# Release Note

2018-Apr-11

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## armv7a

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Release date | Library archive name | Ver. | Note |
| 1 | 2017-Oct-20 | libtutuClear\_152\_20171020.a | 1.5.2 | First release for R16 integration |
| 2 | 2017-Nov-06 | libtutuClear\_161\_20171106.a | 1.6.1 | - Support stereo AEC  - Small-scale algorithm update  - Release DOA API |
| 3 | 2017-Nov-17 | libtutuClear\_162\_20171117.a | 1.6.2 | - Fix issue that no wakeup after 3 hours  - Speed optimization for armv7a |
| 4 | 2017-Nov-27 | libtutuClear\_163\_R16\_20171127.a | 1.6.3 | Remove Small-scale algorithm update on Ver.1.6.1 |
| 5 | 2017-Nov-29 | libtutuClear\_163\_R16\_20171129\_20b.a | 1.6.3 | Accept 32-bit PCM input; previously accept 16-bit PCM input |
| 6 | 2017-Dec-05 | libtutuClear\_163\_R16\_20171205\_W32.a | 1.6.3 | Algo update for 90 dBC AEC test |
| 7 | 2017-Dec-06 | libtutuClear\_164\_R16\_20171206.a | 1.6.4 | Support 16-bit and 32-bit input/output port simultaneously |
| 8 | 2017-Dec-07 | libtutuClear\_165\_R16\_20171207.a | 1.6.5 | AEC performance upgrade with the penalty of additional computational complexity, not fully optmized |
| 9 | 2018-Jan-25 | libtutuClear\_166\_R16\_20180125.a | 1.6.6 | - Support ASR/VOIP dual output  - Speed optimization for armv7a |
| 10 | 2018-Feb-09 | libtutuClear\_166\_R18\_armv7a\_20180209.a | 1.6.6 | - Display debug mesg  - Used at R18 |
|  |  |  |  |  |

## arm64-v8a

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Release date | Library archive name | Ver. | Note |
| 1 | 2017-Nov-18 | libtutuClear\_162\_armv8a\_20171118.a | 1.6.2 | Frist release for R18 integration |
| 2 | 2017-Nov-28 | libtutuClear\_162\_R18\_20171128.a | 1.6.3 | Sync to R16 Ver.1.6.3 |
| 3 | 2017-Nov-30 | libtutuClear\_163\_R18\_20171130\_20b.a | 1.6.3 | Accept 32-bit PCM input; previously accept 16-bit PCM input |
| 4 | 2017-Dec-06 | libtutuClear\_164\_R18\_20171206.a | 1.6.4 | Support 16-bit and 32-bit input/output port simultaneously |
| 5 | 2017-Dec-07 | libtutuClear\_165\_R18\_20171207.a | 1.6.5 | AEC performance upgrade with the penalty of additional computational complexity |
| 6 | 2018-Jan-31 | libtutuClear\_166\_R18\_20180131.a | 1.6.6 | - Support ASR/VOIP dual output  - Speed optimization for armv7a |
| 7 | 2018-Apr-11 | libtutuClear\_167\_R18\_20180411.a | 1.6.7 | Support Amazon ESP |
|  |  |  |  |  |

# Tuning guide

## TUTU\_PARAM\_SYS.uw32OpMode

|  |  |
| --- | --- |
| Bit | Mode description |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 | ASR assist |
| 5 |  |
| 6 |  |
| 7 | Multiple channel I/O data export |
| 8 |  |
| 9 |  |
| 10 | Stereo AEC |
| 11 |  |
| 12 |  |
| 13 | Generating two channel line-out signal. First channel is for speech recognition assist application. Second channel is for two-way communication application |
| 14 | Generating spatial perception signal at third line-out channel for sound energy based auditory scene analysis |
| 15 |  |
| 16~31 | Reserved |

## TUTU\_PARAM\_SYS.uw32FuncMode

|  |  |
| --- | --- |
| Bit | Mode description |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 | Acoustic echo cancellation (AEC) |
| 7 | Array noise suppression |
| 8 |  |
| 9 |  |
| 10 | Auto gain control (AGC). Design for two-way communication |
| 11 | Dynamic range control (DRC) |
| 12 | High-pass filter (HPF) |
| 13 |  |
| 14 | Directional of arrival (DOA) |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |
| 21 |  |
| 22 |  |
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| 30 |  |
| 31 |  |

## How to enable the support for Amazon ESP (Echo Spatial Perception)?

2018-Apr-11

Amazon ESP requires signal with acoustic echo removed and no gain effect applied.

tutuClear provides such ESP signal at third output channel, where first channel contains signal for speech recognition and second channel contains signal for two-way communication. These three channel signals are non-interleaved aligned in the buffer (please ensure enough memory is allocated to this buffer!) assigned as the fourth input argument of TUTUClear\_OneFrame(…, W16 \*ptLOut, …) or TUTUClear\_OneFrame\_32b(…, W32 \*pw32Lout, …).

Two configuration steps are required to enable ESP signal output:

1. While tutuClear initialization, HSB 8 of TUTUClearConfig\_t.uw16MaxNumOfMic needs to be set as 3, E.g. TUTUClearConfig\_t.uw16MaxNumOfMic = 0x0303, meaning three channels of microphone input and three channels of signal output. The third output channel contains signal for Amazon ESP.
2. While tutuClear operation mode setup, the 15-th bit TUTU\_PARAM\_SYS.uw32OpMode needs to be asserted. E.g. TUTU\_PARAM\_SYS.uw32OpMode = 0x00006410, meaning enable ASR assist mode, stereo AEC mode, generating two-way communication signal at 2nd output channel and generating Amazon ESP signal at 2nd output channel.