

SMAF Sound Decorator

Contents Authoring Guideline

< MA-3 / MA-5 Edition >

Ver.1.2.1

2004/11/22

YAMAHA Corporation

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Revision History

Ver.	Date	Description
1.0.0	2004/02/03	Newly Release
1.2.0	2004/08/16	<p>4 Application MIDI Event Text and Copyright Information was added into the list of used MIDI event.</p> <p>4.1 NoteOn Description about a “Note” which relates with same note in same channel was newly added.</p> <p>4.4.1 Bank Select A table for bank select was updated. 14-bit notation table was newly added.</p> <p>4.4.12 Mono-mode ON Description about a “Note” which relates with the timing of which two or more NoteOn are placed.</p> <p>4.4.13 Poly mode ON (Only for MA-3 mode) Critical error on value notation of event was corrected.</p> <p>4.6.2 Text Items were newly added.</p> <p>4.6.3 Copyright Display Items were newly added.</p> <p>5.2 Volume designation and Note event Description about “Start Point” was newly added.</p> <p>6.1 XF Information Header (by language) Items were newly added.</p>
1.2.1	2004/11/22	<p>7.2 Drum Voice MAP The note number (29, 38, 40) of CYBER is changed into the voice which uses RAM.</p>

1. Outline of this Document

This document specifies a guideline for authoring SMF (Standard Midi File) that makes the maximum data of MA-3 or MA-5, in order to create contents for mobile phones equipped with MA-3 or MA-5, YAMAHA's synthesizer LSI for mobile phone, using the SMAF Sound Decorator (SSD) application.

SSD reads a SMF in accordance with this document and converts it into SMAF (Synthetic music Mobile Application Format), as well as playback check. Operations are not guaranteed when reading SMF other than that described in this document. Although MIDI sequencer application software for authoring SMF in accordance with this document is not designated, requirements include the capability of entry of events are described here.

[Note] About the numerical notations

In this book, hexadecimal numbers or decimal numbers express data values.

In the case of hexadecimal numbers, a letter "H" (Hexadecimal) follows the numerical value.

Moreover, "n" means arbitrary integers.

Please refer to the following table 1 when you input value of data.

Table 1 Correspondence Table of Decimal and Hexadecimal

Decimal	Hex.	Decimal	Hex.	Decimal	Hex.	Decimal	Hex.
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. Difference between MA-3 and MA-5

As for the SSD, SMAF/MA-3 or SMAF/MA-5 can be created when MA-3 or MA-5 is designated as an output format, respectively. Differences between SMAF/MA-3 creation and SMAF/MA-5 creation are described here.

2.1. Velocity Curve

Velocity curve of SMAF/MA-3 and SMAF/MA-5 contents made in the SSD is, respectively...

SMAF/MA-3: $20\log(\text{vel}/127)$

SMAF/MA-5: $40\log(\text{vel}/127)$

In the SMAF/MA-5, dynamic range of the volume that can be expressed has spread.

2.2. Hold 1 (Dumper) at the same timing as NoteOff

In the SSD with MA-5, do not place Hold1 (Damper) at the same timing (duration=0) as Note Off. Hold1 (Damper) may not be reflected successfully to a playback sound. It is recommended that Hold 1 (Damper) and Note Off be not placed at the same timing, when the same SMF is used in both MA-3 and MA-5.

2.3. Poly-Mode On

Poly-Mode-On is valid only for MA-3 in the SSD. As for MA-5, the mode is disregarded.

It is recommended that the mode be not used when the same SMF is used in both MA-3 and MA-5.

2.4. Mono-Mode-On and Limit of the Maximum Simultaneous Polyphony Number

In the SSD with MA-3, contents in excess of the number of maximum simultaneous polyphony cannot be created when the Mono-Mode-On is used in some channel.

For details, see 5.3 Mono-Mode-On and limit of the maximum simultaneous polyphony number (only MA-3).

No such limit exists for MA-5.

2.5. NoteOn at the same timing in the Mono-mode-On

In the SSD with MA-3, do not place multiple Note On at the same timing (duration=0) in the channel that the Mono-Mode-On is used.

For details, see 5.4 Note On at the same timing in Mono-Mode-On (only MA-3)

No such limit exists for MA-5.

3. Notes on Authoring SMF

3.1. SMF Format

Be sure to use the Standard MIDI File Format 0 or Format 1.

3.2. MIDI Channel

1 to 16 of MIDI channels can be used.

3.3. Synthesizer Mode and Number of Voice Generation

SSD has the FM 16 tones mode, and FM synthesizer and WT synthesizer can be used.
The number of maximum simultaneous polyphony of MA-3 and MA-5 is indicated in the table 2.

Table 2 Maximum polyphony Number

	FM synthesizer	WT synthesizer	Total
MA-3			
FM16 tones mode	16	8	24
MA-5			
FM16 tones mode	16	16	32

In FM 16 tones mode, 4 operator voices and 2 operator voices can be used.

In one MIDI channel, it can be described in polyphony. However, be careful not to exceed the number of maximum simultaneous polyphony in the total of all MIDI channels. When notes in excess of the number of maximum simultaneous polyphony are input, the note voice-generated last shall be muted on a last-come-first- served basis.

3.4. Tempo

Only the range from 5BH 8DH 80H (quarter notes of 10) to 00H EAH 60H (quarter notes of 1000) becomes valid, as the Set Tempo values.

When tempo is not designated, SSD treats quarter notes as 120. It supports a tempo change in music.

3.5. Time Base

There is no regulation especially. In the SSD, time base and tempo information of SMF are converted to an event that defines time per one tick.

3.6. Channel Attribute

As the Channel attributes, normal channel and drum channel are provided. These attributes can be changed by bank select. (Refer to 4.4.1Bank Select)

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

4. Application MIDI Events

SSD covers the following MIDI events and ignores other than these events. Be sure to insert note event. The initial setting values described below is default values that SSD handles when no events are designated in SMF.

The following table shows MIDI event that is used.

Table 3 Use MIDI Event Lists

Names of MIDI events	Forms
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
Channel Volume	BnH 07H vvH
Panpot	BnH 0AH vvH
Expression	BnH 0BH vvH
Hold1 (damper)	BnH 40H vvH
Data Entry	BnH 06H mmH (MSB) BnH 26H llH (LSB)
RPN	BnH 64H aaH(LSB) BnH 65H bbH(MSB)
All Sound Off	BnH 78H 00H
Reset All Controller	BnH 79H 00H
All Note Off	BnH 7BH 00H
Mono-Mode-On	BnH 7EH 01H
Poly-Mode-On (only MA-3)	BnH 7FH 00H
Pitch Bend	EnH llH mmH
Tempo	FFH 51H 03H aaH bbH ccH
Text	FFH 01H llH ddH...ddH
Copyright Display	FFH 02H llH ddH
Cue Point	FFH 07H 05H 53H 54H 41H 52H 54H(START) FFH 07H 04H 53H 54H 4FH 50H(STOP)
XF Cue Point	FFH 7FH 04H 43H 7BH 02H rrH
Channel status designation	FFH 7FH 14H 43H 02H 00H 04H ddH...ddH
Master volume	F0H 7FH 7FH 04H 01H llH mmH F7H
User event	F0H 43H 79H 06H 7FH 10H ddH F7H

*Poly-Mode-On is a MIDI event, valid only for converting into MA-3.

4.1. NoteOn

9nH kkH vvH

- n: Channel number 0 to 15 (0H to FH)
kk: Note number 0 to 114 (0H to 72H) A of 440 Hz=69
vv: Key velocity: Interpreted as Note Off when this is "0."

In an applicable channel, a voice-generation in the key of a designated note number is started.
Velocity curve differs between MA-3 and MA-5 (Refer to 2.1 Velocity Curve).

Note: Some prosody may differ depending on a program change number.
Refer to "7Voice List", for a target program change number.

In MA-3 and MA-5, the latter voice is delayed for 115 μ s or so as compared to the previous voice when 2 or more notes are voice-generated. Therefore, for example, output level may be decreased depending on a frequency to play back when a same note is voice-generated at the same timing.

As for SSD, multiple simultaneous voice-generation with the same note number in the same channel is treated as one Note event by tie processing. Be sure not to be voice-generated at the same timing, in case of the same note number in the same channel.

4.2. NoteOff

8nH kkH vvH

- n: Channel number 0 to 15 (0H to FH)
kk: Note number 0 to 114 (0H to 72H) A of 440 Hz=69
vv: Key velocity is ignored.

In an applicable channel, voice-generation is ended by the key of a designated note number..

4.3. Program Change

CnH ppH vvH

n: Channel number 0 to 15 (0H to FH)
 pp: Program number 0 to 127 (0H to 7FH)

Initial setting value: 0

A voice of designated channels is set up. 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.

Default voices of drum bank include mixture of PCM voices and FM voices.

Please insert a program change in the next of a bank selection of each channel head. Since program change in music is not accepted, insert it in time point other than the tone generation period.

Note: About the voice can be set by program change, please refer to “7Voice List”. In the list, program numbers are described in ascending order starting with 1.

4.4. Control Change

4.4.1. 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 0 to 127 (00H to 7FH)
 ll: LSB value of bank number 0 to 127 (00H to 7FH)

Initial setting value: 0/0

A bank of designated channel is set up. It is recommended to use bank select MSB and bank select LSB as a set. Table 4 shows bank selects that is handled by the SSD.

Table 4 Bank Select Supporting Table

MSB	LSB											
	0	1	2	3	4	5	6	7	8	9	10	11~127, unspecified
0~121, 126,127 Unspecified	Except 10 ch, it is replaced as MSB: 124, LSB: 0 In 10ch, it is replaced as MSB: 125, LSB: 0, program change: 0											
122,124 (Normal)	It is replaced as LSB: 0											
123,125 (Drum)	It is replaced as LSB: 0, program change: 0											

Table 5 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

Even though a bank select is received, the voices of present Program change is valid until the next Program change is received. In each channel, it becomes a drum channel by designating a program change after designating a drum bank. In addition, by designating a program change after designating a normal bank, it becomes a Normal channel

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

Note: As for SSD, when MSB is 122, it is replaced with 124, or when MSB is 123, it is replaced with 125, so that SMF made for MA-2 can be used even though the output format is for MA-3 or MA-5.

By the Bank Select setting, it decides whether the channel accepts the key-control or not.

In the channel which uses the voice of Normal bank, it accepts key control. (Exception exists in some part. Refer to **7.1 Normal Voice MAP (FM 4 Operator Voice)**)

In the channel which uses the voice of Drum bank, it does not accept key control.

By designating Bank MSB 125, the applicable channel becomes drum channel. When drum set is changed by program change, the instrument of drum is changed to the one that corresponding to the voice map.

Note: About the voice that can be set by Bank select and program change, please refer to “7Voice List.”

4.4.2. 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 5. The depth of vibrato here shows the multiple for vibrato depth that is set for each voice.

Table 6 Relation between Vibrato values and Depth

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

4.4.3. Channel Volume

BnH 07H vvH

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

vv: Control value 0 to 127 (00H to 7FH)

Initial setting value: 100 (64H)

It aims at setting up the volume balance between channels by the message which designates the volume of an applicable channel.

Formula: $\text{Gain[dB]} = 20 \cdot \log((vv)^2 / 127^2)$

Note: When multiple channel volumes exist before the first note message, a channel volume value of an event just before the first note message is reflected to the each channel "SMF" column of the SSD mixer.

4.4.4. 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 (40H; center)

The stereo sound place position of a designated channel is specified. The positioning is made between the left end (0) and right end (127) 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] = $20 \cdot \log(\sin(\pi/2 \cdot (vv)/127))$

4.4.5. 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 (7FH)

A change of the volume set up in the channel volume of an applicable channel is specified.

Note: Although both Channel volume and Expression are used to control the volume, their purposes are different. The Channel volume was used for mix down with volume of overall music that is set before the playback of music data and the fader. And the expression is used to adjust the volume for music expression etc.

Formula: $\text{Exp[dB]} = 20 \cdot \log((vv)^2/127^2)$

4.4.6. Hold (Damper)

BnH 40H vvH

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

Initial setting value: 0

On/Off of damper (sustain pedal) of applicable channels is specified. Off is designated when the value is 0 to 63, or on is designated when the value is 0 to 127.

Note: Note Off is sustained when it is received with damper on. When the damper changes from on to off, the delayed Note Off is executed, and volume envelope proceeds to release.
 Do not put Note Off and Hold 1 on the same timing. For SSD with MA-5, playback voice is not guaranteed.

4.4.7. Data Entry

BnH 06H mmH (MSB)

BnH 26H llH (LSB)

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

Initial setting value: 0/0

It is used for an input of RPN value (MSB/LSB). For details, refer to RPN paragraph.

4.4.8. RPN (Registry Parameter Number)

BnH 64H llH (LSB)

BnH 65H mmH (MSB)

n: Channel number 0 to 15 (0H to FH)
 ll: Parameter number MSB 0 to 127 (00H to 7FH)
 mm: Parameter number MSB 0 to 127 (00H to 7FH)

Initial setting value: 127/127 (7FH/7FH)

It is used for RPN parameter number designation.

4.4.8.1. Pitch Bend Sensitivity

BnH	64H	00H/BnH 65H 00G (RPN parameter designation)
BnH	64H	mmH / BnH 26H llH (data entry)

n: Channel number 0 to 15 (0H to FH)
 mm: MSB of data value 0 to 24 (00H 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=01 and LSB=00, the sensitivity becomes ± 1 halftones. (Overall ranges of change are 2 halftones.)

4.4.9. All Sound Off

BnH	78H	00H
n:	channel number 0 to 15 (0H to FH)	

All the voices under voice-generation are immediately muted by the applicable channel after specification of this message.

4.4.10. Reset All Controller

BnH 79H 00H

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

According to Table 7, a controller is re-set to an initial value after specifying this message.

Table 7 Initial Value of Reset All Controllers

Controller	Name	Value
1	Modulation	0 (OFF)
11	Expression	127 (MAX)
64	Hold1	0 (OFF)
100	RPN LSB	127 (NULL)
101	RPN MSB	127 (NULL)
-	Pitch Bend	MSB 64 / LSB 0
-	Key Velocity	64

Program change, bank select, channel volume and pan are not reset.

Note: Please place the Reset all controller message before the Start Point.
The RPN.LSB/MSB may not be reset if the Reset all controller message was used in music.

4.4.11. All Note Off

BnH 7BH 00H

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

All voices during sound generation on applicable channels are turned-off.

4.4.12. Mono-mode On

BnH 7EH 0x01H

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

An applicable channel is changed to the mono-mode.

It is valid only when it exists before the first note in the music. Mode change in the music is prohibited.

When a channel is in mono-mode, notes of poly are subjected to slur (legato) processing. When a tone of note of the first tone in the slur processing is silenced by DVA, attack can be attached (retrigger) to the note of the second tone.

[Note] In the channel of which Mono-mode was designated, if there is two or more NoteOn existing in same timing, a last note is left, but other are deleted. (This process is applied to also Drum/StreamPCM channels.)

4.4.13. Poly Mode On (Only for MA-3 mode)

BnH 7FH 0x00H

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

An applicable channel is changed to the poly-mode.

It is valid only when it exists before the first note in the music. Mode change in the music is prohibited.

It is an event that is valid only in MA-3 output format, in the SSD. In case of MA-5, the event is disregarded. (Refer to “2.3Poly-Mode On.”)

4.5. Pitch Bend

EnH llH mmH

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

Initial setting value: 0/64 (0H/40H; center)

Changes the pitch of applicable channel up or down. The initial value of change width (pitch bend sensitivity) is ± 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.

4.6. Meta Event

4.6.1. Tempo

FFH 51H 03H ttH ttH ttH

tt tt tt: length of quarter notes (μ sec)

SSD allows designation of tempo in any location because it accommodates to temp change in the music.

4.6.2. Text

FFH 01H llH ddH...ddH

ll : No. of bytes of text (variable length presentation)

dd: text data

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

SSD converts this event to each information of Optional Data Chunk of SMAF/MA-3 and SMAF/MA-5..

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 SSD.

4.6.3. Display of Copyright

FFH 02H llH ddH

ll : no. of bytes of text (variable length presentation)

dd: text data

By describing copyright information, copyright can be inputted.

SSD converts this event to Copyright of Optional Data Chunk of SMAF/MA-3 or SMAF/MA-5.

4.6.4. Cue-Point

FFH	07H	05H	53H	54H	41H	52H	54H (START)
FFH	07H	04H	53H	54H	4FH	50H	(STOP)

A playing start and stop positions as Cue Point of meta-event are specified.

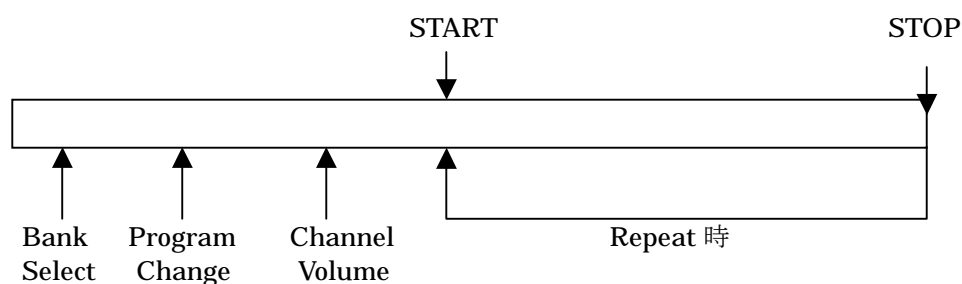
SSD converts these events to Start Point and Stop Point of SMAF/MA-3 or SMAF/MA-5.

4th to 8th bytes of START (53H 54H 41H 52H 54H) means “START”(capital letters) in ASCII.

4th to 7th bytes of STOP (53H 54H 4FH 50H) means “STOP”(capital letters) in ASCII.

START is to be inserted into the position of the first Note On or before it, and STOP is to be inserted after the last Note Off.

START and STOP are to be inserted into music as a pair.



As described above, when START is inserted after the control messages, these control messages are read also at repeating.

4.6.5. XF Cue Point

FFH 7FH 04H 43H 7BH 02H rrH

rr : Rehearsal Mark

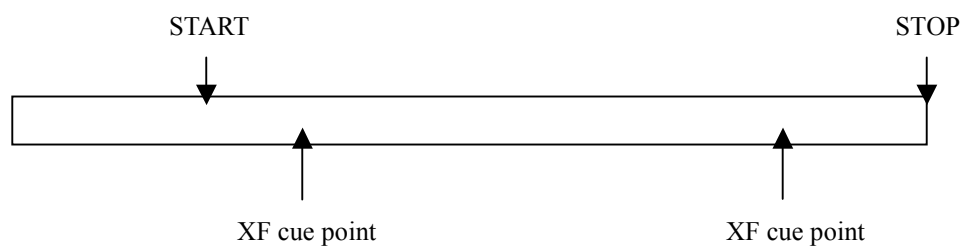
Loop setting point can be designated by describing rehearsal mark with XF-formatting (refer to <APPENDIX>).

SSD converts this event to Phrase List of SMAF/MA-3 or SMAF/MA-5. For the conversion, refer to the following table.

Table 8 Supporting Table of Rehearsal Mark and Phrase List

XF Rehearsal Mark	Loop setting
Intro	Introduction (PI)
Ending	Ending (PE)
A	Melody A (PA)
B	Melody B (PB)
C	Bridge (PS)
D	Interlude (PK)
E	Refrain (PR)

Insert this meta-event between START and STOP of the cue point (4.6.4Cue-Point) in time.



4.6.6. Chanel Status Specification

FFH 7FH 14H 43H 02H 00H 04H ddH...ddH

dd : VS/LED setting value from channel 1 to channel 16 (fixed to 16 pieces)

Table 9 Channel status setting value

Setting value	VS	LED
0	OFF	OFF
1	OFF	ON
2	ON	OFF
3	ON	ON

Channel status information is specified. VS and LED of channels 1 to 16 are specified according to the above table.

4.7. Universal System Exclusive Message

4.7.1. Master Volume

Message	Description
F0H 7FH	Universal real time exclusive header
<device ID>	ID of unit that becomes target (127:ALL)
04H	Sub-ID number #1
01H	Sub-ID number #2
lIH	Master Volume LSB
mmH	Master Volume MSB
F7H	EOX

Initial setting value: 100 (64H)

Performs volume setting of final stage of synthesizer output. "lI" is ignored.

Formula: $\text{Gain[dB]} = 20 * \log((\text{Data})^2 / 127^2)$

Note: When multiple master volume events exist before the first note message, a master volume value of an event just before the first note message is reflected to the each channel "SMF" column of the SSD mixer.

4.8. Classified System Exclusive Message

Performs definition of items such as voice setting and waveform setting specific to each device exclusively.

4.8.1. User Event

F0H 43H 79H 06H 7FH 10H ddH F7H

dd: User event classification 0 to 15 (0H to FH)

An interrupt position on the sequence can be designated.

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.

5. Other Note

5.1. Vibration and LED

We recommend you to use this function at track which note is not voice-generated more moderately than track which note is always generated. And, please create the track which inputted only the specified note to use this vibration and LED effectively especially (For example, the track of only the high hat portion of drum).

About a vibration, when the gate time of the note of synchronous assignment channel is short, the effect may be unable to be seen. Moreover, when the interval of note and note is short, it may be unable to check that the swing has stopped. These are based on the response characteristic of the vibrating motor. The length of gate time and the interval of notes should be set up in consideration of this.

Please check the operation of vibration and LED by actual playback.

5.2. Volume Designation and Note Event

Do not set a note message at the same time of volume designation in the SSD.

Noise may occur and the attack of sound may be lost. In order to avoid them, note message should be set with the interval more than 22 msec after volume designation.

If the time period from Start Point to first NoteOn is similarly short, noise may be generated in a timing of first NoteOn, which is a repeating playback later than 2nd playback.

The target messages of volume designation are Master Volume, Channel Volume, Expression, and Pan pot. When especially volume discrepancy is large, it becomes easy to occur this problem.

5.3. Mono-Mode-On and Limit of the Maximum Simultaneous Polyphony Number (only MA-3)

In the SSD with MA-3 output format, contents in excess of the number of maximum simultaneous polyphony cannot be converted when the Mono-Mode-On is used in some channel, because of possibility of voice-generation number decrease.

When a correspondent error message is output, avoid such case by the following ways; No use of the Mono-Mode-On on SMF, or modifying a sequence data so that contents do not exceed the maximum simultaneous polyphony.

5.4. Note On at the same timing in Mono-Mode-On (only MA-3)

In the SSD with MA-3 format, do not place multiple Note On at the same timing (duration=0) in the channel that the Mono-Mode-On is used.

In the channel that Mono-Mode-On is used, when multiple Note On exist at the same timing, the latter note is voice-generated but the voice level may not come up (volume decreases) to the Total Level.

5.5. Event Density Limit

Event density defines the number of events of the unit time neighborhood, and calculates it by a note event (6Byte), a program change (2Byte), a control change (3Byte), pitch BENDO (3Byte), and the exclusive message (the Byte number and 2(F0, F7) Byte of a data part). A unit is [Byte/sec].

In Table 10, the fiducially point in the SSD to the kind and each of event density is described

Table 10 Kind and fiducially point of Event Density.

Event Density	Definition	Fiducially Point (Byte/s)
Average Event Density	Averaged event density which lets one music pass	500
Momentary Maximum Event Density	Event density in the time when the value in the inside of one music is the largest	1000

In the SSD, data higher than a fiducially point given in table 10 has prepared restriction so that it cannot be saved.

5.6. Total Length after Conversion

When total length becomes below 20msec, it is not converted to SMAF as an error.
Please be sure to create a SMF so that total length exceeds 20msec.

5.7. Key Control Status

If there is a one of the following condition, the key control status of relevant channels are defined as "OFF".

- 1) The value of an existing bank select MSB is only "125 (7DH)", and there is a program change after that.
- 2) In the channel 0x09 (10 channel), the bank selection MSB whose value is "124 (7CH)" (or "122 (7AH)") does not exist.
- 3) Note events do not exist.

What was described above is judged as a drum / stream PCM channel in the SSD.
By the other channel, key control status becomes "unspecified."

5.8. RAM Size Limit

As for SSD, number of voice is limited so that it cannot be converted, when voice number is in excess of the MA-3 or MA-5 RAM size limit. Only when the voice using RAM is selected especially, it exceeds the RAM size limit.

When a corresponding error message is output, avoid such case by selecting a voice that does not use RAM.
For a voice in which RAM is used, refer to "7.2Drum Voice Map.

6. Appendix

6.1. XF Information Header (by language)

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

FFH 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.

1) and 2) of information items and various control codes are described with ASCII.

The following sections describe XF Information Header -- Language Specific that uses Japanese.

6.1.1. Information Items

6.1.1.1. XF Information Header -- Language Specific -- ID (XF Information Header (by Language) ID)

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

6.1.1.2. 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	EUC-KR	Korean

6.1.1.3. Song Name

Expression of time 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.

6.1.1.4. 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, "/".

6.1.1.5. Lyricist

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

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

6.1.1.6. Arranger

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

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

6.1.1.7. 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.

6.1.1.8. Programmer

Name of a person who authored music data.

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

6.2. XF Rehearsal Mark

For XF format, rehearsal marks are defined as the style message as described below.

FF 7F 04 43 7B 02 rr Rehearsal Mark

rr Rehearsal Mark 0yyyxxxx

Lower 4 bits (xxxx)

0: Intro

1: Ending

2: Fill-in

3: A

4: B

:

15: M

Upper 3 bits (yyy)

0-7: individual variation

1 : it is ' A', B' , etc.

2 : it is " A", B" , etc.

Used for designation of an end of the so-called individual sections.

It is placed in between measures.

Music that does not have some rehearsal marks may exist.

The number of measure placed between rehearsal marks can be determined arbitrarily.

7. Voice List

7.1. Normal Voice MAP (FM 4 Operator Voice)

Bank MSB	124				
Bank LSB	0				
VOICE-SET	STANDARD	BRIGHT	BITTER	REFLECT	CYBER
Pch#	VoiceName	VoiceName	VoiceName	VoiceName	VoiceName
1	St-GrandPno	Br-GrandPno	Bi-GrandPno	Re-GrandPno	Cy-GrandPno
2	St-BritePno	Br-BritePno	Bi-BritePno	Re-BritePno	Cy-BritePno
3	St-E.GrandP	Br-E.GrandP	Bi-E.GrandP	Re-E.GrandP	Cy-E.GrandP
4	St-HnkyTonk	Br-HnkyTonk	Bi-HnkyTonk	Re-HnkyTonk	Cy-HnkyTonk
5	St-E.Piano1	Br-E.Piano1	Bi-E.Piano1	Re-E.Piano1	Cy-E.Piano1
6	St-E.Piano2	Br-E.Piano2	Bi-E.Piano2	Re-E.Piano2	Cy-E.Piano2
7	St-Harpsi.	Br-Harpsi.	Bi-Harpsi.	Re-Harpsi.	Cy-Harpsi.
8	St-Clavi.	Br-Clavi.	Bi-Clavi.	Re-Clavi.	Cy-Clavi.
9	St-Celesta	Br-Celesta	Bi-Celesta	Re-Celesta	Cy-Celesta
10	St-Glocken	Br-Glocken	Bi-Glocken	Re-Glocken	Cy-Glocken
11	St-MusicBox	Br-MusicBox	Bi-MusicBox	Re-MusicBox	Cy-MusicBox
12	St-Vibes	Br-Vibes	Bi-Vibes	Re-Vibes	Cy-Vibes
13	St-Marimba	Br-Marimba	Bi-Marimba	Re-Marimba	Cy-Marimba
14	St-Xylophon	Br-Xylophon	Bi-Xylophon	Re-Xylophon	Cy-Xylophon
15	St-TubulBel	Br-TubulBel	Bi-TubulBel	Re-TubulBel	Cy-TubulBel
16	St-Dulcimer	Br-Dulcimer	Bi-Dulcimer	Re-Dulcimer	Cy-Dulcimer
17	St-DrawOrgn	Br-DrawOrgn	Bi-DrawOrgn	Re-DrawOrgn	Cy-DrawOrgn
18	St-PercOrgn	Br-PercOrgn	Bi-PercOrgn	Re-PercOrgn	Cy-PercOrgn
19	St-RockOrgn	Br-RockOrgn	Bi-RockOrgn	Re-RockOrgn	Cy-RockOrgn
20	St-ChrchOrg	Br-ChrchOrg	Bi-ChrchOrg	Re-ChrchOrg	Cy-ChrchOrg
21	St-ReedOrgn	Br-ReedOrgn	Bi-ReedOrgn	Re-ReedOrgn	Cy-ReedOrgn
22	St-Acordion	Br-Acordion	Bi-Acordion	Re-Acordion	Cy-Acordion
23	St-Harmnica	Br-Harmnica	Bi-Harmnica	Re-Harmnica	Cy-Harmnica
24	St-TangoAcid	Br-TangoAcid	Bi-TangoAcid	Re-TangoAcid	Cy-TangoAcid
25	St-NylonGtr	Br-NylonGtr	Bi-NylonGtr	Re-NylonGtr	Cy-NylonGtr
26	St-SteelGtr	Br-SteelGtr	Bi-SteelGtr	Re-SteelGtr	Cy-SteelGtr
27	St-Jazz Gtr	Br-Jazz Gtr	Bi-Jazz Gtr	Re-Jazz Gtr	Cy-Jazz Gtr
28	St-CleanGtr	Br-CleanGtr	Bi-CleanGtr	Re-CleanGtr	Cy-CleanGtr
29	St-Mute.Gtr	Br-Mute.Gtr	Bi-Mute.Gtr	Re-Mute.Gtr	Cy-Mute.Gtr
30	St-Ovrdrive	Br-Ovrdrive	Bi-Ovrdrive	Re-Ovrdrive	Cy-Ovrdrive
31	St-Dist.Gtr	Br-Dist.Gtr	Bi-Dist.Gtr	Re-Dist.Gtr	Cy-Dist.Gtr
32	St-GtrHarmo	Br-GtrHarmo	Bi-GtrHarmo	Re-GtrHarmo	Cy-GtrHarmo
33	St-Aco.Bass	Br-Aco.Bass	Bi-Aco.Bass	Re-Aco.Bass	Cy-Aco.Bass
34	St-FngrBass	Br-FngrBass	Bi-FngrBass	Re-FngrBass	Cy-FngrBass
35	St-PickBass	Br-PickBass	Bi-PickBass	Re-PickBass	Cy-PickBass
36	St-Fretless	Br-Fretless	Bi-Fretless	Re-Fretless	Cy-Fretless
37	St-SlapBas1	Br-SlapBas1	Bi-SlapBas1	Re-SlapBas1	Cy-SlapBas1
38	St-SlapBas2	Br-SlapBas2	Bi-SlapBas2	Re-SlapBas2	Cy-SlapBas2
39	St-SynBass1	Br-SynBass1	Bi-SynBass1	Re-SynBass1	Cy-SynBass1
40	St-SynBass2	Br-SynBass2	Bi-SynBass2	Re-SynBass2	Cy-SynBass2
41	St-Violin	Br-Violin	Bi-Violin	Re-Violin	Cy-Violin
42	St-Viola	Br-Viola	Bi-Viola	Re-Viola	Cy-Viola
43	St-Cello	Br-Cello	Bi-Cello	Re-Cello	Cy-Cello
44	St-ContraBs	Br-ContraBs	Bi-ContraBs	Re-ContraBs	Cy-ContraBs
45	St-Trem.Str	Br-Trem.Str	Bi-Trem.Str	Re-Trem.Str	Cy-Trem.Str
46	St-Pizz.Str	Br-Pizz.Str	Bi-Pizz.Str	Re-Pizz.Str	Cy-Pizz.Str
47	St-Harp	Br-Harp	Bi-Harp	Re-Harp	Cy-Harp
48	St-Timpani	Br-Timpani	Bi-Timpani	Re-Timpani	Cy-Timpani

Bank MSB	124				
Bank LSB	0				
VOICE-SET	STANDARD	BRIGHT	BITTER	REFLECT	CYBER
Pch#	VoiceName	VoiceName	VoiceName	VoiceName	VoiceName
49	St-Strings1	Br-Strings1	Bi-Strings1	Re-Strings1	Cy-Strings1
50	St-Strings2	Br-Strings2	Bi-Strings2	Re-Strings2	Cy-Strings2
51	St-Syn.Str1	Br-Syn.Str1	Bi-Syn.Str1	Re-Syn.Str1	Cy-Syn.Str1
52	St-Syn.Str2	Br-Syn.Str2	Bi-Syn.Str2	Re-Syn.Str2	Cy-Syn.Str2
53	St-ChoirAah	Br-ChoirAah	Bi-ChoirAah	Re-ChoirAah	Cy-ChoirAah
54	St-VoiceOoh	Br-VoiceOoh	Bi-VoiceOoh	Re-VoiceOoh	Cy-VoiceOoh
55	St-SynVoice	Br-SynVoice	Bi-SynVoice	Re-SynVoice	Cy-SynVoice
56	St-Orch.Hit	Br-Orch.Hit	Bi-Orch.Hit	Re-Orch.Hit	Cy-Orch.Hit
57	St-Trumpet	Br-Trumpet	Bi-Trumpet	Re-Trumpet	Cy-Trumpet
58	St-Trombone	Br-Trombone	Bi-Trombone	Re-Trombone	Cy-Trombone
59	St-Tuba	Br-Tuba	Bi-Tuba	Re-Tuba	Cy-Tuba
60	St-Mute.Trp	Br-Mute.Trp	Bi-Mute.Trp	Re-Mute.Trp	Cy-Mute.Trp
61	St-Fr.Horn	Br-Fr.Horn	Bi-Fr.Horn	Re-Fr.Horn	Cy-Fr.Horn
62	St-BrasSect	Br-BrasSect	Bi-BrasSect	Re-BrasSect	Cy-BrasSect
63	St-SynBras1	Br-SynBras1	Bi-SynBras1	Re-SynBras1	Cy-SynBras1
64	St-SynBras2	Br-SynBras2	Bi-SynBras2	Re-SynBras2	Cy-SynBras2
65	St-SprnoSax	Br-SprnoSax	Bi-SprnoSax	Re-SprnoSax	Cy-SprnoSax
66	St-Alto Sax	Br-Alto Sax	Bi-Alto Sax	Re-Alto Sax	Cy-Alto Sax
67	St-TenorSax	Br-TenorSax	Bi-TenorSax	Re-TenorSax	Cy-TenorSax
68	St-Bari.Sax	Br-Bari.Sax	Bi-Bari.Sax	Re-Bari.Sax	Cy-Bari.Sax
69	St-Oboe	Br-Oboe	Bi-Oboe	Re-Oboe	Cy-Oboe
70	St-Eng.Horn	Br-Eng.Horn	Bi-Eng.Horn	Re-Eng.Horn	Cy-Eng.Horn
71	St-Bassoon	Br-Bassoon	Bi-Bassoon	Re-Bassoon	Cy-Bassoon
72	St-Clarinet	Br-Clarinet	Bi-Clarinet	Re-Clarinet	Cy-Clarinet
73	St-Piccolo	Br-Piccolo	Bi-Piccolo	Re-Piccolo	Cy-Piccolo
74	St-Flute	Br-Flute	Bi-Flute	Re-Flute	Cy-Flute
75	St-Recorder	Br-Recorder	Bi-Recorder	Re-Recorder	Cy-Recorder
76	St-PanFlute	Br-PanFlute	Bi-PanFlute	Re-PanFlute	Cy-PanFlute
77	St-Bottle	Br-Bottle	Bi-Bottle	Re-Bottle	Cy-Bottle
78	St-Shakhchi	Br-Shakhchi	Bi-Shakhchi	Re-Shakhchi	Cy-Shakhchi
79	St-Whistle	Br-Whistle	Bi-Whistle	Re-Whistle	Cy-Whistle
80	St-Ocarina	Br-Ocarina	Bi-Ocarina	Re-Ocarina	Cy-Ocarina
81	St-SquareLd	Br-SquareLd	Bi-SquareLd	Re-SquareLd	Cy-SquareLd
82	St-Saw.Lead	Br-Saw.Lead	Bi-Saw.Lead	Re-Saw.Lead	Cy-Saw.Lead
83	St-CaliopLd	Br-CaliopLd	Bi-CaliopLd	Re-CaliopLd	Cy-CaliopLd
84	St-ChiffLd	Br-ChiffLd	Bi-ChiffLd	Re-ChiffLd	Cy-ChiffLd
85	St-CharanLd	Br-CharanLd	Bi-CharanLd	Re-CharanLd	Cy-CharanLd
86	St-Voice Ld	Br-Voice Ld	Bi-Voice Ld	Re-Voice Ld	Cy-Voice Ld
87	St-Fifth Ld	Br-Fifth Ld	Bi-Fifth Ld	Re-Fifth Ld	Cy-Fifth Ld
88	St-Bass & Ld	Br-Bass & Ld	Bi-Bass & Ld	Re-Bass & Ld	Cy-Bass & Ld
89	St-NewAgePd	Br-NewAgePd	Bi-NewAgePd	Re-NewAgePd	Cy-NewAgePd
90	St-Warm Pad	Br-Warm Pad	Bi-Warm Pad	Re-Warm Pad	Cy-Warm Pad
91	St-PolySyPd	Br-PolySyPd	Bi-PolySyPd	Re-PolySyPd	Cy-PolySyPd
92	St-ChoirPad	Br-ChoirPad	Bi-ChoirPad	Re-ChoirPad	Cy-ChoirPad
93	St-BowedPad	Br-BowedPad	Bi-BowedPad	Re-BowedPad	Cy-BowedPad
94	St-MetalPad	Br-MetalPad	Bi-MetalPad	Re-MetalPad	Cy-MetalPad
95	St-Halo Pad	Br-Halo Pad	Bi-Halo Pad	Re-Halo Pad	Cy-Halo Pad
96	St-SweepPad	Br-SweepPad	Bi-SweepPad	Re-SweepPad	Cy-SweepPad
97	St-Rain	Br-Rain	Bi-Rain	Re-Rain	Cy-Rain
98	St-SoundTrk	Br-SoundTrk	Bi-SoundTrk	Re-SoundTrk	Cy-SoundTrk
99	St-Crystal	Br-Crystal	Bi-Crystal	Re-Crystal	Cy-Crystal
100	St-Atmosphr	Br-Atmosphr	Bi-Atmosphr	Re-Atmosphr	Cy-Atmosphr

Bank MSB	124				
Bank LSB	0				
VOICE-SET	STANDARD	BRIGHT	BITTER	REFLECT	CYBER
Pch#	VoiceName	VoiceName	VoiceName	VoiceName	VoiceName
101	St-Bright	Br-Bright	Bi-Bright	Re-Bright	Cy-Bright
102	St-Goblins	Br-Goblins	Bi-Goblins	Re-Goblins	Cy-Goblins
103	St-Echoes	Br-Echoes	Bi-Echoes	Re-Echoes	Cy-Echoes
104	St-Sci-Fi	Br-Sci-Fi	Bi-Sci-Fi	Re-Sci-Fi	Cy-Sci-Fi
105	St-Sitar	Br-Sitar	Bi-Sitar	Re-Sitar	Cy-Sitar
106	St-Banjo	Br-Banjo	Bi-Banjo	Re-Banjo	Cy-Banjo
107	St-Shamisen	Br-Shamisen	Bi-Shamisen	Re-Shamisen	Cy-Shamisen
108	St-Koto	Br-Koto	Bi-Koto	Re-Koto	Cy-Koto
109	St-Kalimba	Br-Kalimba	Bi-Kalimba	Re-Kalimba	Cy-Kalimba
110	St-Bagpipe	Br-Bagpipe	Bi-Bagpipe	Re-Bagpipe	Cy-Bagpipe
111	St-Fiddle	Br-Fiddle	Bi-Fiddle	Re-Fiddle	Cy-Fiddle
112	St-Shanai	Br-Shanai	Bi-Shanai	Re-Shanai	Cy-Shanai
113	St-TnklBell	Br-TnklBell	Bi-TnklBell	Re-TnklBell	Cy-TnklBell
114	St-Agogo	Br-Agogo	Bi-Agogo	Re-Agogo	Cy-Agogo
115	St-SteelDrm	Br-SteelDrm	Bi-SteelDrm	Re-SteelDrm	Cy-SteelDrm
*1 116	St-WoodBlok	Br-WoodBlok	Bi-WoodBlok	Re-WoodBlok	Cy-WoodBlok
*2 117	St-TaikoDrm	Br-TaikoDrm	Bi-TaikoDrm	Re-TaikoDrm	Cy-TaikoDrm
P *3 118	St-MelodTom	Br-MelodTom	Bi-MelodTom	Re-MelodTom	Cy-MelodTom
*4 119	St-Syn.Drum	Br-Syn.Drum	Bi-Syn.Drum	Re-Syn.Drum	Cy-Syn.Drum
*4 120	St-RevCymbl	Br-RevCymbl	Bi-RevCymbl	Re-RevCymbl	Cy-RevCymbl
121	St-FretNoiz	Br-FretNoiz	Bi-FretNoiz	Re-FretNoiz	Cy-FretNoiz
122	St-BrthNoiz	Br-BrthNoiz	Bi-BrthNoiz	Re-BrthNoiz	Cy-BrthNoiz
*5 123	St-Seashore	Br-Seashore	Bi-Seashore	Re-Seashore	Cy-Seashore
*6 124	St-Tweet	Br-Tweet	Bi-Tweet	Re-Tweet	Cy-Tweet
*7 125	St-Telphone	Br-Telphone	Bi-Telphone	Re-Telphone	Cy-Telphone
*7 126	St-Helicptr	Br-Helicptr	Bi-Helicptr	Re-Helicptr	Cy-Helicptr
*6 127	St-Applause	Br-Applause	Bi-Applause	Re-Applause	Cy-Applause
*5 128	St-Gunshot	Br-Gunshot	Bi-Gunshot	Re-Gunshot	Cy-Gunshot

*1 : 50 cent / half-tone, #69 = F#4
 *2 : 50 cent / half-tone, #69 = A2
 *3 : 50 cent / half-tone, #69 = C#4
 *4 : 50 cent / half-tone
 *5 : 20 cent / half-tone
 *6 : 5 cent / half-tone
 *7 : 10 cent / half-tone
 * The key control judging of the voice
 which * attached is used as a drum tone.

:Voice of which is same as Pch# number of other voice set

P: PCM Voice (Only Pch#118)


7.2. Drum Voice Map

In case of many voices which use RAM are used, MA-3/MA-5 RAM size limitation are exceeded, so it can not be converted. For details about the avoidance strategy, see the “5.8RAM Size Limit.”

Bank MSB	125									
Pch#	1									
VOICE-SET	STANDARD		BRIGHT		BITTER		REFLECT		CYBER	
Note#	VoiceName	Typ	VoiceName	Typ	VoiceName	Typ	VoiceName	Typ	VoiceName	Typ
24	St-Seq Click H		Br-Seq Click H		Bi-Seq Click H		Re-Seq Click H		Cy-Seq Click H	
25	St-Brush Tap		Br-Brush Tap		Bi-Brush Tap		Re-Brush Tap		Cy-Brush Tap	
26	St-Brush Swirl	@	Br-Brush Swirl	@	Bi-Brush Swirl	@	Re-Brush Swirl	@	Cy-Brush Swirl	@
27	St-Brush Slap		Br-Brush Slap		Bi-Brush Slap		Re-Brush Slap		Cy-Brush Slap	
28	St-BrushTapSwirl	@	Br-BrushTapSwirl	@	Bi-BrushTapSwirl	@	Re-BrushTapSwirl	@	Cy-BrushTapSwirl	@
29	St-Snare Roll	@	Br-Snare Roll	@	Bi-Snare Roll	@	Re-Snare Roll	@	Cy-Snare Roll	RA@
30	St-Castanet		Br-Castanet		Bi-Castanet		Re-Castanet		Cy-Castanet	
31	St-Snare L		Br-Snare L		Bi-Snare L		Re-Snare L		Cy-Snare L	
32	St-Sticks		Br-Sticks		Bi-Sticks		Re-Sticks		Cy-Sticks	
33	St-Bass DrumL		Br-Bass DrumL		Bi-Bass DrumL		Re-Bass DrumL		Cy-Bass DrumL	
34	St-Open RimShot		Br-Open RimShot		Bi-Open RimShot		Re-Open RimShot		Cy-Open RimShot	
35	St-Bass DrumM		Br-Bass DrumM		Bi-Bass DrumM		Re-Bass DrumM		Cy-Bass DrumM	
36	St-Bass DrumH		Br-Bass DrumH		Bi-Bass DrumH		Re-Bass DrumH		Cy-Bass DrumH	
37	St-ClosedRimShot		Br-ClosedRimShot		Bi-ClosedRimShot		Re-ClosedRimShot		Cy-ClosedRimShot	
38	St-Snare M		Br-Snare M		Bi-Snare M		Re-Snare M		Cy-Snare M	RA
39	St-Hand Clap	RA	Br-Hand Clap	RA	Bi-Hand Clap	RA	Re-Hand Clap	RA	Cy-Hand Clap	
40	St-Snare H		Br-Snare H		Bi-Snare H	RA	Re-Snare H		Cy-Snare H	RA
41	St-Floor TomL		Br-Floor TomL		Bi-Floor TomL		Re-Floor TomL		Cy-Floor TomL	
42	St-Hi-Hat Closed		Br-Hi-Hat Closed		Bi-Hi-Hat Closed		Re-Hi-Hat Closed		Cy-Hi-Hat Closed	
43	St-Floor TomH		Br-Floor TomH		Bi-Floor TomH		Re-Floor TomH		Cy-Floor TomH	
44	St-Hi-Hat Pedal		Br-Hi-Hat Pedal		Bi-Hi-Hat Pedal		Re-Hi-Hat Pedal		Cy-Hi-Hat Pedal	
45	St-Low Tom		Br-Low Tom		Bi-Low Tom		Re-Low Tom		Cy-Low Tom	
46	St-Hi-Hat Open		Br-Hi-Hat Open		Bi-Hi-Hat Open		Re-Hi-Hat Open		Cy-Hi-Hat Open	
47	St-Mid TomL		Br-Mid TomL		Bi-Mid TomL		Re-Mid TomL		Cy-Mid TomL	
48	St-Mid TomH		Br-Mid TomH		Bi-Mid TomH		Re-Mid TomH		Cy-Mid TomH	
49	St-CrashCymbal 1		Br-CrashCymbal 1		Bi-CrashCymbal 1		Re-CrashCymbal 1		Cy-CrashCymbal 1	
50	St-High Tom		Br-High Tom		Bi-High Tom		Re-High Tom		Cy-High Tom	
51	St-Ride Cymbal 1		Br-Ride Cymbal 1		Bi-Ride Cymbal 1		Re-Ride Cymbal 1		Cy-Ride Cymbal 1	
52	St-ChineseCymbal		Br-ChineseCymbal		Bi-ChineseCymbal		Re-ChineseCymbal		Cy-ChineseCymbal	
53	St-RideCymbalCup		Br-RideCymbalCup		Bi-RideCymbalCup		Re-RideCymbalCup		Cy-RideCymbalCup	
54	St-Tambourine	RA	Br-Tambourine	RA	Bi-Tambourine	RA	Re-Tambourine	RA	Cy-Tambourine	
55	St-Splash Cymbal		Br-Splash Cymbal		Bi-Splash Cymbal		Re-Splash Cymbal		Cy-Splash Cymbal	
56	St-Cowbell	RA	Br-Cowbell	RA	Bi-Cowbell	RA	Re-Cowbell	RA	Cy-Cowbell	
57	St-CrashCymbal 2		Br-CrashCymbal 2		Bi-CrashCymbal 2		Re-CrashCymbal 2		Cy-CrashCymbal 2	
58	St-Vibraslap		Br-Vibraslap		Bi-Vibraslap		Re-Vibraslap		Cy-Vibraslap	
59	St-Ride Cymbal 2		Br-Ride Cymbal 2		Bi-Ride Cymbal 2		Re-Ride Cymbal 2		Cy-Ride Cymbal 2	
60	St-Bongo H	RA	Br-Bongo H	RA	Bi-Bongo H	RA	Re-Bongo H	RA	Cy-Bongo H	
61	St-Bongo L	RA	Br-Bongo L	RA	Bi-Bongo L	RA	Re-Bongo L	RA	Cy-Bongo L	
62	St-Conga H Mute	RA	Br-Conga H Mute	RA	Bi-Conga H Mute	RA	Re-Conga H Mute	RA	Cy-Conga H Mute	
63	St-Conga H Open	RA	Br-Conga H Open	RA	Bi-Conga H Open	RA	Re-Conga H Open	RA	Cy-Conga H Open	
64	St-Conga L	RA	Br-Conga L	RA	Bi-Conga L	RA	Re-Conga L	RA	Cy-Conga L	

Only the voice with "@" responds to Key Off.
 Key #42 / #44 / #46 Exclusion allotment.
 Key #71 / #72 Exclusion allotment.
 Key #73 / #74 Exclusion allotment.
 Key #78 / #79 Exclusion allotment.
 Key #80 / #81 Exclusion allotment.

RA: Voice which uses RAM

: Voice which is same as Pch# number of other voice

Bank MSB	125									
Pch#	1									
VOICE-SET	STANDARD		BRIGHT		BITTER		REFLECT		CYBER	
Note#	VoiceName	Typ	VoiceName	Typ	VoiceName	Typ	VoiceName	Typ	VoiceName	Typ
65	St-Timbale H	RA	Br-Timbale H	RA	Bi-Timbale H	RA	Re-Timbale H	RA	Cy-Timbale H	
66	St-Timbale L	RA	Br-Timbale L	RA	Bi-Timbale L	RA	Re-Timbale L	RA	Cy-Timbale L	
67	St-Agogo H		Br-Agogo H		Bi-Agogo H		Re-Agogo H		Cy-Agogo H	
68	St-Agogo L		Br-Agogo L		Bi-Agogo L		Re-Agogo L		Cy-Agogo L	
69	St-Cabasa		Br-Cabasa		Bi-Cabasa		Re-Cabasa		Cy-Cabasa	
70	St-Maracas		Br-Maracas		Bi-Maracas		Re-Maracas		Cy-Maracas	
71	St-SambaWhistleH	@	Br-SambaWhistleH	@	Bi-SambaWhistleH	@	Re-SambaWhistleH	@	Cy-SambaWhistleH	@
72	St-SambaWhistleL	@	Br-SambaWhistleL	@	Bi-SambaWhistleL	@	Re-SambaWhistleL	@	Cy-SambaWhistleL	@
73	St-Guiro Short		Br-Guiro Short		Bi-Guiro Short		Re-Guiro Short		Cy-Guiro Short	
74	St-Guiro Long	RA @	Br-Guiro Long	RA @	Bi-Guiro Long	RA @	Re-Guiro Long	RA @	Cy-Guiro Long	
75	St-Claves		Br-Claves		Bi-Claves		Re-Claves		Cy-Claves	
76	St-Wood Block H		Br-Wood Block H		Bi-Wood Block H		Re-Wood Block H		Cy-Wood Block H	
77	St-Wood Block L		Br-Wood Block L		Bi-Wood Block L		Re-Wood Block L		Cy-Wood Block L	
78	St-Cuica Mute		Br-Cuica Mute		Bi-Cuica Mute		Re-Cuica Mute		Cy-Cuica Mute	
79	St-Cuica Open		Br-Cuica Open		Bi-Cuica Open		Re-Cuica Open		Cy-Cuica Open	
80	St-Triangle Mute		Br-Triangle Mute		Bi-Triangle Mute		Re-Triangle Mute		Cy-Triangle Mute	
81	St-Triangle Open		Br-Triangle Open		Bi-Triangle Open		Re-Triangle Open		Cy-Triangle Open	
82	St-Shaker		Br-Shaker		Bi-Shaker		Re-Shaker		Cy-Shaker	
83	St-Jingle Bells		Br-Jingle Bells		Bi-Jingle Bells		Re-Jingle Bells		Cy-Jingle Bells	
84	St-Bell Tree		Br-Bell Tree		Bi-Bell Tree		Re-Bell Tree		Cy-Bell Tree	

Only the voice with "@" responds to Key Off.

Key #42 / #44 / #46 Exclusion allotment.


Key #71 / #72 Exclusion allotment.

Key #73 / #74 Exclusion allotment.

Key #78 / #79 Exclusion allotment.

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RA: Voice which uses RAM

: Voice which is same as Pch# number of other voice