

# Audio codec library user guide

## 1. Introduction

Audio codec library include G711, ADPCM and AAC codec library, plus AEC library, user can use them to encode pcm data to G711, ADPCM or AAC bitstream, or decode G711 and ADPCM bitstream to pcm data.

## 2. File directory list

These codec source files include three directories, include, source and sample, include directory contain header file of codec API, source directory contain files for codec function, and sample directory contain sample code and pcm files for test.

### G711

- g711/Include

- g711/source

- g711/sample

### ADPCM

- adpcm/Include

- adpcm/source

- adpcm/sample

### AAC (Encoder)

- faac/source

- faac/sample

### AAC (Decoder)

- faad2/source

- faad2/sample

### AEC

- aec/include

- aec/source

- aec/sample

### 3. Building library

to build these library for platform, please copy files into sdk path first, then use “make all” under sdk root directory to build these libraries

#### G711

Source	sdk path
g711/Include	code/lib/Include/nvtaudlib
adpcm/source	code/lib/source/nvtaudlib
adpcm/sample	code/sample/g711_test

#### ADPCM

source	sdk path
adpcm/Include	code/lib/Include/nvtaudlib_adpcm
adpcm/source	code/lib/source/nvtaudlib_adpcm
adpcm/sample	code/sample/adpcm_test

#### AAC (Encoder)

source	sdk path
faac/sample	code/sample/faac_test

#### AAC (Decoder)

source	sdk path
faad2/sample	code/sample/faad2_test

#### AEC

source	sdk path
aec/Include	code/lib/Include/nvtaudlib_aec
aec/source	code/lib/source/nvtaudlib_aec
aec/sample	code/sample/aec_test

Before build faac library, please use the following instruction to install the necessary Ubuntu package:

```
sudo apt install libtool curl
```

Execute **make && make install**, header and lib files will be copied to specified folder.

#### 4. Sample code test

To run sample code for test, the steps are as follows.

##### G711

- a. copy g711\_test and libnvtaudlib\_g711.so to current directory
- b. copy g711\_in.PCM to /mnt/sd/
- c. set LD\_LIBRARY\_PATH to current directory  
Ex : export LD\_LIBRARY\_PATH=/mnt/mtd:\$LD\_LIBRARY\_PATH
- d. run g711\_test, then it will output file to /mnt/sd/  
g711\_bs\_alaw.PCM //encode g711\_in.PCM to alaw bitstream  
g711\_bs\_ulaw.PCM //encode g711\_in.PCM to ulaw bitstream  
g711\_out\_alaw.PCM // decode alaw bitstream to pcm  
g711\_out\_ulaw.PCM // decode ulaw bitstream to pcm

test log:

```
root@NVTEVM:/mnt/mtd$ ./g711_test
Hello, in g711 user space test program ~
In run_g711_test
g711 pattern sample = [720384]
g711 buf_in    addr = [b0920010]
g711 buf_out   addr = [b0bdf810]
g711 buf_bsout addr = [b0a7fc10]
write addr =  b0a7fc10
a-law encode done
write addr =  b0bdf810
a-law decode done
write addr =  b0a7fc10
u-law encode done
write addr =  b0bdf810
u-law decode done
```

##### ADPCM

- a. copy adpcm\_test and libnvtaudlib\_adpcm.so to current directory
- b. copy adpcm\_in.PCM to /mnt/sd/
- c. set LD\_LIBRARY\_PATH to current directory  
Ex : export LD\_LIBRARY\_PATH=/mnt/mtd:\$LD\_LIBRARY\_PATH
- d. run adpcm\_test, then it will output file to /mnt/sd/  
adpcm\_out.PCM //encode adpcm\_in.PCM to adpcm, then decode to

pcm, and save to adpcm\_out.PCM

test log:

```
root@NVTEVM:/mnt/mtd$ ./adpcm_test
Hello, in g711 user space test program ~
In run adpcm test
adpcm pattern size = [1440768] sample count = [720384]
adpcm encode done
adpcm decode done
write addr = ae9d5810
Out run_adpcm_test
```

#### AAC (Encoder)

- copy faac\_test and faac\_in.PCM to current directory
- copy libfaac.so.0.0.0 to current directory and create links as libfaac.so.0
- set LD\_LIBRARY\_PATH to current directory  
Ex : export LD\_LIBRARY\_PATH=/mnt/mtd:\$LD\_LIBRARY\_PATH
- run faac\_test, then it will output file to current directory  
faac\_out\_8khz\_16bit.aac //encode faac\_in.PCM to AAC.

test log:

```
root@NVTEVM:/mnt/mtd$ ./faac_test
pConfiguration->bitRate:64000, pConfiguration->bandWidth:3360
faac complete aac encoder finish!!
```

#### AAC (Decoder)

- copy faad\_test and faad\_in\_8khz\_16bit.aac to current directory
- copy libfaad.so.2.0.0 to current directory and create links as libfaad.so.2
- set LD\_LIBRARY\_PATH to current directory  
Ex : export LD\_LIBRARY\_PATH=/mnt/mtd:\$LD\_LIBRARY\_PATH
- run faad\_test, then it will output file to current directory  
faad\_out.PCM //decode faad\_in\_8khz\_16bit.aac to PCM.

test log:

```
root@NVTEVM:/mnt/mtd$ ./faad_test
frame info: bytesconsumed 204, channels 2, header_type 2
```

```
object_type 2, samples 2048, samplerate 8000
    frame info: bytesconsumed 360, channels 2, header_type 2
object_type 2, samples 2048, samplerate 8000
    frame info: bytesconsumed 520, channels 2, header_type 2
object_type 2, samples 2048, samplerate 8000
```

## AEC

- copy aec\_test, aec\_mic.pcm and aec\_speaker.pcm to current directory
- copy libnvtaudlib\_aec.so to current directory
- set LD\_LIBRARY\_PATH to current directory  
Ex : export LD\_LIBRARY\_PATH=/mnt/mtd:\$LD\_LIBRARY\_PATH
- run aec\_test, then it will output file to current directory  
aec\_output.pcm     // aec\_mic.pcm with echo removed

## test log:

```
root@NVTEVM:/mnt/mtd$ ./aec_test
    mic pcm : aec_mic.pcm
speaker pcm: aec_speaker.pcm
output pcm: aec_output.pcm
```

```
sample rate: 8000, num_mic: 1, num_speaker: 1, channel: 1
decode time = 0.652313 seconds
decode time = 0.102467 seconds
```

## **5. Check output files**

User can use audio application to check correction of output files, for example, you can use Audacity for this check, it is free and open source audio software, you can download it from website <https://www.audacityteam.org/>

To use Audacity to playback g711, adpcm file, open file from menubar File -> Import -> Raw data, please refer its user's manual for detail.

After importing ffmpeg library, Audacity can playback aac file, open file from menubar File -> Open, please refer its user's manual for detail.