MA-3 Sound Middleware
API Specification
for
Realtime MIDI

Version 1.2.1

April 22, 2003

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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Note:

For explanation of definition of functions, the following formats are defined for use.

Definition format	Meaning	Definition format	Meaning
UINT8	8 bits without code	SINT8	8 bits with code
UINT16	16 bits without code	SINT16	16 bits with code
UINT32	32 bits without code	SINT32	32 bits with code

Revision

Version	Date	Description
0.9	June 18, 2001	Initial edition
1.0	June 28, 2001	API name was changed.
1.1.0	July 10, 2001	Definition of Load argument was added.
1.1.1	September 10, 2001	Explanation of Control() was added.
1.1.2	September 19, 2001	API list was added.
1.1.3	November 26, 2001	Seek() parameter was changed.
1.1.4	December 10, 2001	Description of MASMW_GET_LOADINFO and MASMW_SET_LOADINFO was added.
1.1.5	January 25, 2002	The miswritten word was corrected.
1.1.6	March.25, 2002	The miswritten word was corrected.
1.1.7	August 8, 2002	The mistake of argument was corrected. 　2.1.7.2 MaSound_Control (Usual MIDI message issue) 　2.1.7.3　MaSound_Control（SysEx message issue）
1.1.8	September 30, 2002	The mistake of support function was corrected. 1. Introduction
1.2.0	December 15, 2002	The function table was changed. 1. Introduction The clerical error was corrected. 2.1.7.2 MaSound_Control (Usual MIDI message issue) MIDP2.0 corresponding API was added. 2.1.7 ctrl_num 29, 30 were added. 　　MaSound_Control(Setup of volume setting value) 　　MaSound_Control(Setup of period callback interval)
1.2.1	April 22, 2003	Added 　1. Introduction　　The function table was changed. The clerical error was corrected. 　2.1.3　MaSound_Load() 　2.1.7.1 MaSound_Control (setting of Volume setting value) 　2.1.7.3 MaSound_Control (SysEx message issue) 　2.1.7.4 MaSound_Control (acquisition of Volume setting value) 　2.1.10　MaSound_Start() 　2.1.11　MaSound_Stop()

Contents

1   Introduction

This document presents specifications of functions of API (Application Program Interface) when Realtime MIDI is designated. For the details, refer to materials of MA-3 Sound Middleware.

	NON EXISTENT	IDLE	LOADED	OPENED	READY	PLAYING	PAUSE
MaSound_Create	○	×	×	×	×	×	×
MaSound_Load	×	○	×	×	×	×	×
MaSound_Open	×	×	○	×	×	×	×
MaSound_Control							
MASMW_SET_VOLUME	×	×	×	○	○	○	○
MASMW_GET_STATE	×	×	○	○	○	○	○
MASMW_SEND_MIDIMSG	×	×	×	○	○	○	○
MASMW_SEND_SYSEXMIDIMSG	×	×	×	○	○	○	○
MASMW_GET_CONTROL_VAL	×	×	×	×	○	○	○
MASMW_SET_CB_INTERVAL	×	×	○	×	×	×	×
MaSound_Standby	×	×	×	○	×	×	×
MaSound_Seek	×	×	×	×	○	×	○
MaSound_Start	×	×	×	×	○	×	×
MaSound_Pause	×	×	×	×	×	○	×
MaSound_Restart	×	×	×	×	×	×	○
MaSound_Stop	×	×	×	×	×	○	○
MaSound_Close	×	×	×	○	○	×	×
MaSound_Unload	×	×	○	×	×	×	×
MaSound_Delete	×	○	×	×	×	×	×

*The way of looking at this table. ○: executable, ×: impracticality and △: executable with reservation

2   Provisions for MaSound API

This chapter shows provisions for MaSound API at Realtime MIDI reproduction. The group of functions that are covered here is as follows.

Function name	Description
MaSound_Create	MA-3 Stream Converter registration
MaSound_Load	Sequencer loading processing
MaSound_Open	Sequencer opening processing
MaSound_Control	Sets control value.
MaSound_Standby	Sequencer standby processing
MaSound_Seek	Sequencer seeking processing
MaSound_Start	Sequencer starting processing
MaSound_Pause	Sequencer pausing processing
MaSound_Restart	Sequencer restart-from-pause processing
MaSound_Stop	Sequencer stopping processing
MaSound_Close	Sequencer closing processing
MaSound_Unload	Sequencer unloading processing
MaSound_Delete	Deletes registration of MA-3 Stream Converter.

2.1 Definition of functions

2.1.1 MaSound_Create

SINT32 MaSound_Create (UINT8 srm_id) ;

Description

    Sets MA-3 Stream Converter.

Argument

srm_id	Designates MASMW_CNVID_RMD.

Returned value

Non-negative	Function ID of registered MA-3 Stream Converter
Negative	Error code
	MASMW_ERROR_RESOURCE_OVER (-3)

2.1.2 MaSound_Delete

SINT32 MaSound_Delete (SINT32 func_id) ;

Description

    Deletes MA-3 Stream Converter that is registered with func_id.

Argument

func_id	Function ID of MA-3 Stream Converter to be released.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.3 MaSound_Load

SINT32 MaSound_Load(SINT8 func_id, UINT8 *file_ptr, UINT32 file_size, UINT8 mode, SINT32 (*func)(UINT8 id), void * ext_args);

Description

    Loads RealtimeMIDI data.

    Secures tone generation resources needed for loading RealtimeMIDI reproduction.

    Max. one RealtimeMIDI data can be loaded at the same time.

    Since sequence data is not prepared for Realtime MIDI, the mode designation is to be made simply with 0 or 1, otherwise, the designation only means that the transition to the next Open () cannot be made.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed.
file_ptr	NULL
file_size	0
mode	0..1 : Loads.
	2..3 :Performs only error check and returns an error code.
func	Call back function
ext_args	Extension argument. NULL is set.

Returned value

Non-negative	file_id.
Negative	Error code.
	MASMW_ERROR_RESOURCE_OVER (-3)

2.1.4 MaSound_Unload

SINT32 MaSound_Unload (SINT32 func_id, SINT32 file_id, void * ext_args) ;

Description

    Performs unload processing of RealtimeMIDI data.

    Releases tone generation resources that are secured for RealtimeMIDI reproduction.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
ext_args	Extension argument specific to each MA-3 Stream Converter. NULL is set.

Returned value

0	Successful
Negative	Error code.
	MASMW_ERROR (-1)

2.1.5 MaSound_Open

SINT32 MaSound_Open (SINT32 func_id, SINT32 file_id, UINT16 open_mode, void * ext_args) ;

Description

Performs assignment of resources for reproduction of RealtimeMIDI data registered with Load.

Max. one RealtimeMIDI data can be opened at the same time.

RealtimeMIDI tone generation is possible in between Open-Close.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
open_mode	Future function extension argument. "0" is to be set.
ext_args	Extension argument specific to MA-3 Stream Converter. NULL is set.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.6 MaSound_Close

SINT32 MaSound_Close (SINT32 func_id, SINT32 file_id, void * ext_args) ;

Description

Frees resources that are assigned with Open processing.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
ext_args	Extended argument specific to each Stream Converter. NULL is set.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.7 MaSound_Control

SINT32 MaSound_Control (SINT32 func_id, SINT32 file_id, UINT8 ctrl_num, void *prm, void * ext_args) ;

Description

Selects functions relevant to reproduction and executes them. Valid in between Open and Close in principle.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed	
file_id	File id	
ctrl_num	Designates contents of processing. (Numbers that are not designated are not supported.)	
	0:	Sets reproduction volume.
	7:	Usually issues MIDI message.
	8:	Issues SysEx message.
	29:	Acquire ChVolume and MasterVolume.
	30:	Sets the period callback interval.
prm	Parameter needed for processing designated with ctrl_num.	
ext_args	Extension argument specific to each MA-3 Stream Converter. NULL is set.	

Returned value

Non-negative	Successful. When a value is returned, the value.
Negative	Error code
	MASMW_ERROR (-1)

2.1.7.1MaSound_Control (Setup of playback volume)

SINT32 MaSound_Control(SINT32 func_id, SINT32 file_id, UINT8 ctrl_num, void *prm, void * ext_args);

Description	
	Sets playback volume.
	Volume curve is volume [dB] =40 * Log10 (X/127) by setting value to X (0..127).
	Reproduces data as it is by 0dB.
Argument	
func_id	Function ID of MA-3 Stream Converter to be directed.
file_id	File id
ctrl_num	MASMW_SET_VOLUME (0)
prm	*((UINT8*)prm): Volume assignment (0 ~ 127)
	Default is 100.
ext_args	NULL is set.
Returned value	
Non-negative	Successful.
Negative	Error code.

2.1.7.2MaSound_Control (Usual MIDI message issue)

SINT32 MaSound_Control(SINT32 func_id, SINT32 file_id, UINT8 ctrl_num, void *prm, void * ext_args);

Description	
	Usual MIDI message is issued. Supports Running Status.
Argument	
func_id	Function ID of MA-3 Stream Converter to be directed.
file_id	File id
ctrl_num	MASMW_SEND_MIDIMSG (7)
prm	The pointer to MIDI message.
	Msg = ((UINT8*)prm)
	: Put the Standard MIDI message on LSB side by byte-aligned.
ext_args	NULL is set.
Returned value	
Non-negative	Successful.
Negative	Error code.

2.1.7.3MaSound_Control (SysEx message issue)

SINT32 MaSound_Control(SINT32 func_id, SINT32 file_id, UINT8 ctrl_num, void *prm, void * ext_args);

Description		
	Issues SysEx message.	
Argument		
	func_id	Function ID of MA-3 Stream Converter to be directed.
	file_id	File id
	ctrl_num	MASMW_SEND_SYSEXMIDIMSG (8)
	prm	The pointer to _MASMW_MIDIMSG structure.

```
typedef struct _MASMW_MIDIMSG
{
  UINT8*  msg; // The pointer to the message
  UINT32  size; //The byte count of the message
}
```

	ext_args	NULL is set.
Returned value		
	Non-negative	Successful.
	Negative	Error code.

2.1.7.4MaSound_Control (acquisition of volume setting value)

SINT32 MaSound_Control(SINT32 func_id, SINT32 file_id, UINT8 ctrl_num, void *prm, void * ext_args);

Description		
	Acquire the setting value of ChVolume and MasterVolume.	
	The value is guaranteed only after Stanby	
Argument		
	func_id	Function ID of MA-3 Stream Converter to be directed.
	file_id	File id
	ctrl_num	MASMW_GET_CONTROL_VAL (29)
	prm	Pointer for _MASMW_GETCTL structure.
		typedef struct _MASMW_GETCTL
		{
		UINT8 bControl; // Control designation
		UINT8 bCh; // Channel number
		}
		Control designation
		0 : MasterVolume
		1 : ChannelVolume
	ext_args	NULL is set.
Returned value		
	Non-negative	Successful.
	Negative	Error code.

2.1.7.5MaSound_Control(setting of period callback interval)

SINT32 MaSound_Control(SINT32 func_id, SINT32 file_id, UINT8 ctrl_num, void *prm, void * ext_args);

Description		
	Set the period callback function interval.	
	Initialize it to 0 after Load and expect to be set between Load and Open.	
	Issue the period callback between Start and Stop.	
	Here, the callback is returned as ID=17 to callback function designated in MaRmdCnv_Load().	
Argument		
	func_id	Function ID of MA-3 Stream Converter to be directed.
	file_id	File id
	ctrl_num	MASMW_SET_CB_INTERVAL (30)
	prm	*((UINT8*)prm): (0, 20) callback interval [ms]
		0 means "No period callback".
		The setting other than 20 is invalid.
	ext_args	NULL is set
Returned value		
	Non-negative	Successful.
	Negative	Error code.

2.1.8 MaSound_Standby

SINT32 MaSound_Standby (SINT32 func_id, SINT32 file_id, void * ext_args) ;

Description

Performs registration of necessary tones and setting of format initial value. Ignored.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
ext_args	Extension argument specific to each MA-3 Stream Converter. NULL is set.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.9 MaSound_Seek

SINT32 MaSound_Seek (SINT32 func_id, SINT32 file_id, UINT32 pos, UINT8 flag, void * ext_args) ;

Description

Designates reproduction starting position based on time. Ignored.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
pos	Reproduction starting position (ms)
flag	Unused (Set up "0".)
ext_args	Extension argument specific to each MA-3 Stream Converter. NULL is set when no extension argument is needed specifically.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.10MaSound_Start

SINT32 MaSound_Start(SINT32 func_id, SINT32 file_id, UINT16 play_mode, void * ext_args);

Description

Starts Callback when the periodic callback is designated.

The periodic callback is set with MaSound_Control (the setting of the periodic callback interval).

Argument

func_id	Function ID of MA-3 Stream Converter to be directed		
file_id	File id		
play_mode	Reproduction mode. May take a value show below.		
		0	Loop reproduction
		1 to 255	Reproduction count
		Other than above	Reserved
ext_args	Extension argument specific to each MA-3 Stream Converter. NULL is set.		

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.11MaSound_Stop

SINT32 MaSound_Stop(SINT32 func_id, SINT32 file_id, void * ext_args);

Description

The callback is stopped when the periodic callback is designated.

The periodic callback is set with MaSound_Control (the setting of the periodic callback interval).

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
ext_args	Extension argument of each MA-3 Stream Converter, NULL is set.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.12 MaSound_Pause

SINT32 MaSound_Pause (SINT32 func_id, SINT32 file_id, void * ext_args) ;

Description

        Performs pause of reproduction. Ignored.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
ext_args	Extension argument specific to each MA-3 Stream Converter. NULL is set.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)

2.1.13 MaSound_Restart

SINT32 MaSound_Restart (SINT32 func_id, SINT32 file_id, void * ext_args) ;

Description

        Performs releasing of pause. Ignored.

Argument

func_id	Function ID of MA-3 Stream Converter to be directed
file_id	File id
ext_args	Extension argument of each MA-3 Stream Converter, NULL is set.

Returned value

0	Successful
Negative	Error code
	MASMW_ERROR (-1)