

MA-3 Sound Middleware

SMAF Test Data

Ver.1.3.5
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Yamaha Corporation

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Revision

Ver.	Date	Description	
0.80	June 1, 2001	Initial edition	
0.90	June 18, 2001	SMAF/MA-3 test data were added.	
1.00	June 29, 2001	SMAF/MA-3 test data were changed.	
1.20	October 5, 2001	Heavy-load data 1,2 and sample data were added.	
1.2.2	November 29, 2001	Clerical errors were corrected.	
1.2.3	December 20, 2001	Clerical errors were corrected.	
1.3.0	January 30, 2002	Clerical errors were corrected. Error item / data for MA-3 were changed.	
1.3.1	February.27, 2002	.m3h data for MA-3 were added.	
1.3.2	March.27, 2002	Clerical errors were corrected. Illustration description of Heavy load data reconsideration.	
1.3.3	May.29, 2002	2op 40.mmf and 4op 24.mmf were added to all Note pronunciation data.	
1.3.4	June.26, 2002	6.1 6.7 6.16	The description of error data check was added. The acquirable content information from Option_mmf was added. The description of “Un-definition TAG” was reconsidered.
1.3.5	September 20, 2002	5.2 6.1	The key control test data for SMAF / MA-1 / 2 were added. The creation condition of .m3h was added.

1 Introduction

This document explains SMAF data for installation test of Sound Middleware for mobile audio LSI "MA-3" (hereafter called MA-3).

Note: Do not use this test data for purposes other than testing MA-3 Sound Middleware.

Note: When this test data is reproduced by development tool etc., pronunciation may differ.

2 Playing test

2.1 Various types of data

Includes various types of data for checking if reproduction can be performed accurately.

- Checks if reproduction of only Score Track can be made without problem.
- Checks if reproduction of only PCM Audio Track can be made without problem.
- Checks if simultaneous reproduction of Score Track and PCM Audio Track can be made without problem.
- Checks if FIFOs to be used causes problem.
- Checks if reproduction of data obtained only by using FM 2-OP can be made without problem.
- Checks if reproduction of data obtained only by using FM 4-OP can be made without problem.
- Checks if reproduction of data obtained by simultaneously using FM 2-OP and 4-OP can be made without problem.
- Checks if resource management can be made correctly for the system that also uses real time tone generation.

File name	Contents
■ Type0	
Type0_a4.mmf	ADPCM (4kHz) 2 types of waveform data
Type0_a8.mmf	ADPCM (8kHz) 2 types of waveform data
■ Type1	
Type1_2op.mmf	FM (2-OP) 4 channels
Type1_2op_a.mmf	FM (2-OP) 4 channels + ADPCM (4kHz) 1 type of waveform data
■ Type2	
Type2_2op.mmf	FM (2-OP) 8 channels
Type2_2op_a.mmf	FM (2-OP) 8 channels + ADPCM (4kHz) 1 type of waveform data
Type2_4op.mmf	FM (4-OP) 4 channels
Type2_4op_a.mmf	FM (4-OP) 4 channels + ADPCM (4kHz) 1 type of waveform data
■ Type3	
Type3_2op.mmf	FM (2-OP) 12 channels
Type3_2op_a.mmf	FM (2-OP) 12 channels + ADPCM (4kHz) 1 type of waveform data
Type3_2op4op.mmf	FM (2-OP) 4 channels + FM (4-OP) 4 channels
Type3_2op4op_a.mmf	FM (2-OP) 4 channels + FM (4-OP) 4 channels + ADPCM (4 kHz) 1 type of waveform data
■ Type4	
Type4_2op.mmf	FM (2-OP) 16 channels
Type4_2op_a.mmf	FM (2-OP) 16 channels + ADPCM (4 kHz) 1 type of waveform data
Type4_4op.mmf	FM (4-OP) 8 channels
Type4_4op_a.mmf	FM (4-OP) 8 channels + ADPCM (4 kHz) 1 type of waveform data
Type4_2op4op.mmf	FM (2-OP) 8 channels + FM (4-OP) 4 channels
Type4_2op4op_a.mmf	FM (2-OP) 8 channels + FM (4-OP) 4 channels + ADPCM (4 kHz) 1 type of waveform data
■ Option : No M2 designation	
Type_none.mmf	FM (2-OP) 16 channels (The same music data as Type4_2op.mmf)

Note: Since the simultaneous playback with SMAF/MA-1/2/3 and other formats is not supported in MA-3 SMW, the information specified by M2 is disregarded.

2.2 Data common to MA-1 and MA-2

The data includes data for MA-1 and the one for MA-2.

Score Track #0 contains data for MA-1, and Score Tracks #1 through #4 and PCM Audio Track #0 contain data for MA-2.

Checks that data for MA-2 can be reproduced.

File name	Contents
Ma-1+2.mmf	Data Ma1_Nop1_ok.mmf for MA-1 Data Type4_2op_a.mmf for MA-2

2.3 Score Track Chunk test

2.3.1 TimeBase

This is a test for checking if TimeBase has been set correctly.

The values of TimeBase_D and TimeBase_G are common.

All of the following data are the same music that use FM (2-OP) 16 channels. However, for Tb_50ms.mmf, the tone generation is different from others a little. Moreover, the data of TimeBase 1msec and 2msec are processed as error.

File name	Contents
Tb_01ms.mmf	Timebase : 1msec (Error data: TimeBase anomaly)
Tb_02ms.mmf	Timebase : 2msec (Error data: TimeBase anomaly)
Tb_04ms.mmf	Timebase : 4msec
Tb_05ms.mmf	Timebase : 5msec
Tb_10ms.mmf	Timebase : 10msec
Tb_20ms.mmf	Timebase : 20msec
Tb_40ms.mmf	Timebase : 40msec
Tb_50ms.mmf	Timebase : 50msec

2.3.2 Start / Stop Point

This is a test for checking if the middleware complies correctly with Start / Stop Point;

- If correct range can be played.
- If correct range can be played at loop reproduction.
- If the middleware complies with various parameter settings before the Start Point.

All of the following data are the same music that uses FM (2-OP) 16 channels.

St0_Spe.mmf and StSp_None.mmf include silent period of a little less than 2 seconds from the reproduction starting moment to tone generation moment.

File name	Contents
St0_Spe.mmf	Start Point: Head of Sequence Data, Stop Point: End of Sequence Data
Stc_Spe.mmf	Start Point: After setting of various parameters, Stop Point: End of Sequence Data
StSp_none.mf	Start / Stop Point is not designated. (Playing range is from the head to end of Sequence data)

2.4 PCM Audio Track Chunk test

2.4.1 Wave Type

This is a test for checking if waveform data can be reproduced correctly;

- If reproduction of 4 kHz ADPCM data causes problem.
- If reproduction of 8 kHz ADPCM data causes problem.
- If reproduction when the waveform data length is shorter than GateTime causes problem.
- If reproduction when the waveform data length is longer than GateTime causes problem.

For the data of Fq_Xk_s.mmf, voices of various animals are reproduced to the end. For the data of Fq_Xk_l.mmf, GateTime ends in the middle of the data resulting in ending the reproduction in the middle of the data.

File name	Contents
Fq_4k_s.mmf	Waveform data shorter than GateTime, 3 types of 4 kHz waveform data
Fq_4k_l.mmf	Waveform data longer than GateTime, 3 types of 4 kHz waveform data
Fq_8k_s.mmf	Waveform data shorter than GateTime, 2 types of 8 kHz waveform data
Fq_8k_l.mmf	Waveform data longer than GateTime, 2 types of 8 kHz waveform data

2.4.2 TimeBase

This is a test for checking if TimeBase has been set correctly.

The values of TimeBase_D and TimeBase_G are common.

All of the following data are the same music that use 3 types of 4 kHz waveform data. Moreover, the data of TimeBase 1msec and 2msec are processed as error.

File name	Contents
Tb_01ms_a.mmf	Timebase : 1 msec (Error data: TimeBase anomaly)
Tb_02ms_a.mmf	Timebase : 2 msec (Error data: TimeBase anomaly)
Tb_04ms_a.mmf	Timebase : 4 msec
Tb_05ms_a.mmf	Timebase : 5 msec
Tb_10ms_a.mmf	Timebase : 10 msec
Tb_20ms_a.mmf	Timebase : 20 msec
Tb_40ms_a.mmf	Timebase : 40 msec
Tb_50ms_a.mmf	Timebase : 50 msec

2.4.3 Wave registration / Playback

These are data for the check of whether to be registered/played correctly. Effective wave numbers are 1-62. If data is other than them, correct operation is that Registration/playback is not done.

File name	Contents
Wave_1_3e_3f.mmf	Performs registration/pronunciation of wave number #1, #62, #63. (#63 is not registered/played)
Wave_full.mmf	Performs registration/pronunciation of wave number #1 – 62. (More than #33 is not registered/played.)(*1)
Wave_1_32.mmf	Performs registration/pronunciation of wave number #1 – 32.
Wave_31_62.mmf	Performs registration/pronunciation of wave number #31 – 62.

Note(*1) Since the number of the wave maximum registration is restricted to 32, more than 33 is not performed registration pronunciation.

2.4.4 Start / Stop Point

This is a test for checking if the middleware complies correctly with Start / Stop Point;

- If correct range can be played.
- If correct range can be played at loop reproduction.
- If the middleware complies with various parameter settings before the Start Point.

All of the following data are the same music that uses 3 types of 4 kHz waveform data.

St0_Spe_a.mmf and StSp_None_a.mmf include silent period of approximately 2.5 seconds from the reproduction starting moment to tone generation moment.

File name	Contents
St0_Spe_a.mmf	Start Point: Head of Sequence Data, Stop Point: End of Sequence Data
Stc_Spe_a.mmf	Start Point: After setting of various parameters, Stop Point: End of Sequence Data
StSp_none_a.mf	Start / Stop Point is not designated. (Playing range is from the head to end of Sequence data)

2.5 Loop test

2.5.1 Change of various parameters

This is a test for checking if the middleware can comply with the change of parameters in the music.

- If the parameters that are changed in the music has returned to their initial values when the play returns to the head of music at loop reproduction.
- When a reproduction is stopped in the middle, checking if the data can be reproduced in the next reproduction.

Music data is reproduced as follows. The data uses FM (2-OP) channel.

1. Tones are generated one by one for all channels from channel 0 sequentially.
2. After the tone of 16th channel is generated, each parameter is changed for all channels.
3. Tones are generated one by one for all channels from channel 0 sequentially.

File name	Contents
Lp_Prgm.mmf	Program Change event is present in the music.
Lp_Oct.mmf	Octave Shift event is present in the music.
Lp_Mod.mmf	Modulation event is present in the music.
Lp_Pitch.mmf	Pitch Bend event is present in the music.
Lp_Vol.mmf	Volume event is present in the music.
Lp_Pan.mmf	Pan event is present in the music.
Lp_Exp.mmf	Expression event is present in the music.
Lp_Ch.mmf	Channel assignment change event is present in the music (tone change).

2.5.2 Loop delay

This is a test for checking continuation of music from the end to the head in loop reproduction.

File name	Contents
Lp_inter1.mmf	One 5 second Note in FM (2-OP) 1 channel between Start Point and Stop Point
Lp_inter2.mmf	Data including continuation of 32 nd notes for 5 seconds in FM (2-OP) 1 channel
Lp_inter3.mmf	One 5 second Note in FM (2-OP) 16 channel between Start Point and Stop Point
Lp_inter4.mmf	Data including continuation of 32 nd notes for 5 seconds in each of FM (2-OP) 16 channels
Lp_timing.mmf	Data of which tone is generated once in FM (2-OP) 16 channels simultaneously.

2.6 Data for MA-1

2.6.1 Volume adjustment

This is a test for checking if the middleware complies with difference of maximum gain in MA-1 and MA-2.

File name	Contents
Ma1_Volume.mmf	Checking if the output can be reproduced correctly without being clipped.

2.6.2 Play ending test

For the data for MA-1, there is a case that NOP event is not present at the end of play before End Of Sequence of sequence data.

File name	Contents
Ma1_Nop1.mmf	Data that uses only one channel. Tones are generated 16 times while changing the musical scale.
Ma1_Nop2.mmf	Data that uses 4 channels. Channel 1 that is subject to NoteOn initially is subject to NoteOff finally.

Data into which NOP event is inserted correctly.

File name	Contents
Ma1_Nop1_ok.mmf	Correct data of Ma1_Nop1.mmf
Ma1_Nop2_ok.mmf	Correct data of Ma1_Nop2.mmf

2.6.3 Tone change test

This is a test for checking if the middleware is capable of dealing with compatibility of tone parameters for MA-1.

Check is made to see if the release damps correctly.

File name	Contents
Ma1_Voice.mmf	If the action for the compatibility is not made, the tones sustain without being deadened.

2.6.4 Loop test

This is a test for checking if the middleware can comply with the change of parameters in the music.

- If the parameters that are changed in the music has returned to their initial values when the play returns to the head of music at loop reproduction.
- When a reproduction is stopped in the middle, checking if the data can be reproduced in the next reproduction.

File name	Contents
Ma1_Lp_Oct.mmf	Octave Shift event is present in the music.
Ma1_Lp_Mod.mmf	Modulation event is present in the music.

3 Error check

This is an SMAF file that contains erroneous data. It is regarded as irregular SMAF file, and thus, it is not reproduced. Check is made to see if error processing is performed. Note that set values do not always cover every error condition.

3.1 SMAF file test

File name	Contents
Er_Empty.mmf	No contents
Er_FileID.mmf	File ID is not MMMD but MMMM.
Er_Crc.mmf	CRC is not correct.
Er_Cnti_none.mmf	No Contents Info Chunk
Er_Sound_none.mmf	Contents Info Chunk only

3.2 3.2 Contents Info Chunk test

File name	Contents
Er_Cclass_5.mmf	Contents Class of Contents Info Chunk is 0x05.
Er_Ctype_60.mmf	Contents Type of Contents Info Chunk is 0x60 (Reserved).

3.3 Score Track Chunk test

File name	Contents
■ Format Type	
Er_Format_1.mmf	Format Type is 0x01 (Reserved).
■ TimeBase	
Er_TimeBase_4.mmf	TimeBase_D is 0x04 (Reserved), and TimeBase_G is 0x05 (Reserved).
Er_TimeBase_neq.mmf	TimeBase_D is 0x02 (4ms) and TimeBase_G is 0x03 (5ms).
■ Start / Stop Point	
Er_StartP.mmf	Start Point is out of range of Sequence Data.
Er_StopP.mmf	Start Point is out of range of Sequence Data.
Er_StSp.mmf	Start Point is after Stop Point.
■ Tone parameters	
Er_Voice_none_1.mmf	Data for MA-1 that does not include tone parameters
Er_Vocie_none_2.mmf	Data for MA-2 that does not include tone parameters
■ Sequence data	
Er_Seq_none.mmf	Sequence Data Chunk of Score Track #1 is not present.

3.4 PCM Audio Track Chunk test

File name	Contents
■ Format Type	
Er_Format_1.mmf	Format Type is 0x01 (Reserved).
■ Wave Type	
Er_Wave_stereo_a.mmf	Channel is 0x01 (Stereo).
Er_Wave_pcm_a.mmf	Format is 0x0 (Signed PCM).
Er_Wave_fs11_a.mmf	Sampling Freq. is 0x2 (11 kHz).
Er_Wave_bit8_a.mmf	Base Bit is 0x1 (8 bit).
■ TimeBase	
Er_TimeBase_4.mmf	TimeBase_D is 0x04 (Reserved) and TimeBase_G is 0x05 (Reserved).
Er_TimeBase_neq.mmf	TimeBase_D is 0x02 (4 ms) and TimeBase_G is 0x03 (5 ms).
■ Start / Stop Point	
Er_StartP.mmf	Start Point is out of range of Sequence Data.
Er_StopP.mmf	Start Point is out of range of Sequence Data.
Er_StSp.mmf	Start Point is after Stop.
■ Sequence data	
Er_Seq_none.mmf	Sequence Data Chunk of PCM Audio Track #0 is not present.

4 Functional tests

These are test of LED on/off control and vibrator control.

All of the following data provide the same tone generation. The data uses FM (2-OP) 16 channels, and tones are generated one by one for all channels from channel 0 sequentially.

Check is made to see if the operations conform to each channel setting.

File name	Contents
■ No LED and vibrator	
LedVib_none.mmf	No option data for LED Vibration Status of Channel Status of all channels is OFF.
■ Data with LED information	
Led_0.mmf to Led_12.mmf	Synchronizes with channels with number of File name.
Led_0-3.mmf	Synchronizes with 4 channels, 0 to 3.
Led_4-7.mmf	Synchronizes with 4 channels, 4 to 7.
Led_8-11.mmf	Synchronizes with 4 channels, 8 to 11..
■ Data with vibrator information	
Vib_0.mmf to Vib_11.mmf	Synchronizes with channels with number of File name.
Vib_0-3.mmf	Synchronizes with 4 channels, 0 to 3.
Vib_4-7.mmf	Synchronizes with 4 channels, 4 to 7.
Vib_8-11.mmf	Synchronizes with 4 channels, 8 to 11..

5 Others

5.1 Data including many events before Start Point

These are data that include many events superfluously before Start Point. No Note Message exists before Start Point.

Check is made to see if reproduction is performed smoothly without delay.

All of the following data are the same music, and uses FM (2-OP) 5 channels with ADPCM.

File name	Contents
PreStartP.mmf	Many unnecessary events are present before Start Point of Score Track #2 and PCM Audio Track #0.
PreStartP_fm.mmf	Many unnecessary events are present before Start Point of Score Track #2.
PreStartP_ad.mmf	Many unnecessary events are present before Start Point of PCM Audio Track #0.

5.2 Key control test data

These are data that include many events superfluously before Start Point. No Note Message exists before Start Point.

Check is made to see if reproduction is performed smoothly without delay.

All of the following data are the same music, and uses FM (2-OP) 5 channels with ADPCM.

They are the data used for the test of key control. There are ten data each for SMAF/MA-1 and SMAF/MA-2.

Please play each data with key control operating, and check the effect as specification.

File name	Contents
0.1.mmf ~ 10.mmf	SMAF/MA-1 data. Since KCS is turned '0: off', key control is not effective by standard setup. Please confirm that key control is effective by customized SMW. * Since there are also data which used drum sound, when pronunciation key is changed greatly, pronunciation may change extremely.
11.mmf ~ 20.mmf	SMAF/MA-2 data. The Pitch Bend message is contained into sequence. Please confirm that it is reproduced without melody line collapsing, even if playback key changes.

6 SMAF / MA-3 Functional tests

6.1 Data list

This chapter describes the data and its test item for testing whether the event of SMAF/MA-3 etc. is interpreted / performed correctly. The .m3h (MA-3 Hardware file Format) data was added to Reproduction Check Data except for the part (heavy load system). Please use it in case it is checked whether the interpretation of data is performed correctly etc.

However, please play according to the following playback environment in that case, and create .m3h.

Playback environment at .m3h creation

Condition item	Playback conditions
LED/Motor synchronous setup	Sequence synchronization (no blink control)
_Control(Set_Volume)	Initial value
Playback times	1 time

Please perform the examination of error-checking system by checking whether an error code comes correctly. The correspondence of error contents and error code (return value of Load) is as following.

The correspondence of error contents and error code

Error contents	Error code
Anomaly File	-16
Anomaly Chunk Size	-19
Anomaly Track Chunk	-20
Anomaly Reproduction time	-22

6.1.1 Playback check

These are data various type for reproducible check.

Folder name	Contents	
	Scheme item	Note
Ma3_Control	Control channel message	Each control operation check
Ma3_Notes	All Note pronunciation	Pronunciation check of 4OP and 2OP
Ma3_Wave	WT, Stream Audio simultaneous pronunciation	WT maximum simultaneous pronunciation check
Ma3_Voice	Voice	Voice registration / playback check
Ma3_Stream	Stream audio	Various stream pronunciation / control checks
Ma3_Other	Others	The check of contents information others
The number of simultaneous pronunciation	Heavy-load data 1	The repeat of Note ON/OFF every 4msec.
Sampling frequency	Heavy-load data 2	Stream pronunciation which changed the sampling frequency
songs	Sample data	Demonstration music

Note) Ma3_Control ~ Ma3_Other is stored in a play folder, and the number of simultaneous pronunciation, pronunciation interval, and pronunciation time and sampling frequency are stored in the load_test folder.

Note) The .m3h data is stored by the same name as .mmf corresponding to each folder.

6.1.2 Error-checking

These are error data various type. Please check that there are play OK / NG, and unusual playback by error.

Folder name	Contents	
	Scheme item	Note
Ma3_CRC	CRC	CRC-check
Ma3_Chunk_ID	Unusual Chunk ID	Skip check
Ma3_Chunk_Size	Unusual Chunk Size	Operation check (Processing changes with Chunks.)
Ma3_Multi_Chunk	Chunk duplication	Operation check (Processing changes with Chunks.)
Ma3_Event	Non-registered event	Operation changes with event positions.
Ma3_Option_Info	Unusual Option information	Operation changes with unusual states.
Ma3_Phrase	Unusual Phrase information	Operation changes with unusual states.

Note) The above-mentioned folders are stored in the error folder.

6.2 Control change message check

These are the data for checking whether it is responded to the parameter change in Score Track surely.

In Score Track, the use voice changes in the following sequence.

Playback sequence	Channel number	Use voice
1	0	Normal voice FM 4OP
2	1	Normal voice FM 2OP
3	2	Normal voice WT(DLS)
4	3	Normal voice FM extension basic wave type
5	4	Drum voice FM 4OP
6	9	Stream PCM

File name (.mmf)	Contents
Expression	For the check of Expression. Makes change to 50/70/100/127 in order and issues it. Since Expression is ineffective to Stream PCM, it does not change.
All_Soundoff_1	For the check of all sound off. No Hold.
All_Soundoff_2	For the check of all sound off. With Hold
All_Noteoff_1	For the check of all note off. No Hold
All_Noteoff_2	For the check of all note off. With Hold
Volume	For the check of Channel Volume. Makes change to 50/70/100/127 in order and issues it. Since Expression is ineffective to Channel Volume, it does not change.
Pan	For the check of Pan. Makes change to 64/0/127/64 in order and issues it.
Pitch	For the check of Pitch bend. Changes 1 sound up and down, and issues it.
Sensitivity	For the check of Pitch bend sensitivity. Makes change to 0/1/12/24 in order and issues it.
Hold	For the check of Hold. Makes change to 0/64 in order and issues it.
Poly	For the check of Poly mode.
Modulation	For the check of Modulation. Makes change to 0/127 in order and issues it.
Mono	For the check of Mono mode.
Reset	For the check of Reset all controller.

6.3 All Note pronunciation

These are the data for checking whether it is pronounced correctly up to the maximum number of the pronunciation.

File name (.mmf)	Contents
4OP_16.mmf	Pronunciation check of 4OP 16 sound mode (Refer to the following table about pronunciation.)
2OP_32.mmf	Pronunciation check of 2OP 32 sound mode (Refer to the following table about pronunciation.)
4op-24.mmf	The 24 sound (FM 16 sound, WT 8 sound) maximum in 4op mode is outputted simultaneously.
2op-40.mmf	The 40 sound (FM 32 sound, WT 8 sound) maximum in 2op mode is outputted simultaneously.

- 4OP 16 (In Score Track, the use voice changes in the following sequence.)

Playback sequence	Channel number	Use voice
1	0	Normal voice FM 4OP 16 sound
2	2	Normal voice WT (DLS)
3	3	Normal voice FM extended basic wave type
4	4	Drum voice FM 4OP

- 2OP 32 (In Score Track, the use voice changes in the following sequence.)

Playback sequence	Channel number	Use voice
1	1	Normal voice FM 2OP 32 sound
2	2	Drum voice WT (DLS)
3	3	Normal voice FM extended basic wave type 32 sound
4	4	Drum voice FM 2OP 32 sound

- 4OP 24 (In Score Track, the use voice changes in the following sequence.)

Playback sequence	Channel number	Use voice
1	0	Normal tone FM 4OP is added 1 sound at a time every 0.5 seconds.
2	1	Normal tone WT is added 1 sound at a time every 0.5 seconds.

- 2OP 40 (In Score Track, the use voice changes in the following sequence.)

Playback sequence	Channel number	Use voice
1	0	Normal tone FM 2OP is added 1 sounds at a time every 0.5 seconds.
2	1	Normal tone WT is added 1 sounds at a time every 0.5 seconds.

6.4 WT, Stream Audio simultaneous pronunciation

These are the data for checking whether it is pronounced correctly up to the maximum number of the Wave voice pronunciation.

File name (.mmf)	Contents
WT7_Stream1.mmf	WT voice 7 sound, Stream PCM 1 sound
WT6_Stream2.mmf	WT voice 6 sound, Stream PCM 2 sound

6.5 Voice

These are the data for checking whether all the registered voices are pronounced correctly.

File name (.mmf)	Contents
4op_NormalRam.mmf	4OP Normal (RAM) all voice pronunciation
2op_NormalRam.mmf	2OP Normal (RAM) all voice pronunciation
2op_NoramlRom.mmf	2OP Normal (ROM) all voice pronunciation
4op_DrumRam.mmf	4OP Drum (RAM) all voice pronunciation
2op_DrumRam.mmf	2OP Drum (RAM) all voice pronunciation
2op_DrumRom.mmf	2OP Drum (ROM) all voice pronunciation

6.6 Stream Audio

These are the data for pronunciation check of Stream Audio.

File name (.mmf)	Contents
8bit_Stream_1	8-bit waveform play (1 kind)
8bit_Stream_2	8bit waveform play (2 kinds)
8bit_Stream_3	8bit waveform play (2 kinds, with simultaneous pronunciation)
4bit_Stream_1	4bit waveform play (1 kind)
4bit_Stream_2	4bit waveform play (2 kinds)
4bit_Stream_3	4bit waveform play (2 kinds, with simultaneous pronunciation)
St_Control_1	Control to Stream pronunciation, Short / Long Gate Time (8bit)
St_Control_2	Control to Stream pronunciation, Short / Long Gate Time (4bit)
Set_Stream_1	Registration/playback of Stream Size 2000Byte and 1984Byte.
Set_Stream_2	Registration/playback of Stream Size 1000Byte and 992Byte.
Set_Stream_3	Registration/playback of Stream Size 992Byte and 800Byte.

6.7 Others

These are the data for checking whether Option information etc. can be acquired correctly.

File name (.mmf)	Contents
8KByte_Ram	For the check of RAM write-in maximum capacity.
Option	For the check of contents information acquisition. (*1)
Phrase	For the check of Phrase List information acquisition. (*2)
LED_Motor	For the check of LED Motor ON/OFF information acquisition/operation.

Note(*1) The acquirable Contents information is as the following table 1.

Note(*2) The acquirable PhraseList information is as the following table 2.

Table 1 The acquirable contents information from Option.mmf

Information TAG	Information Contents
C0	0x00 (Binary data)
C1	0x32 (Binary data)
C2	0x05 (Binary data)
C3	0x00 (Binary data)
ST	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 S o n g T i t l e
SW	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 C o m p o s e d b y
WW	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 W o r d s b y
AW	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 A r r e n g e d b y (with linefeed code)
AN	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 A r t i s t ' s n a m e
VN	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 V e n d e r ' s n a m e (with linefeed code)
CN	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 C a r r i e r ' s n a m e
CA	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 C a t e g o r y n a m e
CR	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 C o p y r i g h t (C)
GR	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 C o p y r i g h t m a n a g e d b y
MI	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 M a n a g e m e n t I n f o r m a t i o n
CD	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 D a t e C r e a t e d
UD	Y A M A H A y a m a h a や ま は ヤ マ ハ 1 2 3 D a t e R e v i s e d

Table 2 The Phrase List information from Phrase.mmf

Phrase	Start time (msec)	End time (msec)
Music whole	0	141032
Introduction	4780	16732
A melody	16732	26292
B melody	26292	35856
Sabi	35856	50196
Interlude	50196	59760
Refrain	59760	69320
Ending	69320	141032

6.8 Heavy-load data 1

These data take high processing loads. Compressed file and non-compressing file were prepared.

Though natural, the processing load of compressed file becomes higher, and the processing load of the file which has many numbers of simultaneous pronunciation becomes higher.

The play time of all data has unified into 3268 msec. If the play time exceeds this, the shortage of power of CPU etc. can be considered. In this case, the abnormalities in pronunciation may be started.

Folder name	Contents
compress	The folder which stored the compressed file
no_compress	The folder which stored the non-compressing file

Note) The file stored in each folder plays simultaneous pronunciation every 8msec (Gate Time is 4msec) according to the file name.

Note) The pa time points out real time until there is a Call Back from the performance is directed. The correct reproduction time may not be acquisition in _Control(Get-Position).

Note) In unusual pronunciation, volume may become extremely large. Be careful.

6.9 Heavy-load data 2

These data take high processing loads. The file in the folder plays two Stream pronunciation of Sample Rate simultaneously according to the file name.

Though natural, the processing load of high Sample Rate file becomes higher,

However, "25000Hz.mmF" is not pronounced in order that sample frequency may not fulfill Stream registration conditions.

(It does not become an error.)

6.10 Sample data

These are sample music written by the format of MA-3. Please check whether these music is reproduced correctly.

File name (.mmf)	Contents
Acou1.mmf	Playback time: 81948[msec]
Acou2.mmf	Playback time: 41228[msec]
Athome2.mmf	Playback time: 28136[msec]
BBounce_str.mmf	Playback time: 65960[msec]
BlueGras.mmf	Playback time: 65080[msec]
Cafe.mmf	Playback time: 26684[msec]
Cognitos.mmf	Playback time: 92256[msec]
Coolies.mmf	Playback time: 110352[msec]
Downhome.mmf	Playback time: 32100[msec]
EisarV.mmf	Playback time: 4344[msec]
electric.mmf	Playback time: 35160[msec]
Evenings.mmf	Playback time: 97340[msec]
Funct_U.mmf	Playback time: 107132[msec]
Jazz2.mmf	Playback time: 85500[msec]
Jazz35s.mmf	Playback time: 26480[msec]
Jingle01.mmf	Playback time: 70356[msec]
Msc31_Dixie.mmf	Playback time: 64272[msec]
Msc33_Carousel.mmf	Playback time: 53324[msec]
Poly_rap03.mmf	Playback time: 19492[msec]
Pop31.mmf	Playback time: 114928[msec]
Rck36.mmf	Playback time: 11692[msec]
Rondo.mmf	Playback time: 160912[msec]
Sleaze.mmf	Playback time: 73952[msec]
Sp33_Network.mmf	Playback time: 46912[msec]
Spring.mmf	Playback time: 35364[msec]
Stupidiss.mmf	Playback time: 59940[msec]
Techno.mmf	Playback time: 65080[msec]
TV_Theme.mmf	Playback time: 190708[msec]
Twilights.mmf	Playback time: 86972[msec]
Wst31.mmf	Playback time: 98400[msec]

6.11 CRC

CRC is the indispensable data for judging the consistency of data. Therefore, if this is outlying observation or missing, the File will be considered that it cannot judge correctly and will stop processing after it.

File name (.mmf)	Contents	Error contents
CRC00	Successful data	Successful
CRC01	CRC missing	Anomaly file
CRC02	CRC outlying observation	Anomaly file

6.12 Unusual Chunk ID

At the Chunk searching, assumes that Chunk will be defined in the future, Chunk of the present undefined is skipped and it does not become error. However, by this processing, if Chunk required for playback is skipped, it will judge that playback is impossible and will process as an error. Even if it does not become an error, when voice information etc. is skipped, it is possible to happen the abnormalities in pronunciation. (Even if Option information is not registered usually, it is not to consider as an error.)

File name (.mmf)	Contents	Error contents
chunk00	Successful data	Successful
chunk01	Anomaly ATR (Anomaly Sub Chunk ID in ATR)	Successful
chunk02	Anomaly GTR (Anomaly Sub Chunk ID in GTR)	Successful
chunk03	Anomaly MSTR (Anomaly MSTR Chunk ID)	Successful
chunk04	Anomaly OPDA (Anomaly OPDA Chunk ID)	Successful (*1)
chunk05	Anomaly OPDA (Anomaly Dch Chunk ID)	Successful (*1)
chunk06	Anomaly MTR (Anomaly MTR number)	Anomaly Music playback time
chunk07	Anomaly MTR (Anomaly MTR Chunk ID)	Anomaly Music playback time
chunk08	Anomaly MTR (Anomaly MspI Chunk ID)	Successful (*1) (*2)
chunk09	Anomaly MTR (Anomaly Mtsu Chunk ID)	Successful (*3)
chunk10	Anomaly MTR (Anomaly Mtsq Chunk ID)	Anomaly Music playback time
chunk11	Anomaly MTR (Anomaly Mtsp Chunk ID)	Successful (*3)
chunk12	Anomaly MTR (Anomaly Mwa Chunk ID)	Successful (*3)

Note (*1) Since Option information is not registered correctly, there is a control event which cannot be performed correctly.

Note (*2) Since playback section information (playback start / closure position) cannot acquire correctly, playback time may change.

Note (*3) Since a part of the voice to reproduce is not registered, the abnormality in playback may happen.

6.13 Unusual Chunk Size

When this Chunk size data is an unjust value, it becomes impossible to read Chunk correctly after this, since Chunk Size is used for the skip etc. of the Chunk. Therefore, it becomes absolutely condition that the value of data and actual Chunk Size should be same. After fulfilling this condition, the processing according to the significance of the Chunk is performed, when the data is smaller than the indispensable information size of each Chunk or excessive information is contained

File name(.mmf)	Contents	Error contents
size00	Successful data	Successful
size01	Anomaly MMMD Size (Over the file size)	Anomaly file
size02	Anomaly MMMD Size (Under the minimum size)	Anomaly file (argument)
size03	Anomaly CNTI Size (Under the minimum size)	Anomaly file
size04	Anomaly CNTI Size (Over the MMMD size)	Anomaly file
size05	Anomaly CNTI Size (Unnecessarily long)	Successful
size06	Anomaly OPDA Size (Under the minimum size)	Successful (*1)
size07	Anomaly OPDA Size (Over the MMMD size)	Anomaly Chunk Size
size08	Anomaly Dch Size (Short)	Successful (*1)
size09	Anomaly Dch Size (Over OPDA size)	Successful (*1)
size10	Anomaly MTR Size (Under the minimum size)	Anomaly Track Chunk
size11	Anomaly MTR Size (Over the MMMD size)	Anomaly Chunk Size
size12	Anomaly MspI Size (Under the minimum size)	Successful (*1) (*2)
size13	Anomaly MspI Size (Over the MTR size)	Anomaly Track Chunk
size14	Anomaly Mtsu Size (Under the minimum size)	Successful (*3)
size15	Anomaly Mtsu Size (Over the MTR size)	Anomaly Track Chunk
size16	Anomaly Mtsq Size (Under the minimum size)	Anomaly Track Chunk
size17	Anomaly Mtsq Size (Over the MTR size)	Anomaly Track Chunk
size18	Anomaly Mtsp Size (Under the minimum size)	Successful (*3)
size19	Anomaly Mtsp Size (Over the MTR size)	Anomaly Track Chunk
size20	Anomaly Mwa Size (Under the minimum size)	Successful (*3)
size21	Anomaly Mwa Size (Over the Mtsp size)	Successful (*3)
size22	Anomaly ATR Size (Under the minimum size)	Successful
size23	Anomaly ATR Size (Over the MMMD size)	Anomaly Chunk Size
size24	Anomaly GTR Size (Under the minimum size)	Successful
size25	Anomaly GTR Size (Over the MMMD size)	Anomaly Chunk Size

Note (*1) Since Option information is not registered correctly, there is a control event which cannot be performed correctly.

Note (*2) Since playback section information (playback start / closure position) cannot acquire correctly, playback time may change.

Note (*3) Since a part of the voice to reproduce is not registered, the abnormality in playback may happen.

6.14 Chunk duplication

When Chunk with the same Chunk ID exists, the latest Chunk is adopted. Basically, it does not become Error.

Exceptions are only File Chunk (adopts first-arrival), Contents Info Chunk (in duplication, becomes error), Optional Data Chunk (adopts Chunk just after CNTI), and Wave Data Chunk (first-arrival preference (*1)).

However, since the adoption is determined by the latest adoption, be careful that it is processed as an error when the latter Chunk is abnormalities even when the former Chunk is successful.

File name (.mmf)	Contents	Error contents
multi00	Successful data	Successful
multi01	MMMD duplication (Successful former, unusual latter)	Successful
multi02	MMMD duplication (Unusual former, successful latter)	Anomaly file
multi03	CNTI duplication (Both are successful)	Anomaly file
multi04	OPDA duplication	Successful
multi05	MTR duplication (Unusual former, successful latter)	Successful
multi06	MTR duplication (Successful former, unusual latter)	Anomaly Track Chunk
multi07	MspI duplication (Unusual former, successful latter)	Successful
multi08	MspI duplication (Successful former, unusual latter)	Successful (*2)
multi09	Mtsu duplication (Unusual former, successful latter)	Successful
multi10	Mtsu duplication (Successful former, unusual latter)	Successful (*3)
multi11	Mtsq duplication (Unusual former, successful latter)	Successful
multi12	Mtsq duplication (Successful former, unusual latter)	Anomaly Track Chunk
multi13	Mtsp duplication (Unusual former, successful latter)	Successful
multi14	Mtsp duplication (Successful former, unusual latter)	Successful (*3)
multi15	Mwa duplication (Unusual former, successful latter)(*1)	Successful
multi16	Mwa duplication (Successful former, unusual latter)	Successful

Note (*1) When there are abnormalities of such as Format Type and playback time, Chunk is skipped and treated as a thing which was not.

Note (*2) Since playback section information (playback start / closure position) cannot acquire correctly, playback time may change.

Note (*3) Since a part of the voice to reproduce is not registered, the abnormality in playback may happen.

6.15 Non-registered Event

When the non-registered Event which cannot specify the length of message is detected, processes as an error. However, about the event of 0xAn and 0xDn, since the size of a message is specified, skips and does not become an error.

Similarly, the non-registered Exclusive message which size is registered correctly is also skipped.

File name (.mmf)	Contents	Error contents
event00	Successful data	Successful
event01	Event 0xAn (Data byte : 2Byte)	Successful
event02	Event 0xDn (Data byte : 1Byte)	Successful
event03	Non-registered Exclusive(Data size is successful., up to 0xF7)(*1)	Successful
event04	Non-registered Exclusive (Data size is unusual)(*1)	Anomaly Track Chunk
event05	Playback time '16msec'(*2)	Anomaly Music playback time

Note (*1) Exclusive message should be ended by 0xF7. (When ended by except for 0xF7, error.)

Note (*2) When playback time is 20 or less msec, processes as an error.

6.16 Unusual Option information

Even if unusual data are stored in Option information, only the exception handling which cannot take the needed data the worst is performed. Therefore, even if unusual TAG (abnormalities in Size) exists, only the information after it cannot be acquired correctly but it does not become an error.

File name (.mmf)	Contents	Error contents
info00	Successful data	Successful
info01	No OPDA (*1)	Successful
info02	Empty OPDA	Successful
info03	Dch with undefined TAG (*2)	Successful
info04	Dch with size unusual TAG (*3)	Successful

Note (*1) Since OPDA is Option information, even if it does not exist, there is no problem. However, Option information cannot be acquired.

Note (*2) The undefined TAG "FN" is including as Contents information. Information is acquirable correctly including this.

Note (*3) The information is not acquirable correctly from Dch which size abnormal TAG exists.

6.17 Unusual Phrase information

Basically, even if outlying observation is registered, only the information cannot be acquired correctly, but error processing is not performed. However, since sp is the important information which determines the length of sequence data, when it is not set up correctly, processes as an error.

File name (.mmf)	Contents	Error contents
phrase00	Successful data	Successful
phrase01	No registration information (Data size '0')	Successful
phrase02	Undefined TAG use	Successful
phrase03	Unusual information (Data value incorrect)(*1)	Successful
phrase04	Unusual information (st points out the incorrect address.)(*1)	Anomaly Track Chunk
phrase05	Unusual information (st is set up after sp.)	Anomaly Track Chunk
phrase06	Unusual information (sp is set up exceeding the setting range. (*2))	Anomaly Track Chunk

Note (*1) All Phrase information should point out the head of Duration.

Note (*2) The setting range said here is the length of sequence data.