



How to record audio



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1 Article purpose

This article explains how to record audio via the kernel [ALSA](#) audio framework in **Linux® OS** context. The examples below, show how to record audio from the different audio hardware interfaces of the [STM32MPU boards](#).

2 Audio record overview

The [ALSA](#) framework exposes audio devices associated to the board audio hardware interfaces.

The application audio streams are routed by default through the [PulseAudio](#) sound server. [PulseAudio](#) exposes audio profiles, which are mapped on the [ALSA](#) sound card audio devices. The [PulseAudio](#) server provides a command line interface to list audio profiles and to select one, in order to record from a specific audio interface.

The audio record examples in following sections are based on [ALSA utilities](#). Some input paths are configured through [ALSA](#) controls. These configurations are detailed in [sound card configuration](#) article. If an error is issued when running an example, please refer to [Audio troubleshooting grid](#) article for debug.

3 Examples

3.1 Audio record from headset microphone input

3.1.1 Record from ALSA device

Start audio record from 'record_codec' ALSA device:



'record_codec' is an alias defined in /etc/asound.conf, for headset microphone input device.

```
Board $> arecord -D record_codec -f S16_LE -d 10 /tmp/rec.wav
```

3.1.2 Record via PulseAudio

3.1.2.1 For ecosystem release v1.2.0

- **Configure Pulseaudio :**

Change Pulseaudio default input source to 'analog_input':



The Pulseaudio analog_input is defined in /etc/pulse/system.pa configuration file.

```
Board $> pacmd set-default-source analog_input
```

- **Start audio record :**



The Pulseaudio device is the default one, so "-D pulse" option can be omitted in the record command.

```
Board $> arecord -d 10 /tmp/rec.wav
```

3.1.2.2 For ecosystem release v1.1.0

- **Configure Pulseaudio :**

Change Pulseaudio active profile of the sound card, to 'analog-stereo' profile:



Example below is given for **sound card index 0**. Check sound cards index with "*pacctl list cards short*" command.

```
Board $> pacmd set-card-profile 0 output:analog-stereo+input:analog-stereo
```

- Start audio record :



The Pulseaudio device is the default one, so "-D pulse" option can be omitted in the record command.

```
Board $> arecord -d 10 /tmp/rec.wav
```

3.2 Audio record from digital microphone input



The support of digital microphone input is board dependent. Please, check available inputs with "*arecord -l*" command.

3.2.1 Record from ALSA device

Start mono audio record from 'record_dfscdm0' ALSA device:



'record_dfscdm0' is an alias defined in /etc/asound.conf, for digital microphone U1 input device.

```
Board $> arecord -D record_dfscdm0 -r 16000 -f S32_LE -c 1 -d 10 /tmp/rec.wav
```

3.2.2 Record multiple digital microphones from a virtual ALSA device

Start stereo audio record from 'multi' ALSA device:



'multi' device, based on ALSA multi plugin^[1], has to be defined in /etc/asound.conf file.

```
Board $> arecord -D multi -r 16000 -f S32_LE -c 2 -d 10 /tmp/rec.wav
```

3.2.3 Record via PulseAudio

The record via Pulseaudio is only available for ecosystem release v1.2.0

- Configure Pulseaudio

Change Pulseaudio default input source to 'dmic1_input':



The Pulseaudio dmic1_input is defined in /etc/pulse/system.pa configuration file.

```
Board $> pacmd set-default-source dmic1_input
```

- Start audio record :



The Pulseaudio device is the default one, so "-D pulse" option can be omitted in the record command.

```
Board $> arecord -r 48000 -f S32_LE -c 2 -d 10 /tmp/rec.wav
```

3.3 Audio record from S/PDIF input



The support of S/PDIF input is board dependent. Please, check available inputs with "*arecord -l*" command.

3.3.1 Get IEC958 status bits

Some restrictions may apply to IEC958 control, depending on the SPDIFRX device configuration as it is explained in [SPDIFRX device tree configuration](#) and [SPDIFRX Linux driver](#) articles.

```
Board $> amixer -c STM32MP1EV cget iface=PCM,name='IEC958 Capture Default'
```

3.3.2 Record from ALSA device

Start audio record from 'record_spdif' ALSA device:



'record_spdif' is an alias defined in /etc/asound.conf, for S/PDIF input device.



A S/PDIF signal must be available on S/PDIF RCA input connector before starting the record command. The record rate must be set according to S/PDIF signal sampling rate.

```
Board $> arecord -D record_spdif -f S32_LE -c 2 -r 48000 -d 10 /tmp/rec.wav
```

3.3.3 Record via PulseAudio

The record via Pulseaudio is only available for ecosystem release **v1.2.0**

- **Configure Pulseaudio**

Change Pulseaudio default input source to 'iec958_input':



The Pulseaudio iec958_input is defined in /etc/pulse/system.pa configuration file.

```
Board $> pacmd set-default-source iec958_input
```

- Start audio record :



The Pulseaudio device is the default one, so "-D pulse" option can be omitted in the record command.

```
Board $> arecord -r 48000 -f S32_LE -c 2 -d 10 /tmp/rec.wav
```

4 References

- [ALSA PCM plugins](#)

Operating System

Advanced Linux sound architecture

Sony/Philips Digital Interface Format (Protocol (IEC-60958))