

SoundMachine 2.1  
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Freeware  
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(Pseudonyms/alternate possible names: AUPlayer, SNDPlayer [taken], GEEKPlayer, UlawPlayer, MuLawPlayer, AlawPlayer, MuPlayandRecord, ...)

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Recommended Brief Description:

Play and record SND/AU (mu-law, A-law, linear) and AIFF/AIFC (MACE3, MACE6) sound files. Plethora of buttons during play to change speed, play backwards, loop sounds, switch formats, etc. No restriction on file size; playing can take place in background.

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For Impatient New Users:

Use Balloon help (you really only need to use it during the learning phase).

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Sound Formats Supported (Play and Record):

- Ulaw/Mu-law/ $\mu$ -law: (SND\_FORMAT\_MULAW\_8)  
TalkRadio (Geek of the week), or International Telephony format, i.e., 8Khz at 8 bit mono making 64kbits/s (as defined in CCITT G711), or Sun Sparc station format, or Next format, blah blah. With SoundMachine you can record in the  $\mu$ -law format at any sample rate from 4kHz up to 22.3kHz (the mac hardware rate, at least on the older macs). Stick to the preferred 8kHz rate (default) if exporting a  $\mu$ -law sound to the Sun platform or you haven't got a clue about what you are doing.
- AIFF/AIFC (none, MACE3 and MACE6 compression supported)  
Preferred mac format for big sound sound files; all sound data is in the data fork (no resource fork information). When playing, SoundMachine hunts for the sampled data chunk and plays that and ignores things like the MIDI chunk. Since compression schemes such as MACE3 are dynamical in nature (have a state or memory) then playing such a sound backwards causes sound artefacts. I rely on the Sound Manager to expand (convert) in real time rather than do the conversion manually (whereby I could cleanup the backward playing). Stereo play supported. When recording (mono and 8 bits), the sample rate is the hardware rate of 22.3kHz but you can select from the three standard compression schemes. MACE3 is recommended for the 8 bit mac platform since it outperforms  $\mu$ -law which is memoryless and designed for speech.
- Alaw: (SND\_FORMAT\_ALAW\_8)  
This is roughly speaking the European equivalent of  $\mu$ -law. Everything is the same as for the  $\mu$ -law description above (just replace  $\mu$  with A and Bob's your uncle). Play and record facility.
- Linear 8 bit 2's complement: (SND\_FORMAT\_LINEAR\_8)  
Just like  $\mu$ -law and A-law this is another one of the SND/AU formats. SoundMachine supports play and record.
- FSSD non-compressed (play only)  
For example, the sound format supplied with Sound Source's Star Trek. There is a Huffman encoded FSSD format but I don't have enough info about it yet to support it. SoundMachine relies on information in the resource fork to determine the sample rate. Data is offset binary 8 bit mono (just like 'snd ' resource format).
- Other 8 bit formats (override any header)  
You can switch to 2's complement or offset binary representation,  $\mu$ -law, A-law to hear if an unknown sound type is in one of the formats above.

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Environment:

Needs System 7. Can use the Speech Manager if present. Currently requires a 68020 or better. I recommend that you use the new Sound Manager 3.0. Really needs the Apple Sound Chip or better (AV) to work.

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Technical Aspects:

- $\mu$ -law recording is generated indirectly and not in real time (however, the conversion can be put in the background). SoundMachine records to an uncompressed AIFF 22.3kHz file; applies an approximate ideal low pass, digital, antialias filter (approximate delayed truncated sinc

impulse response filter) then linearly interpolates and resamples to the user specified sample rate (which is twice the cut-off frequency of the low pass filter). The AIFF linear data is overwritten by  $\mu$ -law converted data and the file is truncated if necessary; and finally the AIFF header is overwritten with a SND/AU header.]

- Uses a custom double buffering technique to play arbitrarily large files continuously from disk. It relies on other applications being multitasking friendly to give a continuous sound output. SoundMachine does not prime its buffers at interrupt time.
- The size of the buffers it allocates depends on the application memory size; increase this if you think there is a problem with the quality of the sound (especially if use use very high sampling rates, e.g., 44.1kHz (CD) or 48.0kHz (DAT)). The very minimum application size is 256K and is suitable for most 8kHz  $\mu$ -law sounds.
- Be very wary about using the high quality Speech Manager voices as they are system memory hogs. If your memory is limited you should consider using Mr Hughes or Boris (best of the robotic voices) or disabling the voices altogether using the preferences file.
- This is not intended to be a sound format converter (that task is straightforward but very painful to implement, see "SOX") but rather a player for the most common (mac-orientated) SAMPLED SOUND sound formats (let's face it, primarily 8 bit  $\mu$ -law).

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#### Controls:

Sounds can be fastforwarded; reversed and sped-up; paused and looped. Clicking within the progress bar skips to that portion of the sound. There are some keyboard equivalents like:

- g (go) meaning play
- p (pause)
- f (fast forward)
- b (backwards)
- <right arrow> next file in queue
- <left arrow> previous file in queue
- <down arrow> volume down (unrelated to the control panel setting; A and  $\mu$ -law only)
- <up arrow> volume up
- s (stop)
- l (loop)
- u (uh?) sound format change
- i (information) cycle through the information fields
- command period

If you forget just use balloon help.

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#### Additional Features:

Any number of files (max 100) can be dragged and dropped onto the application icon and SoundMachine will queue and (try to) play every file. For help on how to drive SoundMachine use Balloon Help. If there is no data in the data fork of the file, then the file is just skipped (with a warning alert).

The preferences are kept in a file called "SoundMachine Prefs" (this is different from previous versions of SoundMachine which used "SoundMachine Preferences"; this older preferences file should be discarded since the data is in a slightly different format; no harm will come if you don't discard it).

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#### Future Things to do:

1. ADPCM formats.
2. Sound level display.
3. 'snd ' resource playing capability.
4. Play text files using the Speech voice.
5. 16 bit sound.
6. Greater than 2 channel (stereo) support.

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#### Bugs:

Please report any bugs or info on any other sound format you want supported (no promises). With bugs try and describe as precisely as possible the nature of the problem. Also forward a binhexed version of the sound file if you think this might be the problem.

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#### Disclaimer:

SoundMachine is freeware. I retain the copyright, including the right to alter or sell the program. You may use and copy SoundMachine freely only on a non-commercial basis. SoundMachine cannot be distributed with any commercial package without my permission. An exception is that SoundMachine may be included on any CD ROM provided I get a free copy of that CD ROM (this applies also to any updates of SoundMachine that are later included on any CD ROM). You may not alter or sell this program without my permission. This README file must

accompany SoundMachine.

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Acknowledgements:

Many thanks to a bunch of Northern Hemispheric beta testers.

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Obscure Stuff:

```
unsigned char UlawToSnd[] = // x1 (default)
{
  3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 55, 59, 63,
  66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96,
  98, 99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,
  113,114,114,115,115,116,116,117,117,118,118,119,119,120,120,121,
  121,121,122,122,122,122,123,123,123,123,124,124,124,124,125,125,
  125,125,125,125,126,126,126,126,126,126,126,126,127,127,127,127,
  127,127,127,127,127,127,127,127,128,128,128,128,128,128,128,128,
  128,128,128,128,128,128,128,128,128,128,128,128,128,128,128,
  253,249,245,241,237,233,229,225,221,217,213,209,205,201,197,193,
  190,188,186,184,182,180,178,176,174,172,170,168,166,164,162,160,
  158,157,156,155,154,153,152,151,150,149,148,147,146,145,144,143,
  143,142,142,141,141,140,140,139,139,138,138,137,137,136,136,135,
  135,135,134,134,134,134,133,133,133,133,132,132,132,132,131,131,
  131,131,131,131,130,130,130,130,130,130,130,130,129,129,129,129,
  129,129,129,129,129,129,129,129,128,128,128,128,128,128,128,128,
  128,128,128,128,128,128,128,128,128,128,128,128,128,128,128
};
```

This table is actually not the best conversion possible if higher quality sound is desired. After conversion of a  $\mu$ -law number to a 16 bit linear number, SoundMachine has a facility to scale this number and extract the any 8 bits (with saturation) to send to the sound channel (after lookup table conversion).

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SND FORMAT ENCODING NUMBERS

Currently SoundMachine supports numbers 1, 2 and 27

The intention is to support also 3 and 23 to 26; most of the rest are insane.

0	SND_FORMAT_UNSPECIFIED	unspecified format
1	SND_FORMAT_MULAW_8	8-bit mu-law samples
2	SND_FORMAT_LINEAR_8	8-bit linear samples
3	SND_FORMAT_LINEAR_16	16-bit linear samples
4	SND_FORMAT_LINEAR_24	24-bit linear samples
5	SND_FORMAT_LINEAR_32	32-bit linear samples
6	SND_FORMAT_FLOAT	floating-point samples
7	SND_FORMAT_DOUBLE	double-precision float samples
8	SND_FORMAT_INDIRECT	fragmented sampled data
9	SND_FORMAT_NESTED	?
10	SND_FORMAT_DSP_CORE	DSP program
11	SND_FORMAT_DSP_DATA_8	8-bit fixed-point samples
12	SND_FORMAT_DSP_DATA_16	16-bit fixed-point samples
13	SND_FORMAT_DSP_DATA_24	24-bit fixed-point samples
14	SND_FORMAT_DSP_DATA_32	32-bit fixed-point samples
15	?	
16	SND_FORMAT_DISPLAY	non-audio display data
17	SND_FORMAT_MULAW_SQUELCH	?
18	SND_FORMAT_EMPHASIZED	16-bit linear with emphasis
19	SND_FORMAT_COMPRESSED	16-bit linear with compression
20	SND_FORMAT_COMPRESSED_EMPHASIZED	A combination of the two above
21	SND_FORMAT_DSP_COMMANDS	Music Kit DSP commands
22	SND_FORMAT_DSP_COMMANDS_SAMPLES	?
23	SND_FORMAT_ADPCM_G721	
24	SND_FORMAT_ADPCM_G722	
25	SND_FORMAT_ADPCM_G723_3	
26	SND_FORMAT_ADPCM_G723_5	
27	SND_FORMAT_ALAW_8	