

StudioSound

32 Track Audio Sequencing Studio

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1. Specification Overview

StudioSound is a 32 track audio sequencing studio, allowing several hours of audio to be sequenced and mixed, using an intuitive visual cutting desk. Crossfades between sample segments may be drawn with the mouse, and real-time software DSP effects may be applied to each track of the sequence.

Audio samples that have been recorded to hard disc, may be sequenced by StudioSound, adding MIDI control events or patterns, hence producing the finished soundtrack for a multimedia production, or for mastering to DAT and audio CD.

- **Crossfades**

StudioSound allows a crossfade curve to be drawn for each sample segment, permitting audio samples to be smoothly faded out, whilst samples segments on other tracks are faded in.

- **Mixing Desk**

StudioSound provides level and pan controls for each track, thus assigning its contribution to the sequence, with the level of the entire audio sequence controlled with the master fader. All controls operate in real-time, and so changes to the settings may be instantly monitored.

- **Real-time DSP**

StudioSound is able to apply real-time software DSP effects to sample segments on each track of the timeline. As the control knobs are turned for effect modules such as high pass, low pass, and frequency boosts, the affect on the sequence is reflected instantly during playback.

- **Multiple Undo - Redo**

StudioSound is totally non-destructive, such that it never actually modifies audio sample data. All editing is performed in real-time, so any editing operation may be undone or redone at any time, allowing maximum flexibility.

- **Sample Control and Trimming**

Sample segments placed on the StudioSound timeline are treated as objects, and may be dragged around on the timeline, or cut, copied and pasted under the RISC OS clipboard system. Sample segments may also be cropped, such that only smaller snippets of the sample are sequenced in the project. A control panel also permits the playback tempo and gain for each sample segment to be individually controlled.

- **Industry Standard Formats**

StudioSound is able to import and export most industry standard audio file formats, and so most sample files may be dragged directly onto the StudioSound timeline for sequencing.

2. Getting Started

Requirements

StudioSound will run on any Acorn Risc PC machine equipped with a hard disc, and at least 4Mb of memory. Where applying lots of effects on many tracks, a fast IDE or SCSI 2 drive is preferable.

Installation

Please follow the instructions in the separate installation guide supplied with this package, carefully, to install StudioSound to your hard disc.

Registration

Please be sure to return the registration card supplied with the package, this qualifies you: for upgrades and free technical support.

Simple Tutorial

This tutorial will guide you through some of the more commonly used features of StudioSound, to get you started as soon as possible. You should then go on to read the remaining chapters of the manual, to gain a more in depth knowledge of the software.

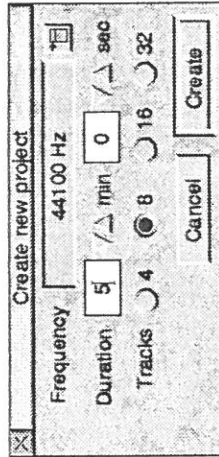


Load StudioSound onto the iconbar by double clicking the !StudioSnd icon that has been installed on your hard disc.

!StudioSnd

Creating a New Project

Click the StudioSound iconbar icon with *Select*, to open the **Create new project window**. This window is used to create a new sequencing project, of definable duration and audio quality.

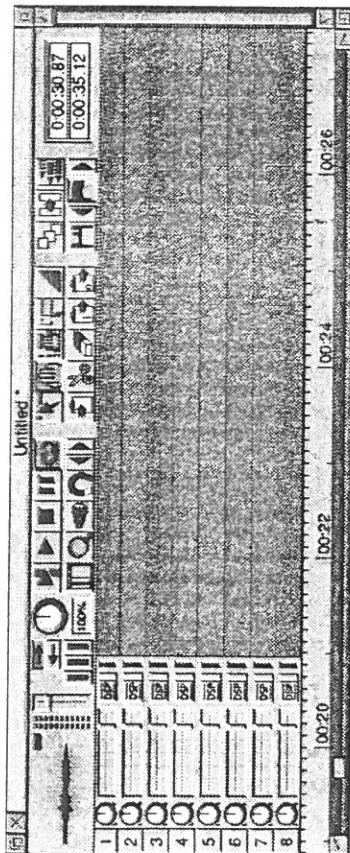


Create new project window

The settings default to a 5 minute sequence, with 8 tracks, at an audio frequency of 44100 Hz, which is fine for our first sequence, so click **Create** to start the project.

The StudioSound Timeline

The StudioSound timeline will be opened reflecting a project of the requested duration, in this case 5 minutes.



StudioSound timeline window

Now drag any audio sample to a point somewhere on the StudioSound timeline, hence representing the sample as a coloured block or segment.



If the segment is larger than the part of the timeline that is being displayed, click the **Zoom out** button until the whole segment can be seen.



Now choose the **Move tool**. This tool allows individual segments to be moved about on the time line. Move the pointer over the segment you have positioned on the timeline, and try to drag it. The segment should move horizontally either way along the track. Now try dragging the segment again, but this time hold down *Shift*, the segment may now be moved onto different tracks.



Choose the **Selection tool**. This tool allows you to make selections on the timeline, either for editing or playing. It works very much like selecting text in a DTP. You will notice that any part of the timeline that is selected, turns blue. Now make a selection that covers the sample segment you have positioned on the timeline.



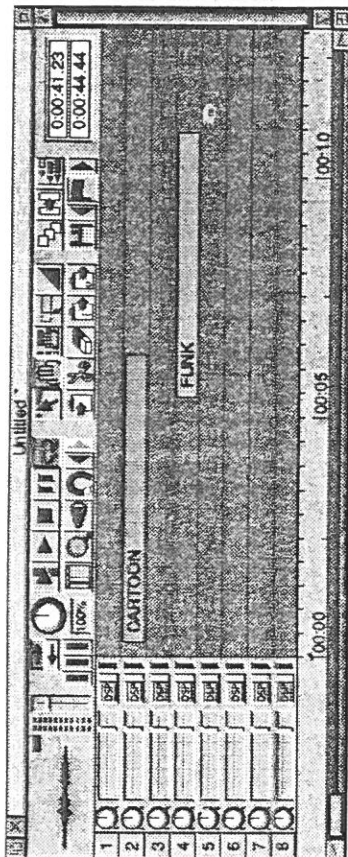
Now click the **Play selection button**. The currently marked selection of the timeline will be played. At the moment you only have one sample segment on the timeline, but if there were other segments on other tracks, they would all be mixed, in realtime. The selection will continue to play until the end is reached, at which point playback will loop back to the beginning of the selection, as the **Looped play button** is selected as default.



Applying a Crossfade

A crossfade permits one audio segment to be smoothly faded into another. StudioSound allows crossfades to be achieved very quickly and simply, but for this we will need a second sample segment, to fade into.

Drag another sample onto the StudioSound timeline, on a track just below the existing sample segment. Again zoom out, if you cannot see the entire sample segment.



Timeline with two sequenced segments

Arrange the segments using the Move tool, to look like the sequence shown here. The two sample segments should overlap slightly. Now using the Selection tool, select the area of the timeline where the sample segments overlap, and then play the selection by clicking the Play selection button.

You will notice that both samples are mixed and played simultaneously, but this is not a fade, what we actually want is for the first segment to fade out, whilst the second segment is faded in.



This is where we introduce the **Envelope tool**. A crossfade is just one of the effects produced using audio envelopes. Select the tool, and you will notice a curve appears on the segment block, with some control points. This curve controls the amplitude of the sample throughout its duration. The curve may be modified by dragging the control points.



Setting an audio envelope curve on sample segments

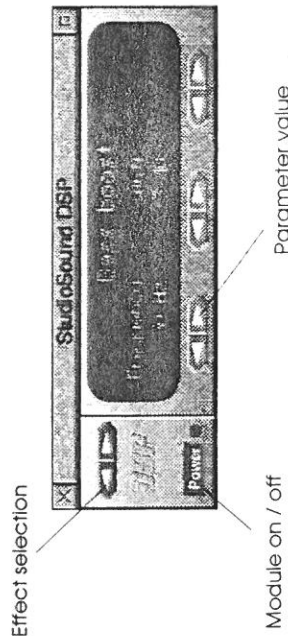
Have a go at dragging the control points on both of the sample segments, then setup the curves of the two segments to look roughly as they do here, and then play the selection again. This time you should have achieved the required crossfade.

Applying Realtime DSP Effects

StudioSound provides a range of software DSP (Digital Signal Processing) effects, that are able to modify the output of an audio segment in realtime. This is a very powerful, and useful feature of StudioSound.

Select the Selection tool, and make a selection on the timeline that entirely covers one of the sample segments. This can be done quickly by double clicking on a sample segment, whilst pressing *Shift*.

Click the Play selection button to start continuously looping playback of the selected segment. Now click the DSP button for the track on which you have selected a sample segment. This will open the DSP window, for that particular track.



Software DSP window

First turn the effect module on, by clicking the **Power** button. You may then cycle through the available effects using the **Effect Selection** buttons.

Choose an effect and modify the parameter values for that effect. The audio output will change in realtime according to the settings made. It is possible to apply up to 4 different effects to each track. The additional modules for this particular track are accessed by **Toggle** icon on the DSP Window.

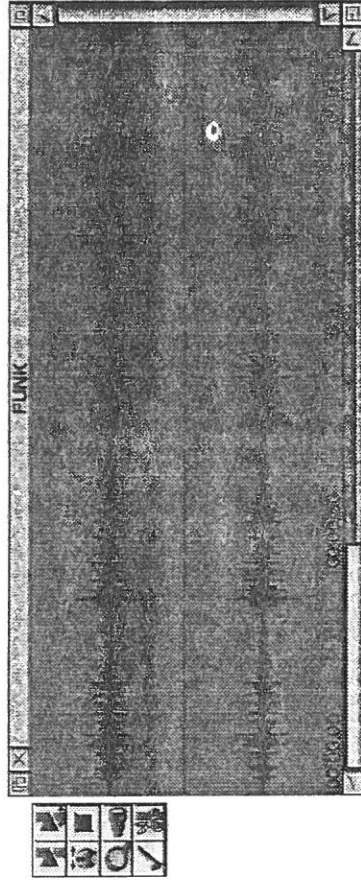
These effects apply only to the track on which they are set, so you can setup different tracks with different effects. Experiment with the available effect modules, noticing the affect on the playback of the sample.

Trimming Sample Segments

So far the sample segments we have used on the timeline have been used in their entirety. However, it is possible to use just small snippets of a sample, by selecting what is to be played using the trimming tools.

Select the **Trimming** tool from the toolbar. You will notice that the sample segments are now displayed with a black bar at either end. These bars can now be dragged to trim the beginning or the end of the sample segment, thus making it shorter.

Trimming can be achieved more accurately using the segment **Viewing** window. This is opened by double clicking on any sample segment.



Sample segment viewing window

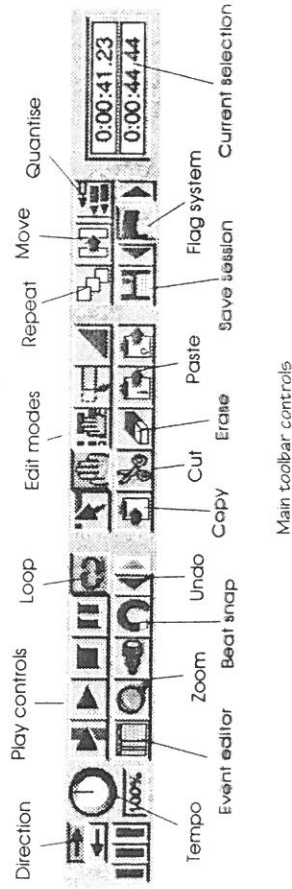
This window displays the waveform of the segment, but also allows the segment to be trimmed. When the window is first opened, the whole of the sample is selected, this is shown by the fact that the area is blue. By clicking in the window, you can make a new selection. Only the area that is selected will be played, the rest of the sample will be trimmed.

Use the zoom tools on the small Viewing window toolbox to see more or less of the sample, and click the Play selection button to play the part of the sample that is currently selected. When you are happy with the trimmed sample, click the **Trim** button to trim the segment on the timeline.

You may also want to cut a slice out of the center of a segment, this too is very simple in StudioSound. Simply make a selection in the Timeline window over the part of the sample segment you wish to remove. Now click the **Cut** tool, and the selected section of the sample segment will be removed. Actually, this isn't quite true, what in fact happens, is, a second copy of the sample segment is made, and then the end of the first sample segment is trimmed, and the beginning of the second sample segment is trimmed, and then they are butted together effectively producing one segment, but with the selected bit removed. Simple, yet effective.

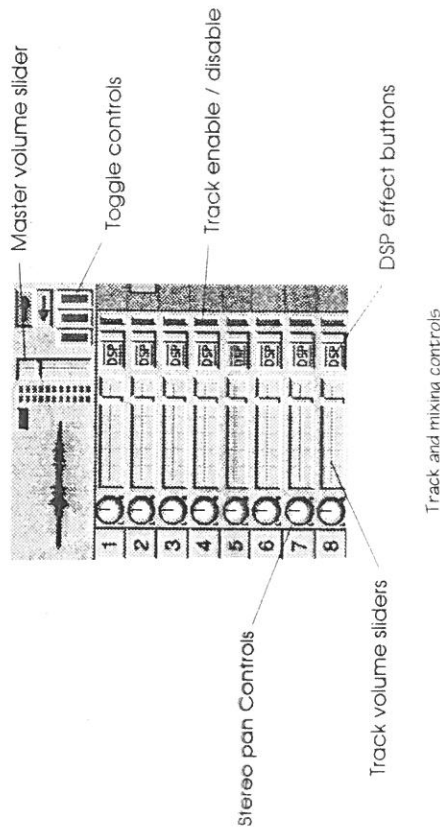
Toolbar Overview

Many of the features offered by StudioSound can be controlled by its comprehensive toolbar system. The horizontal toolbar at the top of the timeline provides general editing controls, whereas the vertical toolbar at the side of the timeline provides track and mixing controls.



Track Control and Mixing

Each track of the StudioSound timeline has its own controls. These enable each track to be individually enabled or disabled, both for playback and for editing operations.



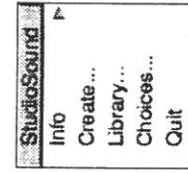
When a track is disabled, its status button is red, otherwise if it is enabled it is green. Three toggle icons on the toolbar, allow all the track status buttons to be toggled simultaneously.

When a track is disabled any operations that are taking place on a selection, such as cut and paste, will not affect the disabled tracks.

The volume sliders and stereo pan controls for each track, control how the track will sound as part of the final mix. When playing the project, these sliders can be moved, and the effect can be heard in real-time. The overall sound output is controlled with the master volume slider.

3. The Iconbar Menu

This menu is accessed by clicking *Menu* over the StudioSound iconbar icon.



Info

Gives general information about StudioSound including the version number.

Create...

Opens the **Create new project window**. Clicking the StudioSound iconbar icon with *Select* has the same effect.

Library...

Opens the **StudioSound Library window**. Clicking the StudioSound iconbar icon with *Adjust* has the same effect.

Choices...

Opens the **StudioSound Choices window**, for setting up default options.

Quit

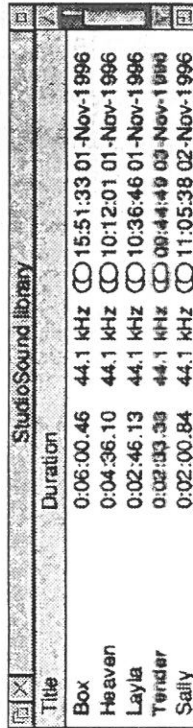
Removes StudioSound and any current projects from the desktop. If there are any unsaved projects, StudioSound will ask for confirmation of this action.

4. Loading Audio Samples

The Library

StudioSound stores all audio samples to be used for a sequence session in the Library, which is opened by choosing **Library...** from the iconbar menu, or clicking the StudioSound iconbar icon with *Adjust*.

An audio sample may be loaded into the library by dragging it from the filer window to the library. The sample may also be put directly onto a track of the timeline by dragging it from the filer window to an appropriate position on the track. In this case the sample will be automatically installed into the library.



StudioSound library		
Title	Duration	
Box	0:06:00.46	44.1 kHz ☐ 15:51:33 01-Nov-1996
Heaven	0:04:36.10	44.1 kHz ☐ 10:12:01 01-Nov-1996
Layla	0:02:46.13	44.1 kHz ☐ 10:36:46 01-Nov-1996
Tender	0:02:33.33	44.1 kHz ☐ 09:44:49 09-Nov-1996
Sally	0:02:00.84	44.1 kHz ☐ 11:05:38 02-Nov-1996

Audio sample library

Each sample is listed in the library along with its duration, sampling frequency, and date of creation. The symbol ☐ is used to denote that the sample is mono, or ☐ if a stereo sample is loaded.

An audio sample may be transferred from the library to the timeline by clicking its name, which will make a musical note appear, which may then be dragged to an appropriate position on a track. Double clicking on a sample entry in the library, will open up the sample segment Viewing window, from where the sample may also be played.

Supported Audio File Formats

Audio samples may be imported into StudioSound in any of the following formats.

Format	Recognition method
Replay(1)	Filetype (&AE7)
Armadeus	Filetype (&D3C)
AudioWorks(2)	Filetype (&BD6)
DataVox	Filetype (&108)
.WAV(3)	Filetype (&FE4) / words 'RIFF' or 'WAVE'
Mascom	Filetype (&103)
Psion	Load only
.SOU	Load only
.VOC	String 'Creative Voice' in the start of file
AIFF	First group chunk 'COMM'
Symphony Sample	Filetype (&10A)
Amiga IFF	First group chunk '8SVX'
Sun/NcXT	First word '.snd'

The Library Menu

This menu is accessed by clicking *Menu* anywhere in the Library window.

Selection

View

Copy

Title

Edit

Remove

Save as default

Remove unused

View

Opens the sample segment Viewing window, containing the selected sample.

Copy

Produces a duplicate of the the selected sample, which may be trimmed and later sequenced on the timeline.

Title

Allows the name of the currently selected sample to be changed.

Edit

This feature is only available when the current sample is a copy of a another sample in the library. It allows the duration of the duplicate sample to be modified, thus the copy may be a smaller section of the whole sample.

Library menu

Edit in ProSound

Takes selected sample into ProSound via the OLE system. This is only available for original sample segments, not for copies of segments, and hence is not shown in the menu here. ProSound version 1.05 or above is required for this feature.

Remove

Will remove the currently selected audio sample from the library.

Save as default

The contents of the library can be saved, so it is restored whenever StudioSound is started.

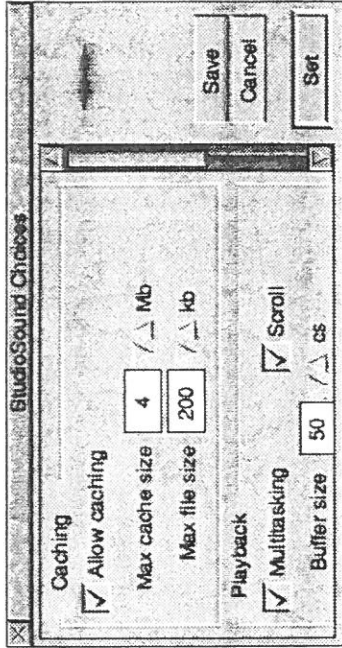
Remove unused

Will remove all audio samples from the library, that are not used in any current StudioSound project.

- (1) Only 8 and 16 bit, format 1. Audio chunks must be stored contiguous.
- (2) Only mono 8bit or 16 bit.
- (3) Only 8 bit and 16 bit PCM and 8 bit a-law and u-law.

5. StudioSound Choices

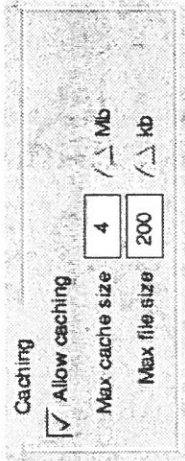
These are accessed by choosing Choices... from the StudioSound iconbar menu.



StudioSound choices window

The choices are sectioned into different areas all contained in a scrollable window. After setting new choices, they may be set to be used temporarily for the current session by clicking *Set*, or may also be saved for use the next time StudioSound is loaded by clicking *Save*. Clicking *Cancel* will close the Choices window, reverting all options back to their original settings.

Cacheing



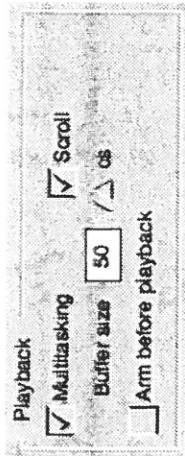
Sample cache choices

The cache can be used to keep smaller samples in memory, rather than on disc. When StudioSound starts playback, it scans the project that is about to be played, to determine which of the files it should read into the cache. This may take a few seconds with very large projects, or if a large amount of memory has been allocated for the cache.

Any changes made to the cache size will not take affect until next time something is played. The **Maximum cache size** can be anything between 1 and 40 Mb. Using a very large cache may actually make editing operations slower, but playback faster.

The **Maximum file size** for the files which should be cached may also be defined at any value between 16 and 2048 Kb.

Playback



Playback choices

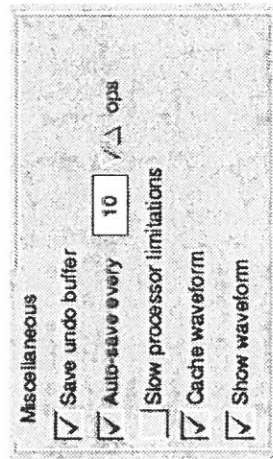
Choosing the **Multitasking** option, allows playback of audio through StudioSound to multitask. All editing operations may then continue during playback, including the application of realtime DSP effects.

Choosing the **Scroll** option will enable the timeline window to scroll during playback, so the position of the playback cursor can always be seen.

The playback buffer is used to achieve smooth, steady playback of the project. The **Buffer size** is set by a value in cs. Larger buffer sizes may be required on slower systems, where the hard disc may not be able to keep up with the required data transfer rate. Using a large buffer results in StudioSound being a little less responsive.

The **Arm before playback** option allows StudioSound to be prepared ready for playback, each time the Play button is pressed. StudioSound will then automatically enter pause mode, ready for instant playback. This is particularly useful for playback under TimeCode control.

Miscellaneous



Miscellaneous choices

Choosing the **Save undo buffer** option permits the undo information to be saved with a session file, thus operations performed in a previous session may still be undone next time editing recommences.

The **Auto-save** facility allows an EDL file to be saved automatically after every n number of operations. You must save the EDL file manually first, so StudioSound knows which EDL to keep updating.

StudioSound uses a special mixing method to enable 2nd and 3rd order DSP effects such as Reverb and Echo to be applied. Such operations may be a little slow, and reduce the number of tracks which may be simultaneously mixed on a non StrongARM machine. The **Slow Processor limitations** option, uses a faster mixing method, but disables all 2nd and 3rd order effects. This option only takes effect the next time StudioSound is loaded.

Caching Waveform Thumbnails

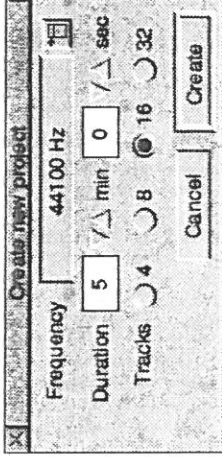
StudioSound has the ability to create a thumbnail waveform image for each of the sample segments being used on the timeline. This is useful when cutting and pasting segments, as it allows silent parts of a segment to be easily identified.

Choosing the **Cache waveform** option will make StudioSound create a small thumbnail version of each sample segment as it is played. This means that whilst each new segment will initially appear as a blank block, as the segments are played a complete thumbnail picture of the project is built up.

The **Show waveform** option enables or disables thumbnail waveform display, so display can be disabled, even if the waveforms are still being cached for later use. Thumbnail waveforms look best in screen modes with 256 colours or more.

6. Creating a New Project

StudioSound enables multiple projects to be edited simultaneously, which are normally created using the **Create new project window**, which is opened by clicking **Select** on the StudioSound iconbar icon, or choosing **Create...** from the iconbar menu.



Create new project window

The **frequency** of the project should be chosen from the standard values available in the popup menu, or a specific value may be entered at the bottom of the menu.

22050 Hz is a commonly used frequency for low-medium quality audio work, 44100 Hz is the standard audio CD frequency, and 48000 Hz is the frequency used for professional audio recording particularly on DAT.

The **time duration** of the project may be set in terms of minutes and seconds. However, it is always possible to extend or reduce the length of a project, should this become necessary at a later stage.

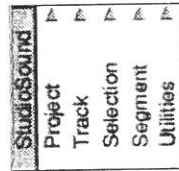
The number of **tracks** to be present in the project should be selected. Using more tracks than required will not impair performance, but will simply make the desktop more cluttered. Additional tracks may be created or removed later during editing.

7. The StudioSound Menu Structure

This section describes the main menu structure of StudioSound, most of the processing and editing functions are accessed from here, however there are a number of keyboard short-cuts performing the same actions, which are listed in a separate section at the back of this manual.

The StudioSound Main Menu

This menu is accessed by clicking *Main menu* anywhere in the Timeline window.



Project submenu

Operations in this submenu will affect the project as a whole.

Track submenu

Operations in this submenu will affect only the track which the pointer was positioned over, when *Main menu* was clicked.

Selection submenu

Operations in this submenu are concerned only with the current selection, across all currently enabled tracks.

Main menu

Segment submenu

Operations in this submenu are concerned only with the current audio segment.

Utilities submenu

This submenu contains various utilities, which do not fit into any of the previous categories.

The Project Submenu

All operations in this submenu will affect the project as a whole.

Project	
Info	
Save EDL F3	
Save	
Duration	
Beats...	
Remove	^Q

Info

Opens a window giving details about the current project.

Save EDL

Opens a standard savebox, allowing a StudioSound EDL (Edit Decision List) to be saved. Dragging this file to the StudioSound icon bar icon at a later time will allow editing to recommence at the point the project was saved. The undo buffer may also be saved, see Choices chapter for more details.

Save

Permits a finished audio file of the sequenced project to be saved, usually mixed down to a twin stereo pair.

Project submenu

Duration

Permits the duration of the project to be extended or reduced.

Beats

Opens a window for control of the StudioSound gridlock system which works in terms of musical bar and beats. It also controls playback tempo.

Remove

Choosing this menu item will remove the current project, requiring confirmation if the project is unsaved.

The Track Submenu

All operations in this submenu will affect only the track over which the pointer was positioned, when Menu was clicked.

Track	
Clear track	
Copy track	
Cut track	
Delete track	
Add track	
Mixer...	
Move	

Clear track

Clears the current track of any segments that have been sequenced.

Copy track

Copies the current track to the StudioSound clipboard.

Cut track

Cuts the current track to the StudioSound clipboard.

Delete track

Removes the current track from the timeline.

Track submenu

Add track

Creates an additional track on the timeline, inserted after the current track.

Mixer...

Opens a mixer window for the current track, allowing more accurate setting than the stereo pan pot and level controls on the timeline toolbar.

Move

Permits the entire track to be slid left or right along the timeline, by a defined period of time.

The Selection Submenu

All operations in this submenu will affect the currently selected area on all tracks that are currently enabled. See the Track Mixing and Control chapter for more details.

Selection	
Select all	^A
Clear selection	^Z

Copy	^C
Cut	^X
Silence	^D
Paste (insert)	^V
Paste (overwrite)	^O

Repeat	
Move	
Quantize	
Play around	^F11

Select all

Select the whole of the timeline.

Clear selection

Deselects any currently made selection.

Copy

Copies the current selection to the StudioSound clipboard.

Cut

Cuts the current selection to the StudioSound clipboard.

Silence

Clears all segments on the timeline covered by the current selection.

Paste (insert)

Pastes by inserting the contents of the StudioSound selection clipboard at the position of the cursor.

Selection submenu

Paste (overwrite)

Pastes the contents of the StudioSound selection clipboard at the position of the cursor, overwriting any audio currently present on the timeline.

Repeat

Allows the current selection to be repeated a set number of times, at a specified offset along the timeline.

Move

Permits the current selection to be moved to another part of the time line.

Quantize

Provides the facility to automatically snap segments within the selection to beats and bars on the timeline, with definable accuracy and sensitivity.

Play around

Will play around the current selection on the timeline, starting a few seconds before the selection and ending a few seconds after. This feature is useful for determining the affect of removing part of the project.

The Segment Submenu

All operations in this submenu will affect the segment over which the pointer was positioned when Menu was clicked.

Segment	
Controls	
View ...	

Copy	
Cut	
Delete	
Paste (insert)	
Paste (overwrite)	

Repeat	
Split	

Controls

Opens the Segment control panel, for control of segment volume, tempo, and enveloping.

View

Opens the Segment viewing window, for viewing the sample waveform, and trimming the segment.

Copy

Copies the current segment to the StudioSound clipboard.

Cut

Cuts the current segment to the StudioSound clipboard.

Delete

Deletes the current segment from the timeline.

Segment submenu

Paste (insert)

Pastes by inserting the contents of the StudioSound segment clipboard at the position of the cursor.

Paste (overwrite)

Pastes the contents of the StudioSound segment clipboard at the position of the cursor, overwriting any audio currently present on the timeline.

Repeat

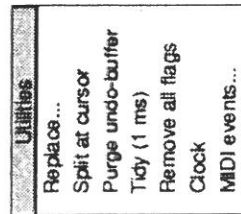
Allows the current segment to be repeated a set number of times, at a specified offset along the timeline.

Split

Permits the current sample segment to be split into two parts at the position of the cursor.

The Utilities Submenu

The items in this submenu offer general tools, that do not fit into any of the previously described categories.



Replace

Allows a sample segment to be replaced with an alternative sample, either locally or globally.

Split at cursor

Allows all segments on the timeline, which are positioned on enabled tracks, to be split at the position of the cursor.

Purge undo buffer

Empties the contents of the undo buffer.

Tidy (1ms)

Removes all segments shorter than 1 ms from the timeline.

Remove all flags

Clears all marker flags that have been set on the timeline.

Clock

Opens the StudioSound real-time studio clock, displaying the current play position timecode.

MIDI events...

Opens the MIDI events editor.

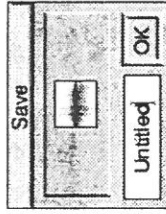
8. Saving StudioSound Audio

At any point during editing, StudioSound may save either a session EDL, or an audio file, both of these options are accessed from the Project submenu.

Saving a Session EDL

It is possible to save a session EDL (Edit Decision List) from StudioSound, which will allow you to return the timeline to the current state, at the next editing session.

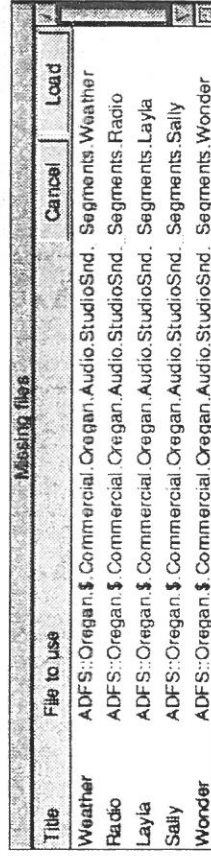
The Save session EDL window may be opened by clicking the **Save EDL** button on the main toolbar, or from the Save EDL choice in the Project submenu.



Save session EDL

The session EDL may be saved with the undo buffer, so that operations performed in the current editing session, may be undone in the next editing session. This option is controlled from the Choices window.

When reloading a StudioSound session EDL, it will expect to find the samples used in the project in the same place they were last time. If this is not the case then the **Missing files window** will be opened, allowing you to manually replace those samples that have not been found.



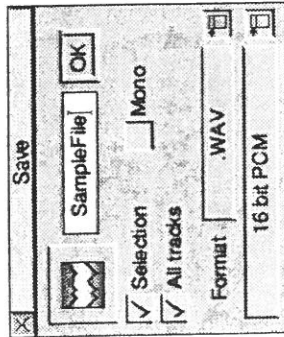
Missing files window

The window contains a list of all those files which could not be found in their expected positions. Dragging a sample file from a filer window onto one of these listed files will replace that segment. The filenames of all missing files are displayed in red, until they have been replaced.

Once all the files have been replaced, click **Load** to open the StudioSound timeline.

Saving a Finished Audio File

Once the sequence is completed a finished audio file of the sequence may be saved, in any one of a number of different audio formats.



Save audio sample window

• Format

The format of the audio sample to be saved is chosen using the two popup menus. First the file type is chosen, in this case WAV has been selected, and then the internal format for the audio data, in this case 16 bit PCM. Most of the formats which StudioSound is able to import, may also be saved from StudioSound.

To save the sample, once the format has been chosen, drag the file icon from the savebox to a filer window.

It is also possible to save as a ProSound Session folder, which may be edited in ProSound, and later imported back into StudioSound.

• Selection

When this option is chosen, only the current selection on the timeline will be saved.

• Mono

When this option is chosen, a mono audio sample is always saved. A mono sample is also saved if the chosen file format does not support stereo audio, even though the Mono option may not be selected.

• All tracks

Forces all tracks to be saved, otherwise only the currently active tracks, according to the settings of the track enable/disable buttons will be saved.

9. Beats and Bars Control

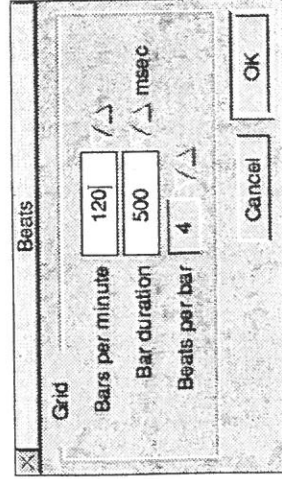
Beat markers may be considered to be analogous to the gridlock of a drawing package, in that they provide an easy means of alignment on the timeline.



Beat markers

Beat markers are displayed as divisions on the timecode ruler, at the bottom of the StudioSound timeline.

The duration of each beat is definable in the **Beats** window, which is accessed by choosing **Beats...** from the Project submenu.



Beat and tempo window

The number of musical bars, and the beats within each bar may be defined, either in terms of **Bars per minute**, or millisecond **Bar duration**.

Notice that when values have been set, such that the number of beats per minute is very high, the number of beat divisions displayed on the timeline may not increase, to avoid clutter.

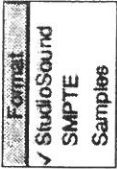
Snapping to Beat Markers

The bar and beats system becomes more useful, when using the **Snap** to beats tool on the main toolbar. With this tool selected, the cursor will be snapped to the nearest beat, as it is moved along the timeline.

Segments will also be snapped to the position of the ends of existing segments on the timeline, to make segment alignment easy.

Timecode Format

The format of the timecode displayed on the Timecode ruler may be changed from the small **Format menu** which is opened by clicking *Menu* over the Timecode ruler.



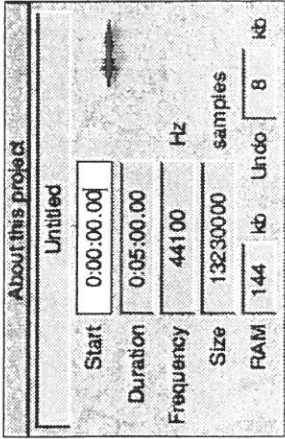
Timecode format menu

Timecodes may be displayed in the standard StudioSound / ProSound format, SMPTE standard, or by number of samples.



10. Project Information and Control

Information about the StudioSound project is given in the **Info window**, which is accessed from the Project submenu.



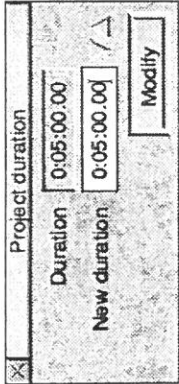
Info window

Information includes, the name of the project, the duration of the project in real time, the frequency and number of samples, the amount of RAM the project is consuming, and the size of the undo buffer.

The timecode of the project **Start** position can be set by entering a timecode in the standard h:mm:ss.cc format. Normally this is set to 0:00:00.00, but it is useful to be able to set an offset, when working under MTC/SMPTE timecode control.

Modifying the Project Duration

The current duration of the project, that was set when the project was created, may be modified at any time in the **Duration window**, which is accessed from the Project submenu.

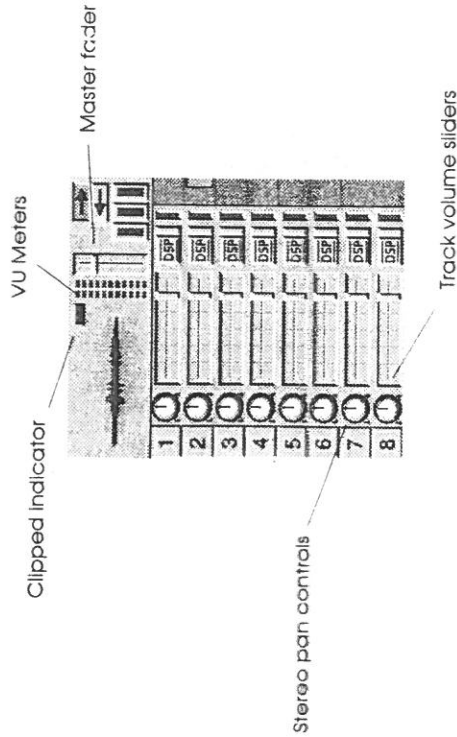


Duration window

Simply enter a new duration in the form h:mm:ss.cc and click **Modify** to adjust the length of the timeline.

11. Track Mixing and Control

Each track of a StudioSound project may contain a number of mono or stereo audio segments. Where audio segments are present on a number of tracks, at the same time on the timeline, they will be mixed according to the current settings of the track mixers.



Mixing

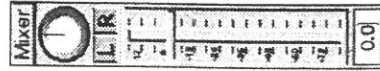
Each track has its own **Volume slider** in the toolbar, which may be dragged to set the corresponding audio level for that individual track. The track may also be assigned a position, somewhere between the left - right stereo domain, by using the small **Stereo pan controls**.

These controls are fine for setting rough levels, but if a more accurate setting is required, this can be achieved by using the slider in the **Mixer panel** for that track. This is opened by choosing **Mixer...** from the **Track** submenu, thus opening a mixer for the track the pointer was positioned over, when **Menu** was clicked.

The **Mixer panel** has controls for accurate level setting, either by moving the slider, or entering a numeric value in dB. The left or right stereo position may be disabled, or the track may be placed somewhere between the two, using the pan control.

When the project is played, the audio from each track is mixed in realtime according to the settings in the mixers. The overall volume level is then controlled by the **Master fader** on the main toolbar.

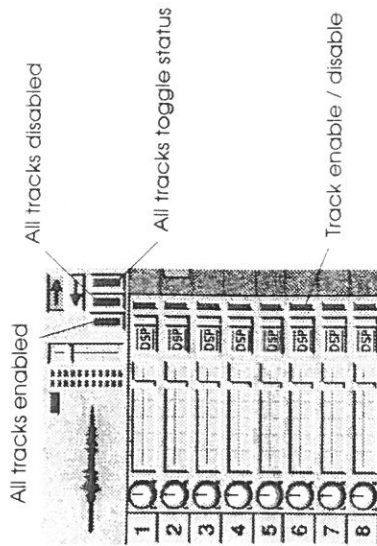
The status of the overall audio output is reflected by the **VU meters**, if these enter the red region, then the audio is being clipped. The **Clipped indicator** will glow red to indicate that the audio output has been clipped at some point during playback, it may be extinguished by clicking it.



Mixer panel

Track Control

Each track of the timeline has its own enable / disable control button. When a track is enabled any editing operation that is performed on a selection, will take an effect on the track. The track will also be included in audio playback of the project. If the track is disabled, it will play no significance in the project.



Track and mixing controls

Each track may be toggled on or off individually by clicking the **Track enable / disable button** with *Select*. Clicking the button with *Adjust* will have the effect of enabling that track, but disabling all other tracks in the project.

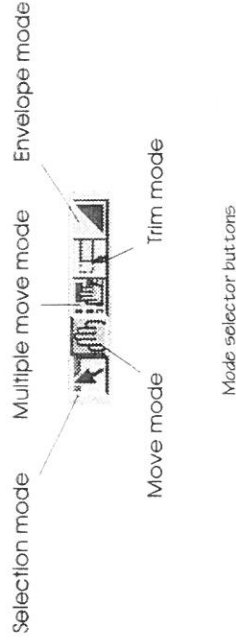
Clicking the **All tracks enabled button**, will enable every track in the project, regardless of its initial status.

Clicking the **All tracks disabled button**, will disable every track in the project, regardless of its initial status.

Clicking the **All tracks toggle status button**, will toggle the status of every track in the project, thus all tracks that were initially disabled become enabled, and vice versa.

12. Editing Modes

StudioSound has 5 different editing modes, which are selected using the **Mode selector buttons** on the toolbar.



Selection Mode

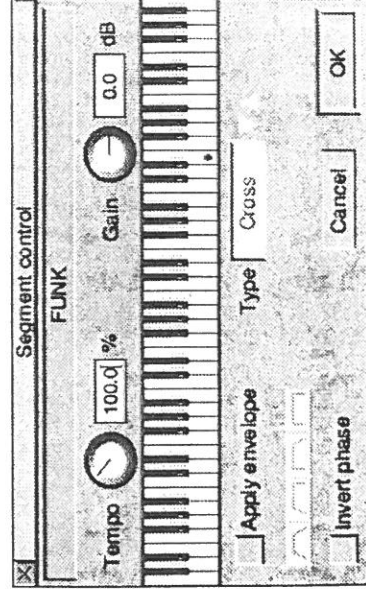
Selection mode is used for making selections on the timeline. However, when in any of the other editing modes a selection can still be made, by clicking and dragging on the Timeline ruler at the bottom of the timeline.

- Double clicking on a sample segment opens the **Viewing window**.

- Double *Shift* clicking on a sample segment, makes a selection on the timeline covering that segment.

- Double *Ctrl* clicking on a segment will open the **Control panel** for that segment.

The Segment Control Panel



Segment control panel

The panel provides **Tempo** and **Gain** control for each individual sample segment. Either may be set by rotating the control knob, or entering a numeric value. A new tempo may also be set by clicking on a key on the small piano keyboard, each note raising the tempo to affect a one semitone pitch change.

The panel also provides envelope control, this is described in the Audio Enveloping chapter.

Move Mode

 Move mode is used for moving sample segments around on the timeline. A sample segment may be clicked, and dragged to move it to its new location.

- Dragging whilst pressing *Shift* allows the segment to be moved onto a different track.
- Dragging whilst pressing *Ctrl* has the same effect as using Multiple Move Mode.
- Double *Ctrl* clicking on a segment will open the **Control panel** for that segment.

Multiple Move Mode

 Multiple move mode operates in exactly the same manner as Move mode, only once a sample segment has been moved, all other sample segments further down the timeline will also be moved, in relation to the new position of the moved segment.

- Dragging whilst pressing *Shift* allows the segment to be moved onto a different track.
- Dragging whilst pressing *Ctrl* has the same effect as using Move Mode.
- Double *Ctrl* clicking on a segment will open the **Control panel** for that segment.

Trim Mode

 Trim mode allows the ends to be trimmed from a sample segment on the timeline. When in Trim mode, each sample segment will be displayed with a small black control bar at either end. These control bars may then be dragged to shorten, or lengthen the sample segment.

Sample trimming can also be achieved more accurately using the **Viewing window**, see the Sample Segment Viewing chapter for more details.

- Double clicking on a sample segment opens the **Viewing window**.
- Double *Ctrl* clicking on a segment will open the **Control panel** for that segment.

Envelope Mode

 Envelope editing mode, permits an audio envelope curve to be set for each sample segment. When envelope curve control points are dragged, the envelope is automatically enabled in the Control panel, and set to a crossfade.

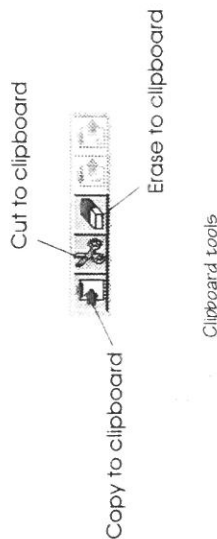
Other types of envelope may be selected from the Control panel. See Audio Enveloping chapter for more details.

- Double *Ctrl* clicking on a segment will open the **Control panel** for that segment.

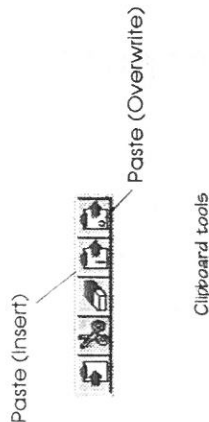
13. Cutting and Pasting Selections

 To make selections on the timeline, the **Selection tool** should be chosen. A selection may then be made, just like with any other RISC OS application using the *Select* and *Adjust* buttons.

Alternatively, a selection may be made by dragging in the Timecode ruler. This feature allows a selection to be made, regardless of the editing mode currently being used.



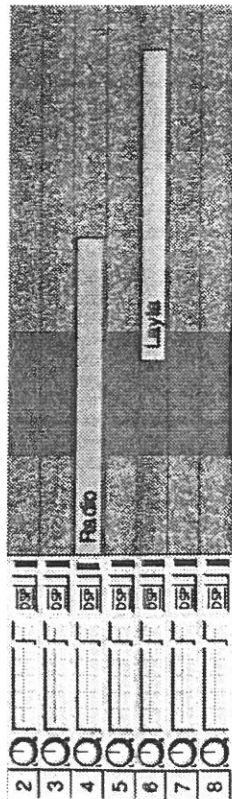
You will notice that once a selection has been made, the **Copy**, **Cut** and **Erase** clipboard tools become available. These tools operate on the current selection, but will only take effect on those tracks which are enabled. The **Paste** tools will not be selectable, because nothing has been cut or copied to the clipboard yet.



Once something has been copied onto the clipboard the **Paste** tools will become available. The contents of the clipboard may be either pasted at the position of the cursor, thus overwriting any audio data currently there, or may be pasted by inserting an appropriate amount of space in the timeline.

Segment Trimming

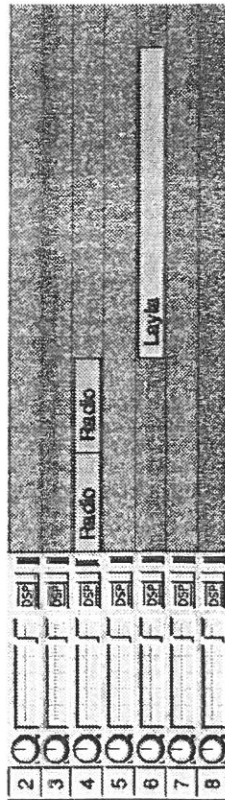
By cutting part of the timeline, it is possible to trim a piece out of the middle of a sample segment. This might be used for cutting a sentence or two from some speech, for instance.



Trimming the middle of a segment

In the example shown here, if the selection were cut, a section will be taken out of the middle of the sample segment labelled *Radio*. At first glance, it looks as though the beginning would also be trimmed from the sample segment labelled *Layla*. However, in this situation, this is not the case, as the track enable buttons have been set such that only track 4 is enabled, and so, only track 4 is affected by the operation.

Of course if we wanted to trim the beginning of the sample segment *Layla*, then track 6 should be simply enabled also.



The result of trimming a segment

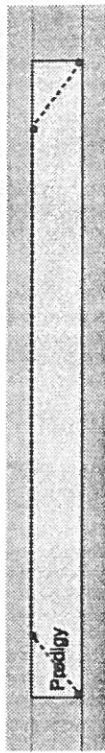
The result of cutting this selection is shown here. A second copy of the sample segment *Radio* has been created. The two segments are not the same though. The segment on the left has been trimmed such that only the beginning of the segment is played. The segment on the right has been trimmed such that only the end of the segment is played. The two segments are butted together, so they play consecutively, hence cutting out the part of the segment which was cut to the clipboard.

If the part of the segment that was cut, needs to be used elsewhere on the timeline, it can be, by simply pasting it back to any point on the track, using the Paste tools.

14. Audio Enveloping

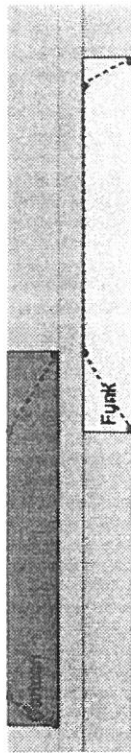
Each sample segment in StudioSound may have an envelope applied. An envelope directly controls the audio volume of the sample segment. As default the audio envelope on each sample segment is disabled, and so the segment will play at full volume throughout.

Selecting the Envelope tool displays the envelope curve on the sample segment. The default curve consists of a line with 4 control points. Each of these control points may be dragged with the mouse, when in Envelope editing mode. Once a control point has been moved, the envelope is activated for that sample segment. Additional control points are added by clicking at the required place on the curve with *Select*, whilst clicking with *Adjust* grabs the control point nearest the pointer.



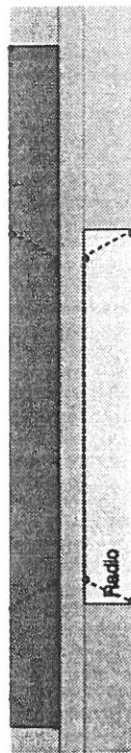
Sample segment with its audio envelope

The curve on the sample segment shown above illustrates the volume being increased from silence to its maximum value, and then back to silence again.



Setting an audio envelope curve on sample segments

The most common use for audio envelopes is to perform a crossfade from one sample segment to another. Here, as illustrated above, one sample segment fades out as another fades in.



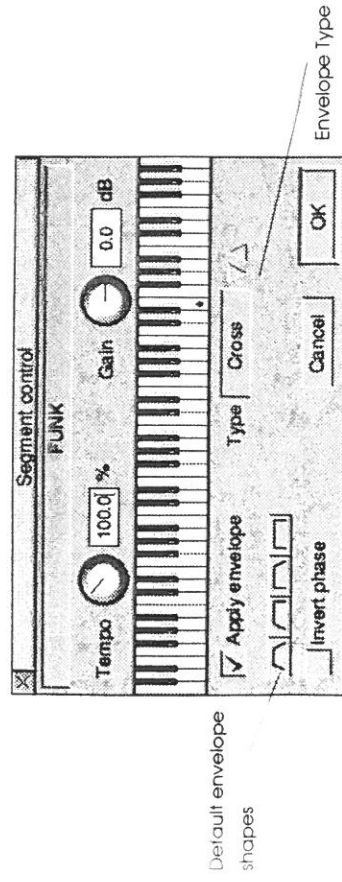
Sample segment with middle section faded out

Another typical use, is to fade the segment out in the middle, while a segment on another track is faded in for a short duration, as shown above.

The envelope curve for each segment may have up to 32 control points, allowing accurate and flexible control, as well as multiple fades.

Envelope Control

Each sample segment has its own Control panel, this is accessed by selecting Controls from the Segment submenu, or by double clicking on the sample segment whilst pressing *Ctrl*.



Segment control panel

The envelope is enabled or disabled with the **Apply envelope** option.

There are 3 different types of audio envelope that can be applied to the segment:

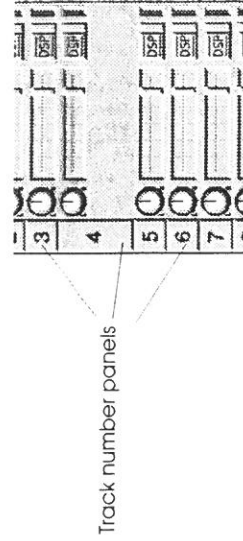
- **dB** - Fades follow a logarithmic curve.
- **Cross** - Crossfades maintain a constant combined audio amplitude between the two segments.
- **Linear** - Fades follow a linear curve.

Several default envelope shapes may be set by clicking on one of the four ramp buttons. These are the most commonly used shapes, and may be used to reset the envelope curve.

The phase of the current sample may be inverted by selecting the **Invert phase** icon.

Track Height Control

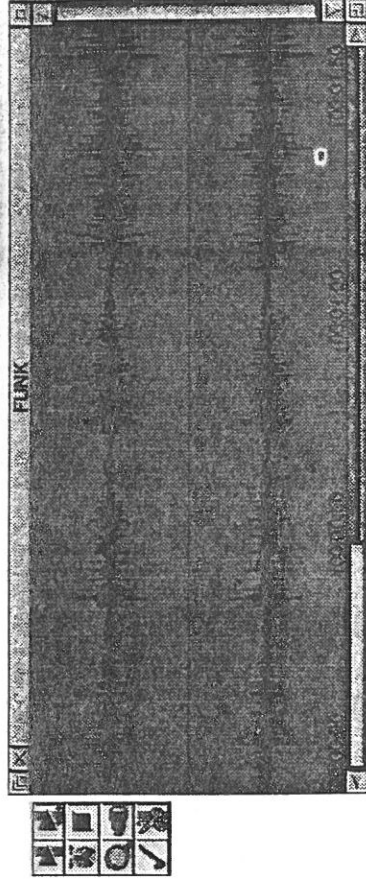
The height of each track may be increased for better control of the envelope curve. Clicking on the track number panels with *Select* increases the vertical height of that track, whilst clicking with *Adjust* decreases the height.



Track number panels

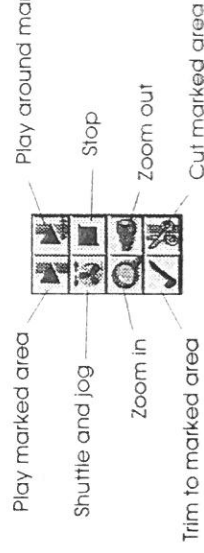
15. Sample Segment Viewing

The Sample segment viewing window is opened by selecting **View...** from the Segment submenu, or by double clicking *Select* on any sample segment, whilst in Selection or Trim mode.



Sample segment viewing window

The window displays the waveform of the sample segment, and also allows the segment to be trimmed very accurately. Moving the window slider bar allows waveform to be scrolled, but you will notice a slight delay in updating the waveform, as it is read off disc, and calculated in realtime.



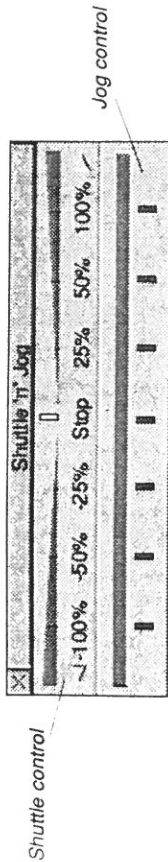
Sample segment viewing tools

Trimming a segment

Dragging with the *Select* and *Adjust* buttons allows a marked area to be defined. This area may be continuously played by clicking the **Play marked area** button. Clicking the **Trim segment** button will result in the segment being trimmed to include only the marked area. So by zooming in, the marked area may be defined very precisely, hence performing an accurate trim.

Shuttle and Jog Control

Audio editing can be achieved far more convincingly by ear, rather than by eye which is the fundamental basis of a waveform editor. The Sample segment viewing window offers shuttle controls, which allow the cursor to move slowly and accurately backwards and forwards over the waveform, playing the sample as it does so.



Shuttle and Jog window

Shuttling

By moving the mouse over the Shuttle window whilst pressing a mouse button the cursor may be moved, and playback achieved at any speed from -200% to +200%. The playback speed is doubled when using Adjust instead of Select.

Jogging

When jogging, the speed with which the mouse is moved controls the speed of movement of the cursor over the waveform. The mouse pointer wraps around to the other side of the window when the edge of the window is reached. The direction of mouse movement controls the direction of cursor movement.

Performance

Shuttling and jogging require a large amount of processor time, and hard disc activity. However, demand on the hardware and hence performance can be improved by using lower zoom settings in the viewing window.

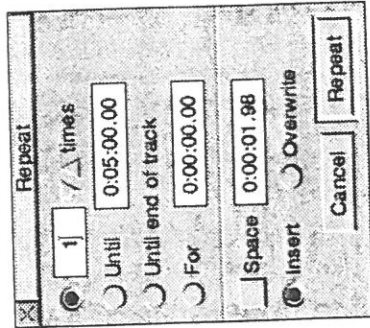
16. Repeating, Moving and Quantization

The repeat, move and quantization tools all operate on the current selection on the timeline. They will only take effect on the tracks which are currently enabled.

Repeat



This tool allows a selection of the timeline to be repeated automatically, without continuous copying and pasting. The Repeat window is opened by clicking the Repeat button on the toolbar, or selecting Repeat from the Selection submenu.



Repeat window

The selection may be repeated a set number of times, until a set point on the timeline is reached, until the end of the track, or for a set duration. Choose the appropriate option, and enter a suitable value.

The Space option may be used to enter a definable space between each repetition.

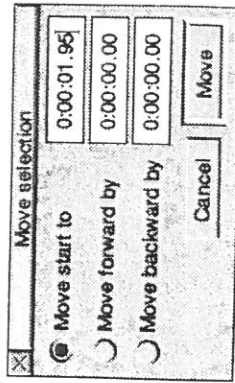
The repeated selection may either Overwrite any existing audio segments on the track, or create a suitable space in the track in which to Insert them.

Single Segment Repeat

A Repeat window is also available from the Segment submenu, offering exactly the same facilities as the window described here, but it only has effect on the single current segment, which is the one the pointer was positioned over when Menu was clicked.

Move

Move selection allows selections of the timeline to be moved back and forth along the timeline, more accurately than using the Move editing mode. The **Move selection window** is accessed by clicking the **Move button** on the toolbar, or selecting **Move** from the Selection submenu.

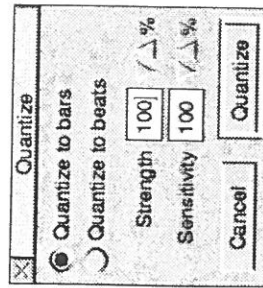


Move selection window

The selection may either be moved to start at a defined position on the timeline, or moved backwards or forwards by a definable time.

Quantization

The quantization tool allows sample segments within the current selection to be quantized, by snapping them to the bar and beat markers of the timeline. This might be used, for example, to make a drum beat sound regular, ie to ensure even spacing and repetition. The **Quantization window** is accessed by clicking the **Quantization button** on the toolbar, or selecting **Quantize** from the Selection submenu.



Quantization window

The selection may be either quantized to bars or beats, by selecting the appropriate option.

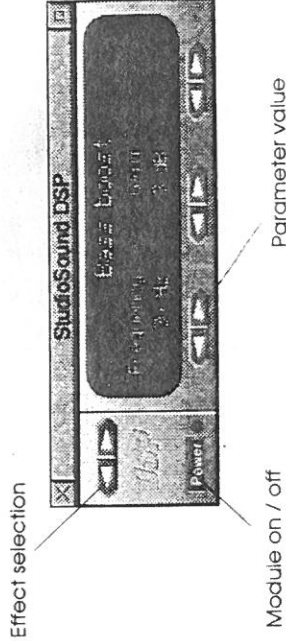
The **Strength** of the quantize, defines how close to the bar or beat the segments are snapped. A strength of 100% positions the segments exactly on the bar or beat, whereas 50% strength will only move the segments half the way to the closest bar or beat.

The **Sensitivity** controls how far from a bar or beat a segment should be, before it is affected by the quantization. A sensitivity of 100% will affect all segments.

17. Real-time DSP Effects

StudioSound is able to apply a number of software DSP effects to each track of the timeline. Effects applied to a track, will affect all sample segments on that track.

The **Software DSP window** is opened by clicking the **DSP button** next to the track on which the effects are to be applied.



Software DSP window

First turn the effect module on, by clicking the **Power button**. You may then cycle through the available effects using the **Effect Selection buttons**.

The DSP effects are modular and so the available effects will vary, and new effects may be added in the form of plug-in modules.

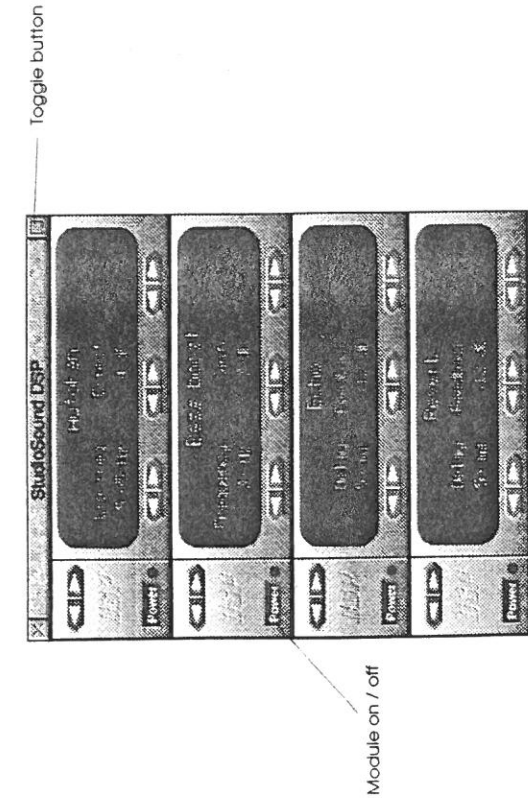
Choose an effect and modify the parameter values for that effect. The audio output will change in real-time according to the settings made.

These effects apply only to the track on which they are set, so you can setup different tracks with different effects. Experiment with the available effect modules, noticing the affect on the playback of the sample.

It is possible to apply up to 4 different effects simultaneously to each track, simply by activating more than one module at a time. The additional modules for each track are accessed by clicking the **Toggle button** on the DSP Window.

Effects currently available for StudioSound include:

AutoPan	Bass Boost	Echo
High Pass	Low Pass	Reverb
Treble Boost		



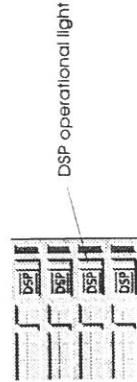
Software DSP window with multiple modules enabled

The application of software DSP effects places quite a hefty demand on the processor. For StrongARM machines this rarely presents a problem, but for slower processors it may be desirable to limit the range of effects available in favour of faster mixing routines, which enable more tracks to be played simultaneously.

The **Slow processor limitations** option in the Choices window, disables all 2nd and 3rd order effects such as reverb and echo, but results in more efficient playback for all other applications.

DSP Operational

Whenever a DSP effect has been applied to a track, the DSP operational light will be lit yellow to indicate this.

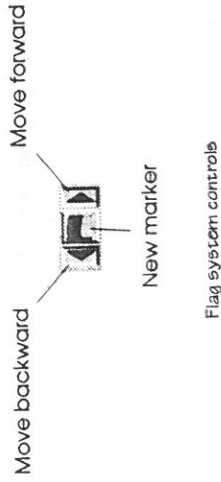


DSP lights

This light will only be extinguished when all DSP modules for that track are turned off.

18. The Flag System

The flag system allows markers to be set on the timeline, to aid navigation through the project during editing.



Flag system controls

A new flag marker may be dragged from the new marker recess, to a point on the timeline. It will then be positioned on the timecode ruler, at the time position to which it was dragged.

Further flag markers may then be dragged in the same manner, at different points on the timeline. The project may then be navigated using the **Move forward** and **Move backward** buttons, to step to each flag marker that has been positioned.

These markers may be typically used to mark the start and end of large sample segments. The markers then become very useful when working at high zoom levels.

A new marker flag may be placed at the position of the cursor, or the position of the playback cursor during playback of a project by pressing **Return**.

Individual markers can be later removed from the timecode ruler, by double clicking them. All marker flags may be removed from the timeline using the **Remove all flags** item in the Utilities submenu.

Naming Flags

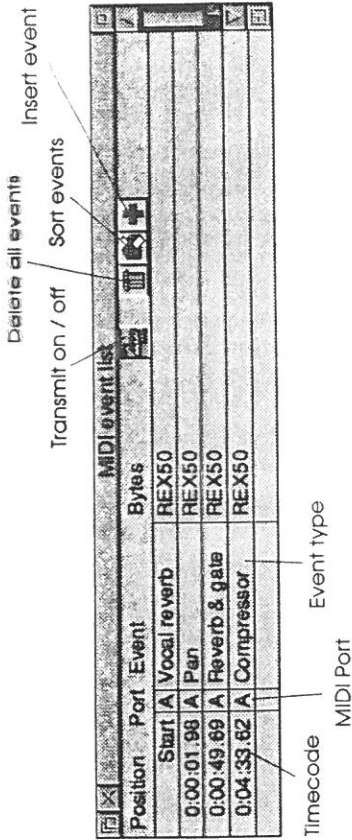
Each marker flag may be given a unique name to indicate the feature of the project it is marking. Double clicking on a marker with *Adjust* will open a small text window, into which the new name is entered.

Clicking *Menu* over the new marker recess will open a list of all currently placed markers, sorted in order of position on the timeline. Choosing a flag from this menu will move the timeline to the position of the flag.

19. MIDI Event Editor

StudioSound allows MIDI events to be generated at any point on the project timeline. This feature is very useful for sending SysEx (System Exclusive) data to external effects units and sound modules.

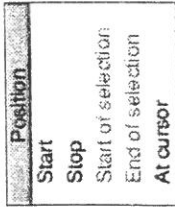
The MIDI Event list window is opened by clicking the Event list editor button, or choosing MIDI events... from the Utilities submenu.



MIDI event editor window

New events are created by clicking the **Insert event button**, causing a blank event to be inserted in the list. This new event now needs to be allocated several parameters before it is useful.

The **Position** of the event is set by clicking *Menu* over the **Position** field. A menu is opened enabling the event to be positioned at the **Start** of project, **End** of project, **Start of selection**, **End of selection**, or at the current **Cursor** position. Alternatively a timecode value can be entered directly into the position field at the caret.



Event position menu

The **MIDI Port** on which the event is to be transmitted must also be selected. Clicking *Menu* over any Port field opens a menu containing the items A,B,C and D, from which the appropriate port should be chosen.

You should now notice that an **Event marker** is placed on the timecode ruler for the new event, at the timecode specified by the position field. The marker is a small sphere, the colour of which depends on the port on which the event is placed. The markers are colour coded as follows:

MIDI - Port A	Yellow
MIDI - Port B	Green
MIDI - Port C	Blue
MIDI - Port D	Red

The event information is complete once the event name and data has been entered into the **Event** and **Bytes** fields. The event name is simply a reference to describe the effect the event will have, and may be entered directly into the field at the caret. The event data field is to contain the SysEx instruction

data itself and again may be entered directly into the field.

SysEx codes are specific to the particular hardware being controlled, and are normally given in a table in the manual provided with the hardware. If a particular piece of hardware is being frequently used, it is possible to set up a Event Definition File, so that events may be automatically selected from a menu.

Clicking **Menu** over any Event field opens a menu of the hardware for which a Event Definition File has been defined. As default, such files have been provided for General MIDI and the Yamaha REX50 sound effects unit. Refer to the Advanced Setup Features chapter for details of creating new Event Definition Files.

Event Editing

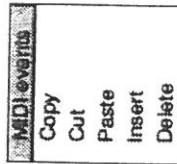
Clicking **Menu** over any **Event Bytes** field opens the **Event edit** menu, allowing individual MIDI events to be copied, cut, pasted or deleted, under standard RISC OS protocol.

New MIDI events can be inserted by clicking the **Insert event button**, and the list may be sorted in order of timecode position by clicking the **Sort events button**.

The **Transmit button** enables or disables transmission of all MIDI events, as the project is played.



Default events menu



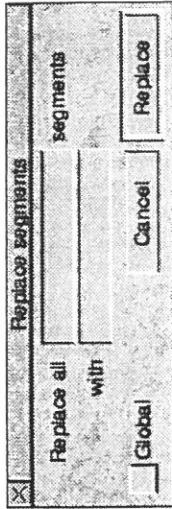
Event edit menu

20. Utilities

The Utilities submenu contains features that are not included in any of the other categories.

Segment Replacement

The Replace segment window is accessed by choosing **Replace...** from the Utilities submenu.



Replace Segment window

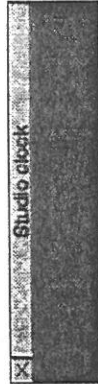
This utility allows the sample segment, over which the pointer was positioned when **Menu** was clicked, to be replaced. The replacement sample is then dragged from the library, or from a filer window. Clicking the **Replace button** will then either replace the sample segment, or all occurrences of it if the **Global** option is selected.

If a selection has been made on the timeline, only segments covered by the selection will be affected by the replace operation.

If a replacement sample is not specified, this has the effect of removing the replaced sample segments from the timeline.

Studio Clock

The **Studio Clock** is accessed by choosing **Clock...** from the Utilities submenu, but is also opened as default with each new project.



Studio clock

The clock shows the current playback time of the project, updated in real-time as the project is played.

21. Advanced Setup

This section describes some of the additional setup facilities provided by StudioSound. Some of these features require a more thorough understanding on RISC OS in order to setup correctly, so if you experience problems contact Oregan Technical Support for assistance.

Playback Drivers

As default StudioSound will playback all audio through the Risc PC internal sound system. StudioSound is supplied with a selection of playback drivers to enable high quality audio output through all popular Acorn soundcards.

The driver folder is accessed by double clicking !StudioSnd whilst pressing *Shift*, and is located at:

!StudioSnd.Drivers

This directory contains a number of applications, which when run will set StudioSound to use the appropriate hardware the next time StudioSound is loaded.



StudioSound playback drivers

!DM1-50S
!Eagle
!Lark
!Replay

AudioDynamics DMI-50S
Wild Vision Eagle M2
Wild Vision Lark card
Internal sound system / Irlam soundcards

Text Only EDL Format

StudioSound supports a special text only EDL file format, which is designed to make it easy for projects to be built up by hand, or for other applications to generate a compatible EDL. Full details of this format may be found in the form of an HTML file, supplied in the Does directory on the StudioSound installation disc.

BackGround Sprite

StudioSound allows a background sprite to be used within the project timeline window, much like that used by the RISC OS desktop itself. The background sprite is located at:

!StudioSnd.Background

The background may be any regular sprite, with a maximum size of 255 x 255 pixels, in either a 16, 256 or 32k colour mode.

MIDI Event Definition Files

An EDF (Event Definition File) may be created for any MIDI device, for automatic selection of any feature provided by the device.

All EDFs are stored in the folder:

`!StudioSnd.MIDI`

Inside this folder the EDFs are further sorted into directories according to device manufacturer. Any new EDF must be declared in the `Device` text file, such that it is recognised each time StudioSound is loaded.

Full details of the EDF format may be found in the form of an HTML file, supplied in the `Does` directory on the StudioSound installation disc.

Please send a copy of any new EDF for external hardware to Oregan for verification, and to make sure it is included and supported in all future versions of StudioSound.

22. Tips for Improving Performance

With a little thought, and application of performance improving techniques, the need for faster and more expensive hardware can be avoided.

Bouncing

Bouncing is a technique used to reduce the system requirements for playing a sequence. When a sequence has been laid down on a number of tracks, and is considered to be finished, but this is only part of a much bigger project, that part of the sequence could be saved as a single audio file.

Replacing a sequence consisting of many segments, on many tracks with a single audio file on a single track, obviously improves performance. However, it is recommended that a session file is saved, prior to doing this, so you can always return to the original sequence if necessary.

Use the `track enable` / `disable` buttons to only save those tracks required, and save as a 16 bit WAV stereo file, to retain maximum audio quality. Now clear the segments that have been saved from the timeline, and replace them with the single audio file that has been created.

Screen Modes

It should be appreciated that the use of screen modes with a high number of colours such as 32K and 16M impose an overhead on the processor. The time taken to redraw the screen is significantly increased, and as such use of these modes should be avoided where not absolutely necessary, especially when using machines with slow processors.

Studio Clock

The Studio Clock is a useful feature of StudioSound, although it does use a significant amount of processor time. For machines with slow processors, it may be worth closing the clock when not in use, in order to gain improved playback performance.

23. Short-cuts and Mouse Actions

A selection of keyboard short-cuts and mouse actions enable more experienced users of StudioSound to move about the package more proficiently.

Keyboard Short-cuts

F1 + Ctrl	Selection tool mode
F2 + Ctrl	Move tool mode
F3	Save session EDL
F3 + Shift	Save audio file
F3 + Ctrl	Multiple move tool mode
F4 + Ctrl	Trimming tool mode
F5 + Ctrl	Enveloping tool mode
F7 + Shift	Zoom in
F8	Undo
F8 + Shift	Zoom out
F9	Redo
Left arrow	Scroll timeline left
Right arrow	Scroll timeline right
Ctrl + Left	Go to start of timeline
Ctrl + Right	Go to end of timeline
Ctrl + A	Select all
Ctrl + C	Copy selection
Ctrl + D	Silence selection
Ctrl + L	Toggle looping on / off
Ctrl + M	Drop marker flag at cursor
Ctrl + O	Paste overwrite
Ctrl + P	Play from cursor / Stop play
Ctrl + Q	Remove project
Ctrl + V	Paste copied selection
Ctrl + X	Delete selection
Ctrl + Z	Clear selection
Return	Drop marker flag at cursor
Space bar	Toggle playback on / off

Iconbar Mouse Actions

Select
Adjust
Menu

Create new project
Open Library
Open iconbar menu

Timeline Window Mouse Actions

Select
Adjust
Drag - Select
Drag - Adjust
Shift + Select
Drag - Shift + Select

Set cursor, gain caret
Gain caret
Reset selection, start drag
Adjust selection
Set selection start or end
Sonic style set selection

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