

# **Contents Authoring Guideline For MA-5 Authoring System < SMAF/Phrase Edition >**

**Version 1.9.4**

**2004/12/17**

**YAMAHA Corporation**

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# Contents

Revision History.....	3
<hr/>	
1. Outline of this document.....	4
<hr/>	
2. Notes on Authoring SMF.....	5
2.1. SMF format.....	5
2.2. MIDI channels.....	5
2.3. Synthesizer mode and No. of tones generated.....	5
2.4. TEMPO.....	5
2.5. Time Base.....	5
2.6. Channel attribute.....	6
<hr/>	
3. Applicable MIDI events.....	7
3.1. NoteOn.....	8
3.2. NoteOff.....	9
3.3. Program Change.....	9
3.4. Control Change.....	10
3.4.1. Bank Select.....	10
3.4.2. Modulation Depth.....	12
3.4.3. Panpot.....	13
3.4.4. Expression.....	13
3.4.5. Data Entry.....	13
3.4.6. RPN.....	14
3.4.6.1. Pitch Bend Sensitivity.....	14
3.4.7. Channel Reserve.....	15
3.5. Pitch Bend.....	15
3.6. Meta Events.....	16
3.6.1. Tempo.....	16
3.6.2. Text.....	16
3.6.3. Display of Copyright.....	16
3.7. Classified System Exclusive Message.....	17
3.7.1. MA-5 User Event.....	17
<hr/>	
4. Notes.....	18
4.1. Process of Slur/Tie.....	18
4.1.1. Slur.....	18
4.1.2. Tie.....	21
4.2. Volume specification and Note message.....	22
4.3. Note of playback repetition.....	22
4.4. NoteOn at the same timing with Mono-mode-On.....	22
4.5. Tone region with PCM voice (WT synthesizer).....	22
4.6. Notes in voice creation using the PCM user waveform.....	23
4.7. Total size after conversion.....	24
<hr/>	
5. Appendix.....	25
5.1. XF information Header (by language).....	25
5.1.1. Information Items.....	25
5.1.1.1. XF Information Header -Language Specific- ID.....	25
5.1.1.2. Language.....	25
5.1.1.3. Song Name.....	26
5.1.1.4. Composer.....	26
5.1.1.5. Lyricist.....	26
5.1.1.6. Arranger.....	26
5.1.1.7. Performer.....	26
5.1.1.8. Programmer.....	26

## Revision History

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Ver.	Date	Description
1.3.4	2004/12/17	New released

# 1. Outline of this document

This document stipulates guideline for authoring SMF (Standard Midi File) that makes maximum data of Yamaha's synthesizer LSI for mobile phone, MA-5 when authoring the contents (SMAF/Phrase L2) for terminals equipped with MA-5 by using MA-5 Authoring System.

MA-5 Authoring system reads SMF in accordance with this document and checks the performance or converts into carrier format. Operations when reading SMF other than the one described in this document are not guaranteed. Although MIDI sequencer application software for authoring SMF in accordance with this document is not designated, the requirements include the capability of entry of events described here.

[Note] In this book, data and value are expressed by the hexadecimal number or the decimal number. In the case of hexadecimal number, H (Hexadecimal) follows the numerical value. Moreover, "n" means arbitrary integers. Please refer to Table 1 when you input data and value.

Table 1 Contrast table of decimal and hexadecimal

Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal
0	00H	32	20H	64	40H	96	60H
1	01H	33	21H	65	41H	97	61H
2	02H	34	22H	66	42H	98	62H
3	03H	35	23H	67	43H	99	63H
4	04H	36	24H	68	44H	100	64H
5	05H	37	25H	69	45H	101	65H
6	06H	38	26H	70	46H	102	66H
7	07H	39	27H	71	47H	103	67H
8	08H	40	28H	72	48H	104	68H
9	09H	41	29H	73	49H	105	69H
10	0AH	42	2AH	74	4AH	106	6AH
11	0BH	43	2BH	75	4BH	107	6BH
12	0CH	44	2CH	76	4CH	108	6CH
13	0DH	45	2DH	77	4DH	109	6DH
14	0EH	46	2EH	78	4EH	110	6EH
15	0FH	47	2FH	79	4FH	111	6FH
16	10H	48	30H	80	50H	112	70H
17	11H	49	31H	81	51H	113	71H
18	12H	50	32H	82	52H	114	72H
19	13H	51	33H	83	53H	115	73H
20	14H	52	34H	84	54H	116	74H
21	15H	53	35H	85	55H	117	75H
22	16H	54	36H	86	56H	118	76H
23	17H	55	37H	87	57H	119	77H
24	18H	56	38H	88	58H	120	78H
25	19H	57	39H	89	59H	121	79H
26	1AH	58	3AH	90	5AH	122	7AH
27	1BH	59	3BH	91	5BH	123	7BH
28	1CH	60	3CH	92	5CH	124	7CH
29	1DH	61	3DH	93	5DH	125	7DH
30	1EH	62	3EH	94	5EH	126	7EH
31	1FH	63	3FH	95	5FH	127	7FH

---

## 2. Notes on Authoring SMF

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### 2.1. SMF format

---

Use Standard MIDI File Format 0 or Format 1.

### 2.2. MIDI channels

---

MIDI channels 1 to 16 are available.

### 2.3. Synthesizer mode and No. of tones generated

---

MA-5 Authoring system has 2 modes, FM32 tone mode and FM16 tone mode. The mode is changed by preference of authoring tool.

When FM16 tone mode was specified with MA-5 Authoring Tool, and Bank Select MSB was specified as 124 or 125, it prepares all 4 operator voices as the default FM voice. When FM32 tone mode was specified and Bank Select MSB was specified as 124 or 125, it prepares all 2 operator voice as default FM voice. Refer to the other documents for the detail of voice map.

The structure of SMAF/Phrase has maximum 4 channels for one file. The number of pronunciation for each channel is 1 tone (monophonic). It is desirable to describe the note message of each channel with monophonic notations. The number of simultaneous pronunciation of one file is up to 4 tones.

Moreover, in SMAF/Phrase, up to 4 files are playable at a time, so the maximum number of simultaneous pronunciation of all 4 files becomes 16 tones.

In MA-5 Authoring Tool, it is possible to output 4 files for every 4 channels, from SMF of 16 channels.

### 2.4. TEMPO

---

Only the range of 5BH 8DH 80H (quarter notes = 10) to 00H EAH 60H (quarter notes = 1000) becomes valid for Set Tempo value.

MA-5 Authoring Tool supports tempo change during the music. But it is not possible to change tempo after loading SMF into MA-5 Authoring Tool.

MA-5 Authoring Tool treats quarter notes as 120, when tempo is not specified.

### 2.5. Time Base

---

MA-5 Authoring Tool converts data into SMAF/Phrase by using SMF time base and tempo information, as 1Tick = 20msec (Fixed).

## **2.6. Channel attribute**

---

As the Channel attributes, normal channel and drum channel are provided. These attributes can be changed by bank select. (Refer to MA-5 Voice MAP/ MA-5 Drum Instrument MAP.)

When designation with bank select is not provided specifically, channel 10 is treated as drum channel, and other channels are treated as normal channel.

### 3. Applicable MIDI events

MA-5 Authoring Tool covers the following MIDI events, and ignores other than these events. There is not event that must be designated. The initial setting values that are described below are default values that MA-5 Authoring Tool handles when no events are designated in SMF.

The following table shows MIDI event which uses.

Table 2 List of used MIDI Event

Name of MIDI Event	Format Type
Note On	9nH kkH vvH
Note Off	8nH kkH vvH
Program Change	CnH ppH
Bank Select	BnH 00H mmH (MSB) BnH 20H llH (LSB)
Modulation Depth	BnH 01H vvH
Panpot	BnH 0Ah vvH
Expression	BnH 0BH vvH
Data Entry	BnH 06H mmH (MSB) BnH 26H llH (LSB)
RPN	BnH 64H aaH (LSB) BnH 65H bbH (MSB)
Channel Reserve	BnH 37H vvH
Pitch Bend	EnH llH mmH
Tempo	FFH 51H 03H ttH ddH...ttH
Text	FFH 01H llH ddH...ddH
Copyright	FFH 02H llH ddH
User Event	F0H 43H 79H 06H 7FH 10H ddH F7H

### 3.1. NoteOn

---

#### **9nH kkH vvH**

---

n: channel number 0 to 15 (0H to FH)

kk: note number 0 to 114 (00H to 72H) A of 440 Hz=69 (45H)

vv: key velocity: Interpreted as NoteOff when this is "00H."

Starts pronunciation with keys of designated note numbers in applicable channels.

It is desirable to describe NoteOn and NoteOff with monophonic notation rules. For more information about slur/tie process of MA-5 Authoring Tool, please refer to "4.1 Process of Slur/Tie".

Formula : Gain[dB] =  $40 * \log((vv)^2 / 127^2)$

- [Note] When no note event exists in SMF, it can not be converted to internal data. Therefore the tool may not work normally. Be sure to insert note events.
- [Note] In the case of drum channel, add/subtract "2" to note number as following, for interpolating the difference between drum voice map of SMAF Phrase L2 and GM drum voice map.
- SMF => SMAF Phrase L2 : (note number of SMAF Phrase L2) = (note number of SMF) + 2  
 SMAF Phrase L2 => SMF : (note number of SMF) = (note number of SMAF Phrase L2) - 2
- [Note] According to the number of program change, the rhythm may differ. For more information about applicable program change number, refer to "Voice List" section of "MA-5 Authoring Tool Users Manual".
- [Note] With MA-5, when two or more notes are performed at a same timing, the later output sound comes out 115μs behind of the previous sound comes out. The level down is possible depending on playback frequency at the pronunciation of a same note at a time.
- [Note] With MA-5, multiple pronunciations at the same note number on the same channel are made to a note event by tie processing. Locate pronunciations not to overlap to each other at the same note number on the same channel.

## 3.2. NoteOff

---

### **8nH kkH vvH**

---

n: Channel number 0 to 15 (0H to FH)

kk: Note number 0 to 114 (00H to 72H) A of 440 Hz=69(45H)

vv: Key velocity is ignored.

In an applicable channel, pronunciation is ended by the key of a specification note number.

[Note] According to the specification of Phrase, it performs NoteOff over all pronouncing notes, at the end of music. If release rate is too long, it leaves pronunciation after music ends, so adjust release rate to applicable length. In addition, cancel “repeat” playback setting when checking. (If “repeat” is set, it makes mute process at the end of music.)

## 3.3. Program Change

---

### **CnH ppH**

---

n: Channel number 0 to 15 (0H to FH)

pp: Program number 0 to 127 (00H to 7FH)

Initial setting value: 0

A voice of designated channels is setup.

When an applicable channel is set for normal channel, a voice from designated banks by bank select is chosen.

When an applicable channel is set as a drum channel, drum set is selected.

With MA-5 Authoring Tool, it is possible to set up to 16 voices into one music. If more than 16 voices are used in a SMF, set usable voice with MA-5 Authoring Tool.

[Note] When program change is performed in music, insert the program change at the time point in which no pronunciation is performed on an applicable channel.

### 3.4. Control Change

#### 3.4.1. Bank Select

**BnH 00H mmH (MSB)**

**BnH 20H llH (LSB)**

- n: Channel number 0 to 15 (0H to FH)
- mm: MSB value of bank number (00H to 7FH)
- ll: LSB value of bank number (00H to 7FH)

Initial setting value: Channel 9 125/0  
 Other than channel 9 124/0

A designated channel is setup. It is recommended to use bank select MSB and bank select LSB as a set. Table 3 shows bank selects that is handled by MA-5 Authoring Tool.

Table 3 Bank select applicability table

MSB	LSB											
	0	1	2	3	4	5	6	7	8	9	10	11 to 127 Un-specified
0~121,126,127 Un-specified	When 10ch, it is replaced to MSB:125/LSB:0/Pch:2 When except 10ch, it is replaced to MSB:124/LSB:1											
122,124 (Normal)	Preset Voice	User Voice									ROM Voice	Replace LSB to 1
123,125 (Drum/StreamPCM)	See the following table											

MSB	LSB	Pch										
		0	1	2	3	4	5	6	7	8	9	10
123,125 (Drum/StreamPCM)	0	Preset Voice	User Voice								ROM Voice	Replace Pch to 2

When AT mode is L1(MA3), use Pch:1 as a user voice.

Table 4 Bank select 14-bit notation value

MSB	LSB	14 bit value
124	0	15872
	1	15873
	2	15874
	3	15875
	4	15876
	5	15877
	6	15878
	7	15879
	8	15880
	9	15881
125	0	16000

A program change is required for determining bank select. If a program change does not exist after bank select, the voice stays with the ordinary program change.

In each channel, it becomes a drum channel by specifying a program change after specifying a drum bank (MSB:125(decimal)). In addition, by specifying a program change after specifying a normal bank (MSB:124(decimal)), it becomes a FM Normal channel

When multiple bank selects are existed, the latest message (last one on the time axis) is processed preferentially.

[Note] With MA-5 Authoring Tool, it replaces MSB with 124 (decimal) when MSB is 122 (decimal), and MSB with 125 (decimal) when MSB is 123 (decimal), to use of SMF which was created with MA-2. In addition, when MSB is other than 124 (122) or 125 (123), channel 10 replaces it with 125, and other channels replace it with 0.

With the Authoring Tool, bank select and program change information of the voice are converted when SMAF Phrase is input/output.

Following tables show examples of bank select and program change conversion.

Table 5 Conversion of Bank select / Program change (case of Phrase L1)

Tool		SMAF Phrase L1		Tool (Re-load SMAF Phrase)	Note
BM:124,BL:0,ch:10	→	Pch:2(EXVO)	→	BM:124, BL:1, Pch:0	Register Extend Normal Voice with BM=124, BL=1 by consecutive number from Pch=0.
BM:125,Pch:1,T:45	→	Pch:3(EXVO)	→	BM:124, BL:1, Pch:1	Replace Drum Voice with Extend Normal Voice

\* BM(Bank Select MSB), BL(Bank Select MSB), BS(Bank Select), Pch (Program Change), NT (Note #).

[Note] When output to SMAF Phrase, a Drum voice becomes Normal voice.

Table 6 Conversion of Bank select / Program change (case of Phrase L2)

Tool		SMAF Phrase L2		Tool (Re-load SMAF Phrase)	Note
BM:124,BL:0,Pch:10	→	BS:1, Pch:0	→	BM:124, BL:1,Pch:0	Register Extend Normal Voice with BM=124, BL=1 by consecutive number from Pch=0.
BM:125,Pch:1,NT:45	→	BS:129,Pch:0,NT:47	→	BM:125,Pch:2,NT:45	Replace Extend Drum Voice with BM=125, Pch=2

\* BM(Bank Select MSB), BL(Bank Select MSB), BS(Bank Select), Pch (Program Change), NT (Note #).

[Note] The same extend drum voices, which are at the same note number but in the different program number, can be assigned only one voice for one Phrase. To use extend drum voices on the same note number, re-assign them to different note numbers. In this case, note events of SMF are also required to change to the applicable note numbers.

### 3.4.2. Modulation Depth

#### **BnH 01H vvH**

n: Channel number 0 to 15 (0H to FH)  
 vv: Depth of vibrato 0 to 127 (00H to 7FH)

Initial setting value: 0

The depth of the vibrato (LFO pitch abnormal conditions) of a designated channel is specified. The relationship between the value and depth of vibrato is shown in **Table 7**. The depth of vibrato here shows the multiple for vibrato depth that is set for each voice.

Table 7 Relationship between Vibrato Value and Depth

Vibrato value	Depth of vibrato
0~7	OFF
8~31	x 1
32~63	x 2
64~95	x 4
96~127	x 8

### 3.4.3. Panpot

---

#### **BnH 0AH vvH**

---

n: Channel number 0 to 15 (0H to FH)  
 vv: Control value 0 to 127 (00H to 7FH)

Initial setting value: 64 (center)

The stereo sound place position of a designated channel is specified. The positioning is made between the left end (0 (decimal)) and right end (127 (decimal)) of the stereophonic sound field by using the following formulas.

Recommended formulas:   Left   Channel Gain[dB] =  $20 \cdot \log(\cos(\pi/2 \cdot (vv)/127))$   
                                   Right  Channel Gain[dB] =  $20 \cdot \log(\sin(\pi/2 \cdot (vv)/127))$

[Note]   If this was inserted at the same timing with NoteOn, it may make noise by interpolating time of volume.

### 3.4.4. Expression

---

#### **BnH 0BH vvH**

---

n: Channel number 0 to 15 (0H to FH)  
 vv: Control value 0 to 127 (00H to 7FH)

Initial setting value: 127

A volume change of an applicable channel is specified.

Formula : Gain[dB] =  $40 \cdot \log((vv)^2/127^2)$

### 3.4.5. Data Entry

---

#### **BnH 06H mmH (MSB)**

---

#### **BnH 26H llH (LSB)**

---

n: Channel number 0 to 15 (0H to FH)  
 mm: MSB of data value 0 to 127 (00H to 7FH)  
 ll:  LSB of data value 0 to 127 (00H to 7FH)

Initial setting value: 0/0

It is used for entering a value of RPN (MSB/LSB). For the details, refer to the section of RPN.

### 3.4.6. RPN

---

**BnH 64H llH (LSB)**

**BnH 65H mmH (MSB)**

---

n: Channel number 0 to 15 (0H to FH)

ll: LSB of parameter number 0 to 127 (00H to 7FH)

mm: MSB of parameter number 0 to 127 (00H to 7FH)

Initial setting value: 127/127

It is used for designating a parameter number of RPN.

#### 3.4.6.1. Pitch Bend Sensitivity

---

**BnH 64H 00H / BnH 65H 00H (RPN parameter designation)**

**BnH 06H mmH / BnH 26H llH (data entry)**

---

n: Channel number 0 to 15 (0H to FH)

mm: MSB of data value 1 to 24 (01H to 18H)

ll: LSB of data value (fixed to 0)

Initial setting value: 2/0 (2 halftones)

Setting of sensitivity of pitch bend is performed. MSB of data entry shows the sensitivity in halftones, and LSB of data entry shows the sensitivity in cents. For example, when MSB=1 and LSB=0, the sensitivity becomes  $\pm 1$  halftones. (Overall ranges of change are 2 halftones.)

When MSB of data entry is other than 1 to 24, it is ignored.

### 3.4.7. Channel Reserve

---

#### **BnH 37H vvH**

n: Channel number 0 to 15 (0H to FH)  
 vv: number of reserve 0 to 16 (00H to 10H)

Initial setting value: 1

The pronunciation of the number of reserve is guaranteed at the channel where channel reserve was specified, by keeping the channel for the number of reserve and distributing note events into these channels. (instead, pronunciations of other channels are deterred.)

With the normal channel, when it exceeds the reserved number, the first note event is muted, and the latest event is pronounced.

With the drum channel, it prioritizes the first arrival and secures the note number for the amount of reserved number, and pick up only note events of applicable note number.

Place this message at the head of each channel (0 Tick). It effects only when this message is placed on the top.

[Note] When note event was distributed into channel 10 by channel reserve, drum voice is designated if channel attributes (normal channel / drum channel) are not specified by bank select or program change. When normal channel is required, be sure to specify the channel attribute by bank select and program change.

### 3.5. Pitch Bend

---

#### **EnH llH mmH**

n: channel number 0 to 15 (0H to FH)  
 ll: LSB of bend value 0 to 127 (00H to 7FH)  
 mm: MSB of bend value 0 to 127 (00H to 7FH)

Initial setting value: 64/00 (center)

Changes the pitch of applicable channel up or down. The initial value of change width (pitch bend range) is  $\pm 2$  halftones. 0/0 makes the downward pitch bend maximum. 127/127 makes the upward pitch bend maximum. Pitch bend range can be set with 0/0 of RPN.

## 3.6. Meta Events

---

### 3.6.1. Tempo

**FFH 51H 03H ttH ttH ttH**

---

tt tt tt: length of quarter notes ( $\mu$  sec)

MA-5 Authoring Tool allows designation of tempo in any location because it accommodates to temp change in the music.

### 3.6.2. Text

**FFH 01H 11G ddH...ddH**

---

ll : number of bytes of text (variable length presentation)

ddt: text data

Title, composer, writer, arranger, player and singer can be inputted by describing XF information header (refer to <APPENDIX>) using this meta-event.

MA-5 Authoring Tool converts this event to each information of Optional Data Chunk of SMAF/Phrase.

Normally, control codes for characters such as “(”, “[” and “/” that are defined with XF information header for portable terminals are displayed as they are on the MA-5 Authoring Tool.

### 3.6.3. Display of Copyright

**FFH 02H 11H ddH**

---

ll : number of bytes of text (variable length presentation)

dd: text data

By describing copyright information, copyright can be inputted.

MA-5 Authoring Tool converts this event to Copyright of Optional Data Chunk of SMAF/Phrase.

## 3.7. Classified System Exclusive Message

---

A voice setting, waveform setting, etc peculiar to a device are defined exclusively.

### 3.7.1. MA-5 User Event

**F0H 43H 79H 06H 7FH 10H Data F7H**

---

Data: User event classification 0 to 15

Specifies the setting position of the user event on sequence.

User can set up 16 kinds of events by this event and it is used in applications, such as JAVA and game.

This event does not affect the music play.

[Note] When designates user event, designate after interval more than 100 msec surely from the front user event. If don't do it, it may not operate normally.

## 4. Notes

### 4.1. Process of Slur/Tie

#### 4.1.1. Slur

When creating a slur phrase, describe the second note to start before the first note ends (refer to **SME**)

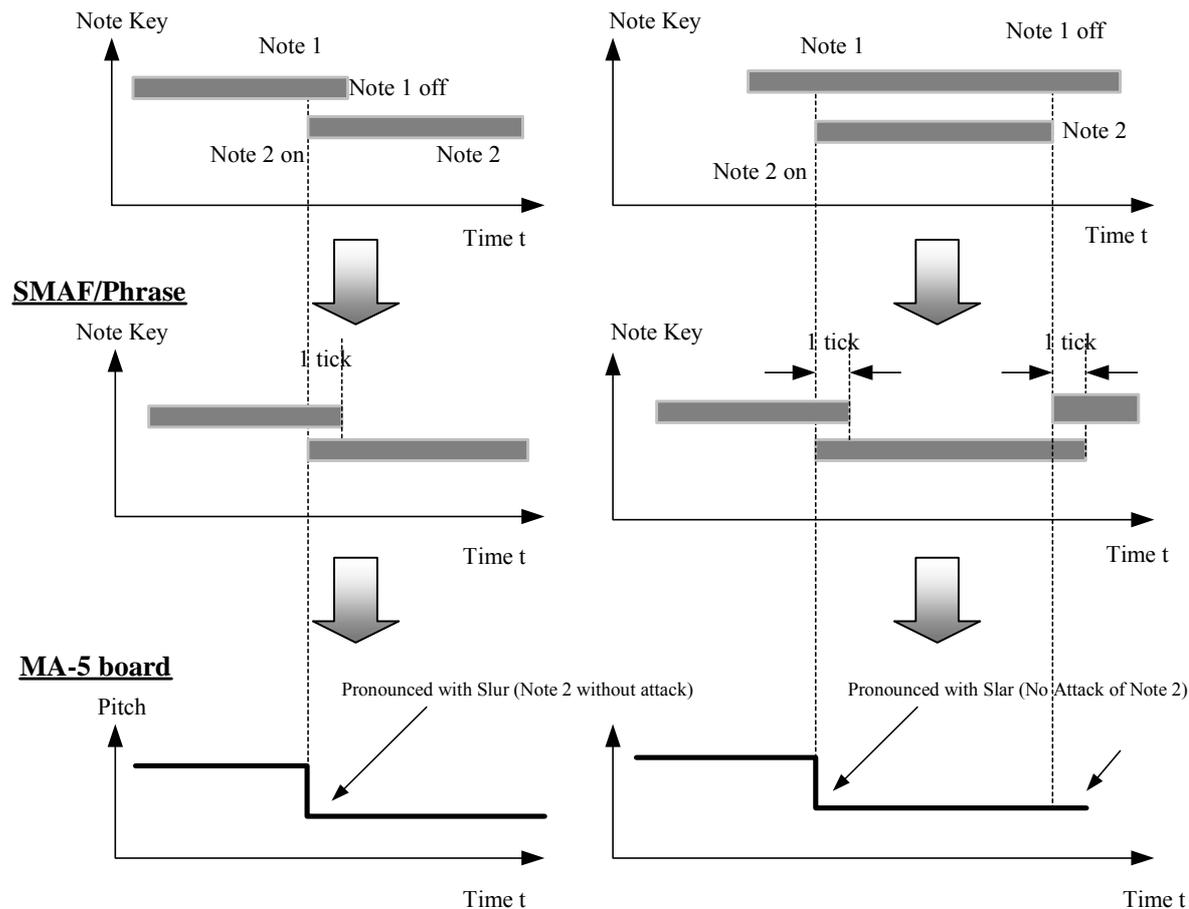
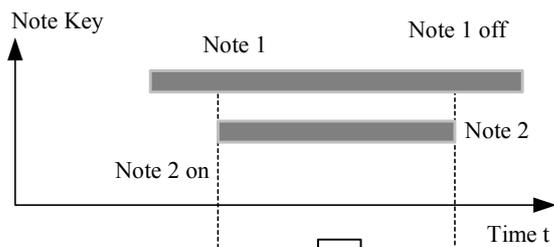
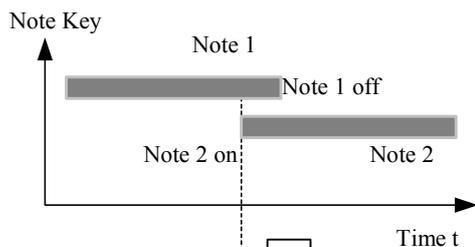
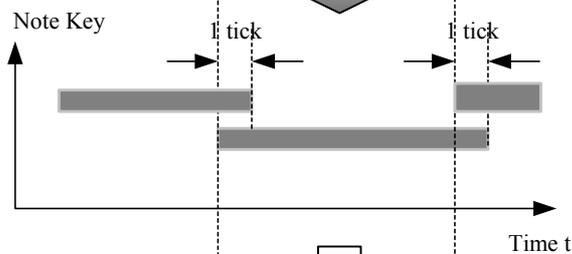
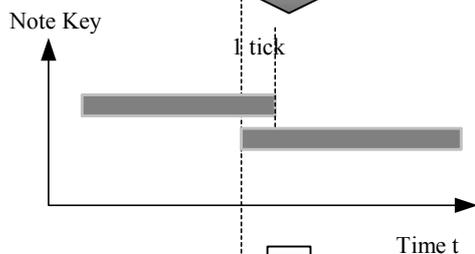


Fig. 1 Process of Slur expression). MA-5 Authoring Tool adjusts the pronunciation end time of the first note, and makes overlapping part "1 tick". With MA-5 board, it pronounces these 2 note as Slur (connect notes as legato).

**SMF**



**SMAF/Phrase**



**MA-5 board**

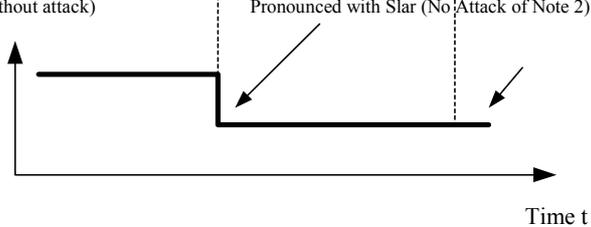
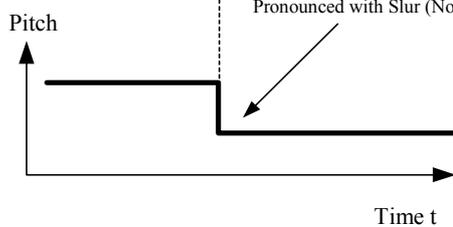
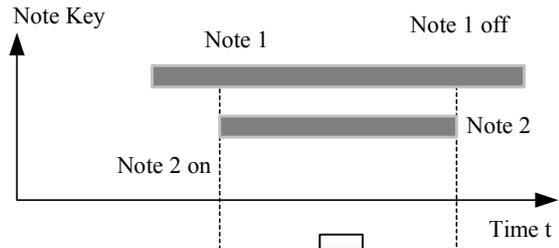
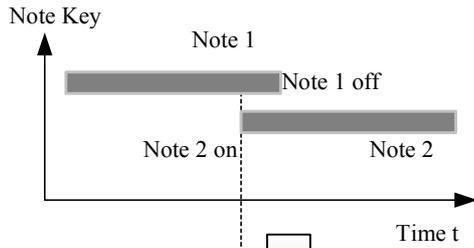


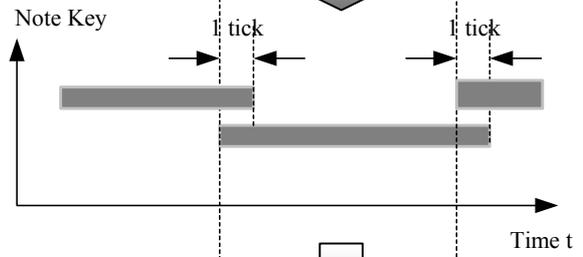
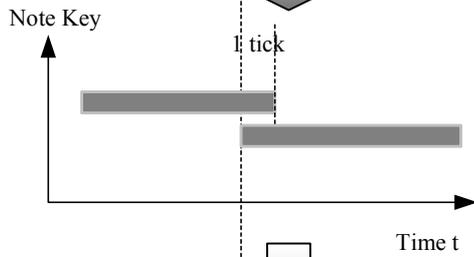
Fig. 1 Process of Slur expression

Right figures of

**SMF**



**SMAF/Phrase**



**MA-5 board**

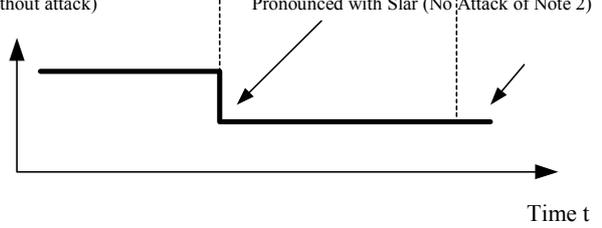
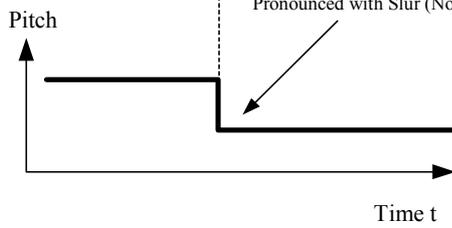


Fig. 1 show the process of the case in which the tone length of the note is completely included in the other tone length on one channel. Basically, do not create such data in the stage of SMF.

### 4.1.2. Tie

When same notes overlap in SMF, MA-5 Authoring Tool converts two notes into one note. Basically, do not create such data in the step of SMF.

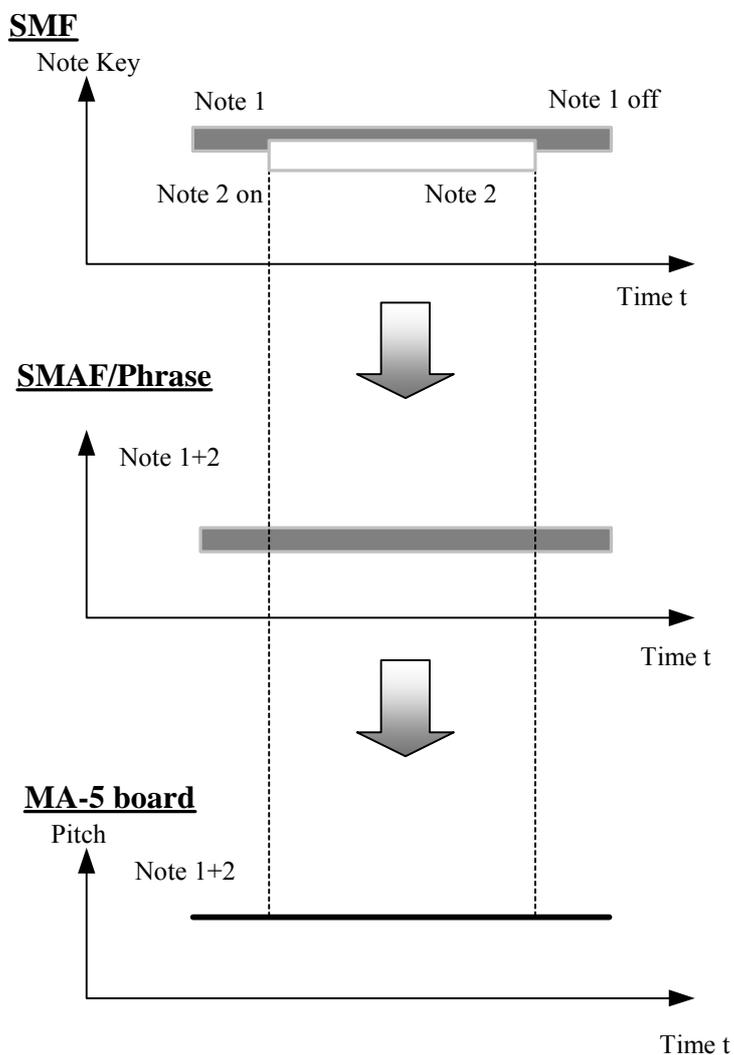


Fig. 2 Process of Tie expression

## **4.2. Volume specification and Note message**

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With MA-5 Authoring Tool, do not insert note message at the same time as the volume specification. It may make noise, or attack of tone may be missed. To avoid these problems, insert a note message with more than 22msec after the volume specification.

The target volume messages are pan pot and expression. Especially when the volume shift is larger, this problem easily occurs.

## **4.3. Note of playback repetition**

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With MA-5 SMAF/Phrase, the playback timing may be delayed a little at the beginning of the music, during playback repetition.

The maximum delay during the playback repetition is 20msec.

According to the above mentioned reasons, when the music, which is expected to return from the terminus of the music to the beginning of music at the exact tempo, is created, be sure to check the playback timing of repetition.

## **4.4. NoteOn at the same timing with Mono-mode-On.**

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With the channel using Mono-mode-On, do not insert multiple NoteOn at the same timing (duration=0).

With the channel using Mono-mode-On, when multiple NoteOn are existing at the same timing, the latest note is pronounced, but the volume may not be increased to the total level (the volume becomes smaller).

## **4.5. Tone region with PCM voice (WT synthesizer)**

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The range of pronounceable frequency is 1500Hz to 48000Hz.

If it exceeds 48000Hz, the tone between 48000Hz to 96000Hz is played with 48000Hz. But if it exceeds 96000Hz, the playback can not be guaranteed.

### 4.6. Notes in voice creation using the PCM user waveform

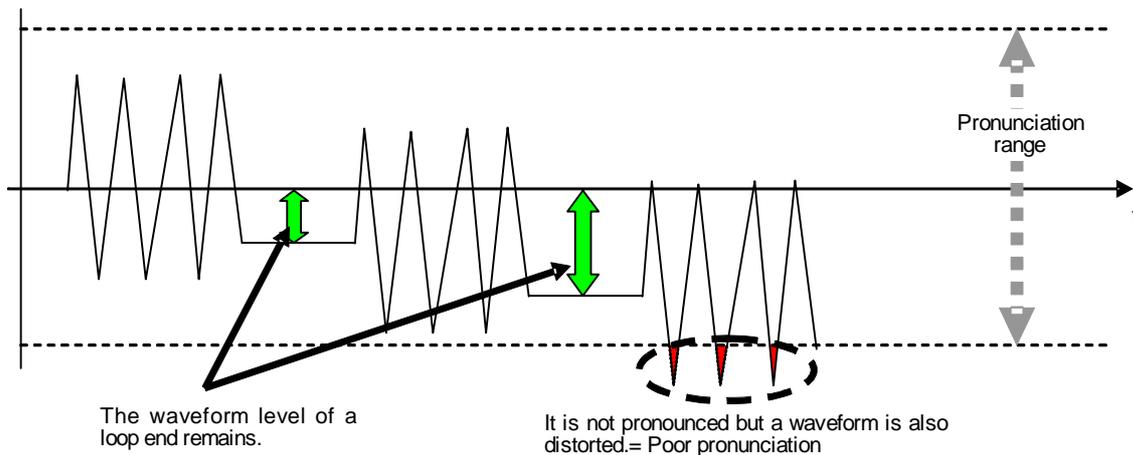
When you create the voice using the PCM user waveform, be careful of below according to the specification of MA-5 hardware

When there is no waveform loop (a loop point and a loop end are the same value), the waveform value is read continuously according to the specification of MA-5 hardware in the place where read-out of a waveform reached the loop end.

Therefore, if a voice parameter is set as “XOF = 1 and SR = 0 (or setup with long decay time)”, or “XOF = 0 and RR = 0 (or setup with long decay time)”, this value will be maintained continuously after note-off also.

In this state, when many note-on of big volume overlaps, sound becomes easy to be distorted.

Moreover, if the voice of such a waveform is pronounced repeatedly, the value maintained after note-off also becomes large by the number of pronounced times, and becomes easy to be distorted much more.



In order to prevent such a condition, we recommend you to set the waveform level at loop end as “0”, or to adjust an envelope so that pronunciation may be completed before a loop end. Please create PCM voice according to

Table 8.

With/Without waveform loop	What voice	waveform level at loop end	XOF	DR	SR	RR	SUS	Comment	
None	One shot or Chunk	0	free	free	free	free	free	No problem occurs.	
		not 0	on	The sum of two lapsed time is better to be shorter.	not 0	not 0	free	off	A problem may occur. Please adjust DR and SR so that pronunciation is completed before a loop end.
			off		not 0	Shorter is better.	off	A problem may occur. Please adjust RR so that pronunciation is completed before a loop end.	
Sustaining	Sustaining	0	off	free	0	not 0	free	No problem occurs.	
		not 0	off	free	0	not 0	free	No problem occurs.	
	With loop Decaying	0	free	free	free	free	free	No problem occurs.	
		not 0	free	free	free	free	free	No problem occurs.	

free : You may do any setup.

Table 8 PCM Voice Authoring Guideline

In addition, with MA-5 Authoring tool

- when clicking OK button with PCM Voice Edit,
  - when saving SMAF,
- following items are checked.

by PCM Voice Edit, when the O.K. button is clicked, the following checks are performed.

1) Check of LoopPoint/EndPoint

When "LoopPoint/EndPoint" is not in a range shown below, it's determined as an error.

- In case of 4bit ADPCM,  
 $0 \leq \text{LoopPoint} \leq [\text{Wave form sampling number} - 1]$   
 $1 \leq \text{EndPoint} \leq [\text{Wave form sampling number}]$
- In case of 8bit PCM,  
 $0 \leq \text{LoopPoint} \leq [\text{Wave form sampling number} - 2]$   
 $0 \leq \text{EndPoint} \leq [\text{Wave form sampling number} - 1]$
- When LoopPoint points out the position exceeding EndPoint, it considers as an error.

2) In case of Loop Point = End Point, or check of wave height in EG and LoopPoint

When all the conditions of the following a. to b. are satisfied, it considers as an error.

a. Loop Point and End Point are specified as same position.

b. Evne in one side, 1000 or more are the wave high price of the following sample points by 16bit PCM conversion.

It is a sample in front of Loop Point (=End Point) and its one at the time of 4bit ADPCM use.

It is the sample of Loop Point (=End Point) and its one back at the time of 8bit PCM use.

c. A setup applicable to following either is made.

- (a)  $\text{XOF} = 1$  and  $\text{SR} \leq 1$
- (b)  $\text{XOF} = 1$  and  $\text{DR} = 0$  and  $\text{SL} \neq 0$
- (c)  $\text{XOF} = 0$  and  $\text{RR} \leq 1$

## 4.7. Total size after conversion

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When total size exceeds 256000byte, it is considered as an error, and not converted.

Be sure to create SMF so that total size becomes less than 256000byte.

## 5. Appendix

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### 5.1. XF information Header (by language)

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Sets information of features and attributes of music by using the form of text meta-event in the format of SMF.

FF 01H len <text>

The information items are divided by an 8 bit colon, “:”, and listed.

No data is placed in the information items that are not described.

New items are to be added after the last item. When no text exists, the processing system places blanks in the following information items even when an 8 bit colon is not found.

The first two items in information section and various control codes are described with ASCII.

#### 5.1.1. Information Items

##### 5.1.1.1. XF Information Header -Language Specific- ID

XF Information Header -- ID indicating Language Specific (characters)    “XFln”

##### 5.1.1.2. Language

Information that designate the code system of characters that are used for XF information header (by language).

It does not designate the character code system that is used for words. The character code system for words is designated with XF words header. It does not show the place of composition.

The Authoring Tool only the following languages.

Symbol	Character code	Applicable languages
L1	Latin 1(ASCII(7bit) + ISO 8859-1)	English, French, German, Italian, Spanish, Portuguese, etc.
JP	Shift-JIS	Japanese
KR	ISO-2022-KR	Korean

#### 5.1.1.3. Song Name

Expression of title by language

When using two or more lines to express a title, place an 8 bit slush, “/”, in the place a linefeed is to be made.

#### 5.1.1.4. Composer

Name of composer of original music

Divide the family name and given name with an 8 bit space, “ ”.

When two or more composers are written, divide them with an 8 bit slush, “/”.

#### 5.1.1.5. Lyricist

Name of writer when words are given to the original music.

The format is the same as the one for the composer.

#### 5.1.1.6. Arranger

Name of a person who arranged original music or music data.

The format is the same as the one for the composer.

#### 5.1.1.7. Performer

Name of a person or a group of persons who plays or sings original music.

The format is the same as the one for the composer.

#### 5.1.1.8. Programmer

Name of a person who authored music data.

The format is the same as the one for the composer.