Using Sweep: Fun with Scrubby

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Introduction

Sweep is an audio editor and live playback tool for GNU/Linux, BSD and compatible systems. It supports many music and voice formats including WAV, AIFF, Ogg Vorbis, Speex and MP3, with multichannel editing and LADSPA effects plugins.

This is an introductory tutorial about using Sweep for editing and experimenting with digital audio. You will find out how to make your Linux box make sounds that you have never heard before, and you might also learn something useful about editing audio files.

Although Sweep is quite powerful, it is an easy to use desktop application and its interface contains none of the esoteric "wierd shit" common in audio software.

Sweep harbours a pesky little virtual stylus tool called "Scrubby" who will invade your mind and make you want to remix your entire CD collection in one day.

In this tutorial you will learn:

- basic audio editing
- how to use many free LADSPA effects plugins including compression, delays, distortion and filters
- immersive loop mode recording
- beatmixing and scrubbing technique
- how to play with digital sampling

Warning

After attending this tutorial, you may never use your Linux box quite the same way again!

Chapter 1. Getting around in Sweep

Viewing the waveform

Main window

Figure 1-1. Main waveform view

This is the main application window in Sweep (Figure 1-1>). The two waveforms shown represent the left (above) and right (below) channels of a stereo WAV file. The grey regions indicate peaks and the dark regions indicate average values for the audio data. Time offsets in hours, minutes and seconds are shown above the waveforms. This window also includes a standard editing toolbar and playback controls.

Zoomed In

Figure 1-2. Zoomed in

You can zoom right in to individual PCM data values using the mouse wheel if available, arrow keys or the zoom control located in the top right corner of the window. The number in the dropdown box indicates the duration of sound visible in the window -- in this case 0.003 seconds.

Vertical Zoom

Figure 1-3. Vertical Zoom

For greater precision, you can zoom the waveform display vertically, either by rolling the mouse wheel over the dB markings on the left side of the window or by pressing Shift and Arrow Up/Down. You can scroll the waveform display up and down by dragging the dB ruler on the left side of the window.

Extended Selections

Figure 1-4. Extended Selection

All edits and processing in Sweep can operate on extended (multi-region) selections. Selection boundaries can be dragged with the mouse and new regions can be added to the selection by holding down the Control key while dragging the mouse. You get audible feedback when doing this.

- Play selection
- Select none / select all
- Invert selection
- Zoom to selection

Chapter 2. Meet Scrubby!

Figure 2-1. Scrubby

Inside Sweep lives a pesky little virtual stylus called Scrubby who enjoys mixing around in your files. Scrubby can be quite a lot of fun to play with, because you can drag him around any digital audio file just like dragging the stylus around on a vinyl record.

For editing purposes, Scrubby can give you a very clear idea of exactly what is in the file you are editing. You can drag him around your cut points to find exactly where to make an edit, just like you would have slowly turned the reels on a tape machine in the old days. You can also place him in a file while an effect is being rendered to zone in on the changes in real time.

Chapter 3. Basic audio editing

This chapter introduces Sweep’s general editing features. The file displayed is Drumswork by Gabriele Trombetti, a short electronic music piece which he provides as a benchmark track for comparing the quality of the various lossy encoders.

Basic editing

Simple edits

- Delete
- Clear
- Crop

Using the clipboard

- Cut
- Copy
- Paste Insert
- Paste Mix
- Paste Crossfade

Figure 3-1. Paste crossfade

Built-in processing

- Fade In / Out
- Reverse
- Normalise

Sample operations

- Channel conversions
- Sample rate conversion

Figure 3-2. Sample rate conversion

Edit History

Figure 3-3. Edit history

Sweep maintains a history of your editing session, and you can easily undo and redo through many previous operations.

Saving and export

PCM formats are supported via Erik de Castro Lopo’s libsndfile.

- at least 14 PCM sound file formats formats including WAV, W64, AIFF/AIFF-C, IFF/SVX, AU and raw PCM files.
- PCM audio encoding formats including 8/16/24/32 bit PCM, 32 and 64 bit floating point, u-law, A-law and ADPCM
- voice encoding formats including GSM 6.10, G721/G723 ADPCM, 12/16/24 bit DWVW

- multichannel file support: Sweep provides complete editing and processing for multichannel sound files.

Ogg Vorbis

Ogg Vorbis is an extremely high quality perceptual audio codec and is free, open and unpatented. Independent tests have found it to be of higher quality than non-free codecs including MP3, WMA and MP3pro -- hence, Ogg Vorbis is Sweep's preferred codec for final export.

Figure 3-4. Ogg Vorbis export

This dialog shows the default Variable Bitrate encoding mode, in which a simple "quality" slider from 0 to 10 allows the Vorbis encoder to vary bitrate depending on the characteristics of the file being encoded.

Sweep can remember your encoding options for you, or allow you to use sensible defaults at any time.

Speex

Speex is a special purpose speech codec, designed for efficient Voice over IP (VoIP) and file-based compression. It is free, open and unpatented.

Figure 3-5. Speex encoding

MP3

Sweep can load MP3 files, but it cannot export them due to patent restrictions.

Figure 3-6. MP3 export

Chapter 4. LADSPA effects plugins

Sweep supports LADSPA effects plugins, including:

- the Computer Music Toolkit by Richard Furse, containing high and low pass filters, compressors, delays, and a port of the popular Freeverb reverb unit.
- SWH plugins, many useful plugins by Steve Harris, including overdrives, comb filter, ring modulator, pitch scaler, chorus, flanger and various distortions.
- more listed at ladspa.org

Currently there are over 70 free plugins available, and more are being worked on. If you are developing audio effects, LADSPA is a very easy standard to write for as it allows you to concentrate on the effect function and requires no user interface programming.

Sweep automatically finds LADSPA plugins and builds simple user interfaces for them.

Figure 4-1. Multivoice Chorus

Chapter 5. immersive loop mode recording

Figure 5-1. Recording

- Record into selection
- Mix in previous
- Looped recording
- Reverse recording

Scrubbing during recording

The play and record heads are independently controlled, allowing you to scrub on audio data as it is being recorded.

Chapter 6. beatmixing and scrubbing technique

More playback modes

So far we've used only the Play and Play Selection modes to play audio. Here are some different ways to play.

- Looped playback
- Reverse playback
- +/- 10% pitch slider
- QWERTY keys
- Logo key to scrub

Beatmixing

How does a DJ mix records?

- Simultaneous playback of multiple files
- Use the pitch slider to match tempo

How does a hip-hop DJ scratch?

- Put the needle on the record!
- Work out some crazy technique

Chapter 7. Resources

Homepage

http://sweep.sourceforge.net (http://sweep.sourceforge.net/)

Mailing lists

There are three mailing lists related to sweep:

- sweep-announce

  which contains only announcements about new releases of sweep. This is a moderated list.

- sweep-users

  For general discussion about using sweep

- sweep-devel

  For discussion about sweep development related issues.

Archives of each list are available on the World Wide Web via the Sweep homepage. You can also subscribe or unsubscribe via a web interface.

For more information about using these lists or to subscribe or unsubscribe via an email interface, send a message with just the word ‘help’ as subject or in the body, to:

- sweep-announce-request@lists.sourceforge.net
- sweep-users-request@lists.sourceforge.net
- sweep-devel-request@lists.sourceforge.net

as appropriate.