

# MA-3 Realtime MIDI Outline of Interpretation

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Yamaha Corporation

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## &lt;Revision&gt;

Ver.	Date	Description
1.0	5/9/2000	Initial edition
1.1	5/21/2001	Velocity curve was corrected.
1.2	6/22/2001	MA-3 tones were changed.
1.3	7/23/2001	Bank=0x78/0x79 support was added.
1.3.1	7/31/2001	MonoMode support was corrected.
1.3.2	9/10/2001	Clerical error was corrected.
1.3.3	9/19/2001	The initial value of MasterVolume was changed into -9 [dB].
1.3.4	9/25/2001	DVA specification was simplified.
1.3.5	11/26/2001	The YAMAHA extension was treated as option.
1.3.6	12/25/2001	Operation of 4-OP voice definition in 2-OP mode was added. The mistake of tone-range expression was corrected.
1.3.7	1/25/2001	The mistake of correspondence bank corrected.
1.3.8	5/15/2002	2 The clerical error in Outline of pronunciation was corrected. 2.1 Setting volume The MasterVolume correspondence (Universal SysEx) was added. MasterVolume only for MA-3 is renamed to MaxGain The Change setting of NoteOn Velocity curve is specified. 2.4.4 Special processing of rhythmic tones was changed. A tone is limited to compatibility with GM L1. 2.5.2 The correspondence message was changed. The change setting of NoteOn Velocity curve is specified The range clerical error of Hold1 is corrected. The MasterVolume correspondence (Universal SysEx) was added. MasterVolume only for MA-3 is renamed to MaxGain. The Pitch bend range was changed into 0..24 from 1..24. The waveform number of WT tone waveform setting was limited to 0..31. GM SystemOn setting clerical error was corrected. The KeyOn/KeyOff clerical error was corrected. The UserEvent clerical error was corrected. 3.1 DEFAULT SOUND SET was changed. The Drum tone was limited to GM L1 specification. 3.3 The clerical error of MIDI Implementation Chart was corrected.
1.5.0	7/15/2002	2.4 The corresponding voice bank was changed to GM L2 conformity. 2.5 The supporting MIDI message was updated. BankSelect setting was changed to GM L2 conformity. GM2 SystemOn was added. 3.3 The unnecessary character of MIDI Implementation Chart was deleted.
1.6.0	12/15/2002	2.5.2.1 The extension message was standardized.

## 1 Outline

This document presents specifications of Realtime MIDI supported by MA-3. MIDI that accepts this interprets messages that comply with GM Lite/GM L1. When HW is in 24-Voice mode, it complies with GM Lite, or when in 40-Voice mode, it complies with GM L1. In addition to the standard GM messages, it supports the extension only for MA-3.

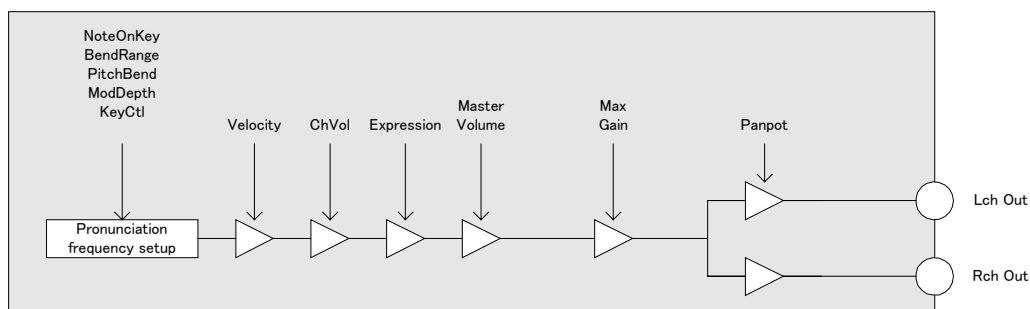
## 2 Outline of tone generation

It is interpreted with the agreement of GM Lite/M L1 as much as possible. However, only DVA processing more nearly simplex than the DVA mechanism specified by GM Lite for load reduction is supported, and some messages considered to be unnecessary for the mobile phone in GM L1 definition are not supported. Since, the above differences exist, it does not become GM full conformity.

- Interpretation of messages in accordance with provisions of GM Lite
  - Poly-phonic tone generation
  - Generates tones giving precedence to later ones by FM/WT sequencer independently.
- Supports GM standard tones. (FM 2-OP tones)
- Defines MaxGain devoted to MA-3 that determines maximum output with a single sound for the purpose of obtaining sufficient sound pressure.  
Standard: -9dB, Maximum: 0dB

### 2.1 Setting volume

Overall volume is obtained by adding five tone parameters that are set with Channel volume, Expression, NoteOn Velocity, MasterVoleme and MaxGain. NoteOn Velocity is a setting of source code and can be selected from 20Log() and 40Log().



## 2.2 Setting pitch

Overall pitch setting is obtained from Note numbers and bend information. Musical intervals are determined from keys and pitch bend in the Note message. However, in MA-3, the octave may fall about above 108.

## 2.3 Assignment of tone generation slot

Operation when the number of tones generated simultaneously is exceeded is as described below. DVA for FM and the one for WT are performed independently.

- 1) When there are KeyOff tones, tones with later KeyOff are given precedence.
- 2) When all tones are KeyOn, tones of later KeyOn are given precedence.

## 2.4 Corresponding voice banks

Melody tones and drum tones are distinguished based on the following conditions. In the designated sections, the tones are generated as GM sound set, and in some sections, users can change the contents. Although results of tone generation are not guaranteed in the banks that are not designated, the installation in MA-3 is to be default drum tones when BankMSB=0x7D, or default melody tones in other case. However, the setting which is other than Bank#0 is effective only at the YAMAHA extension option use.

### Melody

- |                                       |                             |
|---------------------------------------|-----------------------------|
| ▪ Bank = 0x00:0x00, Ch# = 0..8,10..15 | Default voices (For old GM) |
| ▪ BankMSB = 0x7C, BankLSB = 0..9      | User voices (Option)        |
| ▪ BankMSB = 0x79, BankLSB = 0         | Default voices              |

### Drum

- |  |                             |
|--|-----------------------------|
| ▪ Bank = 0x00:0x00, Ch# = 9                  | Default voices (For old GM) |
| ▪ BankMSB = 0x7D, Program = 0..9             | User voices (Option)        |
| ▪ BankMSB = 0x78, , BankLSB = 0, Program = 0 | Default voices              |

### 2.4.1 Number of simultaneously generated tones

MA-3 is to be made operable in 4-OP FM x 16-Voice + WT x 8-Voice mode. 2-OP FM x 32-Voice + WT x 8-Voice mode also can be operated as option.

### 2.4.2 MIDI channels

Corresponding to MIDI channels 1..16, #10 corresponds to percussion, and other numbers correspond to melody sound set.

### 2.4.3 Tone generation

To be omni OFF and poly-phonic ON.

#### **2.4.4 Special processing of rhythmic tones**

- Only Key#71/72/74 respond to KeyOff.
- Exclusive assignment of three hi-hat tones (Key#42/#44/#46)
- Exclusive assignment of Key#71/#72
- Exclusive assignment of Key#73/#74
- Exclusive assignment of Key#78/#79
- Exclusive assignment of Key#80/#81

2.5 The MIDI message to support

2.5.1 7 bit encode

To send specific data in the format of MIDI ExMsg, conversion is made so that the most significant bit becomes "0". This 7 bit encoding method is as described below, where a byte that holds lacking MSB-bit at every 8<sup>th</sup> byte.

Encoded data									Original data	
	MSB							LSB		
1 <sup>st</sup> byte	0	M0	M1	M2	M3	M4	M5	M6		
2 <sup>nd</sup> byte	0	L0							M0	L0
3 <sup>rd</sup> byte	0	L1							M1	L1
4 <sup>th</sup> byte	0	L2							M2	L2
5 <sup>th</sup> byte	0	L3							M3	L3
6 <sup>th</sup> byte	0	L4							M4	L4
7 <sup>th</sup> byte	0	L5							M5	L5
8 <sup>th</sup> byte	0	L6							M6	L6

### 2.5.2 Correspondence message

NoteOff 0x8n, kk, vv

---

Description

Key Off.

Argument

n : Channel number (0..15)  
 kk : Note number (0..127)  
 vv : Key velocity "vv" is ignored.

NoteOn 0x9n, kk, vv

---

Description

Key On.

Argument

n : Channel number (0..15)  
 kk : Note number (0..127)  
 vv : When velocity (0..127) vv = 0, it is interpreted as NoteOff.  
 $\text{Vol[dB]} = 20 * \log(vv/127)$ , however, MUTE when vv = 1.  
 By source option setting, Velocity curve can be changed into 40Log().

BankSelect (MSB) 0xBn, 0x00, vv

BankSelect (LSB) 0xBn, 0x20, vv

---

Description

Sets data bank of designated channel.

Initial value is 0.

The change of the real tone occurs in ProgramChange. 0x00/0x00 is the setting for a part of outdated GM data relief.

The initial value is 0x79/0x00(n != 9), 0x78/0x00(n == 9)

Bank# = 0x00/0x00 becomes GM melody (n!=9), GM drum (n==9).

GM melody is designated for Bank#=0x79/0x00.

GM drum is designated for Bank#=0x78/0x00 and Prg=0x00.

GM melody extension is designated for Bank#=0x7C/0x00..0x7C/0x09

GM drum extension is designated for Bank#=0x7D/xx and Prg=0x00..0x09

When there is no tone in the extended domain, they are to be GM voices.

Argument

n : Channel number (0..15)  
 vv : Set value (0..127)

---

Modulation            0xBn, 0x01, vv

---

## Description

Changes the amount of vibrato of designated channels.

With of change varies among the tones.

## Argument

n :            Channel number (0..15)  
vv :            Depth of vibrato added to standard vibrato (0..127)  
0 :            OFF  
1..127 :       Standard setting  $\times 2^{(vv/32)}$  [cents]  
1..31 :       Standard setting  
32..63 :       Standard setting  $\times 2$   
64..95 :       Standard setting  $\times 4$   
96..127 :      Standard setting  $\times 8$   
default: 0

---

Channel Volume       0xBn, 0x07, vv

---

## Description

Changes volume of designated channels.

## Argument

n :            Channel number (0..15)  
vv :            Control value (0..127)  
Gain[dB] =  $20 * \log (vv^2/127^2)$ , <Gain = MUTE if vv = 0>  
default: 100

---

Panpot                0xBn, 0x0A, vv

---

## Description

Sets panpot of designated channels.

## Argument

n :            Channel number (0..15)  
vv :            Control value (0..127)  
Lch[dB] =  $20 * \log (\cos (PAI/2 * vv/127))$ , <Lch = MUTE if vv = 127>  
Lch[dB] =  $20 * \log (\cos (PAI/2 * vv/127))$ , <Lch = MUTE if vv = 127>  
default: 64

---

Expression            0xBn, 0x0B, vv

---

## Description

Changes volume that is set with ChannelVolume of designated channels.

## Argument

n :            Channel number (0..15)  
vv :            Control value (0..127)  
Exp[dB] =  $20 * \log (vv^2/127^2)$ , <Exp = MUTE if vv = 0>  
default: 127

---

Hold1                      0xBn, 0x40, vv

---

Description

Changes damper setting of designated channels.  
Valid only for tones for which damper is valid.  
Default is OFF.

Argument

n :            Channel number (0..15)  
vv :            Damper setting (0..63:OFF, 64..127:ON)

DataEntry (MSB)        0xBn, 0x06, vv

DataEntry (LSB)        0xBn, 0x26, vv

---

Description

Data entry  
Supports only RPN (0,0) (Setting of pitch bend change width).  
vv that is set at MSB side shows sensitivity in 100 [cents] (0..24)  
LSB is ignored. Default is 200 [cents].

Argument

n :            Channel number (0..15)  
vv :            Set value (0..127)

NRPN (MSB)            0xBn, 0x63, vv

NRPN (LSB)            0xBn, 0x62, vv

---

Description

Sets NRPN number.  
Initial value is 127.  
NRPN is not supported, however, discrimination whether DataEntry is for NRPN or for RPN is made.

Argument

n :            Channel number (0..15)  
vv :            RPN number (0..127)

RPN (MSB)            0xBn, 0x65, vv

RPN (LSB)            0xBn, 0x64, vv

---

Description

Sets RPN number.  
Initial value is 127.  
RPN (0,0) enables setting of pitch bend change width. MSB of DataEntry shows sensitivity in 100 [cents]. (0..24)LSB is ignored. Default is 200 [cents].

Argument

n :            Channel number (0..15)  
vv :            RPN number (0..127)

---

ResetAllCtl            0xBn, 0x79, 0x00

---

## Description

Resets Control value of designated channels.

Mod[Ch] = 0 (OFF)

Expression[Ch] = 127 (Max)

Hold1[Ch] = 0 (OFF)

PitchBend[Ch] = 512 (1.0)

RPN[Ch] = 0x7F:0x7F

## Argument

n :            Channel number (0..15)

---

AllSoundOff            0xBn, 0x78, 0x00

---

## Description

Performs tone deadening of designated channels.

## Argument

n :            Channel number (0..15)

---

AllNoteOff            0xBn, 0x7B, 0x00

---

## Description

KeyOff all tones of designated channels.

## Argument

n :            Channel number (0..15)

---

MonoModeOn            0xBn, 0x7E, 0x01

---

## Description

Designates monophonic tone generation for designated channels.

All default tone generations are poly-phonic.

However, when drum is designated, it is interpreted automatically as PolyModeOn, and designation of MonoModeOn is ignored.

## Argument

n :            Channel number (0..15)

---

PolyModeOn            0xBn, 0x7F, 0x00

---

## Description

Designates poly-phonic tone generation for designated channels.

All default tone generations are poly-phonic.

## Argument

n :            Channel number (0..15)

ProgramChange      0xCn, ppDescription

Sets tones of designated channels.

Argument

n :          Channel number (0..15)  
 pp :        Program number (0..127)  
              default: 0

PitchBend0xEn, LL, HHDescription

Changes pitch of designated channels. Initial value of Max change width is 200[cents], and this Max. can be changed with RPN00H/00H.

Argument

n :          Channel number (0..15)  
 LL :        Amount of bend (LSB : 0..127)  
 HH :        Amount of bend (MSB : 0..127)  
              HH:LL : 0x00:0x00 (-Max)..0x40:0x00 (0[cents])..0x7f:0x7f (+Max)  
              default: 0x40:0x00  
              Cent-linear change curve.

### 2.5.2.1 Extension messages

YAMAHA extension message for MA-3 started from 0xF0, 0x43, 0x79 and 0x06.

#### 2.5.2.1.1 General-purpose extension

GM1 SystemOn 0xF0, 0x7E, 0x7F, 0x09, 0x01, 0xF7

GM2 SystemOn 0xF0, 0x7E, 0x7F, 0x09, 0x03, 0xF7

---

##### Description

Performs initialization as described below after deadening sounds.

MaxGain= 76(-9dB)

MasterVolume = 127(0dB)

#Bank[all] = initial value is 0x79/0x00(n != 9), 0x78/0x00(n == 9)

#Prog[all] = 0

Poly[All] = 1Ch

Volume[all] = 100

Panpot[all] = 64(Center)

Mod[all] = 0(OFF)Exp[all] = 127(Max)

Hold1[all] = 0(OFF)

PitchBend[all] = 0[cent]

RPN[all] = 0x7F:0x7F

##### Argument

None

---

MasterVolume 0xF0, 0x7F, 0x7F, 0x04, 0x01, LL, HH, 0xF7

---

##### Description

Sets Master volume.

##### Argument

LL: Master volume Low rank (0..127)

Ignore

HH: Master volume Upper rank (0..127)

Gain[dB] = 40 \* Log10(HH/127)[dB]

default: 127 (0dB)

**2.5.2.1.2 For MA-3 only**

MaxGain	0xF0, 0x43, 0x79, 0x06, 0x7f, 0x00, vv, 0xF7
---------	--

---

## Description

Sets maximum value of channel volume at MIDI reproduction.  
 True channel volume is obtained as a synthesis of this setting and channel setting volume.  
 This is used when raising sound pressure per a single sound.

## Argument

vv: Master Volume (0..127)  
 $\text{Gain[dB]} = 40 * \text{Log10}(\text{vv}/127)[\text{dB}]$   
 default: 76 (-9dB)

UserEvent	0xF0, 0x43, 0x79, 0x06, 0x7f, 0x10, vv, 0xF7
-----------	--

---

## Description

Interrupt for the system.  
 Only one UserEvent can be placed at a time.  
 UserEvent interval is to be the time in which the reproduction system can process sufficiently.

## Argument

vv : Interrupt number (0..15)

Voice setting      0xF0, 0x43, 0x79, 0x06, 0x7F, 0x01, BM, BL, PC, Note, Flag, ..., 0xF7

#### Description

Registers FM tones of MA-3. Registrations exceeding the capacity of usable RAM are ignored. The extended tones are to be registrable up to BANK=0x7C:0x00..0x7C:0x09 for melody, or to be registrable only in PC=0x00..0x09 of 0x7D:0x00 for drum tones. When MA-3 are used in 2-OP mode, 4-OP voice is disregarded.

#### Argument

BM : Bank No. MSB (0x7C/0x7D)  
 BL : Bank No. LSB (0x00..0x09)  
 PC : Program number (0x00..0x09) // valid at melody tones  
 Note : Note number (0x00..0x7f) // Valid at drum tones  
 Flag : Tone classification (0..1) // 0 : FM, 1 : WT  
 ... : MA-3 data definition (FM or WT) which is 7-bit encoded.  
 KeyNumber : Tone generation MIDI key at drum tones  
 FsMSB/FsLSB : Tones are generated with C4 at C4 (60) frequency drum.  
 RM : 0: RAM waveform, 1: ROM waveform  
 WaveID : WT waveform registration number  
 ROM waveform number (For the details, refer to HW document.)  
 0 : Bass Drum  
 1 : Snare Drum  
 2 : Tom Tom  
 3 : Hi-Hat Closed  
 4 : Hi-Hat Open  
 5 : Ride Cymbal  
 6 : Clash Cymbal  
 Others : MA-3 HW parameter. (Refer to HW documents.)

#### < FM voices >

	MSB					Key Number					LSB	
#0	0		PANPOT								BO	
#1												
#2	LFO		PE		0		0		ALG			
#3	SR				XOF		0		SUS		KSR	
#4	RR				DR							
#5	AR				SL							
#6	TL							KSL				
#7	0		DAM		EAM		0		DVB		EVB	
#8	MULTI				0		DT					
#9	WS					FB						
#10	SR				XOF		0		SUS		KSR	
#11	RR				DR							
#12	AR				SL							
#13	TL							KSL				
#14	0		DAM		EAM		0		DVB		EVB	
#15	MULTI				0		DT					
#16	WS					0						
#17	SR				XOF		0		SUS		KSR	
#18	RR				DR							
#19	AR				SL							
#20	TL							KSL				
#21	0		DAM		EAM		0		DVB		EVB	
#22	MULTI				0		DT					
#23	WS					FB						
#24	SR				XOF		0		SUS		KSR	
#25	RR				DR							
#26	AR				SL							
#27	TL							KSL				
#28	0		DAM		EAM		0		DVB		EVB	
#29	MULTI				0		DT					
#30	WS					0						

#### < WT voices >

MSB											LSB			
#0	FsMSB													
#1	FsLSB													
#2	PANPOT											0	0	PE
#3	LFO			0		0		POF		MODE				
#4	SR			XOF					0		SUS		0	
#5	RR								DR					
#6	AR								SL					
#7	TL											0		0
#8	0	DAM		EAM		0		DVB			EVB			
#9	StartAddressOffset MSB													
#10	StartAddressOffset LSB													
#11	Loop Point MSB													
#12	Loop Point LSB													
#13	End Point MSB													
#14	End Point LSB													
#15	RM	WaveID												

---

Tone waveform setting                      0xF0, 0x43, 0x79, 0x06, 0x7F, 0x03, WID, INF, ..., 0xF7

---

Description

Registers WT waveform of MA-3. The tone waveform setting is to be made before tone setting that uses waveform.

Argument

WID :     Waveform number (0..31)

INF :     Waveform information

         bit 1..0 : format (0, 2, 3)

                 0 : Yamaha 4bit ADPCM

                 2 : 8bit PCM (offset)

                 3 : 8bit PCM (2's comp)

...        Tone data that is 7-bit-encoded.

         For 4 bit data, the order is to be LSB side 4bit => MSB side 4bit

### 3 Appendix

#### 3.1 Default sound set

##### 3.1.1 Melody sound

The Key Range is recommended musical scale range, and thus, the tones are not guaranteed to be designated instrument tones.

Key Range (that may be heard as different instruments) is to be key number with MIDI representation, and the tone generation is to be a temperament unless otherwise designated. As the tones, ROM tones build in MA-3 are used.

PC#	Instrument	Key Range	PC#	Instrument	Key Range
0	GrandPno	21-108	32	AcoBass	28-55
1	BritePno	21-108	33	FngrBass	28-55
2	E.GrandP	21-108	34	PickBass	28-55
3	HnkyTonk	21-108	35	Fretless	28-55
4	E.Piano1	28-103	36	SlapBas1	28-55
5	E.Piano2	28-103	37	SlapBas2	28-55
6	Harpsi	41-89	38	SynBass1	28-55
7	Clavi	36-96	39	SynBass2	28-55
8	Celesta	60-108	40	Violin	55-96
9	Glocken	72-108	41	Viola	48-84
10	MusicBox	60-84	42	Cello	36-72
11	Vibes	53-89	43	Contrabs	28-55
12	Marimba	48-84	44	TremStr	28-96
13	Xylophon	65-96	45	PizzStr	28-96
14	TubulBel	60-77	46	Harp	23-103
15	Dulcimar	60-84	47	Timpani	36-57
16	DrawOrgn	36-96	48	Strings1	28-96
17	PercOrgn	36-96	49	Strings2	28-96
18	RockOrgn	36-96	50	Syn.Str1	36-96
19	ChrchOrg	21-108	51	Syn.Str2	36-96
20	ReedOrgn	36-96	52	ChoirAah	48-79
21	Acordion	53-89	53	VoiceOoh	48-79
22	Harmnica	60-84	54	SynVoice	48-84
23	TangoAcd	53-89	55	Orch.Hit	48-72
24	NylonGtr	40-84	56	Trumpet	58-94
25	SteelGtr	40-84	57	Trombone	34-75
26	JazzGtr	40-86	58	Tuba	29-55
27	CleanGtr	40-86	59	Mute.Trp	58-82
28	Mute.G.tr	40-86	60	Fr.Horn	41-77
29	Ovrdrive	40-86	61	BrasSect	36-96
30	Dist.Gtr	40-86	62	SynBras1	36-96
31	GtrHarmo	40-86	63	SynBras2	36-96

PC#	Instrument	Key Range	PC#	Instrument	Key Range
64	SprnoSax	54-87	96	Rain	36-96
65	AltoSax	49-80	97	SoundTrk	36-96
66	TenorSax	42-75	98	Crystal	36-96
67	Bari.Sax	37-68	99	Atmosphr	36-96
68	Oboe	58-91	100	Bright	36-96
69	Eng.Horn	52-81	101	Goblins	36-96
70	Bassoon	34-72	102	Echoes	36-96
71	Clarinet	50-91	103	Sci-Fi	36-96
72	Piccolo	74-108	104	Sitar	48-77
73	Flute	60-96	105	Banjo	48-84
74	Recorder	60-96	106	Shamisen	50-79
75	PanFlute	60-96	107	Koto	55-84
76	Bottle	60-96	108	Kalimba	48-79
77	Shakhchi	55-84	109	Bagpipe	36-77
78	Whistle	60-96	110	Fiddle	55-96
79	Ocarina	60-84	111	Shanai	48-72
80	SquareLd	21-108	112	TnklBell	72-84
81	SawLead	21-108	113	Agogo	60-72
82	CaliopLd	36-96	114	SteelDrm	52-76
83	ChiffLd	36-96	115	Wood Block	60-72(*1)
84	CharanLd	36-96	116	Taiko Drum	60-72(*2)
85	VoiceLd	36-96	117	Melodic Tom	60-72(*3)
86	FifthLd	36-96	118	Synth Drum	60-72(*4)
87	Bass&Ld	21-108	119	Reverse Cymbal	60-72(*4)
88	NewAgePd	36-96	120	Guitar Fret Noise	60-72
89	WarmPad	36-96	121	Breath Noise	60-72
90	PolySyPd	36-96	122	Seashore	60-72(*5)
91	ChoirPad	36-96	123	Bird Tweet	60-72(*6)
92	BowedPad	36-96	124	Telephone Ring	60-72(*7)
93	MetalPad	36-96	125	Helicopter	60-72(*7)
94	HaloPad	36-96	126	Applause	60-72(*6)
95	SweepPad	36-96	127	Gunshot	60-72(*5)

\*1 : 50 cents / halftone, #69 = F#4

\*2 : 50 cents / halftone, #69 = A2

\*3 : 50 cents / halftone, #69 = C#4

\*4 : 50 cents / halftone

\*5 : 20 cents / halftone

\*6 : 5 cents / halftone

\*7 : 10 cents / halftone

### 3.2 Percussion sound set

Tones generated when drum bank is designated. As the tones, ROM tones build in MA-3 are used.

Key#	Instrument	Pan	Key#	Instrument	Pan
24	-		56	Cowbell	84
25	-		57	Crash Cymbal 2	44
26	-		58	Vibraslap	29
27	-		59	Ride Cymbal 2	44
28	-		60	Bongo H	99
29	-		61	Bongo L	99
30	-		62	Conga H Mute	39
31	-		63	Conga H Open	39
32	-		64	Conga L	44
33	-		65	Timbale H	84
34	-		66	Timbale L	84
35	Bass Drum M	64	67	Agogo H	29
36	Bass Drum H	64	68	Agogo L	29
37	Closed Rim Shot	64	69	Cabasa	29
38	Snare M	64	70	Maracas	24
39	Hand Clap	54	71@	Samba Whistle H	99
40	Snare H	64	72@	Samba Whistle L	99
41	Floor Tom L	34	73	Guiro Short	94
42	Hi-Hat Closed	84	74@	Guiro Long	94
43	Floor Tom H	46	75	Claves	84
44	Hi-Hat Pedal	84	76	Wood Block H	99
45	Low Tom	58	77	Wood Block L	99
46	Hi-Hat Open	84	78	Cuica Mute	44
47	Mid Tom L	70	79	Cuica Open	44
48	Mid Tom H	82	80	Triangle Mute	24
49	Crash Cymbal 1	84	81	Triangle Open	24
50	High Tom	94	82	-	
51	Ride Cymbal 1	44	83	-	
52	Chinese Cymbal	44	84	-	
53	RideCymbal Cup	44	85	-	
54	Tamboulin	74	86	-	
55	Splash Cymbal	54	87	-	

- Only the tones marked with @ responds to KeyOf.

The following can applies to other than BANK#=128.

- Exclusive assignment of three high-hat tones (Key#42/#44/#46)
- Exclusive assignment of Key#71/#72
- Exclusive assignment of Key#73/#74
- Exclusive assignment of Key#78/#79
- Exclusive assignment of Key#80/#81

### 3.3 MIDI Implementation Chart

YAMAHA

[Tone Generator]

Date : 21-MAY-2001

Model YMU762 (MA-3)

MIDI Implementation Chart

Version : 1.0

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	×	×	
Mode	Default Messages Altered	×	3	
		×	×	
		*****	×	
Note Number	:True voice	×	0 - 127	
		*****	0 - 108	
Velocity	Note ON	×	○ 9nH, v=1-127	v=1 is Mute
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	○	
	0,32	×	○	5 is not installed. Only bend range setting (0:0) Only Hold1
	1,5,7,10,11	×	○	
	6,38	×	○	
	64-67	×	○	
Control Change	71-74	×	×	
	84	×	×	
	91,93,94	×	×	
	96-97	×	×	
	98-99	×	×	
	100-101	×	×	
Prog Change	:True#	×	○ 0- 127	
System Exclusive		×	○	
Common	:Song Pos.	×	×	
	:Song Sel.	×	×	
	:Tune	×	×	
System Real Time	:Clock	×	×	
	:Commands	×	×	
Aux	:All Sound Off	×	○ (120)	
	: Reset All Cntrl's	×	○ (121)	
Mes-	:Local ON/OFF	×	×	
Sages	:All Notes OFF	×	○ (123)	
	:Active Sense	×	×	
	:Reset	×	×	
Note:				

Mode3: OMINI OFF, POLY

○ : Yes

× : No