start again at a low value. For example, assume that the effect generates a noise value of 275. The value can either be clipped to 255, or it can wrap around to 20. When Clipping is selected, even 100% noise leaves a recognizable image. If you want a completely randomized image, deselect *Clipping* and select *Color Noise*.

Particles

This section covers three particle effects.

Fractal Clouds *page 702*

Fractal Fire *page 705*

Fractal Tunnel *page 709*

Fractal Clouds

Fractal Clouds gives you quick control over one of the most powerful tools: fractal noise. With *Fractal Clouds*, you can create clouds, oceans, water ripples, and planet surfaces, and much more.

Transfer Mode

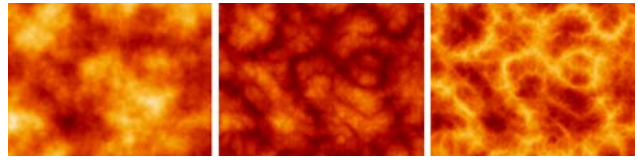
controls how the cloud image is applied to the layer.

- *Replace* -
  replaces the layer with clouds.
- *Over* -
  places clouds over the layer, combining the alpha channels from the layer and the clouds. You can use *Over* to enlarge the layer's alpha channel to include the cloud effect.
- *Under* -
  puts the clouds under the layer, so that they are visible only where pixels in the alpha channel have a value of 127 or lower (where they're more black than white).
- *On* -
  masks the cloud image with the layer's alpha channel.
- *Mask* -
  uses the cloud layer's alpha channel to mask the layer.
- *Stencil* -
  uses the cloud layer's alpha channel to exclude areas of the layer. Stencil is the inverse of Mask.

Appearance

controls the look of the turbulent noise (see below).

- *Clouds* -
  look like standard Photoshop clouds.
- *Billows* -
  have a round, puffier shape and texture.
- *Filaments* -
  have a thin, wispier shape and texture.



Clouds, Billows, and Filaments

- *Detail* -
  determines how much detail is in the cloud pattern. Detail is similar to a focus or sharpness control.
- *Scale* -
  controls the size of the cloud texture. By carefully setting Detail and Scale, you can create the illusion of immense size.
- *Bias* -
  controls the position of texture. Changing Bias moves the texture's high and low points through the Color Map. When you use it in conjunction with Gain and the Color Map controls, you have specific control of the cloud texture's appearance.
- *Gain* -
  controls the amplitude of texture. Increase it to make the parts of the texture farther apart on the Color Map; decrease it for more similarity. Gain functions in much the same way as the Brightness and Contrast effect when you adjust the contrast.
- *Black Clip* -
  controls which values are clipped to black. The higher the number, the more black will appear in the cloud texture.
- *White Clip* -
  determines which values are clipped to white. Lower numbers make more of the cloud texture white.

- *Aspect Ratio* -
  stretches the cloud texture horizontally or vertically, depending on whether the setting is positive or negative.

The *Black Clip* and *White Clip* properties don't necessarily refer to the colors black and white. The left image in the next image shows a standard *Fractal Cloud* layer, created using dark- and light-blue colors. Increasing the *Black Clip* value increases the dark blue in the image, producing the middle image. By adjusting the *Aspect Ratio* value, we can stretch the clouds horizontally, creating a reasonable representation of a cloudy day.



Creating clouds

- *Rotation* -
  rotates the cloud texture independently of the layer.
- *Position* -
  controls where in the noise field the texture is centered. Animate this point to create drift or windy clouds.
- *Mutation Rate* -
  controls the speed of the cloud texture's change over time. Using *Velocity* and *Mutation Rate* together, you can control how peaceful or frenetic the clouds appear to be.
- *Mutation Offset* -
  controls where in the fractal space the cloud, and therefore the texture, is positioned. Use this control to find a texture you like, and then mutate it using *Mutation Rate. Mutation Offset* can also be animated for nonlinear mutation effects.

Fractal Fire

Fractal Fire is an optimized fractal noise factory to make your pyrotechnic soul burn.

Create a nearly endless variety of fire effects, including solar flares, napalm explosions, smoky oil fires, or an inferno to make the devil inside you proud.



Fractal Fire example

Colors

Note that the fire gets its distinctive look from mapping the texture with the color map. The default map has been tested to create a believable and organic fire look.

Texture

determines the texture of the fire.

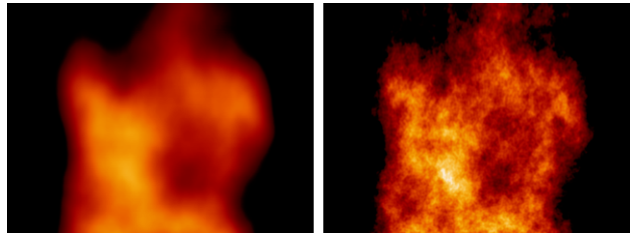
- *Gasoline* -
  creates large flames.
- *Kerosene* -
  gives a more roiling, hot-burning look.
- *Plasma* -
  produces tendrils, suitable for solar flares and energy fields.

Paint Mode

controls how the fire image is applied to the layer.

- *Replace* -
  replaces the layer with fire.
- *Over* -
  places fire over the layer, combining the alpha channels from the layer and the fire. You can use *Over* to enlarge the layer's alpha channel to include the fire effect.

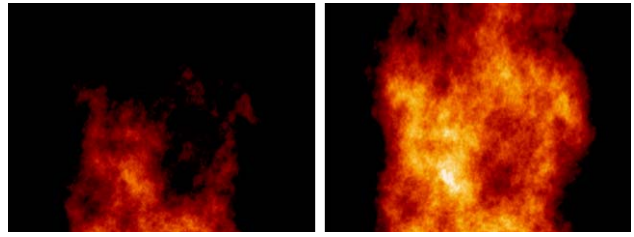
- *Under* -
  puts the fire under the layer, so that it is visible only where pixels in the alpha channel have a value of 127 or lower (where they're more black than white).
- *On* -
  masks the fire image with the layer's alpha channel.
- *Mask* -
  uses the fire's alpha channel to mask the layer.
- *Stencil* -
  uses the fire's alpha channel to exclude areas of the layer. Stencil is the inverse of Mask.
- *Smokiness* -
  adds a smoky artifact to the top of the flames.
- *Detail* -
  determines how much detail is in the flame pattern. *Detail* is similar to a focus or sharpness control:



Detail

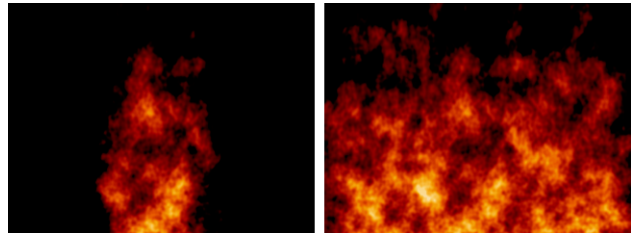
- *Scale* -
  controls how big the flame texture is relative to the flame size. By carefully setting *Detail* and *Scale*, you can create the illusion of immense size.
- *Velocity* -
  specifies how quickly the fire is burning. Lower numbers create slower fires.
- *Mutation Rate* -
  controls the speed of the fire texture's change over time. Using *Velocity* and *Mutation Rate* together, you can control how peaceful or raging the fire appears to be.
- *Mutation Offset* -
  controls where in the fractal space the fire, and therefore the texture, is positioned. Use this control to find a texture you like; then mutate it using *Mutation Rate*. *Mutation Offset* can also be animated for nonlinear mutation effects.

- *Direction* -
  specifies which direction the fire burns from the flame base. This control is useful for adding horizontal flames, like those from flame throwers or jets.
- *Bias* -
  controls the position of texture. Changing *Bias* moves the texture's high and low points through the color map. When you use Bias in conjunction with *Gain* and the *Color Map* controls, you have very specific control of the fire's appearance.
- *Gain* -
  controls the amplitude of texture. Increase it to make the parts of the texture farther apart on the color map; decrease it for more similarity.
- *Flame Height* -
  controls how high the flames rise before fading out. Higher numbers create taller fire:



Flame Height

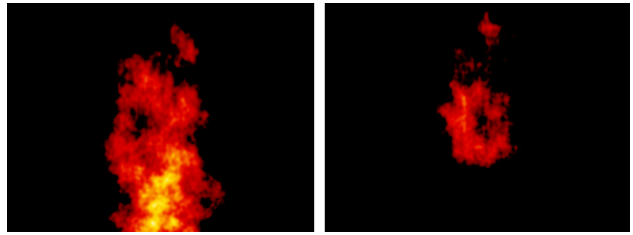
- *Height Cutoff Slope* -
  determines how gradually or abruptly the top of the flames fade out. Higher numbers produce a more gradual transition.
- *Flame Width* -
  specifies how much of the layer width the fire covers (see below).



Flame Width

- *Flame Edge Scale* -
  controls the size of the edge transition, providing greater control of fire motion. Higher numbers create larger, rolling flame edges.
- *Flame Edge Amplitude* -
  specifies the frequency of edge artifacts on the flames. Higher numbers produce more frequent edge changes.
- *Flame Edge Slope* -
  determines how gradually or abruptly the sides of the flames fade out. Higher numbers produce a more gradual transition.
- *Flame Base* -
  controls the position of the bottom of the fire. Higher numbers move the flame base up (assuming a vertical direction setting).

- *Acceleration* -
  specifies how much the flames accelerate as they rise. Higher numbers make the flames move faster as they move higher.
- *Wind* -
  adds a horizontal wind factor, blowing the flames.
- *Wiggle* -
  adds a gusty look to the flames. *Wiggle* works well with *Wind*.
- *Fuel Supply: Cut Off* -
  simulates gas jets, flame throwers, and the like. Keyframing the cut-off from *Off* to *On* will cut off the fire's fuel, and a few frames later, it will die off in a burst of flame:



Fuel Supply Cut Off

Note that you must keyframe the cut-off *Off*, and then *On*, and then move forward a few frames to see the effect.

Fractal Tunnel

Fractal Tunnel creates complex, turbulent tunnel effects, perfect for effects shots featuring wormholes, whirlpools, and other tunnel environments.

Transfer Mode

controls how the tunnel effect is combined with the target layer.

- *Replace* -
  replaces the layer with the tunnel.
- *Over* -
  places the tunnel over the layer, combining the alpha channels from the layer and the tunnel. You can use *Over* to enlarge the layer's alpha channel to include the tunnel effect.
- *Under* -
  puts the tunnel under the layer, so that it is visible only where pixels in the alpha channel have a value of 127 or lower (where they're more black than white).
- *On* -
  masks the tunnel effect with the layer's alpha channel.
- *Mask* -
  uses the tunnel's alpha channel to mask the layer.
- *Stencil*-
  uses the tunnel's alpha channel to exclude areas of the layer. *Stencil* is the inverse of *Mask*.

The other transfer modes are the standard transfer modes.

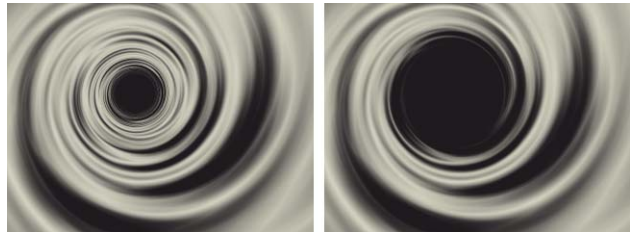
Appearance

controls the look of the turbulent noise in the tunnel.

- *Clouds* -
  look like standard Photoshop clouds.
- *Billows* -
  have a round, puffier shape and texture.
- *Filaments* -
  have a thin, wispier shape and texture.
- Detail -
  determines how much detail is in the tunnel pattern. Detail is similar to a focus or sharpness control.

- *Scale* -
  controls how big the tunnel texture is. By carefully setting *Detail* and *Scale*, you can create the illusion of immense size.
- *Bias* -
  controls the texture's position. Changing *Bias* moves the texture's high and low points through the color map. Using *Bias* with *Gain* and the *Color Map* controls, you have specific control of the tunnel's appearance.
- *Gain* -
  controls the amplitude of texture. Increase it to make the parts of the texture farther apart on the color map; decrease it for more similarity.
- *Black Clip* -
  controls which values are clipped to black. The higher the number, the more black will appear in the tunnel texture.
- *White Clip* -
  determines which values are clipped to white. Lower numbers make more of the tunnel texture white.
- *Fade Inner Radius* -
  controls the radius of the hole at the back of the tunnel. Higher numbers make the hole bigger and closer (see below).

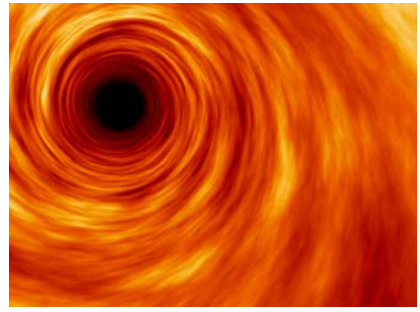
- *Fade Width* -
  determines how hard the transition is between the tunnel and the hole. Higher numbers create softer transitions (see below).



Fade Inner Radius and Fade Width

- *Zoom* -
  controls the illusion of the depth of the tunnel. Higher numbers make the tunnel look deeper.
- *Twist* -
  specifies how much the tunnel corkscrews as it moves through space. Higher numbers create a stronger twist; positive and negative numbers create twist in opposite directions.
- *Rotation* -
  determines a rate of rotation for the tunnel. *Rotation* differs from twist in that rotation moves the entire tunnel uniformly.
- *Velocity* -
  controls the speed the tunnel moves relative to the camera. Higher numbers move it faster. Negative numbers move the tunnel away from the camera; positive numbers move the tunnel towards the camera.
- *z Position* -
  allows you to *move into* the tunnel along the *z* axis. In fact, the texture moves toward you, and the inner radius maintains its distance, so you can easily create a fly-through by animating the *z*-position.
- *Position* -
  controls the tunnel's location in the layer. Animate this point to create an illusion of perspective.

The image below shows the *Fractal Tunnel* effect:



Fractal Tunnel effect

Stylize

This section contains these effects:

Alpha Ramp *page 712*

Drop Shadow *page 714*

Emboss *page 714*

Framer *page 715*

Grunge *page 716*

Mosaic *page 717*

Real Shadows *page 718*

Video Feedback *page 719*

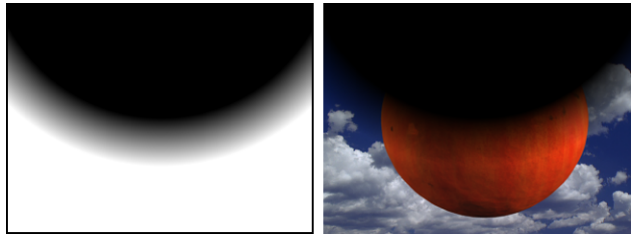
Alpha Ramp

Alpha Ramp quickly creates circular, curved, or linear alpha ramps directly into the alpha channel of your current effect. This effect instantly enhances any effect, without requiring additional matte layers within your composite. Use *Alpha Ramp* to create text transitions and wipes, or to add a transparent-to-opaque gradation to any effect.

View Mode

determines how you see the effect of *Alpha Ramp* with complex images (see figure below).

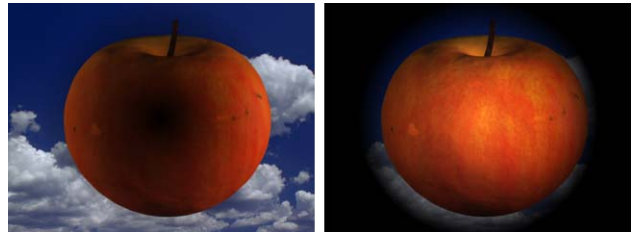
- *Normal* -
  is the regular mode for rendering.
- *Alpha* -
  shows the alpha channel of the layer as white, composited with the other layers in the composite.
- *Ramp*-
  shows the ramp alone as a black-to-white blend on an opaque alpha channel.



Alpha and Normal view modes

- *Ramp Edge Point* -
  is the top, center point of the ramp. If the curvature is 100%, then this is the center of the radial ramp.
- *Ramp Width* -
  is the size of the radiant between the black and white values on the ramp.
- *Ramp Curvature* -
  determines the curve of the ramp. When *Ramp Curvature* is 100%, the ramp is conical, and at 0%, it's linear. At values in between, the ramp is circular with a variable-width flat center.
- *Ramp Angle* -
  determines the direction at which the ramp approaches the ramp edge point. This has no effect if *Ramp Curvature* is set to 100%.
- *Alpha Inversion* -
  smoothly reverses the direction of the ramp. At 50%, the ramp is uniformly 50% opaque.

This figure shows a round blur with a width of 250 at 0% and 100% inversion:



Alpha Inversion

Drop Shadow

Drop Shadow creates a shadow effect on the layers below the layer you apply it to. You can specify the color, size, severity, and position of the drop shadow.

- *Shadow Color* -
  determines the color of the drop shadow. By default, the shadow color is black. However, you can use the eyedropper or the color picker to specify any color for the shadow.
- *Opacity* -
  determines how much the background layers will show through the shadow. The default value is 50%. A higher percentage of opacity results in a darker shadow, obscuring more of the background.
- *Direction* -
  determines the offset direction of the shadow in degrees. The default is 130° but you can change the degrees or the revolutions value.
- *Distance* -
  determines the shadow's position, in distance offset from the original alpha channel. By default, the distance is 10 pixels.
- *Softness* -
  determines how soft the shadow's edges are. The default value is 2 pixels.

Emboss

Emboss creates a color emboss image by sharpening and highlighting the edges of a clip. Anti-aliasing is always enabled, regardless of the layer quality setting.

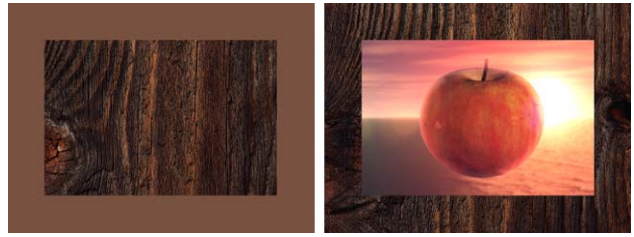
- *Channels* -
  specifies the channel(s) to which the effect is applied.
- *Direction* -
  controls the direction of the image edge highlight.
- *Relief* -
  controls the height of the emboss effect.
- *Contrast* -
  controls the amplitude of the brightness difference.

Framer

Framer quickly and easily performs a fundamental motion graphics design task: drawing boxes and frames around objects on the screen. While drawing boxes isn't difficult, it can be a tedious, time-consuming chore. This effect takes care of it with two mouse clicks.

- *Corner 1* -
  positions the upper-left corner of the frame.
- *Corner 2* -
  positions the lower-right corner of the frame.
- *Frame Width* -
  controls the thickness of the line making up the frame.
- *Frame Color* -
  determines the color of the frame. You can change it using the eyedropper or the swatch.
- *Source Masking: Act as Mask* -
  masks the source layer into the frame line itself. If you set the frame width to a high number, you can create textured picture frames this way.

The figure below shows *Framer* applied to a wood image, which is above the sunset apple image in the composite window. Checking *Act as Mask* drops out the middle and creates a wooden picture frame effect:



Textured picture frame example

Grunge

Grunge creates organic-looking, distressed edges inside the alpha channel of the layer. You can use it to stylishly distress objects for a torn-page look, or to simulate different kinds of corrosion. Use *Grunge* wherever you want to add a little bite to your images.

Grunge Styles

specifies which kind of *Grunge* will be applied.

- *Decay* -
  provides a furry, invasive look. It can eat into the alpha channel substantially:



Decay

- *Sand Blast* -
  is a more subtle *Grunge* effect, simulating the look of blasting the edges away with a sandblaster:



Sand Blast

- *Acid Bath* -
  is the smoothest and most gradual *Grunge* effect. It has a blurrier, graduated look, like chemical damage:



Acid Bath

- *Grunge Amount* -
  controls the intensity of the *Grunge* effect. Higher numbers return more *Grunge*.
  The slider goes only to 1.0, but you can set higher values: click the *Grunge* value and then enter a new one. You may need to use a high setting to completely obliterate large film-res areas. The time needed to calculate a frame goes up dramatically with high *Grunge Amount* settings.
- *Grunge Smoothing* -
  blurs the result of the *Grunge* effect, smoothing out some of the detail. *Smoothing* can be very important when animating grunged layers.

Mosaic

Mosaic samples the pixel values of a clip and fills the clip with solid color rectangles. It is often used for obscuring faces in television news programs and for simulating low-resolution CRT displays.

- *Channels* -
  designates the channel(s) to be affected by the *Mosaic* effect.
- *Link Vertical* -
  links the vertical mosaic amount to the horizontal value.
- *Horizontal Blocks* -
  specifies the number of divisions horizontally.
- *Vertical Blocks* -
  specifies the number of divisions along the vertical axis. The color of each block is the average of all the colors located in the region determined by the *Horizontal Blocks* and *Vertical Blocks* values.
- *Sharp Colors* -
  gives each block the color of the pixel located at its center in the original, unaffected clip.

Real Shadows

Real Shadows adds realistic perspective shadows to any layer with an alpha channel. *Real Shadows* is specifically designed for situations where the target layer is animated, such as keyed footage of people on a bluescreen or greenscreen.

The image below shows how the use of shadows can mean the difference between a believable shot and a fake shot. Apart from the shadows, the two images are identical. Notice that the apple on the left seems to be floating, whereas the apple on the right appears to be on the lunar surface:



Apple On The Moon

- *Color* -
  specifies the color of the shadow. You can use the eyedropper or the color picker to select a color.
- *Opacity* -
  controls the transparency of the shadow. Lower numbers provide more transparency.
- *Softness* -
  determines the blurriness of the shadow as it falls away from the shadow-casting object. Note the wraparound effect of the softness, which makes the shadows look more organic. Higher numbers create more blur.
- *Fadeout* -
  specifies how the shadow fades away as it recedes from the shadow-casting object. Higher numbers create a faster fadeout.
- *Avoid Clipping: Clipping Avoided* -
  allows the shadow to extend past the boundaries of the target layer.

- *Hide Layer: Shadow Only* -
  hides the target image but shows the shadow:



Duck and apple, shadows only

Video Feedback

Video Feedback creates multiple iterations of the layer, using a unique time-slipping compositing algorithm.

Video Feedback simulates the effect of pointing a video camera at its own monitor, creating an infinite reflection (see the image below). In addition, the time-slipping compositing system can create chaotic patterns unattainable in any other way.



Video Feedback example

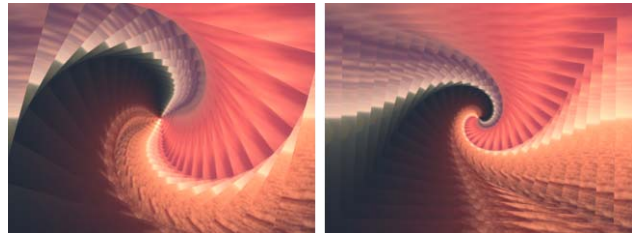
Video Feedback does not operate in the normal way. It composites the current frame with the last frame it produced, regardless of the time associated with either frame, and saves the result internally. If you tweak settings, you may get unexpected or unreproducible results. Renderings with *Video Feedback* must start at layer time 0 to produce consistent results. To reset *Video Feedback*, clear its frame memory by moving the current time to frame 0.

- *Scale* -
  determines the relative scale between iterations. For example, a setting of 0.5 makes each iteration half the size of the previous one:



Scale

- *Rotation* -
  sets the degree of rotation between iterations:



Rotation

- *Offset* -
  specifies the *x,y* offset relationship between iterations.

Transfer Mode

determines the interaction of the iterations with the original layer.

- *Behind* -
  draws the iterations behind the original layer.
- *In Front* -
  draws the iterations in front of the original layer.

The remaining transfer modes behave like the standard layer transfer modes.

- *Fade* -
  controls the fade relationship between iterations. Each time an iteration is rendered, the *Fade* setting determines how much more it should fade than the one before.

Video

This section features three effects:

Broadcast Safe Colors *page 721*

Field Blend *page 722*

Field Swap *page 722*

Broadcast Safe Colors

The *Broadcast Safe Colors* effect alters pixel color values so that they can be accurately represented when viewed on a standard television. Computers and televisions view color differently. Computers see colors in terms of red, green, and blue, whereas televisions see colors in terms of differing composite signals. Standard home televisions cannot display colors above a certain amplitude, but computers easily exceed this amplitude. The *Broadcast Safe Colors* effect alters the colors to ensure they can be viewed in standard television color space.

- *Format* -
  specifies which broadcast standard you want to adjust to: *NTSC* or *PAL*. NTSC is the standard used in North America, as well as in Japan. PAL is used in most of Western Europe, South America, and Australia.

Method

specifies how to reduce the signal amplitude. It contains four options:

- *Reduce Luminance* -
  reduces a pixel's brightness by shifting its color toward black.
- *Reduce Saturation* -
  shifts a pixel's color toward a gray of similar brightness, effectively making the pixel less colorful.
- *Key Out Unsafe* -
  makes unsafe pixels transparent.
- *Key Out Safe* -
  makes safe pixels transparent.
- *Max Amplitude (IRE)* -
  specifies the level above which the layer's pixels are adjusted, in IRE units—the units in which signal amplitude is measured. Safe transmission amplitudes cannot exceed 120 IRE units.

You can specify the Max Amplitude (IRE) value in the range 100 to 120 IRE units. The default value of 110 IRE units provides a safe, conservative starting point. Reducing the level to 100 can significantly change the appearance of the image. Increasing the level to 120 pushes the maximum allowable level and may produce undesired results.

Field Blend

Field Blend removes field information from the frames in the selection range using one of two methods:

- Duplicating one field over the other
- Interpolating the Odd and Even fields of each frame to make them identical.

The *Field Blend* effect is different from the Interlace/Deinterlace effect in that it actually effects the fields, creating a new frame in place of the current frame; Interlace/Deinterlace creates a separate clip based on interlacing or deinterlacing of the current clip.

Field Swap

Field Swap swaps the order in which fields are rendered for a layer. This effect can save you time if you discover your material has been rendered with its fields in the incorrect order, or if you want to create the effect of mis-rendered footage.

The only option in the Timeline for this effect is *Swap*. When *Swap* is selected, the field rendering order is swapped; when it isn't, the order is unchanged. For special effects purposes, you can animate the *Swap* parameter.

Chapter 13

Special FX

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Timewarps and Color Correction

Color Correction Editor *page 725*

Linear Timewarp *page 771*

Timewarp Editor *page 776*

Color Correction Editor

The Avid Liquid *Color Correction Editor* provides primary and secondary color correction functions, including the necessary diagnostic tools (such as the Waveform Monitor and Vectorscope).

The first part of this section will provide you with an overview of the editor's elements and functions. The second part contains a brief discussion of color theory, which you can skip if you're already familiar with color correction. The third part provides you with a detailed description of all the parameters of the primary and secondary correction modules along with several examples.

Tip: If you read this chapter in the online PDF file, you'll be able to view all the illustrations in color, which is very helpful for this particular subject.



Primary color corrections are displayed in real time (GPU-based effect). Secondary color corrections are rendered.

Color Correction Editor (Overview) *page 726*

What is color? *page 731*

Practical tips for using color correction *page 734*

Working with the Vector, Cube and Waveform Displays *page 737*
Introduction to the interpretation of the most important diagnostic displays

Diagnostic displays *page 744*

Tools *page 751*
Legalizer, channel selection and saved settings

Primary Color Correction *page 752*

Six Vector Color Correction *page 764*

Selective Color Correction *page 765*

Color Correction Editor (Overview)

Opening and Operation

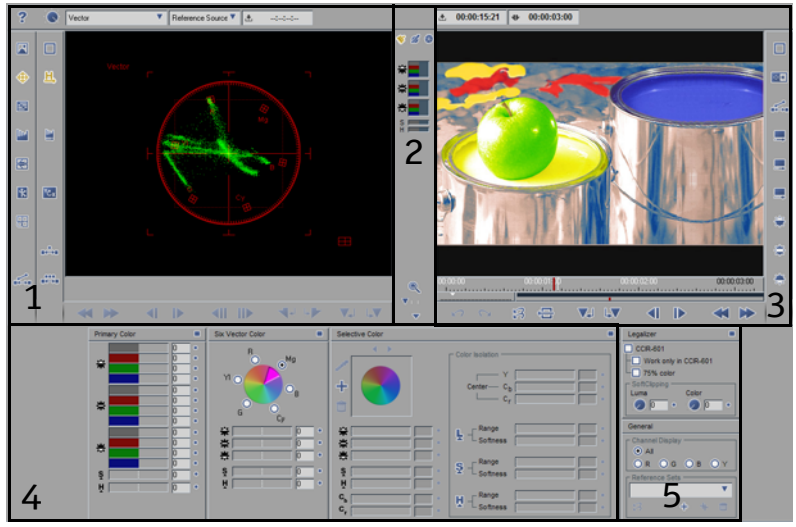
Color Correction Editor operation is the same as clip *Effect Editor* operation (general instructions for use can be found under *"Classic Clip Effect Editors (Filters)"* on page 510). Open the *Color Correction Editor* as follows:

- Drag the editor icon from the `Library` tab in the *Project window* to the relevant clip. Then open the editor either by right-clicking the effect button for the clip or right-clicking the colored line along the top of the clip.



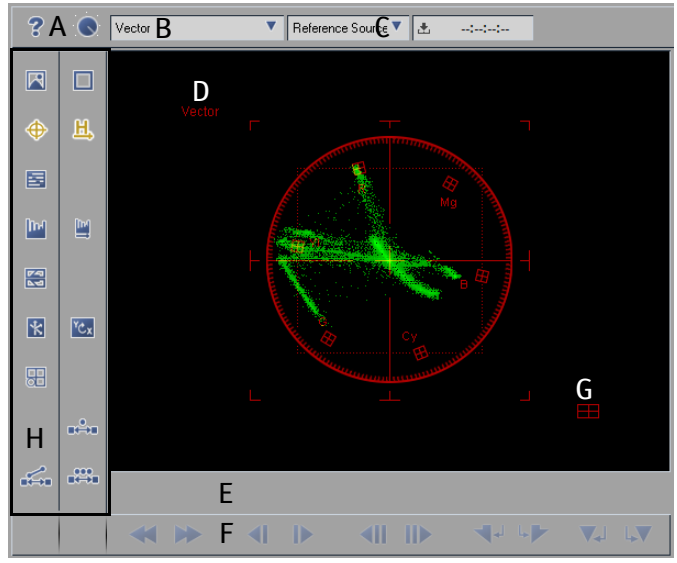
The *Color Correction Editor* takes the place of the *Sequence Editor*. Click the triangular arrow at the bottom between the inlays to open the bottom half of the editor.
The *Color Correction Editor* is divided into five areas:

- (1) Diagnostic displays, inlay reference sources and buttons;
- (2) Compact Display of correctors and magnifier;
- (3) Inlay for the image material to be corrected, *Primary Color Correction* buttons;
- (4) Buttons for *Primary Color Correction* and the two types of secondary correction;
- (5) Tools for editing, such as the *Legalizer*.



Color Correction Editor

Diagnostic Area (1)



Diagnostic area of the Color Correction Editor

This area contains functions for analyzing and assessing the image material to be edited.

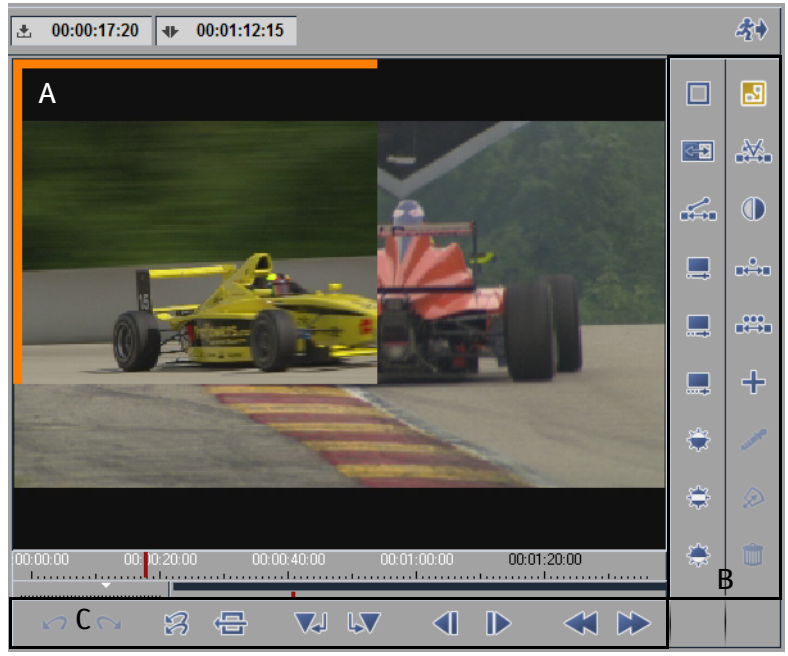
- A - This knob lets you adjust *Display* intensity.
- B - List box for selecting the *Display* (*Vector, Waveform, Histogram, Lightning, Cube, Vectorlight*) or *Reference Source*.
  For descriptions of the individual *Displays*, see *page 744*.
- C - List box for quickly toggling between different *Reference Sources* (*page 753*).
- D - Inlay (here, the *Vector* display)
- E and F - Position bar and buttons for navigating in a *Reference Source*.
- G - Click this symbol to change to the *Vectorlight* Display.
- H - Correction tools, *Display* selectors.

Compact Display and Magnifier (2)



- A - *Compact Display* of the three correctors (*Primary, Six Vector, Selective*); you can edit the tool buttons and sliders.
- B - *Zoom* and scale
  When the *Zoom* is activated, an enlarged view appears wherever the mouse pointer is positioned in the inlay. Moving the slider changes the zoom scale in four different stages.
- C - Opens/closes the expanded *Color Correction Editor*.

Correction Area (3)



Correction area

The original material is edited in this area. Changes are immediately visible in the inlay and at the monitor output.

- A - A *Reference Source* (in an orange frame) is displayed. Select the reference source from the shortcut menu for the relevant *Timeline* clip. See also *"Reference Source"* on page 753.
- B - Buttons (*Color* and *Gray Balance*, *HistoMatch*, *HueMatch*, etc.)
- C - Buttons for navigating in the correction clip; *Undo/Redo*, return to original state, etc.

Comparing the *Master Viewer* inlay and the *Color Correction Editor* viewer, a slight change in contrast and/or brightness can be observed. This is, however, not a defect, but the consequence of different color spaces used for representation of the same clip in the inlays on the one hand and the *Color Correction* viewer on the other hand. While the other inlays display the CCIR color space (RGB 16 to 235), the *Color Correction Editor* works with the full range available because it uses a rendered frame for preview. Therefore it is possible to modify the video level even beyond the 100 and 0% limits.
We would like to stress the fact that serious color correction is not possible by judging the image on a computer monitor. RGB does not display the full range of colors, which becomes particularly obvious with very bright and very dark colors. Connect a calibrated video monitor for optimum, YUV-based performance and quality control.

Primary and Secondary Correctors (4)

You can apply the three correctors individually or combine and apply them consecutively (from left to right).

- *Primary Color Correction* (left) - Permits basic color editing; for example, you can quickly correct a color cast or change the contrast (*page 752*).
- *Six Vector Color Correction* (center) - Permits the selective adjustment of six defined color areas (red, magenta, blue, cyan, green, yellow; *page 764*).
- *Selective Color Correction* - Permits the selection of up to 15 specific color areas for a precise color correction including *ColorWash* and *"Garbage"* (*page 765*).

Tools (5)

The area to the right of the correctors contains:

- A *Legalizer* that can be activated or deactivated. If activated, it will show you when the permissible signal-related threshold has been exceeded in the diagnostic displays (*Vector, Wave,* etc.; see *page 751*).
- A *Channel Selector* that permits the individual selection and display of Y/RGB channels (see *page 751*).
- A selection list containing color correction *Settings* that can be applied repeatedly (see *page 751*).

What is Color?

Depending on who you're talking to, this question can have many different answers.
A physicist might say that color is an electromagnetic radiation of a certain wavelength. A doctor might tell you that it's the stimulation of light-sensitive receptors on the retina. An artist might say, it's a subjective impression. And a philosopher would perhaps answer, it's nothing but an idea.
In any case, color has something to do with light. When Sir Isaac Newton illuminated a prism with a ray of sunlight, three rays emerged from the other side - red, green and blue - which were then changed back into colorless "white" sunlight when they passed through the next prism.

Another observation that you can verify with any paint box is that when you combine certain colors, it produces a hybrid color that is not "contained in" the original colors. Blue and yellow make green. Does this mean that blue or yellow already contain green? Brightness also plays a part. In the dark, even the most vibrant red turns black and if you mix any color with increasing amounts of white, it will eventually turn white.

When thinking about colors, it's helpful to develop models that include a few basic assumptions and that will, in actual practice, result in reasonable outcomes and satisfactory explanations, even if they're not the final word on "Color".

Possible Models

The models used in Avid Liquid *Color Correction* came from computer and television technology. Both are primarily based on the assumption that there are three basic colors (red, green and blue) and a brightness ("gray zone") between the extremes of white and black. Three dimensions are enough to establish a space, which is why we talk about a "color space". Thus we can imagine colors (or, more precisely, hues) as precisely defined points within a precisely defined space.

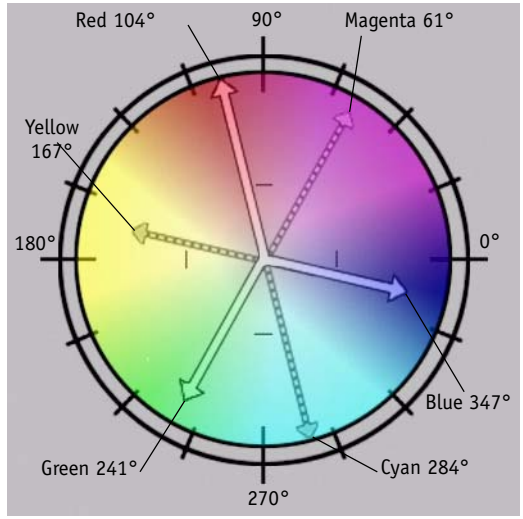
The Color Wheel

The color wheel - a physiologically inspired reflection of the phenomenon of color vision - is based on the assumption that four basic colors form two opposite pairs: red and cyan, blue and yellow.

Add to this the brightness, which ranges between white and black. These three pairs can be spread over a three-dimensional coordinate grid (color space) in which each color that can possibly be displayed is defined by its blue or yellow component, red or green component and a brightness. In color television technology, the opposite color pairs are replaced by the color difference signals R-Y (C_r,U) and B-Y (C_b, V). The luminance signal Y forms the third coordinate.
The basic colors red, green and blue and the mixed colors magenta (violet), cyan and yellow that lie in between are points (color signal locuses) within this wheel. Thus the color phenomenon is also displayed in the vectorscope (the use of this measuring device for color manipulation is highly recommended).

When examining a color bar in the vectorscope, each of the colors named above is represented by a glowing dot at a specific location of the screen (located at the tip of an arrow; see figure). The arrows are called vectors. With the aid of these vectors, all the possible points (= colors or hues) within the wheel can be precisely defined mathematically.

The position of a point relative to the center of the wheel affects the colorfulness (saturation) of a color; a pale blue is close to the center and a vibrant, fire-engine red is located near the wheel's periphery. A hue (red, green, blue, etc.) is an angle in the color wheel. Pure red is located at approx. 104 degrees and red-violet (magenta) at approx. 92°. Note that in the degree scale of the vectorscope, 0° is located at "3 o'clock".
Thus a color is adequately defined by the length of the vector and the angle. On this basis, color corrections are performed in the "YUV" color space.



Color wheel and color vectors (vectorscope view)

RGB Color Space

On a computer monitor, colors are generated by means of red, green and blue dots illuminated at different intensities. If you look closely enough at the monitor, you can see these dots. The red, green and blue (RGB) variables can be stored digitally as bytes with values from 0 to 255. The notation (255,255,255) means “white”, (0,0,0) means “black” and (0,255,0) means a fully saturated “green”. The brightness not only of the resulting colors is also described by the RGB value sets: (25,25,25) would be a dark gray, (200,200,200) a light gray.
Many graphics programs use the RGB model to define colors.

YUV Color Space (YC_bC_r Space)

Television was originally black and white. All the information was transmitted in one signal, the luminance signal (*Y*), which permitted the display of the necessary shades of gray. When color television was developed, it still had to operate on the many existing black-and-white TV sets. For this reason, two “color difference signals” were added to the Y signal: C_b (analog: B-Y; U) and C_r (analog: R-Y; V). These three components form what is often called the “YUV” signal. From this signal, red, blue and green values can be computed that guarantee the correct reproduction of color on the color monitor. Stored digitally as bytes, the value of each component can in theory range from 0 to 255. The actual ranges of values, however, are limited by CCIR Standard 601:
Y (16 to 235)
C_b, C_r (16 to 240)

Mathematically speaking, the two color spaces (YUV and RGB) describe the same space. However, the different range of values results in a very different spatial resolution. Moreover, specific colors are “not possible” in the RGB space but can be produced in the YUV space. See also *“Legalizer”* on page 751.

Practical Tips for Using Color Correction

Color correction is one of the most complex and difficult areas of postproduction. For non-professional users, we'd like to offer the following tips:

No Exact Color Correction on the Computer Monitor

You should always evaluate any color correction on a calibrated video monitor or television. Because of the different display technologies, the colors on the video monitor and computer monitor do not match.

Calibrating the TV Monitor

If possible, purchase a dark-blue filter (e.g. Wratten 47B), which will allow you to simulate the Blue Only (Blue Check) feature available on professional video monitors. You'll find this filter in any of the better photo stores.

If you happen to be reading the printed version of the Reference Manual, you can also go to this section in the online PDF file where the illustrations are in color. In *Avid Liquid*, press F1 and go to the *PDF* tab.

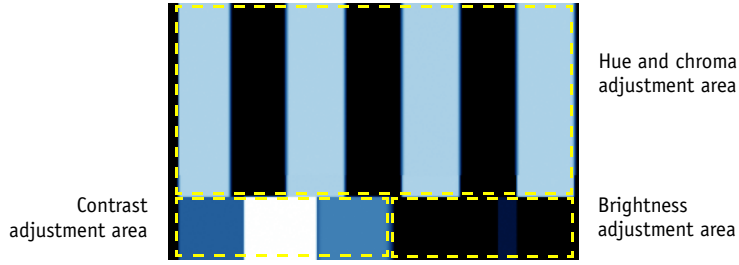
1 To calibrate a typical TV monitor, use the SMPTE color bar test pattern from Avid Liquid (by default located in ..*My Documents**Avid Liquid**Testpattern**NTSC*). Load *SMPTE Color Bars (NTSC)* to a *Project* and then to the *Timeline* or *Clip Viewer* so that it will appear on the TV monitor:



SMPTE color bars
(Top row, left to right: White, Yellow, Cyan, Green, Magenta, Red, Blue
Middle, narrow row: Blue, Black, Magenta, Black, Cyan, Black, White)

2 View the screen through the blue filter (or turn on the Blue Check feature on the monitor).

3 The colors now disappear and you see only alternating lighter and darker bars - three darker and four lighter - as shown below:



SMPTE color bars: Blue Only

4 Use the Hue control (if any) and Chroma control ("Color") to adjust the picture until each of the four lighter, upper bars matches the small rectangle directly beneath it.
Hue mainly adjusts the two inside bars and Chroma adjusts the two outside bars. (You can ignore the bottom row. PAL televisions do not have a Hue control.)

5 Take away the blue filter (turn off Blue Check).

6 Now adjust the brightness. Look at the black area in the bottom row directly below the red bar. In the center is a vertical bar that is barely lighter than its surroundings (depending on the test pattern, this bar may also comprise three individual bars of different shades of gray).
Turn up the brightness until the center bar stands out clearly.
Then turn down the brightness, just until the center bar disappears.

7 And now for the contrast: Adjust the white rectangle between the two blue rectangles until it turns a pure, gleaming white but doesn't intrude into the adjacent rectangles.

8 Contrast and brightness affect one another, so repeat steps 6 and 7 until you obtain the optimal results.

If you have a professional video monitor, set all the controls to the precalibrated positions.

Adapting the Environment

A professional colorist studio is gray and drab. Surrounding colors must not be allowed to distract from the motif.

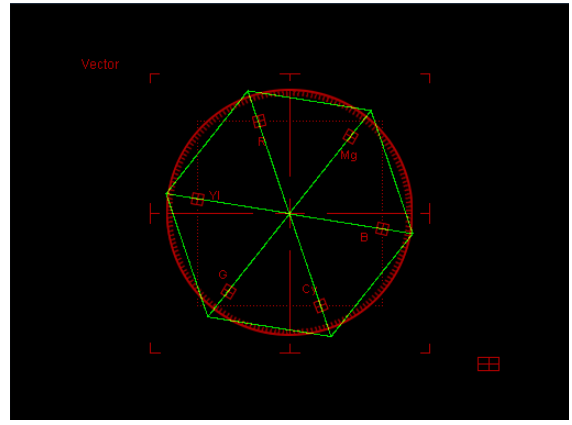
Try to design your editing room to be as neutral as possible:

- Dim the lights as much as possible. Use lighting that is neither too “warm” (light bulbs) nor too “cold” (neon tubes). The ideal setup is a color temperature of 6500 K and indirect lighting.
- Remove all bright colors from your field of vision (flowers, pictures, etc.).
- Place the monitor in front of a neutral background. Make sure no direct light falls on the monitor, including from the sides.
- Avoid color curtains, which can affect room lighting, as well as color carpets and colorful wall coverings.

Working with the Vector and Waveform Diagnostic Displays

This section describes how to work with a vectorscope, waveform, etc. Reading this section will help clarify much of the information on color and color models from the previous section and give it a concrete basis in reality. If you're already familiar with this topic, skip to the description of the individual color correctors (*"Primary Color Correction"* on page 752 ff.).

1 Begin by importing the *RGBspace.bsi* test image from the directory (..\Avid Liquid [x]*Media**Stills**NTSC* or *PAL*) to a *Project Rack*. Then open the *Color Correction Editor* and click the test image to load it in the editor in place of the default image. From the drop-down list box above the Diagnostic Display, select *Vector*. If everything is functioning correctly, a colorful pattern of bands should appear on the right-hand side and the *Vector Display* should contain the following image:



RGBspace.bsi test image in the Vector Display

How to interpret this image:
RGBspace contains the six hues red (*R*), magenta (*Mg*), blue (*B*), cyan (*Cy*), green (*G*) and yellow (*Yl*), each ranging from non-saturated to saturated. These are the six lines radiating from the center point. (See also *"The Color Wheel"* on page 731.)
The edges represent the different gradual transitions from adjacent hues, such as the color gradient from red (255,0,0) to magenta (255,0,255).
About the scale: The horizontal axis is C_b, the vertical axis is C_r, the six markings indicate the corresponding color locuses at a saturation of 75 %.
The maximum saturation of the test image colors is 100 %; this is why the corners of the hexagon are located outside the circle.
The square contains the 75% color range.

Unlike an analog vectorscope, the digital *Vector Display* of Avid Liquid *Color Correction* displays disconnected points. This means, for example, that the typical line patterns are omitted from standard color bars interpretation. Another remark about color bars: The additional points visible in the digital display are the results of minimal "stray colors" in the transition to adjacent colors that are produced through anti-aliasing.



2 Go to the *Primary Color Correction* area (bottom left) and drag the *Saturation* slider (*S*). The hexagon expands or contracts and the colors in the test image intensify, fade or disappear altogether. In the *Vector Display,* a black-and-white image exists as a tiny dot at the point where the coordinates intersect.



Note: Clicking the button displayed quickly resets the original values.



3 Now try the *Hue* slider (*H*). The hexagon rotates like the vanes of a windmill. All the hues in the test image change to the adjacent hue.

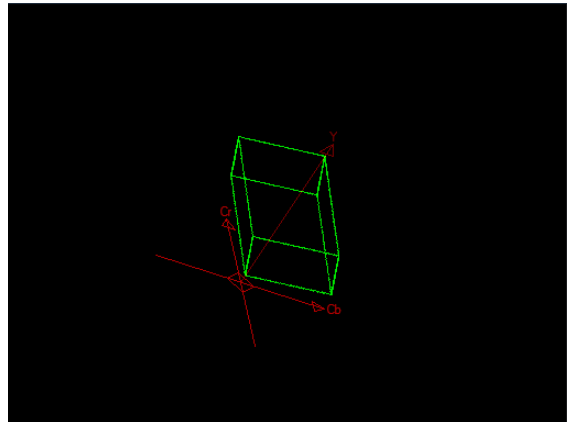
Primary color correction of the hue is especially useful in an NTSC system where often the entire spectrum is shifted during transmission; *Hue* can get it back on track.

4 Drag one of the three gray *Primary Color Correction* bars. These are the *Luminance (Brightness)* sliders. You will notice that while the brightness of the test image varies, the *Vector Display* remains the same. Why?



5 Because *Luminance* operates on a different plane.
You will see this when you select the *Cube* display from the list box or when you click the *Rotate* button (which may have to be retrieved from the tool box).

6 Initially an image appears that is similar to the hexagon in the *Vector Display* but without the circular scale. The axes are identified as C_b and C_r.
You are looking up at a cube whose uppermost corner is positioned exactly above its lowest corner. Left-click in the display above the C_r axis and drag it downward in an arc. The cube is rotated to a position similar to the one in the image below:



The RGBspace.bmp test image in the Cube Display

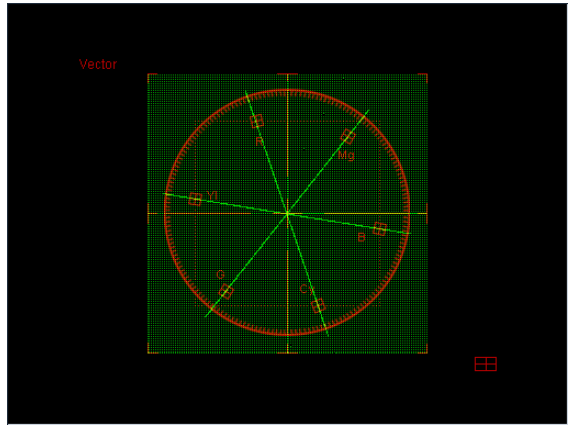
The third axis (*Luminance* axis *Y*) now appears.
What appears to be a cube is the RGB color space. Within this space, imagine the possible RGB colors. As was stated earlier, we're dealing with models and models always require a little imagination.
Once this RGB space appears within the coordinates of the YUV space, notice three things:

- The RGB value for black (0,0,0) is not positioned at Y = 0 but at Y = 16. This is evident from the corner of the cube located just above the axis intersection. Likewise, the RGB value for white (255,255,255) is positioned at Y = 235. This is due to the CCIR Standard mentioned above (*page 733*).
- The cube is smaller than the space created by the YC_bC_r axes. This is also due to the CCIR Standard which specifies values from 16 to 240 for C_b and C_r.
- The RGB cube stands on one of its corners. Its space diagonal from black to white corresponds to the *Y* axis of the YUV space.

Press SHIFT and drag to rotate the cube around the *Y* axis.

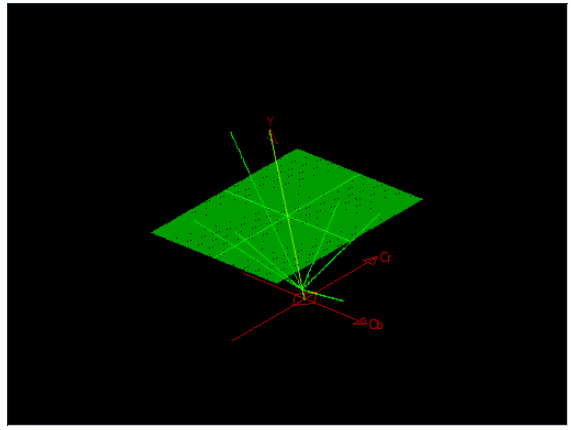
Experiment with the *Saturation* slider to see how the cube expands and contracts.
Once it expands beyond a certain point, clipping occurs; this means you've reached the edge of the permissible YUV space. See also *"Legalizer"* on page 751.

7 Close the *Color Correction Editor* and reopen it immediately to call the standard test image (Note: Make sure there is no clip selected on the *Timeline*!). The *Vector* Display contains the following image:



The standard test image in the Vector Display

How can this be explained?
The six radiating lines that characterize the RGB color space are created by the six color bands at the top of the test image.
The gray-scale wedge at the bottom of the test image describes the range of possible luminance (0 to 255) and, as was explained above, is not visible in this display because luminance is plotted along the *Y* axis.
The most important feature here is the square plane representing the possible colors of the YUV color space. Switch back to the *Cube* Display:

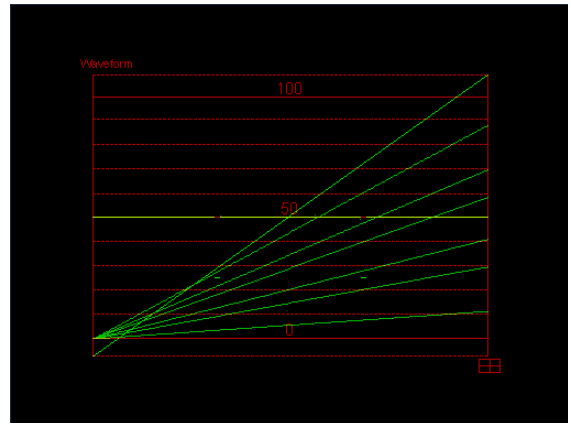


The standard test image in the Cube Display

With a luminance of *Y* = 128, you see the plane of possible colors for the YUV space (here only every fourth color value is displayed as a pixel dot). These values come from the color square in the center of the test image.
Color gradients (C_b,C_r) are arranged on the left and right (half resolution). These two lines form the axis intersection at *Y* = 128.
The gray-scale wedge (luminance from 0 to 255) appears as a green *Y* axis in conformity with YUV.

Experiment with the sliders again to get a feel for *Vector* and *Cube* Display interpretation.

Now switch to the *Waveform* Display:

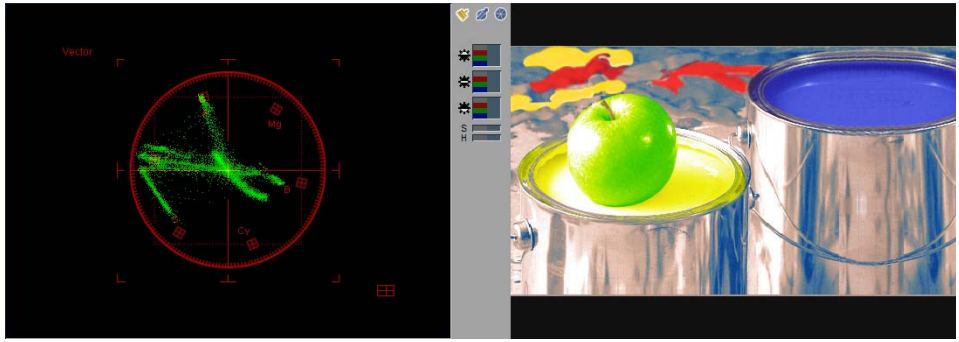


The standard test image in the Waveform Display (not clipped)

The *Waveform Display* lets you measure the luminance (a.k.a. brightness or video level) of an image signal.
In contrast to the *Vector Display*, the *Waveform* has a spatial relationship to the image, as is clearly indicated by the line running diagonally from the bottom left to the top right; this line indicates the increasing luminance of the gray-scale wedge which runs from left to right in the test image.
The other six diagonal lines represent the six color bands in the luminance gradient.
The line of the YUV color fields with two gaps is located at 50% (Y = 128); the short lines below the gaps represent the gray bars between the color fields.

The red scale mark at *0* (percent) stands for CCIR black (Y = 16) and the mark at *100* stands for CCIR white (Y = 235). If you activate the *Legalizer* (*page 751*), the lines/values extending outside this range are clipped.
Another common name for the range from 0 to 100% is the “image amplitude”.

8 Naturally, test images always provide very tidy *Vector* and *Waveform Displays*. The interpretation of "real" video signals can appear confusing but only at first glance. Here are three examples:



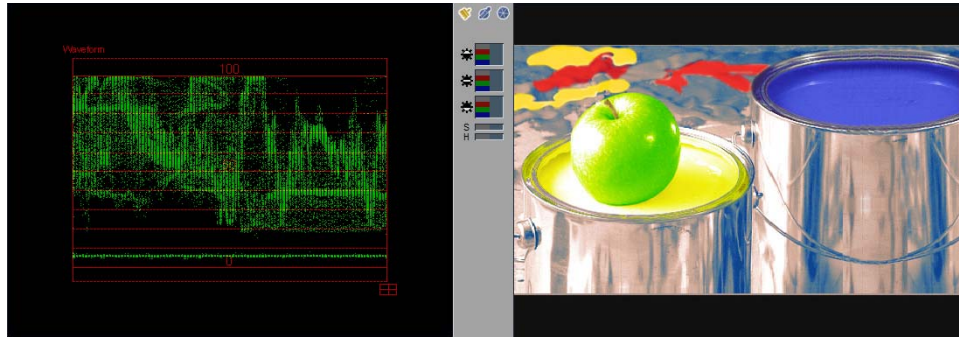
Video image and the associated Vector Display

In this image, a green apple (the Granny Smith variety, to give you an idea) is being dipped in a can of yellow paint. To the right is a can of blue paint and in the background a few splashes of red, yellow, blue and turquoise paint.

Every luminous green dot in the *Vector Display* stands for a precisely defined hue with a specific saturation. Intensely glowing clumps appear wherever a large number of very similar hues are grouped together.

The *Vector* Display clearly reflects the yellow and red color components as well as the turquoise splashes. What is at first surprising is the lack of a distinct "green" display for the apple. Where the human eye makes a clear distinction, the *Vector* analysis sees only nuances of yellow.

The same motif as it appears in the *Waveform Display*:



Video image and the associated Waveform Display

This display shows a relatively uniform distribution of brightness, a wide band that mainly falls between 20 and 80 percent. The short black band at the lower left-hand edge of the image is mapped on the zero line at the bottom left. At points the highlights on the apple and paint cans extend above the 100 percent line.

This motif illustrates even more clearly the spatial relationship between the *Waveform Display* and the associated video image:

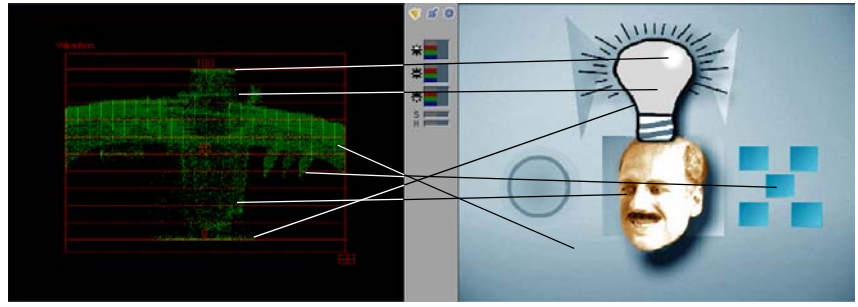


Image and the associated Waveform Display

The even blue background extends in a band across the entire display; the darker squares on the right stand out as three spikes. The lighter reflection on the light bulb is the horizontal mark on the 100 percent line; the uniform gray of the bulb is represented by the slightly longer mark on the 80 percent line. The different luminance values of the face are responsible for the spectrum at the center of the waveform.

Diagnostic Displays (Overview)

Avid Liquid *Color Correction* provides various diagnostic displays for assessing and analyzing video signals. You can select them from the top left-hand list box (above the Diagnostic Display area), or by clicking their respective buttons.

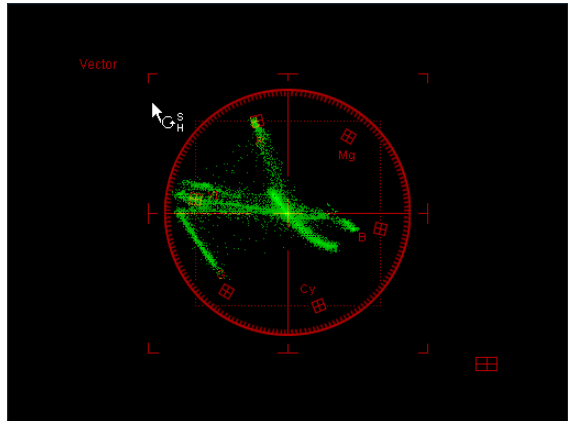
Vector Display



The *Vector Display* allows you to analyze, control and adjust the color components in a video signal.



It is called automatically when you activate the *Hue-Saturation* button (see figure).



Vector Display with mouse pointer

- The abbreviations *R* (red), *Mg* (magenta), *B* (blue), *Cy* (cyan), *G* (green) and *Yl* (yellow) stand for the color signal locuses. The circular degree scale (0 to 359° with 0° at “three o’clock”) indicates the color angle.
- The C_b axis runs horizontally and the C_r axis runs vertically.
- The square formed by the dotted line encloses the range of 75 % color range (see also *Legalizer* on page 751).
- The permissible range as defined by CCIR Standard 601 is specified by the dimensions of the axes (see also *Legalizer* on page 751).
- Single-clicking the segmented rectangle in the bottom right-hand corner instantly takes you to the *Vectorlight Display.*



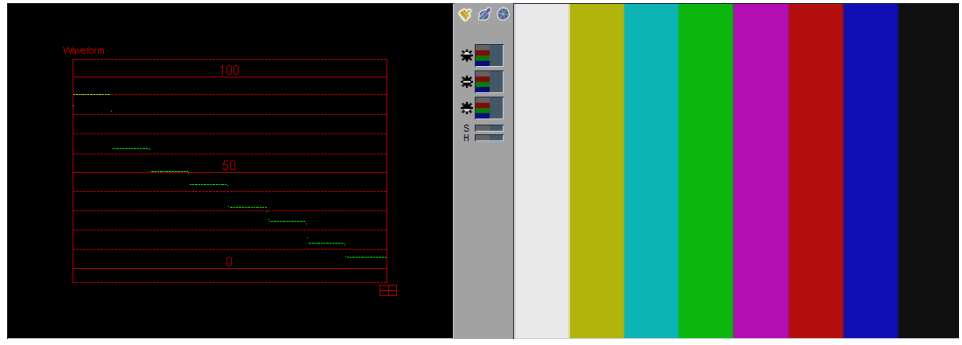
You can set the *Saturation* (*S*) and *Hue* (*H*) directly in the *Vector Display*.

- *Saturation* -
  Drag the mouse pointer across the display, either toward or away from the axis intersection.
  A double-click resets the value to initial state.
- *Hue* -
  Drag the mouse pointer in a circle around the axis intersection.

Waveform Display



The Avid Liquid *Waveform Display* represents the luminance component of a video signal (video level). It analyzes the signal's field lines from left to right, meaning that the waveform image has a spatial correlation to the video image.
This is illustrated by the standard color bar (100/100) with its graduated brightness gradient from white (100 %) to black (0 %):



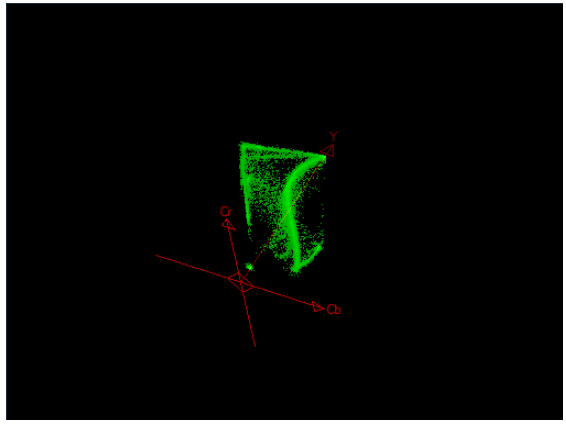
Waveform Display of the 100/100 color bar

The scale from 0 to 100 (percent) refers to the image amplitude. Beyond 100 percent, bright spots in the image appear plain white without any detailing. Using the *Legalizer*, you can clip the signal (*page 751*).

- Single-clicking the segmented rectangle in the bottom right-hand corner instantly takes you to the *Vectorlight Display*.

Cube Display

The *Cube Display* is a three-dimensional display of the video signal along the *Y*, C_b and C_r axes.



Cube Display rotated to an individual perspective

Clicking the *Rotate* button automatically takes you to the *Cube Display*. You can then drag the mouse pointer over the display to create the desired perspective.

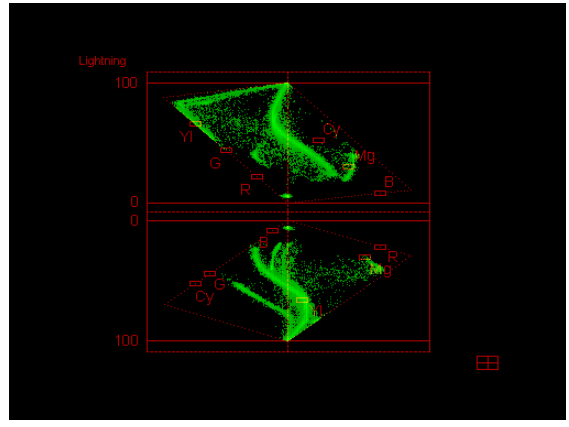
Simultaneously hold down the SHIFT key to rotate the display around the *Y* axis.

This display is especially useful when you're working with *Selective Color Correction*. You can then see how the user-definable *Hue*, *Lightness* and *Saturation* ranges gradually come to encompass the color locuses along the luminance axis as well.

Lightning Display



This display shows the color values of all three signal components (YC_bC_r). All the other displays can indicate either the color component or the luma component. The *Lightning Display* is used especially in video analyzing technology.



Lightning Display

Basically, you are shown two sides of the *Cube Display*, one of which is upsidedown (in the bottom section). The Y component is plotted along the center vertical axis. The C_b component is displayed on the left-hand side of the top section and the C_r on the left-hand side of the bottom section, each in the positive coordinate range.
To clarify this further, load the *RGBspace* graphic. Then experiment a little with the *Hue* slider and compare the results with the *Cube Display* (*page 737*).

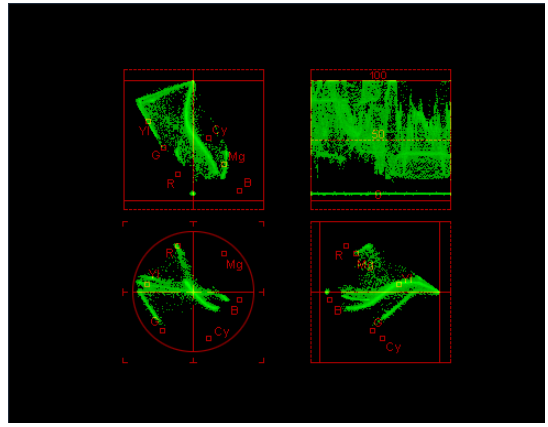
- Single-clicking the segmented rectangle in the bottom right-hand corner instantly takes you to the *Vectorlight Display*.

Vectorlight Display



The *Vectorlight Display* combines several different displays:

- *Vector Display* (bottom left)
- *Waveform Display* (top right)
- The other two are variations of the *Cube Display* (similar to the *Lightning Display*). The *Y* axis is the center vertical axis in the top left display and the center horizontal axis in the bottom right display.
  Changing the *Hue* value rotates the image around the *Y* axis and will help you gain a clearer understanding of the displays.



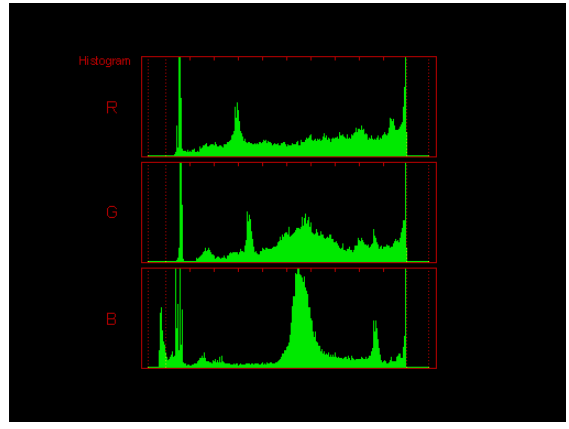
Vectorlight Display

Click one of the *Displays* to maximize it on the screen.

Histogram



The *Histogram* shows the distribution and frequency of the RGB values contained in an image. It has no spatial relationship to the associated image.
Color correction using the Histogram (*HistoMatch*) is described elsewhere: *page 762*.



Histogram Display

- A field is displayed for each channel (red, green, blue).
- The values are plotted from left to right on the X axis (0 to 255), the scale is divided by 10 scale marks along the upper horizontal lines.
- The two inner dotted red lines indicate the edges of the permissible range (approximately as per CCIR 601) and the outer dotted lines represent 0 and 255. See "*Legalizer*" on page 751.
- The Y axis (from bottom to top) represents the number of pixels for each point along the X axis. The Y axis is scaled so that the full height of the scale always represents the maximum value detected, the others adapt accordingly.
- The histogram for a reference source is dark blue; wherever values overlap, the green histogram of the current image is somewhat brighter.

For example, the histogram of a fully saturated red color clip (255,0,0) comprises a green vertical line at position 255 in the *R* field and two lines at position 0 in the *G* and *B* fields. Clearly stated, all the pixels contained in the image are red=255 and it contains no values for the other two components. The histogram for a dark-green color clip (25,25,25) displays the three lines (full height) at the same X positions.

One more example:

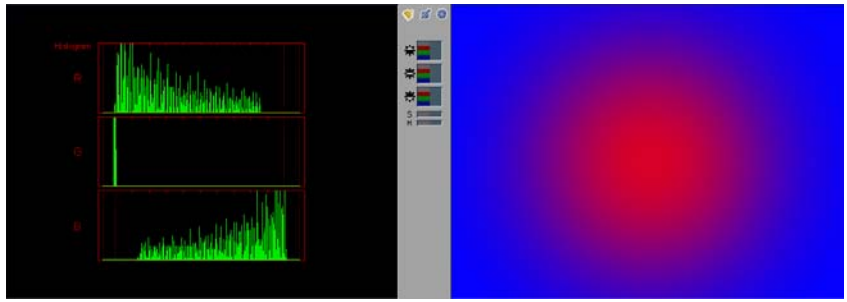


Image and histogram

The motif is a circular gradient from blue to red. A large number of blue pixels are present resulting in a distinct display of R, G and B: three lines to the full height. Red is also present in the requisite specification; theoretically, however, it is only a single pixel (determined by the gradient definition) and therefore it does not show in the histogram display.
The gradient appears as a ramp in the R and B fields.
If saturation is removed from the image, the display in the three fields will be identical; it then represents only the gray-scale values of the gradient.
Experiment a little with the sliders to familiarize yourself with the histogram.

Basically, the following applies: The chances for a differentiated color correction are better if the values are distributed fairly evenly over the individual color channels.

Tools

Legalizer

Four options will help you stay within certain signal-related limits.

CCIR 601

Limits the image output signal to the values permitted by the CCIR-601 Standard by clipping any exceeding components. Use the *SoftClipping* function to configure signal clipping (*page 751*).

Work only in CCIR

This option confines values within the limits of CCIR 601, meaning that illegal colors cannot even be created during correction (rather than only be clipped at the output).

75% Color

Limits the C_bC_r color components to 75 percent of the maximum permissible value.

SoftClipping

Normally, signal peaks that extend beyond the permissible signal range are simply clipped, resulting in a loss of image information.

These two functions (one for *Luminance* and one for *Chrominance*) permit a gradual clipping, i.e. the signal is not simply truncated at the clipping limit but is compressed well below this limit. You can determine the degree to which it is compressed using the sliders.

SoftClipping permits a somewhat better delineation in image areas that are too bright and too dark.

Channel Display

With this function, you can activate the individual color channels R, G and B or the luminance channel Y or all three color channels at the same time. It helps you detect image signal noise in the channels.

Reference Sets

With this function, you can save up to 16 different groups of settings and restore them if necessary. The parameters of all three correctors plus tools are saved.

Click the *Plus* symbol to add a set. A modified set can be saved using the double-*Plus* symbol. *Trash* deletes the current set, which you can choose form the list.

Primary Color Correction

A basic feature of *Primary Color Correction* is the fact that it affects the entire color balance of an image. In other words: If, for example, the red component in *Gamma* is increased, the whole image takes on a more or less distinct reddish "cast". Or it's a cast that is removed by increasing this component.

The sliders for *Primary Color Correction* are located in the lower left-hand section of the *Color Correction Editor* and between the inlays (*Compact Display*).
The *Primary Color Correction* functions are generally adequate for your "everyday" color correction needs.

Primary Color Correction can either be used alone or in combination with the other types of correction.

You can activate or deactivate the parameters by means of the square on the right in the *Primary Color Correction* title bar.

Operating variants *page 753*

→ Separately using sliders and editing fields *page 753*

→ Linked using the mouse in the inlay *page 753*

→ Working with the Reference Source *page 753*

Parameters

→ Gain *page 755*

→ Gamma *page 755*

→ Black *page 755*

→ Hue *page 755*

→ Saturation *page 755*

Set contrast

→ Black-Gamma-Gain contrast *page 756*

→ Contrast Adaptation *page 756*

Cast correction (using the mouse) *page 757*

Gray Balance (subsequent white-balancing) *page 757*

Tone Balance *page 760*

Color Balance *page 761*

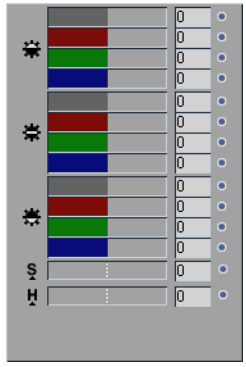
HistoMatch *page 762*

HueMatch *page 763*

Operating Variants

When working with *Primary Color Correction*, you can choose between several operating variants. For purposes of comparison and matching, you can also display a *Reference Source*.

Separate Channel Control



Using the mouse, you can adjust the bars for the color channels (red, green, blue) and luminance (gray) individually.
You can also edit the display fields: Click a field and enter a value or use the UP ARROW or DOWN ARROW keys to increase or decrease values.
Press the TAB key twice to confirm your entry; the cursor then jumps to the next field.

Linked Control

When you drag the mouse pointer over the inlay, the R, G and B channels are modified simultaneously while luminance remains the same. This makes it easy, for example, to correct a color cast.
Imagine the color wheel superimposed on the image. As you drag the mouse pointer toward "3:30 o'clock" the blue component increases while the green and red components are simultaneously reduced. The RGB bars indicate the quantitative change.



Drag the mouse pointer (up or down) while holding down the right mouse button to change the *Luminance*.

Activate linked control by means of the *gain, gamma* or *black* button (*page 754*).

Reference Source

A *Reference Source* makes it easier to correct or adapt the color of image motifs. Some *Primary Color Correction* functions (such as *Tone Balance*) require that you select a *Reference Source*.
This is how it is done:

1 Open the shortcut menu for a *Timeline* clip (this may require that you temporarily close the bottom section of the *Color Correction Editor*) and click *Set As Reference Source* (this function appears in the menu only if the *Color Correction Editor* is open).
This clip continues to be defined as a *Reference Source* until you define another.

2 From the center list box above the diagnostics inlay, select *Reference Source*.



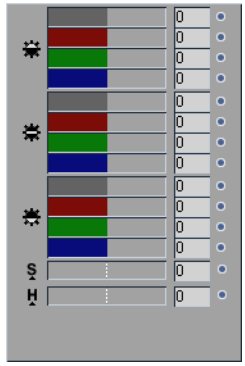
3 Activate the *Set Split Size* function to change the size of the *Reference Source* displayed within the correction inlay. The orange frame indicates its dimensions.
Drag the mouse pointer from the corner or side from which it should be displayed.

4 You can display other *Reference Sources* as described under step 1. Or you can select the *Last Source* or *Next To Last Source* from the center list box above the diagnostics inlay. These options refer to the edited clips.



In order to display the *Reference Source* as a frame beside the correction image, select *Reference* from the left-hand list box above the diagnostics inlay instead of a diagnostic display.
The position bar below the diagnostics inlay refers to the currently active *Reference Source*, thus allowing you to navigate within this clip.

Parameters



Primary Color Correction (from top to bottom: Gain, gamma, black, saturation, hue)

This section describes the individual standard ranges and parameters of *Primary Color Correction*.
You can modify RGB and luminance in three overlapping areas (*Gain, Gamma, Black*) either separately or with R, G and B linked (see also *Linked Control* on page 753).
Hue and *Saturation* can also be configured either separately or in combination.

The effects of these sliders are best illustrated in the *Waveform* and *Cube Displays* (preferably with the *RGBspace* test image; see "*Working with the Vector and Waveform Diagnostic Displays*" on page 737).

You can activate or deactivate the parameters by means of the square on the right in the *Primary Color Correction* title bar.



Be sure to keep an eye on the permissible maximum and minimum levels (verify in the *Waveform or Vector* Display) if, for example, you work for a TV station.

Gain (Highights)



Gain primarily affects the bright spots in an image such as highlights and reflections.
You can raise or lower *Gain* to correct point-sized overexposures/underexposures.

Gain is the variable usually affected with the conventional contrast control on TV or Video Monitors. However, a much more effective contrast adaptation is achieved through the combination *Gain* and *Black* (see *"Contrast"* on page 756).

The *Waveform Display* (with the standard test image) illustrates how the value is raised or lowered when Y=255. The slope of the lines changes.

Gamma (Midtones)



Gamma primarily affects medium-bright areas of an image.

Gamma is the variable you can set by adjusting the conventional brightness control on your TV set.

The *Waveform Display* (with the standard test image) illustrates how the lines from Y=0 to Y=255 are distorted into curves.

Black (Black Value, Pedestal)



Black primarily affects the dark ranges in an image. But be sure not exceed the permissible black value!

The *Waveform Display* (with the standard test image) illustrates how the value is raised or lowered when Y=0. The slope of the line changes.

Hue



This slider causes a gradual transition of colors to the colors adjacent to them.
In the *Vector Display*, a change in *Hue* appears as a rotation of the color locuses around the *Y* axis (which is why it is also called the "color angle"). It has no effect on the *Waveform Display*.

Saturation



Saturation determines the colorfulness of a hue. "Saturation equals zero" is the absence of color components; only the Y (black-and-white) signal remains.
In the *Vector Display*, saturation is defined by the distance from the axis intersection C_b/C_r. Changes in *Saturation* have no visible effect in the *Waveform Display*.

This slider corresponds to the standard color control on a TV set.

Linking of Hue and Saturation



This function allows you to modify *Hue* and *Saturation* simultaneously but only in the *Vector Display (page 744)*. The *Vector Display* is automatically called when you click this button.

The mouse pointer changes on the *Vector Display*. If you drag the mouse pointer:

- In a circular motion, the color locuses rotate around the axis intersection, i.e. the *Hues* change;
- Up and down, the *Saturation* rises/falls.



Simultaneously hold down the SHIFT key to change only the *Saturation*; hold down CTRL to change only the *Hue*.

Contrast

"Contrast" is the difference between the brightest and darkest spots in an image. When the difference is minimal, the image is "flat"; when it's extreme, the contrast is "hard". A black silhouette against a bright white backdrop is about the hardest contrast imaginable. Once contrast is used as a means for designing images, however, the subjective perception of differences between bright and dark is what matters most.

Contrast can be modified in two ways: *Black-Gamma-Gain* control and *Contrast Adaptation*.

Black-Gamma-Gain Control

Contrast can best be increased by making the brightest spots in an image a little brighter and the darkest spots a little darker (and vice versa to reduce contrast).

This is achieved with a slight increase or reduction in *Gain* and a concurrent slight reduction or increase in *Black*. Basically, this applies both to the luminance component and the RGB components.



Saturation also contributes to the subjective perception of contrast.

Contrast Adaptation



This function automatically adapts the contrast based on the brightest and darkest spots in an image:

Activate the function and drag a line from the "black point" to the "white point" (i.e. from the darkest to the brightest point in the image). Because this can be a matter of individual pixels, it may be helpful to activate the *Zoom* (*page 729*).



Y Gain and *Y Black* are modified so that the luminance value of the "black point" is set to true black (Y=0 or Y=16) and the luminance value of the "white point" is set to true white (Y=255 or Y=235).

Correcting Color Cast (with the Mouse)

You can correct a subjectively perceived predominance/lack of a particular hue quickly and easily using linked *Primary Color Correction*:



1 Open the *Color Correction Editor*.



2 Click the clip you want to edit. It can be located in a *Rack* or on the *Timeline*.
If necessary, move to a specific spot in the clip using the position bar or the navigation buttons.

3 Assess the distribution of brightness and then click the *Gain* (highlights), *Gamma* (midtones) or *Black* (dark range) button.

4 Take even greater control: Select the *Vector Display* (*page 744*) and, if necessary, activate the *Legalizer* (*page 751*).

5 Drag the mouse pointer across the inlay in the direction of the hue that you wish to intensify and away from the hue you want to soften.
The luminance remains the same. You can see how the linked values are changing by watching the RGB bars.

Gray Balance (Subsequent White-Balancing)

To a large extent, the human eye is able to adjust to the predominant color temperatures of light. This is why the same white object under different lighting conditions is still perceived as "white".
A video camera must be set to the current definition of "white" before recording and when the light color (color temperature) changes. If white-balancing was not done or was done incorrectly, it can still be corrected subsequently - within certain limits, that is.
What is actually being done is *Gray-Balancing* because true white (255,255,255) seldom occurs. Instead it's a matter of taking an undesirable color cast in an area that is presumed "white" and changing it to "achromatic", i.e. a specific level of gray.
In the RGB model, "gray" is always produced when the RGB values are the same - for example (25,25,25) or (111,111,111). In the YUV model, "gray" is when C_b, $C_r = 0$.
Consequently, Avid Liquid *Gray Balance* requires that gray be contained in the image motif. If it isn't, you might be better off using *Tone Balance* (*page 760*).

1-point gray balance

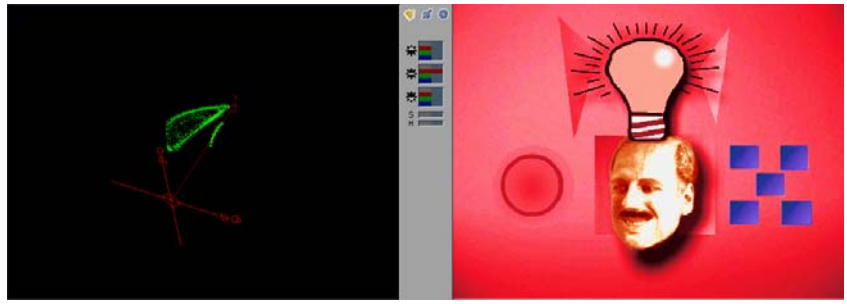
→ How gray balance works (example) *page 758*

→ Options *page 759*

2-point gray balance *page 759*
3-point gray balance *page 759*

1-Point Gray Balance (Example)

The basic functioning of *Gray Balance* will quickly become clear with an example.
The first figure shows a spectrum clearly shifted toward red. The light bulb should actually be CCIR white (Y=235, C_b, C_r = 0). This would be the spot (if this were a camera image) on which you would white-balance.



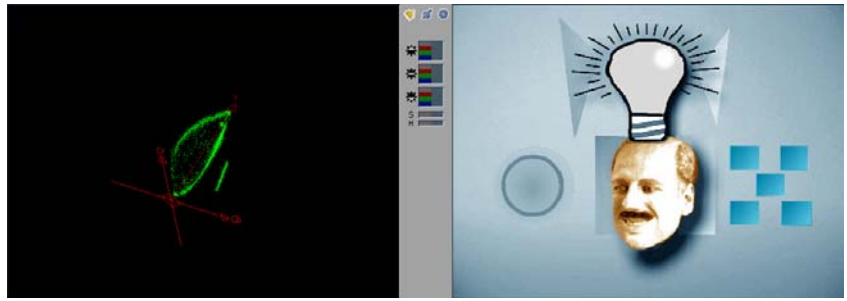
Gray balance: The motif has a reddish cast.

In actuality, however, this spot has the coordinates Y = 234, C_b = -7, C_r = 7, in other words, an undesirable cast.
In the *Cube Display* the narrow, finely curved line of green dots is especially obvious, indicating the cast.



In order to correct this, you would click the *1-Point Gray Balance* button (and also the *Zoom*) and look for a point in the image that is as achromatic as possible. In this case, it's simple: Either the body of the light bulb or the black outline.
Clicking the achromatic point means moving this point precisely to the *Y* axis (C_B, C_R = 0). In other words, this point is defined as "gray".

The next figure again shows the colors correctly while the narrow green line in the *Cube Display* is on the *Y* axis:



Gray is again gray and blue is again blue.

Clicking the blue background would produce a garish, yellowish-red cast. This and similar effects are easily understood when you look at the *Vector Display* and consider shifting the color locuses toward or away from the *Y* axis (achromatic).

Options

1-Point Gray Balance without additional modifications affects the RGB gamma values.

Press the SHIFT key and click to adapt the RGB *Gain* values.
Press the CTRL key and click to adapt the RGB *Black* values.

2-Point Gray Balance

Drag a line between a light-gray point and a dark-gray point within the image to adapt the *RGB Black* values and *RGB Gain* values.
This option can be applied if a color cast caused by an incorrect white-balancing does not run linearly across the brightness areas.

3-Point Gray Balance

3-point Gray Balance affects *Black, Gamma* and *Gain*. When you click the button, three control squares connected by a line appear in the image.

The black square represents *Black*, the gray one *Gamma*, the white, *Gain*.

1 Drag the control squares to spots in the image which correspond to their respective luminance ranges. The black square goes on the darkest spot, the white one to the brightest, the gray square somewhere in between.

2 Click the right mouse button to apply *Gray Balance*.

3 If necessary, repeat steps 1 and 2 to optimize results.

The control squares check luminance values at the spots where you have moved them and change roles accordingly. For example: If you move the gray square representing *Gamma* to a spot which is even darker (in terms of luminance) than the current black square's location, the squares adapt: The gray square changes to black, the black to gray.

Tone Balance



An image motif does not always contain gray for a subsequent white-balancing (*page 757*). In this case, you can use *Tone Balance* to balance color on the basis of a reference hue.
Correction is possible in *Black, Gamma* and *Gain*; the default setting when you click the button is *gamma*.
Luminance remains the same, a fact that sets *Tone Balance* apart from *Color Balance*.

1 You need a *Reference Source (page 753)* containing similar, "correct" hues as far as the mood of the color is concerned. This is clearly a subjective assessment that requires a good eye and a little experience.
Call the *Reference* in the Diagnostic Display.

2 Click the *Tone Balance* button and drag a line from a point in the *Reference Source* to a similar point in the clip with the incorrect color balance (in other words, not from green to red - that certainly wouldn't work).

Press the SHIFT key and drag to adjust the RGB G*ain* values.
Press the CTRL key and drag to adjust the RGB *Black* values.

If this function is activated, the diagnostic display automatically changes to the current *Reference Source*.
See also *"Reference Source"* on page 753.

Color Balance

1-Point and *3-Point Color Balance* match a *Reference Source* and the clip that you want to modify. In contrast to the otherwise similar *Tone Balance* function, luminance is affected by the *Color Balance* function.

1-point Color Balance *page 761*

3-point Color Balance *page 761*

1-point Color Balance

1-Point Color Balance affects *Black, Gamma* and *Gain* simultaneously.

1 You need a *Reference Source (page 753)* containing similar, "correct" hues as far as the mood of the color is concerned. This is clearly a subjective assessment that requires a good eye and a little experience.
Call the *Reference* in the diagnostic display.



2 Click the *Color Balance* button and drag a line from a point in the *Reference Source* to a similar point in the clip with the incorrect color balance.



If this function is activated, the diagnostic display automatically changes to the current *Reference Source*. See also *"Reference Source"* on page 753.

3-point Color Balance



3-Point Color Balance lets you match the *Black, Gamma* and *Gain* ranges separately

When you click the button, three control squares connected by a line appear in the *Reference Source* as well as in the image that you want to modify.

The black square represents *Black*, the gray one *Gamma*, the white one *Gain*.

1 In the *Reference Source* image, drag the control squares to spots in the image which correspond to their respective luminance ranges. The black square goes on the darkest spot, the white one to the brightest, the gray square somewhere in between.

2 Arrange the control squares in the image that has to be modified with respect to similarity in luminance and hue.

3 Click the right mouse button to apply *Color Balance*.

4 If necessary, repeat steps 1, 2 and 3 to optimize results.



The control squares check luminance values at the spots where you have moved them and may adapt accordingly. For example: If you move the gray square representing *Gamma* to a spot which is even darker (in terms of luminance) than the current black square's location, the squares adapt: The gray square changes to black, the black to gray,

HistoMatch

The color balance of two images can also be matched on the basis of the associated histograms. This can be done either manually or automatically. You must have a *reference source*.
The two histograms should be somewhat similar from the start in order to achieve a satisfactory result.
See also *"Histogram"* on page 749.

HistoMatch (Automatic)

1 Load the clip you want to correct in the *Color Correction Editor*.

2 Define a *Reference Source* (*page 753*) and call it from the diagnostic display.



3 Define a working rectangle in both the *Reference Source* and the working image using the button provided.
Matching is performed on the basis of the working rectangles selected.
If you do not define separate rectangles, the entire image is used.



4 Click the *HistoMatch button*. The change instantly becomes visible in the inlay.

HistoMatch (Manual)

When you perform a manual *HistoMatch*, you work with the *Histogram* diagnostic display (*page 749*).

1 Load the clip you want to correct in the *Color Correction Editor*.

2 Define a *Reference Source* (*page 753*).

3 Select the *Histogram* diagnostic display. The histograms for the two clips are both visible and superimposed on one another (green for the correction clip and blue for the *reference source*).



4 Activate the *Histogram Adjust* function and drag the mouse over the display to match the histograms as much as possible:
- Drag the left end to adjust *Black,*
- drag the center to adjust *Gamma,*
- drag the right end to adjust *Gain.*
You can do this in all three of the components (R,G and B).
The changes are simultaneously visible in the correction clip.

HueMatch



This function is used to match the correction clip as closely as possible to the *Reference Source* and affects saturation and hue.

1 Define a *Reference Source* (*page 753*) and call it from the diagnostic display.



2 Define a working rectangle in both the *Reference Source* and the working image using the button provided.
Matching is performed on the basis of the working rectangles selected.
If you do not define separate rectangles, the entire image is used.

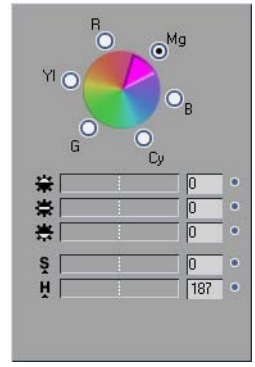
3 Click the *HueMatch button.* The change instantly becomes visible in the inlay.

Six Vector Color Correction

Six Vector Color Correction is already considered to be secondary correction because the hues *R, Mg, B, Cy, G* and *Yl* can be edited independently of one another. For example, you can easily use this function to "repaint" a red car blue.



Six Vector Color Correction appears in the *Compact Display* between the inlays and in the bottom half of the *Color Correction Editor* when it is opened all the way.



Six Vector Color Correction

Six Vector Color Correction can be used separately or in combination with the other correction functions.

You can activate or deactivate the parameters by means of the square on the right in the *Six Vector Color Correction* title bar.

Selecting and Editing a Color Vector

1 First select the *Color Vector* you want to edit by clicking the color or the associated radio button. The transitions between the six sectors are fluid; if you wish to define the hue exactly, you may have to switch to *Selective Color Correction*.

2 Edit the *Color Vector*:

- Either by means of the known parameters (*Gain, Gamma, Black, Hue, Saturation*; see "*Parameters*" on page 754),
- Or by going directly to the *Vector Display w*here you can drag the selected *Color Vector* to the desired location.
  Saturation can also be set by means of the mouse. See also "*Vector Display*" on page 744.

3 If appropriate, select additional *Vectors*. You can edit all six *Vectors*. If you go back and edit a specific *Vector* again, the previous values of this *Vector* are overwritten.

Selective Color Correction

Selective Color Correction permits a very precise definition of the hues you wish to edit. You can pick up to 15 individual hues or color ranges. You can even edit the range for which no selection has been made (the “Garbage”).



Selective Color Correction appears as a *Compact Display* between the inlays and in the bottom half of the *Color Correction Editor* when it is opened all the way.
Selective Color Correction can be used separately or in combination with the other correction functions.

You can activate or deactivate the parameters by means of the square on the right in the *Selective Color Correction* title bar.

Editing is generally performed in the following sequence:

Define vectors (A) *page 766*

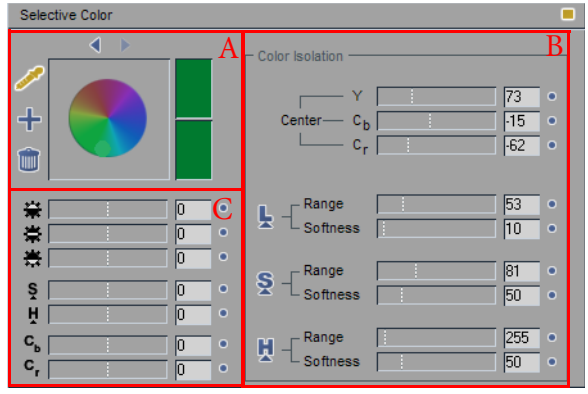
Color isolation (B) *page 767*

Edit colors (C) *page 769*

→ ColorWash *page 769*

→ Non-selected area (garbage) *page 769*

Operating variants *page 770*



Selective Color Correction

Defining Vectors - Selective Color (A)

Initially no *Vectors* are defined.



1 Load the clip you want to edit in the *Color Correction Editor.*

2 Click the *Add Selective Color* button in the *Selective Color* area to activate the *Pipette (Eyedropper)*.



3 Determine the color area in the correction clip as precisely as possible by also using the *Zoom* (*page 728*).

- - Single-click to define a 3x3 pixel area around the *Pipette* position.
- - Drag the mouse pointer to define an area of a selected size (rectangular).
- - Hold down the CTRL key during either of the two procedures above to add other areas.

4 The selected color (i.e., the *Vector*) appears in the two color fields to the right of the color wheel. The lower field will later display the modified color.
In the color wheel itself, a small circle indicates the center of the color currently selected.

5 If necessary, repeat steps 2 and 3.
You can define up to 15 *Vectors*.

6 To toggle between selected *Vectors*, click either the arrow buttons above the color wheel or the small circles within the color wheel.

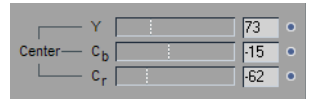
7 To delete selected *Vectors*, select them as described in step 6 and click the *Trash* icon.



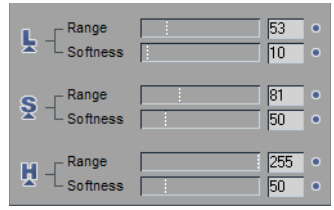
You can also use the *Pipette* to determine the target color (target *Vector*). To do so, use a *Reference Source* (*page 753*).

Color Isolation (B)

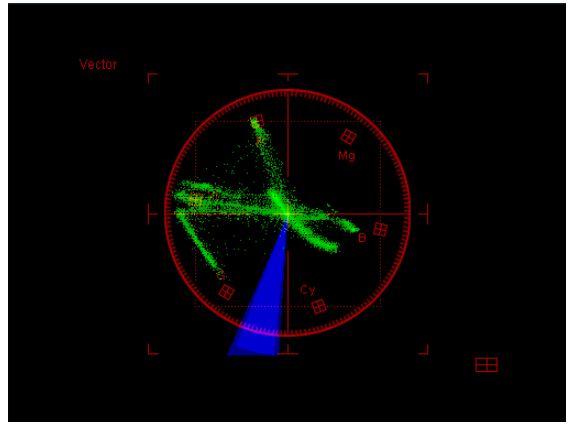
In order to edit a color as precisely as possible, the color must be isolated from the spectrum of colors in the image. Otherwise you might have unwanted color corrections in similar areas.
Avid Liquid specifies each selected color *Vector* as a numeric "center" in YC_bC_r values:



This center is determined mathematically on the basis of various values using the *Pipette*.
A dynamic selection range exists around the center that is described by a luminance (*L*), saturation (*S*) and hue (*H*) range. The less uniform the colors selected with the *Pipette*, the greater the range:



1 Switch to the *Vector Display*. The *Vector* selected is indicated by a blue marking in the display:



Selection range (light blue) and transition range (dark blue)

- The hue *(H)* is represented by the size of the segment angle (the "width of the wedge of pie").
- The saturation *(S)* is represented by the radial extension of the segment.
- The third dimension, luminance *(L)*, is visible only in the *Cube Display* (*page 746*).
- The transition range (*Softness*, dark blue marking) defines the transition from the selected range (light blue) to the non-selected surroundings. The larger the transition range, the softer the transition.

2 In the next few steps, you will try to optimize the selection.
For example, if you wish to isolate and then modify a specific red hue, the associated color locuses (the green points in the *Vector Display*) should be as completely covered by the selection range as possible in all three components (*H, S,* and *L).*

3 If several *Vectors* exist, select one (see above, step 6).

4 To fine-trim the selection, optimize the luminance (*L*), saturation (*S*) and hue (*H).*
(Depending on the image motif, you will not necessarily have to optimize all three components and not necessarily in this order.)



- Luminance (*L*) -
Switch to the *Cube Display* and click the *L* icon.
Working image: Only the ranges that meet the *Y center* plus/minus *Y range* criterion are displayed. The rest of the image is displayed as standard gray (Y=128).
Cube Display: The currently valid luminance range (along the *Y* axis) is displayed as blue.
Move the *Range* slider so that the standard gray disappears from the areas you want to edit or until the luminance range outlined in blue in the *Vector Display* includes the relevant color locuses.
Finally, click the *L* icon once again.



- Saturation (*S*)-
Switch to the *Vector Display* and click the *S* icon.
Working image: Only the ranges that meet the *Cb center, Cr center* plus/minus *Saturation range* criterion are displayed. The rest of the image is displayed as standard gray (Y=128).
Vector Display: The currently valid saturation area is displayed as a rotating ring.
Move the *Range* slider so that the standard gray disappears from the areas you want to edit or until the blue saturation area includes the relevant color locuses.
Finally, click the *S* icon once again.



- Hue (*H*)-
Switch to the *Vector Display* and click the *H icon.*
Working image: Only the ranges that meet the *Cb center, Cr center* plus/minus *Hue range* criterion are displayed. The rest of the image is displayed as standard gray (Y=128).

Vector Display: The currently valid hue range is displayed as a segment of a circle.
Move the *Range* slider so that the standard gray disappears from the areas you want to edit or until the blue segment includes the relevant color locuses.
Finally, click the *H* icon once again.

5 If the *Vector* is sufficiently isolated, you can edit the color as desired.
If you want to define the selection ranges even more precisely (for example, by defining the upper and lower limits of the ranges), see *"Color Isolation Using the Mouse"* on page 770.

Editing Colors

Once your selection(s) have been made and optimally configured, you can perform the desired corrections.

To do this, use the standard tools (*Black, Gamma, Gain, Hue, Saturation*; see "*Primary Color Correction*" on page 752) and drag the C_b and C_r sliders (*ColorWash*; *page 769*).

The lower of the two rectangular color fields next to the color wheel displays the modified color and the top field shows the original color.

ColorWash

Shifting selections horizontally and/or vertically is known as *ColorWash*. To do this, use the C_r and C_b sliders. The effect is very noticeable in the *Vector Display*.

Non-Selected Range (Garbage)

"Garbage" refers to the range not selected in any *Vector*. This option allows you, for example, to isolate three colors and, via "garbage", de-saturate all the others or set them to black and white.

You can edit the non-selected range by not selecting a Vector (click next to the circles in the color wheel or click on the gray area around the color wheel). Naturally, the color isolation parameters are then irrelevant; otherwise apply the correction as described.

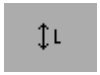
Operating Variants

Color Isolation Using the Mouse

You can also isolate colors directly in the inlay or in the *Vector Display* using the mouse. First you must have selected at least one *Vector* (see *"Defining Vectors - Selective Color (A)"* on page 766).



Then activate *Color Isolation* by clicking the button displayed and position the mouse pointer on the inlay or *Vector Display*. The display contains the selection range, which appears as a larger or smaller blue spot. You can change the shape, position and size of this range:
Drag the mouse pointer over the inlay or display while holding down the left, right or center (wheel) mouse button and the following keys:



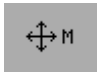
- *Luminance range* -
  Hold down the CTRL key and
  left mouse button to move the lower limit;
  right mouse button to move the upper limit;
  center mouse button (or mouse wheel) to move the center of the luminance range.
  Suitable diagnostic display: *Cube*.



- *Saturation range* -
  Hold down the SHIFT key and
  left mouse button to move the lower limit;
  right mouse button to move the upper limit;
  center mouse button (or mouse wheel) to move the center of the saturation range along the radius.
  Suitable diagnostic display: *Vector*.



- *Hue range* -
  Hold down the ALT key and
  left or right mouse button to enlarge/reduce the hue range (segment);
  center mouse button (or mouse wheel) to rotate the color angle.
  Suitable diagnostic display: *Vector*.



- *Move the center* -
  You can move the center of the selected color along the C_r and C_b axes. The selection range in the *Vector Display* moves accordingly.

Selecting a Target Vector

Using the *Pipette*, you can select a color from a *Reference Source* (*page 753*). Note: This selects the target *Vector*, i.e. the color to be achieved as a result of the correction. The lower of the two color fields then changes to the color defined in the *Reference Source*.

Follow the procedure described in *"Defining Vectors - Selective Color (A)"* on page 766.

Linear Timewarp

Use *Linear Timewarp* to quickly and simply generate linear speed effects in video clips and animations, such as slow motion, fast motion, fit to fill, reverse playback, freezes, strobe effects, etc. *Add Linear Timewarp* is a function in a clip's *Timeline* shortcut menu.
"Linear" means: the playback speed does not change during playback, i.e., remains constant.

Dynamic modifications of speed and direction using *Key Frames* are best achieved with the *Timewarp Editor* (*page 776*). However, for a quick fit to fill operation, for instance, the *Linear Timewarp* function is highly recommended.



Linear Timewarp video effects, within certain limits, are played back in real time. See "*Timewarp and Realtime*" on page 774 in this chapter.
Audio is affected as well, though the pitch stays the same (time stretching feature), and plays in real time.

Add Linear Timewarp *page 771*

Parameters *page 772*
Video and audio computation *page 773*

Timewarp and realtime *page 774*

Generating a freeze (still) *page 775*

Add Linear Timewarp /Edit Linear Timewarp

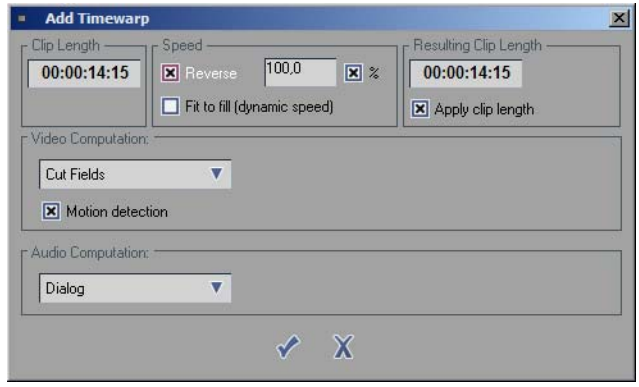
Add Linear Timewarp can be found in the shortcut menu of any video or animation clip on the *Timeline*.

If a clip has already been edited with *Linear Timewarp*, open the shortcut menu by right-clicking the colored broken line at the bottom of the clip, and call the function (*Linear Timewarp* or dynamic *Timewarp* Editor).



TIP: Apply the *Timewarp* effect first, then all other effects. Also make sure *Timewarp* is fully rendered before editing the other effects.
Plus, a *Timewarp* discards a clip's alpha plane so that already applied key effects, for example, would be lost.
If a *Timewarp* effect, be it dynamic or linear, is applied to a clip to which already one or more effects have been applied, the following happens:
The effect line at the clip's top as well as the effect icon disappear from the clip. Instead the black and red *Timewarp* line appear at the bottom of the clip.
This behavior is mandated by technical reasons. However, it does not mean that the previously applied effect(s) has (have) been cleared or deleted from the clip. They become visible once again when the *Timewarp* effect is taken from the clip.

Parameters (Overview)



Add Linear Timewarp

Clip Length

Displayed is the length (or duration) of the original clip just as it sits on the *Timeline*, prior to any *Timewarp* treatment.

Speed

Here's where you set playback speed and direction.

- *Reverse* -
  Check the box to select reverse playback.
- *Percentage* or *factor* -
  Click the % checkbox if you prefer to enter values as a percentage of standard playback speed (which is 100%). Otherwise a factor will be used (1.0 = 100%).
- *Speed* -
  Enter a value, confirm with ENTER to exit the dialog, or hit TAB to confirm and jump to the next selection.
  Examples:
  100% = factor 1.0 = realtime (standard) playback
  50% = factor 0.5 = half the realtime (slomo)
  0% = factor 0.0 = freeze image
  - 100% = factor -1.0 = realtime reverse playback
  Maximum values: fastmotion factor 100 (10 000%); slow motion factor 0.0000001 (0.00001 %).



Freeze: The resulting clip has a default duration of 5 seconds if *Apply clip length* is checked (see below), otherwise its original duration. The image frozen is the one at the clip's mark-in point.

- *Fit to Fill (dynamic speed)* -
  When checked, a manually entered *Speed* becomes redundant. Use *Fit to fill* to close the gap between mark-out of the *Timewarp* clip and the mark-in of the next clip on the same *Track*. Subsequent trimming of the *Timewarp* clip causes the *Speed* value to be adapted according to the trim action.

Resulting Clip Length

Here you find the resulting length of the timewarped clip, assuming you have entered a *Speed* value or selected *Fit to fill*,
or, other way round,
you enter the desired duration in the TC field, which changes the value in the *Speed* field accordingly.

- *Apply clip length* -
  If checked, the clip will automatically be brought to its actual warped length. Caution: a lengthened clip will overwrite the following clip(s) on the same *Track*.
  If this option remains unchecked, you will have to trim the clip manually.

Video Computation

For play speeds below a factor of 1.0 (regardless of whether the value is positive or negative), you have four options for rendering the decelerated material. If the source material was recorded on:

- Video (60/50 fields/second with NTSC/PAL), use *Cut Fields* or *Mix Fields*.
- Film (24/25 frames/second), use *Mix Frames* or *Cut Frames*.

For the best results, we recommend that you render short test clips using the different options. The following generally applies:

- *Mix Fields* (for interlaced video) -
  Motion is played back more smoothly but is not as sharply focused. In most cases, this is the best choice.
- *Cut Fields* (for interlaced video) -
  Provides a sharper focus but motion can be slightly jerky.
- *Mix Frames* (for film/progressive video) -
  Provides smooth motion but is less focused.
- *Cut Frames* (film/progressive video) -
  Provides sharp focus but motion is often jerky.

Motion Detection

In the default configuration, this function is activated. For motifs with a lot of motion or very unsteady cameras, it may be better to deactivate *Motion Detection*.

Strobe Effect

The *Strobe* effect is best used for motifs with a great deal of motion. *Strobe* plays a configurable number of identical frames in succession before repeating the same number of the next frame (omitting those in between). For example: Instead of the standard frame sequence 1-2-3-4-5-6-7 etc., 2-frame-*Strobe* plays back the sequence: 1-1-3-3-5-5-7-7 etc.
Click the button to the left of the list box to enter the strobe number.

Trailing

The *Trailing* effect makes movements and changes of motif visible by means of "trails" in the frame.
Click the button to the left of the list box to define a trail length, type and appearance.

Progressive

The *Progressive* option serves to convert interlaced material to non-interlaced material.

Audio Computation

Select *Dialog* or *Music*, based on the type of audio clip. The pitch is not modified (time stretching feature). Audio-only *Timewarps* are played back in realtime.

Maximum *Speed* values permitted for audio *Timewarp* are 50% and 200%.



Negative speed values are not accepted for audio (i.e. no reverse play). In the case of combined A-V clips, the video is played backward while the audio is played at the desired speed but in the forward direction.

Timewarp and Realtime

As of Version 7, *Timewarp* is handled like a realtime effect: A yellow *Slice* appears above the *Timewarp* clip and the clip is played in real time. If system performance is inadequate, frames are omitted. If (background) rendering is activated, it is also started.

HD clips cannot be played in real time.

Generating a Freeze (Still)

When you apply a *Linear Timewarp* (or the *Timewarp Editor*) to a 1-frame clip, Avid Liquid assumes that you want to freeze exactly this frame, i.e. that you want to turn it into a still. The procedure is as follows (based on the example of a clip frozen at the end):



1 Using the *Add Edit* button (see figure), trim the last frame from the clip. It helps to select a *Timeline* scale of the same size.

2 Open the shortcut menu for the 1-frame clip and select *Add linear Timewarp*.

3 Enter the length desired for the still. Important: If *Apply clip length* is activated, the resulting clip overwrites the next clip on the *Timeline*. In any case, you can trim the still clip on the *Timeline* to any length.

4 Click *OK* to exit *Linear Timewarp*.

A quicker way to achieve the same result is to use the *Easy Freeze Frame* function (*Timeline* clip shortcut menu); see *page 423*.

Variation: Drag the *Timewarp Editor* to the clip, open the effect menu, select *Edit linear TimeWarp* and follow the procedure described above.

Timewarp Editor

The *Timewarp Editor* allows you to modify the play speed and direction of video clips.

You can control speed and direction changes dynamically with *Key Frames*.

The *Timewarp Editor* is a clip effect. *Timewarp* effects are played in real time (with restrictions; see remarks on *page 774*).
For basic information on video effects, see *"Effect Editors (Basics)"* on page 510 and *"Key Frames"* on page 518.



Although we talk about "slow" and "fast" playback, the playback speed of digital video is constant, depending on the current frame rate of the *Timeline*. Render files from *Timewarp* effects are created using this frame rate. The illusion of "slower" or "faster" playback is created when additional frames are interpolated (computed) or frames are omitted.

Opening and Using the Timewarp Editor *page 777*

Functions of the Timewarp Editor (Overview) *page 778*

Interpreting Diagrams *page 781*

Standard Applications *page 788*

Individual Timewarp Effects *page 792*

Dynamic Effects and Audio

As with *Linear Timewarp*, the audio is also affected in the *Timewarp Editor*. The following applies:

- For a linear effect, audio is adapted accordingly (slower/faster at a constant pitch).
- For dynamic effects with multiple *Key Frames*, an average speed is determined and applied to the clip's audio component.
- Audio cannot be played backward.

The maximum values permitted for audio *Timewarp* are 50% and 200%.

Opening and Using the Timewarp Editor



The *Timewarp Editor* is used like a clip *Effect Editor* (for general information see *"Classic Clip Effect Editors (Filters)"* on page 510). To open the *Timewarp Editor*:

- Drag the *Editor Picon* from the `Library` tab of the *Project* window to the appropriate clip.
  Open the *Editor* by right-clicking the continuous colored line on the bottom edge of the clip or from the clip's *FX Properties* dialog box (*page 286*).
- The *Timewarp Editor* initially takes the place of the *Sequence Editor.* Click the triangular arrow at the top between the timecode displays to open the bottom half of the editor.

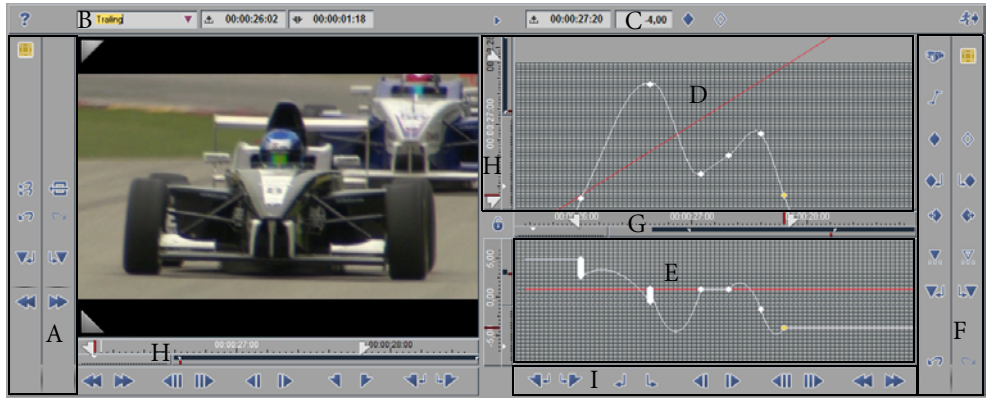
If you use the *Fit to Fill* function, you do not have to open the *Timewarp Editor* (*page 790*).

TIP: apply the *Timewarp* effect first, then all other effects. That is, the *Timewarp* clip needs to be completely rendered before you apply additional effects.
Plus, a *Timewarp* discards a clip's alpha plane so that already applied key effects, for example, would be lost.
If a *Timewarp* effect, be it dynamic or linear, is applied to a clip to which already one or more effects have been applied, the following happens:
The effect line at the clip's top as well as the effect icon disappear from the clip. Instead the black and red *Timewarp* line appear at the bottom of the clip.
This behavior is mandated by technical reasons. However, it does not mean that the previously applied effect(s) has (have) been cleared or deleted from the clip. They become visible once again when the *Timewarp* effect is taken from the clip.

Sometimes you will open the *Timewarp Editor* and discover that a *Speed* has already been selected (usually comprising an odd number with many decimal places). But this is only the case for clips whose clip-in and clip-out are identical to the mark-in and mark-out. The *Timewarp Editor* requires one extra clip before the mark-in and one clip after the mark-out, i.e. in the section to which the *Timewarp* effect is being applied. If the clip-in/mark-in or clip-out/mark-out coincide in the original clip, the mark-in for starting the effect is automatically shifted one frame (and the same happens to the mark-out), thus changing the speed information.

Functions of the Timewarp Editor (Overview)

The *Timewarp Editor* generates a (rendered) destination clip from a source clip.
In the simplest case, it is only a matter of reversing the play direction or decreasing/increasing the play speed. Using multiple *Key Frames*, you can combine the two parameters in one clip as often as you like.



Timewarp Editor (overview, default assignment)

A - Editing and control functions (source clip)

B - Rendering options (e.g. *Strobe* effect); *page 790*

C - Indication of speed at *Playline* position (negative values mean reverse play)

D - Source/destination range: Displays playback behavior of the resulting destination clip; *page 781*

E - Speed diagram displaying changes in speed and play direction of the destination clip

F - Editing and control functions (destination clip)

G - Position bar (destination clip, *page 780*)

H - Position bar (source clip)

I - *Key Frame* functions (*page 779*)

Setting and Editing Key Frames

The *Timewarp Editor* contains the usual range of buttons for setting, deleting and copying *Key Frames* (for basic information, see "*Key Frames*" on page 518).
However, it also allows you to do the following:

- Set a *Key Frame* -
  Press the CTRL key and click the desired position in the grid. The mouse pointer changes to a hand with an extended index finger and a plus sign. This applies to the upper and lower diagrams. The curve changes accordingly.
- Move a *Key Frame* -
  The mouse pointer with the extended finger appears next to the *Key Frames* and can be used to move *Key Frames* to new positions.



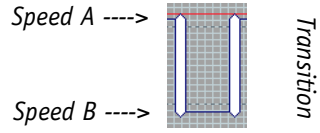
Key Frames in the *Timewarp Editor* are absolute, i.e. when the *Timewarp* clip is subsequently trimmed, the distribution of *Key Frames* over the length of the clip does not change, instead the currently applicable parameters are extrapolated before the first and after the last *Key Frame*.

Linearize/Delinearize Segment



Firstly, this function serves to create direct transitions, such as a sudden shift from "forward" (speed of 1.0) to "reverse" (speed of -1.0).
Secondly, *linearizing* results in a steady progression of motion between two *Key Frames*, i.e. without acceleration or delay. For more information, see the example under "*Linear and Nonlinear (Curve)*" on page 786.

This function always is always applied to the left-hand *Key Frame* and the next *Key Frame* to the right: Select a *Key Frame* (color changes to orange), click the button (click while holding down the SHIFT key to delinearize). The *Key Frames* appear as vertical bars of differing heights, depending on their original position:



Linearized segment with Key Frames



The results of the function are visible in the upper diagram where the transition between two *Key Frames* is linearized or delinearized. Curves become straight lines, and vice versa.

Edit Key Frames (Linearize)

You can extend/shorten *Key Frames* upward/downward to modify shifts in speed and/or direction. When the mouse pointer is positioned near a *Key Frame*, it becomes an arrow. An arrow pointing to the left means that you are editing the segment to the left of the *Key Frame* and an arrow pointing to the right indicates the *Key Frame* to the right. Left-click and drag the upper or lower end of the *Key Frame* to the desired location.

Navigating Diagrams, Keeping Overview

Five functions that make handling and understanding of the diagrams easier:

Move a Segment

Depending on the scale currently set, a smaller or larger portion of the diagram area is outside the range of the display.
Hold down the SHIFT key (the mouse pointer changes to a hand) and drag the pointer across the diagram until the appropriate section is visible.

Locate Selected Key Frame



Click this button to move the *Key Frame* currently selected to the center of the diagram. This is helpful if you previously moved the segment and then lost track of it.

Large Display

Single-click the triangle at the top between the timecode fields to open and close an enlarged view of the diagram.

Position Bars

The position bars in the *Timewarp Editor* function the same way as all the other position bars (see *"Navigation Using the Position Bar"* on page 265). The only difference is that the *Playline* in the lower diagram is used to select speed factors between +/- 100.
The horizontal position bar applies to both diagrams.

Adjust Scale



Click this button to link the scales of the position bars for the source and destination clips.

Interpretation of the Diagrams and Examples

The upper diagram maps the chronology of the source clip (vertical axis and position bar to the left) against the chronology of the destination clip (horizontal axis and position bar). In its initial state when you call a clip that has not yet been edited, the following applies:
Source clip chronology = destination clip chronology.
The straight red line in the display represents this state: The mark-in and mark-out points of the source and destination clips are identical with regard to timecodes. Each individual frame in the source clip is mapped on the corresponding destination clip.

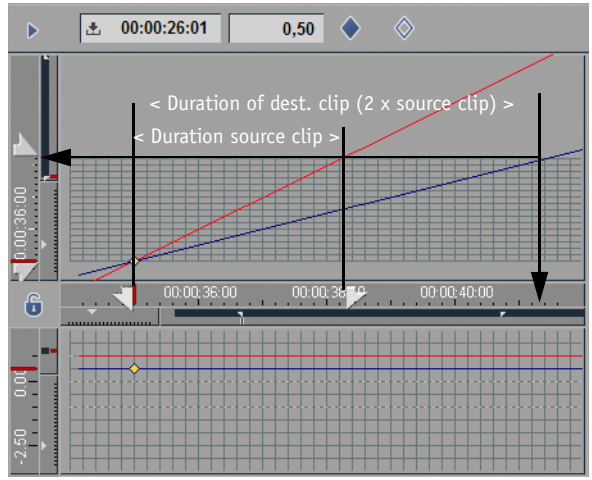
In order to understand all the *Timewarp* functions, it is important to know that "position" in the spatial sense (as applied to a video tape) has nothing to do with the position bars. These bars deal with time.

The lower diagram indicates the speed (vertical) throughout the destination clip time axis (horizontal). In the initial state, the straight red line runs horizontally at a height of 1.0 (100 percent), i.e. in a constant positive play direction.

Some examples:

Linear Slow Motion at Half the Standard Speed

For linear slow motion at 50%, the destination clip becomes twice as long as the source clip. The speed remains constant, which is why it is called "linear slow motion".



Linear slow motion at 50% play speed (factor of 0.5)

A *Key Frame* is set at the first frame of the source clip that is assigned a speed parameter of 0.5. The resulting straight blue line ascends less steeply than the standard red line.

When Does a Timewarp Clip End?

By strict definition, the destination clip ends where the straight blue line exits the diagram grid.
This means that logically it can be played only to the point at which the last frame (interpolated from the source clip) was played back. Beyond this point, the last source clip frame is played back as a still and continues this way for as long as you wish.

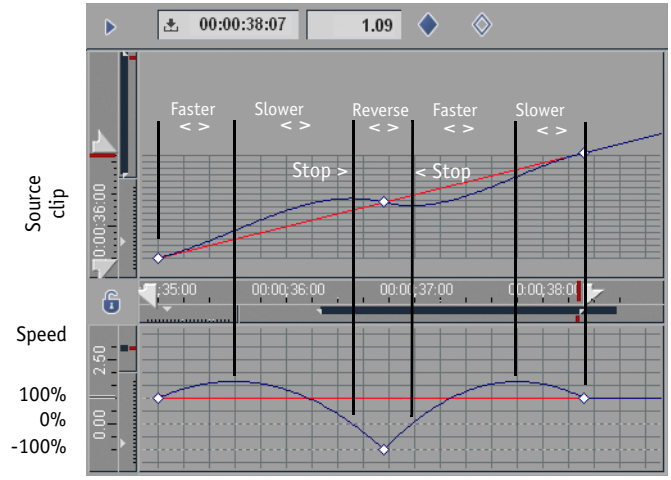
However, basically, the destination clip ends whenever you want it to. You simply have to trim the clip at the appropriate position on the *Timeline* (also see *"Standard Applications"* on page 788).

The vertical extension of the grid in the upper diagram indicates the actual length of the source clip *Media File*. You cannot set *Key Frames* outside this grid.
There is no limit to the horizontal extension to the right and left. In theory at least, the destination clip can be endless.

Dynamic Acceleration/Deceleration

When multiple *Key Frames* are used, you can generate dynamic *Timewarp* effects.

Example:



Accelerate-Decelerate-Stop-Reverse-Accelerate-Decelerate

This *Timewarp* clip has three *Key Frames* linked by curves. The parameters of the first and last *Key Frame* are the same: A factor of 1.0 (100% play speed), i.e. standard playback.

The center *Key Frame* is defined in the speed diagram as -100% (-1.0), i.e. at this point, the destination clip should play at a normal speed but in reverse.

The figure shows the resulting phases:

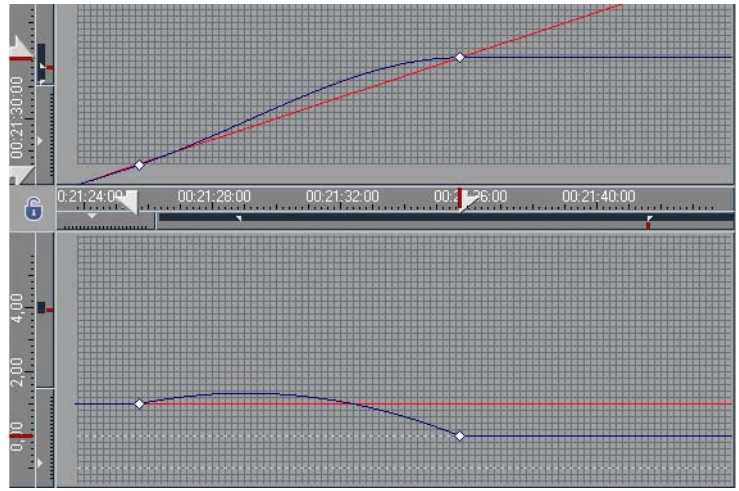
- First the clip accelerates until it reaches about 160% of the initial speed.
- In the second phase, it decelerates to 0% (Stop).
- In the third phase, it runs backward, initially accelerating (to -100%) and then decelerating until it stops again.
- In the next phase, the clip plays in the forward direction and accelerates.
- In the final phase, it decelerates back to the standard speed.

Altogether the destination clip is no longer than the source clip. The accelerated and decelerated segments balance each other out.

Why A Curve?

Let's say you wanted to slow down a clip from standard speed to zero, e.g., decelerate a movement to its complete stop. Therefore, you set *Speed* = 1.0 at the first *Keyframe* (or mark-in) and at the end of the clip, at the second *Keyframe* (or mark-out), to zero.

Now the speed line becomes an initially slightly ascending, and then descending curve that ultimately hits the zero position, from where it goes on again as a straight horizontal line. But somehow you had assumed that the line should have smoothly fallen from the outset. Strange logic? Not at all.

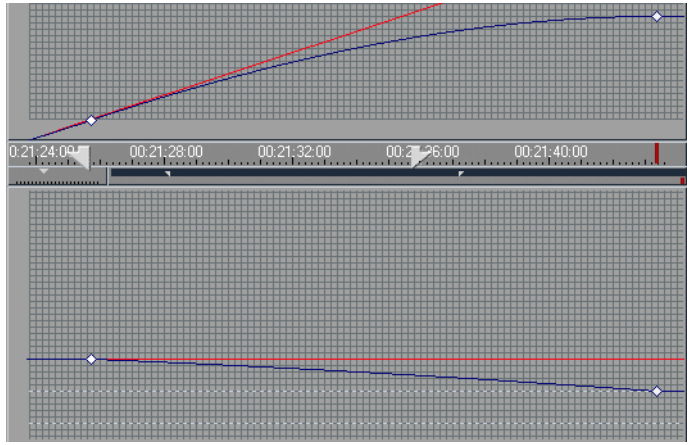


Faster, slower, then stop - same duration

Imagine you wanted to cross a room from one wall to the opposite wall; the walls in this example representing mark-in and first, mark-out and last Keyframe. You set out and walk slower and slower until you stop right in front of the wall. If you constantly slow down, don‘t you need more time to cross the room, more than when you walk your constant normal speed? Yes, you do.

But you have not given the destination clip more time to complete the task, the walls stand where they‘ve stood before. That‘s why you make up for the extra time, and therefore the initial acceleration you see in the curve. This is to make sure that the effect finishes in the source clip’s time frame (source clip and destination clip have the same length = duration).

Of course it is possible to achieve a more or less linear deceleration - but that takes time. More time means to move the mark-out (and the second *Keyframe)* to the right:

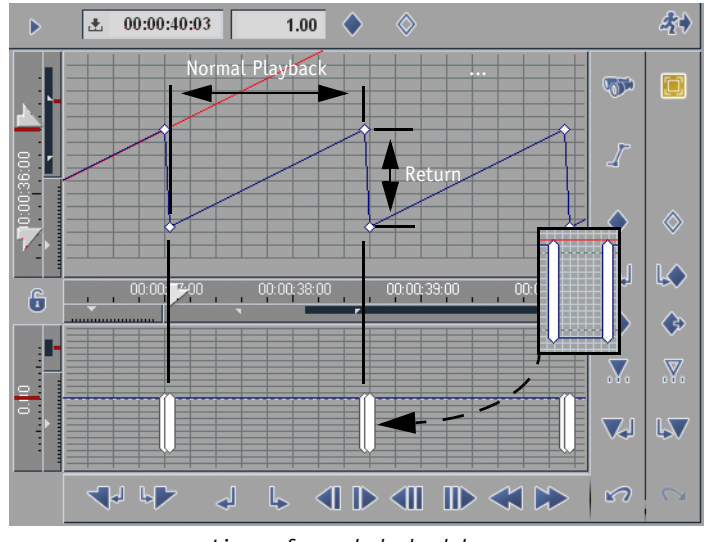


Near constant deceleration, but longer duration

Playback Loop

It is also possible to form a “loop”, i.e. a clip that is played to the end, jumps back to the beginning and is replayed. This can be repeated any number of times:

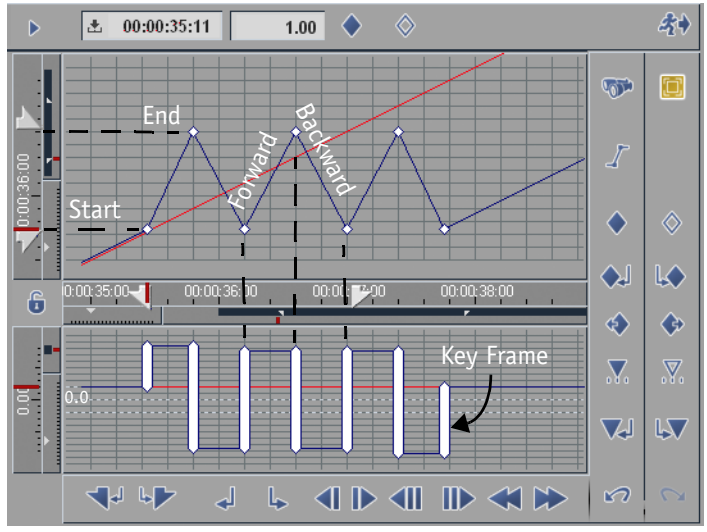
In the segments where the speed remains constant at 1.0, the straight ascending lines in the upper diagram run parallel to the standard line. Each of the almost vertical descents designates the position at which the clip returns to the starting position (by means of an extremely fast “rewind”). At the return point, the *Key Frames* are spaced one frame apart; the transition has been linearized (see enlarged view in the figure and *“Linear and Nonlinear (Curve)”* on page 786).



Linear, forward playback loop

Linear and Nonlinear (Curve)

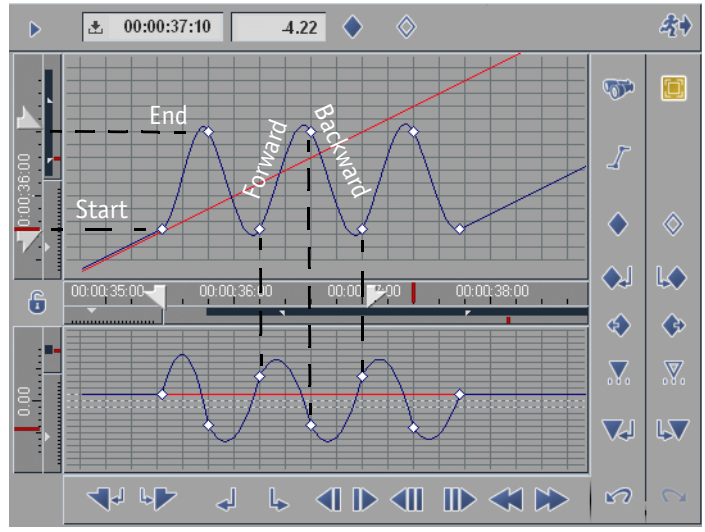
The transitions between the play directions (forward and reverse) and speeds can be configured in several different ways, as illustrated by the next example. The diagram below describes a clip that is played repeatedly from beginning to end and from end to beginning:



Clip played alternately forward and backward

The lower speed diagram recognizes only two states of constant speed: In this example, these are approx. +4 and -4. The transitions have been linearized. This means that the play direction changes directly (the straight lines are bent) and that the defined speed is adopted immediately. There is no gradual transition. The change takes place "within" the *Key Frame* which, for this reason, is displayed extended at the corresponding height.

The figure below shows the same *Key Frame* distribution as the figure above except that the transitions have not been linearized:



Non-linearized variant of previous example

This destination clip demonstrates soft transitions between the forward and backward passages.

Some Basic Rules

Once you know a few basic rules, diagram interpretation becomes much easier:

- A curve/straight line ascending from left to right means:
  In the upper diagram: Play direction = forward;
  In the lower diagram: Acceleration
- A curve/straight line descending from left to right means:
  In the upper diagram: Play direction = backward
  In the lower diagram: Deceleration
- A straight horizontal line means:
  In the upper diagram: Still playback
  In the lower diagram: Constant speed
- A steep curve/straight line:
  In the upper diagram: High speed
  In the lower diagram: Rapid acceleration/deceleration

- A shallow curve/straight line:
  In the upper diagram: Low speed
  In the lower diagram: Gradual acceleration/deceleration

Standard Applications

This section provides you with step-by-step instructions for frequently used applications such as slow motion and stills (Freeze).
For the task of creating these standard applications we recommend you use the *Add Linear Timewarp* function (*page 771*).

When you exit the *Timewarp Editor*, the rendering of effects begins. If the effect has changed the length of the source clip, you must manually trim the clip to the new length on the *Timeline*. Otherwise the rendering stops only at the end of the original clip, that is, even more than necessary is rendered, if the destination clip comes out shorter.

- Use this method for exact trimming of a *Timewarp* clip:
  After editing the effects, set a *Marker* at the last significant frame of your *Timewarp* destination clip, at its last *Key Frame*, for instance. When you then trim the clip on the *Timeline*, drag the clip until the *Marker* symbol appears in the upper right-hand corner. This tells you that you have found the correct mark-out and the actual length.

Slow Motion/ Fast Motion (Linear)

The speed of a slow motion clip is somewhere between 1.0 (standard) and 0.0 (freeze). Values greater than 1 serve to multiply the standard speed.

1. Set a mark-in and mark-out on the *Timeline* clip that you want to edit.
   Make sure you don't set a mark-in and mark-out on the first or last frame of the clip (i.e. the clip-in and clip-out of the *Media File*).
2. Drag the *Timewarp Editor* to the clip and open the *Editor* as described (*page 777*).
3. Position the *Playline* on the mark-in of the source and destination clips.
4. Enter the appropriate speed factor in the field with the blue flag.
   See also "*Render Options*" on page 790.
5. Set a *Key Frame*. A straight blue line with the corresponding gradient appears in the diagram.
6. Exit the *Timewarp Editor* and trim the clip to the new length on the *Timeline*.

Reverse Playback (Linear)

Clips played in reverse have speed factors with a minus sign: -1.0 means the source clip is played at the standard speed but from the mark-out to the mark-in. Reverse slow motion is also possible (e.g. "-0.45").

1 Set a mark-in and mark-out on the *Timeline* clip that you want to edit.
Make sure you don't set a mark-in and mark-out on the first or last frame of the clip (i.e. the clip-in and clip-out of the *Media File*).

2 Drag the *Timewarp Editor* to the clip and open the *Editor* as described (*page 777*).

3 Position the *Playline* on the mark-in of the source and destination clips.

4 Enter the appropriate speed factor with a minus sign in the field with the blue flag.
See also *"Render Options"* on page 790.



Alternate variant: Set the mark-in after the mark-out on the source clip position bar. This also causes a reversal of the source clip.

5 Set a *Key Frame*. A straight blue line with the corresponding gradient appears in the diagram.

6 Exit the *Timewarp Editor* and trim the clip to the new length on the *Timeline*.

Freeze (Still)

Create a still (freeze) as follows:

1 Drag the *Timewarp Editor* to the clip and open the Editor as described (*page 777*).

2 In the source clip, scrub to the frame you want to freeze.

3 Enter a speed factor of *0.0* in the field with the blue flag.
See also *"Render Options"* on page 790.

4 Set a *Key Frame*. A straight, horizontal blue line appears in the diagram.

5 Exit the *Timewarp Editor* and trim the clip to the new length on the *Timeline*.



You can also generate a *Freeze* (faster and more easily) using a *Linear Timewarp* (*page 775*).

Adjust to Length (Fit to Fill)

Instead of specifying a speed factor in the editor, you can define a length for the destination clip, e.g. if you want to fill a gap of a specific duration on the *Timeline*.

1 Drag the *Timewarp Editor* to the appropriate clip.

2 Trim the clip to the appropriate length. Shortening it means accelerating the clip and lengthening it means slow motion. Doubling the length = half speed (0.5).

3 If you wish to edit this clip further, open the *Timewarp Editor*.

Render Options

You can activate a number of options when rendering *Timewarp* effects. You will find these options in the list box above the source clip inlay.

Render Options for Slow Motion

For play speeds below a factor of 1.0 (regardless of whether the value is positive or negative), you have four options for rendering the decelerated material. If the source material was recorded on:

- interlaced Video (60/50 fields/second with NTSC/PAL), use *Cut Fields* or *Mix Fields*.
- film or progressive video (24/25 frames/second), use *Mix Frames* or *Cut Frames*.

For the best results, we recommend that you render short test clips using the different options. The following generally applies:

- *Mix Fields* (for interlaced video):
  Motion is played back more smoothly but is not as sharply focused. In most cases, this is the best choice.
- *Cut Fields* (for interlaced video):
  Provides a sharper focus but motion can be slightly jerky.
- *Mix Frames* (for film/progressive video):
  Provides smooth motion but is less focused.
- *Cut Frames* (film/for progressive video):
  Provides sharp focus but motion is often jerky.

Motion Detection



In the default configuration, this function is activated. For motifs with a lot of motion or very unsteady cameras, it may be better to deactivate *Motion Detection*.

Strobe Effect

The *Strobe* effect is best used for motifs with a great deal of motion. *Strobe* plays a configurable number of identical frames in succession before repeating the same number of the next frame (omitting those in between). For example: Instead of the standard frame sequence 1-2-3-4-5-6-7 etc., 2-frame-*Strobe* plays back the sequence: 1-1-3-3-5-5-7-7 etc.
Click the button to the left of the list box to enter the strobe number.

Trailing

The *Trailing* effect makes movements and changes of motif visible by means of "trails" in the frame.
Click the button to the left of the list box to define a trail length, type and appearance.

Progressive

The *Progressive* option serves to convert interlaced material to non-interlaced material.

Individual Applications

You can create complex *Timewarp Effects* quickly and easily using the tools of the *Timewarp Editor*.
The basic principle is presented here step by step.
For your first attempt, select a clip with a lot of motion in the motif (or in the camera work) and load it in the *Timewarp Editor*.
Initially the source and destination clips are identical.

1 Set the *Playlines* in the source and destination clip position bars to the mark-in if they're not already there.
(At this point you can immediately set your first *Key Frame*, for instance if the clip should play at a specific speed from the very beginning).

2 Scrub the destination clip position bar at the position where you are defining the first modification.

3 Which frame from the source clip do you wish to see in this position in the destination clip?
Scrub the source clip position bar at the desired position.



4 Set a *Key Frame*.

5 If necessary, enter a speed factor. You can also select a render option, such as a *Strobe* effect.
Click *Set Key Frame* once again to apply the values to the *Key Frame*.

6 Repeat steps 2 to 5 until you have defined the sequence of motion for the destination clip. If necessary, linearize individual or all segments.
Scrubbing the destination clip will provide you with a preview.

7 To fine-tune your work, enlarge the diagrams to a comfortable size (or switch to *large display*, *page 780*) and drag the *Key Frames* with the mouse

8 Exit the *Timewarp Editor*, render the effects and trim the clip to the actual length on the *Timeline*.



After editing the effects, set a *Marker* at the last significant frame of your *Timewarp* destination clip, at the last *Key Frame*, for instance. When you then trim the clip on the *Timeline*, drag the clip until the marker symbol appears in the upper right-hand corner. This tells you that you have found the correct mark-out and the actual length.

Chapter 14

Audio

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Audio Postproduction and Audio Effects

This chapter describes the audio functions of Avid Liquid.

Basics

Facts you should know about audio editing in Avid Liquid *page 795*

Audio Tool

Control output levels *page 806*

Audio Editor

→ Multichannel mixer *page 812*

→ Rubberbanding, adjust level, pan and balance directly on the Timeline *page 820*

→ Output mapping: Assigning signals *page 825*

→ Audio Routing (Classic) to assign audio signals to specific outputs *page 833*

→ Insert effects and send effects *page 838*

→ Surround 5.1 *page 842*

Special functions

Fast insertion of fades; live mix; voice-over and more *page 852*

SmartSound: Background music made to measure *page 865*

Audio Effects

→ Standard audio effects and basics *page 869*

→ Plugin audio effects (VST interface) *page 875*

Basics

This section provides a basic description of audio editing in Avid Liquid:

ASIO and DirectSound *page 796*

32-bit floating point audio *page 797*

Special characteristics of audio clips *page 797*

Inserting audio clips on the Timeline *page 801*

Assigning Tracks *page 801*

Stereo and mono, panorama and balance *page 801*

Muting Timeline Tracks *page 804*

Audio scrubbing and monitoring *page 804*

ASIO Driver and DirectSound

Avid Liquid supports the use of sound cards that are based on the ASIO driver standard. ASIO stands for Audio Stream In/Out. ASIO sound cards are often high-quality and offer many configuration options for audio professionals in particular.
This does not necessarily mean that you now need an ASIO-compatible sound card; Avid Liquid also works with the popular DirectSound sound cards, which also offer multichannel output.

- If you have only one DirectSound card (or onboard chip), Avid Liquid automatically uses this device as an audio device.
- The ASIO driver used must be Version 2.0 or later.
- At this time, Avid Liquid's ASIO technology is used only for playback (*Timeline*, *Clip Viewer, etc.*). ASIO plays no part in capture or input.
- With full DirectX and ASIO support, the DirectX full duplex driver from Avid Liquid Version 6.x was rendered unnecessary and is no longer used.

Multiple Sound Cards

A system can have multiple sound cards but only one can be operated with Avid Liquid at any one time. It makes no difference whether the devices are installed internally (PCI) or externally (USB).

A basic distinction is made between DirectSound and ASIO sound cards or chips. DirectSound is the audio component of Microsoft's DirectX driver technology that is also responsible for graphics acceleration and, consequently, for Avid Liquid's realtime effects. Most sound cards are compatible. Avid Liquid requires DirectX Version 9 or later.

Multiple DirectSound Cards

If you have more than one DirectSound card in your system, click Windows Start menu > Settings > Control Panel > Sounds and Audio Devices > Audio tab and select one of the sound cards (= Audio Devices) as the "Default device". Avid Liquid will then work with this device.

In the *Audio Editor*'s *Output Mapping*, the selected card is configured as a "DirectSound device" (see *page 825*).

Multiple ASIO Drivers or Cards

All available ASIO drivers are listed in Avid Liquid under *Edit* > *Control Panel* > *Site* > *System* > *Inputs/Outputs* > *Audio Outputs* > *Audio device*.
Select a driver. If you want to know the sound card or audio hardware that the driver is currently working with, double-click on the *Edit* line below.
The ASIO settings can be very different depending on the manufacturer and driver. For more information, read the driver documentation. The driver itself is not a product of Avid Technology, Inc..

The selected driver is specified by name in the *Audio Editor*'s *Output Mapping* (see *page 825*).

(Multiple) DirectSound and ASIO Cards/Drivers in the System

If this is your configuration, choose either a DirectSound or ASIO card, or an ASIO driver in combination with a sound card. Make your selection as described in the two previous sections.
DirectSound is the alternative to the available ASIO drivers (if more than one is installed) and can be found under *Edit* > *Control Panel* > *Site* > *System* > *Inputs/Outputs* > *Audio Outputs* > *Audio device*.

32-bit Floating Point Audio

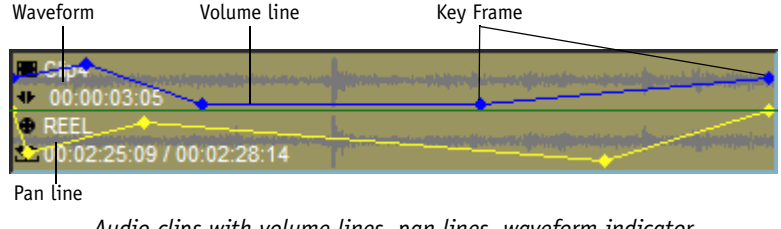
Avid Liquid processes all audio data internally in *32-bit Floating Point* mode. Other formats are converted as necessary. In practice, this results in better sound (in particular, quieter recordings or passages) and a broader dynamic range, without the risk of the signal being clipped. This is why the *Audio Tool's* clipping LEDs (during *Timeline* editing, when working with the *Audio Editor*) no longer light up. Nevertheless, this doesn't mean that you should always slide the fader as far as it will go.
When outputting via IEEE-1394 where PCM 16-bit is required, however, there is always the risk of clipping. You can monitor the results with the *Audio Tool (see also Clipping* on page 808).

- If configured, all products that run under Avid Liquid generate 32-bit floating point files for *Fuse* and rendering.

This option is located under *Edit* > *Control Panel* > *User* > *Audio Settings; see "Audio Format"* on page 862.

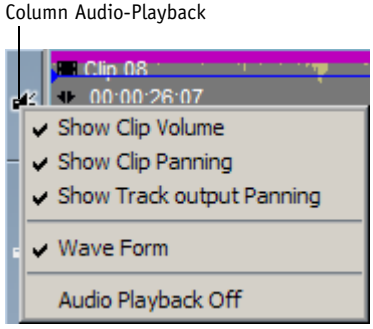
Special Characteristics of Audio Clips

As objects, audio clips are very similar to video clips (moveable, trimmable, etc.) but they do have a few special characteristics.
You can access these functions via the shortcut menu for the *Audio Playback* column, which is located at the beginning of the *Timeline* and is identified by the loudspeaker icon. See also *"Audio Playback"* on page 363.
The options in this shortcut menu are applied either to all *Timeline Tracks* (if you called the menu from the *Audio Playback* column *header*) or to individual *Timeline Tracks* (if you called the menu from the level of the respective *Track*).



Audio clips with volume lines, pan lines, waveform indicator and Key Frames

Show Volume



Activate this option to graphically display the level of an entire clip (appears as a blue line). This line shows audio fade-ins and fade-outs and, if the *Audio Editor* is open, can be moved to any position to edit audio (procedure referred to as "rubberbanding").Volume lines do not necessarily need to be displayed to adjust volume, but it makes mixing easier. These and other audio indicator lines can be displayed simultaneously (with the exception of *Track Panning* and *Surround Panning*, which are mutually exclusive).

Clips whose *Playback Level* (*page 132*) was modified during logging/digitizing are displayed with the *Volume Lines* set to the 0 dB position. Nevertheless, audio is played at the modified level.
The waveform display reflects the *Playback Level* setting. For example, a very low volume clip shows a "flattened" waveform.

Show Panning/Balance

Clip-Specific Panning/Balance

Panorama (pan) lines (yellow) show the right and left orientation of the output signal of an audio clip:

- Pan line at the top of the clip means left,
- at the bottom, right.

See also *"Clip Panning"* on page 816.

Track-Specific Panning/Balance

You can also define the surround and left/right orientation for an entire *Timeline Track*. To display these pan lines, open the shortcut menu for the *Audio Playback Column* and select *Show Track Output Panning*. (See also *"Pan, Balance and Surround Panner (Track)"* on page 818.)

Show Track Output LFE relates to the LFE (subwoofer) channel of a surround mix (visible only with active 5.1 busses: see *page 842*).

Overview of All Audio Indicators

- Clip Volume: Light blue
- Clip Panning/Balance: Yellow
- Track Panning: Green
- Surround Position (*Track*): Green and dark red
- Surround LFE (*Track*): Dark blue

You can activate or deactivate the lines in the shortcut menu for the *Audio playback* column, or by right-clicking in the appropriate segments of the *Audio Mixer*.

Waveform

Choose this option to graphically display a clip's audio signal. This is useful, for example, when the editing work you are doing revolves around a certain audio event (such as a continuous drum beat), in which case you can use the wave peaks as reference points.



It is only possible to display a waveform for individual audio *Source Tracks*. V-A-grouped clips cannot be displayed in waveform mode.

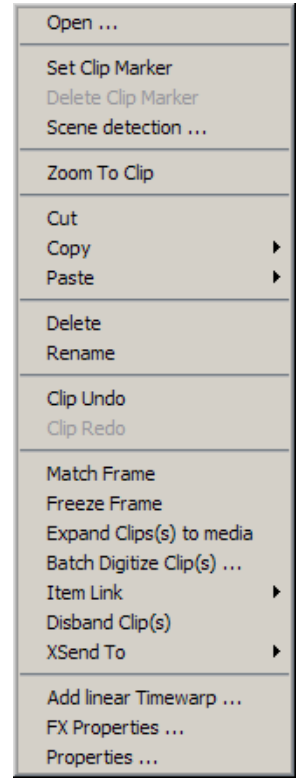
Stereo Waveform Indicator

In the case of stereo-audio clips, the two waveforms are displayed overlapping each other:
A1/3 on top, A2/4 below.

Disband Clip

An audio clip can contain up to four audio *Source Tracks*. Four individual clips can be generated from this type of grouped clip. Open the shortcut menu for the clip.

Use this function to distribute the *Source Tracks* of a grouped clip among the *Timeline Tracks* below the original clip (if free). If there is no free *Track* directly below, an additional *Track* (or more, if necessary) is automatically added.



Clip Shortcut Menu

Stereo clips are separated into two mono clips. Please note that the volume level of the mono clip increases by approx. 6 dB; as a standard, the clips are panned centrically.

Inserting Audio Clips on the Timeline

Audio clips can be inserted on the *Timeline* in three different ways. Each of the methods is described in detail on the page indicated:

- Drag&drop - Inserts (grouped) clips on *Timeline Track (page 412*).
- *Send To...* - Inserts clips at the *Playline* position in accordance with the *Source Track Mapping* (*page 375*).
- *Source Viewer* and *Insert Arrow* - Inserts clips at the mark-in point or at the *Playline* position in accordance with the *Source Track Mapping*. See also *"Source Track Mapping"* on page 375.

Assigning Tracks

Depending on the size of your *Project*, it can be very useful to carefully work out a clear audio editing concept, especially how you plan to distribute the different audio clips. In terms of mixing, consider which audio clips should be grouped and which ones you want to keep separate.



You can name *Timeline Tracks* separately so that it is easy to recognize what type of audio is on what *Track*. For example, you could position all ambient recordings (mono) on a *Timeline Track* called "Ambient," direct sound (mono) on "Direct" and soundtracks (stereo) on "Music" (see *page 364*).

Stereo and Mono, Panorama and Balance

The conventional "audio world" (not including surround sound etc.) is two-dimensional: an imaginative acoustic space is created between "left" and "right" determined by actually existing audio outputs of a system.

They should not be confused with the *Audio Source Tracks*. These are already digitized audio signals labeled *A1, A2, A3* and *A4* in Avid Liquid.

Denominations

With respect to common work steps, the following convention was determined as output standard:

- Audio output (channel) CH-1 (A1), CH-3 (A3) or *Source Track* A1, A3 = odd numbers = "left"
- Audio output (channel) CH-2 (A2), CH-4 (A4) or *Source Track* A2, A4 = even numbers= "right"

Other assignments are always possible with the aid of the appropriate *Mapping* or *Panning*.

Stereo and Mono

A stereo signal in its original meaning reflects a spatial sound source. To create a spatial impression between “left” and “right”, two signals have to be used. For this reason, the term “stereo” refers to a pair of audio signals. A stereo signal understood in this sense consists of two signals that subjectively sound the same, but create an acoustic space centrically between “left” and “right”.

A mono signal is never paired with another signal and does not create a spatial acoustic impression. The final format decides at which audio output the signal applies, for example whether your customer wants to have room noise and live sounds on track1 or 2 of his master tape. If the mono signal is part of a stereo output, it can be assigned to a left or right output by means of panning.

What Belongs Where?

- In Avid Liquid, “stereo” means the following: even *Source Tracks*=right output, odd *Source Track*=left output.
- “Mono” means the following: the signal is output centrically between left and right. In the case of mono, it does not make any difference whether the *Source Track* number is even or odd.

When working on the *Timeline*, Avid Liquid initially proceeds on the assumption that a stereo signal (e.g. a piece of music digitized from a CD) keeps its left-right assignment and is to be assigned to the respective “left” and “right” output to create a spatial acoustic impression. In other words: what is played-in in stereo is also played-back in stereo without you having to make any settings. The same is true for mono signals. Mono is mono without modifying panning. Both channels create the same volume.



The primary left/right orientation of stereo clips and the central orientation of mono clips are default settings.They may, of course, be changed.

Stereo/Mono Is a Clip Property

In Avid Liquid, an audio clip can be either “stereo” or “mono”. This feature is assigned to it and can also be changed. There are three possibilities of changing this feature:

- preferably during digitizing or logging (*page 110*)
- or in the *Audio Mode* function in the clip *Properties* dialog box (*“Tab: General”* on page 283)
- or on the *Timeline* by means of *Adjust Audio* (*“Global Modification of Volume and Panning (Adjust Audio Function)”* on page 855).

The stereo or mono setting can also be seen from the *Detail* (List) *View* in the *Rack* in the *Tracks* column and is characterized by an attached *-S* or *-M* (e.g. “VA1A2-S”).



In the case of imported audio files, Avid Liquid automatically recognizes stereo or mono files and labels them accordingly.

Stereo or Mono or Pseudo-Stereo?

If you ask yourself which kind of clips to work with, stereo or mono, make a decision on the basis of your end product:

- *Stereo-Master*: if all sources are stereo (in the above-mentioned meaning), work with stereo audio clips down the line without having to deal with the left/right assignment.
- *Mono-Master*: identical signals are applied at two or more audio *Tracks* of a master tape.
- *Stereo-Mono*: ambient sound and live sound are mono clips, the underlying music of CD stereo. This keeps a spatial music effect, the sounds are correctly located in the middle. In addition, panning of mono clips can cause a spatial effect.

Panorama and Balance

Panorama (*Pan*) and *Balance* are two possibilities to influence signal orientation within the left/right spectrum:

- The balance is controlled in stereo clips just like in your stereo system: one signal amplitude is lowered, the other one remains unchanged. The left/right signal separation is upheld.
- The panorama is controlled for mono clips: the signal of a channel "migrates" e.g. from left to right. The signal amplitude is not changed, only its left/right distribution.
  This procedure is called "panning".

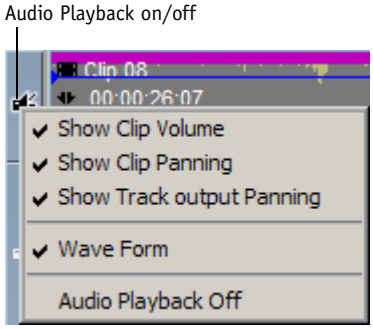


Clip Viewer and *Source Viewer* output mono clips centrically, stereo clips left/right. If you wish to monitor certain *Source Tracks*, use the function *Audio Mode* in the clip *Properties*.

Panorama/Balance and Audio Routing

"Right", "Center" and "Left" are the result of the clip properties "Stereo" and "Mono". Keep this in mind when working with the *Audio Editor*.

Muting Timeline Tracks (Audio Playback)



Shortcut menu for the Audio Playback column

Select this function from the *Audio Playback* column shortcut menu to switch the playback of one or all *Timeline Tracks* off or on. It is the same as *activating* or *deactivating* playback directly in the *Audio Playback column* of a *Timeline Track* (by clicking the *Loudspeaker* icon).

Audio Scrubbing - Digital or Analog

"Audio Scrubbing" in non-linear editing systems corresponds to what you can do with any professional tape recorder: playback or rewind the tape slowly or quickly to find a certain audio location. In Avid Liquid you move the *Playline* via the clips to be played back (in the *Timeline*) or you move the mouse pointer of the *Video Inlay* of the *Clip Viewer*, *Source Viewer* or *Master Viewer*.

Press the SCROLL key on your keyboard once to activate analog audio scrubbing. Next to the *Audio Tool* icon in the taskbar an *A* or *D* indicates the scrubbing mode. Press SCROLL again to deactivate this mode.

Avid Liquid offers you two types of audio scrubbing that depend on the audio material and your personal preference:

- Analog Scrubbing -
  Analog scrubbing sounds similar to what you do on a tape recorder.
- Digital Scrubbing -
  In the case of digital scrubbing, individual frames are played back in a loop.
  Go to *Audio Settings* to change the digital scrub parameters (*page 862*).

To toggle between scrubbing modes use the shortcut menu of the *Audio Tool* icon on the taskbar (right-click). Select your preference, and don't forget to choose the *Tracks* you need to monitor (see the following section).



Toggle analog/digital scrubbing; "D" indicates enabled digital scrubbing

The three steps of successful scrubbing:

1 Enable scrubbing (hit SCROLLLOCK key)

2 Select scrub type (analog or digital, shortcut menu of taskbar *Audio Tool* icon)

3 Select *Timeline Tracks* for scrub (two max, SHIFT-click *Loudspeaker* icon in column)



To scrub frame by frame use the ARROW RIGHT/LEFT keys. Press the ARROW keys and the SHIFT key simultaneously to move the *Playline* by 10 frames each.

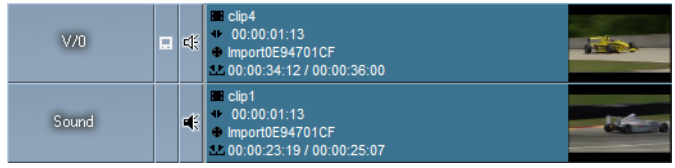


When you position a video/audio clip on the *Timeline* by means of drag&drop, the audio clips may not be placed separatly on the *Track* but remain grouped with the video clip, that is, undisbanded.To scrub the audio portion of that clip, press SHIFT and click the *Track's* loudspeaker icon to change it to a "contour". Both *Video playback* and *Audio playback* must be activated before the *Track* on which this audio/video clip was positioned.



If `Avid Liquid Control` is connected: Activate/deactivate *Scrubbing* mode with the SCROLL key and move the jog button or the shuttle ring as usual. This works in all modules.

Selecting Audio Tracks for Scrubbing (Timeline)



Loudspeaker as contour: The Track "V/0" is activated for Audio Scrubbing.

You can scrub any number of audio clips (*Source Tracks*) simultaneously. To select your *Tracks*, click the loudspeaker icon in the *Audio Playback* column of the respective *Track* while keeping the SHIFT key depressed. The icon appears as a contour. A *Track* for which playback is deactivated (no speaker icon) cannot be played back via scrubbing.

Selecting Audio Tracks for Scrubbing and Monitoring (Clip/Source Viewer)

Drag buttons *A1* to *A4* from the function library (right-click > *Customize* > *Special*) and drop them on the *Source Viewer Toolbar*. These buttons let you select the *Source Tracks* of the clip currently loaded that you want to monitor.

See also *"Source Viewer (Monitor Bus)"* on page 827.

Audio Tool

The *Audio Tool* influences and monitors the audio output signals. In the signal path sequence, it follows the logical output busses, which makes it the ultimate audio levels control before the physical outputs.

This section covers the following topics:

Opening the Audio Tool/Functions *page 807*

Output level meter *page 807*

Clipping *page 808*

32-bit floating point audio *page 808*

No signal at the Audio Tool? *page 808*

Auxiliary level in the taskbar *page 809*

Digital scale and digital audio *page 809*

Opening the Audio Tool/Functions

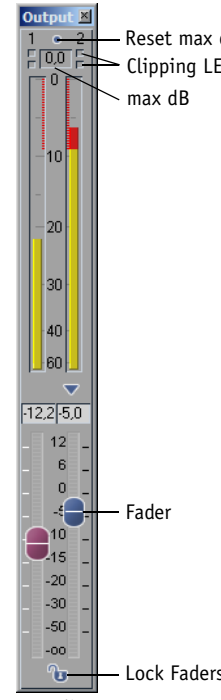


The *Audio Tool* is used for controlling output levels. To open the *Audio Tool* window, click its icon in the taskbar. You can also access the module via *Tools* > *Audio Tool*.

Output Level Meter

- The *Audio Tool* displays the level of the outgoing audio signals in the form of up to four vertical bars that change from yellow to red when the level exceeds -9 dB (default), thus indicating that the level is nearing the overload threshold.
  The overload threshold can be set in steps of 1 dB (-9 to -20 dB) (*Edit* > *Control Panel* > *Site* > *System Settings* > *General* > *General* > *Audio Reference Level*).
- Use the arrow icon to display or hide the controller section. To lock a pair of *Faders* so that they move in unison when you drag them up or down, click their *Lock* buttons.
  Double-click the *Fader* or the scale to reset it to 0 dB.

  If you use a mouse with a mouse wheel, simply turn the wheel to move the *Fader* in increments of 0.3 dB.
- The bar indicators continue to show signal peaks for a few moments after the level has dropped. A given maximum value continues to be displayed in the max dB field until the level is exceeded, or until you delete it by clicking the icon (small round button) button.



Audio Tool

Clipping

The red "LED" indicator above each of the scales shows whether the overload threshold has been exceeded, in which case the system clips the signal. Also, in the *max dB Field*, the value 0.0 is displayed in red and a red cross appears and stays to indicate that the system has clipped the signal. Reset using the *Reset* button.

A second, yellow LED indicator flashes at the output if the signal was already clipped with one of the audio effects. In this case, we advise you to slightly attenuate the signal in the respective audio Effect Editor. (See also *"Audio Effects"* on page 868.)

32-bit Floating Point Audio

Avid Liquid processes all audio data internally in *32-bit Floating Point* mode. Other formats are converted as necessary. In practice, this results in better sound (in particular, quieter recordings or passages) and a broader dynamic range, without the risk of the signal being clipped. This is why the *Audio Tool's* clipping LEDs (during *Timeline* editing, when working with the *Audio Editor*) no longer light up. Nevertheless, this doesn't mean that you should always slide the fader as far as it will go.
When outputting via IEEE-1394 where PCM 16-bit is required, however, there is always the risk of clipping. You can monitor the results with the *Audio Tool.*

- If configured, all products that run under Avid Liquid generate 32-bit floating point files for *Fuse* and rendering.

This option is located under *Edit* > *Control Panel* > *User* > *Audio Settings*.

No Signal at the Audio Tool?

You're playing something back but the *Tool's* scales remain empty, indicating that there is no signal at the master output. There are three likely possibilities:

- Faders pushed down -
  Open up the bottom half of the *Audio Tool* and check the fader levels.
- No bus mapped to output -
  Open *Output Mapping* and check whether the active *Output Busses* are assigned to the appropriate outputs (sound card, IEEE 1394, breakout box, etc.; also see *"Output Mapping: Assigning Signals"* on page 825).

When these problems occur, you may still be able to hear something through the connected speakers, depending on how you have configured your system.
Other possibilities when audio is (apparently) absent:

- *Audio Playback* of *Timeline Track*(s) is disabled (*Track Header*: *Audio playback* column - is loudspeaker icon visible?).
- *Tracks* are routed to incorrect *Output Busses* (*Audio Editor* > *Audio Mixer* > check *Output Mapping*).
- *Track* is muted or another *Track* is set to *Solo* (check *Audio Mixer*).
- The clip's *Audio Source Tracks* are deactivated (check clip *Properties*).
- Audio is being suppressed by an insert or send effect, or by a fader in the *Track's* signal path (audio mixer).
- Clip's *Audio Playback* is set to zero or is too soft (view clip in the *Clip Viewer* > open extended dialog box and check faders).
- Clip has no audio. Activate the *Waveform* display: No wave means no audio. When recording, check cables; go to *Logging Tool* > *Audio* tab: Is there an incoming signal?

Auxiliary Level in the Taskbar



An auxiliary level is located next to the *Audio Tool* icon in the taskbar. The two topmost segments in the four part scale change to red if the outgoing level reaches overload.

Digital Scale and Digital Audio

Digital audio requires different level indicators than analog audio. Avid Liquid works with a digital scale, designed for a range between 0 dB and minus infinite dB. When working with analog peak level meters, most of which are designed for a range between +5 dB and -40 dB, you often end up pushing the 0 dB limit. This is not permitted with digital audio; the -9 dB limit should not be exceeded.

Headroom

With digital audio, overload reserve is called "headroom". Headroom is not standardized; a headroom of 9 to 12 dB is generally used. The "red" range of Avid Liquid's peak level meters begins by default at -9 dB.



Digital audio exhibits less tolerance to overloading than analog audio. If you exceed a certain level, noticeable distortions can be heard or signal information is lost due to clipping. This is particularly important to keep in mind when converting audio signals, for example, from analog to digital or between different digital formats.

Peak Level Meter Response Time

Avid Liquid's peak-monitoring devices are designed with extremely fast response times and register signal peaks even in the 1 millisecond range. Make sure you do not overload even these brief peaks, otherwise you may end up with distortions or loss of audio information due to clipping.

Audio Editor

In the *Audio Editor*, the audio signals are mixed and distributed to the available outputs of the system hardware.



The *Audio Editor* must always be open during audio editing on the *Timeline*.

This section covers the following topics:

Opening the Audio Editor *page 811*

The Audio Mixer *page 812*

→ Rubberbanding *page 820*

→ Key frame toolbar *page 823*

Output mapping: Assigning signals *page 825*

Audio routing A1 to A4 (Classic) *page 833*

Audio Editor settings *page 837*

Working with insert effects and the send bus *page 838*

Surround sound 5.1 *page 842*



Avid Liquid uses *Key Frames* for audio editing.
When the *Audio Editor* is open, audio clips can be completely edited, i.e. trimmed, moved and deleted.

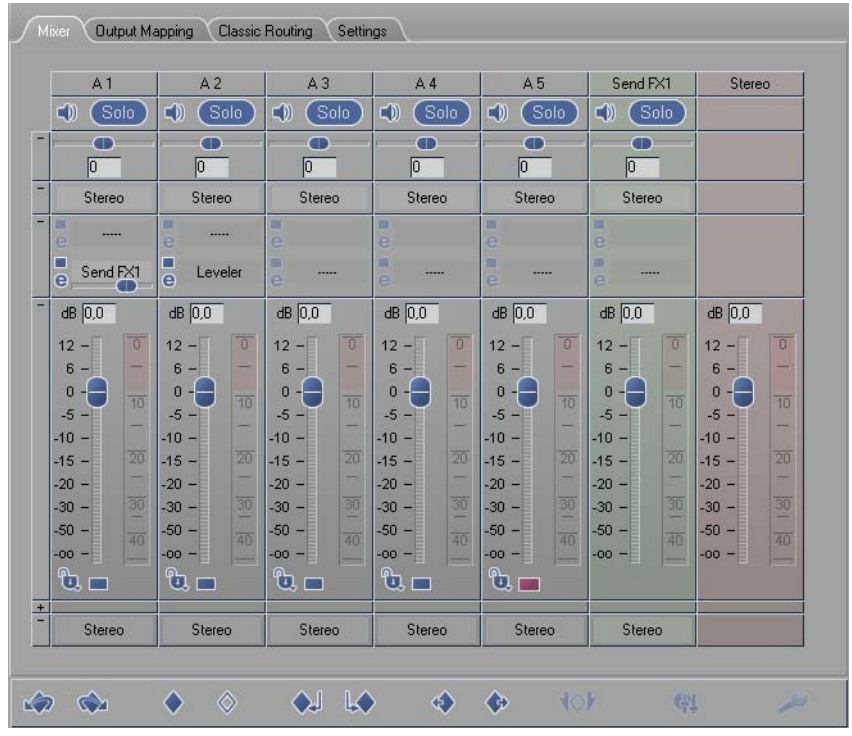
Opening the Audio Editor



To open the *Audio Editor* click its button in the *Master Viewer's* toolbar (or press F4 in the standard keyboard assignment). In the standard view, the *Audio Editor* replaces the *Source Viewer* above the *Timeline*.



The settings in the *Audio Editor* (such as active *Fader* segments and *SendFX Busses*) apply to the current *Sequence*. If you create a new *Sequence*, the default settings are applied. If you open an existing *Sequence*, you work with the existing *Audio Editor* settings for this *Sequence*.
Output Mapping is system- and hardware-dependent and does not change from *Sequence* to *Sequence*.



Audio Editor with mixer in the foreground,
shown here with five fader units, one logical output bus (Stereo) and one send bus

The Audio Mixer

As a virtual mixing console, the *Mixer* is the core of the *Audio Editor*. You can use it to operate any number of fader units, each of which is responsible for one *Timeline Track*. You can also use it as an eight- or twelve-channel mixer, as appropriate: In this case, each fader unit and its associated *Timeline Track* represents one "audio channel".
Plugin audio effects (up to 16 per fader unit) are integrated here. The *Mixer* lets you precisely define volume and panning/balance for entire *Tracks* or individual clips. *Send Busses* (in the figure above, Send FX1) for controlling separate audio effects are located to the right of the standard fader units, which are highlighted in the software with different colors.

Each standard fader unit has the functions described below.



In the default configuration (e.g. following initial installation of the software), only the most important fader sections are visible. You can activate all the other sections described below on the *Settings* tab of the *Audio Editor*.



The settings in the *Audio Editor* (such as active *Fader* segments and *SendFX Busses*) apply to the current *Sequence*. If you create a new *Sequence*, the default settings are applied. If you open an existing *Sequence*, you work with the existing *Audio Editor* settings for this *Sequence*.

Overview of the signal path *page 812*

Assigning timeline tracks (list box) *page 814*

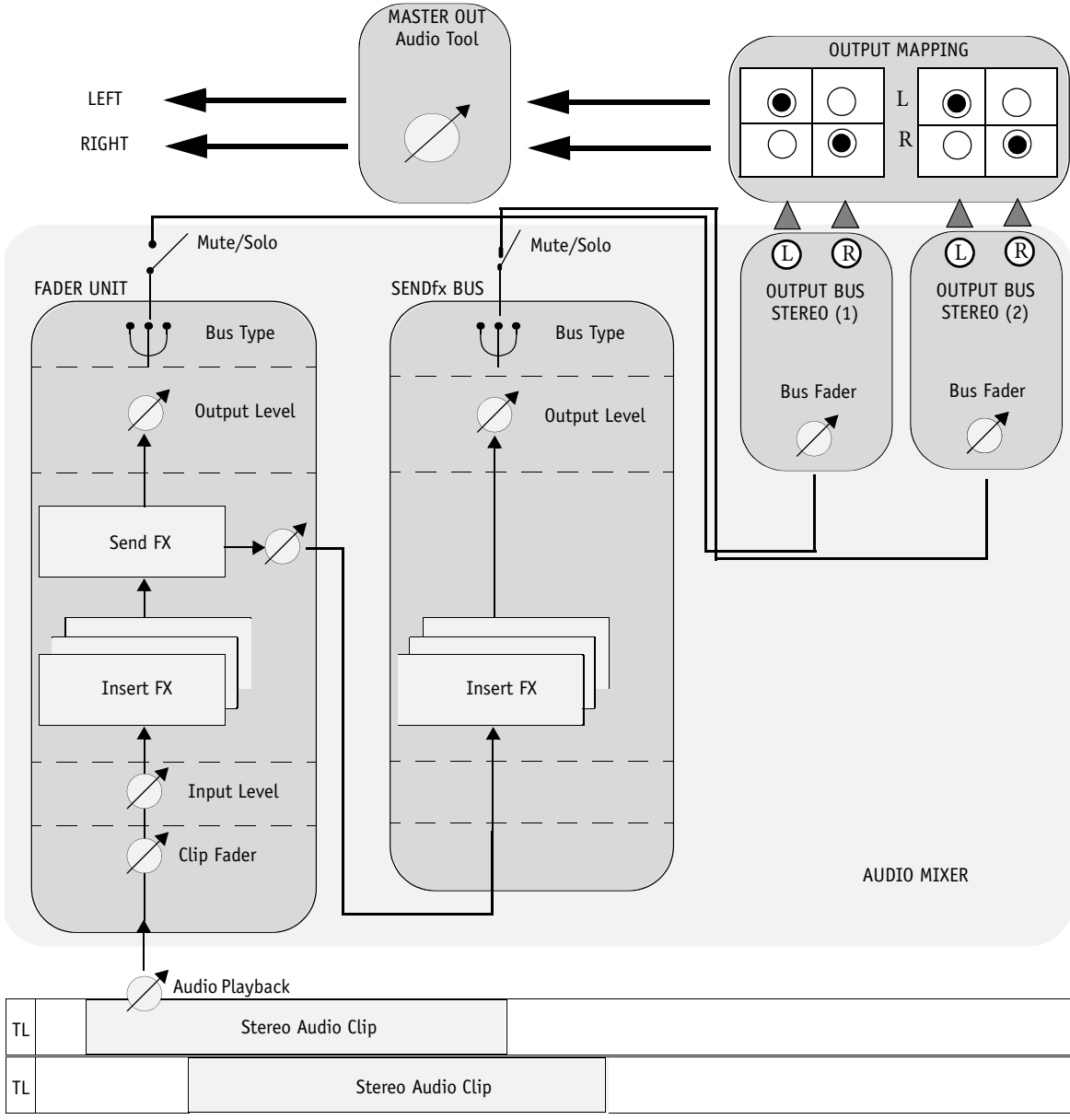
Standard fader functions *page 814*

Send bus faders *page 819*
Special faders for effect editing

Faders for logical output busses *page 820*

Overview of the Signal Path

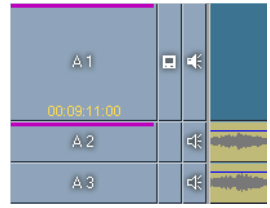
The figure below presents an example of the audio signal path of a *Timeline* stereo audio clip through the *Audio Editor* to the oLutput. One *Send Bus* is displayed in addition to the *Fader Unit*. The peak meters in the *Audio Mixer* follow their respective faders in the signal path.



The path of the audio signal through the Audio Editor

Selecting Timeline Tracks and Fader Units

When you open the *Audio Editor*, the number of fader units visible in the *Mixer* is always the same as the number activated for *Audio Playback* on the *Timeline Tracks*. In the default configuration, five fader units are displayed (*Name 5* to *Name 1*). The fader units have the same names as their associated active *Tracks*.



You can add (or remove) any number of fader units by single-clicking the appropriate *Audio Playback* column. The *Track's* loudspeaker icon must be visible for the fader to appear in the *Mixer* (see figure above).

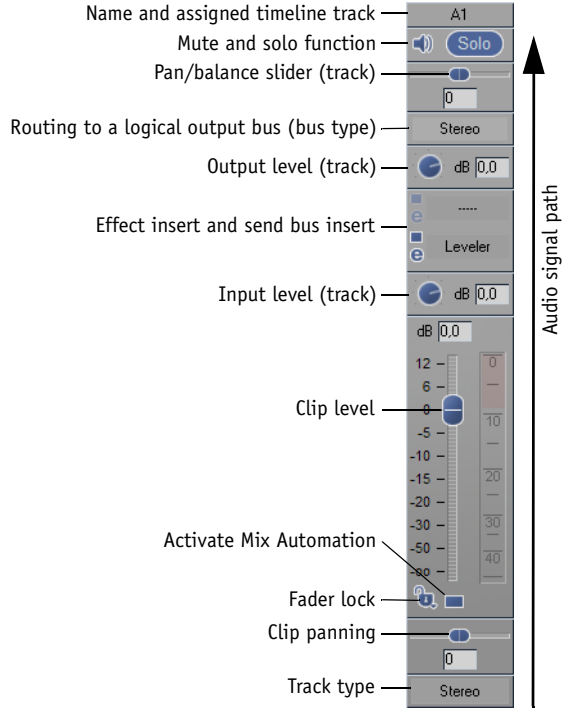
Each *Track* can be assigned only once. Note that one *Timeline Track* can contain up to four *Audio Source Tracks* (*A1* to *A4*) that are mixed down together.

Standard Fader Functions

This section describes the functions of the *Fader Units*. You can show or hide the individual function groups by clicking the *Plus* and *Minus* signs in the left-hand column.
If you don't see all the sections displayed below in your software, activate all the options on the *Audio Editor*'s *Settings* tab.
The signal path traverses the fader unit *from bottom to top*; therefore, we'll start with the *Track Type*.

Wherever you see an editing field, you can also enter a value directly via the keyboard; then press TAB or ENTER to confirm your entry.

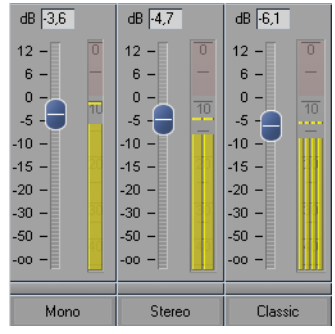
Right-click the plus/minus field to the left of the relevant section to toggle between knobs and sliders.
Note, however, that peak meters are visible only when a slider is selected.



One fader unit

Track Type

Click this field to select the track type appropriate for the audio clips on the associated *Timeline Track*. Avid Liquid recognizes three types of audio clip:



- *Mono* -
  One audio channel (*Source Track*) per clip
- *Stereo* -
  Two audio channels (stereo) per clip (default).
- *Classic* -
  Up to four mono audio channels or 2x2 stereo channels per clip

The figure shows you how this affects the fader peak meters.

(Also see "*Bus Types and Track Types*" on page 827.)

Clip Panning



This section is visible only if you activated *Classic Routing* (*Settings* tab) and permits panning for individual clips.

You should also enable the *Pan/Balance Lines*. Open the shortcut menu for the *Audio Playback* column (the one with the loudspeaker icon) and select the appropriate option. The yellow lines (rubberbands) are then visible in the clip and can be adjusted by means of faders or the mouse (also see "*Show Panning/Balance*" on page 798).

Also see track-specific panning further up in the signal path.

Clip Faders (for the Current Clip)

These faders let you control the volume level of the current clip right where the *Playline* is currently located. An *Audio Key Frame* is set that moves when the fader is moved.

In the main operating range of +12 dB to -20 dB, the control range is linear and has a wide-spaced scale; below -20 dB it has a narrow-spaced scale. Double-click the *Fader* or the scale to reset to the 0 dB position.

The UP ARROW/DOWN ARROW keys change the level in increments of 0.3 dB.

If you use a wheel mouse, turn the wheel to change the level in increments of 0.3 dB.

Levels are relative. *Projects* often contain audio clips of different volume levels. Avid Liquid assumes that every audio clip on the *Timeline* is at "0 dB" when placed there. This value is the default setting of the *Volume Line* and *Fader* (see also *Show Volume* on page 798). Every volume change you make is relative to this 0 dB.
Clips whose *Playback Level* was modified during logging/digitizing or in the *Clip Viewer* are shown with the *volume line* set to the 0 dB position. Nevertheless, audio is played at the modified level.

The waveform display reflects the *Playback Level* setting. For example, a very low volume clip shows a "flattened" waveform.

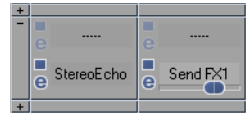
Input Volume (Track)



This fader affects the level at which the signal is fed to the *Insert/Send Effect* section and applies to all the audio clips on the assigned *Track*.

This setting is static for the entire *Track* (no *Key Frames*).
Right-click in the field with the plus/minus sign to the left of the fader to toggle between a knob and slider (with peak meter).

Insert Effects and Send Effects



In this section, you can select effect plugins or send busses for send effects. Once again, the "bottom to top" rule applies (signal path), meaning that the bottom insert effect or send bus is edited first.
When you select (remove) a send effect here, the *Fader Unit* for the *Send Bus* is automatically inserted (removed).

For more information on this topic, see the section on *"Working with Insert Effects, Send Effects and Busses"* on page 838.

Output Volume (Track)



This section lets you raise or lower the volume equally for all the clips on the assigned *Track*.
Because this fader is located after the effect section, you can use it, for example, to re-attenuate effect-related increases in volume.

This setting is static for the entire *Track* (no *Key Frames*).

Routing to a Logical Output Bus (Bus Type)



In this section, you can select the *Logical Output Bus* or the "sum" to which the fader unit signal should be routed. Click the name of the bus to open a menu. These "logical" outputs are assigned to the actual, physical outputs on the *Output Mapping* tab.
Three busses are available: *Stereo, Classic* and *Surround 5.1*. It is possible to configure several busses of the same type (for example, *Stereo (2), Stereo (3)*, etc.).

- Remove *Logical Output Bus* -
  If additional *Logical Output Buses* are configured: Click a fader in the *Audio Mixer* (in the *Logical Output Bus* section) and select the bus to be deleted. Important: This is possible only if no *Tracks/Faders* are routed on this bus.

(See *"Output Mapping: Assigning Signals"* on page 825.)

Pan, Balance and Surround Panner (Track)



For stereo tracks, this section controls the *Balance*; for mono tracks, it controls *Panning*. This information always applies to left (-50) or right (50).
In the case of a surround mix, this section serves to position the virtual sound source within the listening room. The slider then affects the LFE (*Low Frequency Emitter*), i.e. the subwoofer. The field with the moveable dot is called the *Surround Panner* (see *page 842*).
This track-specific *Surround Panning* can be represented by two lines. Open the shortcut menu for the *Audio Playback* column (the one with the loudspeaker icon) and select the *Show Track Output Panning* option.

Mute and Solo (Track)



- *Mute* -
  Click this option if you want to mute this *Track* only. The loudspeaker icon no longer shows "soundwaves". The signal is not routed to the output bus.
- *Solo* -
  Select this option if you're playing the *Sequence* and want to activate audio playback for one specific *Timeline Track* only. Only this signal is forwarded to the output bus.

Additional Functions

Lock Function for Synchronizing Faders

To lock *Faders* so that they move in unison when you drag up or down, click their *Lock* buttons. A selection box including eight different color fields opens. You can now form subgroups of locked *Faders: Faders* having the same color (indicated by a padlock) move in unison.

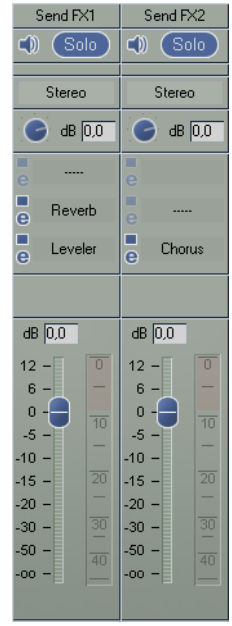
This applies to all faders, regardless of whether they use a slider or knob.

To unlock *Faders*, click the gray box in the selection box.

Activating/Deactivating Audio Mix Automation

Audio Mix Automation permits the live mixing of one or several audio clips (*page 857*).
It also selects the *Track* where a *Voice-Over* clip should be positioned (*page 861*).

Send Bus Faders



Send Busses are a special type of standard fader specifically used for effect editing.
In the software user interface, *Send Bus Faders* can be identified by their greenish color and their (non-editable) name (*Send FX1, Send FX2*, etc.).

Send Bus Faders are not assigned to *Timeline Tracks* but instead get their signals from one or more fader unit(s) or mixer channel(s).
The effect signal is then routed to an output bus and thus inserted in the master signal.
For a full description, see the section on "*Working with Insert Effects, Send Effects and Busses*" on page 838.

Faders for Logical Output Busses

A fader is inserted for every *Logical Output Bus* you define. These faders serve to determine the level at which the audio signals are routed to the particular output bus. The bus fader's peak meter indicates the number and level of the audio signals: Two for *Stereo*, four for *Classic* and six for *Surround*. Output bus faders are red.

See also *"Output Mapping: Assigning Signals"* on page 825.

Rubberbanding

The term "rubberbanding" is used to describe the action of moving and adjusting *Volume Lines, Pan Lines* and setting *Key Frames* on volume and pan lines directly on the clip.

You can do this using the mouse or the fader units.

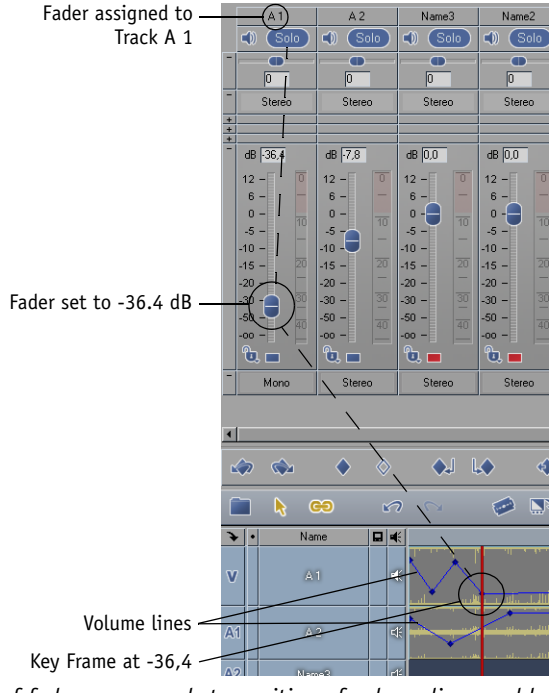
Setting Key Frames

In Audio *Timeline* editing *Key Frames* refer to the small blue diamonds on the *Volume/Pan Lines* used for adjusting an audio clip's volume level or the pan orientation. In order to "bend" an otherwise straight volume line, it is necessary to set *Key Frames*.

1. Activate either *Volume* or *Pan Lines* for the relevant *Timeline Track (page 797*.)
2. Open the *Audio Edito* (*page 811)*
3. Position the *Playline* at a certain location in the clip and adjust the volume at this location in one of the following ways:

- Using the mixer - by moving the *Fader* of the appropriate fader. (If you locked *Faders*, you can adjust several clips on several *Tracks* at once).
- Using the mouse - by going into *Edit Mode* (the mouse pointer turns into a hand with pointing index finger if placed near the *Volume or Pan Line*, a plus symbol appears next to it). Set the mouse pointer to the appropriate position on the volume line and click to insert a *Key Frame* on the line.
  Once a *Key Frame* is set, drag the *Key Frame* horizontally or vertically to change its position. The corresponding *Fader* moves as you move the *Key Frame* vertically and you can read the change on the dB scale.

Clips whose *Playback Level* was modified during logging/digitizing or in the *Clip Viewer* are shown with the *volume line* set to the 0 dB position. Nevertheless, audio is played at the modified level.
The waveform display reflects the *Playback Level* setting. For example, a very low volume clip shows a "flattened" waveform.



Position of fader corresponds to position of volume lines and key frames

Moving Key Frames

When moving the mouse pointer (make sure that you are in *Edit Mode*; *page 411*) near the *Volume* or *Pan Line*, it turns into a hand with a pointing index finger. Click *Key Frame* and drag it to the required position.

In Version 7, the behavior of the next *Key Frame* to the immediate right was changed: If it has not yet been moved, it shifts along with the previous *Key Frame*. If it has already been modified or was inserted after the first, it retains its position.

Audio Key Frame Tooltip

When moving *Key Frames*, a small box appears next to the mouse pointer. It indicates:

- the horizontal displacement of the *Key Frame* position (in +/- mm:ss:ff)
- the quantitative change (in the case of volume lines +/- dB, in the case of pan +/- 50%, i.e. left/right).

You can move horizontally (only to the neighboring *Key Frame*) and vertically (within the maximum values).

Moving Sections between Two Key Frames

Using the Mouse

To move a section between two *Key Frames*, position the mouse pointer on the *Volume Line* between the two *Key Frames* and press the SHIFT key. The mouse pointer turns into a short horizontal line. Now you can move the area between the *Key Frames*. This is useful, for example, if you have faded audio in and out in a clip and want to adjust the entire segment between two *Key Frames*.

Using the Fader

This can be done in a similar way by using the respective *Fader*: set the *Playline* between the *Key Frames* that are to be increased by the same value, hold down the SHIFT key and move the *Fader* up and down. As soon as the *Playline* is located on a *Key Frame*, the line located to the right of it is edited.

Deleting Key Frames

Key Frames can also be deleted in the clip by means of the mouse. Click the respective *Key Frame* and drag it out of the clip. The mouse pointer turns into a Trash icon. You can release the mouse button, the *Key Frame* is now deleted.

Key Frame Toolbar

Located below the *Mixer* is a toolbar with various buttons for controlling *Key Frame* functions.



Key Frame toolbar

These buttons can be used for setting, copying and deleting *Key Frames*. The following information applies to working with both *Volume* and *Pan Lines*.

Each audio clip always has two *Key Frames*, one at the beginning and one at the end.
A new *Key Frame* is set wherever the volume or pan is changed.

Setting Key Frames



To set a Key Frame, position the *Playline* to the position where you want to insert a *Key Frame* and click the *Set Key Frame* button.

Jump from Key Frame to Key Frame



Click this button to move the *Playline* to the previous *Key Frame*.



Click this button to move the *Playline* to the next *Key Frame*.

Deleting Key Frames



Move the *Playline* to the *Key Frame* you want to delete and click the *Delete Key Frame* button.

Deleting Several Key Frames



The *Delete Audio Key Frames* button can be found in the toolbar of the *Audio Editor*. This button can be used for *Key Frames* on the volume line and on the pan line. Activate either *Show Volume* or *Show Panorama* and select a section on the *Timeline* by setting mark-in and mark-out. All *Key Frames* of the active *Tracks* in this section (including those located directly on mark-in and mark-out) are deleted with this function. All *Tracks* that are neither active nor protected remain unaffected.

The line run is determined by the *Key Frame* located before or after the set section between mark-in and mark-out. If there is no clip outside mark-in and mark-out, the lines correspond to the initial values.

In order to delete all *Audio Key Frames* and reset the volume line to its original state, you can also select *FX Properties* in the clip's shortcut menu. Click *Audio Fader* and the *Trash* button.

Undo/Redo Key Frame



Set *Key Frames* in *Volume* and *Pan Lines* can be individually deleted via *Undo Key Frame*. This can be done on one or several audio clips at the same time. These audio clips have to be highlighted (selected). *Redo Key Frame* sets a *Key Frame* removed by *Undo*.

Copy/Paste Key Frame



Click this button to copy *Key Frames* with their audio or pan settings.



Click this button to insert copied *Key Frames* elsewhere on the *Volume* or *Pan Lines* (or even to other clips).

Key Frames can only be copied to audio clips in the same *Track*.

Copy Value to Next/Previous Key Frame



Click this button to transfer settings to the next *Key Frame*.



Click this button to transfer settings to the previous *Key Frame*.

Audio Key Frames on the Timeline Toolbar

You can also add the *Audio Key Frames* function and other *Audio Editor* functions to the *Master Viewer/Timeline* toolbars but they will be active only while the *Audio Editor* is open.

Output Mapping: Assigning Signals

The signals from the individual *Mixer* channels and *Send Busses* are reunited in the output busses before being distributed to the physical hardware or virtual outputs. We call these output busses "logical" busses, as opposed to the actual physical busses to which you connect your speakers or VCR.

Output Mapping is system- and hardware-dependent. The *Mapping* settings cannot be stored with the current *Sequence*.

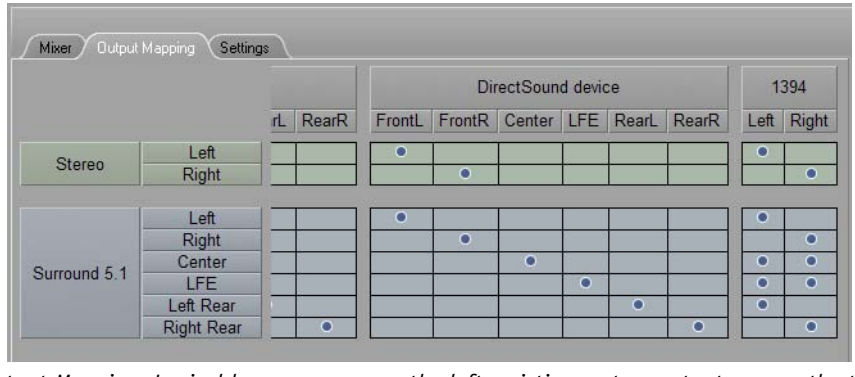
Why busses? *page 826*

Bus types and track types *page 827*

The system's physical and virtual outputs *page 829*

Fuse/export routing *page 830*

Overview of output mapping *page 831*



Output Mapping: Logical busses appear on the left, existing system outputs across the top (only partially visible) and the selected mapping at the points where the two intersect.

Why Busses?

The logical output busses and the actual connection options form a grid on the *Output Mapping* tab. Small dots serve to define and display the relationships between logical busses and physical outputs.

The audio signals intended for the different busses are combined in these busses according to their properties:

- A *Stereo Bus* receives all audio signals with the "left" property at its left channel and all "right" signals at its right channel.
- The *Surround 5.1 Bus* routes all signals it receives with the "rear left" property to its *RearLeft* channel, all signals labeled "left" to its *Left* channel, etc.
- The *Classic Bus* sorts all the *Audio Source Tracks (A1 to A4)* it receives. It is used with *Classic Routing*, which must first be activated on the *Settings* tab, if appropriate.

These properties such as "Left" or "Center" were defined by means of panning (mono clips), balance (stereo clips) or surround panning. Each *Fader Unit* has a separate section for this setting:



Panning controls for the surround bus (left) and stereo/classic busses (right)

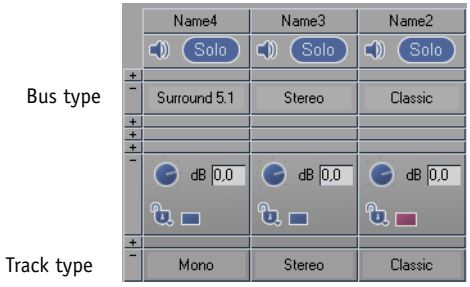
The pan and balance faders determine how the signal is distributed to the output bus channels. This is not an "either/or" situation: Using the pan fader you can, for example, apply 25 percent of a mono signal to the left channel of the stereo bus and apply the remaining 75 percent to the right channel. The peak meters then indicate the distribution.
This is especially obvious when you route a signal to the surround bus. When the dot representing the signal location is positioned near the center point, various percentages are distributed to five bus channels (see *page 846*).

But even without any adjustment by means of these faders, each audio clip still retains the mono or stereo property that was previously defined (for example, at the time of capture). A stereo audio clip retains its left-right distribution to create a spatial sound impression, whereas a mono clip (in the stereo bus) is equally routed to the left and right.

Within a bus, all signals of the same type (for example, all "left" signals) are combined in accordance with their percentages. In *Mapping*, dots are set that serve to route this mix (also sometimes called a "sum") to an output, whether it be an audio connection on the box or an embedded audio signal as in the case of DV or SDI.

Bus Types and Track Types

In the default configuration, the logical output busses available are *Classic (A1 - A4), Stereo* and *Surround*. Each individual channel (fader unit) of the *Audio Mixer* must be assigned to one of these busses, unless you want it to retain the default setting (*Stereo*). Base your assignment on the audio clips currently located on the assigned *Timeline Track* (A1 - A4 grouped, stereo or mono clips). The figure below provides an overview of the *Bus Types* and the *Track Types* suitable for each:



Select the bus type suitable for the track type



As far as possible, position only audio clips of the same type on the same *Timeline Track*. For example, place all stereo music clips on a *Track* called "Music" and all mono, natural sound clips, etc., on a series of *Tracks* named "Nat 1, Nat 2, Nat 3", etc. This will make the assignment in *Output Mapping* clearer and less ambiguous.

Stereo

This bus is a two-channel output bus with a left-right distribution used for typical stereo mixes. It is used with stereo audio clips (default).
The peak meter for the stereo bus has two vertical bars representing the left and right channels.

Surround 5.1

This bus is used for 5.1 surround sound and has six channels: Three for frontal sound, two for rear sound and one for the subwoofer (low frequencies).
Recommended *Track Type: Mono* (stereo audio is mixed to mono).
The peak meter has six vertical bars representing (from left to right) the left, right, center, LFE, left rear and right rear channels.

Source Viewer (Monitor Bus)

This bus allows you to define the system outputs used for routing the audio of clips played in the *Source Viewer* and *Clip Viewer*. (It supersedes the earlier option using *Classic Audio Routing*.) Although this bus is mainly used for audio monitoring, you can route signals from *Timeline Tracks* to this bus.

Classic (A1 - A4)

Up to four *Audio Source Tracks* (channels) can be grouped in a single audio clip: Four mono channels or two sets of two stereo channels. The *Classic* output bus is intended for this type of audio clip. When used with mono *Source Tracks*, this setting is also suitable for the 1:1 output of a four-track recording.
Set the *Track Type* to *Classic*. The peak meter is displayed with room for four vertical bars.



If you play back audio in the *Clip Viewer* or *Logging Tool*, you can define the Audio Monitor with this bus. To do so, assign channels *A1* to *A4* to the appropriate output channels (for example, on the sound card). The *Classic* bus is visible only if you activated the corresponding option in the *Audio Editor Settings*. The *Clip Panning* section is not visible until you activate classic routing.

In *Classic Routing*, make sure the lines are drawn from the subsums to the four logical outputs *A1* to *A4*. Only then will you see four level bars in the clip fader and classic bus fader.

Multiple Busses of the Same Type

You can configure several busses of the same type as well as combine different busses and route them to the same outputs by means of mapping. This is a quick way, for example, to activate or deactivate alternative mixes.

See also *"Routing to a Logical Output Bus (Bus Type)"* on page 818.

- Remove *Logical Output Bus* -
  If additional *Logical Output Buses* are configured: Click a fader in the *Audio Mixer* (in the *Logical Output Bus* section) and select the bus to be deleted. Important: This is possible only if no *Tracks/Faders* are routed on this bus.

Automatic Bus Display

Which output busses are available on this tab depends on the configuration of the *Audio Mixer*.

In the default configuration (with each new *Sequence*), only one *Stereo* output bus is available.
If you need more stereo busses or other busses, click the *Settings* tab, activate the *Logical Output Bus* option and, if necessary, activate *Classic Routing* (A1 to A4). In the *Mixer* section for *Logical Output Busses* (*page 818*), you can then configure new busses and route *Tracks* to existing busses.

The System's Physical and Virtual Outputs

In *Output Mapping*, the computer system's available and active physical and virtual outputs are arranged on the right-hand side above the logical output busses. "Physical" means that real ports exist for these outputs where cables can be connected. A virtual output is, for example, the *Fuse/Export Routing* described below, where only audio files are generated.

- *DirectSound* -
  This refers to the built-in sound card or chip (or one of these cards or chips) that is the primary device for monitoring the audio signal. If multiple DirectX sound cards are installed in your system, one of them must be selected as the "Default device" under Windows Control Panel > Sounds and Audio Devices. The parallel operation of multiple sound cards is not possible under Avid Liquid.
- ASIO sound card (hardware driver and name) -
  See *"ASIO Driver and DirectSound"* on page 796.
- *Audio Scrub* -
  The audio signals generated by audio scrubbing can be routed via the logical output busses to a virtual output called *Audio Scrub*. You can actually listen to these signals via the active DirectSound or ASIO device.
  See also *"Audio Scrubbing - Digital or Analog"* on page 804.
- Outputs on the breakout box -
  (Analog) *Liquid Pro*, for example, might be listed here. All analog outputs (if more than one exists) are sent the same signal.
- DV and HDV (IEEE 1394) embedded output -
  Only one DV recording device can be activated at any one time. If several such devices are connected to your system, select one as follows: *Edit* > *Control Panel* > *Site* > *System* > *Inputs/Outputs* > *Video Outputs* > *IEEE 1394*.
  The current *Output Mapping* applies to the device selected, regardless of the physical computer port to which the device is connected.

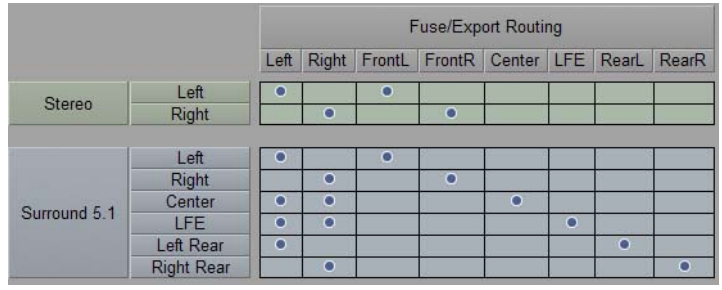
Fuse/Export Routing

Output Mapping plays a role in the *Fuse* process and in the export of *Sequences*.
The individual audio files created by the *Fuse* process can also be regarded as an "output": The *Fuse/Export* output of a logical output bus has up to eight channels, resulting in up to eight individual mono audio files when the dots are set in the mapping matrix.



Make sure to select a preset with separate audio in the *File > Export to File > Fuse* dialog box.
If you want to generate 32-bit floating point audio files using the *Fuse* process, make sure this option is activated in the *Audio Settings* (see *page 862*).

Multiple busses are possible (for example, *Stereo, Stereo (2), Stereo (3)*, etc.), which also increases the number of possible *Fuse* outputs - for example, if you route stereo to *Left* and *Right*, *Stereo (2)* to *FrontL* and *FrontR*, etc.



This configuration results in four audio files for a fuse

Using the *5.1 Bus*, you can generate up to six separate mono audio files, even if you do not intend to produce a surround mix or surround effects. However, it is necessary to provide the *Tracks* with a unique assignment so that the signals are not mixed in the bus. This means that *Surround Panning* does not change throughout output and that the *Surround Panner* is set to a different position for each *Track* (for example, the top left corner for the *Left* channel). Otherwise it is not possible to achieve a clear separation of channels.



The one exception, however, is when you export via the *Dolby Digital 5.1 Encoder* (*Burn to DVD*; "true" 5.1) or as *Matrix Surround* (*Export to File > AVI-WAV export > Audio Channels > Matrix)*: These encoders mix the surround channels in a special stereo signal.
The surround effect will not work unless surround 5.1.mapping is correctly assigned. For more on this topic, see the section on *"Output"* on page 851.

The resulting files are numbered from left to right: *Left* and *Right* are assigned the extensions [filename]_1.wav and [filename] 2.wav, up to *RearR* with [filename]_8.wav.

Level Increase in Stereo Fuse Files

Because the *L/R* and *FrontL/FrontR* channels are mapped in the preset, fused stereo files with an increased level can be produced through addition. Deactivate the *FrontL/R* options if they aren't needed. You can also deactivate *Audio Source Tracks 3* and *4* in the *Fuse* clip (clip *Properties*); no audio information is lost because these channels are only duplicates of *1* and *2*.

Overview of Output Mapping

The table below summarizes the most important information on mapping and mono/stereo. This information does not apply to classic routing (for *Classic Routing*, see next section).

#	Clip Property	Track Type *Mono*	Track Type *Stereo*	Logical Output Bus *Stereo*	Logical Output Bus *Surround 5.1*
1	Mono (A1 only)	x		Panning to center. Original signal level to L/R outputs. For mono output (one channel), use track panning	Mono signal to default surround panning (center)
2	Same as above		x	Conversion to stereo; identical signal to L/R outputs	Both signals to default surround panning (center)
3	Mono (A1 - A4) Separate effect editing*	x		Same as #1	Mono signal to default surround panning (center)
4	Same as above		x	Same as #2	Both signals to default surround panning (center)
5	Stereo (A1 only)	x		Same as #1; signal to L/R outputs	Mono signal to default surround panning (center)
6	Same as above		x	Output to L (left) only Balance adjustment	Both signals to default surround panning (center)

#	Clip Property	Track Type *Mono*	Track Type *Stereo*	Logical Output Bus *Stereo*	Logical Output Bus *Surround 5.1*
7	Stereo (A1/2)		x	L/R output	Same as above
8	Stereo (A1/2, A3/4) Separate effect editing*		x	Separate editing; 1/3 to left and 2/4 to right at output	Same as above
9	Stereo (A1/2) or (A1/2, A3/4) Tracks processed separately in mixer	x		A1 and A2 mixed to mono, resulting in an increased level; panning to center (same procedure with A1/2 A3/4)	Mono signal to default surround panning (center)

* Signals are routed individually to Effect Editors (Insert) and Send FX.

Mixing two or more mono channels can result in an increased level.

Audio Routing A1 to A4 (Classic Routing)

NOTE: *Audio Routing* in the form described here was retained in Version 6.0 (and later) mainly in order to maintain compatibility with older *Sequences* (created using Version 5.6x or earlier). When editing new *Sequences*, use *Output Mapping* (*page 825*; see previous section).

Use the *Audio Editor*'s *Audio Routing* when assigning *Source Tracks* on *Timeline Tracks* to the available *Logical Audio Outputs* by means of submixes (subsums). You can then make the assignments to physical or virtual (*Fuse*) outputs in *Output Mapping*.
Click the *Classic Routing* tab in the *Audio Editor*. If the tab does not appear, activate it by means of the appropriate option on the *Settings* tab.

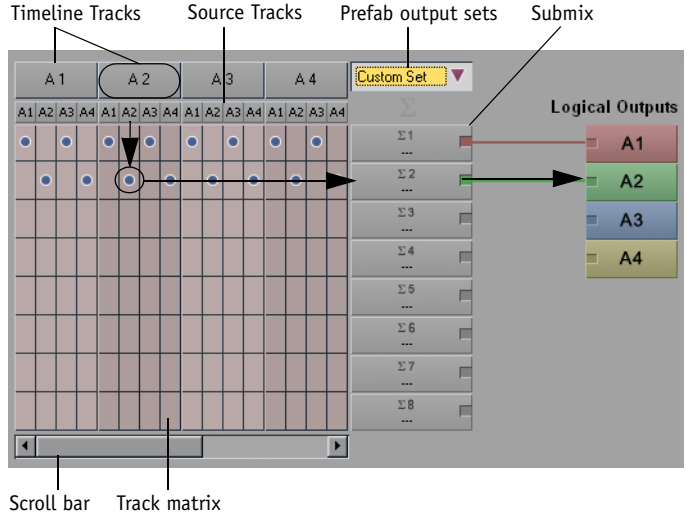
Why Use Audio Routing?

As described earlier, Avid Liquid assigns odd numbered stereo *Source Tracks* (*A1/A3*) to the left output (*A1/A3* in *Audio Routing*) and even ones to *A2/A4*. Mono Tracks are panned centrically, i.e. evenly assigned to *A1/A3* and *A2/A4* (see also "*Stereo and Mono, Panorama and Balance*" on page 801).

This cannot be changed in *Audio Routing*: a mono clip panned on the *Timeline* to the right cannot be applied at the left output by means of *Audio Routing*. The actual panning of mono clips happens in the output "box" (*A1/2* and/or *A3/4*). The left/right distribution can not be changed for mono clips in the routing. This is not true for stereo clips: you can switch them in routing (i.e. switching left and right), since they do not include any panning information, providing *balance* has not been applied to them.

Outputs *A1* to *A4* are logical outputs. They are not assigned to the actual physical outputs until this is performed in *Output Mapping* (see previous section).

Interpreting the Audio Router (Classic)



Audio Editor Classic audio routing

- *Timeline Tracks* are arranged vertically next to each other (as in the *Mixer*). They represent the *Timeline* rotated by 90 degrees.
- Four *Tracks* appear at a time.
- Use the scroll bar to see additional *Tracks*.
- Every *Timeline* Track has four *Source Track* columns (A1 to A4).

The screenshot above shows the *Audio Routing* window of a typical stereo routing. The A2 *Source Track* (right) of the clips on the "A2" *Timeline* Track is assigned to submix Σ2 which, in turn, is assigned to *Output A2 (right)*. *Source Track* A1 (left) is routed via submix Σ1 to *Output A1 (left)*.

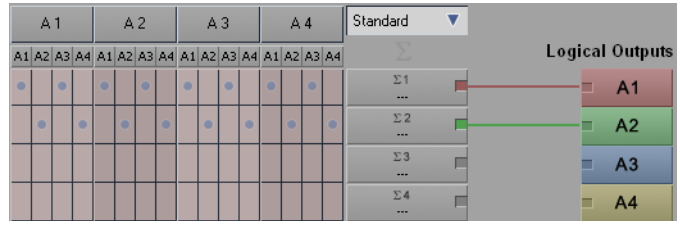


Remember routing applies to all clips on a *Track*. That is why it is advisable to reserve certain Tracks for different types of audio clips (ambient sound, music, etc.).

Predefined Routing Sets

You can either use one of the predefined routing sets or create a customized one. The predefined routings are suitable for most applications.

- *Standard* -
  The example below shows all uneven *Source Tracks* routed via *Submix* 1 to A1. The even *Source Tracks* are routed correspondingly (application for stereo left/right; non-panned mono clips remain centered):



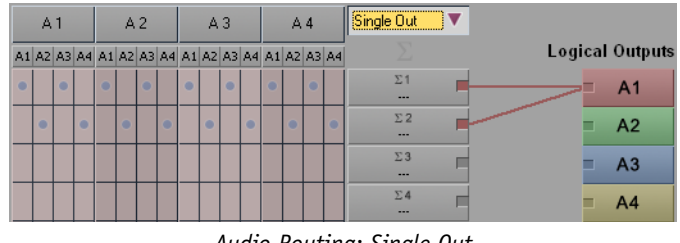
Audio Routing: Standard Set

Direct Out: Digitize the audio clips as "stereo" even if the signals are completely different to create a "clean" separation of *Tracks*. You may, however, also digitize individual monochannel *Tracks* as left or right stereo clips. *Direct Out* means that the signals are passed on unaltered through the system.

- *Single Out* -
  The following *Single Out* unifies all *Source Tracks* on *A1*, thus changing stereo to monochannel mono.



This setting causes a level increase at the output of up to 6 dB.

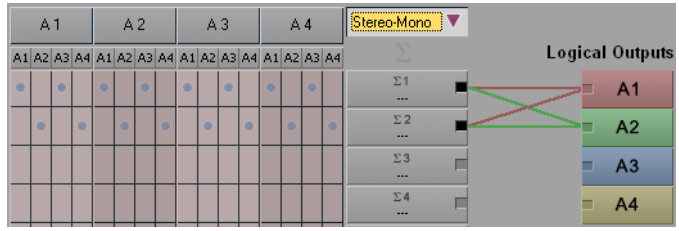


Audio Routing: Single Out

- *Set Stereo-Mono* -
  Set *Stereo-Mono* results in both stereo *Tracks* being assigned to both outputs, thus sounding like mono.



This setting causes a level increase at the output of up to 6 dB.



Audio Routing: Stereo-Mono

- *Multi Channel* - This setting permits a "Direct Out" with four channels. *Audio Source Tracks* 1 to 4 are routed to logical outputs *A-1* to *A-4*, i.e. input = output.

Customized Routing Sets

To create a customized routing set, in the drop-down menu click *Custom Set*. The difference between this window and those of defined sets is that the dots in the matrix can now be edited (and appear darker).

Each of these dots represents a *Source Track*. To assign a *Source Track* to one of the eight *Submixes,* move its dot to another position in the column. To do so, click in the matrix at the desired place (the point of intersection between the *Submixes* row and the *Source Track* column).

To completely eliminate a *Source Track* from the *Audio Routing*, click the dot directly and it disappears.

Submixes

Submixes are used for grouping audio *Tracks* before actual output and help the user maintain a clear overview. *Submixes* can be named individually.

- To do so, double-click below the Σ symbol in the box. In the field that appears, enter a name and confirm with ENTER.

Routing Submixes to Outputs

You can assign *Submixes* to one or more outputs.

- To do so, click one of the small boxes on the right side of the *Submix* box and drag the mouse pointer to the required output. The color of the line that appears corresponds to the output selected.
- To delete a connection, click the corresponding line.

Audio Editor Settings

On this tab, you can determine the functionality of the *Audio Mixer*.



The *Settings* in the *Audio Editor* (such as active *Fader* segments and *SendFX Busses*) apply to the current *Sequence*. If you create a new *Sequence*, the default settings are applied. If you open an existing *Sequence*, you work with the existing *Audio Editor* settings for this *Sequence*. *Output Mapping* is system- and hardware-dependent and does not change from *Sequence* to *Sequence*.

Mixer Sections

In the default configuration, the mixer is displayed with only the *Mute/Solo, Track Panner* and *Clip fader Sections*. To maintain clarity, activate the other sections only as needed.

Audio Mix Automation

- *Record confirmation dialog* -
  At the end of recording, a dialog box appears in which you can define the *Key Frame* density and the affected *Tracks*.
- *Start recording after first touch* -
  Recording doesn't begin until you move a *Fader*. Until that moment, the rubberband remains the same.
- *Stop readback after first touch* -
  This option determines what will happen after you release the fader: If activated, all subsequent *Key Frames* are overwritten with the last value reached, i.e. a flat, horizontal line appears. If deactivated, the rubberband remains the same.

Verbose Mixer Tooltips

Activate this option to obtain detailed tooltips for the various areas of the *Audio Mixer*. Because these boxes are quite large, you can also deactivate them.

Audio Mix Automation

- *Record confirmation dialog* -
  At the end of recording, a dialog box appears in which you can define the *Key Frame* density and the affected *Tracks*. Uncheck the box if you don't want dialog to appear.

Working with Insert Effects, Send Effects and Busses

You can also edit audio effects using the *Audio Editor*.

The concept *page 838*

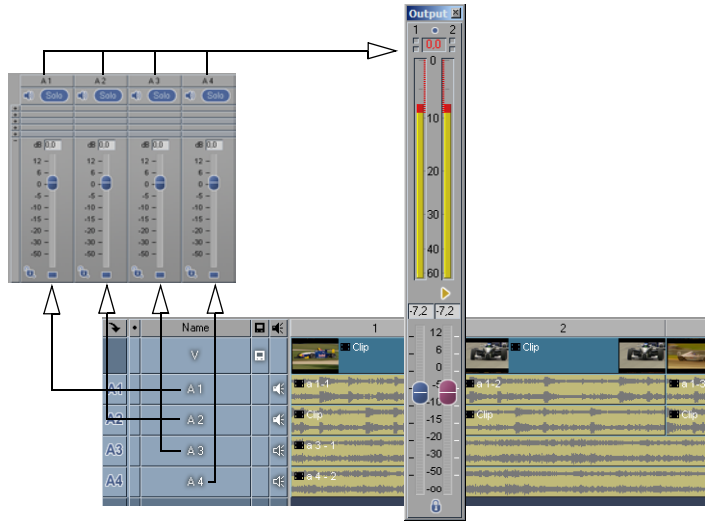
Insert effects *page 839*

Send effects *page 840*

The Concept

You're probably familiar with the concept from hardware audio mixers: All have at least one three-band equalizer with send-effect and effect-return connections plus the associated faders, whereas high-end models have many more options. The Avid Liquid *Audio Mixer* can also do more than just adjust the volume level and pan/balance; it also integrates audio effects. In this context, we make a distinction between *Insert Effects* and *Send Effects*. The only difference is in their application; they are actually the same VST-compatible audio plugin effects (*"Avid Liquid Plugin Audio Effects (VST)"* on page 875).

Each fader (you can also call them "channels") represents a percentage of the total *Timeline* audio for your *Sequence*. All the audio clips on a specific *Timeline Track* are routed through the assigned faders, as illustrated here in a very simplified form:



One fader per track: All stereo audio clips on A2 are edited with fader A2

In this simplified configuration, the *Audio Mixer* is configured only to adjust the volume. Insert effects will be added in the next section.

Insert Effects



Insert effects are inserted directly into the signal path of a fader or channel. All the signals of this channel traverse the effect editor(s), but each is processed separately within the effect.

Insertion of these effects requires that the fader's *Insert/Send FX* section be expanded (see left). One effect slot is provided in the default configuration. The number of slots increases automatically when you insert additional effects.

If no *Insert/Send FX* section is yet visible, open the *Audio Editor's Settings* tab and select the appropriate option.

1 Click the dotted line to open the menu and select one of the available audio effects. Effects supplied with Avid Liquid are described starting on *page 875*.

2 *Edit* -
Click the "e" icon to open and edit the Effect Editor.

3 *Bypass* -
Click the box to temporarily remove the effect from the signal path. This is useful for comparing the edited and unedited state.

4 The colored effect line appears above the name of the *Timeline Track* assigned to the fader. Right-click to launch the Effect Editors from there.

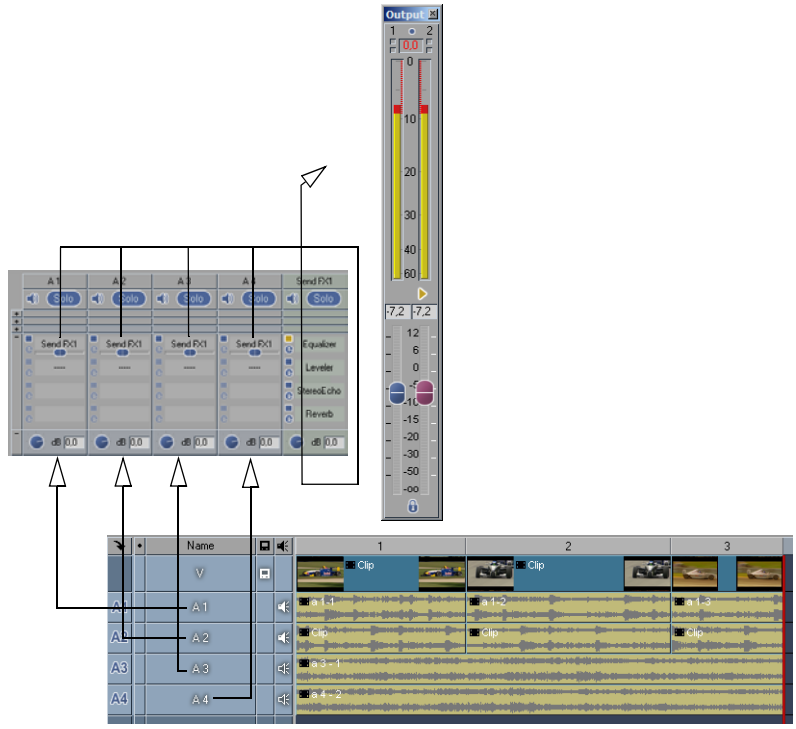
5 If appropriate, insert additional effects.

Note the following:

- The order in which effects are processed is from bottom to top.
- From the insert slot menu, you can change the order of the effects, rename and copy individual effects, and insert them at another location (clip, *Rack*).
- Stereo effects such as *StereoSpread* require a stereo input. In other words, the audio signal edited in the particular *Fader Unit* must come from a stereo clip (*Track Type Stereo*). Or, looking at it another way, stereo channels require stereo effect plugins. On the other hand, you can insert stereo effects in mono channels, but the output will be mono.
- The maximum number of effects per channel is 16.

Send Effects

You can use send effects to bundle multiple channels and route them to the same effects. The edited signal is forwarded from the send bus to an output bus where it is mixed with the output signal.

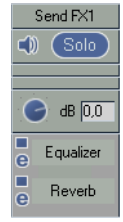


A1 to A4 are routed to the Send FX1 send bus, edited there with effects and mixed with the output signal via an output bus (not shown).

The advantage of this procedure is that the same effect (or combination of effects) does not have to be configured individually for each channel. In addition - and unlike insert effects - the edited (in audio terminology, “wet”) signal is mixed with the original (“dry”) signal. Here’s how it works:

1 The send bus is automatically inserted in the *Mixer* as soon as at least one *Send Effect* is activated in one of the standard *Fader Units* (*new Send Bus* option on *page 817*).
If no *Insert/Send FX* section is yet visible, open the *Audio Editor’s Settings* tab and select the appropriate option.

2 In the send bus:
Click in the insert/send effect section. From the list of available effects, select those that are appropriate (such as the popular combination *Equalizer* and *Reverb* shown in the figure here).
In the send bus, as well, the insert effects are processed from bottom to top.
If you need more than the two insert slots provided in the default configuration, you can configure them on the *Audio Editor*'s *Settings* tab.



3 Now reroute the signals from the relevant channels to the *Send FX1* send bus that you just configured. In the insert/send effect section, select the branch to *Send FX1* instead of an insert effect. This bus then appears as shown here.
The *Bypass* switch for the signal branch is activated but the "e" icon for editing is not. This is because the effects are addressed in the send bus fader.



4 The small slider determines the percentage of the signal that is diverted to the send bus. Move the slider to the far right for 100 percent or to the far left for 0 percent. The remaining, more or less quieter signal can be routed to additional send busses or edited with other insert effects.

5 If necessary, adjust the *Output Level* of the send bus using the fader above the effect section.

6 Like any other channel, the send bus must be assigned to a logical output bus (see *"Output Mapping: Assigning Signals"* on page 825).

Additional Options

- Multiple send busses per channel -
  The mixer channels are not limited to one send bus.
- Combination of send effects and insert effects -
  It is not necessary to observe any particular order here.

Surround 5.1 Sound

A surround sound system puts you right in the center of the action because, unlike a stereo system with two speakers, you experience sound from six speakers: Three in front, two in the rear and one for low frequencies that can even be placed under the couch, since the human ear is unable to localize low tones. The term "Surround 5.1" stands for five speakers plus one subwoofer.

Avid Liquid lets you produce your own 5.1 surround sound mixes. The next section tells you how.

Technical requirements *page 842*

The 5.1 surround concept *page 843*

Dolby Digital Creator 5.1 *page 844*

Stereo or mono clips? *page 844*

Preparing the timeline *page 844*

Configuring the mixer *page 846*

Surround lines on the timeline *page 848*

Output *page 851*

→ Dolby Digital 5.1 *page 844*

→ Matrix Surround *page 851*

Technical Requirements

In order to experience the full listening pleasure of surround 5.1, some equipment is needed:

- A surround-capable sound card with at least two, but preferably six or more audio outputs (ASIO or DirectSound),
- Or a breakout box with six audio outputs (such as `Avid Liquid` Pro Box),
- Suitable speakers and, if appropriate, an amplifier that can process the signals,
- A DVD player and/or surround amplifier and speakers if you produce DVDs or other media with 5.1 surround sound.

And, of course, you need adequate sound material. If you're already toying with the idea of creating a surround mix while filming, you need to make sure you record lots of additional sound. It is also helpful to have a library of background noises, like those available from many commercial suppliers.

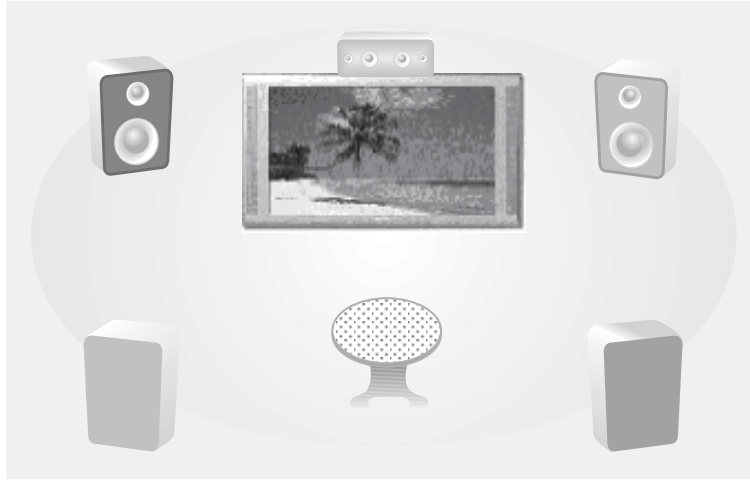
The Surround 5.1 Concept

Of the existing surround systems, 5.1 is the most widespread. It is known under different brand names, including AC-3, Dolby Digital, DTS and MPEG2 Multichannel.

The six 5.1 channels are normally set up as follows:

- Center -
  This channel is mainly used for dialog spoken by visibly active people or for sounds that define or explain the image.
- Stereo and surround channels:
  Left (L), Right (R), RearLeft or Left Surround (LS) and Rear Right or Right Surround (RS) -
  For sounds, sound effects and music.
- LFE (subwoofer) -
  LFE (*Low Frequency Emitter* or *Enhancement* or *Effects*) is responsible for bass tones. Because the human ear is unable to localize low frequencies, the associated speaker can be positioned anywhere.

Ideally, the listener sits at the center of this configuration:



Speaker setup for surround sound

The surround effect is created by cleverly distributing sound events to the five surround channels. Example: Your video image is from the point of view of a person driving a convertible down the highway. Suddenly the driver is overtaken by a Hell's Angel-type biker on a Harley Davidson without a muffler. The thundering engine must first be heard completely from the rear channels and then gradually shift to the left and right front channels in unison with the events pictured. While the motorcycle is even with the convertible, the focus of the sound should be clearly perceived on the left (provided the biker does actually pass on the left).

Dolby Digital 5.1 Creator (Consumer)

Avid Liquid is equipped with the Dolby Digital 5.1 Creator®, a surround sound encoder that allows you to generate "true" 5+1-channel audio that can be burned to a DVD. In contrast to Dolby Prologic, for example, Dolby Digital 5.1 separates all audio channels when encoding and decoding, thus retaining the full spatial impression during playback, provided you have suitable devices and a correct speaker configuration.

- Like DD 5.1, Dolby Digital Stereo also encodes in Dolby's AC-3 technology, but as two-channel stereo rather than surround sound. This compressed data format can be combined with Avid Liquid's *Matrix Surround* to generate virtual surround sound.

These two options are located on the *Modify Preset* > *Settings* tab of Avid Liquid's *Burn to Disc* > *DVD* dialog. Select *Dolby Digital* as *Encoding* option, and either *5.1 Surround* or *Stereo* as *Channel* options.



We recommend that you visit the Dolby website at www.dolby.com, where you will find lots of information on surround sound and, in particular, on the licensing and use of the Dolby logo on your products. Note that this implementation of Dolby Digital 5.1 Creator® does not include a commercial license. Please direct your licensing questions to Dolby.

Mono or Stereo Clips?

In the default configuration, Avid Liquid's *Surround Panner* is set up for mono signals, which is why you should always use mono audio clips for a surround mix. Stereo clips are reduced to a mono signal before being routed to the *Surround Panner*.
For this reason, make sure you already digitize (capture) mono clips in the *Logging Tool*. Otherwise, open the clip shortcut menu (*Timeline*) and select *Disband Clip(s)* to split the stereo clips onto mono clips. Another option is to open the clip *Properties*, where you can then switch the *Audio Mode* from stereo to mono and back again (you can also apply this to several clips simultaneously).

Preparing the Timeline

For the best possible surround mix, reserve *Tracks* on the *Timeline* for your audio clips:

- Reserve one each for L, R, RS, LS and Center, i.e. a total of five *Tracks*.
- LFE -
  You do not necessarily have to configure a separate *Track* for LFE. Generally, the bass portion of the other signals is routed to the LFE channel, which does not have to be assigned an actual position in space.

Assign appropriate names to the *Tracks*, preferably in accordance with the 5.1 convention (*Left, Right*, etc.). This will facilitate assignment in the *Audio Mixer*. Activate *Audio Playback* (loudspeaker icon in the *Track Header*) for each of these *Tracks*; otherwise, they will not have a *Fader Unit* in the *Mixer*.



Surround panning is *Track*-specific, meaning that it is not set for each individual clip. Therefore, note that when you move a clip, surround panning does not move with it! That is why we urge you once again to perform audio postprocduction last of all.

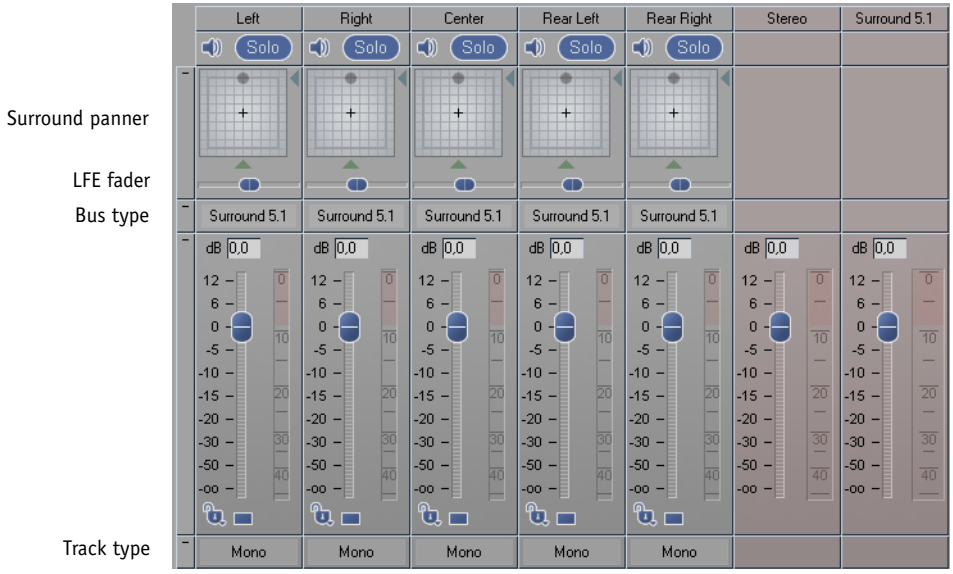


The *Timeline* setup described is only a basic configuration. Naturally, you can also reserve many more *Tracks* for the mix and incorporate send busses in the surround mix.
You might also organize *Tracks* by sound characteristics: Music, voice, natural and ambient sounds, special sound effects, etc.

Configuring the Mixer for a Surround Mix

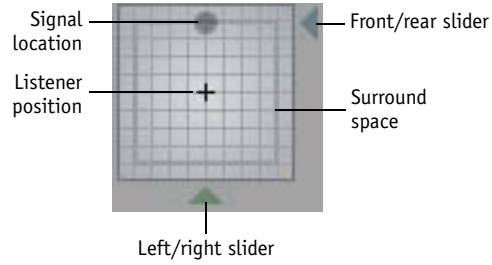
Open the *Audio Editor*. If you already configured the *Timeline Tracks* as described above and activated *Audio Playback* for each, you should see at least five *Fader Units*.

Open the *Bus Type* section. For each fader, select *Surround 5.1*on the top line as the bus type and select *Mono* on the bottom line as the track type. The *Mixer* should now look something like this:



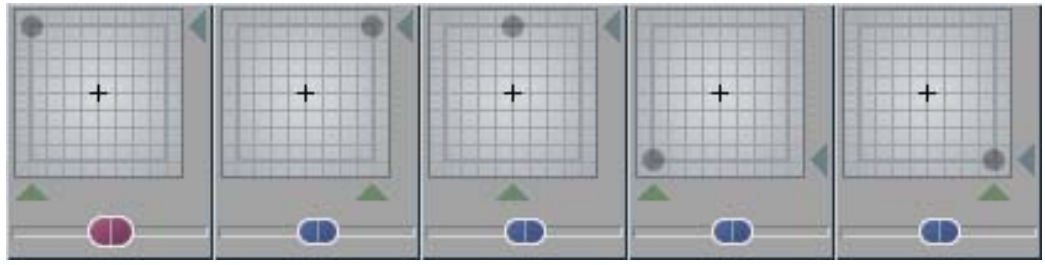
Audio Mixer prepared for a surround mix

The surround 5.1 bus fader with its level meter for the six surround channels appears on the right Let's take a closer look at the *Surround Panner*:



- The listener sits at the center of the surround space.
- The gray dot indicates the spot in the room at which the sound seems to meet. In the default configuration, this is the center position located exactly in front of the listener - obviously, because that's where the center speaker is positioned.
  You can position this dot within the surround space using the mouse.
- The two triangular sliders serve to move the signal location in a straight line from left to right and up and down.

The figures below show the gray dot in the left, right, center, left rear and right rear positions, respectively:



Left, right, center, left rear, right rear

This means:

The surround bus routes the entire audio signal on the particular mixer channel to the specific surround bus channel. For the listener, all the sound seems to be coming from one speaker (provided the other channels are set to mute).

When the gray dot is not located at one of these extreme positions, the signal is distributed to two or more surround channels. In the figure below, the signal location is centered directly behind the listener. In other words, equal percentages of the signal are coming from the left rear and right rear channels and from the two corresponding surround speakers.



Sound is directly behind the listener

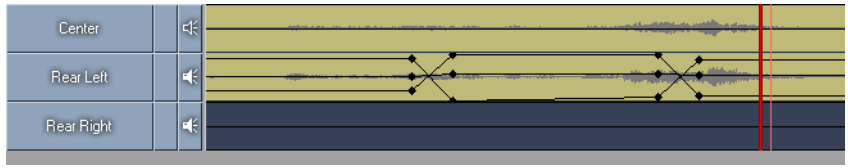
The principle so far: For each channel, you determine which speakers the signal will be output to, either totally or at a certain percentage. The surround impression is produced by the mix of all the channels in the listener's ear.

LFE Fader

The LFE channel operates the subwoofer, which is the surround system's bass speaker. In the default configuration, this fader is centered at 50 percent. The far left position represents 0 percent and the far right represents 100 percent. The fader lets you determine what percentage of the signal will be sent to the LFE channel.

Surround Lines on the Timeline

When you change the surround position of a channel or signal, something also changes on the *Timeline*. Three surround rubberbands are visible on the *Track* - note that this is on the entire *Track*, because surround panning is track-specific and not clip-specific.



Surround rubberbands

The surround position is determined by two lines:

- One line represents movement along the X-axis (left/right) and the other along the Y-axis (front/rear).
- The third line does not appear until you open the shortcut menu for the *Audio Playback Column* (in the figure above, the column with the *Speaker* icon) and activate the *LFE line* display. This line represents the signal's bass enhancement, i.e. the component routed to the subwoofer.

When you change the surround position or *LFE Fader*, *Key Frames* are inserted at the *Playline* position. Exception: There are as yet no *Key Frames* and the *Playline* is located at the very beginning of the *Timeline*. In this case, the lines are only moved up and down horizontally.

Tips for Surround Mixing

Static Surround Sound

If you want to maintain a specific surround composition for the entire duration of a *Sequence*, start by creating it at the beginning of the *Timeline*. Then repeat the settings at the end of the *Sequence Track* by *Track*. The surround rubberbands must run horizontally over the entire length of the sequence.

Dynamic Surround Sound

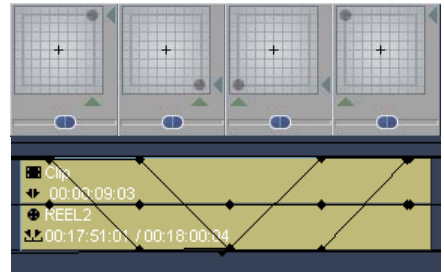
Of course, the real fascination of surround sound is in the dynamic change in sound events. However, this is also where it becomes most difficult, especially if you want to synchronize sound and image. Here's a simple example to explain how it works:

1 Select a clip of about ten seconds with a distinct sound event and place it on a *Track* configured for surround panning.

2 We want the signal to revolve around the listener. Set the *Playline* to the beginning of the clip.

3 Start by moving the gray dot (the surround position) in the *Track*'s *Surround Panner* to the *Left* (L) corner.

4 Each time, move the *Playline* the same distance on the clip and move the dot to each corner in turn, as shown below:



The effect of these actions on the *Timeline* is shown at the bottom.

5 Play back the clip. You will see the dot move in the *Surround Panner* and should also be able to hear the effect.

Distribution of Sounds to Channels

- Commentary and dialog -
  Words spoken by actors in front of the camera as well as off-camera commentary (voiceover) should be routed to the center channel. This will ensure that even listeners who are not sitting at the optimal center point will be able to localize these sound events accurately. Distributing the sound to the left and right would move this impression to the right or left, depending on the listener's position.
- Stereo sound and music -
  The center speaker, which assumes a large part of the center component of a normal stereo mix, can make the stereo impression seem somewhat "narrow". You can expand the stereo signal slightly by applying effects such as the *StereoSpreader*.
- Ambient sound, noise-
  These sounds should reach the listener from all sides and are therefore output in stereo from the left and left rear, and from the right and right rear. Outputting a larger percentage of the signal to the rear speakers increases the listener's "perceived distance" from the sound events of the front channels.
- Sound effects -
  Mono sound effects are distributed equally to the center channel and rear channels so that the listener hears them from all sides. The exception to this rule is image-specific and dynamic effects that must be specially localized.

Timeline and Mixer Configurations for Surround Sound

Other methods are available besides the methods described above in which one *Timeline Track* is reserved for each 5.1 channel:

- *Tracks* for sound types -
  With this method, you design a *Timeline* layout based on sound categories such as voice, on-screen dialog, music 1, music 2, noise, effects, etc. These categories are then "panned" (i.e. distributed to 5.1 channels) according to a more or less defined schema.
- Using 5.1 send busses -
  With this method, you set up five or six send busses, one per 5.1 channel. In the case of complex mixes, this saves you from having to make extensive assignments of surround channels and, possibly, sound effects.

Output

The logical 5.1 output bus with its six channels can be found on the *Output Mapping* tab. Assuming you have the necessary hardware, each of these channels is assigned to a physical hardware output. Check here to determine whether the default assignment corresponds to the port characteristics of your hardware, i.e. whether the logical channels are also output to the correct speakers.
You can delete and set dots in the matrix simply by clicking in the particular fields.
You have several options for outputting real and down-mixed pseudo-surround sound to DVD or exporting it to a file:

Dolby Digital 5.1 Creator

See *"Dolby Digital 5.1 Creator (Consumer)"* on page 844. Here's the procedure in short:

1. Select *File > Burn to Disc > DVD* and choose a suitable *Preset*.
2. Then click *Modify Preset > Settings*.
3. In the *Audio* section, select *Encoding > Dolby Digital*, and *Channels > 5.1 Surround*.

Dolby Digital Stereo

As above, only select *Channels > Stereo*.
To create a pseudo-surround effect, combine your selection with *Matrix Surround* (see below).

Matrix Surround

Matrix Surround is a system that integrates surround sound in a two-channel stereo signal. It also lets you play back the sound on a conventional stereo system (or stereo TV) with only two speakers.

Extracting surround sound from the stereo signal requires a suitable decoder. Most of today's DVD players and surround amplifiers support this.

There are two methods for generating matrix surround files:

- *Export to File > AVI > Modify Preset > Settings* -
  Select *Matrix Surround* from the *Audio Channels* list.
- *Burn to Disc > DVD > Modify Preset > Settings* -
  The parameters of the advanced settings *Audio* section include a *Matrix Surround* option, which activates the 5-in-2 downmix. *Matrix Surround* can be combined with *PCM*, *MP2* and *Dolby Digital Stereo*.



Nevertheless, optimal surround sound requires a mix that uses the *Surround 5.1 Bus*. This is because, technically speaking, the 5.1 encoder follows the 5.1 bus in the audio signal path but has a fixed channel assignment.
A simple stereo mix can also be encoded as a 5.1 signal. Although the decoder then distributes the signal to five speakers (plus subwoofer), this produces only a kind of "pseudo surround".

Special Functions

This section describes a number of special audio functions:

Cross Fade *page 853*

1-click Fade In/Out *page 854*

Global modification of volume and panning *page 855*

Add Dissolve *page 856*

Audio Mix Automation (live audio mix) *page 857*

External (hardware) audio fader *page 860*

Voice-Over *page 861*

Audio Settings *page 862*

Reference Level (Create Signal Clip) *page 164*

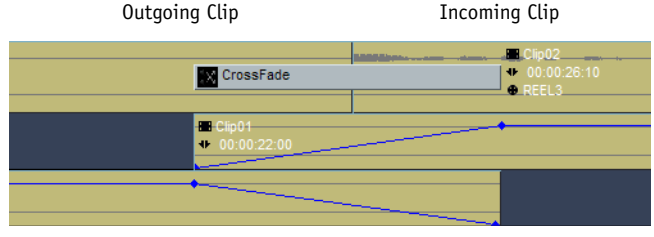
Cross Fade



The *Cross Fade* blends out the outgoing clip, while simultaneously fading in the incoming clip. Fade-ins and fade-outs are always linear.

- *Cross Fade* can be found in the *Project* window on the `Library` tab in the *Folder Classic Transition FX > Audio*. Insert the fade at a transition or at the beginning or end of an audio clip.

The screenshot below shows how the mark-out and mark-in of two audio clips linked with a *Cross Fade* are somewhat shifted to the beginning and end of the cross fade. Remember to leave a bit of leeway (*page 389*) for audio cross fades as for video fades.
A *Cross Fade* can also be inserted at the beginning or end of a clip (i.e. not as a transition) and as a fade-in/out.

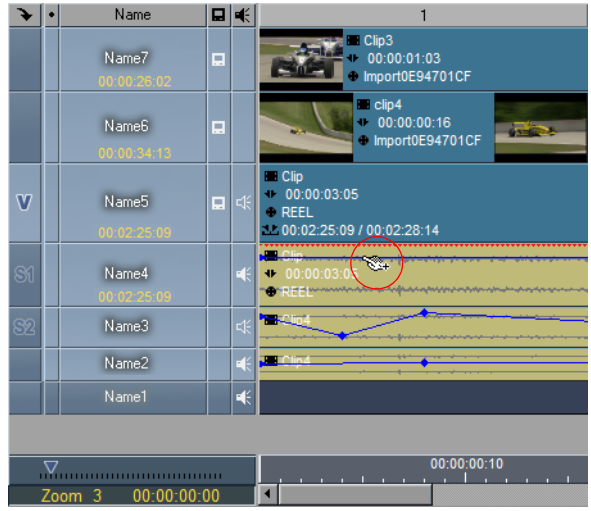


Cross fade with effect and volume lines

The audio level at the beginning and end of the *Cross Fade* corresponds to the level of the clip concerned.

1-click Fade In/Out

This function facilitates the creation of audio fade-ins/outs. The *Audio Editor* has to be open and the *Volume Lines* have to be visible. Make sure you are in *Edit Mode* (*page 411*).



1-click Fade In/Out

- Create fade-in: move the mouse pointer to the beginning of an audio clip near the volume line and keep the CTRL key pressed. The symbol of an ascending volume line appears next to the mouse pointer. The fade-in stretches from the beginning of the clip to where you click.
- Create fade-out: the mouse pointer is located at the end of a clip.

Global Modification of Volume and Panning (Adjust Audio Function)

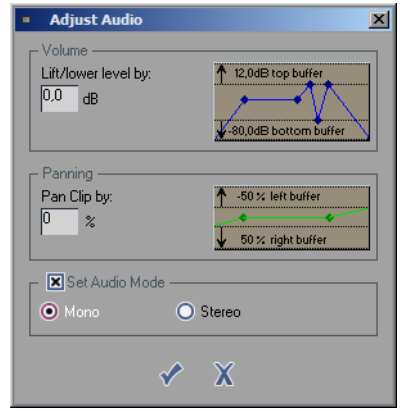
The *Adjust Audio* option allows you to increase or decrease the volume level of one or several audio clips. Each individual *Key Frame* is modified by the indicated value. Also *Panning* can be globally modified.

1 Open the *Audio Editor*.

2 Select one or several clips.

3 Click right in one of the selected clips and select *Adjust Audio* from the shortcut menu. (This entry is only visible with the *Audio Editor* open).

4 A dialog box appears:



Adjust Audio

Global Volume

The example illustration (in the dialog box) to the right shows the scope of level increase or decrease without jolting the *Volume* or *Pan Line*. "15 dB Top Buffer" e.g. means that you can enter 15 dB into the left entry field. If you enter a higher value, the peaks of the volume/pan lines are nevertheless only increased (or decreased) by the technically admissible maximum value; the curves are jolted at these places.

To decrease the value, enter a minus in front of the value.

Please note the following:

- The maximum/minimum value is defined by the *Key Frames* with the highest/lowest value in a selected clip.

- Levels of minus infinite remain unchanged even if the value is decreased beyond the maximum value (otherwise all fade-ins/outs would get lost).
- The maximum/minimum values of volume lines can, in case of global changes, reach the indicated extreme values sooner than values of other *Key Frames*. This may cause volume curves to become flatter (steeper) as a result of global increase/decrease.

Global Panning

Again indicate a maximum level for either completely right panning (50%), or left (-50%), or somewhere in between. 0% indicates center position.

Set Audio Mode

Here you have the chance once again to label the selected clip as "mono" or "stereo". Caution: This is not status indication, i.e. it is not indicated whether the clip actually is stereo or mono. If you are not sure call the *Clip Properties* from the shortcut menu.

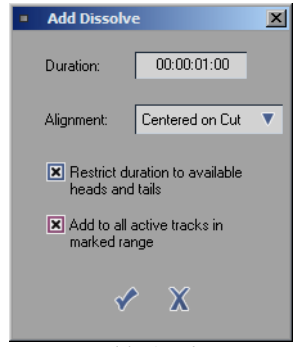
Add Dissolve

This function automates the insertion of *Cross Fade*s and *Dissolves*. Proceed as follows:

1 Set the *Playline* near the editing point. Make sure the respective *Timeline Track* is enabled. If there are several overlapping editing points at this point, you can insert several *Dissolves* at the same time (if the *Tracks* are active).



2 Now you have two options: *Add Dissolve* with or without option (*page 857*). Click the icon in the *Timeline* toolbar, select *Add Dissolve* with option, i.e. position and length of the dissolve can be set in a dialog. The following box opens:



Add Dissolve
Automatic dissolve

3 If necessary, change the indicated duration of the dissolve. One second is preset. Continue by selecting the dissolve position at the editing point:

- Starting from the editing point (fade-in)
- Centered on the editing point (dissolve)
- Ending at the editing point (fade-out)

4 You can also enable a function automatically adapting the dissolve to the available dissolve leeway.

- *Add to all active Tracks in marked range* -
  This helps to distribute *Dissolves* and *Crossfades* over a wide area, even the whole *Sequence*. You only need to set a mark-in and a mark-out to define the horizontal range, and to activate or deactivate the *Tracks* for the vertical selection. Note: *Dissolves* and *Crossfades* can only be placed on active *Tracks*. Mark-in and mark-out must be placed one frame before and after the first and last clip of the range if you want Fade-In and Fade-Out.

5 Click *OK* (checkmark) to insert the dissolve at the editing point.

Without Option



If you wish to continue working with the settings made, clicking on *Add Dissolve* without option inserts a dissolve with the parameters last set at the editing point without further prompt.



If a video edit is located at the editing point on an active *Track*, a video *Dissolve* is included; if an audio edit is located at the editing point on an active *Track*, a cross fade is included. Combinations are possible.

Audio Mix Automation

In the *Audio Editor*, Avid Liquid lets you mix down one or more channels live - and not just the volume, but also panning, including surround panning. By linking faders, you can edit multiple *Tracks* or channels simultaneously.

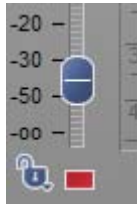
Start by activating the *Audio Mix Automation* function of the *Tracks* to be mixed by clicking on the box underneath the *Fader*. See also *"The Audio Mixer"* on page 812.

The box at the bottom of each *Fader* glows red to indicate that the *Track* has been activated. This selection has priority over the activation or deactivation of *Tracks* in the *Timeline*. Protected *Tracks* cannot be activated for audio mix recording.

The following instructions may also be applied to panorama settings. In this case activate the appropriate rubberband view on the *Track* (see also *Rubberbanding* on page 820).
You can use a MIDI port to connect fader consoles; this is described in more detail on *page 860*.



Starting Audio Mix Automation



Audio Mix Automation active

Set a mark-in on the *Timeline* at the point where the live mix is to start. You can limit the area with a mark-out, otherwise you can stop *Audio Mix Automation* at any time.



Now, if you start playback (with a short preroll) by clicking the *Audio Mix Automation* button, you will see a blue line appear in the selected *Tracks*. Move the *Fader* of a *Track* to raise and lower the volume level. The blue line changes shape accordingly. If you have several *Faders* locked together, you can control several channels simultaneously.

The blue line appears only in the *Tracks* whose *Audio Playback* is switched on ("*Audio Playback*" on page 363). In the case of clip panning, the line is yellow; for *Track* panning, it's green; for surround panning, the two lines are green and red.

Stopping Audio Mix Automation

You have three options for stopping *Audio Mix Automation*:

- Click the function again,
- Click *Stop* or *Play*,
- Run to mark-out.

Specifying Key Frame Resolution

After *Audio Mix Automation* is stopped, a dialog box is displayed that relates to converting the (temporary) blue line to a *Volume*, *Panorama* or LFE line equipped with *Key Frames*:

In the top section, you have the option of setting the *Key Frames*:

- Either for the specific *Tracks* (surround panning, LFE),
- or for the individual clips (volume, clip panning).

Open the shortcut menu for the *Audio Playback* column and activate the relevant line.

Use the *Audio Key Frame Resolution* drop-down menu to specify the resolution of the *Volume* or *Panorama Line*, i.e. how many *Key Frames* will be set.

- *Minimum* - only the absolutely necessary *Key Frames* are set
- *Low* - slightly lower resolution than *Normal*
- *Normal* - good resolution for most applications
- *High* - greatest possible resolution

The rubberbands created during *Mix Automation* (in the clip view with *Volume* or *Pan Lines*) can then also be edited using the *Key Frame* functions.

Repeated Procedures

You may repeat this procedure until the section selected is mixed perfectly. Earlier settings are overwritten with each confirming of the *Audio Mix Automation (*if desired*, see "Audio Editor Settings"* on page 837*)*. You can fine tune your mixes by switching *Tracks* on and off (*Playback on/off*, or by activating/deactivating *Audio Mix Automation* for these Tracks).

Additional Options

Additional options for *Audio Mix Automation* can be found in the *Audio Editor* on the *Settings* tab:

- *Record confirmation dialog* -
  At the end of recording, a dialog box appears in which you can define the *Key Frame* density and the affected *Tracks*.
- *Start recording after first touch* -
  Recording doesn't begin until you move a *Fader*. Until that moment, the rubberband remains the same.
- *Stop readback after first touch* -
  This option determines what will happen after you release the fader: If activated, all subsequent *Key Frames* are overwritten with the last value reached, i.e. a flat, horizontal line appears. If deactivated, the rubberband remains the same.

External Audio Fader

If an external audio fader is connected via a MIDI interface, the *Audio Mixer Faders* (for *Audio Mix Automation*, for example) can also be controlled by hardware. The operation remains essentially the same; the only step you need to carry out before mixing is to balance the hardware faders with the software faders in the *Audio Editor* to ensure smooth fades in and out.

Faders supported *page 860*

Installation *page 860*

Balance faders *page 861*



The *Audio Tool* can also be operated with an external fader.

Faders Supported

At this time, Avid Liquid supports the "Fader Master Pro" from JLCooper Electronics. For the latest information on other devices supported, contact your specialized dealer.

Installation

To connect the external fader, your system must be equipped with a midi interface (gameport) with a D-sub 15-pin connector.

This interface may already be mounted on your motherboard or may be available via an installed sound card. You may also use Danka Data Device's midiLink adaptor which connects to your computer's COM port (www.dankadata.com). In any case, the required (midi) driver must be correctly installed in the Windows Control Panel > Multimedia (see also the installation instructions for the sound card).

Fader Master Pro is connected to the system via an additional adapter from D-sub 15-pin (with photo-coupler) to a 2x 5-pin DIN connector.

To externally control the faders, you have to set the mode for volume control (F01) or panning (F03) on the Fader Master (all other modes are ignored).

Midi Properties

In the *User* settings dialog you will find an item called *Midi Properties*. Use these options to configure Midi devices and Midi ports.

Open *Edit* > *Control Panel* > *User* > *Midi Properties* (a mixer icon) and select the appropriate options.

- *Midi Ports*-
  Assign ports for inputs and outputs
- *Midi Fader Device* -
  select the connected device from the list.

Balancing Faders

Position the *Playline* at the position where you would like to start mixing.

If you open the *Audio Editor* when an external fader is connected and turned on, two arrows, one pointing up and one pointing down, appear to the left of the activation button for *Audio Mix Automation*. These arrows indicate the direction in which the hardware fader must be moved to ensure coverage with the software fader. Once both faders match, both arrows are highlighted and you can start mixing.

Voice-Over

In combination with suitable hardware, the *Voice-Over* function turns Avid Liquid into a live audio recorder, e.g. for comments that can be spoken directly "onto the image". The clips are then inserted on the *Timeline* synchronized with the image.



The clip generated using the Voice-Over function is saved in the Capture directory of the destination volume for this *Project* (for example, "R:\Start-PAL..."). This directory is generated only when clips are digitized (*Batch Digitize* or *Logging Tool*), meaning that material must already have been digitized previously in this *Project*.



Regardless of whether you generated mono or stereo files for the *Voice-Over*, only one clip is inserted in the *Timeline* (naturally, for stereo a stereo clip is saved). The *Edit Style* is not taken into account for *Voice-Over*; the clip is always inserted in *Overwrite Style*.

Requirements

This function requires that your PC have an operational sound card. The microphone is connected to the sound card and the input level (volume) is controlled by means of the sound card settings. You can set the file format (48 or 44.1 kHz, Stereo or Mono) in Avid Liquid under *Control Panel* > *User* > *Audio Settings (page 862)*. However, these settings are dependent on the options available for your sound card.



Because the *Voice-Over* button is not a standard part of the toolbar, you should transfer it from the function library to the toolbar (*page 990*). You will find the icon (a microphone) on the *Mixer* tab.

Procedure for a Voice-Over Session

1 Open the *Audio Editor* and set a mark-in as the starting point for recording. You can also set a mark-out. If you do not set a mark-out, the *Voice-Over* function continues running until you stop it.
The *Voice Over* clip will be inserted in the first (from left to right) *Track* marked active for *Audio Mix Automation*. That's the small red rectangle at the bottom of the *Fader*. *Fader* units and *Timeline Tracks* correspond to each other.



2 To start recording, click the *Voice-Over* button. Record the narration or whatever audio input you choose.

3 To stop recording, click the *Voice-Over* button once again or click the *Play/Stop* button.

4 The *Voice-Over* dialog box is then displayed. Option:
- *Clip Name* lets you define the name under which the clip will be saved in the *Rack*. The *Voice-Over* clip is always saved in the currently active *Rack* and the extension is automatically incremented based on the number of *Voice-Over* clips already present in the active *Rack*.
Note: The clip is always inserted in the *Overwrite Style*, i.e. it overwrites any other clips.

5 If you now confirm your settings by clicking *OK*, the clip generated from mark-in to mark-out or from mark-in until recording stops is inserted synchronously in the *Timeline*.

Controlling Voice-Over Input

To access a fader for controlling the *Voice-Over* signal, select *Edit* > *Control Panel* > *User* > *Audio Settings*. Use the arrow button at the bottom right to add a level and fader. Important: Level meters and faders are activated and usable only if they are supported by the sound card selected.
You can also define a preroll and postroll for the *Voice-Over* operation in the *Audio Settings* dialog box. *Preferred device* allows you to select a specific sound card (if more than one is installed) and *Preferred quality* lets you configure a specific quality level (sampling rate, bit depth, etc.) supported by the sound card.

Audio Settings



Select *Edit* > *Control Panel* > *User* > *Audio Settings* to configure specific *Audio Mix Automation, Voice-Over* and audio format parameters.

Audio Format

Here you can toggle between the standard 16-bit audio format and the higher-quality 32-bit floating point audio format. For more information, see "*32-bit Floating Point Audio*" on page 797.

Parameters for Audio Mix Automation

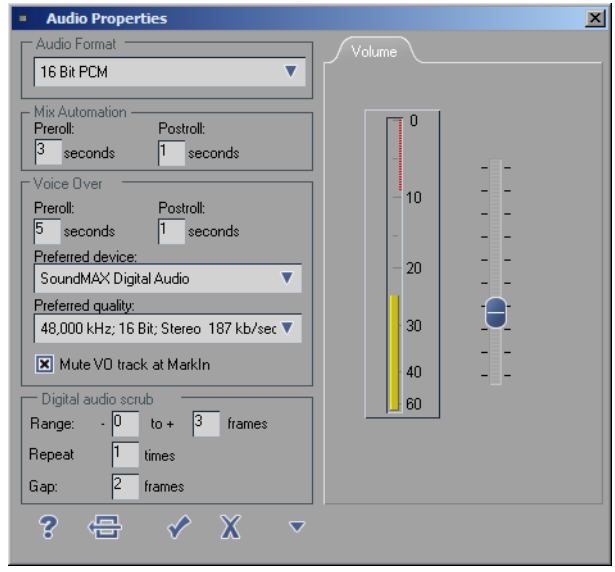
Enter the desired values for *Preroll* and *Postroll* in the two fields.

See also "*Audio Mix Automation*" on page 857.

Parameters for Voice-Over

Here you can set the parameters that will guarantee a successful *Voice-Over* recording. Important: These parameters depend in part on the sound card installed.

See also *"Voice-Over"* on page 861.



Audio Settings

- *Preroll/Postroll* -
  These entries define the preroll and postroll settings for the *Voice-Over* session.
- *Preferred device* -
  This option lets you select different sound cards (if installed).
- *Preferred quality* -
  This option selects the audio quality (Stereo, Mono, Sampling, etc.).
- *Input level* -
  Single-click the small triangle on the bottom right to add an audio meter and a fader to the dialog box, with which you can then control the incoming signal.

Parameters for Digital Audio Scrub

Digital audio scrub (also see *"Audio Scrubbing - Digital or Analog"* on page 804) operates as a very short playback loop centered around the *Playline* position: Each time you move the *Playline*, the playback loop is also shifted. You can modify the playback characteristics of this loop by means of three parameters:

- *Range* -
  Specifies the number of frames that should be played back before and after the *Playline*.
- *Repeat* -
  Specifies the number of repetitions per loop.
- *Gap* -
  Specifies the gap (in frames) between loops, i.e. the pause before the loop restarts.

Reference Level (Create Signal Clip)

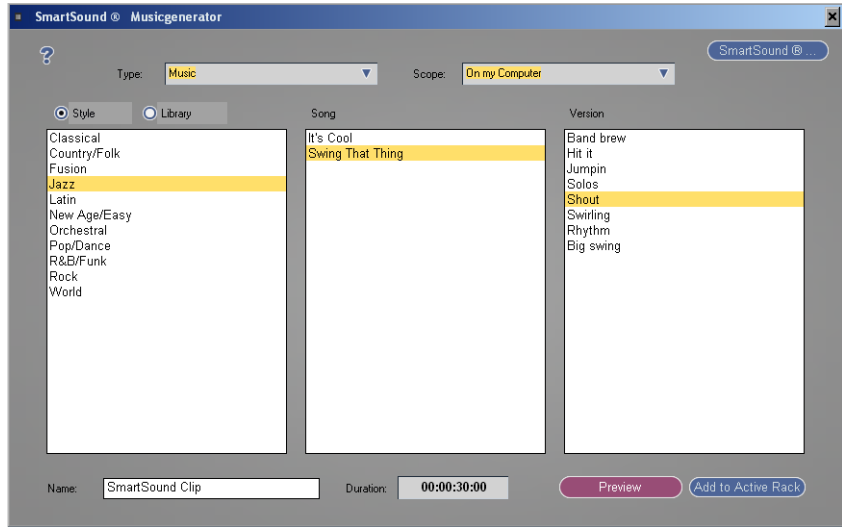
The *Create Signal Clip* function lets you create reference level tones. See also *"Generating a Signal Clip (Reference Level Tones)"* on page 164.

SmartSound: Background Music Made to Measure

SmartSound (if you're not already familiar with it from Pinnacle Studio) is a tool that generates a second-by-second customized soundtrack for the *Timeline*. With SmartSound, you won't encounter the typical problem of ready-made pieces of music that are either too short or too long but seldom fit. SmartSound "composes" on the spot.

Opening the SmartSound Dialog Box

To open the SmartSound dialog box, select *File* > *New* > *SmartSound Clip*.



SmartSound: Background Music Made to Measure

Selecting and Listening to Music

The music genres and libraries are listed on the left, the titles are in the center and the available variants of the selected title are on the right.
Other list boxes contain different categories (such as sound effects). Many sounds and music titles are initially available only as sample sounds and can be purchased directly on the Internet.

- Click the *Preview* button to hear a sample.

Additional options:

- *Add to active rack* -
  Stores a *SmartSound* clip of the selected title in the current (selected) *Rack*.
- *Duration* -
  While composing, the *SmartSound* tool orients itself by the specified *Length* (input field HH:MM:SS:FF).

Transferring a SmartSound Clip to the Timeline

Drag the selected *SmartSound Clip* from the *Rack* and drop in on the *Timeline*.
Adjust the length as necessary.

Using the Blank Clip

In the *Project* window on the *Library* tab, you will find a clip in the *SmartSound Rack* called *Blank*. Drag this clip to the *Timeline*, trim it to the required length and right-click the clip to open its shortcut menu. Select *Open with Smartsound Editor* and then the appropriate *SmartSound*. Click *Accept* to transfer the sound to the *Timeline* clip.

Changing the Length

You can trim a *SmartSound* clip on the *Timeline* at any time. The music or sound is adapted to fit the new length.
The minimum length of a *SmartSound* clip is three seconds; however, some compositions are not available at such short lengths. There is no limit to how much a clip can be lengthened.

- Defining *Timeline* length using a mark-in and mark-out -
  Use a mark-in and mark-out to define a *Timeline* range to be filled with *SmartSound*. Then open the *SmartSound Editor (File > New > SmartSound Clip)* where this length is already preset in the TC field. The clip placed in the *Rack* fits the frame exactly.

More SmartSounds

Click the *SmartSound* button to open a dialog box containing, among other things, information on installed SmartSound libraries and access to additional SmartSounds (Internet connection required).

SmartSound Media Files

These files can't simply be imported from a folder to a *Project*, because they're generated by the *SmartSound* module internally as needed and are not available as WAV files. That's why you also won't see a waveform in the *Source/Clip Viewer* or in the *Timeline* clips. Audio *Timewarp* has no effect on *SmartSound* clips, nor is *XSend to ...* possible until you have converted the *SmartSound* clip(s) to regular WAV and/or AVI files by means of *Fuse*.

Otherwise, *SmartSound* clips are just like any other clips. *SmartSounds* are stored with the *Project*.

SmartSound and ASIO

Many ASIO devices and drivers are not compatible with SmartSound. If no sound is output when the clips are in the *SmartSound* editor, switch to the DirectX audio output (*Edit* > *Control Panel* > *Site* > *System Settings* > *Inputs/Outputs* > *Audio Outputs* > *Sound Device* > *DirectSound*).

On the *Timeline, SmartSounds* are played even when an ASIO driver is activated.

Audio Effects

This section provides you with information on working with audio effects:

Basics

→ Where can I find audio effects? *page 869*

→ Applying effects and opening Effect Editors *page 869*

→ Audio effects are real-time effects *page 869*

→ Changing effect parameters in real time *page 870*

→ FX Properties *page 286*

→ Saving effect settings *page 870*

→ Effects and output level *page 871*

Avid Liquid audio effects (standard)

→ Equalizer *page 871*

→ Maximizer *page 873*

→ Echo *page 874*

→ Cross fade *page 853*

→ Add Dissolve *page 856*

Avid Liquid plugin audio effects (VST-compatible) *page 875*

Where Can I Find Audio Effects?

In the *Project* window, click `Library` *tab* > *Classic Clip FX* > *Audio*. Here you will find the *Equalizer*, *Echo* and *Maximizer* effects.

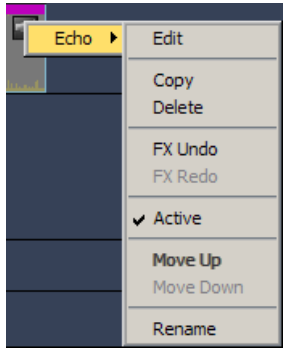
Applying Effects and Opening Effect Editors

1 Drag the desired effect onto the relevant clip.

2 Right-click the effect icon (or the colored line) on the clip to open the shortcut menu.



Depending on the *Track* height and *Timeline* scale selected, the effect icon might not appear. However, the colored line is always visible.



Effect icon in the clip, colored line and Clip FX shortcut menu

3 Select the effect, click *Edit* to open the *Effect Editor*.



You can also open *Effect Editors* by selecting *FX Properties* from the clip's shortcut menu. (See also *"FX Properties"* on page 870.)

Audio Effects Are Real-Time Effects

Audio effects are real-time effects. This means you can make changes to a clip while it is playing using the audio effect edit boxes. However, if you apply, for example, the *Equalizer* effect several times to one clip, you may exceed your system's processing capacity (of course, also due to other required operations). In this case, the system renders the effects. Click the Σ symbol on the taskbar to open the *Render Viewer* window to find out how long rendering will take and/or to halt rendering. See also *"Render Viewer"* on page 536.

Changing Effect Parameters in Real Time

You can evaluate the effect of the *Equalizer*, *Maximizer* and *Echo* directly at the audio material. Follow the steps indicated below:

1 Select the range of the respective audio clip on the *Timeline* by means of mark-in and mark-out (or highlight a range with the shortcut menu of the *Slice Track*).

2 Drag the desired audio effect onto the clip.



3 Start a playback loop by clicking the button *Play In to Out*.

4 Open the *Effect Editor* either by right-clicking the effect icon in the clip or from the shortcut menu of the clip at *Properties FX* (see next heading).

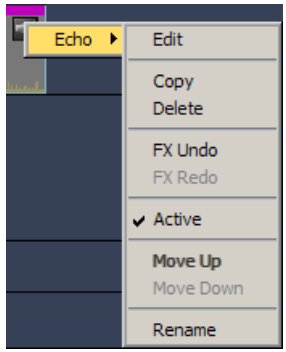
5 If you now change the parameter of the effect (e.g. add echo), you hear the immediate result in real-time.

FX Properties

See *"FX Properties"* on page 286.

Saving Effect Settings

To save effects, e.g. an equalizer effect with specific settings which you plan to use again on other clips, proceed as follows:



- Right-click the *FX* icon on the clip to open the shortcut menu and select *Copy* to create a copy of the given effect.
- Go to a *Rack* and use the *Paste* option from the *Rack* shortcut menu. The effect will be placed in the *Rack* and can be renamed using the *Rename* option.



You can also use the CTRL+C (*Copy*) and CTRL+V (*Paste*) keyboard keys for this operation.



You have to paste the copy in a Rack other than the `Library` *Rack* since this *Rack* is reserved for effects that come with the software.

Effects and Output Level

Changes to *Equalizer, Maximizer* and *Echo* settings have an influence on the level of the output signal. If level increases significantly, clipping may be activated already within the effect. In *Audio Tool* (output), the LED indicator on top (yellow) blinks while clipping. In this case, reduce *Gain* (see also *Clipping* on page 808).

Equalizer

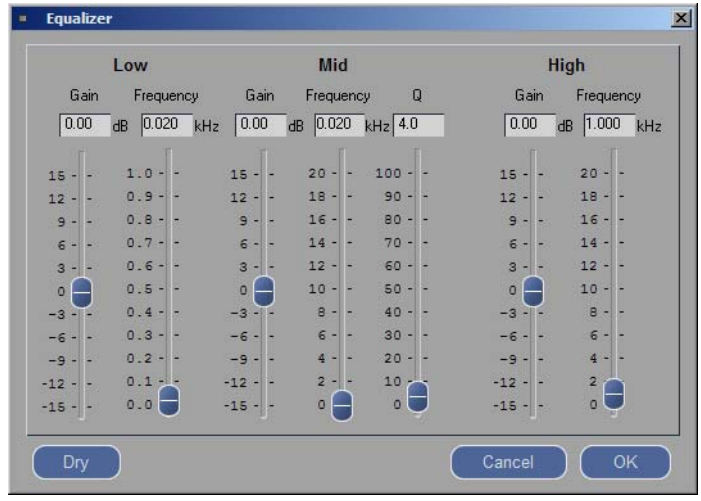


The *Avid Liquid Equalizer* is a parametric triple-band equalizer which gives you the choice of three overlapping frequency bands:

- Low: 20 Hz to 1000 Hz
- Mid: 20 Hz to 20 kHz (with adjustable slope)
- High: 1000 Hz to 20 kHz

"Parametric" means you can precisely define a center frequency for each band. Move the *Gain* slider to amplify and attenuate (increase and decrease) the level of specific frequency bands (+/- 15 dB). Click *Dry* to temporarily eliminate the equalizing from the signal (for example, to compare the manipulated and original signals).

To directly edit these parameters click their respective field and enter a value.



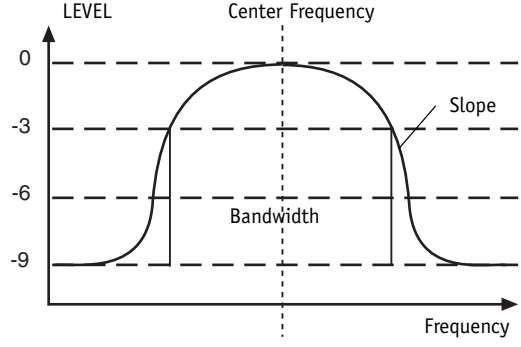
Equalizer

Bell Equalizer and Slope

In the *Mid* range, use the *Slope (Q)* slider to define the frequency range (bandwidth) used for amplification or attenuation. Depending on the settings, amplification or attenuation falls to the right or left of the center *Frequency* by a defined factor. Together with the specified center *Frequency*, *Q* determines the bandwidth for amplification or attenuation. *Equalizer* bandwidth can be controlled with the *Q* slider, using the following formula:

$$\text{Bandwidth} = \frac{\text{Center Frequency}}{\text{Slope (Q)}}$$

The maximum slope factor is 100; the minimum, 4. The higher the slope, the smaller the bandwidth.



Bell equalizer bandwidth

The diagram shows that as the value for slope increases, the bell curve's slope becomes steeper.

Use a high slope value for a small bandwidth. Together with high attenuation, you can create a "notch filter" effect to filter out disturbances such as AC hum.

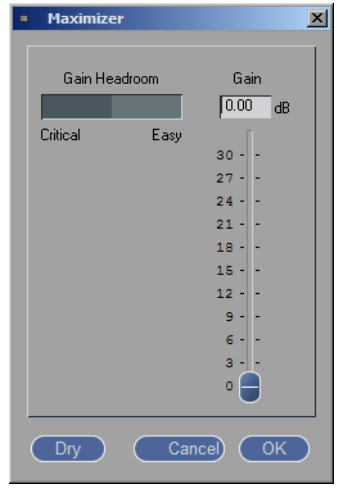
Bandwidth is defined as the resulting value (see graph) at +/- 3 dB from center frequency.

The *Equalizer* can be used several times on the same clip, each time adding three more frequency bands (3, 6, 9...).

Maximizer



The *Maximizer* is an effect for optimizing loudness. With this function, "normalized" audio material with level peaks in the headroom range (see also *Digital Scale and Digital Audio* on page 809) sounds even louder and denser without exceeding the maximum modulation limit. Tone quality is only minimally affected.



Maximizer

Like the *Equalizer*, the *Maximizer* is also a real-time effect. The *Maximizer* continuously analyzes possible gains and displays calculated values in the *Gain Headroom* field. If you increase level with the slider, available *Gain Headroom* becomes smaller (indicated also by *Easy* and *Critical* next to the scale). This lets you play with the maximum loudness level. However, be sure to allow enough room for signal peaks.

Click *Dry* to temporarily deactivate maximizing (for example, to compare the manipulated and original signals).

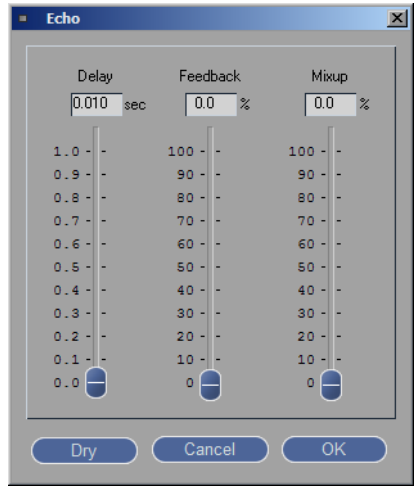
Audio material that was previously recorded with "emphasis" contains amplified, high-frequency signal components. Because this may distort the *Maximizer's* audio analysis, it is recommended that you not use emphasis if the *Maximizer* must be used.

The Avid Liquid *Maximizer* is a combination of a dynamic compressor and a limiter - two components used in professional audio processing.

Echo



Three parameters are available for influencing the outcome of an echo effect: *Delay, Feedback* and *Mixup*. Click *Dry* to temporarily eliminate the echo from the signal (for example, to compare the manipulated and original signals).



Echo effect

Delay

Use this field to specify how long the output signal should be held in the buffer before it is sent back to the signal. To create a reverberation effect, use a relatively small delay value.

Feedback

Use this field to define echo frequency (i.e. how often the delayed signal is returned to the signal).

Mixup

Use this field to define echo level in relationship to the output signal. 100 percent corresponds to a ratio of 1:1, in other words, equally loud.

Cross Fade

The cross fade blends out the outgoing clip, while simultaneously fading in the incoming clip (see *page 853*).

Add Dissolve

With its *Add Dissolve* function, Avid Liquid provides a convenient means of inserting cross fades. See also *"Add Dissolve"* on page 856.

Avid Liquid Plugin Audio Effects (VST)

These plugins are compatible with VST, which has become the de facto standard for plugins in the audio field. This means that all VST plugins can be integrated in Avid Liquid (see *"Integrating VST Effects"* on page 876).
Some of these plugins come with their own graphical user interfaces, while others retain the look and feel of the Avid Liquid Effect Editors.
To find these effects, select the *Library* tab *Realtime Clip FX > Audio.*



VST plugins do not allow you to set *Key Frames*.
The parameter fields are editable with the mouse only, not with the keyboard.

Integrating VST effects

→ VST banks and programs *page 876*

Applying VST effects

→ As clip and "Track" effects *page 877*

→ As insert/send effects in the audio mixer *page 838*

Bypass function *page 877*

Leveler *page 877*

Karaoke *page 878*

Reverb *page 878*

Liquid EQ *page 879*

StereoEcho *page 879*

StereoSpread *page 880*

Integrating VST Effects

If you have additional VST plugins, copy them to the following directory:...*[Avid Liquid program directory]**PlugIns**VST*. You can also create a subdirectory here.
To locate the added effects within Avid Liquid, select the *Library* tab > *Realtime Clip FX* > *Audio*. (It is, however, necessary to restart the application. After plugins are removed from the directory, a restart will take much longer than usual.)

VST Banks and Programs

A *VST Bank* is a collection of *VST Programs*. A *VST Program* is an effect whose parameters are set in a particular way. With most of the effects supplied, you can select these programs from a list of presets. For the *Equalizer*, for example, you can select "Telephone" or "Vocal". The drop-down list is itself a *VST Bank*.

You can replace *VST Programs* and *Banks* with other Steinberg audio products.

Creating and Saving a VST Program

1 Set all the parameters according to your preferences.

2 Click the program selection text box (list of presets) and enter the name of the new program.



3 Open the shortcut menu for VST commands.

4 Select *Save VST Program*.

5 Enter a name for the program file (the name should be the same as for the program you named above). The resulting file has the extension *.fxp.

Loading a VST Program

1 Open the shortcut menu for VST commands.

2 Select *Load VST Program* and select the program's storage location.

3 The *Program* now appears in the list.

If you want to keep this program in the list permanently (=*VST Bank*), save it as part of a VST bank (see the next section).

Changing, Saving and Loading a VST Bank

This procedure is the same as for VST programs except that, in this case, entire banks (lists) are involved. These files are assigned the extension *.fxb.

Applying VST Effects

VST effects are applied just like any other clip effect. Simply drag the effect from the *Rack* and drop it on one or more clips of your choice. Then click either the red line or the effect icon on the clip to open the effect editor.
You can also apply one or more audio VST effects to an entire *Timeline Track*. In this case, drop the effect(s) on the *Track* name. Then right-click the colored line to open the editor.

To use the VST plugins as insert or send effects in the audio mixer, see the section on "*Working with Insert Effects, Send Effects and Busses*" on page 838.

Bypass Function

With audio effects, it is often necessary to make comparisons with the original sound in order to evaluate the results of the effect.



This is done using the *Bypass* function. When this function is activated, the effect is removed from the audio and you can then listen to the original sound in its unadulterated form.
If you do not see this button on the *Toolbar* below the parameter fields, right-click the toolbar, drag the button from the *Library* and drop it on the toolbar.

Leveler

This plugin helps you correct a problem typical of video recording, i.e. the uneven volume of natural sound, meaning the difference between soft and loud passages. The *Leveler* finds a target volume somewhere between the soft and loud sections of the original sound. For sounds below this target volume, the *Leveler* acts as an amplifier and for sounds above it, as an attenuator (compressor). This brings the average volumes closer to the target volume and evens out any fluctuations.

- *Target Volume* -
  Determines the target volume.
- *Compression* -
  Attenuates the loud tones; the louder the tone, the higher the value of this setting.
- *Threshold* -
  This value determines the minimum volume as of which amplification is applied, thus preventing soft background noises from becoming too audible.
- *Expansion* -
  Makes soft tones louder; the further to the right, the louder the tone.

Karaoke

This effect filters out the lead vocal from a musical number so that it can be used, for example, for karaoke performances. Depending on how effective the filtering is, a vocal piece can also be used as instrumental background music for videos. The principle behind this effect is the fact that in vocal numbers, the lead vocal is usually is present on the right and left channels equally. This plugin compares the two channels and removes identical components. There is no way of knowing ahead of time whether a particular recording will be suitable (optimal or less so).

- *Volume* -
  Lets you correct the change in volume that is a by-product of the *Karaoke* effect when it filters out the vocals. If the volume is too low, move the slider to the right.

Reverb

This effect determines sound character by simulating the rooms in which tones/sounds/noises are created and perceived. The reflection of soundwaves (commonly referred to as echo) plays an important part. The size of the room and the nature of the reflecting surfaces create differences in the direct perception of the sound source and in the delayed perception altered by reflection.

A number of room simulations are available.

The following parameters allow you to configure individual acoustic spaces (Tip: Start with a similar preset):

- *Initial Delay* -
  This parameter determines the starting time for the first "early reflection", i.e. how the sound is reflected off the walls in the simulated room. Values range from 0 to 500 milliseconds. The lower the value, the earlier this initial reflection is audible.
- *Room Size* -
  This setting determines the "size" of the simulated room and, therefore, the depth of the reverberation. Values range from 1 to 30. The higher the specified value, the larger the simulated reverberation space.
- *Damping* -
  This parameter serves to attenuate the high frequencies in the reverberation in order to generate a softer, warmer sound. The higher the value, the more the high frequencies are attenuated.
- *Duration* -
  This parameter determines the duration of the reverb effect.

- *Mix* -
  This parameter defines the ratio of the effect signal to the original unedited audio signal. When the slider is set to the center position (default), the ratio is balanced. When moved all the way to the left, only the original signal is audible.

Equalizer

This is a ten-band equalizer for determining the sound characteristic. It allows you to emphasize or suppress specific frequency ranges. Values range from -24 to +24 dB.
A number of standard scenarios are available in a list. Selecting *Flat* sets all the bands to zero.

StereoEcho

StereoEcho is a delay effect with separate settings for the left and right channels. It can also be configured as a single mono delay, in which case the maximum delay time will be doubled.

- *Delay 1 (2)* -
  The delay time for the left channel. The maximum delay time is 1486 ms, unless you link the two channels and apply the effect to the mono channel. In this case, the maximum delay time is 2972 ms (1000 ms = 1 second).
- *Feedback* 1 (2) -
  This parameter determines the amount of the delayed signal to be routed back to the Delay 1 block in order to generate repetitions there. The higher the value, the more often the echo is repeated.
- *Link 1,2 (off, linked)* -
  Select “off” if you want Delay 1 and Delay 2 to be treated as independent units. Select “linked” to link the Delay 1 output to the Delay 2 input.
- *Del2 Bal* -
  This parameter determines how much of the left-channel output is routed to the right-channel input. When set to “0.0” (far left), no signal is forwarded from the left-channel output to the right-channel input. When set to “0.0” (far right), the right-channel input receives both its normal source and the complete output of the left channel.
- *Volume L/R* -
  Determines the output level for the left/right channel delay.

StereoSpread

This effect expands or contracts the spatial impression of a stereo signal. The sound sources that are distributed to the left and right move perceptibly closer together or farther apart.

Move the slider to the left or right until you like the spatial sound experience produced.

- *Inverse* -
  This knob serves to reverse the channels (L>R, R>L).
- *Center* -
  Should normally be *On* (knob is illuminated). When the slider is positioned anywhere within the right half of its range, deactivating *Center* will remove the "virtual" center from the signal. This can serve to simulate a "Karaoke effect" in that it removes or suppresses the lead vocal, which is usually mixed in the exact center. As long as the slider is positioned within the left half of its range, the knob has no effect.

Chapter 15

Titler

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A member of the Pinnacle TitleDeko family of character generators is part of the software bundle that comes with Avid Liquid.

Please note:

- TitleDekoRT is the default integrated titler.
  If TitleDekoPro is bundled with the editing software, it needs to be installed separately from its CD.
- If TitleDekoPro is installed, it will be launched when you click the *CG* symbol. If it is not installed, standard TitleDekoRT will be launched.
- The *Reveal* function of TitleDekoPro is not supported in Avid Liquid.

Starting TitleDeko



If you want to create a title on the correct background (recommended), start by positioning the *Playline* over the background clip on the *Timeline*. This clip will then be visible in TitleDeko, which will help you evaluate the title effect (colors, font size).

Click the "CG" tool button shown on the left to call the titler directly, or click the "Cube" icon and select it from the menu.

The TitleDeko window is located above the Avid Liquid window: As with any Windows program, you can resize this window as desired.

To use TitleDeko, refer to the instructions that came with the titler (online help or the PDF file located in the "TitleDeko" subdirectory of the Avid Liquid installation directory).

Saving Title Graphics

The *Save As... function* lets you save a newly created title to the default directory *Titles* in the Avid Liquid installation directory, in a file with the extension *.tdk. These files are editable title graphics from which you can create the bitmaps (*.bmp) that are then used on the *Timeline* in Avid Liquid. You can also save the *.tdk files in a different directory and under a different name.

Importing Title Graphics to Avid Liquid

To import title graphics, you can now use the *Save as new in Liquid* (CTRL+E) function. Note that the title will be saved as a clip in the *Rack* currently selected in the *Project* window or, if the *Project Browser* is open, it will be saved in the *Rack* selected there.
The procedure using the F12 and F11 keys that was the correct procedure before Version 6 is no longer valid.

Title as Project Metadata / Save Title Path

As of version Avid Liquid 5.6, all title metadata files (*.tdk) are part of the Avid Liquid *Project*. Thus all titles can be shared by several users in the network. Copies of the metadata will be used on a local level.

If you want to keep a title file, you need to save it in TitleDeko (using the *Save as...* function) to a directory of your choice. The save path selection in the *Titler Settings* no longer exists.

Select Titler

- This function is not currently supported -

If there are two or more title generators installed on your system, you may select one as the default titler which is called when you click the "CG" button or select it from the effect editors shortcut menu.

To do so, open Avid Liquid *Edit* > *Control Panel* > *User* > *Titler Properties* and select a titler from the list. (Note: Not all characters generators currently on the market are supported; please consult your Avid Liquid dealer.)



A version 2.55 roll or crawl title which was created with discrete speed settings may play back with a higher speed on the *Timeline* (that is, with a shorter duration). To avoid this effect, modify the title's length by one frame. This resets the speed to the original selection.

Chapter 16

DVD Authoring

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What is DVD?

A DVD (digital versatile disc) is a storage medium that is almost universally usable. DVDs provide superior image and audio quality, are easy to handle and, above all, interactive. With DVDs, viewers can help determine the program - for example, by retrieving different segments on the DVD directly using one or more menus and without rewinding, fast-forwarding or waiting.

What is DVD authoring?

Authoring is the designing of an interactive DVD with selection menus, images, sound and graphics.

What does Avid Liquid offer in the way of DVD authoring?

Avid Liquid guides you from the importing of material to its editing and authoring and all the way to burning it to DVD. The entire production process is seamlessly coordinated. You can even design the DVD menus in Avid Liquid.

It is not currently possible to generate DVDs in an HD/HDV format.

The sections below contain the following information:

Step by step DVD authoring *page 887*
Your first project: Not just for beginners!

DVD Menu Wizard *page 890*
Helps you generate DVD menus

How DVD authoring works *page 891*
Basics, structure and definition of terms

DVD authoring: Reference *page 896*
Overview and detailed description of all the functions and features of the Avid Liquid Authoring Tool

Designing DVD menus *page 926*
Texts, buttons and backgrounds

Burning a DVD *page 939*
How to put the finished product on a disc

Step by Step DVD Authoring

This section describes how to create a DVD (also known as DVD authoring) by taking you through a step-by-step example. You can use it either to get a preliminary look at the functions or to start your first DVD project using your own material. However, only the most important functions will be described.

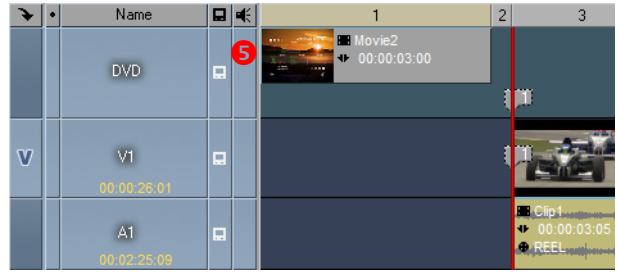
1 Build a *Sequence* or retrieve a finished *Sequence* from the *Timeline*.

2 Take a moment to consider the individual segments (chapters) of the *Sequence*: What do you want to offer in the first menu? Then create a few seconds of space for the menu before the first clip in the *Sequence*.

3 If necessary, render the effects.

4 Open the *Project Browser* (for single-monitor systems); in the *Library*, go to the *DVD Menus Rack*.

5 Select a DVD menu, drag it to a *Track* and drop it ahead of the first clip in the *Sequence*. As soon as you drop it, the menu jumps to a new *DVD Track* added at the top. The menu clip is three seconds long.

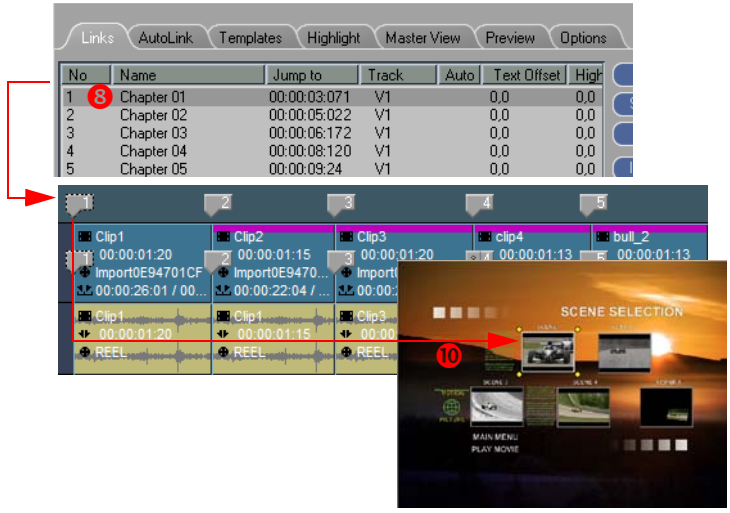




6 Open the *DVD Editor* (double-click the DVD menu or click the *DVD Editor* button in the *Timeline* toolbar).

7 Now start assigning the chapters. This is easily done by Linking each menu button (also called *Link*) to a segment of the *Sequence* by means of drag and drop:

8 Drag *Link* number 1 from the *Link list* to the beginning of your first chapter on the *Timeline*. The frame at the *Playline* position is displayed in the *Master View*. It will be easier to position the Link at the start of the clip if you also press the SHIFT key to activate magnet (snap) mode.
Drop the *Link* on the *DVD Track*. This sets an *Absolute Target*. The *Marker* remains in this position even if you move the clip being viewed.



9 Now drag *Link* number 2 to the start of chapter 2, but this time drop the *Link* on the video clip. This sets an *Anchored Target*. If you move the clip, the *Marker* moves with it.

10 Distribute the remaining *Links*. Each time the menu button is assigned a miniature of the frame at the *Link* position (assuming you selected a DVD menu offering these buttons).

11 What do you want to happen the end of a chapter? Do you want to return to the current menu or do you simply want to continue playing?



12 To set a *Menu Return*, position the *Playline* at the end of a chapter and click the button shown on the left. A *Return Marker* appears on the clip.



13 Set additional *Return Markers* as desired.

14 And now for the preview that lets you test the menu and check navigation. Select the *Preview* tab. After a brief delay, the menu appears in the inlay.

15 Use the *arrow buttons* and click *OK* to activate and select the buttons. You can also jump from the beginning of one chapter to the beginning of another.

16 If contents and navigation are correct, you're ready to export. Call the *File > Burn to Disc > DVD* module.

17 From the list of *Presets* select, for example, *DVD ISO Image* to generate a file that you can play with a software DVD player. It's best to test it before you burn the DVD. If you want to burn it immediately, skip this step.

18 Make sure that the *Loaded Sequence* option is selected in the *Source* area. Check or uncheck the *Mark-In to Mark-Out* option, as needed. Then click *OK* and enter a name for the ISO file and select the save path.

19 Load the DVD image to the software player. If you're satisfied, return to *Burn to Disc > DVD* and select a burn *Preset*. Select *Image File* in the *Source* area and the ISO file you've created. Check the DVD burner info, select a burning speed, etc, and burn the file to the disc you have inserted in your DVD drive.



Software tools are available that simulate a virtual DVD player (i.e. a DVD drive) on which you can play a file instead of a disc. This allows you to play back a DVD image (the *.iso file generated) on a software player such as WinDVD and check it before burning. These tools are available on the Internet as freeware or shareware.

DVD Menu Wizard

Avid Liquid helps you generate DVD menus quickly and easily with the *DVD Menu Wizard*, which combines menu template selection with the *AutoLink* function, i.e. it automatically links menu buttons to audio/video.
If necessary, you can then fine-tune your work in the *DVD Editor*.



1 Call the *DVD Menu Wizard*.
(If the toolbar above the *Timeline* does not already contain this button, right-click the toolbar and select *Customize*. Find the button on the *Special* tab and drag it to the toolbar.)

2 Follow the instructions on the screen.

How Does DVD Authoring Work?

This section introduces the basic terminology and the basics of authoring using Avid Liquid. The interactivity of a DVD is the result of authoring. If you only want to export a film to DVD instead of to a DV or VHS tape, use *File* > *Burn to Disc* > *DVD* in Avid Liquid.

Follow the usual procedure to assemble your material on the *Timeline*. Insert a DVD menu before the start of the *Sequence*. This is the main menu that is the first to be displayed when the DVD is inserted in the player. A separate *Track* (*DVD Track*) is reserved on the *Timeline* for this and other DVD menus:



Everything you need for DVD authoring: Timeline with clips and DVD menu, DVD Editor (shown here with a couple of Links)

The actual authoring procedure takes place in the *DVD Editor*, which you can open as soon as at least one DVD menu appears on the *Timeline*.

Authoring generally means designing the navigation structure of a DVD and, more specifically:

- Linking the selection buttons in a menu to audio/video Sequences on the *Timeline*;
- Designing menus and sometimes even linking them to each other;
- Setting *Return Markers* in order to return to menus.

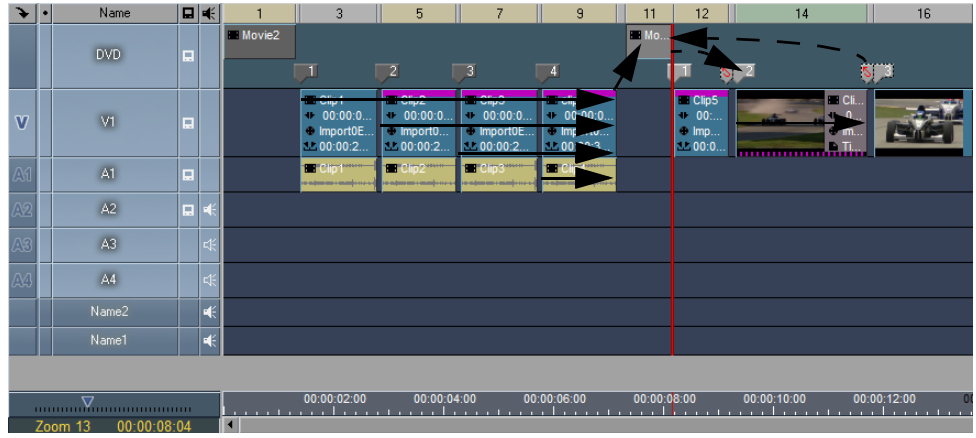
Essential terms:

- DVD menu -
  Presents the options for a DVD and is operated from the DVD player remote (or tested in the *DVD Editor's* preview mode).
  - With Avid Liquid, you can use menu templates and modify them or even design new menus from scratch.
  - DVD menus are always played in a loop.
  - Menu backgrounds and menu buttons can be animated (motion menus).
  - The first menu on the *Timeline* is the main menu (top-level menu). Most DVD remotes have special buttons that return you to the main menu or the previous menu from any point.
  - A DVD menu is a normal clip on the *Timeline* that you can, for example, trim and move.
  - DVD menus are always stored on the *DVD Track*.
- *Chapter* -
  Chapters are AV Sequences that can be activated from the menus. Chapters normally end with a *Return Marker* back to the menu from which they were activated.

  The area between the start of the chapter and the *Return Marker* or new chapter is also known as a "title stream" or "chapter stream".
- *Link* -
  A *Link* establishes the relationship between a menu button and a chapter. In Avid Liquid, each *Link* has a unique number, a name (customizable) and a "target address" which is a timecode that refers to the *Timeline* TC.
- *Target* -
  Each *Link* has a target, whether it's an *Absolute Target* (relating to the *Timeline* master TC) or an *Anchored Target* (relating to a clip). When the clip is moved, *Anchored Targets* move with it while *Absolute Targets* retain their positions.
- DVD *Marker* -
  DVD *Markers* represent the start of chapters on the *Timeline* and, therefore, also represent the *Links* and their *targets*.

DVD Timeline Layout

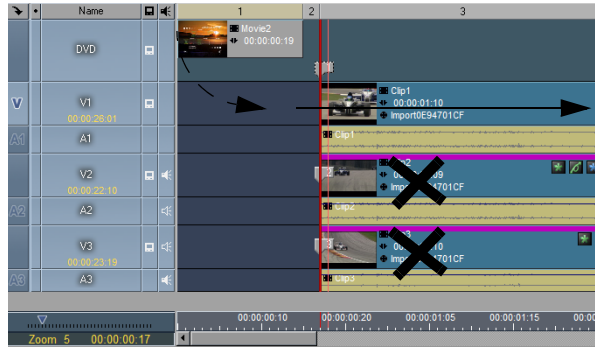
You build a DVD *Sequence* on the *Timeline* just as you would any other *Sequence* (meaning in a linear progression from left to right). Jumps, branches and *Return Markers*, i.e. the *Links* between menus and chapters, are created later by means of DVD navigation.



Timeline with two DVD menus (highest Track)
Left: menu has only Links to chapters, no Return Markers; playback up to the next menu
Right: With Return Markers to menu

Note the following:

- *Links* currently function in a horizontal *Sequence* only. This means that you cannot select individual *Tracks* at a particular position on the *Timeline*. When clips are arranged one above the other (according to the usual *Timeline* priority), the uppermost clip is always played. As the example below demonstrates, there is no point in jumping from the menu to chapter 3 because only the highest chapter (chapter 1) is burned to the DVD (although it will includes a mix of three audio Tracks. Thus it is not currently possible, for example, to design a language selection by arranging a video clip with two or three alternative audio clips.



Timeline priority continues to apply: Even if you jump to Link 3 (lowest Track), the highest Track is played back

If you integrated effects based on multilayering (such as a key or frame within a frame), the layering of clips naturally retains its significance.

- The *Sequence* remains fully editable; even the *Edit Style* remains activated. So when you insert clips, make sure that nothing is overwritten or shifted by *Film Style* clips because then the DVD *Markers* might no longer be correct.
- Note the DVD capacity. Especially in the case of larger *Sequences*, be sure to use the *Burn to Disc > DVD...* module at some point to check the volume of data currently pending. This module displays a "capacity indicator" that tells you how much space is available on the DVD.

If you want to play it safe, protect the *Tracks* (right-click the name field for the *Track* and select *Protected*). You can set *Links* at any time but be careful that you don't accidently modify the *Sequence*.

- How is the DVD *Sequence* transferred to the DVD?
  The following basically applies: The DVD starts in the same way as the *Timeline*, meaning that if you position material before the first DVD menu (such as a trailer), the person viewing the DVD will also have to watch this material until he or she reaches the first or main (also called top)

menu. From that point on, the sequence is determined by the navigation structure you created. Although the export is performed sequentially, this has no effect on the interactive use of the DVD.
To transfer to DVD, use the *File* > *Burn to Disc* > *DVD* module.

The procedure at a glance:

Generally speaking, the entire DVD production process follows this progression:

1 Edit *Sequence*, render all effects (if necessary).

2 Perform DVD authoring using the *DVD Editor* (with menu editing, if applicable) as described in this chapter.

3 Output *Sequence* by means of *File* > *Burn to Disc* > *DVD* in two stages:
- Test the DVD image using a suitable software player (optional).
- Burn and copy.

DVD Authoring: Reference

This section describes all the Avid Liquid DVD authoring functions, organized according to the tabs in the *DVD Editor*. But first a brief summary of the individual elements you will need to create a DVD:

DVD Authoring: Elements

The basic components are as follows:

- *Timeline* with *Sequence*-
  This is where you arrange the contents of the DVD, including video, audio, graphics and...
- *DVD menus* -
  The *Timeline's DVD Track* must contain at least one DVD menu (template or blank menu).
  You will find DVD menus in the *Project* window > *Library* tab > *DVD Menus* (prepared menus that you can edit).
  Variant: *Rack* shortcut menu > *Create* > *DVD Menu* (this creates a blank menu without presettings).
  Then drag the menu to the highest *Track* on the *Timeline*, which automatically becomes the *DVD Track*.



- *DVD Editor* -
  Click the button shown on the left or double-click a DVD menu to open the *DVD Editor*.
  If you open it using the button, the first menu on the *Timeline* (the main menu) is loaded to the *Editor*; if you double-click a menu, that menu is opened.
  You may also click *Tools* > *DVD* > *Editor* to open the *DVD Editor*.
  The following tabs contain the functions for the *DVD Editor*.

Links tab *page 897*

AutoLink tab *page 911*

Highlight tab *page 914*

Templates tab *page 922*

Master View tab *page 923*

Preview tab *page 923*

Options tab *page 925*

Links Tab

This tab contains the basic tools for rendering a DVD menu operational. Here you can assign individual menu buttons to the selected image Sequences.

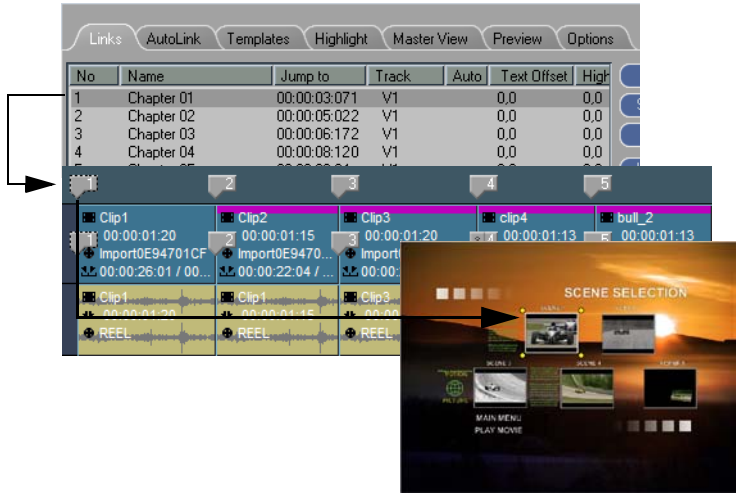
Each menu, which can also consist of several pages, has one *Link* (or chapter) *list*.



DVD Editor in fullscreen mode with separate Master View

Link List

This list contains an overview of all the chapters and *Links* between menu buttons and video/audio in the current *Sequence* on the *Timeline*. The list refers to the menu currently displayed on the right side of the *Viewer*.



List of all the Links for a DVD menu and the associated DVD Markers on the Timeline's DVD Track as well as the menu buttons

- *No* (number)-
  These are the numbers of all the chapters/*Links* for a DVD menu. It corresponds to the numbering of DVD *Markers* on the *Timeline* (provided numeric labels are activated; see *"Options Tab"* on page 925).
  Each number represents a selection button in the DVD menu.

- *Name* -
  The default setting is "Chapter #"; you can edit it by slowly double-clicking the name and entering a designation (then press ENTER).
  Or: Double-click the menu button associated with the *Link*, edit the text box and press *Enter*.
  If you move a *Link* to a *Sequence* position using the mouse (drag and drop), you can automatically edit the name (see *"Options Tab"* on page 925).
  When you use the *AutoLink* functions, the chapter names are assigned automatically (for example, "Edit03" or "Clip08") but you can still edit them afterwards.

- *Jump to* -
  The *Timeline* timecode for the *Link*, the "target address".
  To avoid "VOB problems", make sure the *Links* are not set too closely together (*page 913*).

- *Track* -
  Specifies the *Track* to which a *Link* relates: In the case of an *Anchored Target* (with relation to a *Timeline* clip), it specifies the name of the *Track* on which the clip is located.
  If there is no entry or this field contains "---", it specifies an *Absolute Target*, i.e. a *Link* with a permanent relation to the *Timeline*. In this way, you can easily distinguish between target types in the list.
- *Auto(play)* -
  this column displays an asterisk (*), if the *Autoplay* function was enabled for a menu button. *Autoplay* causes - after a user-defined period of time - a jump to a predefined chapter (*Target)*, if no button was pressed within this time (*page 909*).
- All other column headings -
  refer to menu button highlights (see "*Highlight tab*" on page 914).

Right-click a *Link* in the list to display its shortcut menu and access the commands and options described in the next section.

Commands and Tool Buttons

To the right of the *Link list* is a series of commands in plaintext that allow you, among other things, to assign, delete and move *Links*. You can also call these commands using the tool buttons pictured.

Set Absolute Target



An *Absolute Target* relates to the *Timeline*. It remains in its position even if you move clips and other components of the *Sequence*. The DVD *Marker* for a *Link* set with an *Absolute Target* is positioned on the *DVD Track*. The eye of the anchor is square (for an *Anchored Target*, it's round).

Here's what you do:

1 Select a *Link* (click it in the list).

2 Move the *Playline* to the desired position.

3 Click *Set Absolute Target*.

or

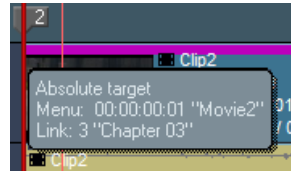
1 Select a *Link* (list), hold down the left mouse button...

2 ... drag the *Link* to the *DVD Track* above the desired position (*the Playline* moves with it; the current frame in the *Sequence* appears in the *Master View*) and drop it.

The *Jump to* and *Track* columns are updated, as is the *Picon* associated with the *Link* in the DVD menu - it now shows the frame at the *Playline/target* position. If this frame is not informative enough, refer to *Set Picons* (*page 903*) to define an individual frame.



- Move the *Target* -
  Click the *Target* to select it and use one of the buttons shown to reposition it (step forward or back 1 or 10 frames).



DVD Marker and tooltip for an Absolute Target



Don't position the *targets* too closely together. Keep at least ten frames between them to avoid having a *VOB problem* (*page 913*).

Set Anchored Target



An *Anchored Target* relates to a clip and moves when the clip is moved. This is an advantage if you edit the *Sequence* later on. The eye of the anchor is round (for an *Absolute Target*, it's square).

The *Marker* for a *Link* with an *Anchored Target* is inserted in the clip; an anchor symbol at the beginning of the clip indicates that an *Anchored Target* relates to this clip (it is "anchored" there with relation to the clip).

A DVD *Marker* is also set on the *DVD Track*. If the clip with an *Anchored Target* is moved, the *Marker* on the *DVD Track* moves with it.

1 Select a *Link* (click it in the list).

2 Move the *Playline* to the desired position.

3 Click *Set Anchored Target.*

or

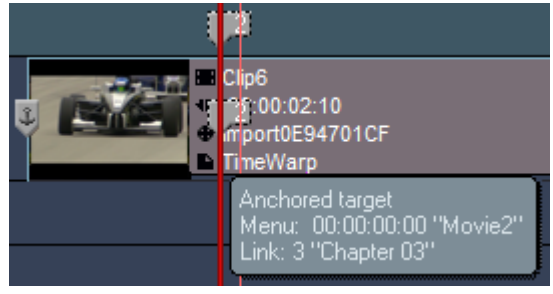
1 Select a *Link* (list), hold down the left mouse button...

2 ...drag the *Link* to the *desired clip* at the desired position (the *Playline* moves with it) and drop it.

The *Jump to* and *Track* columns are updated, as is the *Picon* associated with the *Link* in the DVD menu - it now shows the frame at the *Playline/target* position. If this frame is not informative enough, refer to *Set Picons* (*page 903*) to define an individual frame.



- Move the *Target* -
  Click the *Target* to select it and use one of the buttons shown to reposition it (step forward or back 1 or 10 frames).



Anchored target with anchor symbol and tooltip



Don't position the *targets* too closely together. Keep at least ten frames between them to avoid having a *VOB problem* (*page 913*).



In rare cases, *Anchored Targets* in *Containers* and copied *Sequences* may have to be manually re-assigned; also, it may happen that *Anchored Targets* are converted to *Absolute Targets*. Generally we recommend to fine-edit a *Sequence* before you begin DVD authoring.

Create/Delete/Move Return Marker

A *Return Marker* is a *Marker* that triggers a return to the menu that was activated when the *Return Marker* was created.
This means that as soon as the *Playline* reaches the *Return Marker* in the *Preview,* or when the finished DVD is played to this point, the menu is activated (without a prompt) and played so that another item can be selected.
This allows you to incorporate "loops". Usually a *Return Marker* is created at the end of a chapter if no menu follows it.



- Create *Return Marker* -
  Select a menu, position the *Playline* at the desired location and click *Set return to menu.*
- Delete *Return Marker* -
  Click to select and press DEL or select *Delete* from the shortcut menu
- Move *Return Marker* -
  Hold down the left mouse button and drag the *Marker* to the desired location.

Note: The *Undo* function does not affect *Return Markers*.



Return Marker at the end of a chapter

Insert Additional Link/Reset Link/Delete Link

The more *Links* you set in a menu, the more options you give the DVD user. Adding and deleting *Links* serves to structure the contents of a DVD.



- *Insert additional Link* -
  Click this button to add a blank *Link* to the list; this Link must then be assigned a *target*.
  The *Link* is always inserted above the current (= selected) list position.
  Existing *Links* are shifted downward and, if necessary, another menu page is added (each with the full default number of *Links*, i.e. the number of Links is the same as the number of menu buttons).



- *Reset Link* -
  This button deletes an assigned *target* (removes target timecode from the list and *Markers* from the *Timeline*). However, the *Link* remains in the list and can be reassigned (*Set target*).



- *Delete Link* -
  Removes the *Link* from the list and the DVD *Marker* from the *Timeline*. Subsequent *Links* are shifted upward.
  You can use the *Delete Page* function to delete unassigned *Links* on other menu pages page by page.



- *Move Link up/down* -
  To reposition *Links* within the list, click the *Link* in the list and then click one of the two buttons shown (repeating as necessary) until the *Link* is in the correct position.
  Naturally, the menu button *picons* move with the Links (unless you're using buttons without *picons*).
  The DVD *Markers* on the *Timeline* are renumbered in the process.

Set/Reset Picon

Unless otherwise specified, the *Picon* for a menu button contains the frame from the *target* point (obviously, this applies only to buttons that can display a *Picon*, also called "thumbnails"). But this frame may not be the best choice. To define another frame as a *Picon* for a menu option:

1 Scrub the *Playline* at the desired position (monitor the *Timeline* frame in the *Master View*).



2 Click *Set Picon*.
The *target* timecode remains the same.



- *Reset Picon* -
This button deletes the selected *Picon* but does not modify the *Link*.

Animated Picon

The menu *Picon* does not have to be static. You can underlay all suitable menu buttons (i.e. buttons with alpha plane) with moving images.
Technically speaking, the image area of each *Picon* is keyed out (by alpha plane) and transparent to reveal the image behind the DVD menu. Like looking through a window.

The process for setting animated picons can either be mostly automatic or manual.

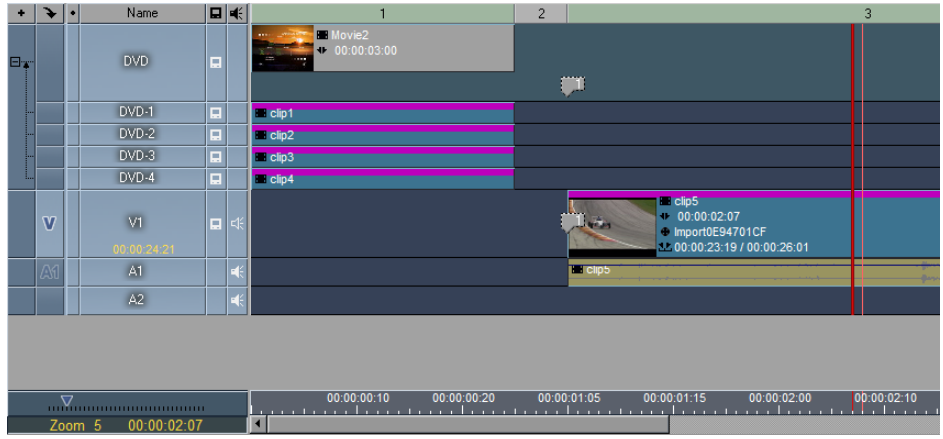
Setting Animated Picons Automatically

1 Drag the first clip (from the *Rack* or *Project Browser*) directly to the desired menu button in the inlay (for example, the button for *Link* 1).

2 This clip is inserted on the *Timeline* directly below the DVD menu and has the exact same length as the DVD menu. A *Track* called *DVD-1* is created.



Hold the ALT-key while dragging and placing the clip on the button to see the described behaviour. If you just drag & drop (no ALT key), the *DVD-... Tracks* are not created and the animation clips stay invisible on the *Timeline*. If you want to apply additional effects on the clips, use the ALT-key procedure. Note: This is possible only for single-page menus.

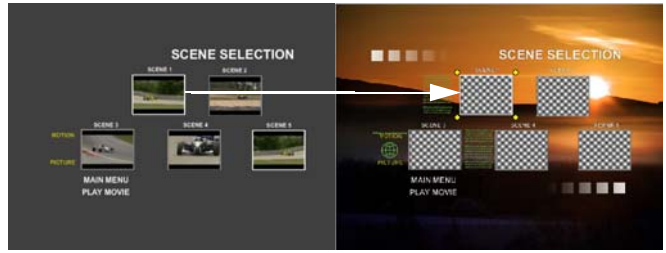


Animated picons: Video clips of the same length as the menu and below it

3 Repeat this procedure until you have assigned all the menu buttons you want.

Please note:

- The *size* and *position* of the clips are automatically adapted in the *2D Editor* (GPU *realtime* only!) to fill the menu button cutouts:



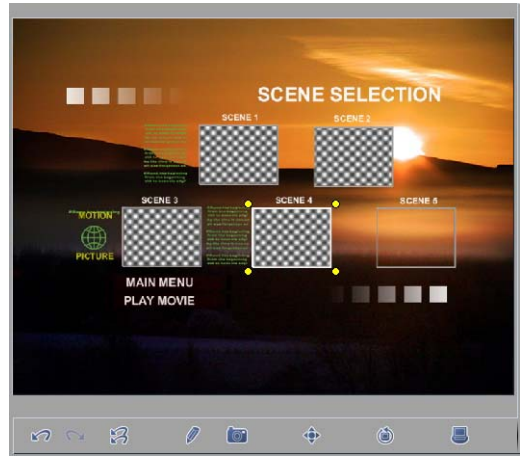
- At the mark-out, the clips are adapted to the length of the DVD menu, meaning that they are trimmed. The mark-in remains the same. It is best to define the cutout and length of the clip ahead of time (*Clip Viewer, Source Viewer)*.
- Note that, like DVD menus, animated *picons* are played in a loop. For this reason, it's a good idea to coordinate the first and last frame; otherwise the image will "jump" as it does in a, well, jump cut.
- You can lengthen or shorten the DVD menu. In this case, you must also trim the clips of he animated *picons*.

- In the same way (i.e. using drag and drop), you can insert a menu background. However, the menu background must contain an alpha plane (at least in some parts), or else you can discard the actual menu background and replace it with a moving image on which the buttons are then arranged (*page 926*).

Setting Animated Picons Manually

1 Select a *Link* or select a menu button from the DVD menu, which amounts to the same thing.

2 Click *Animated Picon*. The image range is now replaced by a black-and-white checkered field, which is the usual method for displaying an alpha plane. If desired, perform the same procedure for other *picons*.



Menu ready for animated picons (black-and-white checks)

3 Exit the *DVD Editor*.

4 If necessary, free *Tracks* on the *Timeline* below the DVD menu so that they can contain the animated *picons*. Continue to do so until you have enough to contain all the animated *picons* you plan to use.

5 Insert the clips that will supply the image material for the animated *picons* below the DVD menu. These clips must be (at least) as long as the menu.

6 Now use the *2D or 3D Editor* to reduce or expand the images so they can be viewed in the appropriate *Picon* fields.

7 Verify the results on the *Timeline* or in the *DVD Editor* preview.

Add/Delete Page

A DVD menu is not limited to a single page. When it has more than one page, each page belonging to the same menu contains one or two buttons that allow you to page forward and back.
A list box above the menu inlay lets you select and go to specific pages.



- *Add Page* -
  This button appends a page of the same type as the menu currently selected to the last page of the menu.



- *Delete Page* -
  This button deletes the "current" page, meaning the page whose page number appears in the list above the inlay or the page that becomes current when a *Link* is selected.
  Important: This command deletes the page along with its *Links*, regardless of whether or not *targets* have been set.



- *Move Page* -
  These buttons let you change the order of the pages in a multi-page menu.

Several Different DVD Menus

It is quite possible to insert several different menus (menu templates) in one DVD project. Position each menu on the *DVD Track* on the *Timeline*.
Note the following when working with multiple menus:

- Different menus, same *target* -
  This is possible; the DVD *Marker* changes its assignment depending on which menu is activated.
- A specific menu relates to a specific *Link* list.

Changing Menus



You can change from one DVD menu to another (that is, load in the *DVD Editor*) as follows:

- Either use the buttons shown on the left

or

- double-click the menu clip desired on the *DVD Track*.

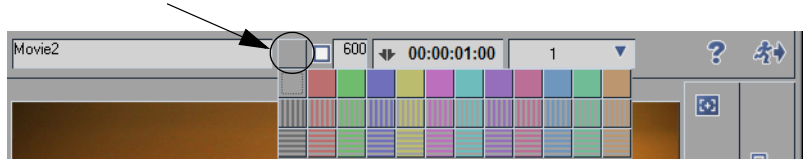
Linking Menus

To Link different menus together on the finished DVD, simply set a *Link* from one menu to another (*Set target*) and, if you wish, back again. This allows you, for example, to set up a hierarchical menu structure.

Identifying DVD Markers and Menus

When working with more than one DVD menu, it is helpful to identify menus and their *Markers* uniquely. You can do this as follows:

- *Select patterns and colors* -
  Click a colored square above the inlay to open a palette of colors and striped patterns and select a design for each menu. The menu and the associated DVD *Markers* and *Return Marker* take on the same design.



Select a menu and Marker design; rename the menu

If you don't see immediate results, activate the *Use colors for DVD menus and related markers in Timeline* option on the *Options tab*.

- *(Re)name menu* -
  You can rename the active menu in the text box above the inlay or assign a name to a blank template. The *Marker* tooltips display this name as their "home menu".

Lengthening/Shortening Menus

DVD menus are inserted on the *Timeline* with a default length of three seconds. You can lengthen or shorten them by trimming them like any other *Timeline* object or by specifying a value in the *Timecode Field* above the inlay. Be sure to take the *Edit Mode* into account (*overwrite* or *film style*).

When a DVD menu is played back in a loop, the length shouldn't make any difference unless animated *picons* (*page 903*) requiring a specific playing time are used.

Desktop/Inlay

In addition to viewing the current menu, you can also modify or switch views in order, for example, to view and modify the navigational relationships of the menu buttons.

Selecting a Menu Background (Motion Menu)

You can use any moving or still image as a background but the menu background must be either fully or partially transparent, or non-existent (see also *"Designing Menus with the DVD Menu Editor"* on page 930).

- Drag a video clip or still to the desktop (inlay). A clip with the same length as the menu is inserted on the *Timeline* on a *Track* named *DVD-B* (background).

Otherwise, the same applies to a moving background as to animated *picons* (*page 903*).



You can also use this button to render a menu background (fully) transparent. If necessary, drag the button from the DVD Editor's tool library.

Navigation View



Click this button to view the relationships between menu buttons. Drag the colored connecting lines to change the navigation structure (see also *Button Navigation* on page 935).

Highlight Collisions



Button highlights must not touch one another. If they do, this symbol flashes and you must edit the DVD menu, particularly by changing the distance between buttons (see also *Avoiding a Highlight Collision* on page 920).

Updating the Video



(With IEEE-1394 output only:) If you also wish to output the image to a connected TV monitor, activate the *Video Update* function. Usually the signal has to be looped through a DV device (analog output, such as the camera). This function slightly reduces processor performance, meaning that editing could go a little less smoothly.

Autoplay

This function initiates a jump from a menu to a certain chapter (*Target*) after a predefined period of time. There's no need to activate a button. That's how you do it:

1 Link menus and *Targets* the usual way.

2 Per each menu page you can define one single button for *Autoplay*. After the defined period of time the menu automatically connects to the button's *Link* (chapter).

3 Right-click either the button in the inlay or the line belonging to the button in the *Link list*.

4 From the shortcut menu select *Autoplay*. The menu entry now displays a checkmark and in the *Auto* column of the *Link list* an asterisk (*) appears.

5 Enable *Autoplay* by clicking the checkbox above the inlay and enter the desired wait time (in seconds) before the automatic jump is to be carried out:



6 Use the *Preview* to test the function.

There can be only one *Autoplay Link* per each menu page. Multiple page menus can have more than one *Autoplay Link*.

Effects with DVD Menus (Transition Menu)

You can also apply effects to DVD menus - e.g. after a menu button is selected, the entire menu is turned like a page in a book before the actual jump command is executed. Such effects are often seen on commercial DVDs. In this case, however, you need the menu to be a "normal" graphics clip that you can edit on the *Timeline*. Do the following:

1 First create the DVD menu with all the *Links*, *Picons,* perhaps an animated background, labels and buttons.

2 In the *DVD Editor*, go to the *Options* tab and in the area for the *Snapshot settings* select:
- *Use background video* (if the menu background contains moving video). Optionally select *Deinterlace*. This is recommended when the background video contains a lot of movement or when the camera was shaky.
- One of the *Highlight* options to define the *Highlight* status with which the *Snapshot* will be recorded. For example, *Active* means that the *Snapshot* displays the menu button with a thick red border as though you had actually pressed the button.

3 Click a *Project Rack* to select it. The *Snapshot* graphics will be stored here.

4 Click the menu button to which the planned effect will be applied.



5 Click the *Snapshot* button.
If this button is not in the toolbar, right-click the toolbar to display the shortcut menu, select *Customize* and drag the button from the *Special tab* in the *Library* to the desired location.
When taking a snapshot of a menu with background video, the current *Playline* position determines the picture.

6 Position the *Snapshot* produced before the target clip (video or audio) or menu but not on the *DVD Track*. (If you intend to create a more complex effect, exit the DVD Editor.)

7 Create the effect.
For example, the menu graphics turn like a page and disappear before the video, a *Wipe* effect is applied or the graphics stall and drop downward. All the FX tools from Avid Liquid are available for your use.



8 When the effect is finished, move the original *Target* of the menu button to the beginning of the effect (if necessary - it depends on the structure of your effect) by clicking the *Target* and using the tool buttons shown.

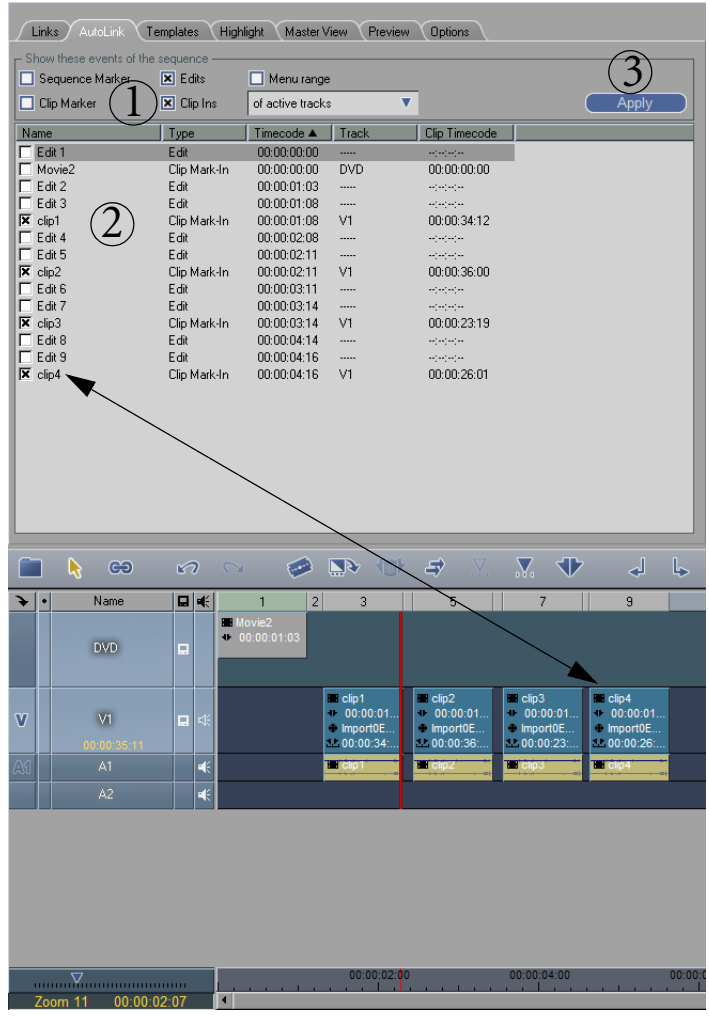
9 Test the results in the DVD preview. Repeat the procedure as needed for other menu buttons.

If you're working with animated buttons or an animated menu background, you must combine the *Snapshot* on the *Timeline* with the associated video clips (same layering as with the DVD menu itself).
A menu *Snapshot* with animated buttons contains an alpha layer with perforated areas for the video animation. Tip: Simply copy the clips from below the DVD menu and move them below the graphics.
For a fully or partially animated background, you must arrange the background video below the Snapshot clip.

AutoLink Tab

These functions save you from having to position each individual *Link* manually. If you use them, it helps to have a clearly structured *Sequence*. For example, let's say you have combined the chapters of your film into six *containers*. These six *Links* can be created in just a few seconds.

When you reuse *AutoLink*, the *Links* previously generated are overwritten.



AutoLink to clip-ins in the four Timeline clips
(numbering refers to summary below)

Basics

1 Position the menu on the *Timeline*, open the *DVD Editor* and select the *AutoLink* tab.

1 Display the *Sequence events* and *Tracks*.

2 Select/remove *Links* by clicking the check box.

3 Click *Apply*.

4 Select a *Marker* design (see "*Identifying DVD Markers and Menus*" on page 907).



5 If necessary, go to the *Link*s tab and click the *Set Picon* option to update the menu with the correct *picons*.

6 Continue editing the *Links* as needed on the *Links* tab.

Details

Displaying Sequence Events

Click the check boxes to include or exclude possible *Links*. To improve overview, you can also sort the list by clicking the column headings; for example, you can combine all *Sequence Markers*.

- *Sequence Marker* and *Clip Marke*r -
  These options display the *Sequence Markers* (set on the *Timeline*) and clip *Markers*. However, *Links* to *Sequence Markers* are generated only if at least one clip is located at the *Sequence Marker* position.
- *Edits* -
  This option displays all the *Edits* according to the *Slice* bar above the *Timeline*.
- *Clip Ins* -
  This option lists all possible *Links* to the first frame of each clip on the *Timeline*.
  Note: If you use dissolves at the beginning of the clip, *AutoLink* also offers the beginning of the dissolve as a "clip-in" since, technically speaking, the clip starts with the first frame of the dissolve.
- *Tracks* and clips -
  The options in this list box allow you to further refine *Link* selection:
  ...of selected clips: The list contains only the clip(s) selected on the *Timeline*.
  ... of active Tracks: The list contains only the *Tracks* activated for editing. Click the *Track* name to (de)activate a Track.
  ... of all Tracks: All Tracks are listed

- *Menu range* -
  This option reduces the range of *Links* listed to those in the *Timeline* range up to the next DVD menu (if any) or up to the end of the *Sequence*.
  If this option is not activated, all the *targets* possible for the *Sequence* are listed (i.e. including those located before the current menu).

Verifying Links

Click a *Link* in the list and the *Master View Playline* jumps to the associated position on the *Timeline* (see the *Jump to* column).



Depending on the screen resolution, the *Master View* may be permanently visible below the list (provided *fullscreen mode* is activated; see figure); if not, you can click the *Master View* tab to view the image for the *Link*.

VOB Problem

DVD specifications stipulate a minimum distance of about ten frames between two DVD-related objects on the *Timeline*.

AutoLink does not perform a preliminary check to determine whether *Links* are being positioned too closely together (i.e. with less than the minimum delay) and might result in a "VOB problem".



However, a VOB problem will be indicated by the flashing symbol shown on the left. The problem area on the *DVD Track* is identified by a vertical colored (pink) marking. Click the flashing symbol to move the *Playline* to the position of the problem and, if necessary, continue clicking it to go to all the other VOB problems.

Resolving a VOB Problem

You must create a minimum gap of at least ten frames. To do so, change the two problem Links by means of

1 *Reset Link* and/or

2 *Set target* (absolute or anchored) -
  Set the target in one of the ways described above (*page 899*). You may also have to move a clip.

Highlight tab

Highlights outline or overlay the menu buttons and indicate the button status in a manner similar to the way the tool buttons in Avid Liquid change when you rest the mouse pointer on them or click the command. In the DVD player, highlights make it easier to select menu options and navigate the menus.

Note that the highlight effect does not appear until you view it in the DVD player or a DVD simulation because they use the subpicture capabilities of the DVD standard.

For fast and uncomplicated highlight editing, we recommend that you use the *DVD Menu Editor* (*page 926*).
The settings on this tab correspond to DVD specifications and are primarily aimed at advanced users.



Options selected and modifications made in the *Highlight* tab are reset to default when a DVD menu template is edited in the *DVD Menu Editor*. We recommend to edit *Highlight* options as the last step in the process.

Highlight states *page 915*

Subpictures

→ Theory... *page 916*

→ ... and a practical example *page 917*

Overview of the highlight functions

→ Moving a text/Picon/highlight *page 919*

→ Defining a palette and transparency *page 920*

→ Text options *page 921*

Highlight States

The highlight buttons in DVD menus indicate three states, and a special visual highlight is assigned to each of these states. For this purpose, *subpictures* with a particular color and transparency are used and superimposed on the actual button (see below). This allows you to design graphically complex buttons and interactivity, because if you used only the *subpictures* permitted by DVD specifications, the results would not be very satisfying visually.

As specified, a highlight button comprises up to four "visual layers":

1 The button (graphics in the background)

2 *Normal* highlight layer
Normally, nothing is defined here because in the unselected, deactivated state, the graphically designed menu button should generally continue to be visible without anything superimposed on it. For this reason, all the transparency values for the *pixel types* are set to 100% (= fully transparent).

3 *Selected* highlight layer
This layer appears as color shading and/or a change in transparency whenever the mouse pointer rests on the button or when you have navigated to this button in the DVD menu.

4 *Activated* highlight layer
This layer briefly confirms its selection by displaying color shading and/or a change in transparency. It's like a visual "clicking" sound.

Why Subpictures?

Subpictures are superimposed on the video and can be used on a DVD for such things as subtitles and overlays as well as for menu button highlights. Even when created in a graphics program, a *subpicture* does not really have its "own" colors; the colors are assigned dynamically as soon as the *subpicture* is played in the DVD player. This assignment (mapping) of color and transparency is performed on the *Highlight* tab.

According to the DVD specification, there are four *pixel types*. Only these four types are used to create *subpictures*. The following are the names of these types as per the specification plus the designation used by Avid Liquid:

- Background / *Color 1*
- Emphasis 1 / *Color 2*
- Emphasis 2 / *Color 3*
- Foreground / *Color 4*

These designations should not be taken literally and in other DVD authoring programs are referred to by different names such as "Red/Green/Blue", "Color Map #1", etc. The designations do not necessarily have anything to do with "background" or "emphasis".
Each *pixel type* has a color from a palette of 16 colors and a degree of transparency that is also one of 16 degrees ranging from fully transparent to opaque. Each menu is checked to determine which colors and degrees of transparency are assigned to which *pixel type*. Thus, the same *subpicture* can appear differently from menu to menu, at least as far as its color is concerned.

Example

Since this is not such a simple topic, we recommend that you start by examining the *subpicture* and highlight structure based on an example:

1 Open the *DVD Editor* and select any DVD menu template.



2 Go to the *DVD Menu Editor* and, for simplicity's sake, delete all menu buttons except one (click to select and then delete).
(See also *"Designing Menus with the DVD Menu Editor"* on page 930).

3 Click *OK* to exit the *DVD Menu Editor*.

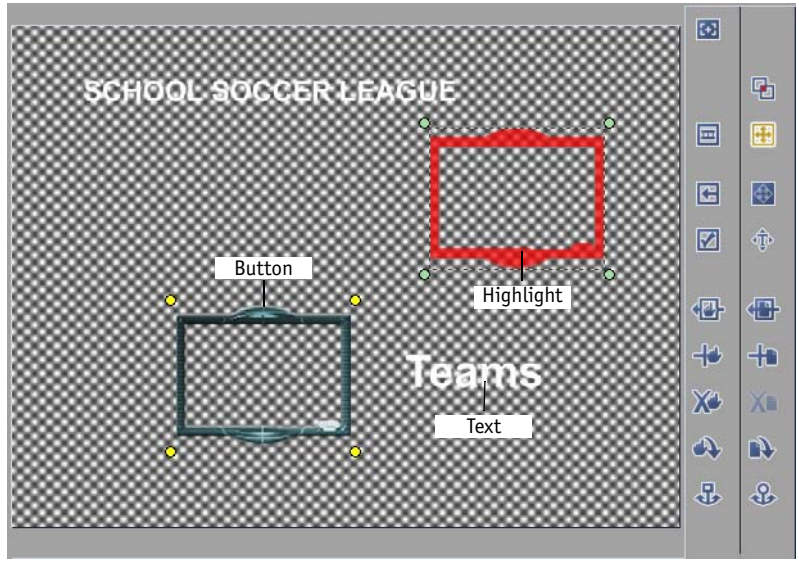


4 Click the button shown on the left. This will allow you to move the highlight on the remaining button. Move it away from the button.



5 Do the same with the text. To do so, deactivate the *Highlight Button* and activate the *Text Button* shown on the left.
(If all three buttons are activated, including the *Picon Button*, you can move the entire menu button.)

6 It should now look something like this:



Menu button (left, graphics) and highlight (right, subpicture) separated

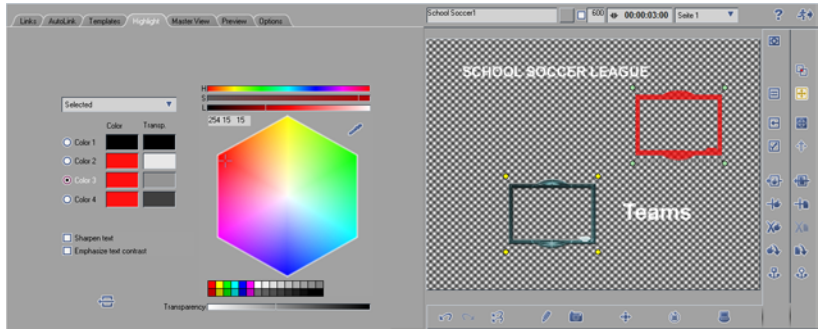
7 From the list box, select the *Selected* state.

8 Now select the *Color 1* to *4 pixel types* one after the other and assign any colors you wish in the color field.

9 Move the mouse pointer across the highlight and observe which areas of the highlight change.

10 For each *pixel type*, play with the *transparency* as well.
(If the slider is in the white area, the *pixel type* is opaque; in the black area it is fully transparent).
The opposite of transparency is opacity. Some applications use this term.

11 Move the highlight back onto the button (completely or partially overlapping) and observe the effect of the transparency colors on the button's color background.



Highlight and customized pixel types

This should give you an idea of how *pixel types* can influence the appearance of a button based on a color palette and transparency.

Overview of Button and Highlight Functions

This section provides an overview of the highlight functions.

Moving a Text/Picon and Highlight

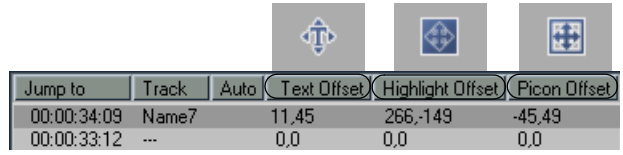


You can move a

- button text,
- button highlight and
- button Picon (menu button graphics)

either individually or as a group.
To do so, activate one, two or all three of the tool buttons shown either simultaneously or in succession. Then click a button and move the element to the desired position.

This movement is documented in separate columns in the *Link list* (*Links* tab):



Jump to	Track	Auto	Text Offset	Highlight Offset	Picon Offset
00:00:34:09	Name7		11,45	266,-149	-45,49
00:00:33:12	---		0,0	0,0	0,0

The coordinates (e.g. -35,334) have the following meaning:
The first number is the horizontal position and the second is the vertical. Negative or positive values describe the direction.

-h,v = moved to the left horizontally
+h,v = moved to the right horizontally
h,-v = moved up vertically
h,+v = moved down vertically

Combinations are also possible, of course. 0,0 is the initial state. The numeric values refer to pixels (video pixels).

To reset a button to the initial state, right-click the associated *Link* in the list to display a shortcut menu and select *Reset Position Offsets*.

Avoiding a Highlight Collision



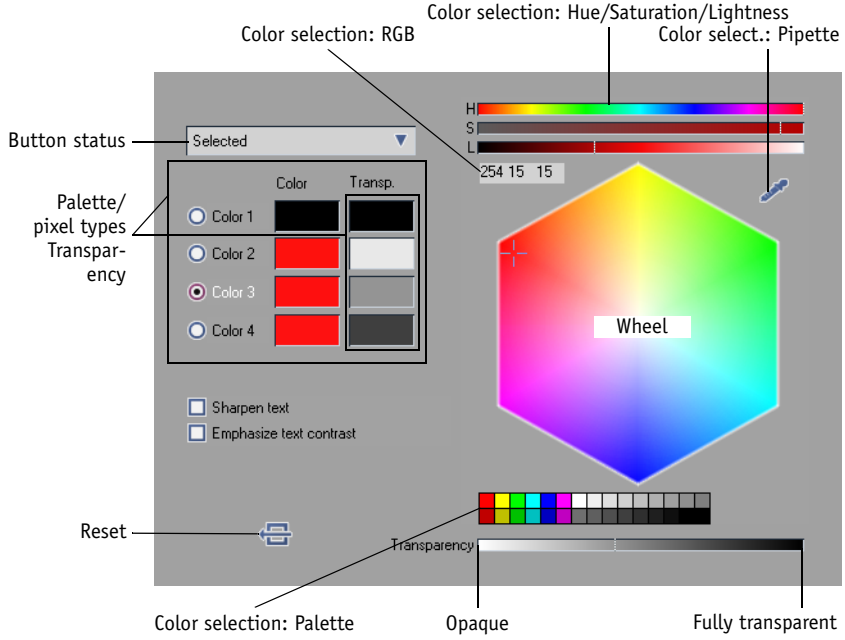
DVD specifications prohibit the overlapping of highlights. Avid Liquid's *DVD Editor* is provided with an "alarm signal" for such situations. It should be located on the toolbar when you start moving highlights. If you don't see it on the toolbar, retrieve it from the function Library (right-click toolbar and select *Customize*).

- If highlights overlap, the button flashes.
- Click the button to display the collision areas in bright red.
- The button does not stop flashing until you have corrected the highlight collision(s).

Collisions are easy to correct; simply create a little more space between the buttons (see also *Designing Menus with the DVD Menu Editor* on page 930).

Defining a Palette and Transparency

All the buttons you need to edit the palette and button statuses are located on the left.



Tools for designing highlights

Button Status List Box

Begin here by selecting which of the three possible button statuses you would like to edit.

Palette and Pixel Types

You can define a color and a degree of transparency for each of the four *pixel types*. Click the radio button to select the *pixel type* you want to edit.

Color Selection

You will probably recognize these variations from other areas of Avid Liquid. There are five ways to define a color:

- *HSL* model (hue, saturation, lightness): Move the slider across the color bars.
- *RGB* (red, green, blue): Enter the values directly.
- *Pipette*: Click, hold down the left mouse button, drag to the desired location and drop. This applies to the entire desktop.
- *Color wheel*: Move the crosshairs in the color wheel.
- *Color palette*: Select a color.

Transparency

Use this slider to assign a specific transparency to the *pixel type* selected.

Reset

Restores the initial state.

Text Options

Sharpen Text and *Emphasize text contrast*- these options improve readability of text in DVD menus.

Templates Tab

Avid Liquid comes with a set of standard DVD menus. You can select one on the *Templates* tab and then customize it using the *DVD Menu Editor* (see also *Creating and Designing DVD menus* on page 926).

Selecting a Menu Template

If you have already opened the *DVD Editor* with a *template*, you can replace this template with a different one. The *Links* already defined are transferred to the new *template* along with their *picons* and additional menu pages are added as necessary.

Click a *template* to select it and then click *Apply* or press ENTER. Or simply double-click the *template*.

Finding Other Menu Templates

The path specified above the list of *templates* indicates where the *templates* are currently stored. If there are other *templates* in another directory, click *Browse* to navigate to the directory and make a selection as described above.



Make sure you select a directory containing templates here, and not individual menu files.

You can use menu templates from Pinnacle Impression. Photoshop files (*.psd) are also permitted as templates. See "*Designing Menus with Adobe Photoshop*" on page 937.

Editing Menu Templates and Creating New Menus

See "*Creating and Designing DVD menus*" on page 926.

Master View Tab

The *Master View* shows you the image on the *Timeline*, thus allowing you to set *targets* "on sight". When you define *targets* using drag and drop, this tab is automatically opened as soon as the mouse pointer rests on the *Timeline* and when you scrub the *Timeline position bar*.

If you work with a computer monitor resolution greater than 768 vertical pixels, you can activate the *Master View* permanently:



Click this button to activate *fullscreen mode*. If the button isn't already on the toolbar, retrieve it from the *Timeline* function Library.
Please note, however, that activating this mode will slightly reduce the size of the list box.



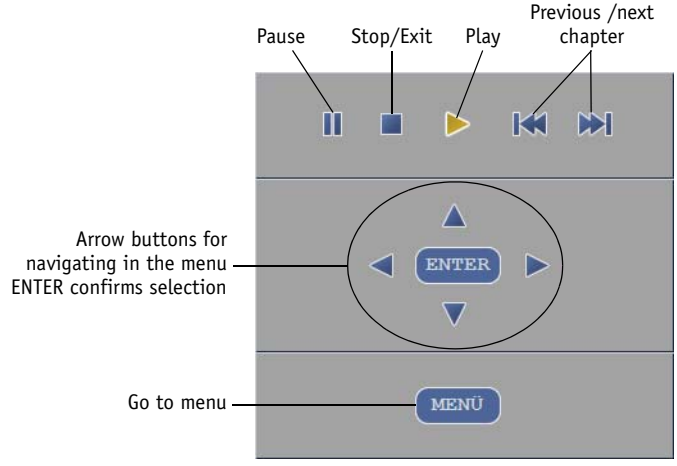
(With IEEE-1394 output only:) If you also wish to output the image to a connected TV monitor, activate the *Video Update* function. Usually the signal has to be looped through a DV device (analog output, such as the camera). This function slightly reduces processor performance with the result that, depending on your system's performance capability, editing could go a little less smoothly.

Preview Tab

A preview or simulation allows you to test the DVD *Sequence* before exporting and/or burning it. Most importantly, you can test menu navigation.A menu without assigned *Links* cannot be viewed in the preview.



Go to the *Templates* tab or click the button shown on the left. On the right you will see the DVD menu, initially played in a loop, and on the left a DVD remote reduced to the basic functions:



DVD preview

Navigating with Arrow Buttons

Start by using these buttons to select the menu buttons and then click *OK* to confirm your selection and execute the command (jumps to selected chapter).

Player Buttons

Previous/Next Chapter: These buttons let you jump from chapter to chapter in either direction without previously selecting a button in the DVD menu. The order of the chapters is based on the *Timeline*.

The *Stop* button stops play and exits the preview.

Play and *Pause* apply both to the DVD menu and to the chapter.

Go to menu displays the previous menu.

Clicking a Picon/Button

- Single-click: enables the highlight.
- Double-click: jumps to the chapter linked to the *Picon* or button and starts playback.

Options Tab

You can select from among four options:

- *Show numeric labels at Timeline markers* -
  This option makes it easier to assign *Links* and *Timeline DVD Markers*.
- *Use colors for DVD Menus and related markers in Timeline* -
  Activating this option is especially useful if you are working with more than one DVD menu. The *Links* are then assigned more clearly to their menus (See also *"Several Different DVD Menus"* on page 906.).
- *Edit label if Link is dropped on target* -
  Select this option only if you assign *Links* using drag and drop. As soon as you drop the *Link*, a text box opens in which you can specify a name. Then press ENTER.
- *Auto seek Sequence to selected Link* -
  This option synchronizes the *Playline*. In other words, click a *Link* in the list or click a menu option and the *Playline* is automatically shifted to the correct position on the *Timeline*.
- *Set target picons with AutoLink function* -
  Grabs the frame at the *Target* position to be used in a thumbnail button; if not selected, the *Picon* can later be set individually. *AutoLink* only.
- *Set target text with AutoLink function* -
  Same as above; only that the name at the *Target* position will be used, e.g. the clip's name. *AutoLink* only.
- *Set return marker with AutoLink function* -
  Sets a menu return jump marker for each link set by means of *AutoLink*.

Menu Snapshot Settings

(See *"Effects with DVD Menus (Transition Menu)"* on page 909.)

- *Use background video* -
  If the menu background contains moving video. *Deinterlace* is recommended especially for background video that contains a lot of movement.
- *Highlight* options -
  These options define the *Highlight* status with which the *Snapshot* will be recorded. For example, *Active* means that the *Snapshot* displays the menu button with a thick red border as though you had actually pressed the button.

Creating and Designing DVD menus

Menus are the basic interactive components of a DVD; they present the DVD contents and options available for selection.
Technically speaking, a DVD menu is a graphics file with an integrated navigation structure. The file can have an alpha channel for fully or partially transparent areas, which means it can also be animated (for example, with a background video).
On the Avid Liquid *Timeline*, a DVD menu is a clip placed on a special *Track* (*DVD Track*).
When you play a DVD, the DVD player stops when it reaches a menu position and waits for a command.

This section tells you how to create and edit DVD menus using the integrated *DVD Menu Editor.* Other sections describe the creation of manual *Links* (*page 897*) and automatic *Links* (*AutoLink*, *page 911*).

Creating DVD menus *page 926*

DVD menus on the Timeline *page 929*

Designing DVD menus *page 930*

Designing Menus with Adobe Photoshop *page 937*

Creating DVD Menus

Basically, you have three options:

- Create a blank template and, little by little, insert the contents (backgrounds, text, buttons, etc.).
- Edit one of the prepared menu templates to meet your own requirements. You can also do this using the *DVD Menu Wizard* (*page 890*).
- Import a menu that was created by means of another application (for example, Adobe Photoshop) or a menu from another Pinnacle DVD product (such as Impression).

This section will provide you with detailed information, especially on the first two options for which you can use the integrated Avid Liquid *DVD Menu Editor.*

Blank Template

A blank template is an empty DVD menu without buttons, background, texts, etc. In this case, you start from scratch and have two options:

Retrieve Blank Template from Library Rack

1 In either the *Project* window or *Project Browser*, open the *Library* tab.

2 Go to the *Rack* called *DVD Menus.*

3 Drag the *blank* menu to the *Timeline* and drop it at the desired location. It doesn't matter which *Track* because the DVD menu automatically jumps to the *DVD Track*. If this *Track* does not yet exist, it is automatically created.

4 Double-click the DVD menu and continue from the section entitled *"DVD Menus on the Timeline"* on page 929.

Create Blank Template in the Project

1 In the *Project* window *Project Browser*, right-click any *Rack* and from the shortcut menu displayed, select *Create > DVD menu*.

2 A blank DVD menu is placed in the *Rack*.

3 Drag the *blank* menu to the *Timeline* and drop it at the desired location. It doesn't matter which *Track* because the DVD menu automatically jumps to the *DVD Track*. If this Track does not yet exist, it is automatically created.

4 Double-click the DVD menu and continue from the section entitled *"Designing Menus with the DVD Menu Editor"* on page 930.

Editing a Menu Template

1 In either the *Project* window or *Project Browser*, open the *Library* tab.

2 Go to the *Rack* called *DVD Menus*.

3 Select one of the prepared menus.

4 Drag the selected menu to the *Timeline* and drop it at the desired location. It doesn't matter which *Track* because the DVD menu automatically jumps to the *DVD Track*. If this Track does not yet exist, it is automatically created.

5 Double-click the DVD menu and continue from the section entitled *"Designing Menus with the DVD Menu Editor"* on page 930.



Later on you can replace any menu with another without losing the buttons, texts or navigation simply by selecting a new template. If necessary, one or more pages are added to accommodate all the *Links*.

Importing a DVD Menu

1 In either the *Project* window or *Project Browser*, open the *Library* tab.

2 Go to the *Rack* called *DVD Menus*.

3 Drag the *blank* menu to the *Timeline* and drop it at the desired location. It doesn't matter which *Track* because the DVD menu automatically jumps to the *DVD Track*. If this Track does not yet exist, it is automatically created.

4 Double-click the DVD menu to open the *DVD Editor*.

5 On the *Templates* tab, use the *Browse* function to open a Windows dialog box.

6 Find the directory containing the DVD menu(s) and click *OK*.

7 The list of available menus is displayed. To select a menu, either double-click it or single-click to select it and then click *Apply*.

8 Now continue from the section entitled *"Designing Menus with the DVD Menu Editor"* on page 930 (or begin immediately to assign *Links*).

DVD Menus on the Timeline

Like other clips, DVD menus can be

- trimmed,
- moved,
- deleted,
- inserted,
- grouped with other clips (helpful with animated *picons*),
- integrated in a *Container*.

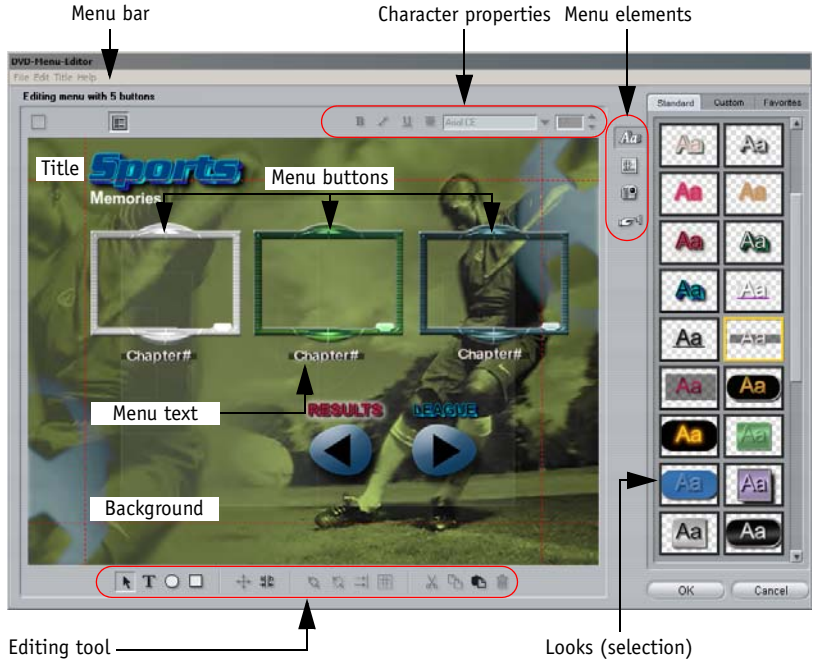
However, be sure to note the *Edit Style*: With *Film Style*, you change the position of other menus on the *DVD Track* when you move or trim a menu.
Also keep in mind that the first menu on the *Timeline* is the main menu.

Because the DVD menu is played back in a loop, its length on the *Timeline* makes no difference - unless you use animated *picons* or a motion background. In this case, it can be helpful to trim the menu to the length dictated by the moving images (*page 903*).

Designing Menus with the DVD Menu Editor

You may remember the *DVD Menu Editor* integrated in Avid Liquid from *TitleDeko*; the two applications are also related.

The elements of a menu are buttons, text, backgrounds and images. The *DVD Menu Editor* adds the highlights for interactive button navigation in the menu.



The DVD Menu Editor

Opening the DVD Menu Editor



First open the *DVD Editor* (for example, by double-clicking a DVD menu on the *Timeline*).

Then click this button in the Editor task bar or click *Edit menu*. Finish by clicking *OK* to return to the *DVD Editor,* where you will find the new or edited menu.
The functions are as follows:

Drawing and text tools *page 932*

Character properties *page 932*

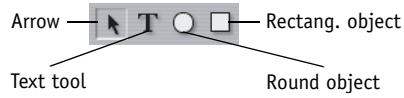
Looks *page 933*

Backgrounds *page 933*

Inserting images *page 933*

DVD buttons *page 934*

Drawing and Text Tools



- With the *Arrow*, you can begin by selecting the objects (by clicking) and then scale and move them. When you rest the mouse pointer on an object, it changes according to the functionality. For example, if the mouse pointer shows a rotation symbol above the highest (green) handle, you can rotate the object.
- The *T* lets you generate a new text object. Click the desired location and start typing.
- The *Circle* and *Rectangle* generate round and rectangular objects. You can edit surfaces, edges and shadows as though they were characters (see *"Character and Object Looks"* on page 933). Note the layers - objects can overlap each other either partially or completely. You can control the layer Sequence by selecting *menu bar > Titles> Layers*.



- The *Crosshairs* represent scaling and moving mode and are automatically activated when an object is selected.

- *Kerning* and *Leading* control the "a-b" tool but only in the case of text objects. Select a text object and use the mouse pointer to drag the text frame to the left or right and change letter spacing (= kerning).
  For multi-line text objects, you can change line spacing by dragging the mouse pointer vertically (= leading).

  Drag one of the corner handles to distort the object.



- The *Chain* and *Broken Chain* are tools for grouping and ungrouping objects.
  Use CTRL + click to select the objects you want to group together. Then click the chain button. You can ungroup objects by clicking one of the group elements and then clicking the broken chain button.
- To align objects, click the button with the two horizontal arrows. Select the relevant objects (CTRL + click) and select the desired option from the menu (click the buttons!).
- To position objects, click this button to open a small menu. After you select an option, a selected object is positioned at a defined location on the desktop, such as in the upper right-hand corner. The scale is the "safe range" indicated by the red dashed line.



These are the standard copy, cut and paste buttons, plus the trash button for deleting objects.

Character Properties



These buttons should also be familiar: *B* for bold, *I* for italics and *U* for underline, plus the font list and font sizes specified in points as provided by the Windows operating system. The line button (circled in red) provides a menu with additional text formatting commands, such as the left/right/centered alignment of text lines.
Select the text just as you would with a word processing program (by running the cursor over the text) so that the changes will be applied.

Character and Object Looks



The first tab contains the palette of prepared looks. Click the text object to select it and then click a look. Or first select a look and then write the text using the text tool.
These settings also apply to rectangular and round objects which, like the characters, can be assigned a color, edge or shadow.

The second tab, which is the *Custom* tab, provides a slider by means of which you can conveniently control the *Face* (surface of the letters), *Edge* and *Shadow* properties.
In each case, you can select a color (blend or single color) or *Transparency*. Click the color box to open the color dialog box.

The third tab (*Favorites)* is intended for customized looks. Click the suitcase button to add the look currently designed and selected with *Custom*.

Backgrounds



Backgrounds completely fill the edit window (full menu format). You can select a background from the palette (single-click it) or create a color background (full tone or blend). If you don't want to use a background (for example, if you want to superimpose the menu buttons on a video), click the *Transparency* option.

Click the *Folder* button to open a Windows dialog box for opening a file. This also lets you select any graphics file as a background. Select the directory containing the graphics. The graphics are then loaded in the palette as a miniature (along with any other images found in the directory). All the usual graphics file formats are accepted, including TIFF, BMP and JPEG.
If necessary, make sure that the background graphics are scaled to the correct size while also maintaining the aspect ratio. If you create the graphics yourself, select a square pixel format of 640*480 (NTSC) or 720*576 (PAL) to avoid scaling.
The background files that come with the product are stored in the.../*Media/DVD/Backgrounds* directory of your Avid Liquid installation.



To insert a (animated) background in the *DVD Editor*, drag a (video) clip to the desktop and drop it (drag and drop).

Inserting images



Unlike backgrounds, images are not scaled automatically. Use the handles on the image object to resize it to your specifications and position the image wherever you want.

Click the *Folder* button to open a Windows dialog box and select the folder containing the image(s). The images are loaded in the palette as miniatures. Drag an image to the desktop.

DVD Menu Buttons



These buttons allow you to turn a normal title into a DVD menu. They control navigation while also using visual highlights, if desired.

Button Types

Except for the menu background, any object on the desktop can be declared a menu button. Click the object and assign it a button type from the list:

Normal button -
The standard button, a round or rectangular object, a text button.

Thumbnail button -
A button with a miniature field containing, for example, the first frame of a video chapter (*Picon*). These buttons usually appear as picture frames, meaning that they have an area of transparency (alpha).

Previous button -
In multi-page menus, the button that takes you to the previous page.

Next button -
In multi-page menus, the button that takes you to the next page.

Not a button -
Lets you cancel a button assignment.

Prepared Buttons

You can simply drag these buttons from the palette to the desktop where you can position and scale them as desired. To change the button type, click the button to select it and select the desired type from the list.



According to the DVD specification, no more than 36 buttons are allowed on one DVD menu.

To replace a button, select it and then double-click another design in the palette.

The buttons that come with the product are located in the.../*Media/DVD/Buttons* directory of your Avid Liquid installation.

Arranging Buttons: Be Careful of Highlights

Be sure to leave a gap between buttons, especially if the buttons have highlights. Highlights must not overlap.



In the *DVD Editor*, a button highlight problem (= "collision") is indicated by this flashing symbol. You then need to change the distance between buttons in the *DVD Menu Editor* (See also *"Avoiding a Highlight Collision"* on page 920.).

Button Highlights

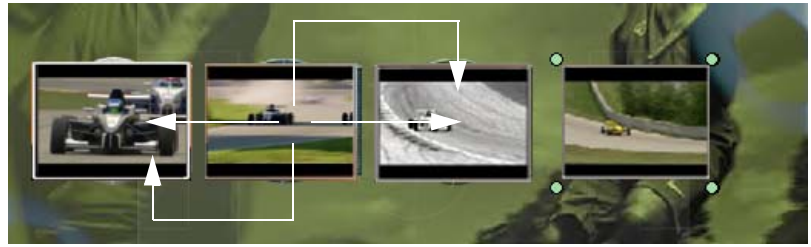
Highlights provide visual emphasis that makes it easier to navigate a DVD menu. For example, you can see which menu button you just actuated with your DVD remote (*Selected* status).

Highlight style -
Three styles are available: Either a box around the button's outer edge, a highlighting of the buttons entire surface (regardless of its shape) or underlining. Click the check box and one of these variants.

Button status -
Select a color and transparency (or opacity) for each status, preferably using the same values for all the buttons in a menu.

Button Navigation

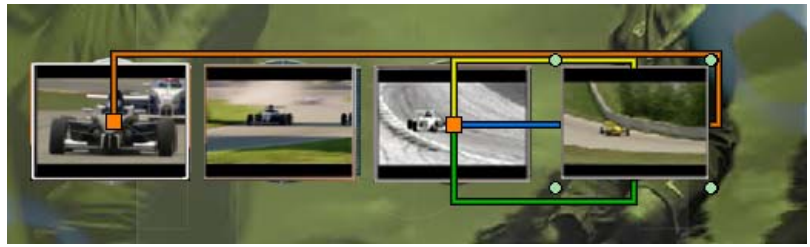
You should always try to arrange the buttons in a menu so that navigation with the DVD remote is intuitive. Generally, you have four arrow buttons - Up, Down, Left and Right. When four menu buttons are arranged side by side, for example, this would mean the following relationships:



Navigating with arrow buttons



In the *DVD Editor*, you can display the relationships that were automatically assigned at the start and also change them simply by dragging the colored lines.
Click the button shown on the left to change the menu view along the following lines:



Navigation view (DVD Editor)

Now when you press the right arrow on the DVD remote, in this example you will be returned to the first button (as seen from the left).

The yellow line stands for "move up" the green for the "move down" navigation button, the colors orange and blue for the right and left relations, respectively. To reassign these connections

1 select a button

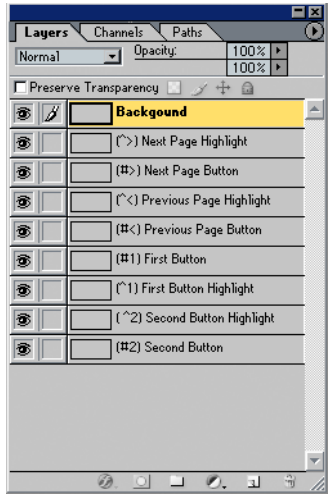
2 move the cursor over the button close to the line that you want modify. The cursor now looks like a bold arrow

3 drag the line to the desired button and drop it when the small orange box appears.

Example: to edit the "move right" relation of a button, change the orange colored line.

The Next and Previous buttons, however, have a defined relationship with the next or previous menu page.

Designing Menus with Adobe Photoshop



Sample level structure of a DVD menu in Photoshop

You can also use Adobe Photoshop to create DVD menus with highlight buttons for Avid Liquid. For problem-free importing of these menus, note the conventions below. In particular, you must ensure that the layers of all the graphic elements used have specific designations in Photoshop.

Background Layer

The menu background must be created in the correct format (NTSC 720*480 pixels; PAL 720*576 pixels) with a color depth of 24 or 32 bits and areas of transparency defined by alpha channel. The layer name must start with a "(B)". For example: *(B) Background*.
A second descriptive designation, such as "Background" in the example here, is optional.

Button Layers

The two button types are link buttons and previous/next page buttons. Each button comprises two layers:

- Button background/mask (name starting with "(#)")
- Highlight layer: "(^)"

The button background layers are permanently linked to the menu background and must have a 32-bit color depth. The mask is used via an alpha channel, for example, to permit buttons with *animated picons*. According to DVD specifications, the highlight layer can have no more than four colors.

Previous Page/Next Page

In order to be able to page through multi-page menus, you must create buttons that refer to the next and previous pages. These buttons have the following structure:

- *(#<)* background of previous page button / *(^<)* previous page highlight layer
- *(#>)* background of next page button / *(^>)* next page highlight layer

Important: Previous/next page buttons must be created in pairs; otherwise the Photoshop file will not be recognized as a DVD menu.

Link (Menu) Buttons

The name of a link button starts with "(#..." and a digit. A particular digit can occur only once for each menu because the digit serves to define the link to a highlight layer. For example: *(#3) Button 3*.
Two variants of link button exist: static and dynamic.

- A static button has no alpha and appears in the menu exactly as it was created in Photoshop, e.g. a text on a colored background ("Play video 1").
- A dynamic button (thumbnail) has a user-defined alpha layer (mask) that can be used in the *DVD Editor* either as a surface for a normal *picon* or as a key area for an *animated picon*.
  See also *"Links Tab"* on page 897.

Highlights

The name of a button highlight layer starts with "(^..." and the digit of the associated background layer. For example: *(^3) Highlight*.

DVD specifications permit a palette of only four colors for highlight layers. Since these four colors can be edited using the Highlight Tool in the Avid Liquid *DVD Editor*, it makes no difference which four colors you use to design highlights in Photoshop. If you use more than four colors, the number is reduced to four adapted colors. It is generally recommended that the four colors used be as easily distinguishable from one another as possible.

Importing Photoshop Menus

1. Save the menus you created by means of Photoshop in the directory of your choice.
2. In Avid Liquid, open the *DVD Editor* and select the *Templates* tab (see *page 922*).
3. Click *Browse* and select the directory containing your menus.
4. The list of menus now contains these menus for use in the DVD Editor.

Burning a DVD

In order to save blanks and time, before exporting and burning the DVD you should test it:

- in the *DVD Editor* preview and
- possibly, on a software DVD player (see remarks below).

For extensive projects, you should also check the volume of data from time to time while authoring to ensure that the length of the program, quality requirements and medium capacity are coordinated with one another. The DVD burn module contains a data capacity indicator that tells you exactly how much of the DVD's capacity you will use. If space starts getting tight, you can...

- ...reduce the program length (which means shortening the *Sequence*),
- ...reduce the bit rate for encoding,
- ...or allow this decision to be made automatically.

If you don't want to deal with the details of DVD export, use one of the DVD presets. Here is a brief overview:

1. Insert a blank in the DVD recorder.
2. Select *File > Burn to Disc > DVD*
3. Select one of the available presets (e.g. *DVD Direct to Disc)* or create a new preset.
4. Check the *Capacity Indicator*, *Source* selection, burner info, speed, etc.
5. If everything fits, click *OK*.
6. During IPB conversion, the computer is blocked. You can continue editing as soon as compiling has started and during the burning process.

For all details on exporting and burning MPEG video, see the following chapter.



Software tools are available that simulate a virtual DVD player (i.e. a DVD drive) on which you can play a file instead of a disc. This allows you to play back an image (the *.iso file generated) on a software player such as WinDVD and check it before burning. These tools are available on the Internet as freeware or shareware.

Chapter 17

Export

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As of Version 7, all possible methods for outputting *Sequences*, clips, metadata, files, etc. are integrated into the *File* menu on the menu bar. This chapter describes all these output options.

Record to Tape *page 943*

→ Transferring the audio/video signal to a controllable recorder via the digital/analog interfaces *page 945*

→ Striping tapes and recording leaders *page 948*

Export to File... *page 951*

→ General functions in the Export dialog box *page 952*

→ MPEG-1, -2, -4 *page 956*

→ Windows Media *page 958*

→ QuickTime *page 958*

→ Fuse *page 959*

→ DivX *page 960*

→ RealMedia *page 961*

→ 3GPP *page 961*

→ Flash Video *page 963*

→ AVI *page 963*

→ Images and graphics *page 964*

→ Sony PSP *page 965*

→ Apple iPod *page 965*

→ Exporting audio only (PCM WAV) *page 964*

Burn to Disc *page 966*

→ General functions in the Burn dialog box *page 967*

→ DVD *page 968*

→ Super VCD *page 969*

→ VideoCD *page 969*

→ Video and audio parameters *page 970*

→ Options *page 973*

IPB Settings

→ Settings for advanced users *page 975*

XML/ALE/OMF/EDL

See the chapter on data exchange, *page 167*

Record to Tape

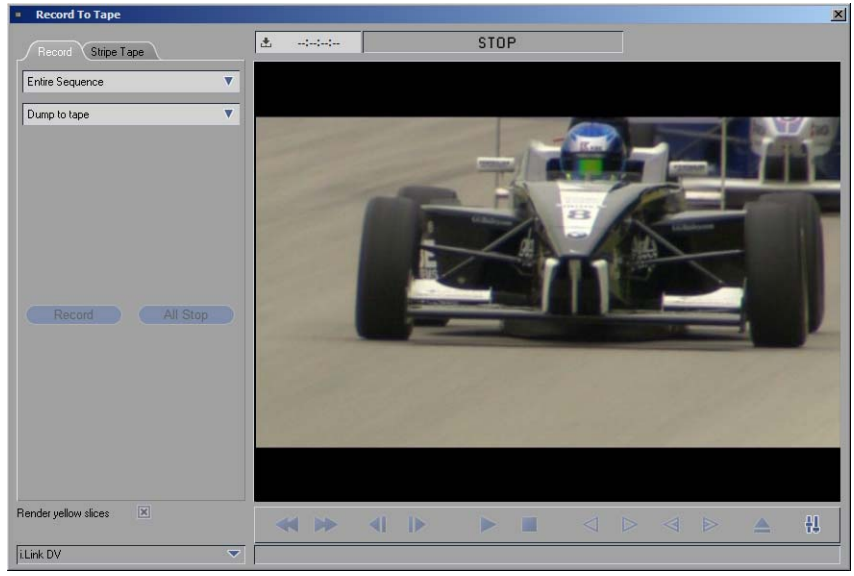
Select *File* > *Record to Tape* to open the appropriate window. This window contains two tabs

→ Record *page 945*

→ Stripe Tape *page 948*

plus a recorder toolbar and a drop-down list box for selecting a recorder and video inlay.

The timecode of the current *Timeline* is the master TC because the *Timeline* represents the master in non-linear editing.
This means that the recording tape (or master tape) must have a compatible timecode. For example, your *Sequence* starts at 10:00:00:00 hours, but the tape has been striped starting at 02:00:00.00 hours. In this case, record to tape will fail, at least in insert mode.
Remedy: Adapt the *Timeline* TC (see *page 406*) or re-encode the tape accordingly.
Also, when you use an encoded tape to perform an insert edit, the *Timeline* TC and tape TC must be compatible and the clips must be positioned correctly on the *Timeline*.



Record to Tape

Output HDV/DVHS/MicroMV/ProHD

If you want to record one of these MPEG2 formats:

- Look under *Edit* > *Control Panel* > *Site* > *System Settings* > *Inputs/Outputs* > *Video Outputs* > *IEEE 1394* > *MPEG2 Output Format* to find out whether the desired format is selected.
- The recorder must be set to the current *Timeline* and output format; otherwise an error message will be issued.
  In addition to the MPEG2 family (for example, HDV1), the frame rates and resolutions must also match.
- Before you start the recorder and begin recording, the *Sequence* on the *Timeline* must be rendered in a continuous MPEG2 stream.
  Rendering is performed only where necessary, such as at edits and wherever effects were applied. At these locations, you will also see an image; otherwise the inlay will remain black.
- During MPEG2 recording, there is no image in the inlay and no audio being output via the system outputs. If possible, connect a video monitor and an audio monitor to the recorder.
- Recording automatically stops at the end of the *Sequence*.

Output DVCPro 25

Change the default output from *DV* to *DVCPro25* under *Edit* > *Control Panel* > *Site* > *System Settings* > *Inputs/Outputs* > *Video Outputs* > *IEEE 1394* > *DV Output Format.*

Avid Liquid: Using Analog Outputs

If you operate Avid Liquid with an analog breakout box, you can also record the analog signals that are output. However, analog recording and recorder control work only in combination with an active RS-422 interface (see Avid Liquid Product Manual). Without RS-422 control, you will have to start *Timeline* playback and device recording manually. Analog recording cannot be combined with IEEE-1394 control.

Record

To transfer a *Sequence* to a connected recorder, click the *Record* tab and select from among the options listed below.

The *Record to Tape* command requires a recorder that can be controlled via IEEE 1394 (i.Link DV) or RS 422.
If you don't have a controllable recorder connected, start playback from the *Timeline* and operate the recorder manually (without the *Record to Tape* module).

1: Select Recording Range and Device

1 *Entire Sequence* or *Mark-In to Mark-Out*, depending on whether you want to transfer the entire *Sequence* or the portion marked on the *Timeline* by a *mark-in* and *mark-out*.

2 Check whether the device specified in the drop-down menu in the lower left is the one to which you want to output the *Sequence*. If not, select another device (see *Player Settings*).

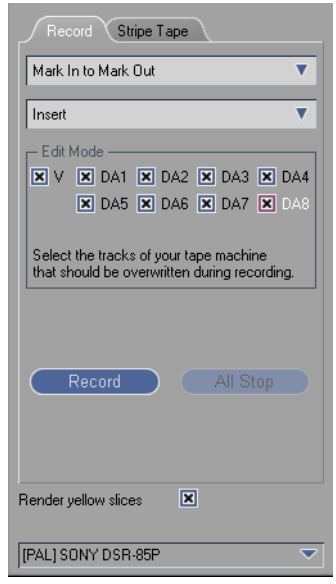
3 *Render yellow slices* -
Activate this option to render all as yet unrendered realtime effects and ranges (slices) on the *Timeline* highlighted in yellow prior to output. Only rendered realtime passages can be output via DV (IEEE).

4 *Used Video Output* -
The *Used Video Output* list is important for the correct synchronization of the connected master recorder. Depending on the product and breakout box, select one of the following:
- *SDTI, IEEE 1394, Analog* (if connected via compressed video outputs)
- *Y/C, CVBS, YUV, SDI, Digital* (if connected via non-compressed outputs).

2: Select Recording Mode

NOTE: The recording modes available for selection depend on the control protocol used by the recorder (IEEE 1394 or RS 422 Betacam protocol) and your editing system.

- Select *Dump To Tape* and the recorder will start as soon as you click *Record*. Important: The data is transferred to all available tracks on the recorder (V, A1 to ...), i.e. all tracks are overwritten.



Select Recording Mode (Insert)

- If you select *Insert*, you will have to activate the desired tracks manually.
  These tracks are the tracks actually provided in the relevant video format and by the recorder and not the *Audio Source Tracks* or *Timeline Tracks*. The options here depend on the features of the recorder selected in the *Player Settings* dialog box.
- *Assemble* allows you to output to a tape that was not completely encoded. The tape recorder continues writing the *Timeline* timecode. No segments can be inserted by means of *Assemble*, because the exit point at the mark-out most probably includes noise signals. Normally, you should encode several seconds at the beginning of the tape to enable a correct cut-in. If the recording is interrupted, you will have to continue within the encoded range.
  As in the case of *Dump To Tape*, this option offers no track selection, i.e. all tracks available on the recorder are overwritten.



As with all toolbars, you can also customize the recorder controls below the inlay. Right-click the toolbar to open the *Customize* dialog box. See also “” on page 990.

3: Start Recording

If everything is set correctly, click *Record*.

- In *Insert* and *Assemble* mode, the recorder now cues the tape to the *Sequence*'s starting point on the *Timeline* or to the specified *Mark-In* and, following a brief preroll, starts to record.
- In *Dump To Tape* mode, the recorder immediately starts recording at the current tape position; the *Sequence* is output directly.
- In the case of MPEG2 output formats, the MPEG2 stream is rendered before recording begins.
- Recording stops when the end of the *Sequence* or a *Mark-Out* is reached.



For Insert editing, you need a striped tape (a tape that contains timecode information; see below). This is not necessary if you select *Dump To Tape* or *Assemble*.

You can monitor the process in the video inlay. Click *All Stop* to interrupt the process.

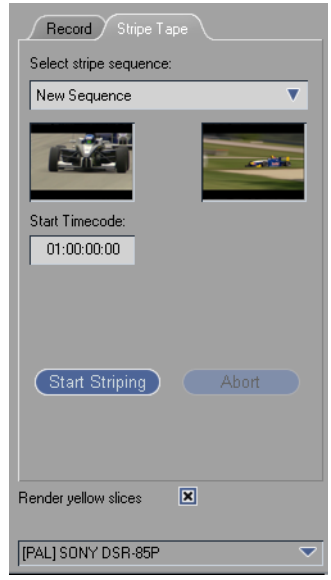
Stripe Tape

In order to be able to edit in *Insert* mode, the recording tape must have a complete timecode (or, in *Assemble* mode, at least a few seconds for a first cut-in). You can work without a striped tape only if you select the *Dump To Tape* option and are sure that the *Sequence* can be transferred to the tape in one go. If there are interruptions, the recorder may not start with a clean cut.

During striping, a black signal is present at the hardware video output, or else a selected *Sequence* is transferred as a leader.

In the case of devices controlled via i.Link (IEEE 1394), striping is generally not necessary or useful because the limitations of the 1394 protocol make editing in Insert mode impossible.
This function is ideal if you need a tape with a continuous timecode for camera recording, but you can achieve the same effect simply by setting the camera to "Record" with the lens cap on and running the tape.

Open Stripe Tape



Select sequence

Click the *Stripe Tape* tab to view the options for configuring striping.

Select Stripe Sequence

First determine whether you want to start striping with a specific leader. Click *Select Stripe Sequence* and select the *Sequence* from the menu displayed (you can generate your own *Sequences* and store them in *Project* templates so that they are always available for creating a *Project*. The list of available *Sequences* always applies to the current *Project*).
The *Sequence's Head Frame* and *Tail Frame* are displayed in the image windows.
Activate this function if you want to record a special leader, color bars or other test signals before the actual *Sequence*.



As an alternative to *Dump To Tape*, you can also use this method to output the actual *Sequence* to an unencoded tape quickly and directly by selecting it under *Select Stripe Sequence*. The *Sequence* does not have to be on the *Timeline*. The timecode is taken from the *Start Timecode* field and the *Sequence's* original timecode is ignored (only with RS 422).
In addition and in contrast to *Dump To Tape*, the tape is rewound to the beginning for recording.

Enter Start Timecode (RS 422 only)

Enter the timecode's start value in the input field and press ENTER (possible only via RS 422 device control).

Start Encoding

Click *Start* to open the dialog box.





Make sure that the timecode generator on your recorder is set to *Preset* (if applicable).

- Click *OK* or the *Eject* button to change the tape and then click *OK*. The recorder rewinds the tape to the beginning and starts striping.
- Click *Cancel* to stop striping.

Fifteen seconds of black preroll are automatically recorded before the encoding sequence starts. On recorders that are controlled via the RS 422 interface, this preroll always starts 15 seconds before the specified start of the sequence. This means that encoding starts at the *specified timecode minus 15 seconds*. (On some devices controlled via i.Link, you can change the preroll in the player settings.)

Master Tape TC and Timeline TC

There is a direct relationship between the start of the striping timecode and the start of the *Timeline* timecode (see also *Set Start Timecode* on page 406). To calculate the start timecode for striping, subtract the duration of the leader from the *Timeline's Start Timecode*.

A standard leader is usually 60 seconds of color bars with a reference tone followed by a 30-second black image.

For example, if your *Sequence* starts at 00:02:00:00, enter a value of 00:00:30:00 for the leader (or 09:58:30:00 for a sequence starting at 10:00:00:00, for instance).

Export to File

These export functions export to one or more files. Depending on your selection, the media data from clips or a *Sequence* is converted to another media format, or is simply copied.

All export formats are accessed via the same Export dialog box. The parameters offered for selection change according to the destination format. The current *Timeline* format also plays a role; for example, the available frame rates (fps) for a *Fuse* are adapted to the PAL/NTSC/HD scan frequencies.

General functions of the Export dialog box *page 952*

Export parameters for the available formats

→ MPEG-1, -2, -4 *page 956*

→ Windows Media *page 958*

→ QuickTime *page 958*

→ Fuse *page 959*

→ DivX *page 960*

→ RealMedia *page 961*

→ 3GPP *page 961*

→ Flash Video *page 963*

→ AVI *page 963*

→ Audio only *page 964*

→ Images and graphics (TIFF, BMP, TGA, JPEG) *page 964*

→ Sony PSP and Apple iPod *page 965*

General Functions of the Export Dialog Box

Open the *Export* dialog box from the menu bar: *File > Export to File > [any export format]*. This section describes the commands in the dialog box and how to create custom export presets.

Areas of the Export dialog box

→ List of export formats *page 953*

→ List of presets *page 953*

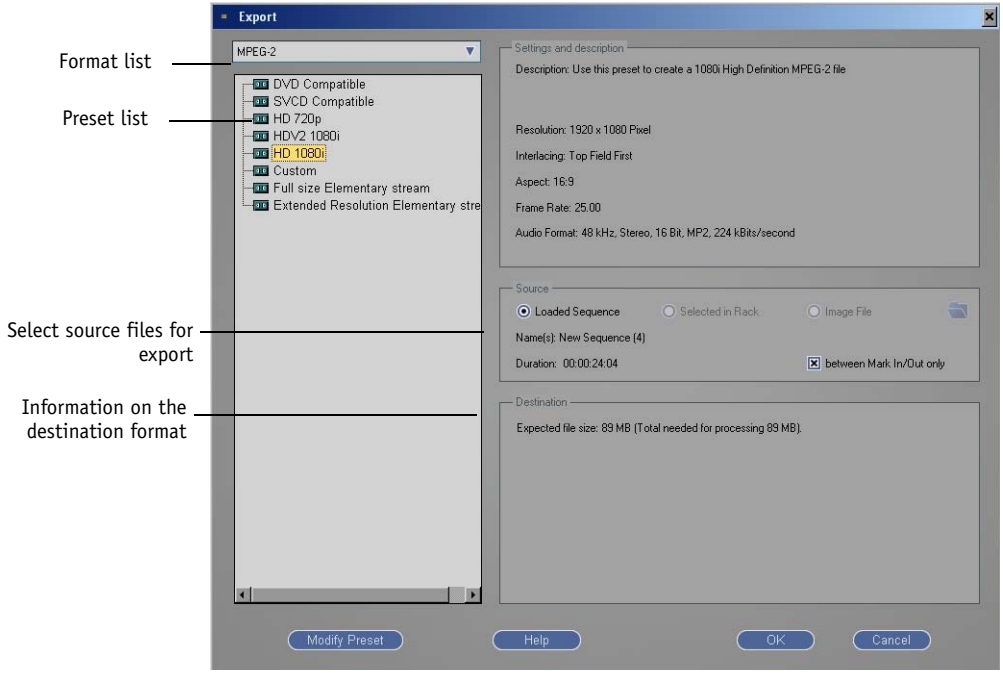
→ Description of the current format *page 953*

→ Selecting the export source *page 953*

→ Information on the destination format *page 954*

Exporting using standard presets *page 954*

Creating and saving custom presets *page 955*



Export Dialog Box

List of Export Formats

This list contains all available export formats.
Make sure the selected export codec is actually installed on your system (for example, DivX or RealMedia). If not, the export will fail.

List of presets

Frequently used, standard export presets are available for every export format. A preset is a set of defined parameters that can also be modified (see below).
For the sake of clarity, some presets are sorted by PAL/NTSC and aspect ratio (4:3/16:9).
The choice of presets can also be affected by the current *Timeline* format (for example, the available frame rates (fps) for a *Fuse*).

Description of the Current preset

This area provides an overview of the most important parameters of the preset currently selected.

Select the Export Source

Here you can define the object or objects to be exported.

- *Current Sequence* -
  The *Sequence* currently on the *Timeline*.
- *Selected in rack* -
  One or more objects (clips, *Sequences*) that were selected in a *Rack* before the *Export* dialog box was opened.
- *Image File* -
  Only for formats that will ultimately be burned to disc, such as DVD.
- *Duration* and list of objects -
  Lists the name(s) of the selected object(s) and the overall *Duration*, i.e. the length of the resulting export file(s).
- *Mark In to Mark Out* only -
  This applies both to *Sequences* and to all other objects that are selected for export and that can be defined by a mark-in and/or mark-out.
  If necessary, check objects in the *Clip Viewer* to determine whether and where mark-ins and mark-outs are positioned. Otherwise, it may be that not everything you intended to export will actually be exported.

Information on the Destination Format

For formats that are not burned to disc, the calculated size of the export file(s) is indicated here. The storage capacity requirements, including temporary files, is displayed as a function of the format selected. At a minimum, this much space must be available on the destination medium (hard disc, USB stick, etc.).

Export Using Standard presets

1 Select the object(s) in the *Rack* or the *Sequence* on the *Timeline* (mark-in/out) to be exported.

2 Select *File* > *Export to File* and choose a category (if available), such as *PAL* or *NTSC*, Standard or HD.

3 Select a preset and check the information area to determine whether it meets your needs.
If not, you can use this preset as a template and modify various parameters as described below.

4 In the *Source* area, define the origin of the export material and the mark-in/out boundaries, if applicable.

5 Click *OK*.

6 Based on the export format, a dialog box is now displayed in which you can define parameters for the codec used.

7 In the next dialog box, specify the storage location and file name.



When multiple objects are exported, the name entered is assigned to all resulting files and, as of the second file, a number is appended and incremented: ExportFile, ExportFile1, ExportFile2, etc.

8 The export dialog box documents how the operation is progressing. You can display a video image.

Edit and Save Custom presets

You can change a preset preset and save it for future use.

1 Select a preset and click *Modify Preset*.

2 Configure the parameters as desired.
- Slide the fader to the right or left.
- To edit a field, double-click and enter a new value; then press ENTER or TAB or click once more.
- Right-click the field to restore the original value.
(Not every value entered is possible. If a value is not possible, the system takes the valid value closest to your entry. The parameters and individual formats are described later on in this chapter.)

3 Click *Save as new preset* to open a dialog box in which you can name the preset and enter a description.

4 Click *OK*. The new preset now appears in the list of presets.



Custom presets are saved under the *User* who is logged in. If you want to keep this preset (for example, for an initial installation) or transfer it to another computer, go to the *User Login* dialog box and save the *User Settings* (for more information, refer to the "Sign Up" chapter in this manual).
The user-specific data is saved under [Avid Liquid installation directory] *User sets*\[user name]\..
The "default" user and his or her settings, templates, presets, etc. are overwritten with each initial installation.

Delete preset

1 Select a custom preset and click *Modify Preset*.

2 Click *Delete*.

You cannot delete the standard presets.

Export MPEG-1, -2, -4

Click *Modify Preset* to open the *Edit Presets* dialog box. This dialog box contains three tabs - *General* (information on the preset), *Video* and *Audio* - whose parameters are described below.

Video Parameters

Width by Height

Specified in pixels. Note the values permitted for the selected format standard.

Interlacing (not available for MPEG-1)

Select the field sequence, or *Progressive* for fullscreen mode.

Frames Per Second

Can be specified to up to two decimal places for drop-frame formats.

Average Bitrate

For MPEG formats that work with variable bit rates, specify an average value. Upper limits, when required by the video content, are defined in the next parameter.

Specified in bits per second (8,000,000 = 8 Megabits/second).

Maximum Bitrate/Peak

Highest permissible bit rate for encoding.

Bitrate Control VBR/CBR

VBR stands for variable bit rate (you must specify an average and maximum bit rate value).
CBR stands for constant bit rate. In this case you only need to define the maximum value.

See also *"Bitrate and Bitrate Control (VBR/CBR)"* on page 970.

GOP Size

See *"GOP size"* on page 971.

Closed GOP

See *"Closed GOP"* on page 971.

Encoding Quality (MPEG-4 only)

The maximum value is *100* (percent).

Audio Parameters

Sample Rate

32 kHz, 44.1 kHz or *48 kHz*. Avid Liquid operates internally at 48 kHz.

Channels

Stereo, Mono, MultiChannel. Mono generates a downmix to one channel.

Sample Size

8 or 16 bit. The latter setting provides better quality.

Encoding

- *MP2* -
  The audio file has the extension *.mpa.
- *MPEG-4* -
  For MPEG-4 video export only.

Bit Rate

Bit rates differ depending on the audio codec selected (specified in bits per second; 224,000 = 224 kbit/s).

Export Windows Media

Windows Media is the proprietary format of the Microsoft Windows operating systems and, therefore, widely used.
Avid Liquid generates *.wmv files (video with audio) and *.wma files (audio only).

Profile List

This list contains a large selection of presets for almost any application. These presets can be edited in Avid Liquid only to a limited extent. In addition to the parameters for video, the *Modify Preset* dialog box also offers the possibility of entering information regarding the *Title, Author* and *Copyright,* and a *Description*.

Custom

In order to have complete freedom in editing Windows Media presets, you need the "Windows Media Profile Editor" that comes with Microsoft's Windows Media Encoder. Download this program from the Microsoft website.

In the *Modify Preset* dialog box, click *Advanced*. Then select the preset file created using the Media Profile Editor (*.prx). Click *Save as new preset* and enter a name and description. The new preset is added to the list.



This codec is not produced by Avid Technology, Inc. For information on the latest codec versions, contact the manufacturer.

Export QuickTime

QuickTime was developed by Apple Computers, Inc. and is widely used, particularly on the Macintosh platform

Avid Liquid generates *.mov files (including audio).

Video and Audio

See "*Video Parameters*" on page 956 and "*Audio Parameters*" on page 957.

Advanced

The QuickTime codec options are listed here.



This codec is not produced by Avid Technology, Inc. For information and the latest codec versions, contact the manufacturer.

Fuse

Fuse is a downmix of several media files to a single file. It allows a separation of video and audio data, meaning that you can produce only one video file from the numerous media files behind the clips of a *Sequence*.
This function is often used as a convenient method of further processing the output of a *Sequence* (for example, in another application). Initially, three presets are available: *Standard*, *No Import*, *No extra Audio*. The range of functions for these presets appears in the information area in the upper right-hand corner of the dialog box.

Select Fuse Codec

The *Fuse* process can be accompanied by a format conversion, although it does not have to be. The *Fuse* codec (i.e. the format) in which the *Fuse* file or files are generated is defined in the *Timeline Settings* (right-click an empty *Timeline* area > *Current Sequence* > *Codec Preset*).
Before starting the *Fuse* process, check the following:

- Are all relevant *Timeline Tracks* activated for *Audio/Video Playback*?
  Audio: In the *Audio Editor*, check the *Output Mapping* for the *Fuse/Export* output, because these settings determine the number of audio files generated.
- Have integrated render effects already been rendered? It's best if a *Sequence* is completely rendered before you start the *Fuse Sequence*.

If you do not perform a conversion, the files are simply copied and the process takes very little time. With conversion, it may take a while longer - especially if sections of the *Sequence* have to be rendered before the actual *Fuse* process begins.

Select Audio Channels

Because *Fuse* functions as a virtual output, you can assign up to eight output channels to the *Logical Output Bus* (for example,. *Stereo*) in the *Audio Editor's Output Mapping*. Instead of being routed to video and audio outputs, the *Timeline* signal is transferred to files and generates a corresponding number of audio files. This means that you can output a multichannel mix or a 5.1 mix on the file level.

Options

- *Import after Fuse* -
  After the *Fuse* process is completed, the clip for the *Fuse* file is imported to the active *Rack*.
- *Create separate audio streams* -
  This option generates separate files for each individual audio stream, and up to eight files when *Render/Fuse Output Mapping* is used. For more information, refer to the Audio chapter.
- *Embed audio if possible* -
  This option applies only to "wrapper" formats, such as *.avi or *.mxf. In this case, the audio streams are written to the same file as the video file.



Stereo clips generated by a *Fuse* and imported back to the *Project* have a higher audio level. This is due to the settings under *Audio Editor* > *Output Mapping*, where both the *Left/Right* channels and the *FrontL/FrontR* channels are routed in the preset. The addition of these channels causes the level to rise. To prevent this, deactivate the *FrontL/FrontR* channels before the *Fuse* process. To correct a clip that is already fused without losing audio information, deactivate the *Properties* of *Tracks* 3 and 4 that duplicate those of *Tracks* 1 and 2.

Export DivX

The DivX codec is based on the MPEG-4 standard. DivX provides extremely high compression compared to MPEG-2, which makes it very popular, especially for downloading movies from the Internet.

Video

- *Video Encoding* -
  DivX.
- *Interlacing* -
  See *"Interlacing (not available for MPEG-1)"* on page 956.

Audio

Select *MP2* or *MP3*.



This codec is not produced by Avid Technology, Inc. For information and the latest codec versions, contact the manufacturer.

Export RealMedia

RealMedia is a video/audio format from RealNetworks that is widely used on the Internet, especially for streaming content.
Avid Liquid generates files in the *.rm format.



This codec is not included in Avid Liquid's standard scope of supply. However, you can download it from the Internet and install it to make it available in Avid Liquid. For information on the latest codec versions, contact the manufacturer.

Video

Set the video resolution (*Height, Width*) and *Bit Rate*

Audio

Audio is encoded in the RealAudio format and integrated in the *.rm data.

Export 3GPP

3GPP permits multimedia on cell phones and PDAs. Video compression is provided by MPEG-4 or H.263 codecs; audio is encoded to the 3GPP standard, either by means of AMR (Adaptive Multirate Codec) or AAC (Advanced Audio Coding).
Avid Liquid generates files in the *.3gp format.



These codecs are not included in Avid Liquid's standard scope of supply. 3GPP export is not possible until you install the codecs on your system.

Video

- *Encoding* -
  H.263 or *MPEG-4*.
- *Resolution* -
  Width and *Height* (in pixels).
- *Encoding Quality* -
  This parameter affects the file size; the higher the quality, the larger the file.
- *Interlacing* -
  Interlaced (1st/2nd line) or *Progressive*.

- *Frame Aspect* -
  4:3, 16:9
- *Frame Rate* (fps) -
  Specified in frames per second (fps).
- *Average bitrate (bps)* -
  The average value around which the bit rate fluctuates.

Audio

- *Samplerate* -
  8 or *16 kHz* (better quality).
- *Channels* -
  Mono or *Stereo.*
- *Sample Size* -
  8 or *16* bit (better quality).
- *Encoding* -
  AMR (Adaptive Multirate Codec).
- *Audio Bitrate* -
  Higher values mean higher quality, but they also mean larger files.



These codecs are not produced by Avid Technology, Inc. For information on the latest codec versions, contact the manufacturers.

Export Flash Video

Avid Liquid can convert clips and *Sequences* to Macromedia Flash Video. A *.flv file is created. You need to have Macromedia Flash Player on your system.

Video

- *Frames per second* -
  12/24/25 (PAL), 15/24/30 (NTSC)
- *Bitrate* -
  between 200 and 2400 kbit/sec.

Audio

44.1 kHz Mono @ 16 bit (not changeable).



This codec is not produced by Avid Technology, Inc. For information on the latest codec versions, contact the manufacturers.

Export AVI

AVI (Audio Video Interleaved) is a file format developed by Microsoft in which audio and video data is stored together in one file (which is why it's also called a container format). Here you can select whether to encode the data with the DV codec or in MJPEG format. The file extension is always *.avi, except when you export audio only, in which case it is *.wav.

Video

- *Encoding* -
  DV or *MJPEG*.
- *Interlacing* -
  Progressive (frames); *1st/2nd* field first.

Audio

- *Samplerate* -
  32 kHz, 44.1 kHz or *48 kHz*. Avid Liquid operates internally at 48 kHz.
- *Channels* -
  Stereo, Mono and *Matrix*.
  For information on *Matrix*, see *page 973*.
- *Encoding* -
  PCM (Pulse Code Modulation; uncompressed audio).

File

This area determines the composition of the export files.

- *Video and Audio* -
  Default setting normally used.
- *Video Only* -
  Ignores any audio data.
- *Audio Only* -
  Ignores any video data.

Export Audio Only

If you're only concerned with exporting audio files, use AVI export, which provides an *Audio Only* preset. However, you can also produce your own preset using the method described above. To do so, go to the *File* area, select *Audio Only* and save this preset.

Export Images and Graphics (TIFF, BMP, TGA,JPEG)

You can output the images from *Sequences* and clips as single frame files in the *TIFF, BMP* (bitmap*), TARGA* (Targa) and *JPEG* formats

To select the file format, click *Modify Preset*. On the *Video* area, select the image format and, if necessary, other parameters as well. Then save the newly configured preset under a new name and description (see *"Edit and Save Custom presets"* on page 955).

Click *OK* to open the next dialog box. If necessary, change to the folder in which you want to save the file(s).
Enter a master name for the file(s). The system then numbers the files in ascending order.
Example: "MasterName0001, MasterName0002, MasterName0003," etc.

Export PSP and iPod

These export formats create MPEG-4 files (*. mp4 extension) that can be played on the popular Apple iPod and Sony PSP audio/video devices. Basic codecs are part of your Avid Liquid installation. To stay up to date with codecs, visit the Manufacturers' websites.

Video

- *Width by Height* (iPod only) -
  Pixels; to create custom formats.
- *Interlacing* (iPod only) -
  Progressive, or interlaced field order (top/bottom field first).
- *FPS* (iPod only) -
  Frames per second.
- *Encoding* -
  MPEG-4 variable bit rate.
- *Peak Bitrate* -
  select the maximum encoding bitrate here.

Audio

- *Audio Sample Rate* -
  24, 32, 44.1, 48 kHz.
- *Channels* -
  Stereo or Mono.
- *Sample Size* -
  8 or 16 bit.
- *Encoding* -
  MPEG-4 audio encoding.
- *Audio Bitrate* -
  select a value between 16 and 192 kbit/sec.



These codecs are not produced by Avid Technology, Inc. For information on the latest codec versions, contact the manufacturers.

Burn to Disc (VCD, SVCD, DVD)

This chapter describes the output of MPEG1 and MPEG2 material, which is usually burned to disc media, either immediately or after additional editing. Avid Liquid offers you several options, ranging from the elementary stream as a basis for DVD authoring, to ready-to-play DVD (provided you have a DVD burner).

These functions are available under *File > Burn to Disc > DVD, SVCD, VCD.*

Burning to disc: General functions *page 967*

Burning DVDs/exporting compatible data *page 968*

Burning SVCDs/exporting compatible data *page 969*

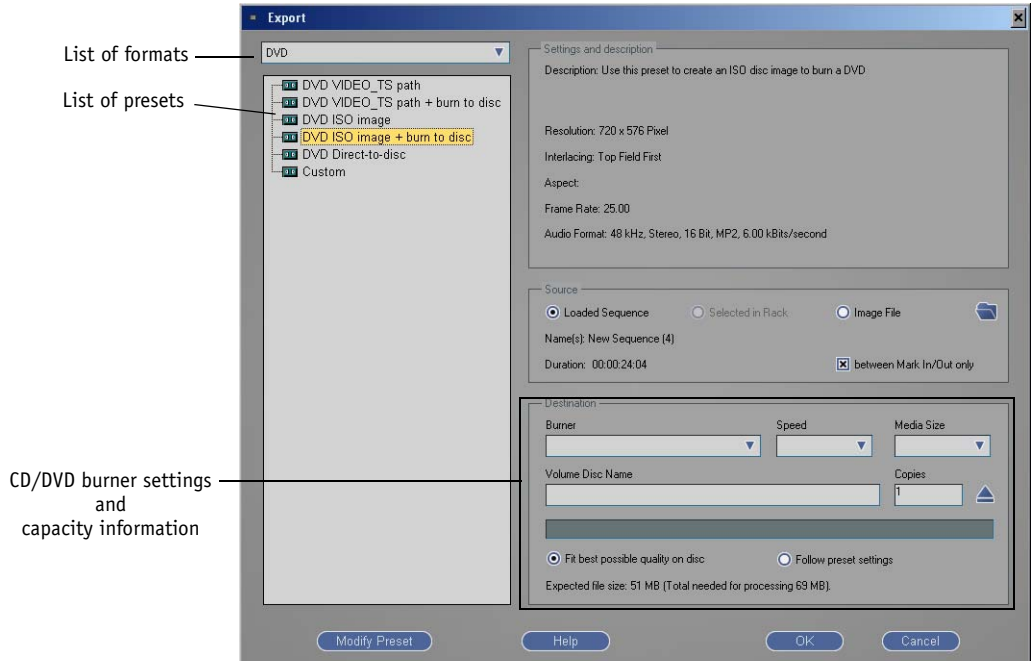
Burning VCDs/exporting compatible data *page 969*

Video and audio parameters *page 970*

Options *page 973*

Burn to Disc: General Functions

If you select *DVD*, *SVCD* or *VCD* for exporting or burning, the *Destination* area of the Export dialog box will contain several more parameters. For basic information on the *Source* and *Description* areas and on working with presets, see *page 952*.



Burn to Disc

- *Burner* -
  The DVD or CD burner appears here. If multiple burners are installed and detected, select a burner from the list.
- *Speed* -
  Select a burner speed. Often, it's better not to choose the maximum speed.
- *Media Size* -
  Displays the capacity of the inserted medium. If necessary, select a different size from the list.
- *Volume Disc Name* -
  Enter a name for the medium which will then, for example, be displayed in the Windows Explorer.

- *Copies* -
  Enter the number of identical discs you want to burn.
  As soon as one disc is completed, you are prompted to insert a new medium in the burner.
- *Eject* -
  Opens the disc drive tray.
- *Capacity indicator* -
  Indicates used and available capacity on the current destination medium.
- *Fit best possible quality on disc* -
  Avid Liquid automatically adjusts bit rate settings to take optimal advantage of the medium's capacity. In other words, the bit rates are increased slightly if more space is available, and decreased if the capacity is not quite sufficient. DVD specifications are respected.
- *Follow preset settings* -
  Avid Liquid follows the defined parameter settings, regardless of whether they come from the standard preset or from a custom preset.
  Consult the *Capacity Indicator*.

Burn DVDs/Export Compatible Data

Select one of the standard presets or create one to meet your own requirements (see *"Edit and Save Custom presets"* on page 955 and the description of video and audio parameters and other options starting on *page 970*).

The following is a brief overview of the standard presets.

- *DVD Video_TS path* -
  Creates a directory on the destination medium and saves VOB files there, along with other necessary data that can later be burned to a disc.
- *DVD Video_TS path + burn to disc* -
  Same as above; after the files are saved, burning is initiated provided that a suitable medium is inserted and the burner is ready.
- *DVD ISO image* -
  Generates a file with the extension *.iso that can be burned to a DVD.
- *DVD ISO image + burn to disc* -
  Same as above; after the files are saved, burning is initiated provided that a suitable medium is inserted and the burner is ready.
- *DVD Direct-to-disc* -
  Starts the burning procedure immediately without first generating an image file.
- *Custom* -
  Basic preset for custom editing (see *"Edit and Save Custom presets"* on page 955).

Burn SVCDs/Export Compatible Data

SVCD stands for Super VideoCD. Basic data includes:

- 480 x 480/480 x576 pixel resolution (NTSC/PAL) at 29.97 fps/25 fps.
- 4:3/16:9; progressive or interlaced; MPEG-2 at max. 2.576 Mbit/second (audio and video).
- One or two audio channels, MP2 44.1 kHz; mono/stereo; max. 224 kbit/second.

Select one of the standard presets or create a custom preset that meets your requirements (see *"Edit and Save Custom presets"* on page 955 and the description of video and audio parameters and other options starting on *page 970*).

The following is a brief overview of the standard presets:

- *SVCD streams* -
  Generates an *.mpg file (audio and video).
- *SVCD PDI image* -
  Generates an image file (*.pdi) that can be burned to a CD.
- *SVCD PDI image + burn to disc* -
  Generates an image file (*.pdi) that is then burned to the CD inserted in the burner.
- *Custom* -
  Basic preset for custom editing (see *"Edit and Save Custom presets"* on page 955).

Burn VCD/Export Compatible Data

VCD stands for VideoCD. Basic data includes:

- 352 x240/352 x 288 pixel resolution (NTSC/PAL) at 29.97 fps/25 fps.
- Video aspect ratio is 4:3 only; progressive or interlaced; MPEG-1 at max. 1.411 Mbit/second (audio and video).
- Two audio channels, MP2 44.1 kHz stereo; max. 224 kbit/second.

Same as *Burn SVCD* but based on the VCD standard.

Video and Audio Parameters for DVD, VCD and SVCD

To modify a preset, select the *Custom* standard preset (or another) and then click *Modify Preset*.



Note that when you modify the preset parameters, they may fall outside the range of the format standards - for example, by exceeding the maximum bit rate.

Video parameters *page 970*

Audio parameters *page 971*

Video Parameters

Interlacing

Select interlaced (*Top/Bottom field first*), or else *Progressive* for full frame.

Bitrate and Bitrate Control (VBR/CBR)

According to its specifications, a DVD, or rather a DVD player can handle a data stream of max. 10.08 megabits per second (Mbps or Mbit/s) all inclusive (i.e. video plus audio plus subtitles plus reserve). Naturally, the bit rate also depends on how much program you want to fit onto a disc, but using the *Capacity Indicator*, you can easily determine the "bit budget" and optimally utilize the medium.

Avid Liquid offers two versions:

Constant (CBR)

A constant bit rate (CBR) ensures that each frame is handled with (almost) the same compression. This has the advantage of allowing precise calculation, but it ignores the fact that some simple frame sequences can be encoded just as well at a lower bit rate, meaning that you would be "wasting" bandwidth. This is not so important, however, if you have a lot of free space available on the CD or DVD.

Constant (CBR) is recommended for formats that require a fixed bit rate (such as VCD).

If you select *Constant*, only the *Peak* meter counts. Set it to the desired video bit rate. Maximum value: 15 Mbps (ES); 8.5 Mbps (DVD image, VOB). The table below lists the approximate playing times for a 4.37 GB DVD:

3.0 Mbps > approx. 120 minutes
4.0 Mbps > approx. 100 minutes
6.0 Mbps > approx. 75 minutes
7.0 Mbps > approx. 65 minutes
7.5 Mbps > approx. 60 minutes
(with PCM audio)

Variable Mode (VBR)

Variable bit rate (VBR) is the answer when you have frame sequences with different degrees of complexity where the rate and, therefore, the compression fluctuates around an *Average*. When you specify a *Maximum* value, you can encode especially fast (high motion) or complex (high detail) scenes at a higher bit rate and thereby improve the quality of the visual impression.
The *Average* value can be no greater than the *Peak Value* currently set. Note that the *Average Value* has a greater influence on the bit rate than the maximum value.

- *VBR* -
  Select an *Average* value and a *Peak* value. This option is generally recommended for DVDs and recordings longer than 15 minutes.



The disadvantage of *VBR*, however, is that the fluctuating average makes it impossible to accurately precalculate the size. This means that the *Capacity Indicator* is not altogether reliable.

GOP

GOP (Group of Pictures) relates to the sequence of I-, P- and B-frames used for MPEG2 compression. I-frames (*intra-codec picture*) store the contents of an image at their full resolution; P- and B-frames each store changes in the image that occur between I-frames. P stands for *forward Predictive* pictures and B stands for *Bi-directional predictive* pictures. A GOP can look something like this:
I-B-B-P-B-B-P-B-B-P-B-B-P-B-B-I.

GOP size

The GOP size (or "N value") is measured from I-frame to I-frame. The shorter the GOP, the more I-frames with relation to the overall MPEG2 sequence; the longer the GOP, the fewer the I-frames with relation to the overall MPEG2 sequence. Short GOPs require a higher bit rate because more I-frames also means more data.

Closed GOP

A closed GOP ends with a P-frame; an open GOP ends with a B-frame.

Audio Parameters

Various options are available for selection, depending on the destination format (DVD, (S)VCD).

Sample Rate

48 kHz (for DVD), *44.1 kHz* (VCD, SVCD).

Encoding

- *MP2* -
  As per MPEG-1, Layer 2, at 44.1 or 48 kHz compressed; file extension is *.mpa; various bit rates available.
- *PCM* -
  Uncompressed audio, at 44.1 kHz or 48 kHz, file extension is *.wav.
- *AC3* (Dolby Digital Stereo/Dolby Digital 5.1) -
  see *"Dolby Digital Stereo® and Dolby Digital 5.1®"* on page 972.

Bit Rate

Discrete values available from 64 to 448 kbit/second; in the case of PCM-WAV, permanently set to 1536 kbit/second.

Channels

- *Stereo* -
  Default option for *PCM* and *MP2 Encoding*.
- *Dolby Digital 5.1* and *Dolby Digital Stereo* -
  Available for selection when AC3 encoding is selected. For details, see *"Dolby Digital Stereo® and Dolby Digital 5.1®"* on page 972.
- *Matrix Surround* -
  For details, see *"Matrix Surround"* on page 973.

Dolby Digital Stereo® and Dolby Digital 5.1®

Avid Liquid is equipped with *Dolby Digital 5.1 Creator®*, a surround sound encoder that makes it possible to generate "true" 5+1-channel audio that can be burned to DVD. In contrast to Dolby Prologic, for example, *Dolby Digital 5.1* separates all audio channels when encoding and decoding, thus retaining the full spatial impression during playback (provided you have suitable devices and a correct speaker configuration).

Dolby Digital Stereo is a compressed format and, like *Dolby Digital 5.1,* encodes in Dolby's AC-3 technology, but as two-channel stereo rather than surround sound. This format can be combined with *Matrix Surround* to generate virtual surround sound.



We recommend that you visit the Dolby website at www.dolby.com, where you will find lots of information on surround sound and, in particular, on the licensing and use of the Dolby logo on your products. Note that the Dolby Digital 5.1 Creator® provided with Avid Liquid does not include a commercial license. Direct your licensing questions to Dolby.

Matrix Surround

This option generates audio files that encode the five surround channels in one stereo signal. Through all kinds of technical maneuvers, this method simulates the presence of five separate channels downmixed to two stereo channels. It also allows you to burn surround sound mixes to DVD and to enjoy full surround sound playback.
Most DVD players recognize and decode this stereo surround signal for playback on five channels (left, right, center, rear left, rear right). At the same time, however, the stereo file can also be played back normally on two channels (left/right).

Options

Re-encoding

Following the initial export, these options can help accelerate further export processes that use the same material, provided that temporary files were not deleted and that the original material was not modified.

- *Always the whole movie* -
  All the data is re-encoded for export/burning.
- *No existing MENU files* -
  Existing menu data is not re-encoded.
- *No existing CHAPTER files* -
  Existing DVD chapters (Chapter/Title) are not re-encoded.
- *No existing AUDIO files* -
  Existing audio data is not re-encoded.

Size Correction

See also *"Burn to Disc: General Functions"* on page 967, *Fit best possible quality on disc.*

- *Don't correct* -
  Size correction is not performed.
- *Reduce number of frames* -
  If the selected export project doesn't fit on the disc, this option trims excess images.

Single Stream

„Single Stream“ means a DVD without any DVD authoring structure (no menus). It consists of one continuous MPEG stream.

- *Loop playback* -
  The DVD created is played back in a continuous loop (at end of stream, automatically returns to the beginning).

Clean-up

- *Delete temporary files* -
  The temporary files created for some export formats can be automatically deleted after the export process is completed.
  Important: Do not activate this option if you activated options under *Re-encode* (other than *Always the whole movie*).

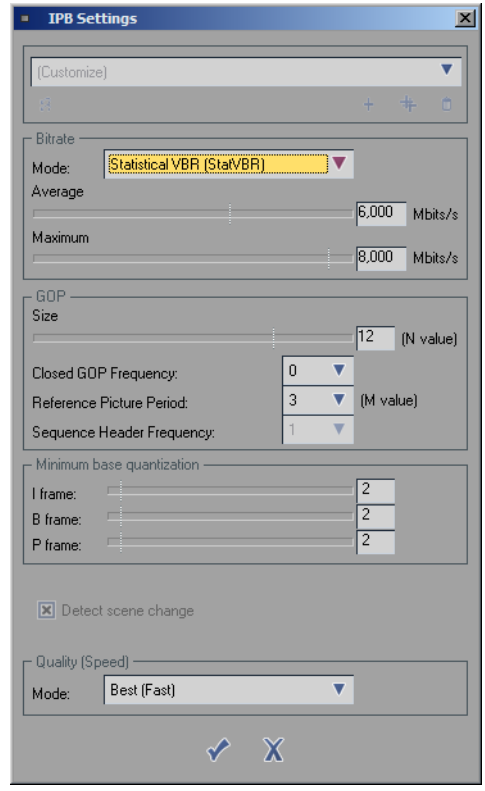
Burner Tray

- *Open after burning succeeded* -
  Tray opens.
- *Close again after burning* -
  Tray closes again. Normally, a Windows routine is then started and you can immediately review the burned material in a media viewer.

IPB Settings

IPB Settings determine the parameters of the MPEG2 elementary stream (for example, the bit rate) and, therefore, the quality of the result. You access the *IPB Settings* when you edit the *MPEG-2 MP@HL (M2V)+* codec or the *DVD PAL/NTSC* codecs (under *Edit* > *Control Panel* > *Site* > *Codec Presets*). These codecs are used for capture (*Logging Tool* only, not *EZ Capture*) or as *Render/Fuse* codecs.

"IPB" refers to the MPEG format used here; more specifically, it refers to the sequence of I, P and B frames. IPB sequences form a "GOP" (Group of Pictures, *page 977*). MPEG IPB is an elementary stream (video) and as such forms the basis for DVD production. The following is an overview of the available parameters:



IPB Settings

Bit rate *page 976*

GOP *page 977*

Minimum Base Quantization *page 980*

Additional options *page 980*

Quality and speed *page 981*

Tips on setting it right *page 982*

Bit Rate

According to specifications, a DVD or rather a DVD player can handle a data stream of maximum 10.08 megabits per second (Mbps) all inclusive, i.e. video plus audio plus subtitles plus reserve. You must raise or lower the maximum video bit rate depending on what you intend to do with the files generated.
For SVCD, the maximum is 2.6 Mbps plus the audio bit rate; for VCD, the maximum is 1.150.
Naturally, the bit rate also depends on how much program you want to accommodate on a disc, but using the *Capacity Indicator*, you can easily determine the "bit budget" and optimally utilize the medium.
A bitrate that goes beyond 15 Mbit/s (possible only at ES or PS export) is automatically signed as "High Level" in terms of MPEG standards. For more information, see the chapter entitled "High Definition".
Avid Liquid features three bit rate modes in the *Mode* selection:

Constant (CBR)

A constant bit rate (CBR) ensures that each image is handled with (nearly) the same compression. This has the advantage of allowing you to make an exact precise calculation but it ignores the fact that some simple frame sequences can be encoded equally as well at a lower bit rate, meaning that you would be "wasting" bandwidth. This is not so important, however, if you have a lot of free space available on the CD or DVD.

CBR is recommended for destination formats which require a fixed bit rate, such as VCD.

Selecting *Constant* enables the *Maximum* slider. Use the slider to set the desired video bit rate. Maximum value: 15 Mbps (ES); 8.5 (DVD Image, VOB). The table below lists the approximate playing times for a 4.37 GB DVD:

3.0 Mbps > approx. 120 minutes
4.0 Mbps > approx. 100 minutes
6.0 Mbps > approx. 75 minutes
7.0 Mbps > approx. 65 minutes
7.5 Mbps > approx. 60 minutes
(with PCM audio)

Variable Modes (VBR)

A variable bit rate (VBR) is the answer when you have frame sequences with different degrees of complexity where the rate and, therefore, the compression fluctuates around an A*verage*. When you specify a *Maximum* value, you can encode particularly fast (high motion) or complex (high detail) scenes at a higher bit rate and thereby increase the quality of the visual impression.
The *Average* can be no higher than the maximum value currently set. Note that the average value has a greater influence on data throughput than the maximum value.

- *Storage VBR (StorVBR)* -
  This mode mostly keeps the bit rate at or slightly below the selected average value, which it does not exceed. Recommended for most applications. In contrast to CBR both VBR modes do not encode "empty" bits (what's called zero bit stuffing).
- *Statistical VBR (StatVBR)* -
  Select an average value and a maximum value. Generally recommended for DVD and any recording longer than 15 minutes. This mode supports only 4:2:0 chroma sampling and long GOPs (M = 3 and N = 15).



The disadvantage of *VBR*, however, is that the fluctuating average makes it impossible to accurately precalculate the size.

GOP

GOP (Group of Pictures) relates to the sequence of I, P and B frames used for MPEG compression. I frames (intra-codec picture) store the contents of an image at their full resolution; P and B frames each store changes in the image that occur between I frame and I frame. P stands for forward Predictive pictures and B stands for Bi-directional pictures. GOPs are very basic elements of an MPEG stream. A GOP can have the following appearance:
I-B-B-P-B-B-P-B-B-P-B-B-P-B-B-I

I-frame only

In the case of the *Elementary Stream* and *Program Stream Destination* formats: Click this option to export a stream consisting entirely of I-frames. Afterwards, the *N* and *M* value can no longer be changed.

GOP Size

The GOP size (aka N value) is measured from I frame to I frame. The shorter the GOP, the more I frames with relation to the overall MPEG sequence; the longer the GOP, the fewer the I frames in an MPEG stream. Short GOPs require a higher bit rate because more I frames also means more data.
Keep this in mind if you want to modify the GOP.

- GOP sizes:
  Software Encoding (export):
  - NTSC 16 (4..16); closed GOP
  - PAL 13 (4..13); closed GOP
  (A closed GOP ends on a P frame; an open on a B frame.)
  - NTSC 18 (4..18); open GOP
  - PAL 15 (3..15) open GOP
  Recommended for DVD: open GOP (standard), PAL 12, NTSC 15.
- IPB-Capture (*Logging Tool*):
  NTSC 15 (4..16); closed GOP; recommended for DVD: 15
  PAL 12 (3..15); closed GOP; recommended for DVD: 12

Closed GOP Frequency

A closed GOP ends on a P frame, an open GOP on a B frame.

- *0-*
  only the first GOP is closed, all other will be open.
- *1-*
  all GOPs are closed. If an open GOP is closed, the current GOP size increases by +1. Exception: NTSC @ GOP = 18 → 16; PAL @ GOP =15 → 13
- *0 to 10 -*
  only IPB capture: every n^{th} GOP is closed.

(These remarks refer to a single, consistent MPEG stream.)

Reference Picture Period

Reference Picture Period (aka "M value" or "P frame distance") defines the distance between so called reference frames (I and P frames). This distance is specified by the number of B frames in between + 1. If you take the following GOP
I-B-B-P-B-B-P-B-B-P-B-B-P-B-B-I
as an example, you can see that *Reference Picture Period* was set to 3: 2 B frames + 1 = 3.



The *N value* (GOP size) must be an integer multiple of the *M value* in order to achieve optimum quality. Example: M = 3, N = 12. Even N+1 can be acceptable (closed GOP).

The optimum *M value* depends on the image content. High *M values* are good for images with not a lot of movement and only a few scene changes.

Valid *M values*:

- Chroma *4:2:0* -
  1, 2, 3
- Chroma *4:2:2* -
  1, 2 (*4:2:2* only on ES/PS export)

2 and *3* only with open GOP. More info on *Chroma format* on *page 980*.

The values deviate for IPB capture (*Logging Tool*):

1 or *3* (*CBR* and *StorVBR*); 3 (*StatVBR*).

Reference Picture Period and open/closed GOP sizes (Overview)

- At Open GOP a *Reference Picture Period* of 1 is not available.
- At Closed GOP, a *Reference Picture Period* of 1 and a GOP size of 1 I-frame only will be activated.

The following GOP size ranges are available (in brackets the values available at IPB capture)…

- …at *Reference Picture Period* of 1
  2-16 [1-15], PAL, Open GOP
  2-18 [1-15], NTSC, Open GOP
  1-16 [1-15], PAL, Closed GOP
  1-18 [1-15], NTSC, Closed GOP
- …at *Reference Picture Period* of 2
  2-16 [2-14], PAL, Open GOP
  2-18 [2-14], NTSC, Open GOP
  3-15 [2-14], PAL, Closed GOP
  3-17 [2-14], NTSC, Closed GOP
- ...at *Reference Picture Period* of 3
  3-15 [3-15], PAL, Open GOP
  3-18 [3-15], NTSC, Open GOP
  4-13 [3-15], PAL, Closed GOP
  4-16 [3-15], NTSC, Closed GOP

Sequence Header Frequency

The *Sequence Header* carries information such as bit rate or frame size that the decoder needs and belongs per DVD specifications at the start of every MPEG stream. If the decoder does not get this information the stream cannot be decoded. Usually the decoder attempts to start its job at the beginning of the sequence. If this is foreseeably not possible, additional *Sequence Headers* can be inserted in the stream. Per default this value = *1*. This means that every single GOP of a stream gets its own *Sequence Header. 0* means that only one *Sequence Header* is inserted, before the first GOP of the stream.

For IPB capture (*Logging Tool*), the value is permanently set to 1.

GOP Structure Samples

With different settings for GOP type, *N* and *M* values, a wide range of GOP structures is possible:

GOP Size	GOP Type (N)	RefPicture Period (M)	IPB Structure
13	Closed	3	IPBBPBBPBBPBBIPBB...
12	Closed	3	IPBBPBBPBBPBIPBB...
12	Open	3	IBBPBBPBBPBBIBB...
1	Closed	1	IIII...
2	Closed	1	IPIP...
4	Closed	1	IPPPIP...
2	Open	2	IBIBIB...

Minimum Base Quantization

This parameter influences encoding quality and ranges between *1* and *20* (theoretically it can go up to 112, but that would generate inacceptable results). I, B and F slider move in sync. *1* specifies the optimum quality, *20* is not so good, but still ok.
Default = 2 (IPB Capture = 1).

One exception: *IPB Settings* when accessed via the *Logging Tool* (not in all products) let you move the three sliders individually.

Additional Options

- *Detect scene change* -
  This is a function of the *Logging Tool*. On detecting subsequent video images which differ greatly from one another, Avid Liquid acknowledges the new scene by inserting an I-Frame at the start of the new scene.
- 4:2:2 -
  is a color sampling procedure (Chroma Sampling; see also the Glossary for more information on various sampling methods). DV and also DVD conforming to MP@ML employs a 4:2:0 sampling, which is the default for all MPEG related data export. When (S)VCD or DVD is selected as the *Destination* format, the *4:2:2* option remains inaccessible. 4:2:2 is not in line with DVD specs. 4:2:2 generates a better quality output for use in professional post production facilities. Valid *Destinations* are *Elementary* and *Program Stream* exclusively, at bit rates up to 50 Mbit/s.

- *Extended resolution* -
  Generates larger images (extended height). NTSC: 512; PAL: 608. Attention: extended resolution is not conforming to DVD specs.
- Inverse Telecine (NTSC; with Avid Liquid Chrome HD; IPB Capture only) -
  Inverse Telecine makes sense only in NTSC because it reverses a "trick" used when converting from film (24 frames per second) to NTSC video (29.97 or 30 frames per second). In the process known as "Telecine", individual film images are duplicated at specific intervals so that the playing time of the original film and video do not diverge too greatly. *Inverse Telecine* eliminates these identical and therefore redundant images during compression and consequently saves space.

Quality and Speed

This feature lets you choose your preferred optimization of the encoding process: speed, storage space on the medium or visual quality (Avid Liquid Chrome HD does not support the *Quality <-> Speed* selection in IPB Capture).

The bit rate also plays a role. You can select:

- *Optimal (fast)*
- *Good (very fast)*
- *Standard (fastest)*

This selection influences several encoding parameters. Between levels, encoding speed increases by approximately factor 2 (or decreases, when going down).
To illustrate the interdependency of the three criteria - speed, storage, quality - it is possible to set up a small matrix. Note that the user's time (or patience...) and the available space on the medium are the defining criteria, and the quality the result:

Storage media has → User has... ↓	... small capacity (bit rate <= 4 Mbit/s)	... medium capacity (bit rate ~ 6 Mbit/s)	... large capacity (bit rate >= 8 Mbit/s)
... little time selection = *Standard*	draft quality	decent quality	good quality
... sufficient time selection = *Good*	near decent quality	decent quality	good quality
... lots of time selection = *Optimal*	decent quality	good quality	very good quality

Tips on Setting it Right

In addition to all said about quality and speed settings, we recommend to keep the following facts in mind:

- Use open GOP whenever possible because image quality from frame to frame will maintain a similar level.
- Use variable bit rate (*VBR*). *CBR* is a must for VCD and other fixed bit rate applications, but otherwise, because of "zero bit stuffing", a waste of bandwidth.
- Highest efficiency can be achieved by setting *GOP Size* and *Reference Picture Period* (M and N values) to the aforementioned "integer multiple" relation (*page 978*). Example: M = 3, N = 12. N+1 can also be acceptable (closed GOP).

Chapter 18

Customize Avid Liquid

make manage move | media™

Avid®

Avid Liquid adapts itself to your way of working - not the other way around! You can customize the software interface as well as assign functions to peripherals such as the keyboard or `Avid Liquid Control` as desired. Each user can individually optimize his or her working environment, store it on a diskette and use it on other Avid Liquid systems.

At the same time, certain settings are dependent on the particular system configuration or studio environment. For this reason, Avid Liquid makes a distinction between *User Settings* and *Site Settings*:

User Settings *page 985*

These include all settings that can be linked to a specific user name.

→ Basics and definition of terms *page 985*

→ Managing property sets *page 987*

→ Customizing toolbars *page 990*

→ Customizing the keyboard *page 993*

→ Keyboard shortcuts *page 997*

→ Assigning keys for `Avid Liquid Control` *page 1000*

→ Network settings *page 194*

Site Settings

These are settings that apply to the specific system and its environment regardless of a specific user.

For more information, refer to the separate product manual supplied with your editing system.

User Settings

Basics and Definition of Terms



Avid Liquid comes with six standard toolbar assignments and specific default settings in other modules as well (*page 63*).



You can always restore the default settings, for example by logging on to the system under one of the defaults or by resetting the values in specific modules (see the tool button shown here).

What Is Saved?

Avid Liquid constantly notes changes made to the software interface and dialog boxes. This means if you were logged in under a certain user name, your configuration (settings upon closing the software) is immediately activated when you log in again under the same name. Your configuration contains information on the last open *Project*, the position of the windows on the desktop, the views, size of the *Timeline* Tracks, toolbar setup, etc.

In addition to all this configuration data saved in a user profile, property sets are also available for logged-in users to choose from.

What Are User Profiles?

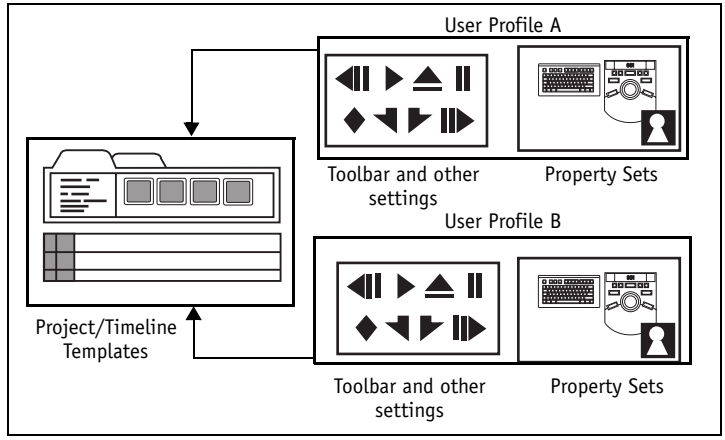
When logging on, you can identify yourself as a specific user. If no *User Profile* exists for you, a new one is created. If you want to change the configuration of the Avid Liquid software by changing to another user, you have to close Avid Liquid desktop and then log in again under the other name (to activate a different *Profile*). When closing Avid Liquid (*File > Exit Avid Liquid*), the system asks you whether you want to log in under a different name. See *"Logging on As an Existing User"* on page 63.)

Property Sets

Property sets are used for adapting Avid Liquid modules to your particular needs. For example, you can customize the key assignments of `Avid Liquid Control` and your computer's keyboard. You can also switch between *Property Sets* during a given session to accommodate the demands of different tasks. Every user can create an unlimited number of *Property Sets*.

Templates

Avid Liquid offers two other types of *Templates*: *Project Templates* and *Timeline Templates*. These *Templates* are available to all users. *Project Templates* can be loaded when you create a new *Project*. *Timeline Templates* are available once you have opened a *Project*. ("*Project Template*" on page 209.



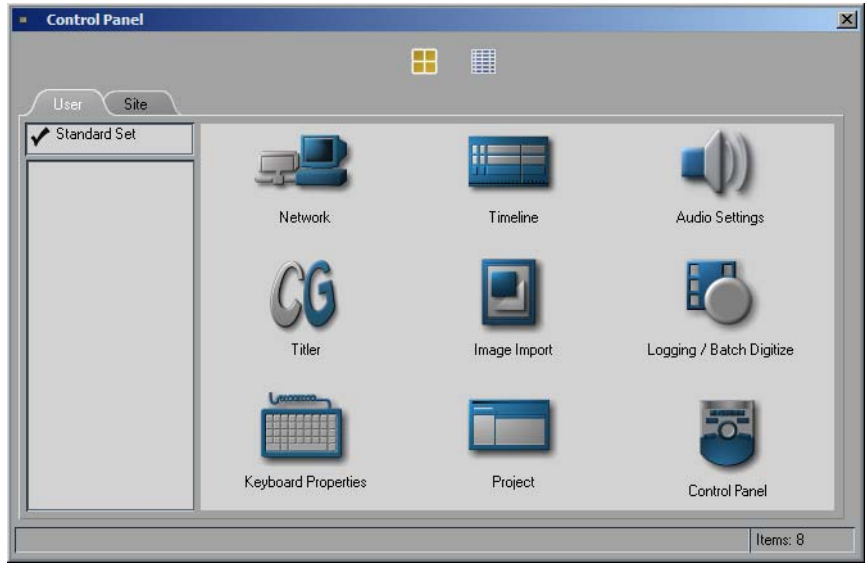
Managing Property Sets

Using *Property Sets*, you can quickly change user settings.

Calling Property Sets

Select *Edit* > *Control Panel*.

The *Control Panel* is used for adjusting the main hardware and software settings. Avid Liquid manages two types of *Property Sets*: *Site* (system-related settings) and *User* (user-related settings). These categories are divided up between the two tabs on the left side of the *Control Panel*. The area on the right side of the *Control Panel* window contains the icons of configurable hardware and software modules (called *Property Items* or modules). To "manage" sets means to create, load and delete them.



Control Panel with tabs and configurable modules (on right)

Available Property Sets

The *User* tab is used for managing *Property Sets* created by logged-in users. In this tab you can save and load the settings for individual tasks, such as logging, raw editing, final editing and audio editing. The *User* tab typically contains the following modules:

- Keyboard Assignments *page 993*
- Key assignments of `Avid Liquid Control` (*page 1000*)
- Project Properties *page 222*
- Timeline Properties *page 357*
- Logging Tool *page 114*
- Graphics import global settings *page 154*
- Audio Settings *page 862*
- Media Management *page 313*
- Network Settings *page 194*
- Titler selection *page 881*

Where are Templates and Property Sets Saved?

Avid Liquid saves *Sets*, *Timeline Templates* and *Project Templates* in certain directories on the system hard disk. Use Windows Explorer or another file management program to access these files if you need to.

- *Timeline Templates* have the "vmf" extension added to the name you saved them under. *Timeline Templates* are saved under: [Avid Liquid program path]...\Templates\.
- *Project Templates* are saved under: [Avid Liquid program path]...\Templates\ "Template Name" \ File name extension: *.template
- *Property Sets* are saved under: [Avid Liquid program path]...\User\ "User Template Name" \ Settings \ "Property Set Name(s)"



Please note that you may have to copy entire folders with all subdirectories in order to have all necessary data. This is more important, for example, with *Project Templates* which have a more complex structure than *Timeline Templates* which only consist of one file.

Creating New Property Sets

Depending on the category under which you want to create the new property set, first select the appropriate tab (*Site* or *User*). Right-click the list box. From the shortcut menu that opens select *New Property Set*. Avid Liquid inserts a set with the temporary name *New Set* into the list box.

Activating Sets

The active set has a check mark in front of its name. Click in front of the set name you want to become active and the check mark moves accordingly.

Close the *Control Panel* to activate the set.

Deleting Sets

To delete a property set right-click the set name and select *Delete*.

Renaming Sets

To change the name of a property set, right-click the name of the set, select *Rename*, type the name required and then press ENTER.

Customizing Toolbars

Many modules in Avid Liquid are equipped with functions and toolbars that you can access with the mouse.

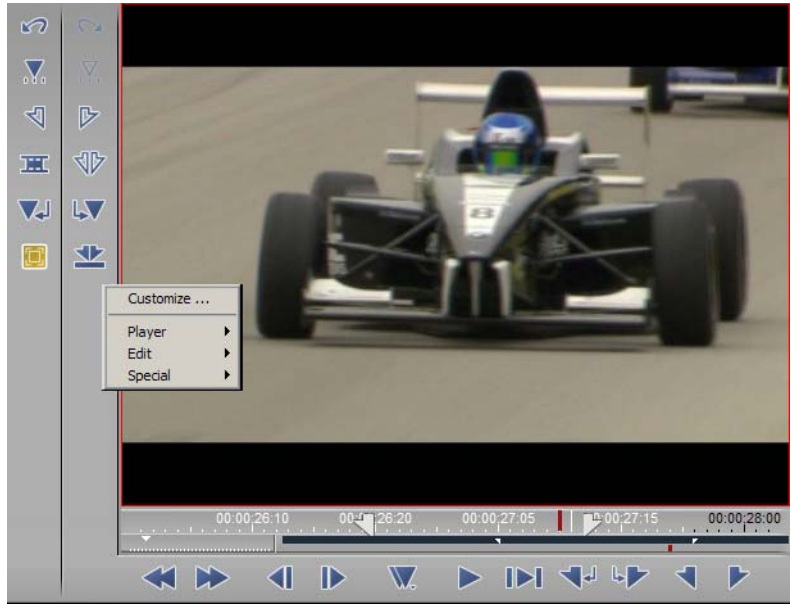
Customizing toolbars

You can define which functions will be included in the toolbars and the order in which they will appear on an individual basis (*page 990*).

Calling tools once

You can call functions that are not often used from the *Customize* menu to execute them once (*page 992*).

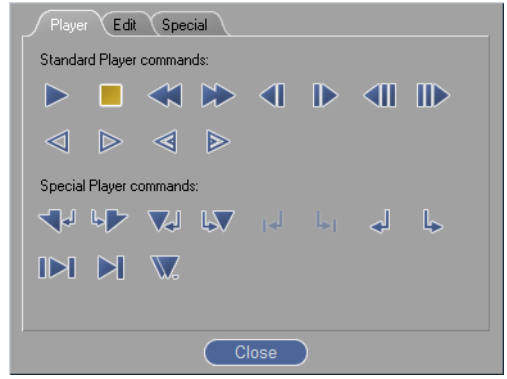
Customizing Toolbars



Customizable toolbars in the Sequence Editor

1 Right-click a toolbar to find out whether it can be customized.

2 In the shortcut menu that appears, click *Customize* to open a dialog box with usually one to three tabs: *Player, Edit* and *Special.* Which tabs appear depends on the software module. The buttons that can be integrated in the particular toolbar you are using are available on the tabs.



Tool box: Player tab with tool buttons

To make changes to a toolbar, the *Customize* tool box has to be open:

3 *Adding Tools*: Drag the buttons from a given tab to the toolbar. The buttons already on the toolbar are shifted to make room for the new buttons.

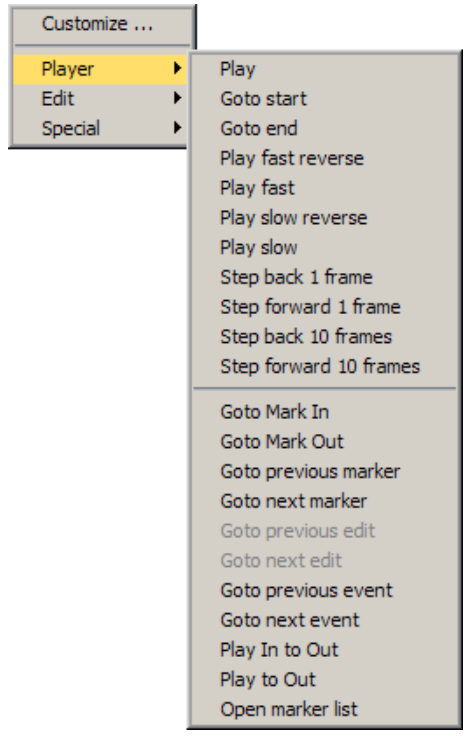
- *Removing Tools*: Drag unnecessary buttons from the toolbar to the box or desktop to remove them from the toolbar; the mouse pointer turns into a *Trash* icon as soon as you are in an area where the element can be safely dropped. Buttons are not deleted - they are always available in the *Customize* box.
  You can even have more than one copy of a button on the toolbar. Every button maintains its function, regardless of its position on the toolbar.
- *Moving Tools*: You can move the buttons on the toolbar as long as the *Customize* box is open. When you click a button, a grey box appears around it, indicating the actual size of the button. This shows you the invisible gaps for spacing buttons.
- *Grouping Tools*: To arrange buttons in groups, slightly push one button against another. This creates a narrow dividing line at the border(s) of this group.
  When you remove a button from a toolbar the remaining buttons move together to fill the gap. The *Special* tab contains gaps of various sizes for creating spaces between buttons.

4 When you are finished arranging the buttons, click *Close*. This saves the changes you made to the current *User Profile* (*page 985*).

You cannot access buttons that are forced out of the toolbar area when you add new buttons. To make room for existing buttons as well as new ones, you may have to remove some other buttons or spacing elements.

Calling Tools Once

Tools that are not often used do not have to be placed on the toolbar to call them once. Click on the right side of the toolbar to open a shortcut menu:



Select the desired function from the list of tools. This function is carried out immediately and only once. A tool symbol is not placed on the toolbar. The first menu level reflects the arrangement of the toolbox in the tab (*Player*, *Edit*, *Special...*).

Assign Functions to Keyboard



In Avid Liquid, you can assign certain functions to certain keys. You can select whether these functions should only be effective in certain modules or whether they should be available everywhere (placed on the *Global Layer*). For example, you can specify that pressing the spacebar always executes *Start/Stop Playback* for the *Timeline* even while you are working in the *Audio Editor*. In addition, you can assign menu commands to keys.

This section covers the following topics:

Assignment layers *page 993*

Selecting modules *page 994*

Removing a function *page 995*

Customizing the Global Layer *page 995*

Key Caps *page 996*

Modifier commands *page 997*

Assignment Layers

There are two types of layers:

- Keyboard shortcuts valid only in modules (*Master Viewer, Audio Editor, Logging Tool* etc.).
- Global keyboard shortcuts which have the same function no matter what module you are in (*Global Layer*). However, if you assign a different function to the same key within the same module, this function takes precedence.

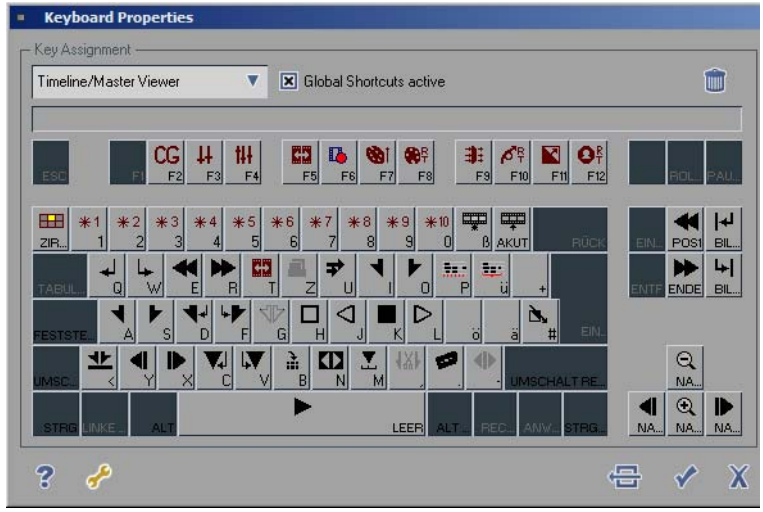
If a key is assigned two different functions, the module-specific function takes priority over the *Global Layer* function.

Selecting Modules

1 Select *Edit* > *Control Panel* > *User* > *Keyboard Settings* to open a dialog box.

2 It is easy to assign keys: To do so, first select from the drop-down menu the software module you want to customize, then simply drag the desired functions from the tool box to the given keys (to open the tool box, click on the wrench icon in the lower left). Assignable keys appear "pushed" when you move the cursor over them. You cannot assign functions to certain reserved keys.
To assign the SHIFT, ALT and CTRL layers, hold down the desired key on the keyboard while placing the function. These software modules can be customized:

- *Source Viewer, Master Viewer, Clip Viewer, Logging Tool, Trim Editor, Record to Tape,* all *Effect Editors*
- The function icons are found in the tabs which vary from module to module.
- Functions executed from a shortcut menu, instead of an icon, are listed at the very right in the tab. When you drag such a function to a key, a "T" appears. The function name is displayed when you place the cursor on the key.
See also *"Key Caps"* on page 996.



Key assignments for modules

Remove Function from Key

To remove a function from a key, click on the key and press DEL (or click on the *Trash* icon). Functions are never deleted permanently - they are always available in the tool box.

Customizing the Global Layer

Global keyboard shortcuts always have the same function, irrespective of what module is currently active.
Important: If a key is assigned two different functions, the module-specific function takes priority over the *Global Layer* function.

You can enable and disable the *Global Layer* in its entirety. To assign global functions to keys, do the following:

1 Select the *Global Shortcuts* option from the drop-down menu on the left.

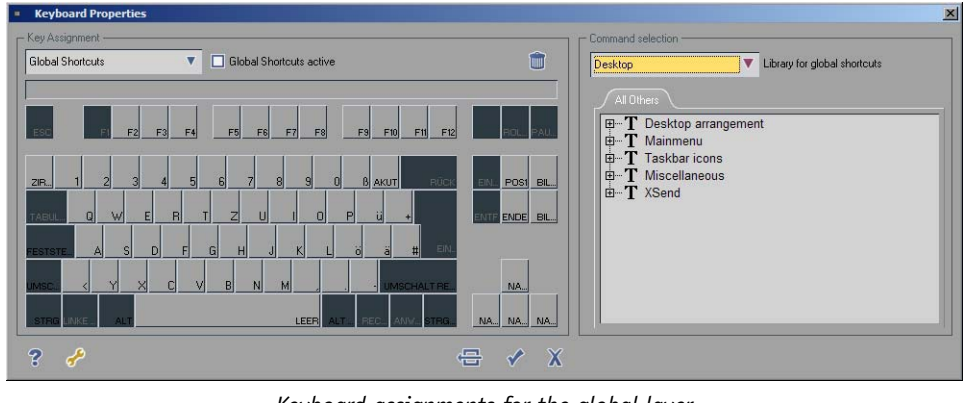
2 Click on the *Global Shortcuts* active checkbox.

3 Click on the wrench icon to open the tool box.

4 From the drop-down menu on the right, select the available modules for global layer functions.

5 Drag the desired functions to the desired keys.

The functions from the various modules are color-coded so you can easily recognize the assignment.



Keyboard assignments for the global layer

Key Caps

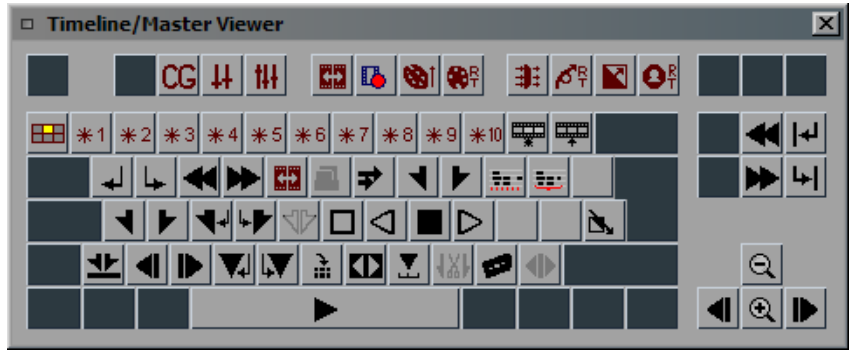


Click on this icon displayed in the right-hand corner of the task bar to open the *Key Caps* window which shows the current keyboard assignments. This window contains a keyboard image with the assignment for the current module.

You can execute functions by clicking on the respective key icon.

Global layer functions are color-coded.

Individual assignments: see *"Assign Functions to Keyboard"* on page 993.

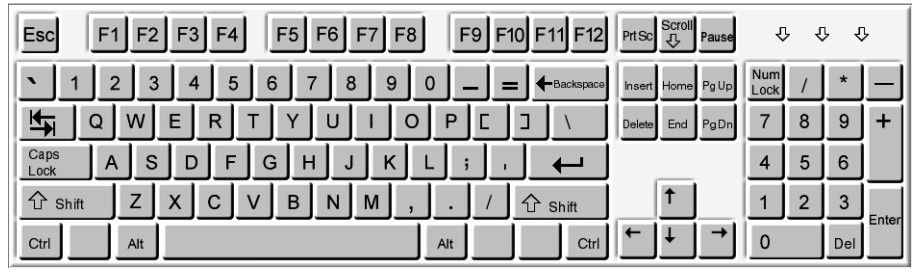


Key Caps window (Master Viewer assignment sample)

Modifiers and Keyboard Shortcuts (Defaults)

The default keyboard shortcuts allow you to activate the most frequently used functions. For example, you can start and stop the playback of video and/or audio clips in any video inlay by pressing the SPACEBAR.

Please note that the keyboard shortcuts are default settings that come with the software. The actual functions may differ from those listed here because it is possible to assign functions to certain keys as described in the previous section (*"Assign Functions to Keyboard"* on page 993).



The US keyboard layout is the reference keyboard for default key assignments

All keys referred to in this manual are based on the above shown keyboard (US keyboard layout).
If you are working with a different type of keyboard, the keys may be labeled differently, but their functions remain the same.
In other words, keyboard shortcut assignments are based on the physical keys and not how they are labeled.

Modifier Commands

Modifier commands are used to switch between different mouse modes. Hold down the indicated key(s) and drag, click etc. the mouse.

NOTE: In Windows the key sequence Alt + Shift is by default used to toggle "Input Locales", i.e., among other things, to switch keyboard layouts. Since some Avid Liquid keyboard shortcuts make use of the very same keyboard sequence, we recommend that you disable that sequence.
To do so, right-click the language symbol next to the Windows taskbar clock. In the Regional Options dialog, click the Input Locales tab, and in the Hot Keys for Input Locales area click Change Key Sequence. Next, disable or change the sequence.
Alternative procedure: Windows Start menu > Control Panel > Regional Options > Input Locales.

Timeline

Actions	Key or Key Combination
Snap object/Playline to closest edit	SHIFT
Drag up/down to zoom in/out	], ARROW DOWN/UP
Scrub audio (toggle on/off)	SCROLL
To copy Track, drag up/down	CTRL
Switch to cursor Edit mode (temporarily)	ALT
Actions (only in edit mode)	
Click objects to select several items	SHIFT
Switch to Scrub mode (temporarily)	ALT

Sequence Editor

Action	Key or Key Combination
Drag clip from Source Viewer	CTRL
Scrub audio (toggle on/off)	SCROLL
Drag Mark-In/ Mark-Out	Alt

Effect Editors

Actions Double-click returns image to original state	Key or Key Combination
Position button selected	
Horizontal movement only	SHIFT
Vertical movement only	CTRL
Size button selected	
Drag up/down to adjust image size	SHIFT
Rotation button selected	
90-degree increments only	SHIFT
45-degree increments only	Ctrl
Border inside tool selected	
Drag up/down to adjust border size	SHIFT
Pick border color from image	ALT
Border outside tool selected	
Drag up/down to adjust border size	SHIFT
Pick color from image	ALT
Shadow button selected	
Drag up/down to adjust transparency	SHIFT
Pick shadow color from image	ALT
Any button selected	
Toggle temporarily to Position tool	SHIFT + CTRL

Keyboard Shortcuts

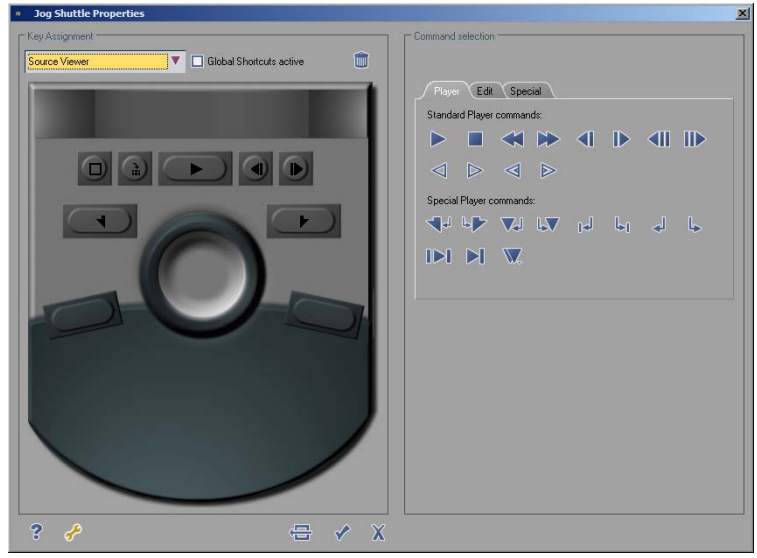
Use Avid Liquid's *Key Caps* function (*page 996*) to obtain an overview of current key assignments.

Avid Liquid Control Assigning Keys



Control Panel

You can access these settings under *Edit* > *Control Panel* > *User* > *Control Panel.*



Dialog Box Customizing: Control

`Avid Liquid Control` is an control panel for remote control of the player/recorder connected. You can assign customizable tools to its keys.
A *Global Layer* can also be defined (just like for the keyboard). See also *"Customizing the Global Layer"* on page 995.

Assign Keys

1 From the menu bar, select *Edit* > *Control Panel* > *User* > *Control Panel* to open a dialog box.

2 To assign functions to the keys, first select a module form the list, e.g. *Timeline/Master Viewer* or *Logging Tool.*

3 Then use the same procedure as for customizing toolbars: simply drag a given function to a particular key.
It is also possible to assign shortcut menu functions to keys. These are represented by a "T".

4 The two lowest keys function as SHIFT (right) or CTRL key (left). Functions can now be assigned to the seven upper keys on two further levels. Keep the SHIFT or CTRL key pressed while assigning functions to the keys.

If you attempt to make an unauthorized assignment, the function you are dragging turns into the *Trash* icon and cannot be dropped on the key.

Glossary

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1080/24p

One of the possible formats within the →DTV standard developed by the →ATSC for the digital broadcasting of TV programs in the US. 1080/24 p stands for the vertical resolution of 1080 lines and an aspect ratio of 16:9.

The addition 24 p determines the image frequency of 24 frames which corresponds to the exact image frequency commonly used in film recording and *Project*ion.

Thanks to 24p systems planned by the industry, it will, in the future, be possible to represent movies without the →3:2 PULL-DOWN used for NTSC at an image rate corresponding to movie pictures on a DTV-compatible home device.

16:9

In contrast to the aspect ratio of 4:3 most commonly known in the field of TV, 16:9 offers a wider picture. Modern TV systems such as →PALPLUS or →HDTV prefer this wider picture.

16:9 supporters state that the wider picture corresponds much better to the human visual field than the almost square ratio of 4:3.

Many recording and post-production devices can nowadays be switched from 4:3 to 16:9.

3:2 Pull-Down

For a movie picture, 24 images per second are usually exposed in the camera and *Project*ed at the same image frequency. This, however, causes problems as soon as the picture is scanned for later video editing, since video systems use different image frequencies.

→NTSC works with 525 lines and 60 fields. The 3:2 pull-down is used during film scanning to receive 60 video fields from 24 film images. 3 video fields are generated from the first film image, 2 from the second, and so on. This results in (12 x 3) + (12 x 2) = 60 fields per second.

4:1:1

The →SAMPLING RATIO used for a video format is commonly indicated as a ratio between a brightness signal (→LUMINANCE SIGNAL,→Y) and the two →COLOR DIFFERENCE SIGNALS (→CHROMINANCE SIGNAL, →R-Y, →B-Y).

In the ratio 4:1:1, values for Y, R-Y and B-Y are generated for each line of the video image. Four times as many Y-values than color values are available. In comparison with the sampling ratio 4:2:2, the horizontal chroma resolution is reduced to 50 %, whilst the vertical chroma resolution remains the same. The video format DVCPRO developed by Panasonic uses the sampling ratio 4:1:1.

4:2:0

The →SAMPLING RATIO used for a video format is commonly indicated as a ratio between a brightness signal (→LUMINANCE SIGNAL, →Y) and the two →COLOR DIFFERENCE SIGNALS (→CHROMINANCE SIGNAL, →R-Y, →B-Y).

In the ratio 4:2:0, the Y-signal is registered in each line, whereas only one of the two color difference signals R-Y or B-Y are registered alternately from line to line. In comparison with the sampling ratio 4:2:2, the vertical chroma resolution is reduced by 50 % whilst the horizontal chroma resolution remains the same. The →DV FORMAT and the DVCAM format, a further development by Sony, as well as MPEG-2 MP@ML use the ratio 4:2:0.

4:2:2

The →SAMPLING RATIO used for a video format is commonly indicated as a ratio between a brightness signal (→LUMINANCE SIGNAL, →Y) and the two →COLOR DIFFERENCE SIGNALS (→CHROMINANCE SIGNAL, →R-Y, →B-Y).

In the ratio 4:2:2, two complete color values consisting of the color difference signals R-Y and B-Y are available for four Y-values each. The chroma resolution of formats using 4:2:2 is twice as high as that of formats with 4:2:0 or 4:1:1. This fact is

of particular importance in →POST PRODUCTION, e.g. when →CHROMA KEYS or →LAYERING is supposed to be carried out.

D9 by JVC, Digital Betacam by Sony and DVCPRO50 by Panasonic as well as MPEG-2 422 P@ML are just some of the formats using 4:2:2.

4:2:2:4

This →SAMPLING RATIO corresponds to 4:2:2 but includes an additional →KEY SIGNAL (→ALPHA CHANNEL) with a →RESOLUTION as high as the Y-signal.

422P@ML

→MPEG

4:4:4

The→SAMPLING RATIO of the→LUMINANCE SIGNAL (→Y) and the two →COLOR DIFFERENCE SIGNALS (→CHROMINANCE SIGNALS, →R-Y, →B-Y) used in a video format or the ratio of color components within the →RGB COLOR SPACE are commonly indicated by a ratio.

4:4:4 means that the three components of the video signal were registered with the same →SAMPLING RATIO of 13.5 →MHZ normally used within the general field of video. 4:4:4 is generally only used for RGB applications.

4:4:4:4

This →SAMPLING RATIO corresponds to 4:4:4, but includes an additional →KEY SIGNAL (→ALPHA CHANNEL) with equally high →RESOLUTION.

5.1 Audio

In contrast to the →STEREO SOUND SYSTEM and conventional →SURROUND SYSTEMS, this sound system offers five separate full band audio signals: Left, middle, right, rear left, rear right. An additional subwoofer channel is also provided.

601

Common abbreviation for →ITU-R 601.

AC-3

→DOLBY DIGITAL

A/D Conversion

Analog-to-digital conversion

Term mainly used to describe components for →DIGITIZING or →QUANTISIZING and refers to a converter which transforms analog signals into digital data. All analog signals have to be digitized for subsequent use by computers. Furthermore, digital data allow lower →GENERATION LOSSES, are reproducible and allow image effects in post-production that would not be possible with analog technologies.

AES/EBU

Is used as a term for a digital audio standard as defined together by the Audio Engineering Society (AES) and the European Broadcasting Union (EBU). An interface for serial transmission of digital audio data has been defined on the basis of these standards. The AES/EBU standards have agreed upon 32, 44.1 and 48 kHz as possible sampling frequencies. Resolution can be up to 24 bits at maximum. Studios usually use a resolution of 16 bits (in special cases 20 bits) and a sampling frequency of 48 kHz (e.g. DAT). This results in a data rate of 768 kbits/s.

Aliasing

General term for disturbing effects that may be caused by sampling frequencies being too low. An example for this is graphical aliasing, the principle of which is simple: Placing two screens upon each other can cause additional, finer patterns than those existing in one of the two screens. Such patterns can have a disturbing influence on the picture.

Temporal aliasing is known from wildwest movies: When a wagon crosses the picture, we oftentimes see the wheels turning backward. Reason: The rotating frequency of the spokes collides with the frequency with which the TV image repeats itself (50 Hz).

Also the undesirable steppiness visible in the case of diagonal or curved lines in computer graphics or along sharp key edges is known as aliasing effect → ANTIALIASING.

Alpha Channel

Alpha channel, in the case of computer-based systems, is the function known as key channel or key level in conventional video technology (→KEYING). Masks can be superimposed on a picture signal, thus enabling different keying tricks such as inserting image signals or executing of →CHROMA KEYING.

One can also say that the alpha channel includes transparency information of a picture file by means of which the transparency between front and background of a picture can be controlled.

Analog

In very simple words one could say that analog processes work with continuously variable values in indefinite intermediate steps, while digital processes only know two states: 1 or 0, yes or no. Continuous phenomena like curves can in fact be displayed continuously in analog technology, while digital technology subdivides these phenomena into sections and disaggregates them into single events.

Analog technology processes and transmits data in the form of concrete physical values (electric flows). The accuracy (→RESOLUTION) depends on the way of physical data storing. Analog data can be invariably changed (e.g. audio/video level).

Analog component signals

→COMPONENT SIGNALS

Animation

Process in which a Sequence of moved images is created by combining different frames. In the case of editing systems, single graphics or titles can be animated to form a moved image Sequence. Two versions, i.e. 2D and 3D animation, exist.

Antialiasing

Smoothing or reducing disturbing picture effects caused by →ALIASING. Filters and →INTERPOLATION are used for this purpose. By means of interpolation, i.e. the calculation of intermediate values along the sharp edges of types and graphics, these edges can be smoothed out, thus generating a smoother picture. The pixel structure along tilted or bent edges is mixed with the surrounding colors, i.e. the transition area becomes a bit "blurry".

API

Application Programming Interface. These pre-defined software interfaces allow communication between different software applications. →PLUG-INS, for example, can be included in the editing software application via API. Also the interplay between editing software and a video board, for example the perfect utilization of effect hardware, is realized via API.

Artefact

In video technology, this term describes visible, disturbing defects in pictures caused by technical limitation. Oftentimes they cannot be described by technical measured variables. Noise signals at object edges or undesired contours in picture sections often occur in picture areas in which smooth transitions should be displayed. Artefacts also often occur in cases where the amount of video data is considerably decreased as a result of high →COMPRESSION RATES. The visible and typical "building block effects" of highly compressed video signals are called artefacts. Also →ALIASING is one kind of artefact.

Assemble

In conventional video technology this terms describes one of the two editing modes that are possible with video tapes. In the case of assemble

edit, all Tracks on the video tape are added free of disturbances at the cutting point, but all Tracks are newly written. The other editing method for video tapes is known as →INSERT EDIT.

ASCII

American Standard Code for Information Interchange.

This standard determines how keyboard characters are stored as digital information. Only 127 characters have been determined, the fact of which causes major problems with special characters, such as Ä, Ö, Ü and ß.

Aspect ratio

This is the ratio between the length and the width of video images. The aspect ratio of 4:3 determined in the PAL, NTSC and Secam TV systems has had the upper hand thus far. The trend towards wider screen formats, which has been evident in cinema for some time now, is also hitting the small screen. More advanced TV systems such as →PALPLUS or →HDTV are banking on a wider screen with an aspect ratio of 16:9.

Those in favor of 16:9 argue that, in comparison with the almost square 4:3 ratio, the wider screen corresponds more to the human visual range. In many recording and post-production devices it is possible to change between the aspect ratios 4:3 and 16:9.

Asymmetrical

Asymmetrical lines are shielded with a single-wire and used, among other things, for transmitting audio signals (cinch). In contrast to symmetrical audio lines, they are more susceptible to disturbances.

ATM

Asynchronous Transfer Mode. A network protocol which was originally designed for the telecommunications market. ATM enables the operation of networks that allow high-speed data transfer. ATM is capable of transmitting digital high quality live video Sequences (→ITU-R 601) or of shifting extremely large files between different work places. It remains to be seen whether ATM will be widely used in the field of video technology. Efforts, however, are already materializing.

ATSC

Advanced Television Systems Committee.

This American body was originally founded to determine standards for creating, broadcasting and receiving High Definition Television (→HDTV). In the US, this body established relevant, technical regulations for digital broadcasting of TV programs via antenna or satellite. In general practice, the terms ATSC and →DTV are used as synonyms for the US version of digital television (in contrast with →DVB).

Audio clip

Digital audio data are often known as audio clips. This is true for audio elements that are placed on the →TIMELINE in the case of editing systems for further processing as well as for wave files (→WAV) that can be intended for completely different uses.

AUX

Auxiliary.

Refers to an auxiliary input. In a video editing system, a channel reserved for connecting an external audio and/or video device.

AVI

Audio Video Interleave.

A data format developed by Microsoft for digital video. AVI is software-based, and the AVI files can be played with the respective software without the help of additional special video hardware. Compressed picture and sound data are interleaved in such a way that they proceed synchronous to one another.

AV hard disks

→HARD DISKS

Background

1) Refers to the background of a key animated scene →BLUE BOX.
2) The second image plane in video mixer panels is sometimes referred to as background.

Background Rendering

→RENDERING.
Background rendering systems may render Sequences without requiring the full power of the computer. The user may continue processing his application while the computer renders in the background.

Bandwidth

1) Bandwidth is the spacing between the upper and the lower end of the frequency range in a signal spectrum or a transmission channel. This applies for magnetic, audio and video tape widths.

2) Bandwidth describes the information quantity that can be transmitted within a defined period of time. If an image is to be displayed or transmitted in great sharpness and resolution of detail, a high bandwidth is required.

Batch Digitizing

If a great amount of original material exists, the material which has a higher compression factor or lower data rate is digitized in the non-linear cut and stored onto the hard disks connected. Although the image quality deteriorates because of the higher compression, it does, however, also require less hard disk capacity for storing the data. After finishing a rough version of the cut, material exists which is not used. The required hard disk capacity of the material to be used becomes smaller and it may be automatically re-digitized by means of batch digitizing at a lower compression rate (or higher data rate).
This process may be repeated as often as desired in case capacities have become available after sorting out image material. It may be that finally the highest image quality of the system is available for the fine cut.
The process of initial digitizing by means of a logging list after sighting and logging the material on the tapes is referred to as batch digitizing. The clips generated in the logging list are also digitized automatically.

Betacam

1/2 inch video format operating with analog component signals.
Luminance and color difference signals are transmitted and recorded staggeredly (time multiplex method). With this method, a significantly improved image quality may be achieved compared to for instance the S-VHS format.
Betacam has been developed through the years to Betacam SP. In this modified system the components are recorded in a frequency-modulated manner.

The luminance component (→Y) receives the higher frequency bandwidth of 5.5 MHz compared to the chrominance components (→R-Y AND B-Y) which are recorded each at 2 MHz each on a separate helical Track.
In order to preserve the recording quality in post production editing over many generations, the component signals must also be processed separately in post production.

Betacam SX

Betacam SX is a digital recording system of Sony, which compresses the data according to the →MPEG-2-STUDIO STANDARD (4:2:2: studio profile) by factor 10:1 and writes it onto tape at a video data rate of 18 Mbits/s.

MPEG-2 enables higher compression factors at equal or improved image quality than other compression methods, owing to the fact that this method combines a plurality of frames when compressing video streams (→MPEG). The other systems, however, compress frame by frame (→M-JPEG).
The formerly used Betacam SX devices may also reproduce analog Betacam SP tapes. With this format

Sony aims at applications in the broadcast market and markets it as a successor of the Betacam SP format widely used by TV broadcasting stations.

B-frame

Bi-directional frame
→MPEG

BIOS

Basic Input Output System
Designation for the automatic "start program" of a computer. It is stored on a separate chip. The BIOS basically controls the access to the microprocessor and prepares the acceptance of commands. A program cannot operate without the BIOS.

Bit

Binary Digit
Basic unit in →DIGITAL TECHNOLOGY. One bit may adopt two states: 0 or 1.

Bit rate

Number of bits transmitted serially per second.

Bit stream

→DATA STREAM

Blackburst

Black signal, burst blanking.

Video signal without luminance or chrominance components (except for bursts), which, however, includes all other elements of a video signal. The black burst is a reference/synchronizing signal which is usually used for timing audio and video samples.

Bluebox

A frequently used type of →CHROMA KEYING, i.e. the color key trick, which is used with blue as key color. A scene is recorded in front of a blue background. The blue portions of the image are keyed and replaced by other parts of a different image (→ALPHA CHANNEL).

BNC

Bayonet Neil-Concelman.
A common plug connection used in professional video technology with an →IMPEDANCE of 75 ohms. BNC plugs are used in both analog and digital video technology.
Some few consumer recorders also have BNC terminals for image display. Using a metal adapter plug, a connection to cinch can easily be established by BNC. This adapter is available both in male and female form.

Broadcast Quality

Although the expression broadcast quality is frequently used, a fixed definition does not exist. Generally accepted measurable variables do not exist.
Usually the tape format →BETACAM SP is selected as reference point: Broadcast quality usually describes the picture quality that the user subjectively considers as being equal to the Betacam SP picture quality.
Also non-linear editing does not include any fixed measured variables to determine the broadcast quality. As a rule, video boards and editing systems with a →COMPRESSION RATE (approx. 1:2) as low as possible or a data rate of approx. 50 Mbits/s are understood by this.

Browser

Common word for a software by means of which Internet or World Wide Web contents can be displayed. Different manufacturers also use program modules for their editing systems which are also known as browsers. They are widely used to display the existing digitized clips, graphics, titles or effects in a simple and clear way. The user can get an overview of the existing material with the help of a browser.

Bus

An internal data pathway for transmitting bit patterns. The access to a

bus is usually microprocessor-controlled. The individual components of a computer communicate via a bus system. Common bus systems in the PC field are: ISA, EISA and PCI.

B-Y

Color difference signal of one of the analog →COMPONENT SIGNALS. It is created by subtraction of the luminance value (Y) from the blue contribution of a pixel. The color difference signal B-Y includes information regarding chrominance and saturation.

Byte

1 byte includes 8 bits and enables registration and reproduction of 256 discrete values (brightness, color).

Capture

Refers to the process of digitizing and recording video and audio material from an external source onto the hard disk of a non-linear editing system.

Carrier frequency

The carrier frequency is a →FREQUENCY used as a carrier in order to transmit other signals. The actual information to be transmitted is impressed on the carrier frequency in accordance with one of many available procedures. This procedure is referred to as modulation (frequency modulation, amplitude modulation, phase modulation).

CCIR

Comité Consultatif International des Radiocommunications. Standardization committee that has absorbed into →ITU.

Chroma Keying

Color key. Video effects technique in which areas of a video picture that appear in a specific saturated hue (color shade) are replaced by corresponding parts of a different video image. Blue is usually used as the key color (→BLUE BOX).

Example: In a studio, anchorpersons are usually placed in front of a blue or green screen into which the changing texts or images are included with the help of the chroma keying technique.

Chrominance

Color, color part, chrominance signal.

Chrominance is the color part (consisting of hue and saturation) of a video signal, while →LUMINANCE refers to the brightness part of a video signal.

Cinch

Most video devices within the field of consumer electronics are equipped with cinch connections for picture and sound output. The yellow jack is necessary for the video signal, the red and white cinch jacks for the audio signal in →STEREO as in- and output.

Clip

Individual video and audio Sequences are often referred to as clips in post production. As a rule, the term clip only refers to the graphical display of images and sound Sequences in the *Project* files or in the →TIMELINE. Since clips are only links to the actual data (Media Files on the hard disks), they can be edited without modification of the actual data on the hard disk.

ClipLink

The ClipLink function developed by Sony includes a bundle of individual functions included into devices equipped with the DVCAM format. ClipLink mainly offers advantages in post production.

Different additional information, such as start and stop time code and picture icons, is stored together with each recorded scene. When Camcorder-recording, an evaluation (NG=no good or OK=good) can be assigned to each take by pressing a button. A specially equipped editing system can read these data, adapt them if necessary and load the takes marked as OK onto the hard disk.

To make use of ClipLink functions, tapes including a storage chip have

to be used in the case of original recordings. Disciplined and careful recording is a prerequisite for efficient use.

Clipping

Amplitude limiting.

1) Digital audio distortion. Digital audio systems exhibit less tolerance to overloading than analog audio systems. If you exceed a certain level, noticeable distortions can be heard. This is particularly important to keep in mind when converting audio signals, for example, from analog to digital or between different digital formats (→A/D CONVERSION). Converters only offer distortion-free operation up to a precisely defined level.

2) The threshold or the setting of a suitable threshold during →KEYING. For example, if →LUMINANCE KEYING is carried out, one has to predetermine up to which luminance value keying is supposed to take place.

Color difference signal

Information regarding luminance and chrominance for each pixel is necessary to create video images. In video technology, this information is commonly sampled in the form of a luminance signal and two color difference signals.

The reason why two color difference signals are needed which together determine one certain color can be explained as follows: Imagine all producible colors within the video system as being a circular area. When positioning a reticule in the middle of this circle, each color (more detailed: each color mode) can be explained as a combination of a value on the x-and y-axis. In common practice, the value pairs U/V, Cr/Cb and R-Y/B-Y are referred to as color difference signals and used as if they all had the same meaning, although this is not true in reality, to be exact. (→YUV, Y, CR, CB and →Y,R-Y,B-Y)

Color saturation

A measurement for determining the intensity of the colors in a video signal.

Color space

Depending on the defined reference points or limits, a color range known as color space can be defined on the basis of the spectrum of all colors existing in nature. To be able to reproduce images as detailed as possible, information regarding brightness and color from the predefined color space is necessary for each pixel to be displayed.

There are various methods for being able to supply this necessary information and to define the color space. One of them mainly used in conventional video processing is the determination of luminance values (→LUMINANCE, →Y) and color difference signals (R-Y, B-Y). The color space defined in such a way is most commonly referred to as YUV color space.

In the field of computer graphics, images are commonly processed within the RGB color space in which all colors are defined as a mix of the three basic colors red, green and blue. The conversion of data from one into another color space is possible but may result in deteriorating quality and errors.

Complete systems

Non-linear editing systems are offered in different versions. A complete system offers all components required for full operation of an editing system with the exception of peripherals such as video recorders. The user receives a completely configured, operable computer system.

Component signals

To display video images, information on brightness and color is required for each pixel. In video technology, this information is commonly sampled by means of one brightness signal and two color difference signals. The three signals are also referred to as component signals.

In analog video technology, the analog component signals →YUV produce the best signal quality. The term YUV is commonly known and used although the correct term for analog component signals is: Y, R-Y, B-Y. Video formats working with component signals are: →BETACAM and MII. Digital component signals are defined by →ITU-R 601 standard. They are created from the analog component signals Y,R-Y and B-Y at a sampling ratio of →4:2:2 and are called Y, Cr, Cb.

Compare: →COMPOSITE.

Composite

Video signals can be coded in various ways: Composite systems process information on brightness and color (→LUMINANCE and →CHROMINANCE) in combination, that means they form one single signal. In →COMPONENT SYSTEMS, chrominance and luminance are separately processed. Composite and component systems are available in analog and digital versions. →CVBS.

Compositing

Simultaneous multi-layering of various focal planes. Compositing is often used for TV trailers, advertising productions or for special effects in feature films. Typical functions required for compositing are →LAYERING and key functions (→CHROMA KEYING).

The better the compositing results are supposed to be, the higher the system requirements. High end applications require 8 or 10 bit signal processing to maintain the quality throughout various generations (→GENERATION LOSSES) and to ensure high-quality chroma keys. The quality of a compositing system also depends on the number of layers, i.e. focal planes that can be simultaneously processed and on how fast the composition can be rendered (→RENDERING).

Compression

Digitization of large quantities of video and film material creates large amounts of data. To be able to process these data with commonly applied computer technology, the data quantities are being reduced by means of compression.

With the help of different calculation operations, one tries to recognize the irrelevant or least relevant information within a picture in order to leave it out. In the case of mild compression, all original data can be restored from the compressed data stream. In the case of stronger compression, picture information is irretrievably lost. The data quantity results in a loss of picture quality.

There are several different compression methods with different efficiency levels. The goal is always to reach an image impression as natural as possible with a minimum amount of data.

The →COMPRESSION RATE is used as a measure for determining the strength of the compression carried out.

Common compression methods are →MPEG, →JPEG, →M-JPEG, DV.

Compression rate

The compression rate indicates the ratio of the original amount of data and the compressed data quantity.

In general, picture quality and storage requirement depend on each other. A low compression rate generates good quality but requires a lot of storage capacity. Increasingly compressed material does not require a lot of storage capacity but offers an impaired image quality. To find a compromise between existing storage capacity and image quality, many manufacturers offer variable compression rates that can be predetermined.

The compression rate of a system, however, is only of limited importance for comparing the quality of different systems with each other. Major differences in picture quality between the images compressed at 1:8 by one system or by another system also offering 1:8 compression can however exist. This is due to the fact that some compression methods work more effectively and produce better results than others.

In the case of →MPEG, one no longer talks of compression rates (e.g. 5:1) based on a different way of data reduction, but of →DATA RATES (such as 25Mbits/s, for example). In general, the relation between image quality and storage capacity is more favorable in the case of →MPEG than in the case of →M-JPEG.

Consolidate

Consolidate is a function included in some editing systems to delete superfluous data that were not used in the current *Project*. The remaining data are written onto the hard disk in such a way that the shortest possible access times are realized (→FRAGMENTATION). The write/read head does not permanently have to be moved between the different sectors, thus making the system faster and more efficient. This is of particular importance when connected storing media with low →COMPRESSION RATES are operated at maximum efficiency.

Control Interfaces

When controlling camcorders or recorders by computer, the interface sockets of these devices are of particular importance. Consumer devices feature the Sony or Panasonic versions of control sockets, if at all. Sometimes they are also incorporated in the devices of other manufacturers.

The Sony version is called LANC or Control L. Two designs are available, i.e. older devices feature a 5-pole special connection, while most of the newer devices have a 2.5-millimeter stereo jack connection.

For device control, Panasonic are banking on a special five-pole edit jack mainly referred to as Panasonic Edit. However, this jack is not compatible with the old five-pole LANC terminal. The synchro-edit jack, which is also supplied by Panasonic, is not suitable for the control of the devices by the computer.

Most of the software program manufacturers attach special cables to their programs, with which the video devices can be remotely controlled by the computer. On the computer side, they fit into the serial port in most cases, while, on the video side, they fit the Sony LANC or Panasonic Edit jack.

In the professional area, the →RS-422 and →RS-232 interface generate the control contact between the computer and video worlds.

Conversion of Standards

The conversion of standards refers to the process of converting video signals from one TV standard to another. The fundamental differences between the various TV systems (PAL, NTSC, Secam) lie in the number of lines, the color transmission and the carrier frequencies. The conversion of standards is implemented with special devices, whereby high levels of technical expenditure are required in order to achieve optimum results.

Copying losses

→GENERATION LOSSES

Cr, Cb

→Y, CR, CB

CPU

Central Processing Unit or central microprocessor. The hardware core or "switching center" of a computer. The CPU converts the commands of a program and coordinates the necessary actions. For the CPU, video images are only a Sequence of data (→RENDERING). The CPU receives the data from the internal memory (→RAM) and returns them to the internal memory after having calculated them.

Cross Color

The "flickering" or "shimmering" of certain colors in video images. Cross color disturbances often occur in video images with fine black-and-white structures. In this case, high frequency black-and-white information is wrongly interpreted as chroma signals by the processing electronic unit.

Cross color effects are particularly visible in →COMPOSITE SYSTEMS and sometimes also linked to the signal mode (→CVBS) and the TV system (→PAL).

The effect is often visible in the case of checked patterns on cloth. Such fine structures which represent high bandwidth frequencies change slightly in amplitude and phase from line to line.

CSDI

→SDTI

CTL

Capstan TRacking Logic.

In the case of video magnetic tape recording one has to make sure that the individual Tracks are accurately hit when playing. Synchronous pulses are recorded image by image on a separate Track of the video tape in the case of many video formats. They control the tape velocity. These pulses are referred to as CTL or control Track. The CTL Track does not include any absolute time information and is not a →TIMECODE such as →LTC or →VTIC. By counting the individual pulses (with the tape counter) the CTL can calculate a relative tape position used for calculating a relative time information. This is how the counters of most home video devices work.

Cut

Transition from one scene to another. Linear editing by means of magnetic tape is subdivided into →ASSEMBLE and →INSERT EDIT. Most non-linear editing systems offer two different options, i.e. the user may choose whether he wants to replace or move the scene at the registered editing point.

CVBS

Color Video Burst Signal.

CVBS

Color Video Blanking Synchronous signal.

All components of a standardized analog video signal in the PAL standard are combined to form one single component that can be transmitted by means of a simple laminated coax. The only problem are the crosstalk effects between the individual signal components that result in typical quality impairment. In professional post-production, CVBS signals are not used anymore, as a rule. In transmission technology where places far apart have to be cable-connected, CVBS signals are sometimes still used for economic reasons. CVBS is also referred to as →COMPOSITE SIGNAL.

D1

A format for digital video tape recording in the case of which digital →COMPONENT SIGNALS according to →ITU-R 601 are recorded on a 3/4" (19 mm) wide oxide tape without data reduction (8 bits, →4:2:2). Four digital audio channels are available. The maximum recording time of D1 tapes is 94 minutes.

D1 devices are among the most expensive video recorders and are mainly used in high end post production or archiving due to their extraordinary recording quality. Sony and BTS (Philips) offer D1 devices.

D2

A format for digital tape recording in the case of which digital →COMPOSITE VIDEO SIGNALS as well as four sound channels are recorded on a 3/4" (19 mm) wide metal tape. The analog composite signal is quantisized at 8 bits. The maximum recording time of a D2 tape is 208 minutes. D2 is not compatible with D1. Sony and Ampex were able to establish D2 as high end tape format in the United States at a point in time when the video industry still mainly worked with analog technology. D2 has not been officially, but de facto discontinued.

D3

A format for digital tape recording in the case of which one digital →COMPOSITE SIGNAL with four sound channels is recorded on a 1/2" (12.7 mm) wide technical pure iron tape. Quantization is at 8 bits, the maximum recording time of tapes is 245 minutes. D3 was developed by Panasonic and is the rival product of D2.

D5

A format for digital tape recording in the case of which digital →COMPONENT VIDEO SIGNAL with four sound channels is recorded on a 1/2" wide technical pure iron tape according to →ITU-R 601. In contrast to D1, the signals are quantisized at 10 bits. The D5 format developed by Panasonic works without data reduction and is thus preferably used in post production. The maximum recording time per tape is 123 minutes.

D6

A format for digital tape recording in the case of which a digital →HDTV component signal as well as 12 audio channels are recorded on an 3/4" (19 mm) wide technical pure iron tape. D6 is based on a D1 drive. The D6 format was developed by BTS (Philips).

D7

Official name under which the →DVCPRO recording format developed by Panasonic is standardized.

D8

In general practice, this abbreviation is becoming the short form of the video tape format →DIGITAL 8 developed by Sony. D8, however, is not a format name adopted, determined and accepted by international standardization bodies.

D9

Digital video tape format by JVC which was initially marketed under the name Digital S. D9 records on High Density MP (Metal Particle) 1/2" (12.7 mm) wide metal tapes. The Track width of D9 is 20 mm. D9 works with 4:2:2 signal processing and compresses the image material on the basis of DCT (Discrete Cosine Transformation) at a factor of 3.3:1. Two Tracks are always written simultaneously. One frame consists of 12 adjacent diagonal Tracks in the individual segments of which video, subcode and up to four PCM audio Tracks are located. Moreover, the tape includes two cue audio Tracks and one control Track (→CTL). The video data rate amounts to 50 Mbits/s, the total digital data rate written onto the tape including the audio data, the subcodes and the error control amounts to 99 Mbits/s. The tape run velocity of D9 is 57.8 mm, the maximum recording time is 104 minutes. In the case of D9, the sound is sampled at 16 bits and 48 KHz and written onto the tape as PCM sound in an uncompressed way. Four channels are provided for this purpose. D9 was developed by JVC and is currently only available from this manufacturer.

D/A conversion

Digital- to- analog conversion.

Term mainly referring to components for converting digital into analog signals. Digital signals must be converted into an analog format to enable presentation on a video monitor. D/A conversion is also necessary for producing non-linear digitally edited films on an analog video tape format such as →BETACAM SP. Many devices, such as digital video recorders emit digital as well as analog signals.

DAT

Digital Audio Tape.

Recorder for digital sound recording with a sampling frequency of 48 KHz and a resolution of 16 (20) bits. →AES/EBU.

Data compression

→COMPRESSION, →DV, →MPEG, →M-JPEG.

Data rate (data stream)

Amount of data transmitted in a certain period of time, usually indicated in Mbits/s. In comparison with →M-JPEG which indicates the →COMPRESSION RATE, →MPEG indicates the data rate value. This value determines the dimension of the applied data reduction.

Data recorder

Recorders that enable recording and playing of digital data by means of a magnetic tape. Data recorders are generally used for archiving digital data permanently as well as for backup purposes.

There are, however, also data recorders that are used in video technology, for example in the field of server technology or archiving of transmitted TV programs. Additional coder/decoder to transfer mere data into displayable video signals are however necessary. Different drives and formats such as →DST and →DLT are used.

dB

Logarithmic unit for measuring the physical signal strength (voltage, power, sound).

DCT compression

Discrete Cosine Transformation

DCT is a standard method for compressing digital video images. It serves as a basis for many data reducing methods. →JPEG, →DV and →MPEG depend on DCT.

DCT format

Digital video tape format where digital component signals as well as four sound Tracks are recorded. DCT functions with a 3/4" (19 mm) wide technical pure iron tape with a maximum recording time of 190 minutes. DCT was developed by Ampex and is today applied in the form of →DST →DATA RECORDERS.

DDR

Digital Disk Recorder →DISK RECORDER.

Digital

In simple terms, one could say that digital processes only know two states: 1 or 0, yes or no. Continuous phenomena like curves are subdivided into sections and disaggregated into single events.

Digital technology processes and transmits data as information packages. In contrast to analog systems, digital data can be identically presented and stored (light, electricity, characters, magnetic particles) in different media (data carriers). The accuracy of presentation (resolution) is independent of the medium. A large quantity of data is necessary for high-quality signal processing. Since digital technology uses mere numerical values, the large amount of data can be reduced with the help of suitable mathematical methods (→COMPRESSION).

Digital component signals

→COMPONENT SIGNALS.

Digital 8

Digital vide tape format used for recording →DV-coded digital image and sound data on Hi8 tapes instead of DV tapes. Besides the width of the tape material (8 mm for Digital 8, 6.35 mm for DV) Digital 8 differs from DV in that it only requires six Tracks for one image due to the used 8 mm tape (DV: 12 Tracks). Like DV, Digital 8 records the sound either at 12 bits/32 kHz (4 Tracks) or at 16 bits/48 kHz (2 Tracks). Digital 8 devices are currently only sold by Sony and can play Hi8 and Video 8 cassettes.

Digital Betacam

VCR format for digital components with 10 bits resolution. Digital Betacam makes use of a data compression of 2:1 (→DCT-based). Digital Betacam records on a 1/2" (12.7 mm) wide technical pure iron tape.

Individual recorder models in the Digital Betacam format can also play SP. Digital Betacam was developed by Sony.

Digital recorders

Video recorders that record digital signals on magnetic tapes.

Digital S

→D9

Digitizer

Video board that offers connections for analog video signals and converts them into a digital format for further processing by PC.

DIN four-pole

Video device in S-VHS or Hi 8 tape format as well as S-Video-suitable monitors and other accessories generally include a DIN four-pole jacket, also known as 4-pole-mini DIN jacket. The manufacturers refer to this jacket as S-Video or →Y/C on their devices. The corresponding cables transmit the luminance and chrominance signal separate from one another, thereby making use of the increased picture quality of these devices even when transmitting from one device to another device or monitor.

DIN six pole

Older audio devices are still equipped with a six pole DIN socket. Adapters and cinchs are available for them. This enables a connection of older devices to modern audio cards.

Disc recorder

Disc recorders are recorders that store image and sound on a hard disk instead of a magnetic tape. Depending on the manufacturer, the digital image and sound data are recorded either in an uncompressed or compressed way. As with non-linear editing systems, the manufacturer of disc recorders make use of different compression methods. As a rule, disc recorders are used as stand alone devices, but there are also board-only solutions by means of which a PC can be transformed into a disc recorder.

Dissolve

Transition from one picture Sequence to the next. In an analog cut, the video level of the first picture Sequence is reduced while the level of the second picture Sequence is increased to the same extent. In the picture, the picture contents are superimposed and a soft transition between the scenes is created.

DLT

Digital Linear Tape.

DLT tape drives are used for storing and archiving of digital image and sound data. They enable fast access and storage times but are more expensive than other tape drives.

Dolby

Dolby is a method for reducing noise in analog magnetic tape recording. There are different methods (Dolby A, B, C, SR) aiming at different requirements of professional technology and consumer electronics.

Dolby Digital

Dolby Digital is a digital multichannel sound method. The individual channels are clearly separated from each other. Dolby Digital stores five separate channels as well as an additional woofer effect channel (LFE). The data are coded according to the AC-3 method (audio coding-3). Dolby Digital enables constant data rates between 64 kB/s up to 640 kB/s. This method is for example used for DVD, but also for laser disk or cinema.

Dolby Surround

Dolby Surround is an analog multichannel sound system that includes four sound channels (right, left, middle, surround)

Drive

General term for component groups or complete devices including movable elements. The part of a video recorder threading up the tape or playing it is for example referred to as tape drive. Also devices by means of which CDs, disks or other removable storage media are played as well as →HARD DISKS and →RAIDs are referred to as drives.

Drop Frame Timecode

A type of →SMPTE TIMECODE designed to mach clock time for NTSC exactly. The technical background of this special timecode: NTSC does not work at a frame frequency of 60, but of 59.94 Hz. This value corresponds to 29.97 frames per second rather than 30, the fact of which causes problems during timecoding. The 0.03 frames missing per second add up to form complete frames and cause a difference between timecode value and number of frames. This problem is technically solved by applying the drop frame method. Two frames per minute are simply left out. The time difference that would otherwise occur is eliminated by applying this method. NTSC video recorders or timecode boards usually offer the possibility to work in drop-frame or →NON-DROP-FRAME MODE.

DST

Digital Storage Technology.

DST is based on the DCT format developed by Ampex. DST is frequently used in high-end post production as a backup medium.

DTV

Digital Television.

Combination of various digital signal formats used in the US as a standard for broadcasting digital TV programs (terrestrially, i.e. via antenna or satellite). DTV allows various quality steps and signal variations.

Determining values within the US DTV-standard are: number of →LINES and →PIXELS, →ASPECT RATIO and →IMAGE FREQUENCY. It is also taken into consideration whether images are broadcast in →INTERLACED MODE (→INTERLACED, I) or simply line by line (→PROGRESSIVE, P). The detailed technical regulations for DTV were developed by the Advanced Television Systems Comittee (ATSC). In general practice, the terms →ATSC and DTV are widely used as a synonym for the US version of digital television (in contrast with →DVB).

The US has developed first products that meet all DTV requirements.

In the medium run, DTV is supposed to be introduced as a substitute for the broadcasting standard NTSC all over the United States.

DV

Digital VCR format for recording digital sound and image data on a 1/4" (6.35 mm) wide ME (Metal Evaporated) tape. The DV format enables 8-bit recording and compresses the data by factor 5:1. A mathematical method referred to as discrete cosine transformation (→DCT) is used for this purpose. The irrelevant information within a frame is recognized and left out with the help of DCT and other computer operations. Moreover, the luminance and chrominance portions of the image signal are not sampled at →4:2:2 but at 4:2:0 (PAL). In the case of NTSC, DV is carried out at 4:1:1. The chroma resolution is a bit decreased for the sake of saving data information.

DV functions at a video data rate of approx. 25 megabits per second (abbreviated as Mbit/s or Mbps). The Track width of the tape is 10 mm.

The sound remains uncompressed and can be two-channel recorded with 16 bits and 48 KHz. Some devices also enable recording with four sound channels. Recording is carried out at 12 bits and 32 kHz. DV devices use the ultra-compact mini DV tapes (with a running time up to 60 minutes in standard play) or

the bigger standard tapes (up to 270 minutes at max.). DV was originally intended for the consumer market, but proved to be absolutely suitable for DV professionals for acquisition purposes.

D-VHS

Digital tape format with which for example coded digital TV signals (→DVB, DTV) can be recorded directly. The idea of a D-VHS recorder can be summarized in simple terms: the recorder simply writes all incoming data to the tape. The respective decoder then decodes the data during playback. D-VHS recorders are planned to be able to play back VHS tapes.

Market introduction of this format developed by JVC and presented in 1995 for the first time was repeatedly delayed due to the unclear situation regarding digital broadcasting standards and due to copyright problems.

DVB

Digital Video Broadcasting

DVB includes a packet of features for broadcasting programs via a digital, terrestrial network. DVB is the European equivalent of the American →DTV.

DVCAM

Digital video tape format. DVCAM is based on the →DV FORMAT and was developed by Sony. Sony changed a number of DV parameters for the DVCAM format. 4:2:0-sampling and data reduction by means of DCT was maintained, the Track width, however was increased to 15 mm. The tape speed is higher (28.2 mm/s) which results in shorter playing times compared with DV. Depending on the cassette, they are 12, 64, 124, 164 or 184 minutes. DV uses metal evaporated (ME) tapes. DVCAM devices can also play DV cassettes.

DVCPRO

Panasonic developed the digital video tape format DVCPro on the basis of the →DV FORMAT. The technical data of the DVCPro standard are similar to those of DV. There are, however, some differences: DVCPro uses a Track width of 18 mm. Tape speed is 33.8 mm/s, i.e. almost twice as fast as in the case of DV.

Moreover, DVCPro works with other tape material, i.e. metal particle tape. Other differences to DV: The sampling ratio of DVCPro was determined at 4:1:1 and not at 4:2:0. In doing so, the developers are trying to reduce vertical chrominance errors that appear as color smears after repeated copying in DV. Also the DVCPro Track frame looks different than in the case of DV: DVCPro records an additional →CTL and a cue margin Track. The CTL Track has advantages for linear editing, since shorter preroll times can be realized with equal or even better editing accuracy. The cue Track serves as an additional analog sound Track enabling the operator to hear the playing sound of a video recorder in jog and shuttle mode.

DVCPRO50

The digital vid eo tape format DVCPro50 was developed by Panasonic on the basis of →DVCPRO. It differs from other →DV FORMATS in that signal sampling is 4:2:2 and that the video data rate corresponds to 50 Mbits/s.

For enhanced signal sampling quality and higher data rate, the tape is played at double speed, thus reducing the running time per cassette by 50 % in contrast to DVCPro. DVCPro50 in the PAL version records 24 Tracks per frame, i.e. twice as many helical Tracks as DVCPro. DVCPro50 provides four instead of two digital audio channels for sound recording. They enable a resolution of 16 bits/48 kHz.

DVD

Digital Versatile Disc.

Digital optical storage medium in the form of an →OPTICAL DISC. The abbreviation was formerly used for the term Digital Video Disc, but was renamed later into Digital Versatile

Disc to emphasize the variety of possibilities of this disc.

The outer dimensions of the DVD correspond to those of an audio CD: diameter: 12 cm; 1.2 millimeters thick.

DVD is characterized by its high storage capacity. It can be manufactured in various ways. The maximum version includes two layers on each side on which the data is stored. In this version the DVD can store 25 times as much information as the corresponding audio CD. One could, by making use of modern technology, manufacture audio discs with a playing time of 30 hours.

Feature films in good, digital image and sound quality can be stored on a DVD (→DVD-VIDEO). DVD is also suitable as a storage medium in the field of computers.

Here, the DVD is used as →DVD-ROM and →DVD-RAM. The DVD-RAM, however, is based on a different storage method than all other DVD standards. For this reason, DVD-RAM is not compatible with DVD-ROM or DVD-Video, which means that it cannot be played back by means of Consumer Electronic players, thus reducing the use of DVD-RAM exclusively to the use as a mass storage medium in the computer sector. The DVD format enables construction of downward-compatible devices. DVD home devices can therefore also play audio CDs, DVD-PC-drives can play additional CD-ROMs. The existing CD stock can therefore be used for other purposes.

By including an number of refinements within the manufacturing and playing process, the storage capacity of the basic version of a DVD (single-sided, single storage layer) was enhanced by factor 7 in comparison with the CD. The functions, however, remained the same. The reached capacity of 4.7 GB will be enough for most applications in the following years (→DVD-5). A feature film with a running time of 133 minutes can be stored on such a disc in various language and subtitle versions in the best picture quality nowadays available for consumers. (More than 500 lines horizontal resolution).

Since it has to be expected that the demand for storage in the field of computer applications will increase even further in the future, the developers have integrated additional extension features. The maximum capacity is reached at 17 GB (→DVD-18).

DVD-5

Single-sided, single-layer DVD on which a maximum of 4.7 GB of data can be stored.

DVD-9

Single-sided, dual-layer DVD on which a maximum of 8.5 GB of data can be stored.

DVD-10

Double-sided, single-layer DVD. Offers a maximum storage capacity of 9.4 GB.

DVD-18

Double-sided, dual-layer DVD which offers a maximum storage capacity of 17 GB.

DVD-R

DVD-Recordable.

A variant of of the Digital Versatile Disk which can be written once. A DVD-R is a preform and corresponds to an empty tape in terms of functionality. The DVD-R can be written by a PC in the formats DVD-Video, DVD-Audio or DVD-ROM. Generally, it should be possible to play back a recorded DVD-R with DVD-drives of your PC and - in the case of DVD-Video formatted versions - with DVD players. This, however, causes some problems from time to time, in particular with first generation devices. The maximum storage capacity of a DVD-R is 3.9 GB, next-generation DVD-Rs, however, will have a storage capacity of 4.7 GB.

DVD-RAM

DVD-Random Access Memory.

A DVD-RAM basically differs from a DVD-ROM in that both formats are not compatible with each other. This fact can be seen with the naked eye: the DVD-RAM is delivered in a housing referred to as "Caddy" and looks more like a large diskette. A DVD-RAM can be written and later deleted. It offers a maximum storage capacity of 2.6 GB on both sides. It can be read and played-back exclusively with DVD-RAM PC drives. Since DVD-RAMs can be written and deleted, they are perfectly suitable as a fast and large exhangeable storage medium. DVD-RAM drives can also play DVD-ROMs if they are inserted in a caddy.

DVD-ROM

DVD-Read Only Memory.

A DVD-ROM is not manufactured as a preform and recorded later, but is copied from a matrix similar to a record or audio CD. The already recorded or written DVD leaves the manufacturing site and can, under no circumstances, be written later. The DVD-ROM can include any kind of data and is therefore mainly used as a computer storage medium. It can be compared with a CD-ROM, but offers increased storage capacity. DVD-ROMs will soon be available in all DVD-storage versions (DVD, DVD-5, DVD-9, DVD-10, DVD-18). As a rule, DVD-ROMs include PC data, such as softwares or data bases. It is, however, also possible to save video data on a DVD-ROM. A DVD-Video is basically only a special version of the DVD-ROM. DVD-ROMs can be played back with PC-DVD-drives.

DVD-Video

Digital Versatile Disc-Video.

One possible →DVD FORMAT. Common especially in the field of home entertainment with movies as content. According to plans, the DVD Video will replace the recorded VHS tape in the near future. Compared with a VHS cassette, the DVD not only offers enhanced image quality, but also several additional features: the sound on a DVD-Video can be set to different languages, and subtitles in even more different languages can be integrated. The same video Sequence can be located on the disk in different camera positions. The user can then select the desired sound, fade-in subtitles and switch between the different camera positions. All these functions can be realized, but are only partly used in the case of current DVDs.

In the case of DVD-Video, the picture material is coded according to MPEG-2 (MP@ML), thus realizing data rates of up to 9.8 Mbps. As a rule, only data rates between 2 and 8 Mbps are used. A motion picture with a duration of approx. 135 minutes can be stored on a →DVD-5 in this quality. The standard provides DVD-variants for which video material is coded with a reduced resolution (according to MPEG-2 SP@ML and MPEG-1). These versions are suitable for DVD applications that require storage of a maximum of material.

The sound for DVD-Video can be stored in different formats. It is generally possible to store the sound on a DVD as uncompressed →PCM SOUND (up to 24 bits/96 kHz) or uncompressed audio format (→DOLBY DIGITAL AC-3 or →MPEG-1 Layer 2 MP2). A DVD-Video has to offer at least one of these formats.

Right after the introduction of DVD, the US and Europe disagreed on the question in which format the sound was to be stored. The NTSC countries soon chose Dolby Digital (AC-3), whereas the PAL countries concentrated on MPEG. Meanwhile both formats are allowed in Europe, and both compression standards are also supported in NTSC countries.

DVE

Digital Video Effect.

Abbreviation for digital video effects or device for generating them.

DVTR

Digital Video Tape Recorder

→DIGITAL RECORDER

EBU

European Broadcasting Union.

Organization of European broadcasting stations located in Geneva. The EBU submits standardization proposals to the →ITU-R.

Edit Decision List (EDL)

The EDL (Edit Decision List) is a list, in table format, of the cutting data of the film in the form of timecode values. The EDL is generated automatically during editing by many editing systems and can be saved to a disk. When working in off-line/on-line mode, the editing decision list is of vital importance: The EDL generated in →OFF-LINE EDITING is read into the →ON-LINE SYSTEM as a basis for the final cut. The problem inherent in this process is that while the EDL contains all of the timecode values required for post-editing, it does not include any information about effects, color corrections, sound level settings or similar items of information. Hence, inserting a diskette containing the EDL into the on-line editing control is generally not all there is to on-line editing; instead, effects and picture corrections must be reproduced. There are various EDL formats such as Sony, CMX and CVG which can, however, be converted to one another by means of appropriate software tools.

EDL

→EDIT DECISION LIST

Elementary Stream

→MPEG-2 data streams can consist of different components. If video and audio data are saved and handled separately, the data stream is referred to as Elementary Stream which is, among other applications, also suitable as a source for DVD-Authoring Systems. Video and audio linked to each other in bundles is referred to as →PROGRAM STREAM which is also used in the case of →DVD-VIDEO.

Embedded Audio

Audio signal included in a digital signal like the →SDI SIGNAL.

ENG

Electronic News Gathering. This term is nowadays mainly used for describing the shooting of short news reports with teams consisting of one or two members. The equipment used for this purpose is easier to handle and more robust than studio equipment.

EQ (Equalizer)

The loudness of certain frequency ranges can be selectively increased or decreased by means of an equalizer.

Ethernet

Standardized network that can be used with different data rates. 10 Base-T and 100 Base-T (100 MB/s) are the most common ones. Gigabit-Ethernet is supposed to handle even higher data rates of 1000 MB/s and is currently being developed and refined.

Fader

Slider control of electronic devices such as audiomixers, amplifiers and recorders by means of which the amplitude of a signal can be invariably changed. This traditional user element is often displayed in graphical software interfaces.

Fade to black

The video amplitude is slowly reduced to zero, the picture content in the end position is uniformly black.

Fiber Channel

Fiber Channel was developed as a serial interface specifically designed for transmitting extremely large quantities of data. Fiber Channel includes quite a few standards and can be applied in various ways:

Point-to-Point, Arbitrated Loop (AL) and Switched Fabric.

Point-to-point is specifically suitable for direct high speed connections, for example between a workstation and a disk array. By means of Arbitrated Loop (AL), up to 126 devices can be loop-connected, thus enabling data rates up to 200 MB/s. The third possibility is a distributor known as Fabric by means of which large quantities of data can be transmitted in the GB area via Fiber Channel.

Field

Each video image displayed by interlacing comprises two fields. One field of a video image includes all uneven lines, the other one the even lines. →PROGRESSIVE SAMPLING does not know any fields.

Field Sequence

Each PAL video frame (→FRAME) consists of two fields. When editing, one has to pay attention that - explained in simple terms - the right Sequence is adhered to. Each first and second field has to follow alternately, and the two first fields may not be edited successively.

It becomes even more intricate when working with composite signals. Based on technical circumstances that we will not explained in detail, only every eighth field is identical in technical terms. Precise operation to avoid potential problems requires editing of this signal at a certain point and not at any given point, which means that the editing point has to be displaced by up to seven fields from the desired location. This is of course an obstacle for creativity and results in the fact that no editors in the professional, creative sector use composite signal editing any longer.

Component video signals are not subject to such restrictions and allow editing any field boundary.

File Server

→SERVER

FireWire

→IEEE 1394

Fragmentation

Changing, partial deletion or completion of existing data on a →HARD DISK leads to increased hard disk fragmentation. The created gaps between the sectors are written on over and over again. Linked →CLIPS or files are subdivided into individual parts on the hard disk and recorded across numerous, incoherent disk sectors. The read head of the hard disk has to be repositioned during reading of a clip, thus constantly crossing the complete disk radius in the worst case. This takes time, leads to reduced disk velocity and to interrupted rendition, all of which should be avoided. Certain service programs should therefore be used to regularly defragment the hard disk to optimize the reading velocity.

Frame

Each video frame in PAL standard is composed of 625 picture lines and divided into two subsequent →FIELDS. PAL works with 25 frames per second. The first field contains the uneven, the second one the even lines. The division into fields is intended to represent pictures to the human eye in such a way that flickers are almost absent. In addition, it leads to a frame rate of 50 Hz with PAL, at which the human brain does not perceive the frames as individual ones but as a continuous Sequence instead.

Frame rate

In motion picture and video technology this is the frequency with which picture information is renewed on a screen within one second (measured in →HZ).

Minimum frame rates of 50 Hz are necessary in order to achieve a flicker-free picture on a monitor. Computer monitors generally work with a repeat frequency of 75 Hz or more.

Frame Buffer

Digital storage for individual video frames, generally offered as a component of →TBCs or →STANDARD CONVERTERS only.

Framestore

→FRAME STORAGE

Freeze

If a video recorder is switched to pause during playback, it outputs a freeze frame. In the freeze frame signal, the data of the same individual picture is output in a continuous Sequence. Naturally it is also possible to read out freeze frames from a memory (frame buffer).

Frequency

The number of oscillations within a certain period of time measured in →HZ. Since the video sector mainly works high frequencies, the abbreviation MHz meaning Megahertz is very common. Frequency indications are often used in video technology for various purposes, e.g. for determining bandwidths, sampling rates and carrier frequencies.

FX

Abbreviation for effects. It is used in various different fields, of film and TV production.

In post production, the FX is commonly referred to as a general term for any kind of image manipulation such as wipes and keying effects, 3-D image manipulation, color variations etc.

GB

→GIGABYTE

Generation losses

Generation losses are any kind of quality impairment caused by duplicating material. Every recording or re-recording causes a degradation in terms of signal quality. Generation losses are clearly visible in analog magnetic tape recordings.

Digital systems, however, that use compression, may also cause such losses. Realization of elaborate digital tricks by making use of various effects may lead to →SEQUENCING of various compression or decompression steps. If the same picture material is compressed and decompressed over and over again, a loss in picture quality becomes visible as a result of rounding errors after a few generations. This digital recording loss is higher, the higher the compression factor. Digital duplication losses are usually of no importance in normal editing without multiple effect levels.

Gigabit Ethernet

→ETHERNET

Gigabyte

Measuring unit for data quantity. One gigabyte corresponds to 1 024 megabyte. This value is a result of the computing tradition to count by power of two: 1GB=210MB=220kb=230bytes=1, 073, 741, 824 bytes.

Many manufacturers nowadays have do no longer work with this traditional binary system and are using the decimal system instead in which one gigabyte corresponds to 1, 000, 000, 000 bytes.

GOP

Group of pictures

→MPEG

GPI

General Purpose Interface.

Interface that creates simple start/stop commands. GPI jacks are often located in genlocks and linear editing controls. GPI impulses are used for triggering external devices and to start a Sequence of effects via GPI or to fetch the next stored page of a title generator or fixed image system.

GUI

Graphical User Interface.

Graphical user interface, i.e. the monitor screen by means of which the user operates a computer or other devices.

Hard disk

Magnetic storage medium for recording bigger quantities of digital data. The hard disk is subdivided into sectors in which data are stored. An address book makes sure that the stored data can be found later on. The magnetic disk rotates, and an axially movable write/read head is positioned in such a way that the individual sectors can be read or newly written.
The most important factor apart from the storage capacity indicated in →GIGABYTE is the velocity of the disk. In particular in the case of non-linear editing systems, very fast hard disks are required, since the performance of the systems is, among other aspects, also determined by the performance of the hard disk. It is of particular importance that a data transmission rate as high as possible be reached without interruption of the write and read operations (sustained data rate). A good measure for the quality of a disk is the minimum data rate guaranteed by the manufacturer. The maximum top values often mentioned are of lesser importance in video operations. If longer video scenes are to be disk-recorded, the continuously reached data rate should not drop, since this could cause dropouts, i.e. interruptions in the motions. Some manufacturers offer special AV hard disks. Their special controlling software suppresses recalibration of the disk during writing or reading processes. Background of this modification for AV use: "Normal" hard disks recalibrate as soon as the hard disk gets too hot during operation, the fact leads to inaccurate reading or writing of the data Tracks. This thermal recalibration is normally automatically activated and can, in extreme cases, take longer than one second, thus causing the data rate to drop to zero. This, however, is not acceptable for continuous video playing. →RAID, →SCSI.

HDCAM

The digital video tape format HDCAM by Sony is based on digital Betacam. It was designed for →HDTV APPLICATIONS and enables a resolution of 1920 x 1080 pixels in 16:9 format (59.94 or 60 Hz). The carrier is a 14 mm wide metal particle tape with extremely fine particles (length: 0.125 mm) reeled in a Betacam cassette housing.
HDCAM records 12 Tracks with a width of 20 mm each per frame and compresses the digital data internally by factor 4:1. The tape is described as having a video data rate of 140 Mbits/s.

HDTV

High Definition Television.
General term for all kinds of TV signals offering increased →RESOLUTION, i.e. pictures with enhanced sharpness in comparison with most commonly known TV systems. Unfortunately, no worldwide uniform HDTV standard exists. Despite a large bandwidth of different versions with different line numbers and frame frequency, there are some uniformly valid parameters: HDTV works with a 16:9 aspect ratio and a number of lines that is considerably higher than that compared with PAL or NTSC. (1250 lines/50 Hertz and 1125 lines/60 Hertz) is nowadays actively used. HDTV is only used on a small scale worldwide. →DTV regulation in the United States will increase the number of HDTV playing modes, among them 1080i (1080 lines, →INTERLACED) as well as 720 p (720 lines, →PROGRESSIVE).

Hertz (Hz)

Hz = Abbreviation for Hertz
Measuring unit for a frequency named after Heinrich Hertz. X Hertz correspond to x oscillations per second.

Hi 8

Analog video tape format from the field of consumer electronics using 8 mm wide ME or MP tape. Hi 8 was further developed by Sony from →VIDEO 8. Separate processing of luminance (Y) and chrominance (C) signal and a larger video frequency of bandwidth of Hi 8 enables a higher resolution than with Video 8.

Horizontal resolution

Vertical resolution is determined in today's TV systems by the number of lines (PAL: 625, NTSC: 525). The horizontal resolution may vary between different devices and formats. Horizontal resolution is determined by means of test signals or test charts. They show vertically arranged, parallel →LINES. The number of lines (or the frequency corresponding to it) that the respective device can display as a pattern consisting of individual lines is used as a measure.
Maximum resolution of a system or device can be expressed in lines or frequency. The conversion formula is: Cutoff frequency in MHz x 82 = resolution in lines.
The maximum horizontal resolution of the PAL standard is 5 MHz, i.e. 410 lines. VHS devices reach a maximum horizontal resolution of approx. 3 MHz (approx. 250 lines).

Host

Main computer of a system, either representing the central computer or carrying out certain controlling or monitoring functions.

Huffman

Algorithm used in many →COMPRESSION METHODS for loss-free data quantity reduction.

Hybrid systems

Hybrid systems are editing and processing systems which simultaneously control non-linear sources (hard disks, MO disks) as well as linear sources (video recorders), capable of mixing signals from both sources.

IEEE 1394

Standard for fast, serial data transmission at up to 400 Mbits/s. The slightly modified version for transmitting DV signals is referred to as →I.LINK.

IEEE 1394 was developed by Apple and introduced under the name →FIREWIRE. Different devices such as Camcorders, recorders as well as printers, scanners, CD drives and hard disks can be linked to one another via IEEE 1394.

IEEE 1394 today supports up to 16 devices per system and enables a maximum of 63 devices to be connected. Until today, the cable length was limited to 4.5 meters, but this problem will be solved in the future by using fiberglass cables. IEEE 1394 networks are then also possible.

i.LINK

i.LINK (→FIREWIRE) is the technical term for the IEEE 1394-1995 standards and their supplements. DV signals can be transmitted at a speed of up to 100 Mbits/s via i.LINK.

I-frame

→MPEG

I-Frame only

→MPEG

Illegal Colors

Computer-based systems can generate colors that cannot be video-processed due to technical restrictions (they are located outside the →COLOR SPACE defined for video). Those creating graphics including increasingly saturated red with a high luminance ratio will notice during video processing that this color cannot be displayed or is displayed in an altered or distorted way. Several paint and editing systems therefore include a function by means of which these illegal colors can be either displayed and excluded.

Impedance

Resistance.

Electric characteristic of components measured in ohms.

If various devices are combined or network-linked, the impedance of the individual devices has to be adapted. Certain networks and video lines require a terminating resistor at their open ends to avoid distortions and signal changes.

Inlay

Window within a software interface in which a video signal is displayed.

Insert

Cut which is inserted into an existing video Sequence. In the case of magnetic tape recordings, insert editing exchanges image and/or sound signals without damaging the control Track. The other editing method used in video editing is →ASSEMBLE EDITING.

Interframe Compression

→MPEG

Interlace

For interlaced scanning the video frame is divided into two fields. These are transmitted and built up in succession. The first field contains all uneven lines of the picture, the second one all of the even lines. In the →PAL STANDARD, 25 frames (hence 50 fields are transmitted per second. The human eye does not perceive these 50 fields as a Sequence of individual pictures, but as a continuous event.

Interpolation

In the case of interpolation, a new intermediate value is calculated on the basis of known values.

Editing and compositing systems for example make use of interpolation to design movement effects.

Distorted images caused for example by →ALIASING can also be partially reduced by interpolation (→ANTIALIASING).

Intraframe Compression

→MPEG

ITU

International Telecommunications Union.

This body determines standards. Manufacturers in ITU often suggest certain standardization facts and solutions which are then examined by the ITU, possibly amended and then turned into a mandatory standard.
The standard ITU-R 601 is very well known.

The ITU includes different divisions dealing with standardization issues. The ITU-R is responsible for broadcasting issues, whereas the ITU-T develops and passes on recommendations within the field of telecommunications. The ITU-R was previously known as CCIR, the ITU-T as CCITT.

ITU-R 601

This standard defines the A/D conversion of →COMPONENT SIGNALS. ITU-R 601 defines 4:2:2 sampling which means that the luminance signal (Y) is sampled at 13.5 MHz, whereas the →COLOR DIFFERENCE SIGNALS (→B-Y, →R-Y) are sampled (quantisized) at 6.75 MHz each.

Jack connectors

Jack connectors are used for analog audio signals and are available in different sizes: 6.3 mm and 3.5 mm are for example used for headphones, microphones or active loudspeakers. In the course of miniaturization, manufacturers are also supplying 2.5 mm versions. Adapters are available for all sizes. Stereo requires three-pole cables and connectors, mono two-pole connectors.

Jam-Sync

Abbreviation for the capability of a device to read the timecode from the video tape and to continue writing this timecode in case of further recordings.

Java

Java is a programming language developed by Sun Microsystems. It enables the programming of platform-independent tools.

Jitter

Small vibrations when displaying video on a screen. This phenomenon can often be seen in the case of facades with many straight edges.

Jitter is caused by many factors, mainly during tape-recording, as a result of phase fluctuations.

Jog/Shuttle

Operating wheel for controlling video (tape) drives. The jog/shuttle wheel enables easy change between playing and winding as well as detailed cross connecting frame per frame.

Jog/Shuttle wheels are very common in conventional technology, but are nowadays often available in many non-linear editing systems in the form of certain, separate operating consoles as an optional feature.

JPEG

Joint Photographic Experts Group.

JPEG refers to a standard for compressing digital frames. The JPEG method is based on →DISCRETE COSINE TRANSFORMATION (DCT).

Key

1) Collective term for different functions enabling partial combination of two video frames to form one new frame. Examples for this are →CHROMA KEYING and →LUMA KEYING.

2) When working with a key function (→KEYING), the key signal has the function of a mask and determines which part of the frame results from which original source is sometimes simply referred to as key.

Keycode

In the field of film, keycode is synonymous to timecode and serves as a means for numbering the frames in a machine-readable way.

A code is applied to the negative stock at the perforations. This code can be read by certain devices and includes, besides the numeration, information such as data regarding manufacturer of the respective material. Furthermore, the keycode is used to re-edit the original negative stock more or less automatically (in an ideal case) after non-linear offline-editing based on an →EDIT LIST (→EDL).

Keyframe

Keyframes are frames within an effect Sequence determined by the user as start, turning or finish of an effect.

To be able to calculate or execute a keyframe-based effect, at least two keyframes have to be determined, i.e. start and finish. If the effect is not supposed to be run in a smooth linear way or according to a curve defined by the manufacturer, further keyframes have to be set within the Sequence indicating the progression. The effect progression between the keyframes is then automatically calculated (→INTERPOLATION).

Keying

Keying is the process of combining two video pictures to form a new picture in which a certain area of the video picture is superimposed on the other video picture. With each used →KEY, the user defines which areas of the pictures should be superimposed in what form on the other picture (→KEY, →CHROMAKEY, →LUMINANCE KEY).

LANC

→CONTROL INTERFACES

Layer

In postproduction, in particular in →COMPOSITING, a term for describing the individual image elements or channels that are supposed to be combined with each other or superimposed on each other and which form a common source image. To be able to link up the different layers, →KEYS AND MASK TECHNIQUES are used.

Layering

Working with →LAYERS. In complicated postproduction *Project*s many individual picture elements are combined to form one common video image. Some time ago this had to be done in a number of successive copying steps. Modern non-linear editing and compositing systems nowadays offer channels or layers

that can be graphically displayed to enable a better overview of the layering. Later changes of a layer are possible with non-linear systems without having to newly carry out all other work steps.

Level

This term was originally used to describe a value to be set, such as loudness. The term, however, is nowadays also used to describe the quality steps within →MPEG.

Linear editing

The term linear editing is derived from linear editing systems. Up to then the commonly used term was video editing. In the case of linear editing, at least two video recorders are controlled in such a way that scenes can be marked on the original tape in order later to be copied onto another recorder scene by scene. There are, however, two limitations for creative work: If a scene with a different length is supposed to be copied onto the already edited tape, all successive scenes have to be recopied again, since all scenes have to be on the tape in linear order. Simple insertion as in conventional film editing is not possible. Furthermore, access to the individual scenes of the original material is not directly possible. The tape has to be spooled to the respective place for access because the scenes are also recorded on the original tape in linear Sequences. Linear editing in the case of video tapes prolongs the effective editing time due to the required →PREROLL, cue review and winding times of the recorders.

Lines

In opposition to the horizontal TV-lines the number of which is predetermined by TV systems (PAL:625, NTSC:525) vertical lines serve as a measure for horizontal →RESOLUTION OF A DEVICE (or system or format).

It is indicated how many vertical, parallel adjacent lines the respective device can display as a pattern consisting of individual lines.

The maximum horizontal resolution in lines can also be expressed as frequency and referred to as cut-off frequency. The formula is: Cut-off frequency in MHz x 82 = resolution in TV-lines.

Logging

Term used for searching, selecting and marking of the original material, on the occasion of which it is determined which video and audio Sequences will be used in the final film. Only these parts are then digitized. This saves you time and storage capacity and enables a broader overview. As a rule, a timecode list is produced during logging which includes all start and finish points of the usable scenes. Dubbing of the marked passages can be carried out during logging or later in a separate step known as →BATCH DIGITIZING.

LTC

Longitudinal timecode
This →TIMECODE, like a sound signal, is written onto an outer audio Track or a special separate longitudinal Track of the video tape specially provided for the timecode. Later recording of the LTC is also possible. LTC can be read during forward or backward playing of the tape but not if the tape is stopped, i.e. in the case of fixed images. →VITC serves as an alternative or supplement to LTC.

Luminance Signal

To display video images, information on brightness and color are required for every single pixel. This information is commonly sampled in video technology in the form of one brightness and two color difference signals. The brightness ratio of a video signal is referred to as luminance signal (Y).
In the beginning of electronic image processing, in cameras and film scanners, three signals are generated at first which correspond to the blue color ratio of the light. Three new signals are calculated from these three signals: one brightness signal and two color difference signals by

using the following formula: Y=0.3R + 0.59G + 0.12 B.
This evaluation was developed empirically and is based on the brightness perception of the eye and the characteristics of tube cameras and monitors.

Luminance Key

An effect making use of luminance information of an image to create a "keying template" (→ALPHA CHANNEL). If, for example, a black font is used on a white background as a luminance key model, either the black font or the white background can be removed by keying and replaced by an image content of a different video image. Fonts and logos are often inserted into video images by means of luma keying.

Main Level

→MPEG

Main Profile

→MPEG

Master

The master or master tape is the tape on which the final cut is recorded.

Maximizer

Maximizers are intelligent audio processors. Through the use of targeted compression of audio material they effect a subjective volume increase without actually increasing the audio level.

MB

→MEGABYTE

Megabyte

Unit of measure for data quantities.

According to the traditional definition of 1 →BYTE is 210 x210, then 1 MB comprises 1,024 x 1,024 bytes = 1,048,576 bytes. Recently, some of the manufacturers have stopped using this traditional binary calculation method, and are using the decimal system instead. According to this version, one megabyte corresponds to 1,000,000 bytes.

To display a full uncompressed frame with full resolution in accordance with ITU-R 601, graphics data of slightly less than 1 MB are required (830 KB).

Megahertz

A →FREQUENCY of one million oscillations (samples) per second. (→HERTZ)

Metadata

Data about data: Metadata comprises all information stored by the system about the actual useful data used for the work. Metadata are particularly important for archiving or other database functions.

MHz

→MEGAHERTZ.

MIDI

Musical Instruments Digital Interface.

MIDI is a digital communications standard for electronic musical instruments and effects devices. Controlling of such devices by means of a PC requires a MIDI interface.

Mixed Resolution Editing

If an editing system features the Mixed Resolution Editing function, this function permits the use of material of different quality levels in one and the same *Project*. This is important if the material was digitized in various resolutions in order to save fixed disk capacity.

M-JPEG

Motion JPEG is a video compression process which is based on →JPEG (JOINT PHOTOGRAPHIC EXPERTS GROUP). During this process, each single frame is compressed separately, and the data stream generated in this way is processed as a linked Sequence of JPEG-compressed single frames. There is no universal M-JPEG standard - the individual manufacturers have stipulated their own formats in this regard.

ML

→MPEG

MO Disk

Magneto-optical disk.

MO disks combine the technical benefits of an optical medium (CD) with the advantages of magnetic recording.

The →STORAGE CAPACITIES per disk are in the →GIGABYTE range. Because they are secure and robust, MO disks are particularly well suited to archiving.

Motion vectors

Direction and distance information used in →MPEG encoding. This defines the movement of an image portion from one →FRAME to the next.

MP

→MPEG

MP@ML

→MPEG

MPEG

MPEG is a standardized compression procedure particularly suitable for the compression of data of full-motion pictures.

In the case of MPEG being an asymmetrical compression method, coding is far more complicated than decoding. Important: MPEG specifies the data format and the decoding process, but lets the manufacturer decide how to create the data. Each manufacturer can use his/her own coding method and algorithms, as long as standard MPEG-coded data streams are created that can be read and played-back with any standard MPEG decoder.

An important difference between MPEG and other compression procedures such as →M-JPEG is that MPEG does not necessarily compress single frames (intraframe) only, but can also analyze the data of several successive images and use the information derived from this for compression. On this basis a video Sequence can be compressed far more effectively, as frame information of several single frames can be collated. In technical jargon this is referred to as Interframe Compression. The single frames of a video Sequence are composed of I, B and P frames, in accordance with the MPEG standard. I frames are index frames. They contain all important frame information and are generally compressed in the same fashion as is done for each single frame during a motion JPEG compression. However, with MPEG it is also possible to implement different levels of compression in different sections within a frame, for example, the compression implemented for the frame center is less than that implemented at the edges. Compared to motion JPEG, this feature permits a 10 - 15% data reduction with the same level of optical quality. B frames are bi-directional frames, i.e. frames which only contain the differences between a frame and the previous or following one. The term "P frame" stands for Predicted Frames. They are interpolated on the basis of frames which have appeared so far.

The MPEG standard refers to the Sequence of I, B and P frames as a Group of Pictures (GOP). Each manufacturer can use GOPs of any length and composition. The only prerequisite is that a GOP must contain at least one I frame.

The subject area of GOP also incorporates a restriction or, at least an obstacle which is typical of MPEG: Cutting in the middle of a GOP is either not possible at all or requires considerable technical effort. Therefore, MPEG-based interfaces work with very short GOPs or exclusively with I frames.

Initially, MPEG was defined as a common basis for four individual standards.

Both MPEG-1 and MPEG-4 work with low data rates and are therefore primarily suited for multimedia or telecommunications applications. MPEG-3 was originally used in HDTV applications but is today only

used for audio compression (MP3), whereas video compression was later integrated into the MPEG-2 standard. In professional video systems, the MPEG-2 standard plays the most important role.

MPEG-2 is divided into various profiles and levels for which different parameters were stipulated: data rates, GOP structures, resolution, i.e. the number of of lines and pixels as well as the →SAMPLING and →FRAME frequency.

In post-editing, MPEG-2 422P@ML has been established (also referred to as 422 Studio Profile@Level). This MPEG version only operates with I frames and 4:2:2 sampling; the resolution is 720 x 608 pixels. The standardized maximum data rate is around 50 Mbits/s.

Hence, MPEG-2 provides a special sub-procedure for different applications. It is equally important to note that, while MPEG-2 prescribes the decoding in detail, it is up to the individual manufacturers to use their own coding procedure. The only prerequisite is that MPEG-2-coded data must be readable and playable on any type of MPEG-2 decoder. Therefore, in contrast to →M-JPEG, exchangeability of MPEG data between two systems is ensured.

MPEG-1

→MPEG

MPEG-1 Layer 1, 2, 3 Audio

Different audio codecs are provided in the MPEG standard, i.e. layer 1, layer 2 and layer 3. The complexity and performance of these schemes increases from layer to layer. The layers are upward-compatible with each other, i.e. a layer-2 decoder also accepts layer-1 audio, but not layer-3 audio. All 3 layers can use 32, 44.1 or 48 kHz sampling frequencies. Layer 2 is of importance in creating DVD.

MPEG-2

→MPEG

MPEG-3

→MPEG

MPEG-4

→MPEG

Multimedia

This heavily abused term, which is at times used rather randomly for totally different subject matters and circumstances, is undergoing continuous semantic change. According to one of the more precise definitions, multimedia is the combination of the most varied of media communication methods in one interactive medium.

Multi-processor

Some of the newer workstations and computers can be equipped with more than just one processor (→CPU) and are not limited to one processor, as is the case with normal PCs. This can considerably increase the efficiency and speed of these workstations.

Multi-Tracking

The multi-tRacking function is predominantly found in compositing systems. This function permits the marking of objects within a frame Sequence, by the definition of one or, preferably, several (up to 4) distinctive points edges or transitions and the tRacking of the movements of the object over the complete scene.

The tRacker analyses and records the movements and also permits the allocation of these movement Sequences to other objects. In this way, moving objects can also be used as a template for masks and keys. Furthermore, the recorded movement Sequences also allow computer-generated objects to be realistically integrated into scenes, during which the camera is moving.

Native Digital Editing

Editing systems featuring Native Digital Editing maintain the quality of the initial material during editing, by retaining the native original format during the editing process to as great an extent as possible.

Hence, no unnecessary, avoidable conversions or decompression and recompression steps are implemented with the material played in. Therefore, the best possible picture quality is maintained.

Conversions are only implemented when absolutely unavoidable, e.g. in the event that analog material is played in or if dissolves or effects are supposed to be performed with the picture material.

Noise

Irregular level variations of a low order of magnitude. All analog video signals contain noise contents. Ideally, the noise level may not be more than an LSB (Least Significant Bit) of the digital dynamic range. Signals which are pure digital generations do not contain any noise.

Non-drop frame

Strictly speaking, NTSC does not work at a frame rate of 60 Hz, but of 59.94 Hz. This corresponds to 29.97 frames per second.

Due to this uneven figure, problems may arise in relation to the timecode. The 0.03 fields which are missing per second, add up to form whole pictures, leading to a mismatch between the timecode value and the number of frames. In technical terms, this problem is solved by using the drop frame procedure. In this process, two frames are simply left out per minute. The time mismatch which would normally occur is thus prevented. However, it is also possible to operate NTSC recorders in the non-drop-frame mode. In this case all 30 frames are displayed and the described time displacement occurs.

Non-linear Editing

In non-linear editing the editor can access each frame of the existing material directly and without any spooling/pre-rolls or search periods. The storage medium used does not specify any Sequence within the picture material which would have to be observed during processing. It is possible to implement changes at any point of a *Project* and at all times.This permits a mixture of film and video cutting methods. Picture material can be handled in a speedy and flexible manner.

Non-Square-Pixel

→PIXEL

NTSC

National Television Standards Committee.

The NTSC was developed in the USA and is the oldest standard for color picture broadcasting. NTSC operates at 60 Hz and with 525 lines, 60 fields and 30 frames per second. NTSC is used in the USA, Canada and Japan and in many other countries. In Europe, PAL is mainly used for TV broadcasting. The bandwidth of NTSC is 4.2 MHz, the color signal is modulated on an auxiliary signal (subcarrier) at a frequency of 3.58 MHz.

Offline Editing

During offline editing, films are generally cut with a reduced picture quality and on a cheap system for cost reasons. On completion of the off-line editing process, the editor stores his
→EDITING DECISION LIST (EDL).

This EDL is used as a basis for the post-editing of the film in a second work phase in the on-line studio, with the full quality and the more expensive devices required for this purpose.

Online Editing

During online editing the master of a film is edited in the best possible quality. The end product is generated in one work step. In the event that the *Project* was previously edited off-line, the →EDITING DECISION LIST derived from off-line editing is used as the basis for on-line editing.

Optical Disk

→OPTICAL STORAGE MEDIA

Optical storage media

The basic principle of optical disks such as CD and DVD is the same: a

disk of transparent polycarbonate is vaporized on one side with reflective coating and coated with wafer-thin varnish. In the polycarbonate disk a helical, narrow-wound Track extends from the inside to the outside through the plastic. On this Track, digital information in the form of lands and pits are lined up one behind the other. Each transition, irrespective of its direction, stands for a digital 1; the absence of a transition represents a digital 0.

The windings of the data spiral are 1.6 mm apart; thus 50 windings would be as wide as a single human hair. The individual pits are between 0.8 and 1 mm. When played, the disk rotates while an axially mobile scanner unit follows the data Track. This combined scanner unit consists of a laser diode and a lens with a photodiode at the back. The laser beam of the laser diode is thrown back by the reflective rear side coating of the CD. If the beam hits the lands, it is directly reflected into the lens system at high intensity, while the pits, by contrast, scatter the beam and only a little light falls on the photodiode. The changing intensity of the reflected light impulses therefore reproduces the bit Sequence or data stream.

Original

The tapes which were used for the initial recording, are referred to as the original or original tapes. In most cases, original tapes are produced by the camcorder or the studio recorder in the case of studio productions or film scanning. The best scenes of the original tapes are selected during editing, compiled to the finished film and recorded on the →MASTER.

PAL

Phase Alternating Line.

PAL is the predominant TV standard in Europe. PAL operates at a frequency of 50 hertz which corresponds to 25 frames or 50 fields and with 625 lines. Compared to NTSC, the type of color transmission is different for PAL which yields advantages for the color stability of the transmitted pictures, but also requires higher technical expenditure and causes problems in post-editing.

(→FIELD SEQUENCE). In the case of PAL, the bandwidth is 5.5 MHz, the color carrier Sequence 4.43 MHz.

PALplus

PALplus is a TV standard which was developed on the basis of PAL and is compatible with PAL. The fundamental differences between PALplus and PAL are that PALplus operates with a aspect ratio of 16:9 and prefiltering of the PALplus signal to ensure a better picture quality.

In PALplus the 575 lines of the active picture content is composed of a central band signal which consists of 432 lines and a helper signal containing 143 lines. With a PALplus receiver the complete picture can be represented, i.e. the 575 active lines. On the other hand, a conventional 4:3 receiver represents the 432 lines of the central band in letterbox format, that is, with a black bar at the top and bottom edge of the picture.

Panasonic Edit

→CONTROL INTERFACE

PCM

Pulse Code Modulation.

The Pulse Code Modulation method is one of several methods used in analog/digital conversion. The PCM sound named after this method of →DVDs and different video tape formats usually includes two digital audio channels.

P Frame

→MPEG

Pixel

Picture element, picture point.

A pixel is the smallest unit within a raster image.

Pixels are further divided into square pixels (square picture points) and non square pixels.

The reasons for this are as follows:

In contrast to computer monitors, video monitors operate with rectangular instead of square pixels, as they are also defined in →ITU-R 601 (non square pixel). A PAL picture on a video monitor has 720 x 576 pixels.

In the computer field, however, square pixels are the norm. A 4:3 PAL picture must be represented on a computer monitor with 768 x 576 pixels, due to the square pixel form, in order to maintain the same aspect ratios.

In the event that the difference between square and non-square pixels is not taken into account by the manufacturer of a computer-based video system, there may be slight distortions in the representation of video images on computer monitors.

Platform

In our somewhat narrower definition, a platform is the combination of processor and operating system with which a computer or a workstation operates.

In postproduction, the term "platform" mostly relates to the operating system only. The operating systems Windows, MacOS and Unix are widely used.

Most of the manufacturers offer their interface systems on one of the three specified standard platforms. Hence, a normal computer from the Intel family, a Macintosh or a silicon graphics computer is used and extended to form a non-linear system with hardware (mostly plug-in cards), software and standard peripheral devices (SCSI hard disks).

Playback Server

→VIDEO SERVER

Plug-In

A plug-in is a software extension which can change, expand or update the scope of performance of editing or compositing software in partial areas. Plug-ins are frequently used in postproduction to expand the effects capabilities of a system.

Postproduction

The work processes used by the motion picture and video industry can be divided into several phases. Postproduction describes the production phase of post-editing the recorded material. It therefore comprises work steps such as cutting, effect editing, post-addition of sound to the film and graphical editing.

Postroll

The period required by a video recorder to bring the tape to a standstill and to change over from playback or recording to pause. This also applies to linear cuts with video recorders which do not stop abruptly upon completion of the cutting, but run slightly past the cut end.

Precoding (Striping)

Generally the recording of a black-burst signal, a timecode and a →CTL SIGNAL to a magnetic tape. A recording tape must be precoded so that →INSERT CUTS can be implemented. The precoding of tapes also offers advantages in terms of quality, as the roughness of unplayed tapes is initially more pronounced and is then smoothed out during precoding which, in turn, improves recording quality.

Preread

The preread function allows a video recorder to play a video signal and to record this video signal at precisely the same tape point at which it was played, in the same work step. This function makes it possible to achieve effects such as dissolves with a linear two-machine editing workstation (for example for →ON-LINE EDITING). Normally three or more machines are required to produce such effects.

Preroll

1) The period required by a video recorder for the run-up from the pause function and switching into the play or recording mode is referred to as preroll.

2) For linear cuts with video recorders, preroll is also understood to mean the rewinding of the tape to a defined point before the actual cutting point. The tape is parked at that point and also runs up from there during editing, such that playback is allowed to stabilize until the cutting point.

Profile

→MPEG

Progressive Scanning

During progressive scanning, a picture is built up line by line. PAL on the other hand uses →INTERLACED SCANNING instead. Progressive scanning is commonly used with computers, but has also recently been used in some video devices which are marketed in the USA and which take into account the →DTV SPECIFICATIONS.

Program Stream

In contrast to the →ELEMENTARY STREAM, the Program Streams consist of only one file in which audio and video are linked to each other (multiplexed). This enables simultaneous playback of sound and image. Program Streams are mainly used for computerized playback of high-quality videos (archiving, kiosk systems, etc.)

QSDI

→SDTI.

Quality Specifications

Since there is no objective procedure for assessing the quality of pictures from non-linear systems as yet, it is customary to compare it with the picture quality of tape systems - even if this is like comparing chalk and cheese.

In order to grade the various picture quality levels within the own product range, various companies have created their own value systems.

Quantisation

Quantisation describes the sampling of an analog signal during A/D conversion. Video signals are frequently quantised with 8 or 10 bits, while values of 12 or 16 bits have been established in professional audio systems.

Quicktime

Originally developed by Apple as a video format for Macintosh computers, Quicktime was initially comparable with Video for Windows. However, Quicktime was then further developed and significantly expanded. Now numerous computer-based editing systems use Quicktime as an internal data format. Quicktime can be used on all platforms and is no longer exclusively limited to Macintosh computers, but can also be used on Windows computers.

RAID

Redundant Array of Inexpensive/ Independent Drives

This arrangement links up whole batches of hard drives in one device. They operate like one single large hard drive with a high storage capacity and fast access. Depending on the operating mode, RAIDs offer increased data security (→RAID LEVEL).

While RAIDs are the backbone of most of the hard disk recorders and servers, they are also increasingly used in conjunction with editing systems.

RAID Arrays

→RAIDS

RAID Level

Along with a high data throughput, RAID arrays also offer increased data security in most cases, provided that the RAID arrays are operated according to the relevant level (0 to 5).

RAID 0: Several hard disks are operated in striping mode. During this process the data is distributed to the various disks. While this process does not offer an increased level of data security, the write/read rate is very high.

RAID 1: The data is mirrored, i.e. written to two disks. While this process requires double storage space, it offers a high level of data security.

RAID 2: Similar to RAID-1 arrays, but this level requires even more storage space as additional error correction is implemented.

RAID 3: Frequently used for disk recorders and servers. These arrays are highly efficient and, compared to RAID 0, offer an increased level of data security by storing back-up information on an additional disk which can be used to reconstruct data even if one of the other disks of the arrays fails to operate.

RAID 4: Based on RAID 3 but in contrast to that, it is also possible to transmit smaller data blocks.

RAID 5: Read access processes can be administrated in parallel, and are hence distributed to all drives. Otherwise as for level 4.

RAM

Random Access Memory

Temporary memory for data with which the processor is currently working. When the computer shuts down, the data contained therein are deleted.

RCTC

Rewritable Consumer Timecode.

Sony developed the RCTC for consumer devices of the Video8 and Hi8 format. The RCTC is recorded in a special tape range between picture and sound information. With devices that are equipped accordingly, the RCTC can be recorded later on any Hi8 or Video8 tape. Any timecode that may already be present is overwritten in this process.

During playback, the RCTC is read separately by the tape and output as a separate signal via the LANC remote terminal (→CONTROL INTERFACE) of these devices.

Recorder

The term "recorder" refers to various types of recording devices. During linear editing the recording device is referred to as the recorder. The →MASTER is recorded by the recorder; the slave device is called the player.

Rendering

Effects which are not available in real time must be calculated. This process is referred to as rendering. Numerous non-linear systems offer only a limited repertoire of real-time effects and to a large extent work with effects which must be rendered.

Resolution

The better the resolution of a system, format or device, the finer the visible picture details. The resolution is often used as a synonym for sharpness. As a standard, the maximum resolution is indicated in →LINES or →MEGAHERTZ. The number of lines is predetermined by the individual TV systems and indicates the respective vertical resolution (PAL: 625 lines; 576 of them are active lines that are in fact used for the picture content). For this reason, only the horizontal resolution is indicated.

→PIXEL NUMBERS are often stated as a measure for resolution, e.g. 720 x 576 which corresponds to the PAL resolution. In common practice one should pay attention to the fact that these indications often refer to system limits and not to values attainable in reality, for they are influenced by individual components ranging from Camcorders to monitors. Each component within the signal path can influence the attained resolution.

RGB

RGB is the abbreviation for the primary colors, i.e. red, green and blue. Cameras, video and computer monitors work internally with RGB signals. In video systems, RGB signals

are not generally transmitted between the different devices; instead, other signals which are derived from RGB (→LUMINANCE SIGNAL, →COLOR DIFFERENCE SIGNALS) are used.

ROM

Read Only Memory

Non-writable memory with permanently stored data.

(→RAM).

Rotoscoping

Animation technology for which live footage is used as a reference for animated cartoon Sequences which were drawn in individual frames. Rotoscoping was already in use back when animated films were still drawn manually. Advanced computer systems have simplified rotoscoping with numerous semi-automatic functions.

RS-232

Standard for the transmission of serial data over short distances. For example PCs have RS-232 interfaces (→CONTROL INTERFACES).

RS-422

Standard for the transmission of serial data over medium distances (up to 300 m).

RS-422 interfaces are a very common feature in professional video systems and are used for the remote control of the devices.

(→CONTROL INTERFACES).

Sampling

Process with which analog signals can be converted into a series of digital data.

Continuous phenomena such as curves are divided into sections in digital technology and then further divided into individual events.

The more precise the sampling implemented, i.e. the higher the sampling rate, the more precise is the original recorded during sampling and the finer the details that can be sampled and reproduced digitally.

Sampling rate

→SAMPLING

Sampling ratio

The display of video images requires information on brightness and color for each pixel. In video technology, this information is normally processed in the form of a brightness signal (→Y) and two color difference signals (→R-Y, →B-Y). The brightness information is generally registered in more detail than the color information. This is made possible by sampling the brightness signals at a →FREQUENCY OF 13.5 →MHZ when transforming the video images into digital data. The color difference signals however, are sampled at 6.75 MHz. To simplify work in general practice, only the used ratio of the sampling frequencies for a digital video format or a digital video standard is indicated, such as →4:2:2 or →4:1:1. 4 generally represents the sampling frequency of 13.5 MHz.

Saturation

→COLOR SATURATION

Scart

Irrespective of whether it is a TV set or a video recorder - most consumer devices are equipped with this heteropolar terminal which is also frequently referred to as Euro AV. The appropriate 21-pole flat connector combines all picture and sound connections of the relevant device.

In principle, only scart cables where all of the 21 poles are assigned, offer the full functional range in both directions and are therefore suitable for playback and recording between the devices connected therewith. Along with these full-range cables, the market also offers economy solutions which are only equipped in part and only function in one direction.

Scrubbing

This function allows one to hear the digital sound as one would when playing a videotape using →JOG/

SHUTTLe. This permits the exact localization of cutting points in the audio range.

SCSI

Small Computer Systems Interface.

Widely used parallel computer interface for the transmission of high data rates. The SCSI interface has also been established in non-linear editing systems in terms of hard disk connection. With SCSI, up to 8 devices can be connected to one another. The standard SCSI achieves a data transfer rate of close to 5 MB/s. Fast SCSIs enable a data transfer rate of 10 MB/s, while Ultra SCSIs transmit 20 MB/s. With all of these variants the standard bus width can be extended from 8 bits to 16 or 32 bits (wide).

Naturally, the data transmission rates also increase as a result. An ultrawide SCSI interface with maximum bus width achieves 40 MB/s. The ultrawide SCSI 2 bus manages a maximum data throughput of 80 MB/s.

SDI

Serial Digital Interface

This interface initially and primarily developed by Sony, was standardized under the name SMPTE 259M. Via this interface, uncompressed digital component signals (in accordance with ITU-R 601) are transmitted in series.

BNC standard connectors with 75 Ohm and coaxial cables are used, as they are for common analog video signals. (→COMPOSITE, →FBAS). Cable connections with a maximum length of 200 m are possible with SDI.

SDI achieves a transmission rate of 270 Mbit/s. It is also possible to embed audio data into the data stream (→EMBEDDED AUDIO).

SDTI

Serial Digital Transport Interface

SDTI is based on SDI and uses the same physical bases, i.e. cables and sockets.

The development of SDTI originated from the desire to be able to copy even compressed digital signals directly and to distribute them via studio infrastructures. Initially, Sony and Panasonic developed various format-specific interfaces: SCDI for DVCPro, QSDI for DVCAM and SDDI for →BETACAM SX.

SDTI brings these starting points under one umbrella, but only determines the data transmission method and not the data format. The SDTI standard regulates the external form of the signal stream such that the signal can be distributed via SDI infrastructures. The type of useful data which is transported in this fashion, is up to the users. Therefore, SDTI enables the most varied types of compressed video data, such as MPEG and DV-compressed video data to be distributed in existing digital video networks, at high transfer speeds.

In future, SDTI is to enable the distribution of both compressed and uncompressed data streams in one and the same network. The relevant end device recognizes by the signal whether it contains uncompressed or compressed picture data and whether it can process these data.

Secam

Séquential Couleur à Mémoire.

This TV standard was developed in France. Today it is used in France, some former Eastern block countries and the former French colonies. Overall, the use of Secam is on the retreat. Secam is similar to PAL. For this reason, conversion (→STANDARD CONVERSION) between these systems is comparably simple. Secam processes 625 lines and the frame rate is 50 Hz.

Sequencing

Repeated compression and decompression of digital material in successive processing steps and/or signal conversion of this material are referred to as sequencing. The problem of sequencing different digital compression and signal conversion steps is the fact that these calculation

operations may lead to rounding errors which manifest themselves as image distortions (→GENERATION LOSSES).

Server

The term "server" generally stands for central equipment which is accessed by several users or workstations via a network.

File servers are computers which provide central data inventories such as databases for use by the connected computers (clients).

In general, video servers are devices that are especially aligned to the recording and playing of video and audio Sequences. There is a wide range of video servers for various application purposes: news servers, transmission servers and postproduction servers. Video servers are available in single or multi-channel designs.

Shortcuts

1) In Windows, shortcuts are placeholders which refer to original files at another location. By opening the shortcut, the original file is opened and also modified, where applicable.

2) Keyboard shortcuts are predefined key combinations which permit certain functions to be executed directly via the keyboard.

Shuttle

→JOG/SHUTTLE

Signal-to-Noise-Ratio

Used as a parameter for the quality of a signal or even of a recording system: it specifies in decibels the ratio between the actual useful signal and the junk content superimposed on it. The useful signal is the actual signal content which is to be recorded or transmitted. Junk signals are almost unavoidable. The only way to deal with them is to keep them as small as possible. They can be caused by outside influences, for example magnetic fields, but may also be attributed to the tolerances of the components used or to the construction of a device such as crosstalk effects between conducting Tracks.

With analog systems in particular it is difficult to achieve and maintain high signal-to-noise-ratios.

SMPTE

Society of Motion Picture and Television Engineers

US lobby group with international sections comprising representatives of studios, broadcasting stations and manufacturers and various professional groups from the entire motion picture and television industry. The SMPTE maintains a series of committees dealing with standards and standardization proposals.

SMPTE/EBU Timecode

This is the currently normal and widely used →TIMECODE STANDARD (→VITC and →LTC) which was introduced by the →SMPTE.

Time data in the format of hour:minute:second:image are assigned to each video picture. In the PAL system, the last digit contains values from 00 to 24; the other digits may adopt values from 00 to 59. A valid timecode value would be 01:24:56:22.

S/N

→SIGNAL-TO-NOISE-RATIO

Storage Requirements

The computer-based processing of video pictures requires a far greater quantity of storage space than conventional PC applications.

For example, a video image digitized with a resolution of 8 bits in accordance with →ITU-R 601, takes up 810 KB. With 25 pictures per seconds this amounts to 21 MB per second of video. (All details relate to 625 lines and 50 Hz).

When working with pictures in HDTV quality, this value is approximately 6 times higher. For digital pictures with motion picture resolution which are to be *Project*ed in the cinema, the required data volume is even higher again.

Square Pixel

→PIXEL

SSA

SSA stands for Serial Storage Architecture, authoritative network architecture forged by Siemens and IBM. SSA makes it possible to network printers, scanners and magnetic storage media or even workstations, servers and PCs with a high-speed and efficient connection.

SSA is based on loop architecture (circular networking) and can work with up to eight controllers (e.g. workstations) per loop. The workstations themselves can be connected to a maximum of 128 devices within the loop (e.g. hard disks).

The American company, Pathlight developed the IMageNet SSA Workgroup Storage Network on the basis of SSA. This network currently offers a bandwidth of 80 MB/s; 160 MB/s is planned. For this reason it is particularly suited to the data-intensive applications so typical of digital post-editing.

Stabilizer

1) Simplified version of a timebase corrector (→TBC). With simplified switchings, the stabilizer ensures that the video signals passing through it are freed from →JITTER and other instabilities, but does not offer the, at times, comprehensive functional range of a full TBC.

2) In some compositing systems, motion information which was acquired with the help of a →(MULTI-) TRACKER can be used in order to stabilize distorted original recordings during post-editing.

Stereo

System for surround sound reproduction with two channels (right and left).

Storage Capacity

Maximum data volume that can be stored on a certain data carrier. Nevertheless, in order to be able to work in an efficient manner with the existing and generally limited storage capacity of a non-linear editing system, the initial data volume incurred is reduced by →COMPRESSION. Storage media, the storage capacity and work speed of which are sufficient for them to be used for non-linear digital video editing, include →RAID drives and →AV HARD DISKS.

Subpixel

The smallest unit of a digital video image is the pixel. Nevertheless, in many cases better and more natural results can be achieved if the devices used offer a finer →RESOLUTION internally, the smallest unit of which is even smaller than a pixel, hence is in the subpixel range.

In this way curves take on a far more natural and even shape when generated with a device or software that operates and interpolates in the subpixel range.

Even when →TRACKING PICTURE ELEMENTS, when →ANTIALIASING and when working with digital effects, better results can be achieved by interpolating in the subpixel range.

Surround

Generic term for various room sound procedures. Surround systems are geared towards achieving a more natural spatial sound reproduction, during which the listener is not only exposed to acoustic irradiation from the front, but sits in the center of sound events.

S-VHS

Analog videotape format which is used in the consumer and partially in the semi-professional area. S-VHS is based on →VHS, but employs different tape material (MP = Metal Particle tape) and works with a higher →RESOLUTION, i.e. close to 400 →LINES. In addition to the →FBAS SIGNAL (→COMPOSITE), S-VHS devices also output a →Y/C SIGNAL.

S-Video

→Y/C

Symmetrical

Symmetrical cables are twin-core shielded leads in which noise fields are mutually eliminated. Symmetrical audio connections are customary on the professional market; →XLR sockets and plug connectors are used as connections.

Synchronization

1) The linking of image and sound signals in order to run image and sound events simultaneously.

2) The balanced coupling of individual devices with a timing signal, e.g. studio clocking.

TBC

Time Base Corrector

A TBC balances out time faults in video signals which, for example, may occur due to flutters. Such time faults may take the form of a jittering picture or jittering object edges in the picture (→JITTER).

In general, professional video recorders, switchers or other video devices are equipped with an integrated TBC. However, stand-alone TBCs are also available which can be synchronized with the remaining studio equipment via a reference signal (Genlock).

TCP/IP

Transfer Control Protocol/Internet Protocol

TCP/IP is a combination of various standards which permit data to be exchanged between several computers. TCP/IP is particularly common in Internet applications.

Timecode

The timecode incorporates numbering of each individual picture. A timecode is assigned to each individual frame which is then recorded together with the video picture.

Different procedures can be used to write the timecode onto a video band (YVITC, →LTC). The logics and specification of the values is a common feature of all procedures.

The pictures are numbered in ascending order from the start of the tape. The time is specified in hours, minutes, seconds and individual pictures. For example, the value 01:59:59:24 is followed by the next logical value 02:00:00:00. At the last digit, values of 00 to 24 are possible, since our TV system (→PAL) works with 25 frames per second.

Time line

Many non-linear editing systems work with a user interface, the central element of which is a time line. The time line is the graphical representation of a film. The individual scenes are arranged as bars or symbols, via a time axis, as they are to be reproduced in the film.

When editing with time line, the cutter edits his picture and sound clips by placing them on the time line in the desired Sequence. The complete film is produced in this way.

Time lines are also used for mixing desks or effects devices where they are used in order to input a Sequence of effects or tricks.

Timing rate

→FREQUENCY

Tracking

→MULTI-TRACKING

Transition

Transition, flag

The simplest form of transition is the →DISSOLVE, i.e. the soft transition from the picture of one scene to the picture of the next scene.

Trimming

Trimming is the exact fitting of the length of a clip at a cutting point. For non-linear systems, this can be implemented at any point in time of the cut. In many systems, this can also be done by means of a trim editor which would, ideally, provide the relevant functionality.

U-matic

Old-fashioned videotape format which records video signals and two sound Tracks to a 3/4" tape (19 mm) in the color-under procedure. In Europe, the procedures used included related formats U-matic High Band, U-matic Low Band and U-matic SP. U-matic devices are no longer produced.

Unbalanced

→ASYMMETRICAL

Underscan

An underscan switching on the monitor makes it possible to view the complete video signal on the monitor. In underscan mode, even those parts of the video picture can be viewed which are normally not shown on the screen (→VITC, blanking intervals, copy protection signals).

VCR

Video Cassette Recorder

Vector-based

Effects or graphics which are not stored in the form of pixel patterns, but are based on geometric construction regulations instead.

Vector graphics can be enlarged and reduced to almost any extent without object edges showing step effects.

Ventriculation

Actually the generation of ventricles, i.e. hollows or chambers. In digital video technology, ventriculation refers to an effect that may occur during multiple copying of digital data. When using specific calculation regulations, minor copying faults may result which are reflected in distortions and alienation of the original picture content (→ALIASING,→ ANTIALIASING). Disturbances may occur in extreme cases.

VHS

Video Home System.

The analog video tape format VHS was developed by JVC for the consumer market and has gained comprehensive acceptance there. With the VHS system, recording is implemented with a half-inch (12.7 mm) tape.

VHS is not suitable for professional use due to the low →RESOLUTION.

Video-8

The analog video tape format Video-8 was developed by Sony for use in compact consumer camcorders. Recording is implemented with an 8mm wide videotape.

VHS is not suitable for professional use, due to the low →RESOLUTION.

Video Server

→SERVER

VITC

Vertical Interval Timecode.

One of the different procedures to record a →TIMECODE.

During recording, the VITC is written into one or more of the unused lines at the start of each individual full picture (blanking interval). For this purpose the recording device must be equipped with a VITC generator. During normal operation, the VITC is stored on the videotape as a non-visible part of the picture signal. During reproduction it is output as a part of the video signal, and the timecode information must be filtered out of the picture signal using a VITC reader.

The VITC must be recorded simultaneously with the picture signal; it is not possible to code recordings with VITC at a later stage.

VOB

Video Object

A VOB file is a >DVD-compatible file which was not yet incorporated into a disk-format according to the DVD standard. VOB files can (in contrast to >Program Streams) often be read and played back by standard DVD-software, thus, by using VOB-files, making it possible

to use other storage media than the DVD and to use them similar to a DVD in a computer.

WAV

Designation used for the waveform (.wav) audio file format, the standard file format for audio files on the Windows operating system.

Workstation

Powerful computer with a fast processor, high clocking rate and equipment which is geared towards professional work.

WORM

Write Once Read Many.

Storage medium that allows to be written on only once. WORM CDs are suitable for the long-term archiving of data and for backups. They can only be written on once, but can be read out any number of times.

XLR

Multi-pole, stable plug connection. In audio technology, three XLR-3 connections are used to transmit analog, symmetric or digital audio signals. The four-pole version of the XLR connection is generally used to transmit supply voltages, i.e. between battery charging devices, batteries, power supplies and camcorders.

Y/C

Video signal standard with which color and brightness information is transmitted separately. (Luminance Y, chrominance C). The quality achieved by this method is better than that achieved with →Composite Signals (FBAS). The Y/C socket (Hosiden, four-pole mini DIN) was introduced as a signal interface between →S-VHS and →Hi8. The Y/C connection is frequently referred to as S-Video.

Y, Cr, Cb

The digital luminance and color difference signals for ITU-R 601 coding. The → Luminance Signal Y is scanned at 13.5 MHz, the two →Color Difference Signals at 6.75 MHz.

CR is the digital version of the analog component R-Y. Cb is the digital version of B-Y.

Y, R-Y, B-Y

This is the analog →Luminance Signal (Y) and the two →Color Difference Signals (R-Y, B-Y) of →Component Video Systems.

Y contains the brightness information while the two color difference signals together provide the color information.

Signals in the form of Y, R-Y, B-Y are essential for many TV areas. ITU-R 601 stipulates that these signals are the output signals for digital component video signals (→Y, Cr, CB). They are digitized in the ratio →4:2:2 for this purpose.

YUV

Common designation for analog component signals. Brightness and color information are transmitted separately, in the form of a →Luminance Signal (Y) and two →Color Difference Signals (R-Y, B-Y). The quality of YUV pictures is therefore significantly better than that of →Composite (→FBAS) or YY/C.

Strictly speaking, the designation YUV signal is inaccurate because U and V are not signals, but instead refer to the coordinate axes for color processing in the →PAL system.

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