

MA-3 Sound Middleware Specification for Wav format

Version 1.1.0

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Yamaha Corporation

[Notes]

This document is the specification of MA-3 Sound Middleware as sample source code.
This explains the expected operation of Sound Middleware, but doesn't guarantee operation of sample middleware.

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Revision

Version	Date	Description	
1.0.0	September 23, 2002	Newly release	
1.1.0	April 2, 2003	1	Fs upper limit was changed to 24KHz.
		2.2	Fs upper limit was changed to 24KHz.
		3.3.1	Fs upper limit was changed to 24KHz.

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1 Introduction

This document describes the WAV format form supported by MA-3. Only the monophonic 8bit PCM data with Fs from 4kHz to 24kHz is supported.

2 Format specification

2.1 File structure

WAV format is the chunk structure of RIFF form. The example of minimum composition is shown below. At least two chunks, format chunk which specifies a format, and data chunk which stores PCM data, are needed. Be sure to process in which a problem does not occur even if two or more chunks are set. When two or more chunks are set, It is aimed at a chunk found in the first from the file head.

Moreover, when there is unknown chunk, it is necessary to surely ignore. Since chunk is to surely have the ID of 4 bytes, and the size of 4 bytes, it can be skipped reading easily. The numeric data is stored in LittleEndian.

<File chunk>

UINT8	ID[4] = "RIFF"	
UINT32	Size	// Overall size [bytes]
UINT8	ID[4] = "WAVE"	// Format type

<Wave chunk>

<format chunk>

UINT8	ID[4] = "fmt "	
UINT32	Size	// Data size [bytes]
UINT16	FormatTag	// Format type
UINT16	Channel	// The number of channels
UINT32	Fs	// Sampling frequency [Hz]
UINT32	SamplePerSec	// The sample size per second
UINT16	Block	// The byte count of one sample data
UINT16	Bit	// The number of quantization bits

<data chunk>

UINT8	ID[4] = "data"	
UINT32	Size	// Data size[bytes]
UINT8	Data	// Data

:

<End>

2.2 Format chunk

The data information of data chunk is stored. The size of 16 bytes is required as the chunk size at least.

MA-3 does not support the data whose format form is not PCM (1), and the data whose format is not monophonic, FS is not 4K ~ 24kHz, and the number of quantization bits is not 8.

UINT8	ID[4] = "fmt "	
UINT32	Size	// Data size [bytes]
UINT16	FormatTag	// Format type
UINT16	Channel	// The number of channels
UINT32	Fs	// sampling frequency [Hz]
UINT32	SamplePerSec	// The sample size per second
UINT16	Block	// The byte count of one sample data
UINT16	Bit	// The number of quantization bits

2.3 Data chunk

This chunk stores the data specified by format chunk.

2.3.1 Allocation of sample data

Allocation of data is as follows.

8bit Mono	1Byte					
	Data					
8bit Stereo	Left data	Right data				
16bit Mono	Data	Data				
	(L)	(H)				
16bit Stereo	Left data	Left data	Right data	Right data		
	(L)	(H)	(L)	(H)		

2.3.2 The format of a sample data

The number of quantization bits	Data format	Minimum	Maximum
8	With no sign	0	255
16	With sign	-32768	32767

3 Error check

3.1 File size

When a file size does not fulfill 12, it becomes an error.

UINT8	ID[4] = "RIFF"
UINT32	Size
UINT8	ID[4] = "WAVE"

3.2 Header chunk

When it corresponds to the following items, error check ends at the time and it becomes as an error.

- When Chunk ID is not "RIFF"
- When the format type is not "WAVE"
- When RIFF chunk size + chunk header size (8) is larger than the file size
- When RIFF chunk size does not fulfill 12

3.3 Sub chunk

When the size of RIFF chunk remainder is larger than 8, searches format chunk and data chunk. When it is other chunks, ignores.

3.3.1 Format chunk

When Chunk ID is "fmt", the following items are checked. When it corresponds, error check ends at the time and becomes as an error. When two or more chunks exist, it is aimed at a chunk found in the first from the file head.

- When chunk size + chunk header (8) is larger than RIFF chunk remaining size
- When chunk size is less than 16
- When format tag is not PCM (1)
- When the number of channels is not 1
- When the sampling frequency is less than 4kHz or larger than 24kHz
- When the number of quantization bits is not 8

3.3.2 Data chunk

When Chunk ID is "data", the following items are checked. When it corresponds, error check ends at the time and becomes as an error. When two or more chunks exist, it is aimed at a chunk found in the first from the file head.

- When chunk size + chunk header (8) is larger than RIFF chunk remaining size

3.3.3 Other chunks

When Chunk ID is except the above, the following items are checked. When it corresponds, error check ends at the time and becomes as an error.

- When chunk size + chunk header (8) is larger than RIFF chunk remaining size