Audio Inputs and Outputs

Audio inputs and outputs are physical connectors of a device. Video capture devices have inputs, output devices have outputs, zero or more each. Radio devices have no audio inputs or outputs. They have exactly one tuner which in fact *is* an audio source, but this API associates tuners with video inputs or outputs only, and radio devices have none of these. [1] A connector on a TV card to loop back the received audio signal to a sound card is not considered an audio output.

Audio and video inputs and outputs are associated. Selecting a video source also selects an audio source. This is most evident when the video and audio source is a tuner. Further audio connectors can combine with more than one video input or output. Assumed two composite video inputs and two audio inputs exist, there may be up to four valid combinations. The relation of video and audio connectors is defined in the `audioset` field of the respective struct :c:type:`v4l2_input` or struct :c:type:`v4l2_output`, where each bit represents the index number, starting at zero, of one audio input or output.

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To learn about the number and attributes of the available inputs and outputs applications can enumerate them with the :ref:`VIDIOC_ENUMAUDIO` and :ref:`VIDIOC_ENUMAUDOUT <VIDIOC_ENUMAUDOUT>` ioctl, respectively. The struct :c:type:`v4l2_audio` returned by the :ref:`VIDIOC_ENUMAUDIO` ioctl also contains signal status information applicable when the current audio input is queried.

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The :ref:`VIDIOC_G_AUDIO <VIDIOC_G_AUDIO>` and :ref:`VIDIOC_G_AUDOUT <VIDIOC_G_AUDOUT>` ioctls report the current audio input and output, respectively.

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Note

Note that, unlike :ref:`VIDIOC_G_INPUT <VIDIOC_G_INPUT>` and :ref:`VIDIOC_G_OUTPUT <VIDIOC_G_OUTPUT>` these ioctls return a structure as :ref:`VIDIOC_ENUMAUDIO` and :ref:`VIDIOC_ENUMAUDOUT <VIDIOC_ENUMAUDOUT>` do, not just an index.

To select an audio input and change its properties applications call the :ref:`VIDIOC_S_AUDIO <VIDIOC_G_AUDIO>` ioctl. To select an audio output (which presently has no changeable properties) applications call the :ref:`VIDIOC_S_AUDOUT <VIDIOC_G_AUDOUT>` ioctl.

Drivers must implement all audio input ioctls when the device has multiple selectable audio inputs, all audio output ioctls when the device has multiple selectable audio outputs. When the device has any audio inputs or outputs the driver must set the `V4L2_CAP_AUDIO` flag in the struct :c:type:`v4l2_capability` returned by the :ref:`VIDIOC_QUERYCAP` ioctl.

Example: Information about the current audio input

```
struct v4l2_audio audio;

memset(&audio, 0, sizeof(audio));

if (-1 == ioctl(fd, VIDIOC_G_AUDIO, &audio)) {
    perror("VIDIOC_G_AUDIO");
    exit(EXIT_FAILURE);
}

printf("Current input: %s\\n", audio.name);
```

Example: Switching to the first audio input

```
struct v4l2_audio audio;

memset(&audio, 0, sizeof(audio)); /* clear audio.mode, audio.reserved */

audio.index = 0;

if (-1 == ioctl(fd, VIDIOC_S_AUDIO, &audio)) {
    perror("VIDIOC_S_AUDIO");
    exit(EXIT_FAILURE);
}
```

[1]   Actually struct :c:type:`v4l2_audio` ought to have a `tuner` field like struct :c:type:`v4l2_input`, not only making the API more consistent but also permitting radio devices with multiple tuners.