

## SPiRiT Voice Storage Codec

Speech storage applications require a codec capable to efficiently compress speech for more effective usage of data storage resources. At the same time the codec should secure high voice quality.

The SPiRiT proprietary Voice Storage Codec (VoStoC) is specifically developed for such applications, as it allows high compression rates without significant quality loss.

The SPiRiT VoStoC is a multirate variable bit rate, ICELP-based voice codec. It operates at six average bit rates (approximated values): 2400 bps, 3200 bps, 4000 bps, 5600 bps, 8000 bps, and 12000 bps.

Thanks to SPiRiT unique proprietary algorithms the VoStoC codec allows flexible trade-off between compression rate and speech quality. It has a slightly increased variable algorithmic delay for better quality than standard codecs offer at comparable bit rates. The codec's output bit rate varies constantly in direct relation to the information density of the input speech.

Generally six operation modes, varying in voice quality and compression rate, are available.

VoStoC is a multi-channel codec; speech encoding and decoding are performed independently on the "frame-by-frame" basis. Speech signal is sampled at 8 kHz sampling rate with 16-bit PCM. Frame length is 20 ms (160 samples). Algorithmic delay varies in the range from 65 ms to 205 ms.

The voice quality depends on the chosen bit rate and varies in the range from 3.2 to 4.0 PESQ MOS.

## Specifications

The voice quality of SPiRiT VoStoC codec depends on the chosen bit rate.

Average Bit Rate, Bps	Speech Quality*, PESQ MOS
2400	3.25
3200	3.45
4000	3.66
5600	3.85
8000	3.95
12000	4.03

\*Voice quality is estimated using ITU-T P.862 recommendation (PESQ)

## Benefits

- Efficient voice compression to save data storage resources
- Better voice quality than standard codecs provide at comparable bit rates
- 6 average bit rates for flexible trade-off between compression rate and speech quality

## Key Features

- Speech quality from 3.2 to 4.0 PESQ MOS
- Broad range of operating bit rates from 2400 to 12000

## Applications

- Voice storage applications

## Availability

- ARM7 Now
- ARM9E Now
- PC Now

## Features

- ICELP-based algorithm
- Six average bit rates supported (approximated values): 2400 bps, 3200 bps, 4000 bps, 5600 bps, 8000 bps, and 12000 bps
- Better speech quality than standard codecs provide at comparable bit rates
- Variable Bit Rate – output bit rate depends on information density of the input speech
- Flexible trade-off between compression rate and speech quality
- Input data 8 KHz 16 bit PCM
- Code is reentrant and supports dynamic memory allocation

## Resource Requirements

PLATFORM	ARM7 (Encoder + Decoder)					
AVERAGE BIT RATE	2400	3200	4000	5600	8000	12000
Peak MIPS	41.17	38.93	38.79	43.85	45.72	54.80
Program + Constant Memory, KB	67.56	67.56	67.56	67.56	67.56	67.56
Dynamic Memory (per channel), KB	2.35	2.02	2.02	2.02	2.02	2.02
Scratch, KB	2.18	2.96	2.96	2.96	2.96	2.96
Stack, bytes	576	740	740	740	740	740

PLATFORM	ARM9E (Encoder + Decoder)					
AVERAGE BIT RATE	2400	3200	4000	5600	8000	12000
Peak MIPS	22.71	24.51	24.44	27.56	28.57	34.29
Program + Constant Memory, KB	66.7	66.7	66.7	66.7	66.7	66.7
Dynamic Memory (per channel), KB	2.35	2.02	2.02	2.02	2.02	2.02
Scratch, KB	2.18	2.96	2.96	2.96	2.96	2.96
Stack, bytes	572	728	728	728	728	728

PC-based version of VoStoC codec is available and can be supplied together with the ARM-based version upon request.

### CONTACTS

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