

# Sounds of Open Source

processing sound with sox



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@OpenClipart

## Record audio

```
rec -r 44100 -b 16 -e signed-integer audio.mp3
```

## Record audio

```
# Thread_queue_size applies to the first  
# input specified after it.  
# In some cases it's not enough to avoid  
# "buffer xrun", try to record video and  
# audio separately.
```

```
ffmpeg -f alsa -thread_queue_size 4096  
-i hw:0 -acodec aac audio.mp3
```

## Record audio

→ Self-describing formats



→ Raw or headerless formats

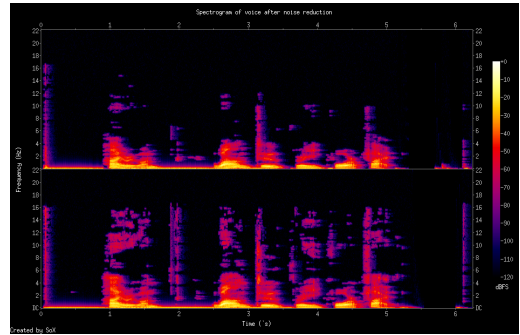
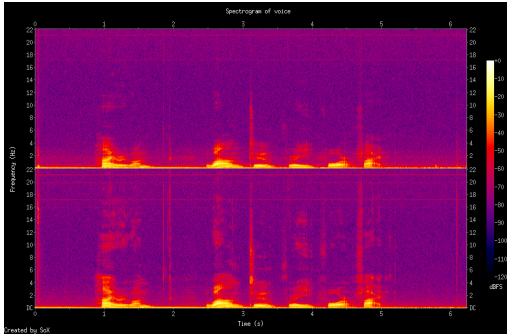


## Cleaning up

```
# the noise is always different,  
# try to record it immediately  
# before the actual audio.
```

```
sox noise.mp3 -n noiseprof noise.prof  
sox audio.mp3 output.mp3 noisered noise.prof 0.21
```

## Cleaning up



## Cleaning up

```
# Voice Activity Detector to trim  
# silence and quiet background noise  
# at the beginning and the end
```

```
sox audio.mp3 trimmed.mp3 vad
```



## Cleaning up

# -v, --volume to adjust volume by certain factor

```
sox audio.mp3 output.mp3 stat
```

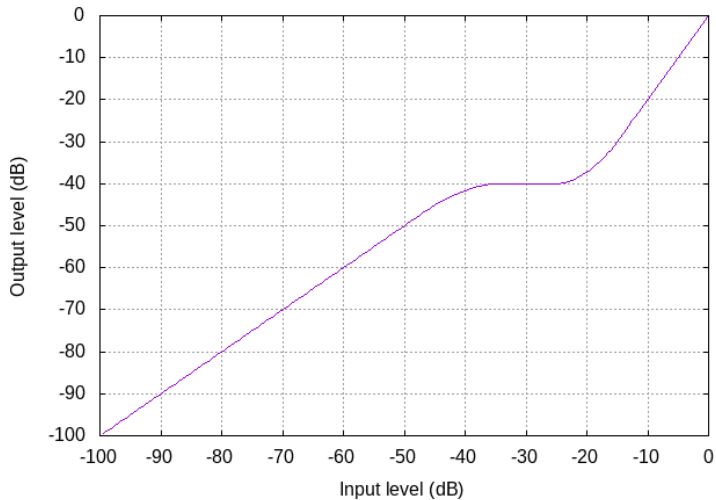
```
Samples read:          441216
Length (seconds):      10.004898
Scaled by:             2147483647.0
Maximum amplitude:     0.019642
Minimum amplitude:     -0.019630
Mean    norm:          0.004128
Mean    amplitude:     -0.000000
Volume adjustment:     50.911
```

## Automatic Gain Control

```
sox audio.mp3 agc.mp3 compand  
0.3,0.3 6:-80,-80,-60,-60,-40,-40,-20,-40 0 0 0.3
```

# Automatic Gain Control

SoX effect: compand



## Unite and lead

# without the volume specified sox can try to  
# automatically adjust the volume to prevent  
# clipping, making everything unexpectedly quiet.

```
sox -v 1.0 part.1.mp3 part.2.mp3 concat.mp3
```

```
sox -m -v 1.0 part.1.mp3 part.2.mp3 mixture.mp3
```

## Unite and lead

```
sox audio.mp3 output.mp3 \  
  trim 0 30 # cut out from the 0 to 30th second  
  fade 5    # fade in/out for 5 seconds  
  pad 7     # pad with 7 seconds of silence
```

## Unite and lead

```
# splice two parts together at position 00:25 with  
# excess/leeway 1 second and half-cosine wave fading
```

```
sox part1.mp3 part2.mp3 mix.mp3 \  
    splice -h 00:25,1,1
```

## Effects

```
# add an echo with the delay 500 ms and loudness 0.3
```

```
sox voice.clean.mp3 echo.mp3 echo 0.8 0.9 500 0.3
```

## Effects

```
# Kaiser-Bessel window band-pass filter
# to generate "phone" effect

sox audio.mp3 output.mp3 sinc 500-3000 vol +3

# Add some clicking noise on top of it
sox -n pinknoise.mp3 rate 44100 \
    synth 10 pinknoise vol 0.01
sox -m -v 1 output.mp3 pinknoise.mp3 phone.mp3
```

Kaiser-Bessel window



## Generating effects

```
# -n says the input is a special "null" file  
sox -n guitar-chortds.mp3 \
```

```
# sine waves for tones of specified note and octave  
synth pl G2 pl B2 pl D3 pl G3 pl D4 pl G4 \
```

```
# delay channels with each tone and mix with fading effect  
delay 0 .05 .1 .15 .2 .25 remix - fade 0 4 .1 norm -1
```

## Development history

[sox.sourceforge.net](https://sox.sourceforge.net)


## Development history




Releases

Tags

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on Feb 22, 2015 

**sox-14.4.2** 

 45b161d  zip  tar.gz

## Development history

SoX has had several vulnerabilities listed in the National Vulnerability Database since its last public release in 2015. These vulnerabilities include stack and heap overflows and denial-of-service attacks.

## Development history



master ▾



Commits on May 9, 2021

**mp3: fix error handling in rewrite\_tags()** ...



**mansr** committed on May 9



Commits on Feb 1, 2021


**sox.1: fix example for mcompand** ...




**mansr** committed on Feb 1

## Questions?

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