

1. Receive data

* “†” marked parameters are recognized by only GM2 sound generator.

■ Channel Voice Messages

● Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH
9nH	kkH	00H
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = note off velocity:	00H - 7FH (0 - 127)	

* Some instruments are not received in Rhythm set.

● Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = note on velocity:	01H - 7FH (1 - 127)	

● Control Change

○ Bank Select (Controller number 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm, ll = Bank number:	00 00H - 7F 7FH (bank.1 - bank.16384)	

* The Rhythms and Tones corresponding to each Bank Select are as follows.

• V-Piano Grand (GP-7)

BANK SELECT LSB	PROGRAM NUMBER	GROUP
000	001 - 030	Preset
064	001 - 100	User

• GM2

BANK SELECT MSB	LSB	PROGRAM NUMBER	GROUP
000		001 - 128	GM Tone
:			
032		001 - 128	GM Tone
120		001 - 057	GM2 Rhythm
121	000 -	001 - 128	GM2 Tone

○ Modulation (Controller number 1) †

Status	2nd byte	3rd byte
BnH	01H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Modulation depth:	00H - 7FH (0 - 127)	

○ Portamento Time (Controller number 5) †

Status	2nd byte	3rd byte
BnH	05H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Portamento Time:	00H - 7FH (0 - 127)	

○ Data Entry (Controller number 6, 38) †

Status	2nd byte	3rd byte
BnH	06H	mmH
BnH	26H	llH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm, ll = the value of the parameter specified by RPN/NRPN		
mm = MSB, ll = LSB		

○ Volume (Controller number 7)

Status	2nd byte	3rd byte
BnH	07H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Volume:	00H - 7FH (0 - 127)	

○ Panpot (Controller number 10) †

Status	2nd byte	3rd byte
BnH	0AH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Panpot:	00H - 40H - 7FH (Left - Center - Right),	

○ Expression (Controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Expression:	00H - 7FH (0 - 127)	

○ Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH	

○ Portamento (Controller number 65) †

Status	2nd byte	3rd byte
BnH	41H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON	

○ Sostenuto (Controller number 66)

Status	2nd byte	3rd byte
BnH	42H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON	

○ Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127)	

○ Legato Foot Switch (Controller number 68) †

Status	2nd byte	3rd byte
BnH	44H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON	

MIDI Implementation

○Resonance (Controller number 71) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	47H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Resonance value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Release Time (Controller number 72) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	48H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Release Time value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Attack time (Controller number 73) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	49H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Attack time value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Cutoff (Controller number 74) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	4AH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Cutoff value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Decay Time (Controller number 75) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	4BH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Decay Time value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Vibrato Rate (Controller number 76) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	4CH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Vibrato Rate value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Vibrato Depth (Controller number 77) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	4DH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Vibrato Depth Value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Vibrato Delay (Controller number 78) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	4EH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Vibrato Delay value (relative change):	00H - 7FH (-64 - 0 - +63)	

○Portamento Control (Controller number 84) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	54H	kkH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = source note number:	00H - 7FH (0 - 127)	

- * A Note-on received immediately after a Portamento Control message will change continuously in pitch, starting from the pitch of the Source Note Number.
- * If a voice is already sounding for a note number identical to the Source Note Number, this voice will continue sounding (i.e., legato) and will, when the next Note-on is received, smoothly change to the pitch of that Note-on.
- * The rate of the pitch change caused by Portamento Control is determined by the Portamento Time value.

○Effect 1 (Reverb Send Level) (Controller number 91)

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	5BH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Reverb Send Level:	00H - 7FH (0 - 127)	

○Effect 3 (Chorus Send Level) (Controller number 93) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	5DH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Chorus Send Level:	00H - 7FH (0 - 127)	

○RPN MSB/LSB (Controller number 100, 101) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	65H	mmH
BnH	64H	llH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm = upper byte (MSB) of parameter number specified by RPN		
ll = lower byte (LSB) of parameter number specified by RPN		

<<< RPN >>>

Control Changes include RPN (Registered Parameter Numbers), which are extended. When using RPNs, first RPN (Controller numbers 100 and 101; they can be sent in any order) should be sent in order to select the parameter, then Data Entry (Controller numbers 6 and 38) should be sent to set the value. Once RPN messages are received, Data Entry messages that is received at the same MIDI channel after that are recognized as changing toward the value of the RPN messages. In order not to make any mistakes, transmitting RPN Null is recommended after setting parameters you need.

This device receives the following RPNs.

RPN	Data entry	Notes
<u>MSB, LSB</u>	<u>MSB, LSB</u>	
00H, 00H	mmH, llH	Pitch Bend Sensitivity mm: 00H - 18H (0 - 24 semitones) ll: ignored (processed as 00H) Up to 2 octave can be specified in semitone steps.
00H, 01H	mmH, llH	Channel Fine Tuning mm, ll: 20 00H - 40 00H - 60 00H (-4096 x 100 / 8192 - 0 - +4096 x 100 / 8192 cent)
00H, 02H	mmH, llH	Channel Coarse Tuning mm: 10H - 40H - 70H (-48 - 0 - +48 semitones) ll: ignored (processed as 00H)
00H, 05H	mmH, llH	Modulation Depth Range mm, ll: 00 00H - 06 00H (0 - 16384 x 600 / 16384 cent)
7FH, 7FH	---, ---	RPN null RPN and NRPN will be set as "unspecified." Once this setting has been made, subsequent Parameter values that were previously set will not change. mm, ll: ignored

●Program Change

<u>Status</u>	<u>2nd byte</u>
CnH	ppH
n = MIDI channel number:	0H - FH (ch.1 - 16)
pp = Program number:	00H - 7FH (prog.1 - prog.128)

●Pitch Bend Change †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
EnH	llH	mmH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm, ll = Pitch Bend value:	00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)	

■ Channel Mode Messages

● All Sounds Off (Controller number 120)

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	78H	00H
n = MIDI channel number:		0H - FH (ch.1 - 16)

* When this message is received, all notes currently sounding on the corresponding channel will be turned off.

● Reset All Controllers (Controller number 121)

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	79H	00H
n = MIDI channel number:		0H - FH (ch.1 - 16)

* When this message is received, the following controllers will be set to their reset values.

<u>Controller</u>	<u>Reset value</u>
Pitch Bend Change	±0 (center)
Channel Pressure	0 (off)
Modulation	0 (off)
Breath Type	0 (min)
Expression	127 (max)
Hold 1	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
Hold 2	0 (off)
RPN	unset; previously set data will not change
NRPN	unset; previously set data will not change

● All Notes Off (Controller number 123)

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	7BH	00H
n = MIDI channel number:		0H - FH (ch.1 - 16)

* When All Notes Off is received, all notes on the corresponding channel will be turned off. However, if Hold 1 or Sostenuto is ON, the sound will be continued until these are turned off.

● OMNI OFF (Controller number 124) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	7CH	00H
n = MIDI channel number:		0H - FH (ch.1 - 16)

* The same processing will be carried out as when All Notes Off is received.

● OMNI ON (Controller number 125) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	7DH	00H
n = MIDI channel number:		0H - FH (ch.1 - 16)

* The same processing will be carried out as when All Notes Off is received. OMNI ON will not be turned on.

● MONO (Controller number 126) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	7EH	mmH
n = MIDI channel number:		0H - FH (ch.1 - 16)
mm = mono number:		00H - 10H (0 - 16)

* The same processing will be carried out as when All Notes Off is received.

● POLY (Controller number 127) †

<u>Status</u>	<u>2nd byte</u>	<u>3rd byte</u>
BnH	7FH	00H
n = MIDI channel number:		0H - FH (ch.1 - 16)

* The same processing will be carried out as when All Notes Off is received.

■ System Realtime Message

● Active Sensing

<u>Status</u>
FEH

* When Active Sensing is received, the unit will begin monitoring the intervals of all further messages. While monitoring, if the interval between messages exceeds 420 ms, the same processing will be carried out as when All Sounds Off, All Notes Off and Reset All Controllers are received, and message interval monitoring will be halted.

■ System Exclusive Message

<u>Status</u>	<u>Data byte</u>	<u>Status</u>
F0H	iiH, ddH, .....eeH	F7H
F0H:	System Exclusive Message status	

ii = ID number: an ID number (manufacturer ID) to indicate the manufacturer whose Exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are extensions of the MIDI standard; Universal Non-realtime Messages (7EH) and Universal Realtime Messages (7FH).

dd,.....ee = data: 00H - 7FH (0 - 127)

F7H: EOX (End Of Exclusive)

Of the System Exclusive messages received by this device, the Universal Non-realtime messages and the Universal Realtime messages and the Data Request (RQ1) messages and the Data Set (DT1) messages will be set automatically.

● Universal Non-realtime System Exclusive Messages

○ Identity Request Message

<u>Status</u>	<u>Data byte</u>	<u>Status</u>
F0H	7EH, dev, 06H, 01H	F7H

<u>Byte</u>	<u>Explanation</u>
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (dev: 10H - 1FH (1 - 32), the initial value is 10H (17))
06H	Sub ID#1 (General Information)
01H	Sub ID#2 (Identity Request)
F7H	EOX (End Of Exclusive)

* When this message is received, Identity Reply message (p. 7) will be transmitted.

○ GM1 System On †

<u>Status</u>	<u>Data byte</u>	<u>Status</u>
F0H	7EH, 7FH, 09H, 01H	F7H

<u>Byte</u>	<u>Explanation</u>
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
01H	Sub ID#2 (General MIDI 1 On)
F7H	EOX (End Of Exclusive)

○ GM2 System On †

<u>Status</u>	<u>Data byte</u>	<u>Status</u>
F0H	7EH 7FH 09H 03H	F7H

<u>Byte</u>	<u>Explanation</u>
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
03H	Sub ID#2 (General MIDI 2 On)
F7H	EOX (End Of Exclusive)

MIDI Implementation

○GM System Off †

Status	Data byte	Status
F0H	7EH, 7F, 09H, 02H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
02H	Sub ID#2 (General MIDI Off)
F7H	EOX (End Of Exclusive)

●Universal Realtime System Exclusive Messages

○Master Volume †

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 01H, lH, mmH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
01H	Sub ID#2 (Master Volume)
lH	Master Volume lower byte
mmH	Master Volume upper byte
F7H	EOX (End Of Exclusive)

* The lower byte (lH) of Master Volume will be handled as 00H.

○Master Fine Tuning

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 03H, lH, mmH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
03H	Sub ID#2 (Master Fine Tuning)
lH	Master Fine Tuning LSB
mmH	Master Fine Tuning MSB
F7H	EOX (End Of Exclusive)

mm, ll: 00 00H - 40 00H - 7F 7FH (-100 - 0 - +99.9 [cents])

○Master Coarse Tuning †

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 04H, lH, mmH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
04H	Sub ID#2 (Master Coarse Tuning)
lH	Master Coarse Tuning LSB
mmH	Master Coarse Tuning MSB
F7H	EOX (End Of Exclusive)

ll: ignored (processed as 00H)
mm: 28H - 40H - 58H (-24 - 0 - +24 [semitones])

●Global Parameter Control

○Reverb Parameters †

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 05H, 01H, 01H, 01H, 01H, ppH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
05H	Sub ID#2 (Global Parameter Control)
01H	Slot path length
01H	Parameter ID width
01H	Value width
01H	Slot path MSB
01H	Slot path LSB (Effect 0101: Reverb)
ppH	Parameter to be controlled.
vvH	Value for the parameter.
	pp=0 Reverb Type
	vv = 00H Small Room
	vv = 01H Medium Room
	vv = 02H Large Room
	vv = 03H Medium Hall
	vv = 04H Large Hall
	vv = 08H Plate
	pp=1 Reverb Time
	vv = 00H - 7FH 0 - 127
F7H	EOX (End Of Exclusive)

○Chorus Parameters †

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 05H, 01H, 01H, 01H, 01H, 02H, ppH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
05H	Sub ID#2 (Global Parameter Control)
01H	Slot path length
01H	Parameter ID width
01H	Value width
01H	Slot path MSB
02H	Slot path LSB (Effect 0102: Chorus)
ppH	Parameter to be controlled.
vvH	Value for the parameter.
	pp=0 Chorus Type
	vv=0 Chorus1
	vv=1 Chorus2
	vv=2 Chorus3
	vv=3 Chorus4
	vv=4 FB Chorus
	vv=5 Flanger
	pp=1 Mod Rate
	vv= 00H - 7FH 0 - 127
	pp=2 Mod Depth
	vv = 00H - 7FH 0 - 127
	pp=3 Feedback
	vv = 00H - 7FH 0 - 127
	pp=4 Send To Reverb
	vv = 00H - 7FH 0 - 127
F7H	EOX (End Of Exclusive)

○Channel Pressure †

Status	Data byte	Status
F0H	7FH, 7FH, 09H, 01H, 0nH, ppH, rrH	F7H
Byte	Explanation	
F0H	Exclusive status	
7FH	ID number (universal realtime message)	
7FH	Device ID (Broadcast)	
09H	Sub ID#1 (Controller Destination Setting)	
01H	Sub ID#2 (Channel Pressure)	
0nH	MIDI Channel (00 - 0F)	
ppH	Controlled parameter	
rrH	Controlled range	
	pp=0 Pitch Control	
	rr = 28H - 58H -24 - +24 [semitones]	
	pp=1 Filter Cutoff Control	
	rr = 00H - 7FH -9600 - +9450 [cents]	
	pp=2 Amplitude Control	
	rr = 00H - 7FH 0 - 200%	
	pp=3 LFO Pitch Depth	
	rr = 00H - 7FH 0 - 600 [cents]	
	pp=4 LFO Filter Depth	
	rr = 00H - 7FH 0 - 2400 [cents]	
	pp=5 LFO Amplitude Depth	
	rr = 00H - 7FH 0 - 100%	
F7H	EOX (End Of Exclusive)	

○Controller †

Status	Data byte	Status
F0H	7FH, 7FH, 09H, 03H, 0nH, ccH, ppH, rrH	F7H
Byte	Explanation	
F0H	Exclusive status	
7FH	ID number (universal realtime message)	
7FH	Device ID (Broadcast)	
09H	Sub ID#1 (Controller Destination Setting)	
03H	Sub ID#2 (Control Change)	
0nH	MIDI Channel (00 - 0F)	
ccH	Controller number (01 - 1F, 40 - 5F)	
ppH	Controlled parameter	
rrH	Controlled range	
	pp=0 Pitch Control	
	rr = 28H - 58H -24 - +24 [semitones]	
	pp=1 Filter Cutoff Control	
	rr = 00H - 7FH -9600 - +9450 [cents]	
	pp=2 Amplitude Control	
	rr = 00H - 7FH 0 - 200%	
	pp=3 LFO Pitch Depth	
	rr = 00H - 7FH 0 - 600 [cents]	
	pp=4 LFO Filter Depth	
	rr = 00H - 7FH 0 - 2400 [cents]	
	pp=5 LFO Amplitude Depth	
	rr = 00H - 7FH 0 - 100%	
F7H	EOX (End Of Exclusive)	

○Scale/Octave Tuning Adjust †

Status	Data byte	Status
F0H	7EH, 7FH, 08H, 08H, ffH, ggH, hhH, ssH...	F7H
Byte	Explanation	
F0H	Exclusive status	
7EH	ID number (Universal Non-realtime Message)	
7FH	Device ID (Broadcast)	
08H	Sub ID#1 (MIDI Tuning Standard)	
08H	Sub ID#2 (scale/octave tuning 1-byte form)	
ffH	Channel/Option byte 1	
	bits 0 to 1 = channel 15 to 16	
	bit 2 to 6 = Undefined	
ggH	Channel byte 2	
	bits 0 to 6 = channel 8 to 14	
hhH	Channel byte 3	
	bits 0 to 6 = channel 1 to 7	
ssH	12 byte tuning offset of 12 semitones from C to B	
	00H = -64 [cents]	
	40H = 0 [cents] (equal temperament)	
	7FH = +63 [cents]	
F7H	EOX (End Of Exclusive)	

○Key-based Instrument Controllers †

Status	Data byte	Status
F0H	7FH, 7FH, 0AH, 01H, 0nH, kkH, nnH, vvH	F7H
Byte	Explanation	
F0H	Exclusive status	
7FH	ID number (universal realtime message)	
7FH	Device ID (Broadcast)	
0AH	Sub ID#1 (Key-Based Instrument Control)	
01H	Sub ID#2 (Controller)	
0nH	MIDI Channel (00 - 0F)	
kkH	Key Number	
nnH	Controller Number	
vvH	Value	
	nn=07H Level	
	vv = 00H - 7FH 0 - 200% (Relative)	
	nn=0AH Pan	
	vv = 00H - 7FH Left - Right (Absolute)	
	nn=5BH Reverb Send	
	vv = 00H - 7FH 0 - 127 (Absolute)	
	nn=5D Chorus Send	
	vv = 00H - 7FH 0 - 127 (Absolute)	
:	:	
F7	EOX (End Of Exclusive)	

* This parameter affects drum instruments only.

●Data Transmission

This instrument can use exclusive messages to exchange many varieties of internal settings with other devices.

The model ID of the exclusive messages used by this instrument is 00H 00H 39H.

○Data Request 1 (RQ1)

This message requests the other device to transmit data. The address and size indicate the type and amount of data that is requested.

When a Data Request message is received, if the device is in a state in which it is able to transmit data, and if the address and size are appropriate, the requested data is transmitted as a Data Set 1 (DT1) message. If the conditions are not met, nothing is transmitted.

Status	data byte	status
F0H	41H, dev, 00H, 00H, 39H, 11H, aaH, bbH, ccH, ddH, ssH, ttH, uuH, vvH, sum	F7H
Byte	Remarks	
F0H	Exclusive status	
41H	ID number (Roland)	
dev	Devdevice ID (dev: 10H, 7FH)	
00H	Model ID #1 (V-Piano Grand (GP-7))	
00H	Model ID #2 (V-Piano Grand (GP-7))	
39H	model ID #3 (V-Piano Grand (GP-7))	
11H	Command ID (RQ1)	
aaH	Address MSB	
bbH	Address	
ccH	Address	
ddH	Address LSB	
ssH	Size MSB	
ttH	Size	
uuH	Size	
vvH	Size LSB	
sum	Checksum	
F7H	EOX (End Of Exclusive)	

* The size of data that can be transmitted at one time is fixed for each type of data. And data requests must be made with a fixed starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 7).

* For the checksum, refer to 12 page.

MIDI Implementation

○Data set 1 (DT1)

This is the message that actually performs data transmission, and is used when you wish to transmit the data.

Status	Data byte	Status
F0H	41H, dev, 00H, 00H, 39H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H
Byte	Explanation	
F0H	Exclusive status	
41H	ID number (Roland)	
dev	Device ID (dev: 10H, 7FH)	
00H	Model ID #1 (V-Piano Grand (GP-7))	
00H	Model ID #2 (V-Piano Grand (GP-7))	
39H	Model ID #3 (V-Piano Grand (GP-7))	
12H	Command ID (DT1)	
aaH	Address MSB: upper byte of the starting address of the data to be sent	
bbH	Address: upper middle byte of the starting address of the data to be sent	
ccH	Address: lower middle byte of the starting address of the data to be sent	
ddH	Address LSB: lower byte of the starting address of the data to be sent.	
eeH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.	
:	:	
ffH	Data	
sum	Checksum	
F7H	EOX (End Of Exclusive)	

- * The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 7).
- * Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.
- * Regarding the checksum, please refer to p. 12.

2. Data Transmission

■Channel Voice Messages

●Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
kk = note number:		00H - 7FH (0 - 127)
vv = note of velocity:		00H - 7FH (0 - 127)

●Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
kk = note number:		00H - 7FH (0 - 127)
vv = note on velocity:		01H - 7FH (1 - 127)

●Control Change

○Bank Select (Controller number 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH
n = MIDI channel number:		0H - FH (ch.1 - 16)
mm, ll = Bank number:		00 00H - 7F 7FH (bank.1 - bank.16384)

○Expression (Controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Expression:		00H - 7FH (0 - 127)

○Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Control value:		00H - 7FH (0 - 127)

* These messages are transmitted when Damper pedal is operated.

○Sostenuto (Controller number 66)

Status	2nd byte	3rd byte
BnH	42H	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Control value:		00H - 7FH (0 - 127)

○Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Control value:		00H - 7FH (0 - 127)

●Program Change

Status	2nd byte	
CnH	ppH	
n = MIDI channel number:		0H - FH (ch.1 - 16)
pp = Program number:		00H - 7FH (prog.1 - prog.128)

■System Realtime Messages

●Timing Clock

Status
F8H

●Start

Status
FAH

●Stop

Status
FCH

● Active Sensing

Status
FEH

* This message is transmitted at intervals of approximately 250 msec.

■ System Exclusive Messages

Universal Non-realtime System Exclusive Message and Data Set 1 (DT1) are the only System Exclusive messages transmitted by the V-Piano Grand.

● Universal Non-realtime System Exclusive Message

○ Identity Reply Message

Receiving Identity Request Message, the V-Piano Grand send this message.

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 39H, 02H, 02H, 00H, 00H, 01H, 00H, 02H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (use the same as the device ID of Roland)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Reply)
41H	ID number (Roland)
39H 02H	Device family code (V-Piano Grand (GP-7))
02H 00H	Device family number code (V-Piano Grand (GP-7))
00H 01H 00H 02H	Software revision level
F7H	EOX (End of Exclusive)

● Data Transmission

○ Data set 1 (DT1)

Status	Data byte	Status
F0H	41H, dev, 00H, 00H, 39H, 12H, aaH, bbH, F7H ccH, ddH, eeH, ... ffH, sum	

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 10H)
00H	Model ID #1 (V-Piano Grand (GP-7))
00H	Model ID #2 (V-Piano Grand (GP-7))
39H	Model ID #3 (V-Piano Grand (GP-7))
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: upper middle byte of the starting address of the data to be sent
ccH	Address: lower middle byte of the starting address of the data to be sent
ddH	Address LSB: lower byte of the starting address of the data to be sent.
eeH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
ffH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 7).

* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.

3. Parameter Address Map

* Transmission of "#" marked address is divided to some packets.

1 V-Piano Grand (GP-7) (Model ID = 00H 00H 39H)

○ Individual Parameters

* Please don't use a parameter or a address marked <Reserved>.

* The parameters for Setup are temporary. If you want to leave the parameters after the V-Piano Grand is turned off, execute SETUP Write.

Start Address	Description
03 00 00 00	Tone (Temporary)
20 00 00 00	System
30 00 00 00	Setup (Temporary)

* Tone

Offset Address	Description
00 00	0aaa aaaa Tone Name 1 (32 - 127) [ASCII]
00 01	0aaa aaaa Tone Name 2 (32 - 127) [ASCII]
00 02	0aaa aaaa Tone Name 3 (32 - 127) [ASCII]
00 03	0aaa aaaa Tone Name 4 (32 - 127) [ASCII]
00 04	0aaa aaaa Tone Name 5 (32 - 127) [ASCII]
00 05	0aaa aaaa Tone Name 6 (32 - 127) [ASCII]
00 06	0aaa aaaa Tone Name 7 (32 - 127) [ASCII]
00 07	0aaa aaaa Tone Name 8 (32 - 127) [ASCII]
00 08	0aaa aaaa Tone Name 9 (32 - 127) [ASCII]
00 09	0aaa aaaa Tone Name 10 (32 - 127) [ASCII]
00 0A	0aaa aaaa Tone Name 11 (32 - 127) [ASCII]
00 0B	0aaa aaaa Tone Name 12 (32 - 127) [ASCII]
00 0C	0aaa aaaa Tone Name 13 (32 - 127) [ASCII]
00 0D	0aaa aaaa Tone Name 14 (32 - 127) [ASCII]
00 0E	0aaa aaaa Tone Name 15 (32 - 127) [ASCII]
00 0F	0aaa aaaa Tone Name 16 (32 - 127) [ASCII]
00 10 : 00 23	<Reserved>
# 00 24	0000 0000 0aaa aaaa Sound Lift (0 - 100)
# 00 26	0aaa aaaa 0bbb bbbb Tone Color (8185 - 8192 - 8199) -7 - 0 - 7
# 00 28	0aaa aaaa 0bbb bbbb Tone Color Velocity Follow (8092 - 8192 - 8292) -100 - 0 - 100
# 00 2A : 01 59	0aaa aaaa 0bbb bbbb Tone Color Each Key A0 - C8 (8185 - 8192 - 8199) -7 - 0 - 7
# 01 5A	0000 0000 0000 000a Tone EQ Zone 1 Switch (0 - 1) OFF, ON
# 01 5C	0000 0000 0aaa aaaa Tone EQ Zone 1 Key Lower (21 - 108) A0 - C8
# 01 5E	0000 0000 0aaa aaaa Tone EQ Zone 1 Key Upper (21 - 108) A0 - C8
# 01 60	0000 0000 000a aaaa Tone EQ Zone 1 Frequency (0 - 30) 16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000 [Hz]
# 01 62	0aaa aaaa 0bbb bbbb Tone EQ Zone 1 Gain (8132 - 8192 - 8252) -12.0 - +12.0 [dB] (1step = 0.2dB)
# 01 64	0000 0000 0000 0aaa Tone EQ Zone 1 Q (0 - 4) 0.5, 1.0, 2.0, 4.0, 8.0
# 01 66	0000 0000 0000 000a Tone EQ Zone 2 Switch (0 - 1) OFF, ON
# 01 68	0000 0000 0aaa aaaa Tone EQ Zone 2 Key Lower (21 - 108) A0 - C8
# 01 6A	0000 0000 0aaa aaaa Tone EQ Zone 2 Key Upper (21 - 108) A0 - C8
# 01 6C	0000 0000 000a aaaa Tone EQ Zone 2 Frequency (0 - 30) 16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000 [Hz]
# 01 6E	0aaa aaaa 0bbb bbbb Tone EQ Zone 2 Gain (8132 - 8192 - 8252) -12.0 - +12.0 [dB] (1step = 0.2dB)
# 01 70	0000 0000 0000 0aaa Tone EQ Zone 2 Q (0 - 4) 0.5, 1.0, 2.0, 4.0, 8.0
# 01 72	0000 0000 0000 000a Tone EQ Zone 3 Switch (0 - 1) OFF, ON
# 01 74	0000 0000 0aaa aaaa Tone EQ Zone 3 Key Lower (21 - 108)

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#	01 76	0000 0000 0aaa aaaa	Tone EQ Zone 3 Key Upper	A0 - C8 (21 - 108) A0 - C8
#	01 78	0000 0000 000a aaaa	Tone EQ Zone 3 Frequency	(0 - 30) 16,20,25,31,40,50,63,80,100,125,160, 200,250,315,400,500,630,800,1000, 1250,1600,2000,2500,3150,4000,5000, 6300,8000,10000,12500,16000[Hz]
#	01 7A	0aaa aaaa 0bbb bbbb	Tone EQ Zone 3 Gain	(8132 - 8192 - 8252) -12.0 - +12.0[dB] (1step = 0.2dB)
#	01 7C	0000 0000 0000 0aaa	Tone EQ Zone 3 Q	(0 - 4) 0.5, 1.0, 2.0, 4.0, 8.0
#	01 7E	0000 0000 0000 000a	Tone EQ Zone 4 Switch	(0 - 1) OFF, ON
#	02 00	0000 0000 0aaa aaaa	Tone EQ Zone 4 Key Lower	(21 - 108) A0 - C8
#	02 02	0000 0000 0aaa aaaa	Tone EQ Zone 4 Key Upper	(21 - 108) A0 - C8
#	02 04	0000 0000 000a aaaa	Tone EQ Zone 4 Frequency	(0 - 30) 16,20,25,31,40,50,63,80,100,125,160, 200,250,315,400,500,630,800,1000, 1250,1600,2000,2500,3150,4000,5000, 6300,8000,10000,12500,16000[Hz]
#	02 06	0aaa aaaa 0bbb bbbb	Tone EQ Zone 4 Gain	(8132 - 8192 - 8252) -12.0 - +12.0[dB] (1step = 0.2dB)
#	02 08	0000 0000 0000 0aaa	Tone EQ Zone 4 Q	(0 - 4) 0.5, 1.0, 2.0, 4.0, 8.0
#	02 0A	0aaa aaaa 0bbb bbbb	Soft Pedal Sense	(8092 - 8192 - 8292) -100 - 0 - 100
#	02 0C	0aaa aaaa 0bbb bbbb	Soft Pedal Sense Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	03 3A	0aaa aaaa 0bbb bbbb	Soft Pedal Sense Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	03 3C	0000 0000 0000 bbbb	[F1] Button Parameter Assign	(0 - 13) Sound Lift, Tone Color, Soft Pedal Sense, Stretch Tune, Unison Tune, Hammer Hardness, Cross Resonance, Decay Time, String Resonance, Damper Resonance, Soundboard Resonance, Key Off Resonance, Damping Time, Damper Noise Level
#	03 3E	0000 0000 0000 bbbb	[F2] Button Parameter Assign	(0 - 13) Sound Lift, Tone Color, Soft Pedal Sense, Stretch Tune, Unison Tune, Hammer Hardness, Cross Resonance, Decay Time, String Resonance, Damper Resonance, Soundboard Resonance, Key Off Resonance, Damping Time, Damper Noise Level
#	03 40	0000 0000 0000 bbbb	[F3] Button Parameter Assign	(0 - 13) Sound Lift, Tone Color, Soft Pedal Sense, Stretch Tune, Unison Tune, Hammer Hardness, Cross Resonance, Decay Time, String Resonance, Damper Resonance, Soundboard Resonance, Key Off Resonance, Damping Time, Damper Noise Level
#	03 42	0aaa aaaa 0bbb bbbb	[F4] Button Parameter Assign	{16383, 0 - 13) Utility, Sound Lift, Tone Color, Soft Pedal Sense, Stretch Tune, Unison Tune, Hammer Hardness, Cross Resonance, Decay Time, String Resonance, Damper Resonance, Soundboard Resonance, Key Off Resonance, Damping Time, Damper Noise Level
#	03 44	0000 0000 0000 00aa	Stretch Tune Upper Type	(0 - 3) Gentle, Standard, Deep, User
#	03 46	0000 0000 0000 00aa	Stretch Tune Lower Type	(0 - 3) Gentle, Standard, Deep, User
#	03 48	0aaa aaaa 0bbb bbbb	Stretch Tune Current A0 - C8 (RQ1 Only)	(7692 - 8192 - 8692) -50.0 - 50.0[cent]
#	04 76	0aaa aaaa 0bbb bbbb	Stretch Tune User A0 - C8	(7692 - 8192 - 8692) -50.0 - 50.0[cent]
#	04 78	0aaa aaaa 0bbb bbbb	Stretch Tune User A0 - C8	(7692 - 8192 - 8692) -50.0 - 50.0[cent]
#	06 26	0aaa aaaa 0bbb bbbb	Stretch Tune User A0 - C8	(7692 - 8192 - 8692) -50.0 - 50.0[cent]
#	06 28	0aaa aaaa 0bbb bbbb	Unison Tune	(8092 - 8192 - 8292) -100 - 0 - 100
#	06 2A	0aaa aaaa 0bbb bbbb	Unison Tune Velocity Follow	(8092 - 8192 - 8292) -100 - 0 - 100
#	06 2C	0aaa aaaa 0bbb bbbb	Unison Tune Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	07 5A	0aaa aaaa 0bbb bbbb	Unison Tune Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	07 5C	0aaa aaaa 0bbb bbbb	Unison Tune 1st String Offset	(8092 - 8192 - 8292) -100 - 0 - 100
#	07 5E	0aaa aaaa 0bbb bbbb	Unison Tune 3rd String Offset	(8092 - 8192 - 8292) -100 - 0 - 100
#	07 60	0aaa aaaa 0bbb bbbb	Hammer Hardness	(8092 - 8192 - 8292) -100 - 0 - 100
#	07 62	0aaa aaaa 0bbb bbbb	Hammer Hardness Velocity Follow	(8092 - 8192 - 8292) -100 - 0 - 100
#	07 64	0aaa aaaa 0bbb bbbb	Hammer Hardness Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	09 12	0aaa aaaa 0bbb bbbb	Hammer Hardness Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	09 14	0aaa aaaa 0bbb bbbb	Cross Resonance	(8092 - 8192 - 8292)

#	09 16	0aaa aaaa 0bbb bbbb	Cross Resonance Velocity Follow	(8092 - 8192 - 8292) -100 - 0 - 100
#	09 18	0aaa aaaa 0bbb bbbb	Cross Resonance Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	0A 46	0aaa aaaa 0bbb bbbb	Cross Resonance Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	0A 48	0aaa aaaa 0bbb bbbb	Decay Time	(8092 - 8192 - 8292) -100 - 0 - 100
#	0A 4A	0aaa aaaa 0bbb bbbb	Decay Time Velocity Follow	(8092 - 8192 - 8292) -100 - 0 - 100
#	0A 4C	0aaa aaaa 0bbb bbbb	Decay Time Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	0B 7A	0aaa aaaa 0bbb bbbb	Decay Time Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	0B 7C	0aaa aaaa 0bbb bbbb	String Resonance	(8092 - 8192 - 8292) -100 - 0 - 100
#	0B 7E	0aaa aaaa 0bbb bbbb	Damper Resonance	(8092 - 8192 - 8292) -100 - 0 - 100
#	0C 00	0aaa aaaa 0bbb bbbb	Soundboard Resonance	(8092 - 8192 - 8292) -100 - 0 - 100
#	0C 02	0aaa aaaa 0bbb bbbb	Key Off Resonance	(8092 - 8192 - 8292) -100 - 0 - 100
#	0C 04	0aaa aaaa 0bbb bbbb	Damping Time	(8092 - 8192 - 8292) -100 - 0 - 100
#	0C 06	0aaa aaaa 0bbb bbbb	Damping Time Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	0D 34	0aaa aaaa 0bbb bbbb	Damping Time Each Key A0 - C8	(8092 - 8192 - 8292) -100 - 0 - 100
#	0D 36	0aaa aaaa 0bbb bbbb	Damper Noise Level	(8092 - 8192 - 8292) -100 - 0 - 100
00 00 0D 38 | Total Size				

* System

Offset	Address	Description
00 00 00	0000 0000	System Common
00 03 00	0000 cccc	System Favorite SETUP
00 04 00	0000 dddd	System Visual Control

* System Common

Offset	Address	Description	
#	00 00	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Master Tune (24 - 2024)
	00 04	0000 0aaa	Temperament EQUAL, JUST MAJOR, JUST MINOR, PYTHAGOREAN, KIRNBERGER, MEANTONE, WERCKMEISTER, ARABIC
	00 05	0000 aaaa	Temperament Key (0 - 11) C, C#, D, Eb, E, F, F#, G, G#, A, Bb, B
	00 06	0aaa aaaa	Master Volume (0 - 127)
	00 07	0aaa aaaa	Output Gain (52 - 76)
	00 08	0000 000a	EQ Mode (-12 - 12)
	00 09	0000 000a	Piano Pedal Mode SETUP, SYSTEM (0 - 1)
	00 0A	0000 000a	Foot Controllers Mode SETUP, SYSTEM (0 - 1)
	00 0B	0000 000a	Ambience Mode SETUP, SYSTEM (0 - 1)
	00 0C	0aaa aaaa	GM2/WAV Volume (0 - 127)
	00 0D	0000 000a	Tx Edit (0 - 1)
	00 0E		OFF, ON
	00 0F		<Reserved>
	00 10	000a aaaa	System Left Pedal Assign 1 (0 - 23) OFF, SOFT, SOSTENUTO, MIDI OUT SW, SONG PLAY/STOP, TRANSPOSE SW, SONG RESET, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL, SETUP UP, SETUP DOWN
	00 11		<Reserved>
	00 12		<Reserved>
	00 13	000a aaaa	System Left Pedal Assign 2 (0 - 17) OFF, SOFT, SOSTENUTO, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL, SETUP UP, SETUP DOWN
	00 14		<Reserved>
	00 15		<Reserved>
	00 16	000a aaaa	System Center Pedal Assign 1 (0 - 23) OFF, SOFT, SOSTENUTO, MIDI OUT SW, SONG PLAY/STOP, TRANSPOSE SW, SONG RESET, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL, SETUP UP, SETUP DOWN
	00 17		<Reserved>
	00 18		<Reserved>

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00 19	000a aaaa	System Center Pedal Assign 2	(0 - 17)	OFF, SOFT, SOSTENUTO, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL
00 1A	<Reserved>			
00 1B	<Reserved>			
00 1C	000a aaaa	System FC1 Assign 1	(0 - 23)	OFF, SOFT, SOSTENUTO, MIDI OUT SW, SONG PLAY/STOP, TRANPOSE SW, SONG RESET, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL, SETUP UP, SETUP DOWN
00 1D	<Reserved>			
00 1E	<Reserved>			
00 1F	000a aaaa	System FC1 Assign 2	(0 - 17)	OFF, SOFT, SOSTENUTO, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL
00 20	<Reserved>			
00 21	<Reserved>			
00 22	000a aaaa	System FC2 Assign 1	(0 - 23)	OFF, SOFT, SOSTENUTO, MIDI OUT SW, SONG PLAY/STOP, TRANPOSE SW, SONG RESET, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL, SETUP UP, SETUP DOWN
00 23	<Reserved>			
00 24	<Reserved>			
00 25	000a aaaa	System FC2 Assign 2	(0 - 17)	OFF, SOFT, SOSTENUTO, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL
00 26	<Reserved>			
00 27	<Reserved>			
00 28	0000 000a	Song MIDI Output	(0 - 1)	OFF, ON
00 29	000a aaaa	V-Piano Rx Channel	(0 - 16)	1 - 16, OFF
00 2A	0000 000a	Play Mode	(0 - 1)	ONE SONG, ALL SONG
00 2B	0000 0aaa	Key Touch	(1 - 5)	SUPER LIGHT, LIGHT, MEDIUM, HEAVY, SUPER HEAVY
00 2C	000a aaaa	Key Touch Offset	(54 - 73)	-10 - +9
00 2D	0aaa aaaa	Velocity	(0 - 127)	
00 2E	0aaa aaaa	Velocity Delay Sens	(1 - 127)	REAL, 1 - 127
00 2F	0aaa aaaa	Velocity Key Follow Sens	(1 - 127)	-63 - +63
00 30	0aaa aaaa	Piano Emotion	(0 - 127)	-63 - +63
00 31	0000 000a	System Equalizer Switch	(0 - 1)	OFF, ON
00 32	000a aaaa	System Equalizer Input Gain	(0 - 30)	-15 - +15[dB]
00 33	0000 000a	System Equalizer Low Type	(0 - 1)	Shelving, Peaking
00 34	000a aaaa	System Equalizer Low Frequency	(0 - 30)	16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000[Hz]
00 35	0aaa aaaa	System Equalizer Low Gain	(4 - 124)	-12.0 - +12.0[dB] (1step = 0.2dB)
00 36	0000 0aaa	System Equalizer Low Q	(0 - 4)	
00 37	000a aaaa	System Equalizer Low Mid Frequency	(0 - 30)	16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000[Hz]
00 38	0aaa aaaa	System Equalizer Low Mid Gain	(4 - 124)	-12.0 - +12.0[dB] (1step = 0.2dB)
00 39	0000 0aaa	System Equalizer Low Mid Q	(0 - 4)	
00 3A	000a aaaa	System Equalizer High Mid Frequency	(0 - 30)	16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000[Hz]
00 3B	0aaa aaaa	System Equalizer High Mid Gain	(4 - 124)	-12.0 - +12.0[dB] (1step = 0.2dB)
00 3C	0000 0aaa	System Equalizer High Mid Q	(0 - 4)	
00 3D	0000 000a	System Equalizer High Type	(0 - 1)	Shelving, Peaking
00 3E	000a aaaa	System Equalizer High Frequency	(0 - 30)	16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, 10000, 12500, 16000[Hz]
00 3F	0aaa aaaa	System Equalizer High Gain	(4 - 124)	-12.0 - +12.0[dB] (1step = 0.2dB)
00 40	0000 0aaa	System Equalizer High Q	(0 - 4)	
00 41	0000 aaaa	System Ambience Type	(0 - 14)	ROOM 1, ROOM 2, ROOM 3, STUDIO 1, STUDIO 2, STUDIO 3, CLUB 1, CLUB 2, CLUB 3, HALL 1, HALL 2, HALL 3, S.HALL 1, S.HALL 2, S.HALL 3,

00 42	0aaa aaaa	System Ambience Level	(0 - 127)
00 43	0000 00aa	V-Piano Output Mode	(0 - 2)
00 44	0000 00aa	GM2/WAV Output Mode	(0 - 2)
00 45	0aaa aaaa	Output Balance	A:100-B:0 - A:0-B:100
00 46	0000 000a	Line Out Mode	(0 - 1)
00 47	0000 00aa	Sound Perspective	(0 - 2)
00 48	0000 00aa	Headphone Mode	(0 - 2)
00 49	0000 00aa	Information Type	(0 - 3)
00 00 00 4A	Total Size		

* System Favorite SETUP

Offset	Address	Description	
00 00	0aaa aaaa	Favorite SETUP [TONE 1] Button	(0 - 99)
00 01	0aaa aaaa	Favorite SETUP [TONE 2] Button	(0 - 99)
00 02	0aaa aaaa	Favorite SETUP [TONE 3] Button	(0 - 99)
00 03	0aaa aaaa	Favorite SETUP [TONE 4] Button	(0 - 99)
00 00 00 04	Total Size		

* System Visual Control

Offset	Address	Description	
00 00	0000 000a	Switch	(0 - 1)
00 01		<Reserved>	OFF, ON
00 02		<Reserved>	
00 03	0000 aaaa	Tx Channel	(0 - 15)
00 04	0aaa aaaa	Key Range Lower	1 - 16 (0 - 87)
00 05	0aaa aaaa	Key Range Upper	A0 - C8 (0 - 87)
00 06	0000 000a	Local Switch	A0 - C8 (0 - 1)
00 00 00 07	Total Size		

* SETUP

Offset	Address	Description	
00 00	0aaa aaaa	SETUP Name 1	(32 - 127)
00 01	0aaa aaaa	SETUP Name 2	32 - 127 [ASCII]
00 02	0aaa aaaa	SETUP Name 3	(32 - 127)
00 03	0aaa aaaa	SETUP Name 4	32 - 127 [ASCII]
00 04	0aaa aaaa	SETUP Name 5	(32 - 127)
00 05	0aaa aaaa	SETUP Name 6	32 - 127 [ASCII]
00 06	0aaa aaaa	SETUP Name 7	(32 - 127)
00 07	0aaa aaaa	SETUP Name 8	32 - 127 [ASCII]
00 08	0aaa aaaa	SETUP Name 9	(32 - 127)
00 09	0aaa aaaa	SETUP Name 10	32 - 127 [ASCII]
00 0A	0aaa aaaa	SETUP Name 11	(32 - 127)
00 0B	0aaa aaaa	SETUP Name 12	32 - 127 [ASCII]
00 0C	0aaa aaaa	SETUP Name 13	(32 - 127)
00 0D	0aaa aaaa	SETUP Name 14	32 - 127 [ASCII]
00 0E	0aaa aaaa	SETUP Name 15	(32 - 127)
00 0F	0aaa aaaa	SETUP Name 16	32 - 127 [ASCII]
00 10			
01 1A		<Reserved>	
01 1B	000a aaaa	Setup FC1 Assign 1	(0 - 21)
01 1C		OFF, SOFT, SOSTENUTO, MIDI OUT SW, SONG PLAY/STOP, TRANPOSE SW, SONG RESET, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL	
01 1D		<Reserved>	
01 1E	000a aaaa	Setup FC2 Assign 1	(0 - 21)
01 1F		OFF, SOFT, SOSTENUTO, MIDI OUT SW, SONG PLAY/STOP, TRANPOSE SW, SONG RESET, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE, DECAY TIME, TONE COLOR, DAMPING TIME, DAMPER NOISE LEVEL	
01 20		<Reserved>	
01 21	000a aaaa	Setup FC1 Assign 2	(0 - 17)
01 22		OFF, SOFT, SOSTENUTO, MASTER VOLUME, EXPRESSION, AMBIENCE LEVEL, SOUND LIFT, STRING RESONANCE, DAMPER RESONANCE, SOUNDBOARD RESO, KEY OFF RESONANCE, UNISON TUNE, HAMMER HARDNESS, CROSS RESONANCE,	

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01 22		<Reserved>	DECAY TIME, TONE COLOR,	01 61	0000 aaaa	[F2] Button Function Assign	Master Tune, Ambience Type, Pedal Assign,
01 23		<Reserved>	DAMPING TIME, DAMPER NOISE LEVEL				Tone Button Mode, MIDI Out Switch
01 24	000a aaaa	Setup FC2 Assign 2	(0 - 17)	01 62	0000 aaaa	[F3] Button Function Assign	Song, Tempo, Play/Stop, Song Reset,
			OFF, SOFT, SOSTENUTO,				Master Tune, Ambience Type, Pedal Assign,
			MASTER VOLUME, EXPRESSION,				Tone Button Mode, MIDI Out Switch
			AMBIENCE LEVEL,	01 63		<Reserved>	
			SOUND LIFT, STRING RESONANCE,	01 64	0aaa aaaa	Tone Button Assign 1 Bank Select MSB	(0 - 127)
			DAMPER RESONANCE, SOUNDBOARD RESO,	01 65	0aaa aaaa	Tone Button Assign 1 Bank Select LSB	(0 - 127)
			KEY OFF RESONANCE, UNISON TUNE,	01 66	0aaa aaaa	Tone Button Assign 1 Program Change	(0 - 127)
			HAMMER HARDNESS, CROSS RESONANCE,				1 - 128
			DECAY TIME, TONE COLOR,	01 67	0aaa aaaa	Tone Button Assign 2 Bank Select MSB	(0 - 127)
01 25		<Reserved>	DAMPING TIME, DAMPER NOISE LEVEL	01 68	0aaa aaaa	Tone Button Assign 2 Bank Select LSB	(0 - 127)
01 26		<Reserved>		01 69	0aaa aaaa	Tone Button Assign 2 Program Change	(0 - 127)
							1 - 128
01 27	000a aaaa	Setup Left Pedal Assign 1	(0 - 21)	01 6A	0aaa aaaa	Tone Button Assign 3 Bank Select MSB	(0 - 127)
			OFF, SOFT, SOSTENUTO,	01 6B	0aaa aaaa	Tone Button Assign 3 Bank Select LSB	(0 - 127)
			MIDI OUT SW, SONG PLAY/STOP,	01 6C	0aaa aaaa	Tone Button Assign 3 Program Change	(0 - 127)
			TRANSPOSE SW, SONG RESET,				1 - 128
			MASTER VOLUME, EXPRESSION,	01 6D	0aaa aaaa	Tone Button Assign 4 Bank Select MSB	(0 - 127)
			AMBIENCE LEVEL,	01 6E	0aaa aaaa	Tone Button Assign 4 Bank Select LSB	(0 - 127)
			SOUND LIFT, STRING RESONANCE,	01 6F	0aaa aaaa	Tone Button Assign 4 Program Change	(0 - 127)
			DAMPER RESONANCE, SOUNDBOARD RESO,				1 - 128
			KEY OFF RESONANCE, UNISON TUNE,				
			HAMMER HARDNESS, CROSS RESONANCE,				
			DECAY TIME, TONE COLOR,				
			DAMPING TIME, DAMPER NOISE LEVEL				
01 28		<Reserved>		01 70		<Reserved>	
01 29		<Reserved>		:			
01 2A	000a aaaa	Setup Center Pedal Assign 1	(0 - 21)	02 13		<Reserved>	
			OFF, SOFT, SOSTENUTO,				
			MIDI OUT SW, SONG PLAY/STOP,	02 14	0000 00aa	Tone Button Number	(0 - 3)
			TRANSPOSE SW, SONG RESET,				1 - 4
			MASTER VOLUME, EXPRESSION,	02 15	0aaa aaaa	Tone Bank Select MSB	(0 - 127)
			AMBIENCE LEVEL,	02 16	0aaa aaaa	Tone Bank Select LSB	(0 - 127)
			SOUND LIFT, STRING RESONANCE,	02 17	0aaa aaaa	Tone Program Change	(0 - 127)
			DAMPER RESONANCE, SOUNDBOARD RESO,				1 - 128
			KEY OFF RESONANCE, UNISON TUNE,	02 18	0000 000a	Transpose Switch	(0 - 1)
			HAMMER HARDNESS, CROSS RESONANCE,				OFF, ON
			DECAY TIME, TONE COLOR,	02 19	0aaa aaaa	Transpose Value	(52 - 76)
			DAMPING TIME, DAMPER NOISE LEVEL				-12 - 12
01 2B		<Reserved>		02 1A	0aaa aaaa	Panning Width	(0 - 100)
01 2C		<Reserved>		:			
				02 1B		<Reserved>	
				:			
01 2D	000a aaaa	Setup Left Pedal Assign 2	(0 - 17)	40 2e		<Reserved>	
			OFF, SOFT, SOSTENUTO,				
			MASTER VOLUME, EXPRESSION,	40 2f	0000 aaaa	MIDI Tx Channel	(0 - 15)
			AMBIENCE LEVEL,				1 - 16
			SOUND LIFT, STRING RESONANCE,	40 30	0000 000a	Tx Bank Select (MSB) Switch	(0 - 1)
			DAMPER RESONANCE, SOUNDBOARD RESO,				OFF, ON
			KEY OFF RESONANCE, UNISON TUNE,	40 31	0aaa aaaa	Tx Bank Select (MSB)	(0 - 127)
			HAMMER HARDNESS, CROSS RESONANCE,	40 32	0000 000a	Tx Bank Select (LSB) Switch	(0 - 1)
			DECAY TIME, TONE COLOR,				OFF, ON
			DAMPING TIME, DAMPER NOISE LEVEL	40 33	0aaa aaaa	Tx Bank Select (LSB)	(0 - 127)
01 2E		<Reserved>		40 34	0000 000a	Tx Program Change Switch	(0 - 1)
01 2F		<Reserved>					OFF, ON
01 30	000a aaaa	Setup Center Pedal Assign 2	(0 - 17)	40 35	0aaa aaaa	Tx Program Change	(0 - 127)
			OFF, SOFT, SOSTENUTO,				1 - 128
			MASTER VOLUME, EXPRESSION,	00 00 40 36	Total Size		
			AMBIENCE LEVEL,				
			SOUND LIFT, STRING RESONANCE,				
			DAMPER RESONANCE, SOUNDBOARD RESO,				
			KEY OFF RESONANCE, UNISON TUNE,				
			HAMMER HARDNESS, CROSS RESONANCE,				
			DECAY TIME, TONE COLOR,				
			DAMPING TIME, DAMPER NOISE LEVEL				
01 31		<Reserved>					
01 32		<Reserved>					
:							
01 33		<Reserved>					
:							
01 38		<Reserved>					
01 39	0000 000a	Setup Equalizer Switch	(0 - 1)				
			OFF, ON				
01 3A	000a aaaa	Setup Equalizer Input Gain	(0 - 30)				
			-15 - +15[dB]				
01 3B	0000 000a	Setup Equalizer Low Type	(0 - 1)				
			Shelving, Peaking				
01 3C	000a aaaa	Setup Equalizer Low Frequency	(0 - 30)				
			16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160,				
			200, 250, 315, 400, 500, 630, 800, 1000,				
			1250, 1600, 2000, 2500, 3150, 4000, 5000,				
			6300, 8000, 10000, 12500, 16000[Hz]				
01 3D	0aaa aaaa	Setup Equalizer Low Gain	(4 - 124)				
			-12.0 - +12.0[dB] (1step = 0.2dB)				
01 3E	0000 0aaa	Setup Equalizer Low Q	(0 - 4)				
			0.5, 1.0, 2.0, 4.0, 8.0				
01 3F	000a aaaa	Setup Equalizer Low Mid Frequency	(0 - 30)				
			16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160,				
			200, 250, 315, 400, 500, 630, 800, 1000,				
			1250, 1600, 2000, 2500, 3150, 4000, 5000,				
			6300, 8000, 10000, 12500, 16000[Hz]				
01 40	0aaa aaaa	Setup Equalizer Low Mid Gain	(4 - 124)				
			-12.0 - +12.0[dB] (1step = 0.2dB)				
01 41	0000 0aaa	Setup Equalizer Low Mid Q	(0 - 4)				
			0.5, 1.0, 2.0, 4.0, 8.0				
01 42	000a aaaa	Setup Equalizer High Mid Frequency	(0 - 30)				
			16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160,				
			200, 250, 315, 400, 500, 630, 800, 1000,				
			1250, 1600, 2000, 2500, 3150, 4000, 5000,				
			6300, 8000, 10000, 12500, 16000[Hz]				
01 43	0aaa aaaa	Setup Equalizer High Mid Gain	(4 - 124)				
			-12.0 - +12.0[dB] (1step = 0.2dB)				
01 44	0000 0aaa	Setup Equalizer High Mid Q	(0 - 4)				
			0.5, 1.0, 2.0, 4.0, 8.0				
01 45	0000 000a	Setup Equalizer High Type	(0 - 1)				
			Shelving, Peaking				
01 46	000a aaaa	Setup Equalizer High Frequency	(0 - 30)				
			16, 20, 25, 31, 40, 50, 63, 80, 100, 125, 160,				
			200, 250, 315, 400, 500, 630, 800, 1000,				
			1250, 1600, 2000, 2500, 3150, 4000, 5000,				
			6300, 8000, 10000, 12500, 16000[Hz]				
01 47	0aaa aaaa	Setup Equalizer High Gain	(4 - 124)				
			-12.0 - +12.0[dB] (1step = 0.2dB)				
01 48	0000 0aaa	Setup Equalizer High Q	(0 - 4)				
			0.5, 1.0, 2.0, 4.0, 8.0				
:							
01 49		<Reserved>					
:							
01 54		<Reserved>					
01 55	0000 aaaa	Setup Ambience Type	(0 - 14)				
			ROOM 1, ROOM 2, ROOM 3,				
			STUDIO 1, STUDIO 2, STUDIO 3,				
			CLUB 1, CLUB 2, CLUB 3,				
			HALL 1, HALL 2, HALL 3,				
			S.HALL 1, S.HALL 2, S.HALL 3				
01 56	0aaa aaaa	Setup Ambience Level	(0 - 127)				
:							
01 57		<Reserved>					
:							
01 5F		<Reserved>					
01 60	0000 aaaa	[F1] Button Function Assign	(0 - 8)				
			Song, Tempo, Play/Stop, Song Reset,				

Decimal and Hexadecimal Table

(An "H" is appended to the end of numbers in hexadecimal notation.)

In MIDI documentation, data values and addresses/sizes of Exclusive messages, etc. are expressed as hexadecimal values for each 7 bits.

The following table shows how these correspond to decimal numbers.

D	H	D	H	D	H	D	H
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

D: decimal

H: hexadecimal

- * Decimal values such as MIDI channel and program change are listed as one greater than the values given in the above table.
- * A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of $aa \times 128 + bb$.
- * In the case of values which have a \pm sign, 00H = -64, 40H = ± 0 , and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = ± 0 , and 7F 7FH = +8191. For example, if aa bbH were expressed as decimal, this would be $aa \times 128 + bb - 64 \times 128$.
- * Data marked "Use nibbled data" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of $a \times 16 + b$.

<Example 1>

What is the decimal expression of 5AH?

From the preceding table, 5AH = 90

<Example 2>

What is the decimal expression of the value 12 34H given as hexadecimal for each 7 bits?

From the preceding table, since 12H = 18 and 34H = 52
 $18 \times 128 + 52 = 2356$

<Example 3>

What is the decimal expression of the nibbled value 0A 03 09 0D?

From the preceding table, since 0AH = 10, 03H = 3, 09H = 9, 0DH = 13
 $((10 \times 16 + 3) \times 16 + 9) \times 16 + 13 = 41885$

<Example 4>

What is the nibbled expression of the decimal value 1258?

```

16 ) 1258
   ) 78 ...10
   ) 4 ...14
     0 ... 4
    
```

Since from the preceding table, 0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH, the result is: 00 04 0E 0AH.

Examples of Actual MIDI Messages

<Example 1> 92 3E 5F

9n is the Note-on status, and n is the MIDI channel number. Since 2H = 2, 3EH = 62, and 5FH = 95, this is a Note-on message with MIDI CH = 3, note number 62 (note name is D4), and velocity 95.

<Example 2> CE 49

CnH is the Program Change status, and n is the MIDI channel number. Since EH = 14 and 49H = 73, this is a Program Change message with MIDI CH = 15, program number 74 (Flute in GS).

<Example 3> EA 00 28

EnH is the Pitch Bend Change status, and n is the MIDI channel number. The 2nd byte (00H = 0) is the LSB and the 3rd byte (28H = 40) is the MSB, but Pitch Bend Value is a signed number in which $40 \text{ 00H} (= 64 \times 12 + 80 = 8192)$ is 0, so this Pitch Bend Value is

$$28 \text{ 00H} - 40 \text{ 00H} = 40 \times 12 + 80 - (64 \times 12 + 80) = 5120 - 8192 = -3072$$

If the Pitch Bend Sensitivity is set to 2 semitones, $-8192 (00 \text{ 00H})$ will cause the pitch to change -200 cents, so in this case $-200 \times (-3072) \div (-8192) = -75$ cents of Pitch Bend is being applied to MIDI channel 11.

<Example 4> B3 64 00 65 00 06 0C 26 00 64 7F 65 7F

BnH is the Control Change status, and n is the MIDI channel number. For Control Changes, the 2nd byte is the control number, and the 3rd byte is the value. In a case in which two or more messages consecutive messages have the same status, MIDI has a provision called "running status" which allows the status byte of the second and following messages to be omitted. Thus, the above messages have the following meaning.

B3	64 00	MIDI ch.4, lower byte of RPN parameter number:	00H
(B3)	65 00	(MIDI ch.4) upper byte of RPN parameter number:	00H
(B3)	06 0C	(MIDI ch.4) upper byte of parameter value:	0CH
(B3)	26 00	(MIDI ch.4) lower byte of parameter value:	00H
(B3)	64 7F	(MIDI ch.4) lower byte of RPN parameter number:	7FH
(B3)	65 7F	(MIDI ch.4) upper byte of RPN parameter number:	7FH

In other words, the above messages specify a value of 0C 00H for RPN parameter number 00 00H on MIDI channel 4, and then set the RPN parameter number to 7F 7FH.

RPN parameter number 00 00H is Pitch Bend Sensitivity, and the MSB of the value indicates semitone units, so a value of 0CH = 12 sets the maximum pitch bend range to ± 12 semitones (1 octave). (On GS sound generators the LSB of Pitch Bend Sensitivity is ignored, but the LSB should be transmitted anyway (with a value of 0) so that operation will be correct on any device.)

Once the parameter number has been specified for RPN or NRPN, all Data Entry messages transmitted on that same channel will be valid, so after the desired value has been transmitted, it is a good idea to set the parameter number to 7F 7FH to prevent accidents. This is the reason for the (B3) 64 7F (B3) 65 7F at the end.

It is not desirable for Performance data (such as Standard MIDI File data) to contain many events with running status as given in <Example 4>. This is because if playback is halted during the song and then rewound or fast-forwarded, the sequencer may not be able to transmit the correct status, and the sound generator will then misinterpret the data. Take care to give each event its own status.

It is also necessary that the RPN or NRPN parameter number setting and the value setting be done in the proper order. On some sequencers, events occurring in the same (or consecutive) clock may be transmitted in an order different than the order in which they were received. For this reason it is a good idea to slightly skew the time of each event (about 1 tick for TPQN = 96, and about 5 ticks for TPQN = 480).

* TPQN: Ticks Per Quarter Note

MIDI Implementation

■ Example of an Exclusive Message and Calculating a Checksum

Roland Exclusive messages (RQ1, DT1) are transmitted with a checksum at the end (before F7) to make sure that the message was correctly received. The value of the checksum is determined by the address and data (or size) of the transmitted Exclusive message.

● How to calculate the checksum

(hexadecimal numbers are indicated by "H")

The checksum is a value derived by adding the address, size, and checksum itself and inverting the lower 7 bits.

Here's an example of how the check sum is calculated. We will assume that in the Exclusive message we are transmitting, the address is aa bb cc ddH and the data or size is ee ffH.

aa + bb + cc + dd + ee + ff = sum
 sum ÷ 128 = quotient ... remainder
 128 - remainder = checksum

<Example> Setting Temperament to JUST MINOR (DT1)

According to the "Parameter Address Map" (p. 7), the start address of System is 20 00 00 00H, the offset address of System Common is 00 00H, and the address of Temperament is 00 04H. Therefore the address of Temperament of System is;

```

    20 00 00 00H
      00 00H
+ ) _____
    20 00 00 04H
    
```

JUST MINOR has the value of 02H.

So the system exclusive message should be sent is;

F0 41 10 00 00 39 12 20 00 00 04 02 ?? F7
 (1) (2) (3) (4) (5) address data checksum (6)

(1) Exclusive Status (2) ID (Roland) (3) Device ID (17)
 (4) Model ID (V-Piano Grand (GP-7)) (5) Command ID (DT1) (6) End of Exclusive

Then calculate the checksum.

20H + 00H + 00H + 04H + 02H = 32 + 0 + 0 + 4 + 2 = 38 (sum)
 38 (sum) ÷ 128 = 0 (quotient) ... 38 (remainder)
 checksum = 128 - 38 (remainder) = 90 = 5AH

This means that F0 41 10 00 00 39 12 20 00 00 04 02 5A F7 is the message should be sent.

■ ASCII Code Table

Setup Name of MIDI data are described the ASCII code in the table below.

D	H	Char	D	H	Char	D	H	Char
32	20H	SP	64	40H	@	96	60H	`
33	21H	!	65	41H	A	97	61H	a
34	22H	"	66	42H	B	98	62H	b
35	23H	#	67	43H	C	99	63H	c
36	24H	\$	68	44H	D	100	64H	d
37	25H	%	69	45H	E	101	65H	e
38	26H	&	70	46H	F	102	66H	f
39	27H	`	71	47H	G	103	67H	g
40	28H	(	72	48H	H	104	68H	h
41	29H	)	73	49H	I	105	69H	i
42	2AH	+	74	4AH	J	106	6AH	j
43	2BH	=	75	4BH	K	107	6BH	k
44	2CH	,	76	4CH	L	108	6CH	l
45	2DH	-	77	4DH	M	109	6DH	m
46	2EH	.	78	4EH	N	110	6EH	n
47	2FH	/	79	4FH	O	111	6FH	o
48	30H	0	80	50H	P	112	70H	p
49	31H	1	81	51H	Q	113	71H	q
50	32H	2	82	52H	R	114	72H	r
51	33H	3	83	53H	S	115	73H	s
52	34H	4	84	54H	T	116	74H	t
53	35H	5	85	55H	U	117	75H	u
54	36H	6	86	56H	V	118	76H	v
55	37H	7	87	57H	W	119	77H	w
56	38H	8	88	58H	X	120	78H	x
57	39H	9	89	59H	Y	121	79H	y
58	3AH	:	90	5AH	Z	122	7AH	z
59	3BH	;	91	5BH	[	123	7BH	{
60	3CH	<	92	5CH	\	124	7CH	|
61	3DH	=	93	5DH	]	125	7DH	}
62	3EH	>	94	5EH	^			
63	3FH	?	95	5FH	_			

D: decimal

H: hexadecimal

* "SP" is space.

Correspondence Between Preset Tones and Program Changes

To select any of the sounds listed below, transmit the relevant Program Change on the channel that's been set for V-Piano Rx Channel (default value: ch. 1).

Bank Select		Program Number	Tone Name
MSB	LSB		
-	-	001	Vintage Piano 1
-	-	002	V1 Studio
-	-	003	V1 Concert
-	-	004	V1 Session
-	-	005	V1 Mellow
-	-	006	V1 Bright
-	-	007	V1 Honky Tonk
-	-	008	Vintage Piano 2
-	-	009	V2 Studio
-	-	010	V2 Concert
-	-	011	V2 Session
-	-	012	V2 Clear
-	-	013	V2 Upright
-	-	014	Fortepiano
-	-	015	All Silver 1
-	-	016	All Triple
-	-	017	Glass Piano
-	-	018	Silver Dynamic
-	-	019	Silver Extreme
-	-	020	All Silver 2
-	-	021	Triple Power
-	-	022	Triple Mellow
-	-	023	Deep Resonant
-	-	024	Hybrid Silver
-	-	025	Vertical
-	-	026	V1 Impactance
-	-	027	Triple Large
-	-	028	Metallic SB
-	-	029	V-Concert Grand
-	-	030	V-Concert Mellow