

SoundMachine

User's Guide

Version 2.5

Description

SoundMachine is a user friendly sound file player for common audio formats such as m-law (mu-law), AIFF and WAVE. It supports a simple interface and is well suited to Web browsers or as a stand-alone application. It has been accelerated for PowerPC and can be run on the 68K range of Macintoshes (it is a so-called Fat Binary). However, depending on the sound format being played the performance of SoundMachine is limited by the speed of the Macintosh.

SoundMachine has one major window called the Player Window and three minor windows called the Queue Window, Message Window and Hack Window. This manual briefly describes the four windows. It is assumed that the user is familiar with the Macintosh interface.

System Requirements

SoundMachine requires System 7. The most recent version of Apple's Sound Manager is recommended. At the time of this manual the latest version was 3.1. The Sound Manager is incorporated into the system software or as a system extension.

Sound Support

SoundMachine currently supports the following common sound formats:

- AU m-law (telephony companding)
- AU A-law (telephony companding)
- AU Linear 8bit and 16bit uncompressed
- AIFF 8bit and 16bit uncompressed
- AIFC m-law (ULAW)

- AIFC Alaw (ALAW)
- AIFC MACE3:1 8bit compression
- AIFC MACE6:1 8bit compression
- AIFC IMA4:1 16bit compression
- Mac 'snd ' resources
- Finder Sound Files
- WAVE 8bit and 16bit uncompressed
- FSSD 8bit, mono uncompressed

In the future additional sound formats may be added. The philosophy behind SoundMachine is that it is a player and not a converter of sound formats. Generally speaking converting sound formats causes a loss in sound quality (fidelity) and is largely unnecessary.

In the future SoundMachine will interface transparently with a limited sound converter program and a simple recorder program.

Installation

Copy the application to your hard disk and launch it. After personalizing the application (see next section) SoundMachine automatically creates a file called SoundMachine 2.5 Prefs in the Preferences Folder of the System Folder.

Personalizing SoundMachine

The first time SoundMachine is launched a registration screen appears. This version of SoundMachine is licensed for personal use only and cannot be used at a commercial site or business. Information regarding commercial use and site licenses can be found on the Splashscreen at the application startup or by selecting the About SoundMachine... under the Apple menu.

You need to enter your name and affiliation into the two fields. Each field takes up to 255 characters. The enable button only becomes activated after you have made an entry into both fields. Because the Registration operation modifies the application, SoundMachine needs to be on an unlocked or writable volume such as your hard disk or floppy. After personalizing the application can be locked or replaced on a locked volume (neither is necessary).

Player Window

The Player Window can be displayed by choosing the item Player Window

under the Window menu or by the command key equivalent $\text{⌘}1$.

The Player Window, shown below in Figure 1, is the main control window for SoundMachine. Its operation is relatively straightforward because it is based on standard and hopefully familiar Hi Fi or VCR like controls.



Figure 1: Player Window at Minimum Width

General Manipulation

The Player Window dimensions and position will be remembered between SoundMachine sessions if the appropriate Preferences setting is selected (this is the default and is recommended).

The Player Window may be dragged to any position on the screen by clicking and holding down the mouse button in the title bar on the left hand side of the window (see Figure 1).

The Player Window can also be moved to one of five preferred positions on the screen if it is the currently active window by going to the Move submenu under the Window menu and selecting the preferred position.



Grow Box

This Player Window may be resized horizontally to change the width of the window but not vertically (that is, the height is fixed) using the grow box in the lower right hand corner (see Figure 1). The Player Window may be resized at any time.



Hide Box

The Player Window may be hidden by clicking in the go-away box in the top left hand corner of the title bar (see Figure 1), or by selecting Hide ($\text{⌘}H$) under the Window menu or by selecting Hide All (every visible window is hidden).



Zoom Box

The Player Window may be zoomed by clicking in the zoom box in the bottom left hand corner of the title bar (see Figure 1). Zooming toggles between the user selected size and the minimum size (as shown in Figure 1).

Balloon Help

All window items have Balloon help. To activate Balloon help go to the Guide Menu (or Help Menu) adjacent to the Application Menu on the right hand side of the menu bar and select item Show Balloons. After activation of Balloon Help, passing the cursor over any item, for example a button, will give a description of the item's function, for example, as in Figure 2.

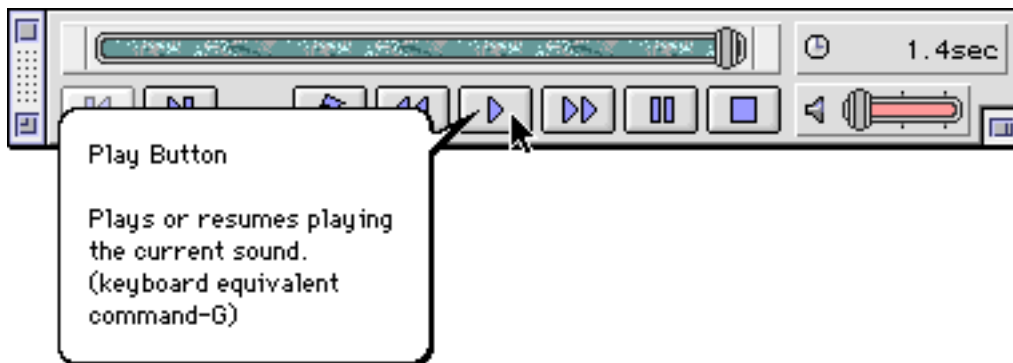


Figure 2: Example of Balloon Help for the Play Button

Player Window Buttons

Some or all of the buttons may be dimmed at any given time. This indicates the button's function is not currently available. For example, all buttons are dimmed if the current sound queue is empty, and the Previous button is dimmed if the current sound file is presently the first in the queue (that is, it doesn't have a precursor), etc.

The buttons in the Player Window are:



Stop

The Stop button terminates playing on the current sound. The keyboard equivalent is \mathbb{P} . (period). When momentarily depressed the Stop button symbol becomes red.



Backward

The Backward button plays the current sound backwards. The keyboard equivalent is $\mathbb{P}<$. When switching from forward play to backward, the speed is normal (but backwards). Further presses of the Backward button accelerates the backwards playing to 140% then 200% of normal speed. When depressed the Backward button symbol becomes green.

**Play**

The Play button plays the current sound. The keyboard equivalent is ⌘G. Pressing Play during a current sound activates the pause state (described below). When depressed the Play button symbol becomes green.

**Fast Forward**

The Fast Forward button plays the current sound forward at a higher than normal rate. The keyboard equivalent is ⌘>. A further press of the Fast Forward button accelerates the playing from 140% to 200% of normal speed. When depressed the Fast Forward button symbol becomes green.

**Pause**

The Pause button pauses the current sound. The keyboard equivalent is ⌘/. Pressing the pause button a second time resumes the previous play setting. When depressed the Play button symbol becomes red.

**Previous**

The Previous button moves the the current sound file to the previous one in the sound queue. The keyboard equivalent is ⌘[. When momentarily depressed the Previous button symbol becomes yellow.

**Next**

The Previous button moves the the current sound file to the previous one in the sound queue. The keyboard equivalent is ⌘]. When momentarily depressed the Next button symbol becomes yellow.

**Loop**

The Loop button activates looping of the current sound file when depressed. The keyboard equivalent is ⌘L. When momentarily depressed the Loop button symbol becomes yellow.

Keyboard and Menu Equivalents

The above buttons' functions are all duplicated in the Control menu. This menu also indicates the keyboard equivalents for the buttons and the menu item icons reflect the state of the buttons in the Player Window. There is some color coding. Red indicates operations that terminate playing, that is, stop and pause. Green indicates operations that initiate playing, that is, backward, play and fast forward. Yellow indicates operations that modify the operation of the sound

queue (when more than one sound file is loaded).



Figure 3: Player Window Progress Slider Control

Player Window Progress Slider Control

This control, shown in Figure 3, serves a few functions. Firstly it indicates the currently playing portion of the sound. Secondly the slider can be grabbed and moved to any portion of the progress bar to change the currently playing portion. The same can be achieved by simply clicking the mouse in any portion of the bar, including the two rectangles either end of the control (Figure 3).

Player Window Time Display

The Time Display, shown in Figure 4 indicates the elapsed time corresponding to the slider position (in Figure 1, the Time Display shows 1.3 seconds corresponding to the slider at the far right edge). The display is in seconds, or minutes and seconds, or hours and minutes depending on the elapsed time of the sound currently being played.

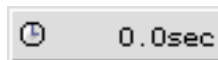


Figure 4: Player Window Time Display

Player Window Amplifier

The Amplifier, shown in Figure 5, permits a restricted level of amplification of the sound. This does not substitute or replace the Sound Control Panel function. The two effects actually work independently. The Amplifier here is actually a purely software control that boosts the digital signal and is only effective on quiet sounds or quiet recordings. For loader sounds there will be some level of clipping or distortion. For some compressed sound formats this control is ineffective (and a warning will be generated in the Message Window, see later). The amplifier setting is remembered between launches of SoundMachine.

The range of available amplification is from 0 dB (zero amplification, the default level) to approximately 6 dB (twice amplitude or 4 times the power). When a new amplifier setting is selected there may be a momentary pause in the playing of any sound. This pause may be of greater duration for non-PowerPC computers.



Figure 5: Player Window Amplifier Control

Advanced feature: The current value in dB of the Amplifier setting may be displayed in the Message Window by going to the Amplifier Setting of the Get submenu under the Window menu.

Queue Window

The Queue Window, shown in Figure 6, is perhaps the most intimidating window for SoundMachine. It consists of arrays of buttons and two list items. With some practice this window becomes easy to use and has an intuitive interface. Note that the appearance of the Queue Window may differ slightly from that shown in Figure 6. SoundMachine uses the font Tekton Plus Regular for list items if it is present in your System, otherwise Geneva is used (these defaults as well as other layout parameters can be changed with a resource editor such as Resedit).

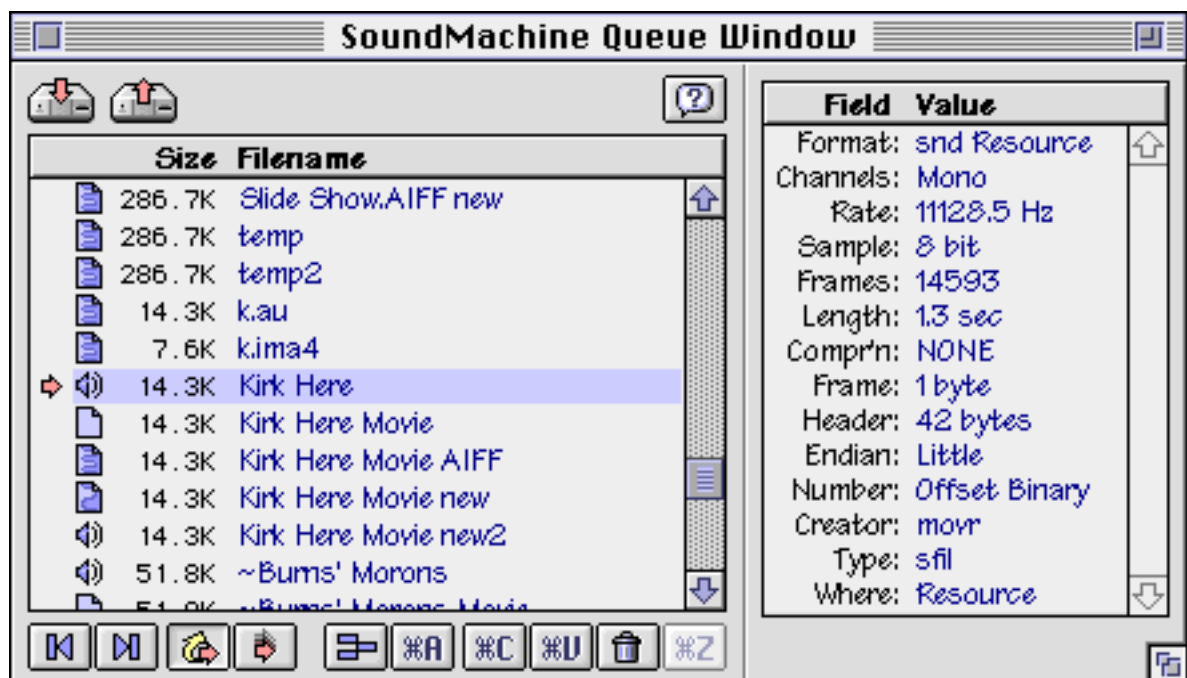


Figure 6: Queue Window

General Manipulation

The Queue Window may be dragged any position on the screen by clicking and holding down the mouse button in the bar on the top of the window.

The Queue Window can also be moved to one of five preferred positions on the screen if it is the currently active window by going to the Move submenu under the Window menu and selecting the preferred position.



Grow Box The Queue Window may be resized horizontally and vertically using the grow box in the lower right hand corner. The Queue Window dimensions and position will be remembered between SoundMachine sessions if the appropriate Preferences setting is selected (this is the default and recommended setting).



Hide Box The Queue Window may be hidden by selecting Hide (⌘-H) under the Window menu or Hide All (all visible windows are hidden) or by clicking in the go-away box in the top left hand corner of the title bar (see Figure 6).



Zoom Box The Queue Window may be zoomed by clicking in the zoom box in the top right hand corner of the title bar (see Figure 6). Zooming toggles between the user selected size and the minimum size.

Queue Window Sound List

The left hand side of the Queue Window in Figure 6 is dominated by a sound list. Each valid sound file is displayed with its sample data size, filename and a small identifying icon. One or more sound files can be selected using the mouse and mouse button. Once selected, sound files can be cut and pasted within the sound list. On the left hand side of the list a small arrow indicates the current sound file, that is, the sound file that is currently loaded.



Help All window items have Balloon help. To activate Balloon help go to the Guide Menu adjacent to the Application Menu and select item Show Balloons. Once activated, passing the cursor over any item, for example a button, will give a description of the item's function. The alternative to going to the Guide Menu is to click on the button with the ? (question mark) icon. When depressed this button indicates that Balloon help is activated.

Queue Window Description List

The right hand side of the Queue Window in Figure 6 is shows the description list. It shows the major parameters of the current sound file. Double clicking within this list launches the Hack Window (described later) where these parameters can be adjusted within certain limits.

Queue Window Buttons

Some or all of the buttons may be dimmed at any given time. This indicates the button's function is not currently available.

The Queue Windows buttons can be broken up into 3 categories: (i) loading and saving buttons (Figure 7); (ii) indexing buttons (Figure 8) and (iii) edit buttons. In the first category there are the Create Alias List Button and the Open Button.



Figure 7: Queue Window Create Alias List Button and Open Button

SoundMachine doesn't actually save files to disk but rather can save a list of aliases to such files. Clicking the Create Alias List button throws up a dialog box making it possible to save the current list to a single file guided by the user.

The Open button acts both as a single sound file Open button and a SoundMachine List file (multiple sound files) Open List button.



Figure 8: Queue Window Indexing Buttons

In Figure 8, the four indexing buttons are shown. The first two mimic the Previous and Next buttons from the Player Window. The second two buttons are quite important, they are the Repeat button and the Automatic Advance button. The Automatic Advance button progresses the current sound file arrow marker (see Figure 6) down the sound list after each sound file has completed playing when depressed. The Repeat button, when depressed, sends the current sound file marker back to the top of the sound list when the bottom sound file has finished playing.



Figure 9: Queue Window Edit Buttons

The remaining buttons in the Queue Window, see Figure 9, provide the simple cut and paste like commands which are also available in the Edit menu (when

the Queue Window is activated). These buttons are best understood by experimenting or by using Balloon help. From left to right the buttons in Figure 9 are the: Selection Toggle button, Select All, Copy, Paste, Clear (Remove) and Undo.

Message Window

To activate the Message Window, shown in Figure 10, go to the Window menu and select Message Window (you may also use the keyboard equivalent ⌘O).



Figure 10: Message Window

The Message Window dimensions and position is analogous to the Player window (see above).

Up to 16 (past) messages and information is displayed in this window when certain events and actions take place. The types of the messages displayed can be adjusted by going to the Options submenu under the Window menu. The user can generate messages at any time by selecting items from the Get submenu under the Window menu.

Hack Window

To activate the Hack Window, shown in Figure 11, go to the Window menu and select Hack Window (you may also use the keyboard equivalent ⌘3). (The Hack Window is also opened whenever the description list items in the Queue Window are double clicked, see the right hand list in Figure 6.)

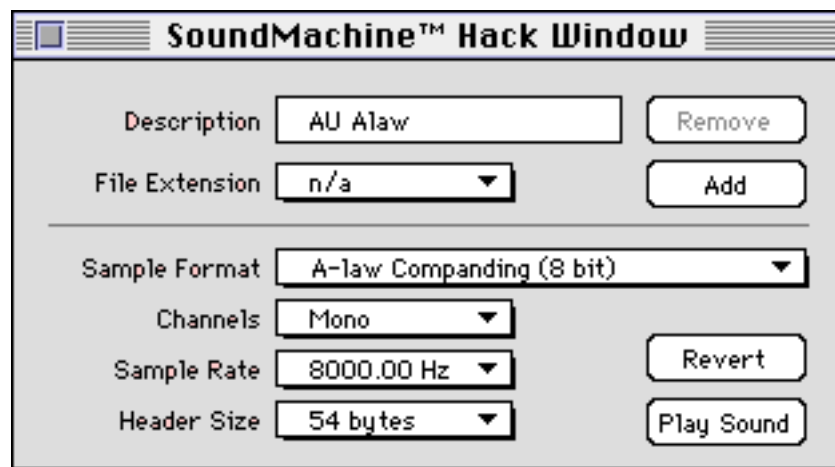


Figure 11: Hack Window

The Hack Window and its features are intended for more advanced users. From within this window you can:

- Modify the parameters which define the way that the sound format is played. (This does not convert the sound file but simply change the way that the information is interpreted.)
- Define and save new formats, identified by the file's name extension so that SoundMachine can automatically identify future occurrences of this sound format (when the same extension is found).

The usefulness of this feature is for: (i) sound formats that SoundMachine does not recognize, and (ii) sound formats with non-existent or corrupt header information.

There is no guarantee that SoundMachine will be able to correctly every type of sound file, or even sound files of a given extension.

As with other SoundMachine windows Balloon Help is available which describes the various popup menus and fields.

To understand how to use the hack window some basic information is relevant. There are four major components to most sampled sound formats, and these are controlled by four popup menus in the Hack Window.

Format

This is the numerical representation of the samples which form the sound. The popup menu gives the most common representations, including 8 and 16 bit

formats, companded (nonlinear) and linear formats, uncompressed and compressed. The top popup menu item indicates the default value (automatically determined by SoundMachine) and is separated from the remaining values in the menu by a line.

Channels

Either mono or stereo. The top popup menu item indicates the default value and is separated from the remaining values in the menu by a line.

Sample Rate

The speed in Hertz (samples/sec) at which the samples are played. The Sample Rate is limited to the range 2048.0 Hz to 65535.0 Hz. The top popup menu item indicates the default value and is separated from the remaining values in the menu by a line.

Most common sample rates are hard wired into the menu. (Use balloon help to get an explanation of these sample rates.) However, it is possible by choosing the Custom... item to choose an arbitrary value from 2048.0 Hz to 65535.0 Hz. The Custom... item activates a modal dialog window called SoundMachine Sample Rate into which the new Sample Rate can be entered. SoundMachine checks the entered sample rate to ensure that it is in the right range. Once a valid Sample Rate has been selected the new value is entered in the menu directly below the Custom... item, and can be used in the future up until a new value is selected.

Head

This value in bytes defined the starting position in the file from which the samples are played. This feature is useful to skip unrecognized sound headers. The Head is limited to be greater than or equal to 0 bytes but less than the file's size. The top popup menu item indicates the default value and is separated from the remaining values in the menu by a line.

A range of Head sizes are hard wired into the menu. However, it is possible by choosing the Custom... item to choose an arbitrary value from 0 bytes but less than the file's size. The Custom... item activates a modal dialog window called "SoundMachine Header Size" into which the new Head size can be entered. SoundMachine checks the entered size to ensure that it is in the right range. Once a valid Head size has been selected the new value is entered in the menu directly below the Custom... item, and can be used in the future up until a new value is selected.

Play/Stop Sound Button

When the Hack Window is first opened the values for these four parameters are set to the defaults according to SoundMachine's best guess for the current sound file. Whenever the parameters are changed the "Play Sound" button can be used to hear the effect of the change. During playing the button label changes to "Stop Sound" and when pressed terminates the current sound playing.

Revert Button

The user can hit the "Revert" button at any time to bring the four sound parameters back to their default settings.

Add Button

The Add operation refers to adding a new extension to the file extension popup menu. Suppose a file, `filename.voc`, is encountered and when played under the default SoundMachine settings sounds distorted. By adjusting the four key popups described above it is possible to associate any desired set of selected sound parameters with any future sound files which have extension `voc`. The operations are relatively intuitive and Balloon help can be used to guide the process. Note that file extensions are used as a last resort when SoundMachine attempts to decipher a sound file. SoundMachine also looks for a valid sound header of the sound formats it knows about before deciphering based on the extension.

SoundMachine comes with two built in format by extension settings. The first is "(none)" which means if there is either: (i) no extension; or (ii) an unsupported extension. To see what sound parameters correspond to "(none)" use the Hack Window's File Extension popup. The second built in extension is "au".

It is possible to save different sound formats under different extensions which differ only in their case. For example, it is possible to have an extension setting for `AU` which differs from `au`. Note that in the absence of an `AU` extension, a filename with extension `AU` will default to the settings corresponding to `au`, as would a file with extension `au`. It is probably not so important to understand these details except to realize that SoundMachine has a degree of intelligence that tends to do the sensible thing.

Remove Button

The Remove operation does the opposite of the Add button.

Menus

For completeness we describe SoundMachine's menu. Many of the menu items follow the standard Macintosh model and are easy to understand. Other menu items have already been described above. Finally, there is no better substitute to understanding the menu than activating Balloon Help. Here we will concentrate only on important points.

File Menu

The file menu is shown in Figure 12.



Figure 12: File Menu

Open Alias List... restricts the file opening dialog to the SoundMachine List files (created with the item command Create Alias List...) whereas Open... is capable of opening any type of file including SoundMachine List files. Note that SoundMachine List files don't contain the sound files themselves but aliases to them.

If you wish to open all sound files in some folder you need to use the drag and drop Finder feature. From the Finder, drag the relevant folder onto the SoundMachine application icon.

Close only operates on the active window and has the same effect as hiding a window.

Save Copy As... actually duplicates the current file to any desired disk location. For example, in Figure 6, the file pointed to by the red arrow is the current file and SoundMachine would duplicate this AIFF file. This feature is useful when other applications such as Web browsers use SoundMachine. Typically sound

files are automatically removed by such browsers (because typically they consume large amounts of disk space). With this feature you can make a copy before it is deleted. This feature also makes the creator of the saved file SoundMachine.

Finally the Import/Export ... facility is discribed at the Creating and Changing AIFF Audio Files section later.

File Menu

The file menu is show in Figure 13.

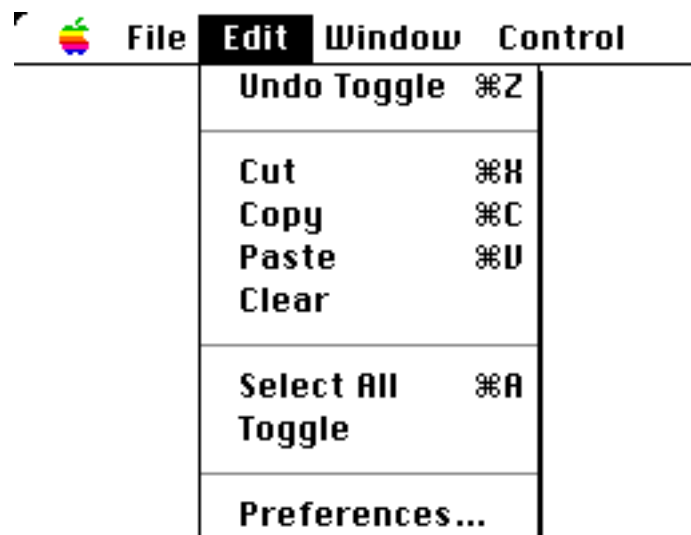


Figure 13: Edit Menu

These menu items are only available to the Queue Window as described above. The exception is Preferences... which displays a simple preferences window.

Window Menu

The file menu is show in Figure 14. The elements of this menu were covered above.

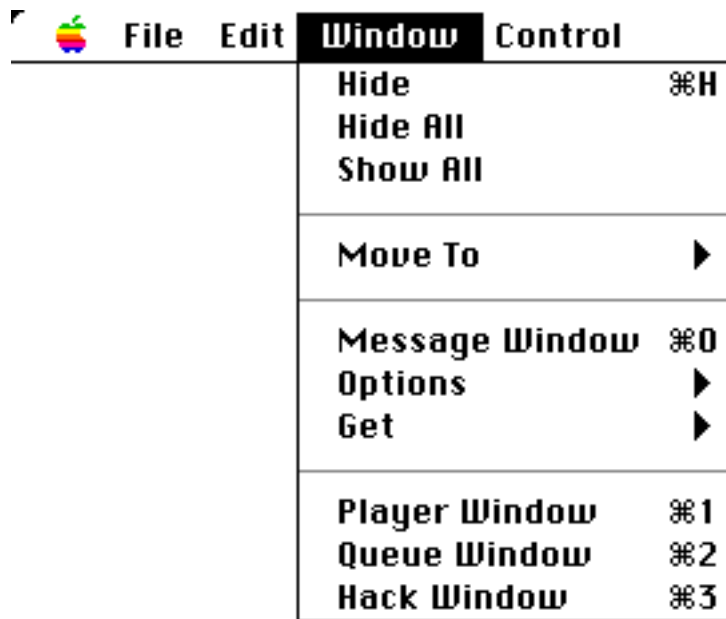


Figure 14: Window Menu

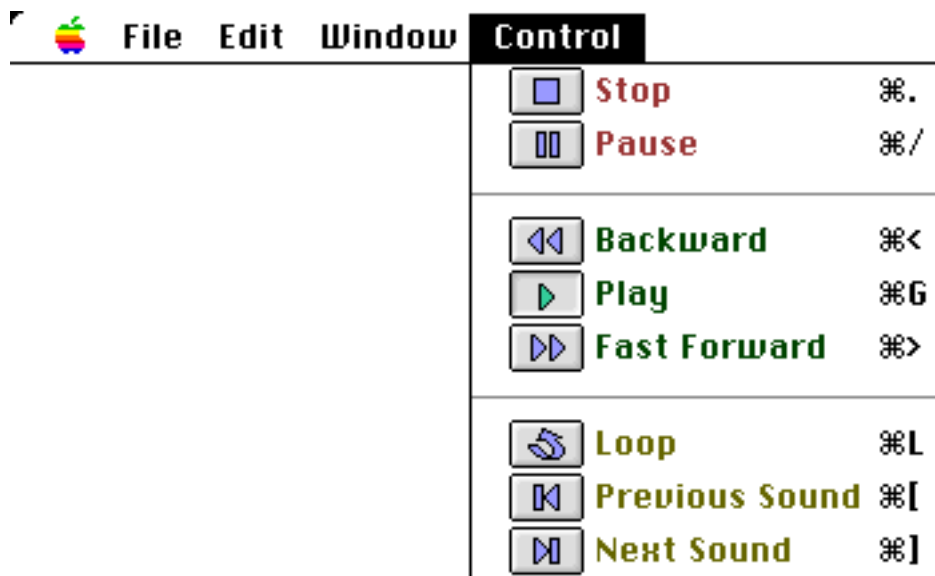


Figure 15: Control Menu

Control Menu

The control menu is shown in Figure 15. The items in this menu correspond simply to the buttons in the Player Window. In this way control of the sound currently playing is possible without having the Player Window (or any other window) open.

Preferences

Preferences Window

The SoundMachine Preferences Window is shown in Figure 16. It can be activated from the Edit menu, see Figure 13. There are seven check boxes. If you have a Macintosh capable of 16 output you should check Play 16 bit When Possible. Audio Feedback with Operations activates or deactivates some minor sound effects. The next two items, Automatic Advance through Play List and Repeat All Play List, are identical to the Automatic Advance and Repeat buttons in Figure 8. Remember Window Sizes & Positions ensures that the window positions, visibility and sizes are preserved between SoundMachine sessions. You can the way the Splash Screen fires up with Temporary Splash Screen on Launch. Finally Chatterbox Mode is a novelty item where menu item names, etc., are spoken if the Speech Manager is present. Using the popup it is possible to select any voices currently in the system. Note that these voices do not reside in SoundMachine and are part of the System software or extensions to the system software. High quality voices tend to require large amounts of System heap memory and, after the novelty has worn off, this item is best not selected,



Figure 16: SoundMachine Preferences Window

Creating and Changing AIFF Audio Files

Overview

The preferred sound format for the MacOS and SoundMachine is AIFF. This section gives details on:

- Creating an AIFF Audio File from an Audio CD
- Converting QuickTime Movie Audio Tracks to AIFF Audio Files
- Resample, Compress, Decompress an AIFF Audio File

Note that the same processing can be applied to System 7 Sound Files (files which plays sounds in the Finder when they are double clicked) but for simplicity most of the following procedures are described in terms of AIFF Audio Files.

Extensions, Applications or Utilities Required

You may well already have these on your computer. These are generally either available in your System or freely available from Apple (<http://www.apple.com>).

System Extensions:

QuickTime 2.1 or later (minimum requirement is 2.0).

SoundManager 3.1 or later (minimum requirement is 3.0).

Note that the audio file manipulations described here can also be done with the application MoviePlayer 2.1 (or later). This is also available at the Apple web site.

Disclaimer

Respect any copyright associated with copying a CD track or any audio file.

Warning

Audio files can be extremely large and are hazardous to your hard disk space, especially if you want 16bit stereo uncompressed files. Even if the sound file is compressed, as an intermediate step an uncompressed version needs to be saved. Make sure you have plenty of disk space or be prepared to save only short sections of audio.

Creating an AIFF Audio File from an Audio CD

This procedure is not as difficult as it first seems. Then again I'm not so sure. The same procedure can be used to import quicktime movie audio tracks, resample the sounds, compress, recompress and decompress AIFC audio files. The only difference is in the various popup menus and Options buttons.

1. Load an audio into the computer's CD-ROM drive (this is guaranteed only to work on Apple internal and external CD-ROM drives)
2. Launch SoundMachine (if necessary)
3. Go to Import/Export... under the File menu
4. Click the Desktop button (if necessary) to move to the Desktop
5. Locate the Audio CD; it is distinguished by its icon and its generic name.
6. Double click on this list item to yield a list of the tracks.
7. Double click the desired track (number) or click the Convert... button

At this point you can (bad move):

- 8a. Save the converted CD audio track as a movie on your hard disk. This is a bad idea because the file is going to be very large and default quality settings (unknown) for the sampling rate and number of channels (mono or stereo) are in force.

or (good move):

- 8b. Click Options... and you'll see a standard QuickTime Audio CD Import Options Window, see Figure 17, appear that permits you to adjust the following:

Audio Settings: Rate, Size and Use (meaning sampling rate which depends on your hardware and may vary from computer model to model; sample size which is either standard 8 bit or CD hi fi quality 16 bit; and number of channels, i.e., mono or stereo). Remember uncompressed 16 bit sound files are twice the size of 8 bit sound files for the same recording; and of course, stereo files are twice the size of mono files.

Audio Selection: Adjust the start and end time of the desired recording. Use the Play button to preview the selection you have made. The selection can

be adjusted using either the two end handles on the slider or clicking the numbers or up and down arrows.

9. Click OK to leave the Audio CD Import Options dialog.

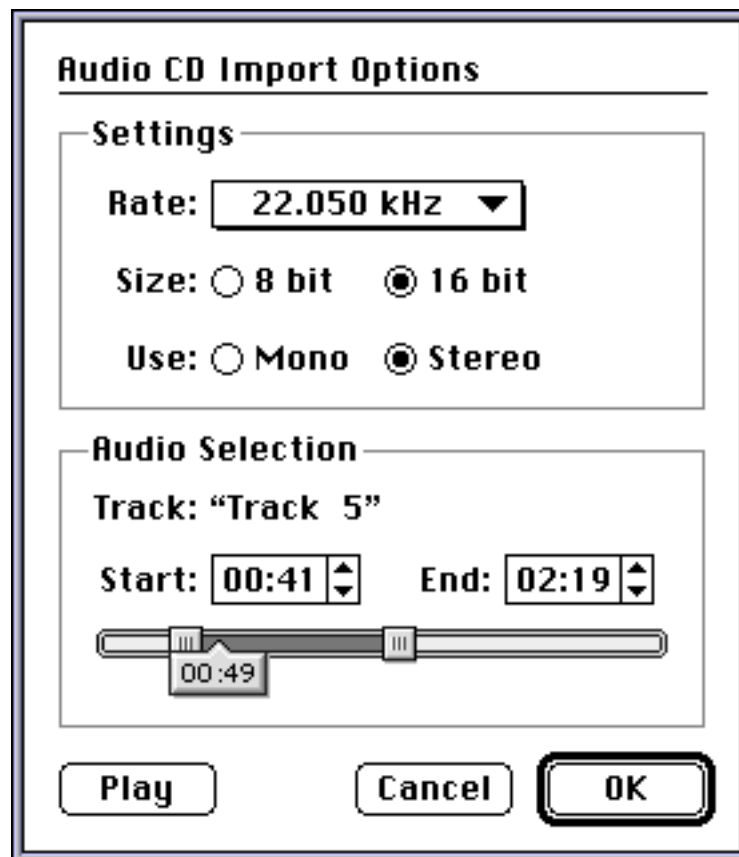


Figure 17: QuickTime Audio CD Import Options Window

10. Click Save in the convert dialog to save the selection of the track onto your hard disk (what's left of it).
11. (At this point you have a QuickTime movie file that MoviePlayer 2.1 can play. Note that QuickTime movies can contain: "moving pictures", "moving pictures with sound" or "sound only" (and some other options). To convert the "movie" into a form that SoundMachine can play go to section 3 of "Conversion of QuickTime Movie Audio Track to AIFF" (below). This way you can convert the movie to an AIFF Audio file with the option of applying some compression the reduce the size of the file and/or choosing another sampling rate and/or changing the number of channels.)

12. Now there is a dialog and goto the popup and select “Sound to AIFF” (or you may use “Sound To System 7 Sound” to make a Finder playable sound).
13. Click Options... to get the standard QuickTime Sound Export Options Window show in Figure 18.
14. There are a lots of choices and you may wish to experiment to select the options you are happiest with. I recommend the IMA 4:1 compression scheme or the none scheme. (The MACE compression schemes are old and not in wide use, also the mLaw 2:1 compression is not common in the AIFF format but more common with a different header or format.)
15. Click OK

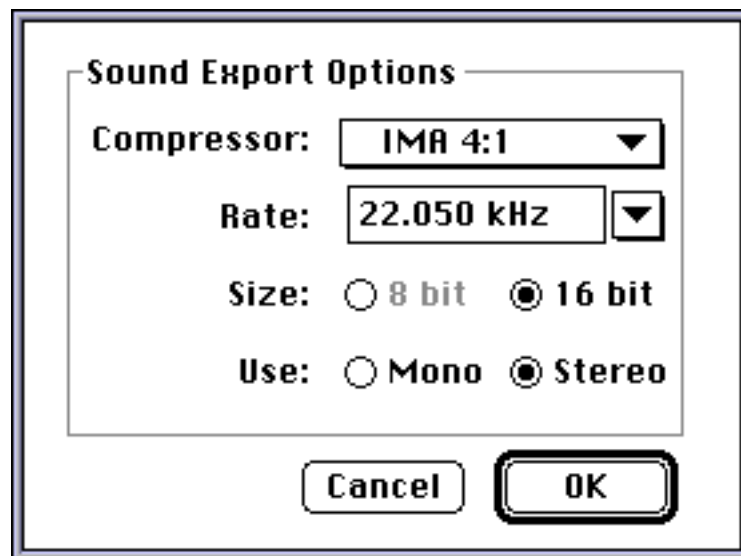


Figure 18: QuickTime Sound Export Options Window

16. Save the file to disk under a new name.
17. SoundMachine should automatically load the audio file. In the future to have SoundMachine open and play such files you can drag its icon from the finder onto the SoundMachine application icon or use Open under the File menu from SoundMachine.
