

1. Receive data

■ Channel Voice Messages

● Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH
9nH	kkH	00H

n = MIDI channel number: 0H-FH (ch.1-ch.16)

kk = note number: 00H-7FH (0-127)

vv = note off velocity: 00H-7FH (0-127)

- * For Drum Parts, these messages are received when Rx.NOTE OFF = ON for each Instrument.
- * The velocity values of Note Off messages are ignored.

● Note on

Status	2nd bytes	3rd byte
9nH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

kk = note number: 00H-7FH (0-127)

vv = note on velocity: 01H-7FH (1-127)

- * Not received when Rx.NOTE MESSAGE = OFF. (Initial value is ON)
- * For Drum Parts, not received when Rx.NOTE ON = OFF for each Instrument.

● Polyphonic Key Pressure

Status	2nd bytes	3rd byte
AnH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

kk = note number: 00H-7FH (0-127)

vv = key pressure: 00H-7FH (0-127)

- * Not received when Rx.POLY PRESSURE (PAf) = OFF. (Initial value is ON)
- * The resulting effect is determined by System Exclusive messages. With the initial settings, there will be no effect.

● Control Change

- * When Rx.CONTROL CHANGE = OFF, all control change messages except for Channel Mode messages will be ignored.
- * The value specified by a Control Change message will not be reset even by a Program Change, etc.

○ Bank Select (Controller number 0, 32)

Status	2nd bytes	3rd byte
BnH	00H	mmH
BnH	20H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

mm, ll = Bank number: 00H, 00H-7FH, 7FH (bank.1-bank.16384), Initial Value = 00 00H (bank.1)

- * Not received when Rx.BANK SELECT = OFF.
- * "Rx.BANK SELECT" is set to OFF by "GM1 System On," and Bank Select message will be ignored.
- * "Rx.BANK SELECT" is set to ON by "GM2 System On."
- * "Rx.BANK SELECT" is set to ON by power-on Reset or by receiving "GS RESET."
- * When Rx.BANK SELECT LSB = OFF, Bank number LSB (llH) will be handled as 00H regardless of the received value. However, when sending Bank Select messages, you have to send both the MSB (mmH) and LSB (llH), the value should be 00H) together.
- * Bank Select processing will be suspended until a Program Change message is received.
- * The GS format "Variation number" is the value of the Bank Select MSB (Controller number 0) expressed in decimal.
- * Some other GS devices do not recognize the Bank Select LSB (Controller number 32).

○ Modulation (Controller number 1)

Status	2nd bytes	3rd byte
BnH	01H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Modulation depth: 00H-7FH (0-127)

- * Not received when Rx.MODULATION = OFF. (Initial value is ON)
- * The resulting effect is determined by System Exclusive messages. With the initial settings, this is Pitch Modulation Depth.

○ Portamento Time (Controller number 5)

Status	2nd bytes	3rd byte
BnH	05H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Portamento Time: 00H-7FH (0-127), Initial value = 00H (0)

- * This adjusts the rate of pitch change when Portamento is ON or when using the Portamento Control. A value of 0 results in the fastest change.

○ Data Entry (Controller number 6, 38)

Status	2nd bytes	3rd byte
BnH	06H	mmH
BnH	26H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

mm, ll = the value of the parameter specified by RPN/NRPN

mm = MSB, ll = LSB

○ Volume (Controller number 7)

Status	2nd bytes	3rd byte
BnH	07H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Volume: 00H-7FH (0-127), Initial Value = 64H (100)

- * Volume messages are used to adjust the volume balance of each Part.
- * Not received when Rx.VOLUME = OFF. (Initial value is ON)

○ Pan (Controller number 10)

Status	2nd bytes	3rd byte
BnH	0AH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = pan: 00H-40H-7FH (Left-Center-Right), Initial Value = 40H (Center)

- * For Rhythm Parts, this is a relative adjustment of each Instrument's pan setting.
- * Some Tones are not capable of being panned all the way to the left or right.
- * Not received when Rx.PANPOT = OFF. (Initial value is ON)

○ Expression (Controller number 11)

Status	2nd bytes	3rd byte
BnH	0BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Expression: 00H-7FH (0-127), Initial Value = 7FH (127)

- * This adjusts the volume of a Part. It can be used independently from Volume messages. Expression messages are used for musical expression within a performance; e.g., expression pedal movements, crescendo and decrescendo.
- * Not received when Rx.EXPRESSION = OFF. (Initial value is ON)

○ Hold 1 (Controller number 64)

Status	2nd bytes	3rd byte
BnH	40H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

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

- * Not received when Rx.HOLD1 = OFF. (Initial value is ON)

○ Portamento (Controller number 65)

Status	2nd bytes	3rd byte
BnH	41H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Control value: 00H-7FH (0-127) 0-63 = OFF, 64-127 = ON

- * Not received when Rx.PORTAMENTO = OFF. (Initial value is ON)

○ Sostenuto (Controller number 66)

Status	2nd bytes	3rd byte
BnH	42H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Control value: 00H-7FH (0-127) 0-63 = OFF, 64-127 = ON

- * Not received when Rx.SOSTENUTO = OFF. (Initial value is ON)

○Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127) 0-63 = OFF, 64-127 = ON

- * Not received when Rx.SOFT = OFF. (Initial value is ON)
- * Some Tones will not exhibit any change.

○Filter Resonance (Timbre/Harmonic Intensity) (Controller number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Resonance value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value = 40H (no change)

- * Some Tones will not exhibit any change.

○Release Time (Controller number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Release Time value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value = 40H (no change)

- * Some Tones will not exhibit any change.

○Attack time (Controller number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Attack time value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value=40H (no change)

- * Some Tones will not exhibit any change.

○Cutoff (Controller number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Cutoff value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value = 40H (no change)

- * Some Tones will not exhibit any change.

○Decay Time (Controller number 75)

Status	2nd byte	3rd byte
BnH	4BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Decay Time value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value = 40H (no change)

- * Some Tones will not exhibit any change.

○Vibrato Rate (Controller number 76)

Status	2nd byte	3rd byte
BnH	4CH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Vibrato Rate value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value = 40H (no change)

- * Some Tones will not exhibit any change.

○Vibrato Depth (Controller number 77)

Status	2nd byte	3rd byte
BnH	4DH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Vibrato Depth Value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial Value = 40H (no change)

- * Some Tones will not exhibit any change.

○Vibrato Delay (Controller number 78)

Status	2nd byte	3rd byte
BnH	4EH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Vibrato Delay value (relative change) : 00H-7FH(-64 - 0 - +63),
Initial value=40H (no change)

- * Some Tones will not exhibit any change.

○Portamento control (Controller number 84)

Status	2nd bytes	3rd byte
BnH	54H	kkH

n = MIDI channel number: 0H-FH (ch.1-ch.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.

Example 1.

On MIDI	Description	Result
90 3C 40	Note on C4	C4 on
B0 54 3C	Portamento Control from C4	no change (C4 voice still sounding)
90 40 40	Note on E4	glide from C4 to E4
80 3C 40	Note off C4	no change
80 40 40	Note off E4	E4 off

Example 2.

On MIDI	Description	Result
B0 54 3C	Portamento Control from C4	no change
90 40 40	Note on E4	E4 is played with glide from C4 to E4
80 40 40	Note off E4	E4 off

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

Status	2nd bytes	3rd byte
BnH	5BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127), Initial Value = 28H (40)

- * This message adjusts the Reverb Send Level of each Part.

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

Status	2nd bytes	3rd byte
BnH	5DH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127), Initial Value = 00H (0)

- * This message adjusts the Chorus Send Level of each Part.

○NRPN MSB/LSB (Controller number 98, 99)

Status	2nd bytes	3rd byte
BnH	63H	mmH
BnH	62H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

mm = upper byte (MSB) of the parameter number specified by NRPN

ll = lower byte (LSB) of the parameter number specified by NRPN

- * Rx.NRPN is set to OFF by power-on reset or by receiving "GM1 System On" or "GM2 System On," and NRPN message will be ignored. NRPN message will be received when Rx.NRPN = ON, or by receiving "GS RESET."
- * The value set by NRPN will not be reset even if Program Change or Reset All Controllers is received.

NRPN

The NRPN (Non Registered Parameter Number) message allows an extended range of control changes to be used.

To use these messages, you must first use NRPN MSB and NRPN LSB messages to specify the parameter to be controlled, and then use Data Entry messages to specify the value of the specified parameter. Once an NRPN parameter has been specified, all Data Entry messages received on that channel will modify the value of that parameter. To prevent accidents, it is recommended that you set RPN Null (RPN Number = 7FH/7FH) when you have finished setting the value of the desired parameter. Refer to Section 4. Supplementary material "Examples of actual MIDI messages" <Example 4> (p. 13). On the GS devices, Data entry LSB (llH) of NRPN is ignored, so it is no problem to send Data entry MSB (mmH) only (without Data entry LSB).

On the HP-337, NRPN can be used to modify the following parameters.

NRPN	Data entry	Description
<u>MSB</u> <u>LSB</u>	<u>MSB</u>	<u>Description</u>
01H 08H	mmH	Vibrato Rate (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 09H	mmH	Vibrato Depth (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 0AH	mmH	Vibrato Delay (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 20H	mmH	TVF Cutoff Frequency (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 21H	mmH	TVF Resonance (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 63H	mmH	TVF&TVA Envelope Attack Time (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 64H	mmH	TVF&TVA Envelope Decay Time (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 66H	mmH	TVF&TVA Envelope Release Time (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
18H rrH	mmH	Drum Instrument Pitch Coarse (relative change) rr : key number of drum instrument mm: 00H-40H-7FH (-63 - 0 - +63 semitone)
1AH rrH	mmH	Drum Instrument TVA Level (absolute change) rr : key number of drum instrument mm: 00H-7FH (zero-maximum)
1CH rrH	mmH	Drum Instrument Panpot (absolute change) rr : key number of drum instrument mm: 00H, 01H-40H-7FH (Random, Left-Center-Right)
1DH rrH	mmH	Drum Instrument Reverb Send Level (absolute change) rr : key number of drum instrument mm: 01H-7FH (zero-maximum)
1EH rrH	mmH	Drum Instrument Chorus Send Level (absolute change) rr : key number of drum instrument mm: 01H-7FH (zero-maximum)

- * Parameters marked "relative change" will change relatively to the preset value(40H). Even among different GS devices, "relative change" parameters may sometimes differ in the way the sound changes or in the range of change.
- * Parameters marked "absolute change" will be set to the absolute value of the parameter, regardless of the preset value.
- * Data entry LSB (llH) is ignored.

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

Status	2nd bytes	3rd byte
BnH	65H	mmH
BnH	64H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

mm = upper byte (MSB) of parameter number specified by RPN

ll = lower byte (LSB) of parameter number specified by RPN

- * Not received when Rx.RPN = OFF. (Initial value is ON)
- * The value specified by RPN will not be reset even by messages such as Program Change or Reset All Controller.

RPN

The RPN (Registered Parameter Number) messages are expanded control changes, and each function of an RPN is described by the MIDI Standard.

To use these messages, you must first use RPN MSB and RPN LSB messages to specify the parameter to be controlled, and then use Data Entry messages to specify the value of the specified parameter. Once an RPN parameter has been specified, all Data Entry messages received on that channel will modify the value of that parameter. To prevent accidents, it is recommended that you set RPN Null (RPN Number = 7FH/7FH) when you have finished setting the value of the desired parameter. Refer to Section 4. "Examples of actual MIDI messages" <Example 4> (p. 13).

On the HP-337, RPN can be used to modify the following parameters.

RPN	Data entry	Explanation
<u>MSB</u> <u>LSB</u>	<u>MSB</u> <u>LSB</u>	<u>Explanation</u>
00H 00H	mmH ---	Pitch Bend Sensitivity mm: 00H-18H (0-24 semitones), Initial Value = 02H (2 semitones) ll : ignored (processed as 00h) specify up to 2 octaves in semitone steps
00H 01H	mmH llH	Master Fine Tuning mm, ll : 00 00H - 40 00H - 7F 7FH (-100 - 0 - +99.99 cents), Initial Value = 40 00H (0 cent) ll : ignored (processed as 00h) specify up to 2 octaves in semitone steps Refer to 4. Supplementary material, "About tuning" (p. 14)
00H 02H	mmH ---	Master Coarse Tuning mm : 28H - 40H - 58H (-24 - 0 - +24 semitones), Initial Value = 40H (0 cent) ll : ignored (processed as 00h)
00H 05H	mmH llH	Modulation Depth Range mm : 00H - 04H (0 - 4 semitones) ll : 00H - 7FH (0 - 100 cents) 100/128 Cent/Value
7FH 7FH	--- ---	RPN null Set condition where RPN and NRPN are unspecified. The data entry messages after set RPN null will be ignored. (No Data entry messages are required after RPN null). Settings already made will not change. mm, ll : ignored

●Program Change

Status	2nd bytes
CnH	ppH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

pp = Program number: 00H-7FH (prog.1-prog.128)

- * Not received when Rx.PROGRAM CHANGE = OFF. (Initial value is ON)
- * After a Program Change message is received, the sound will change beginning with the next Note-on. Voices already sounding when the Program Change message was received will not be affected.
- * For Drum Parts, Program Change messages will not be received on bank numbers 129-16384 (the value of Control Number 0 is other than 0 (00H)).

●Channel Pressure

Status	2nd bytes
DnH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Channel Pressure: 00H-7FH (0-127)

- * Not received when Rx.CH PRESSURE (CA) = OFF. (Initial value is ON)
- * The resulting effect is determined by System Exclusive messages. With the initial settings there will be no effect.

●Pitch Bend Change

Status	2nd byte	3rd bytes
EnH	llH	mmH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

mm, ll = Pitch Bend value: 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

- * Not received when Rx.PITCH BEND = OFF. (Initial value is ON)
- * The resulting effect is determined by System Exclusive messages. With the initial settings the effect is Pitch Bend.

■Channel Mode Messages

●All Sounds Off (Controller number 120)

Status	2nd byte	3rd bytes
BnH	78H	00H

n = MIDI channel number: 0H-FH (ch.1-ch.16)

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

●Reset All Controllers (Controller number 121)

Status	2nd byte	3rd bytes
BnH	79H	00H

n = MIDI channel number: 0H-FH (ch.1-ch.16)

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

Controller	Reset value
Pitch Bend Change	+0 (Center)
Polyphonic Key Pressure	0 (off)
Channel Pressure	0 (off)
Modulation	0 (off)
Expression	127 (max)
Hold 1	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
RPN	unset; previously set data will not change
NRPN	unset; previously set data will not change

●Loacl Control (Controller number 122)

Status	2nd byte	3rd bytes
BnH	7AH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

vv = Control value: 00H, 7FH (0, 127), 00H: Local Off, 7FH: Local On

●All Notes Off (Controller number 123)

Status	2nd byte	3rd bytes
BnH	7BH	00H

n = MIDI channel number: 0H-FH (ch.1-ch.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)

Status	2nd byte	3rd bytes
BnH	7CH	00H

n = MIDI channel number: 0H-FH (ch.1-ch.16)

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

●OMNI ON (Controller number 125)

Status	2nd byte	3rd bytes
BnH	7DH	00H

n = MIDI channel number: 0H-FH (ch.1-ch.16)

- * OMNI ON is only recognized as "All notes off"; the Mode doesn't change (OMNI OFF remains).

●MONO (Controller number 126)

Status	2nd byte	3rd bytes
BnH	7EH	mmH

n = MIDI channel number: 0H-FH (ch.1-ch.16)

mm = mono number: 00H-10H (0-16)

- * The same processing will be carried out as when All Sounds Off and All Notes Off is received, and the corresponding channel will be set to Mode 4 (M = 1) regardless of the value of "mono number."

●POLY (Controller number 127)

Status	2nd byte	3rd bytes
BnH	7FH	00H

n = MIDI channel number: 0H-FH (ch.1-ch.16)

- * The same processing will be carried out as when All Sounds Off and All Notes Off is received, and the corresponding channel will be set to Mode 3.

■System Realtime Message

●Active Sensing

Status
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

Status	Data byte	Status
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)

The System Exclusive Messages received by the HP-337 are; messages related to mode settings, Universal Realtime System Exclusive messages and Data Set (DT1).

●System exclusive messages related to mode settings

These messages are used to initialize a device to GS or General MIDI mode, or change the operating mode. When creating performance data, a "GM1 System On" message should be inserted at the beginning of a General MIDI 1 score, a "GM2 System On" message at the beginning of a General MIDI 2 score, and a "GS Reset" message at the beginning of a GS music data. Each song should contain only one mode message as appropriate for the type of data. (Do not insert two or more mode setting messages in a single song.)

"GM System On" uses Universal Non-realtime Message format. "GS Reset" uses Roland system Exclusive format "Data Set 1 (DT1)."

○GM1 System On

This is a command message that resets the internal settings of the unit to the General MIDI initial state (General MIDI System-Level 1). After receiving this message HP-337, will automatically be set to the proper condition for correctly playing a General MIDI score.

Status	Data byte	Status
F0H	7EH, 7FH, 09H, 01H	F7H

Byte	Explanation
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)

- * When this message is received, Rx.BANK SELECT will be OFF and Rx.NRPN will be OFF.
- * There must be an interval of at least 50 ms between this message and the next.

○GM2 System On

Status	Data byte	Status
F0H	7EH 7FH 09H 03H	F7H

Byte	Explanation
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)

- * When this message is received, the HP-337 will be able to receive the messages specified by General MIDI 2, and use the General MIDI 2 soundmap.
- * There must be an interval of at least 50 ms between this message and the next.

○GM System Off

"GM System Off" is a command message that resets the internal state of the HP-337 from the GM state to its native condition. The HP-337 will reset to the GS default state.

Status	Data byte	Status
F0H	7EH, 7FH, 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)
40H	EOX (End of exclusive)

- * When this message is received, the HP-337 will reset to the GS default state.
- * There must be an interval of at least 50 ms between this message and the next.

○GS reset

GS Reset is a command message that resets the internal settings of a device to the GS initial state. This message will appear at the beginning of GS music data, and a GS device that receives this message will automatically be set to the proper state to correctly playback GS music data.

Status	Data byte	Status
F0H	41H, 10H, 42H, 12H, 40H, 00H, 7FH, 00H, 41H	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
10H	Device ID (dev: 00H-1FH (1-32), Initial value is 10H (17))
42H	Model ID (GS)
12H	Command ID (DT1)
40H	Address MSB
00H	Address
7FH	Address LSB
00H	Data (GS reset)
41H	Checksum
F7H	EOX (End Of Exclusive)

- * When this message is received, Rx.NRPN will be ON.
- * There must be an interval of at least 50 ms between this message and the next.

●Universal Realtime System Exclusive Messages

○Master volume

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

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

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

○Master Fine Tuning

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 03H, llH, 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)
llH	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,llH,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)
llH	Master Coarse Tuning LSB
mmH	Master Coarse Tuning MSB
F7H	EOX (End Of Exclusive)

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

●Global Parameter Control

Parameters of the Global Parameter Control are newly provided for the General MIDI 2.

○Reverb Parameters

Status	Data byte	Status
F0H	7FH,7FH,04H,05H,01H,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.
F7H	EOX (End Of Exclusive)

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

○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.	
F7H	EOX (End Of Exclusive)	
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	

○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	
F7H	EOX (End Of Exclusive)	
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 [%]	

○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	
F7H	EOX (End Of Exclusive)	
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 [%]	

○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 byte1	
	bits 0 to 1 = channel 15 to 16	
	bit 2 to 6 = Undefined	
ggH	Channel byte2	
	bits 0 to 6 = channel 8 to 14	
hhH	Channel byte3	
	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 - 0FH)	
kkH	Key Number	
nnH	Control Number	
vvH	Value	
F7	EOX (End Of Exclusive)	
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)	

* This parameter affects drum instruments only.

● Universal Non-realtime System Exclusive Messages

○ Identity Request Message

Status	Data byte	Status
F0H	7FH, 10H, 06H, 01H	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
10H	Device ID
06H	Sub ID#1 (General Information)
01H	Sub ID#2 (Identity Request)
F7H	EOX (End Of Exclusive)

● Data transmission

HP-337 can receive the various parameters using System Exclusive messages. The exclusive message of GS format data has a model ID of 42H and a device ID of 10H (17), and it is common to all the GS devices.

○ 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, 10H, 42H, 12H, aaH, bbH, ccH, ddH, ... eeH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
10H	Device ID
42H	Model ID (GS)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the transmitted data
bbH	Address: middle byte of the starting address of the transmitted data
ccH	Address LSB: lower byte of the starting address of the transmitted data
ddH	Data: the actual data to be transmitted. Multiple bytes of data are transmitted starting from the address.
:	
:	
eeH	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 can be received only from the specified starting address and size. Refer to the Address and Size given in Section 3 (p. 9).
- * Data larger than 128 bytes must be divided into packets of 128 bytes or less. If "Data Set 1" is transmitted successively, there must be an interval of at least 40 ms between packets.
- * Regarding the checksum please refer to section 4 (p. 13).

2. Transmit data

Arranger data can not be transmitted.

■ Channel Voice Messages

● Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
kk = note number: 00H-7FH (0-127)
vv = note off velocity: 00H-7FH (0-127)

* Note off message is sent out with the velocity of 40H.

● Note on

Status	2nd bytes	3rd byte
9nH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.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 bytes	3rd byte
BnH	00H	mmH
BnH	20H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm, ll = Bank number: 00H, 00H-7FH, 7FH (bank.1-bank.16384)

○ Volume (Controller number 7)

Status	2nd bytes	3rd byte
BnH	07H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Volume: 00H-7FH (0-127)

○ Hold 1 (Controller number 64)

Status	2nd bytes	3rd byte
BnH	40H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)

○ Sostenuto (Controller number 66)

Status	2nd bytes	3rd byte
BnH	42H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127) 0-63 = OFF, 64-127 = ON

○ Soft (Controller number 67)

Status	2nd bytes	3rd byte
BnH	43H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)

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

Status	2nd bytes	3rd byte
BnH	5BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)

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

Status	2nd bytes	3rd byte
BnH	5DH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)

●Program Change

Status	2nd bytes
CnH	ppH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
pp = Program number: 00H-7FH (prog.1-prog.128)

■System Realtime Message

●Realtime Clock

Status
F8H

●Active sensing

Status
FEH

* This will be transmitted constantly at intervals of approximately 250 ms.

■System exclusive messages

○Identity Reply

Status	Data byte	Status
F0H	7EH, 10H, 06H, 02H, 41H, 42H, 00H, 00H, 09H, 00H, 01H, 00H, 00H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (universal non-realtime message)
10H	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)
42H	Device family code (LSB)
00H	Device family code (MSB)
00H	Device family number code (LSB)
09H	Device family number code (MSB)
00H	Software revision level
01H	Software revision level
00H	Software revision level
00H	Software revision level
F7H	EOX (End of Exclusive)

3. Parameter Address Map (Model ID = 42H)

This map indicates address, size, Data (range), Parameter, Description, and Default Value of parameters which can be transferred using and "Data set 1 (DT1)." All the numbers of address, size, Data, and Default Value are indicated in 7-bit Hexadecimal-form.

■Address Block map

An outlined address map of the Exclusive Communication is as follows;

Address (H)	Block
40 00 00	SYSTEM PARAMETERS Individual
40 01 3F	
40 1x 00	
40 2x 5A	PART PARAMETERS Individual (x = 0-F)
41 m0 00	
41 m8 7F	SRUM SETUP PARAMETERS Individual (m = 0-1)
48 00 00	
48 01 10	SYSTEM PARAMETERS Bulk
48 1D 0F	PART PARAMETERS Bulk
49 m0 00	DRUM SETUP PARAMETER Bulk (m = 0-1)
49 mE 17	

There are two ways in which GS data is transmitted: Individual Parameter Transmission in which individual parameters are transmitted one by one, and Bulk Dump Transmission in which a large amount of data is transmitted at once.

■Individual Parameters

Individual Parameter Transmission transmits data (or requests data) for one parameter as one exclusive message (one packet of "F0 F7").

In Individual Parameter Transmission, you must use the Address and Size listed in the following "Parameter Address Map." Addresses marked at "#" cannot be used as starting addresses.

●System Parameters

Parameters related to the system of the device are called System Parameters.

Address (H)	Size (H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 00 00	00 00 04	0018-07E8	MASTER TUNE	-100.0 - +100.0 [cent]	00 04 00 00	0 [cent]
40 00 01#				Use nibblized data.		
40 00 02#						
40 00 03#						

* Refer to section 4. Supplementary material, "About tuning" (p. 14).

40 00 04	00 00 01	00-7F	MASTER VOLUME	0-127 (= F0 7F 7F 04 01 00 vv F7)	7F	127
40 00 05	00 00 01	28-58	MASTER KEY-SHIFT	-24 - +24 [semitones]	40	0 [semitones]
40 00 06	00 00 01	01-7F	MASTER PAN	-63 (LEFT) - +63 (RIGHT)	40	0 (CENTER)
40 00 7F	00 00 01	00	MODE SET	00 = GS Reset, 127 = Exit GS (Rx. only)		

* Refer to "System exclusive messages related to mode settings" (p. 4).

40 01 10	00 00 10	00-40	VOICE RESERVE	Part 10 (Drum Part)	02	2
40 01 11#				Part 1	06	6
40 01 12#				Part 2	02	2
40 01 13#				Part 3	02	2
40 01 14#				Part 4	02	2
40 01 15#				Part 5	02	2
40 01 16#				Part 6	02	2
40 01 17#				Part 7	02	2
40 01 18#				Part 8	02	2
40 01 19#				Part 9	02	2
40 01 1A#				Part 11	00	0
40 01 :#				:		
40 01 1F#				Part 16	00	0

* The sum total of voices in the voice reserve function must be equal to or less than the number of the maximum polyphony. The maximum polyphony of the HP-337 is 128. For compatibility with other GS models, it is recommended that the maximum polyphony be equal or less than 24.

40 01 30	00 00 01	00-07	REVERB MACRO	00: Room 1 01: Room 2 02: Room 3 03: Hall 1 04: Hall 2 05: Plate 06: Delay 07: Panning Delay	04	Hall 2
40 01 31	00 00 01	00-07	REVERB CHARACTER	0-7	04	4
40 01 32	00 00 01	00-07	REVERB PRE-LPF	0-7	00	0
40 01 33	00 00 01	00-7F	REVERB LEVEL	0-127	40	64
40 01 34	00 00 01	00-7F	REVERB TIME	0-127	40	64
40 01 35	00 00 01	00-7F	REVERB DELAY FEEDBACK	0-127	00	0

* REVERB MACRO is a macro parameter that allows global setting of reverb parameters. When you select the reverb type with REVERB MACRO, each reverb parameter will be set to the most suitable value.

* REVERB CHARACTER is a parameter that changes the reverb algorithm. The value of REVERB CHARACTER corresponds to the REVERB MACRO of the same number.

40 01 38	00 00 01	00-07	CHORUS MACRO	00: Chorus 1 01: Chorus 2 02: Chorus 3 03: Chorus 4 04: Feedback Chorus 05: Flanger 06: Short Delay 07: Short Delay (FB)	02	Chorus 3
40 01 39	00 00 01	00-07	CHORUS PRE-LPF	0-7	00	0
40 01 3A	00 00 01	00-7F	CHORUS LEVEL	0-127	40	64
40 01 3B	00 00 01	00-7F	CHORUS FEEDBACK	0-127	08	8
40 01 3C	00 00 01	00-7F	CHORUS DELAY	0-127	50	80
40 01 3D	00 00 01	00-7F	CHORUS RATE	0-127	03	3
40 01 3E	00 00 01	00-7F	CHORUS DEPTH	0-127	13	19
40 01 3F	00 00 01	00-7F	CHORUS SEND LEVEL TO REVERB	0-127	00	0

* CHORUS MACRO is a macro parameter that allows global setting of chorus parameters. When you use CHORUS MACRO to select the chorus type, each chorus parameter will be set to the most suitable value.

●Part Parameters

HP-337 has 16 parts. Parameters that can be set individually for each Part are called Part parameters.

If you use exclusive messages to set Part parameters, specify the address by Block number rather than Part Number (normally the same number as the MIDI channel). The Block number can be specified as one of 16 blocks, from 0 (H) to F (H).

The relation between Part number and Block number is as follows.

x...BLOCK NUMBER (0-F),	Part 1 (MIDI ch = 1) x = 1
	Part 2 (MIDI ch = 2) x = 2
	: : :
	Part 9 (MIDI ch = 9) x = 9
	Part10 (MIDI ch = 10) x = 0
	Part11 (MIDI ch = 11) x = A
	Part12 (MIDI ch = 12) x = B
	: : :
	Part16 (MIDI ch = 16) x = F

Address (H)	Size (H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 1x 00	00 00 02	00-7F	TONE NUMBER	CC#00 VALUE 0-127	00	0
40 1x 01#		00-7F		P.C. VALUE 1-128	00	1
40 1x 02	00 00 01	00-10	Rx. CHANNEL	1-16, OFF	Same as the Part Number	
40 1x 03	00 00 01	00-01	Rx. PITCH BEND	OFF/ON	01	ON
40 1x 04	00 00 01	00-01	Rx. CH PRESSURE (CA)	OFF/ON	01	ON
40 1x 05	00 00 01	00-01	Rx. PROGRAM CHANGE	OFF/ON	01	ON
40 1x 06	00 00 01	00-01	Rx. CONTROL CHANGE	OFF/ON	01	ON
40 1x 07	00 00 01	00-01	Rx. POLY PRESSURE (PA)	OFF/ON	01	ON
40 1x 08	00 00 01	00-01	Rx. NOTE MESSAGE	OFF/ON	01	ON
40 1x 09	00 00 01	00-01	Rx. RPN	OFF/ON	01	ON
40 1x 0A	00 00 01	00-01	Rx. NRPN	OFF/ON	00 (01*)	OFF (ON*)

* When "GM1 System On" and "GM2 System On" are received, Rx. NRPN will be set OFF. When "GS Reset" is received, it will be set ON.

40 1x 0B	00 00 01	00-01	Rx. MODULATION	OFF/ON	01	ON
40 1x 0C	00 00 01	00-01	Rx. VOLUME	OFF/ON	01	ON
40 1x 0D	00 00 01	00-01	Rx. PANPOT	OFF/ON	01	ON
40 1x 0E	00 00 01	00-01	Rx. EXPRESSION	OFF/ON	01	ON
40 1x 0F	00 00 01	00-01	Rx. HOLD1	OFF/ON	01	ON
40 1x 10	00 00 01	00-01	Rx. PORTAMENTO	OFF/ON	01	ON
40 1x 11	00 00 01	00-01	Rx. SOSTENUTO	OFF/ON	01	ON
40 1x 12	00 00 01	00-01	Rx. SOFT	OFF/ON	01	ON
40 1x 13	00 00 01	00-01	MONO/POLY MODE (= CC# 126 01 / CC# 127 00)	Mono/Poly	01	Poly
40 1x 14	00 00 01	00-02	ASSIGN MODE	0 = SINGLE 1 = LIMITED-MULTI 2 = FULL-MULTI	00 at x = 0 01 at x ≠ 0	SINGLE at x = 0 LIMITED-MULTI at x ≠ 0

* ASSIGN MODE is the parameter that determines how voice assignment will be handled when sounds overlap on identical note numbers in the same channel (i.e., repeatedly struck notes). This is initialized to a mode suitable for each Part, so for general purposes there is no need to change this.

40 1x 15	00 00 01	00-02	USE FOR RHYTHM PART	0 = OFF 1 = MAP1 2 = MAP2	00 at x ≠ 0 01 at x = 0	OFF at x ≠ 0 MAP1 at x = 0
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* This parameter sets the Drum Map of the Part used as the Drum Part. HP-337 can simultaneously (in different Parts) use up to two Drum Maps (MAP1, MAP2). With the initial settings, Part10 (MIDI CH = 10, x = 0) is set to MAP1 (1), and other Parts are set to normal instrumental Parts (OFF (0)).

40 1x 16	00 00 01	28-58	PITCH KEY SHIFT	-24 - +24 [semitones]	40	0 [semitones]
40 1x 17	00 00 02	08-F8	PITCH OFFSET FINE	-12.0 - +12.0 [Hz]	08 00	0 [Hz]
40 1x 18#				Use nibblized data.		

* PITCH OFFSET FINE allows you to alter, by a specified frequency amount, the pitch at which notes will sound. This parameter differs from the conventional Fine Tuning (RPN #1) parameter in that the amount of frequency alteration (in Hertz) will be identical no matter which note is played. When a multiple number of Parts, each of which has been given a different setting for PITCH OFFSET FINE, are sounded by means of an identical note number, you can obtain a Celeste effect.

40 1x 19	00 00 01	00-7F	PART LEVEL (= CC# 7)	0-127	64	100
40 1x 1A	00 00 01	00-7F	VELOCITY SENSE DEPTH	0-127	40	64
40 1x 1B	00 00 01	00-7F	VELOCITY SENSE OFFSET	0-127	40	64
40 1x 1C	00 00 01	00-7F	PART PANPOT (= CC# 10, except RANDOM)	-64 (RANDOM), -63 (LEFT) - +63 (RIGHT)	40	0 (CENTER)
40 1x 1D	00 00 01	00-7F	KEY RANGE LOW	(C-1)-(G9)	00	C-1
40 1x 1E	00 00 01	00-7F	KEY RANGE HIGH	(C-1)-(G9)	7F	G 9
40 1x 1F	00 00 01	00-5F	CC1 CONTROLLER NUMBER	0-95	10	16
40 1x 20	00 00 01	00-5F	CC2 CONTROLLER NUMBER	0-95	11	17
40 1x 21	00 00 01	00-7F	CHORUS SEND LEVEL (= CC# 93)	0-127	00	0
40 1x 22	00 00 01	00-7F	REVERB SEND LEVEL (= CC# 91)	0-127	28	40
40 1x 23	00 00 01	00-01	Rx. BANK SELECT	OFF/ON	01 (00*)	ON (OFF*)

- * "Rx.BANK SELECT" is set to OFF by "GM1 System On," and Bank Select message will be ignored.
- * "Rx.BANK SELECT" is set to ON by "GM2 System On."
- * "Rx.BANK SELECT" is set to ON by power-on Reset or by receiving "GS RESET."

40 1x 24	00 00 01	00-01	Rx.BANK SELECT LSB	OFF/ON	00	OFF
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- * HP-337 can be recognise Bank Select LSB (40H-43H) even if this message is OFF.

40 1x 25	00 00 01	00-01	TONE REMAIN	OFF/ON	01	ON
40 1x 28	00 00 03	00-7F	Bank Select LSB Range	LSB (from)	40	40H
40 1x 29#				LSB (to)	43	43H
40 1x 30	00 00 01	0E-72	TONE MODIFY 1 Vibrato rate (= NRP# 8)	-50 - +50	40	0
40 1x 31	00 00 01	0E-72	TONE MODIFY 2 Vibrato depth (= NRP# 9)	-50 - +50	40	0
40 1x 32	00 00 01	0E-72	TONE MODIFY 3 TVF cutoff frequency (= NRP# 32)	-50 - +50	40	0
40 1x 33	00 00 01	0E-72	TONE MODIFY 4 TVF resonance (= NRP# 33)	-50 - +50	40	0
40 1x 34	00 00 01	0E-72	TONE MODIFY 5 TVF&TVA Env.attack (= NRP# 99)	-50 - +50	40	0
40 1x 35	00 00 01	0E-72	TONE MODIFY 6 TVF&TVA Env.decay (= NRP# 100)	-50 - +50	40	0
40 1x 36	00 00 01	0E-72	TONE MODIFY 7 TVF&TVA Env.release (= NRP# 102)	-50 - +50	40	0
40 1x 37	00 00 01	0E-72	TONE MODIFY 8 Vibrato delay (= NRP# 10)	-50 - +50	40	0
40 1x 40	00 00 0C	00-7F	SCALE TUNING C	-64 - +63 [cent]	40	0 [cent]
40 1x 41#		00-7F	SCALE TUNING C#	-64 - +63 [cent]	40	0 [cent]
40 1x 42#		00-7F	SCALE TUNING D	-64 - +63 [cent]	40	0 [cent]
40 1x 43#		00-7F	SCALE TUNING D#	-64 - +63 [cent]	40	0 [cent]
40 1x 44#		00-7F	SCALE TUNING E	-64 - +63 [cent]	40	0 [cent]
40 1x 45#		00-7F	SCALE TUNING F	-64 - +63 [cent]	40	0 [cent]
40 1x 46#		00-7F	SCALE TUNING F#	-64 - +63 [cent]	40	0 [cent]
40 1x 47#		00-7F	SCALE TUNING G	-64 - +63 [cent]	40	0 [cent]
40 1x 48#		00-7F	SCALE TUNING G#	-64 - +63 [cent]	40	0 [cent]
40 1x 49#		00-7F	SCALE TUNING A	-64 - +63 [cent]	40	0 [cent]
40 1x 4A#		00-7F	SCALE TUNING A#	-64 - +63 [cent]	40	0 [cent]
40 1x 4B#		00-7F	SCALE TUNING B	-64 - +63 [cent]	40	0 [cent]

- * SCALE TUNING is a function that allows fine adjustment to the pitch of each note in the octave. The pitch of each identically-named note in all octaves will change simultaneously. A setting of +/- 0 cent (40H) is equal temperament. Refer to section 4. Supplementary material, "The Scale Tune Feature"(p. 14).

40 2x 00	00 00 01	28-58	MOD PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 01	00 00 01	00-7F	MOD TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 02	00 00 01	00-7F	MOD AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 03	00 00 01	00-7F	MOD LFO1 RATE CONTROL-	10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 04	00 00 01	00-7F	MOD LFO1 PITCH DEPTH	0-600 [cent]	0A	47 [cent]
40 2x 05	00 00 01	00-7F	MOD LFO1 TVF DEPTH0	-2400 [cent]	00	0 [cent]
40 2x 06	00 00 01	00-7F	MOD LFO1 TVA DEPTH0	-100.0 [%]	00	0 [%]
40 2x 07	00 00 01	00-7F	MOD LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 08	00 00 01	00-7F	MOD LFO2 PITCH DEPTH0	-600 [cent]	00	0 [cent]
40 2x 09	00 00 01	00-7F	MOD LFO2 TVF DEPTH0	-2400 [cent]	00	0 [cent]
40 2x 0A	00 00 01	00-7F	MOD LFO2 TVA DEPTH0	-100.0 [%]	00	0 [%]
40 2x 10	00 00 01	40-58	BEND PITCH CONTROL	0-24 [semitone]	42	2 [semitones]
40 2x 11	00 00 01	00-7F	BEND TVF CUTOFF CONTROL-	9600 - +9600 [cent]	40	0 [cent]
40 2x 12	00 00 01	00-7F	BEND AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 13	00 00 01	00-7F	BEND LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 14	00 00 01	00-7F	BEND LFO1 PITCH DEPTH0	-600 [cent]	00	0 [cent]
40 2x 15	00 00 01	00-7F	BEND LFO1 TVF DEPTH0	-2400 [cent]	00	0 [cent]
40 2x 16	00 00 01	00-7F	BEND LFO1 TVA DEPTH0	-100.0 [%]	00	0 [%]
40 2x 17	00 00 01	00-7F	BEND LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 18	00 00 01	00-7F	BEND LFO2 PITCH DEPTH0	-600 [cent]	00	0 [cent]
40 2x 19	00 00 01	00-7F	BEND LFO2 TVF DEPTH0	-2400 [cent]	00	0 [cent]
40 2x 1A	00 00 01	00-7F	BEND LFO2 TVA DEPTH0	-100.0 [%]	00	0 [%]
40 2x 20	00 00 01	28-58	CAF PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 21	00 00 01	00-7F	CAF TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 22	00 00 01	00-7F	CAF AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]

40 2x 23	00 00 01	00-7F	CAF LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 24	00 00 01	00-7F	CAF LFO1 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 25	00 00 01	00-7F	CAF LFO1 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 26	00 00 01	00-7F	CAF LFO1 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 27	00 00 01	00-7F	CAF LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 28	00 00 01	00-7F	CAF LFO2 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 29	00 00 01	00-7F	CAF LFO2 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 2A	00 00 01	00-7F	CAF LFO2 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 30	00 00 01	28-58	PAF PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 31	00 00 01	00-7F	PAF TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 32	00 00 01	00-7F	PAF AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 33	00 00 01	00-7F	PAF LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 34	00 00 01	00-7F	PAF LFO1 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 35	00 00 01	00-7F	PAF LFO1 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 36	00 00 01	00-7F	PAF LFO1 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 37	00 00 01	00-7F	PAF LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 38	00 00 01	00-7F	PAF LFO2 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 39	00 00 01	00-7F	PAF LFO2 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 3A	00 00 01	00-7F	PAF LFO2 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 40	00 00 01	28-58	CC1 PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 41	00 00 01	00-7F	CC1 TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 42	00 00 01	00-7F	CC1 AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 43	00 00 01	00-7F	CC1 LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 44	00 00 01	00-7F	CC1 LFO1 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 45	00 00 01	00-7F	CC1 LFO1 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 46	00 00 01	00-7F	CC1 LFO1 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 47	00 00 01	00-7F	CC1 LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 48	00 00 01	00-7F	CC1 LFO2 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 49	00 00 01	00-7F	CC1 LFO2 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 4A	00 00 01	00-7F	CC1 LFO2 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 50	00 00 01	28-58	CC2 PITCH CONTROL	-24 - +24 [semitone]	40	0 [semitones]
40 2x 51	00 00 01	00-7F	CC2 TVF CUTOFF CONTROL	-9600 - +9600 [cent]	40	0 [cent]
40 2x 52	00 00 01	00-7F	CC2 AMPLITUDE CONTROL	-100.0 - +100.0 [%]	40	0 [%]
40 2x 53	00 00 01	00-7F	CC2 LFO1 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 54	00 00 01	00-7F	CC2 LFO1 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 55	00 00 01	00-7F	CC2 LFO1 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 56	00 00 01	00-7F	CC2 LFO1 TVA DEPTH	0-100.0 [%]	00	0 [%]
40 2x 57	00 00 01	00-7F	CC2 LFO2 RATE CONTROL	-10.0 - +10.0 [Hz]	40	0 [Hz]
40 2x 58	00 00 01	00-7F	CC2 LFO2 PITCH DEPTH	0-600 [cent]	00	0 [cent]
40 2x 59	00 00 01	00-7F	CC2 LFO2 TVF DEPTH	0-2400 [cent]	00	0 [cent]
40 2x 5A	00 00 01	00-7F	CC2 LFO2 TVA DEPTH	0-100.0 [%]	00	0 [%]

● Drum Setup Parameters

* m: Map number (0 = MAP1, 1 = MAP2)

* rr: drum part note number (00H-7FH)

Address (H)	Size (H)	Data (H)	Parameter	Description
41 m1 rr	00 00 01	00-7F	PLAY NOTE NUMBER	Pitch coarse
41 m2 rr	00 00 01	00-7F	LEVEL (= NRP# 26)	TVA level
41 m3 rr	00 00 01	00-7F	ASSIGN GROUP NUMBER	Non, 1-127
41 m4 rr	00 00 01	00-7F	PANPOT (= NRP# 28, except RANDOM)	-64 (RANDOM), -63 (LEFT) - +63 (RIGHT)
41 m5 rr	00 00 01	00-7F	REVERB SEND LEVEL (= NRP# 29)	0.0-1.0 Multiplicand of the part reverb depth
41 m6 rr	00 00 01	00-7F	CHORUS SEND LEVEL (= NRP# 30)	0.0-1.0 Multiplicand of the part chorus depth
41 m7 rr	00 00 01	00-01	Rx. NOTE OFF	OFF/ON
41 m8 rr	00 00 01	00-01	Rx. NOTE ON	OFF/ON

* When the Drum Set is changed, DRUM SETUP PARAMETER values will all be initialized.

4. Supplementary material

●Decimal and Hexadecimal table

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.

Dec.	Hex.	Dec.	Hex.	Dec.	Hex.	Dec.	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

- * Decimal values such as MIDI channel, bank select, and program change are listed as one (1) 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 +/- 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 $aa \text{ bbH} - 40 \text{ 00H} = aa \times 128 + bb - 64 \times 128$.
- * Data marked "nibbled" 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?

<u>16</u>	<u>1258</u>
<u>16</u>	<u>78</u> ... 10
<u>16</u>	<u>4</u> ... 14
0	... 4

Since from the preceding table, 0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH, the answer 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 00H (= $64 \times 128 + 0 = 8192$) is 0, so this Pitch Bend Value is $28 \text{ 00H} - 40 \text{ 00H} = 40 \times 128 + 0 - (64 \times 128 + 0) = 5120 - 8192 = -3072$

If the Pitch Bend Sensitivity is set to 2 semitones, -8192 (00 00H) will cause the pitch to change -200 cents, so in this case $-200 \times (-3072) / (-8192) = -75$ 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 sources 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 rewind or fast-forwarded, the sequencer may not be able to transmit the correct status, and the sound source 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

●Example of an Exclusive message and calculating a Checksum

Roland Exclusive messages 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.

uHow 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 checksum is calculated. We will assume that in the exclusive message we are transmitting, the address is aa bb ccH and the data or size is dd ee ffH.

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

<Example> Setting REVERB MACRO to ROOM 3
 According to the "Parameter Address Map," the REVERB MACRO Address is 40 01 30H, and ROOM 3 is a value of 02H. Thus,

F0 41 10 42 12 40 01 30 02 ?? F7
 (1) (2) (3) (4) (5) Address data Checksum (6)

(1) Exclusive Status, (2) ID (Roland), (3) Device ID (17),
 (4) Model ID (GS), (5) Command ID (DT1), (6) End of Exclusive

Next we calculate the checksum.

40H + 01H + 30H + 02H = 64 + 1 + 48 + 2 = 115 (sum)
 115 (sum) / 128 = 0 (quotient) ... 115 (remainder)
 checksum = 128 - 115 (remainder) = 13 = 0DH

This means that F0 41 10 42 12 40 01 30 02 0D F7 is the message we transmit.

●About tuning

In MIDI, individual Parts are tuned by sending RPN #1 (Master Fine Tuning) to the appropriate MIDI channel.
 In MIDI, an entire device is tuned by either sending RPN #1 to all MIDI channels being used, or by sending a System Exclusive MASTER TUNE (address 40 00 00H).
 RPN #1 allows tuning to be specified in steps of approximately 0.012 cents (to be precise, 100/8192 cent), and System Exclusive MASTER TUNE allows tuning in steps of 0.1 cent. One cent is 1/100th of a semitone.
 The values of RPN #1 (Master Fine Tuning) and System Exclusive MASTER TUNE are added together to determine the actual pitch sounded by each Part.

Frequently used tuning values are given in the following table for your reference. Values are in hexadecimal (decimal in parentheses).

Hz in A4	cent	RPN #1	Sys.Ex. 40 00 00
445.0	+19.56	4C 43 (+1603)	00 04 0C 04 (+196)
444.0	+15.67	4A 03 (+1283)	00 04 09 0D (+157)
443.0	+11.76	47 44 (+ 964)	00 04 07 06 (+118)
442.0	+ 7.85	45 03 (+ 643)	00 04 04 0F (+ 79)
441.0	+ 3.93	42 42 (+ 322)	00 04 02 07 (+ 39)
440.0	0.00	40 00 (0)	00 04 00 00 (0)
439.0	- 3.94	3D 3D (- 323)	00 03 0D 09 (- 39)
438.0	- 7.89	3A 7A (- 646)	00 03 0B 01 (- 79)

<Example> Set the tuning of MIDI channel 3 to A4 = 442.0 Hz
 Send RPN#1 to MIDI channel 3. From the above table, the value is 45 03H.

B2 64 00 MIDI ch.3, lower byte of RPN parameter number: 00H
 (B2) 65 01 (MIDI ch.3) upper byte of RPN parameter number: 01H
 (B2) 06 45 (MIDI ch.3) upper byte of parameter value: 45H
 (B2) 26 03 (MIDI ch.3) lower byte of parameter value: 03H
 (B2) 64 7F (MIDI ch.3) lower byte of RPN parameter number: 7FH
 (B2) 65 7F (MIDI ch.3) upper byte of RPN parameter number: 7FH

●The Scale Tune Feature (address: 40 1x 40)

The scale Tune feature allows you to finely adjust the individual pitch of the notes from C through B. Though the settings are made while working with one octave, the fine adjustments will affect all octaves. By making the appropriate Scale Tune settings, you can obtain a complete variety of tuning methods other than equal temperament. As examples, three possible types of scale setting are explained below.

○Equal Temperament

This method of tuning divides the octave into 12 equal parts. It is currently the most widely used form of tuning, especially in occidental music. On HP-337, the default settings for the Scale Tune feature produce equal temperament.

○Just Temperament (Keytone C)

The three main chords resound much more beautifully than with equal temperament, but this benefit can only be obtained in one key. If transposed, the chords tend to become ambiguous. The example given involves settings for a key in which C is the keynote.

○Arabian Scale

By altering the setting for Scale Tune, you can obtain a variety of other tunings suited for ethnic music. For example, the settings introduced below will set the unit to use the Arabian Scale.

Example Settings

Note name	Equal Temperament	Just Temperament (Keytone C)	Arabian Scale
C	0	0	-6
C#	0	-8	+45
D	0	+4	-2
D#	0	+16	-12
E	0	-14	-51
F	0	-2	-8
F#	0	-10	+43
G	0	+2	-4
G#	0	+14	+47
A	0	-16	0
A#	0	+14	-10
B	0	-12	-49

The values in the table are given in cents. Refer to the explanation of Scale Tuning (p. 11) to convert these values to hexadecimal, and transmit them as exclusive data.
 For example, to set the tune (C-B) of the Part1 Arabian Scale, send the data as follows:
 F0 41 10 42 12 40 11 40 3A 6D 3E 34 0D 38 6B 3C 6F 40 36 0F 50 F7

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●Tone List

○HP-337 TONE MAPPING

CC0 / CC32 / PC#	Tone Name	Voices	Notes (GS)
00h / 00h / 00h	Grand Piano1	2	
00h / 01h / 00h	Piano1	1	8-16
00h / 41h / 00h	MIDI Piano1	2	1-8
08h / 00h / 00h	Piano 1w	2	8-17
08h / 40h / 00h	Grand Piano1	2	1-1
10h / 00h / 00h	Piano 1d	1	8-18
10h / 40h / 00h	UprightPiano	2	1-2
10h / 41h / 00h	Ballad Piano	2	
00h / 00h / 01h	Piano 2	1	8-19
00h / 40h / 01h	Piano	2	
00h / 41h / 01h	MIDI Piano2	2	1-9
00h / 42h / 01h	Bright Piano	2	
00h / 48h / 01h	Piano 2*	1	
08h / 00h / 01h	Piano 2w	2	8-20
08h / 41h / 01h	Grand Piano2	1	1-10
00h / 00h / 02h	Piano 3	1	8-21
00h / 41h / 02h	EG+Rhodes 1	2	
00h / 42h / 02h	EG+Rhodes 2	2	
00h / 48h / 02h	Piano 3*	1	
08h / 00h / 02h	Piano 3w	2	8-22
08h / 40h / 02h	Rock Piano	2	1-3
08h / 41h / 02h	Air Grand	3	1-6
08h / 42h / 02h	PianoStrings	4	1-5
08h / 43h / 02h	Bright Piano	2	
00h / 00h / 03h	GS Honkytonk	2	8-23
00h / 48h / 03h	Honky-tonk*	2	
08h / 00h / 03h	Honky-tonk 2	2	1-7 8-24
08h / 40h / 03h	Honky-tonk	2	1-4
00h / 00h / 04h	GS E.Piano1	1	8-25
00h / 41h / 04h	Hard Rhodes	2	
00h / 42h / 04h	Stage Rhodes	2	2-3
00h / 48h / 04h	E.Piano 1*	1	
08h / 00h / 04h	Detuned EP 1	2	8-30
08h / 40h / 04h	Soft E.Piano	2	2-4
08h / 42h / 04h	Chord EP1	1	
10h / 00h / 04h	E.Piano 1v	2	8-28
10h / 40h / 04h	E.Piano 1	2	2-1
18h / 00h / 04h	60's E.Piano	1	2-6 8-27
18h / 40h / 04h	Sine Rhodes	1	
18h / 48h / 04h	60'sE.Piano*	1	
00h / 00h / 05h	GS E.Piano2	1	8-26
00h / 40h / 05h	Hard E.Piano	2	2-5
00h / 41h / 05h	E.Piano 3	1	
00h / 48h / 05h	E.Piano 2*	1	
08h / 00h / 05h	Detuned EP 2	2	8-31
08h / 40h / 05h	St.FM EP	2	
08h / 41h / 05h	FM+SA EP	2	
08h / 42h / 05h	Hard FM EP	2	
10h / 00h / 05h	E.Piano 2v	2	8-29
10h / 40h / 05h	E.Piano 2	1	2-2
00h / 00h / 06h	GS Harpsi.	1	8-32
00h / 40h / 06h	Harpsichord1	1	3-1
00h / 48h / 06h	Harpsichord*	1	
08h / 00h / 06h	Coupled Hps.	2	8-33
08h / 40h / 06h	Harpsichord2	2	3-2
10h / 00h / 06h	Harpsi.w	2	8-34
18h / 00h / 06h	Harpsi.o	2	8-35
00h / 00h / 07h	Soft Clav.	1	2-7 8-36
00h / 40h / 07h	Analog Clav.	2	
00h / 41h / 07h	5th Ana.Clav	2	
00h / 48h / 07h	Clav.*	1	
00h / 00h / 08h	Celesta	1	4-4 8-37
00h / 48h / 08h	Celesta*	1	
00h / 00h / 09h	Glockenspiel	1	4-8 8-38
00h / 48h / 09h	Glocken*	1	
00h / 00h / 0Ah	GS Music Box	1	8-39
00h / 40h / 0Ah	Music Box	1	4-5
00h / 48h / 0Ah	Music Box*	1	

00h / 00h / 0Bh	GS Vibe	1	8-40
00h / 40h / 0Bh	Vibraphone	1	4-1
00h / 48h / 0Bh	Vibraphone*	1	
08h / 00h / 0Bh	Vibe.w	2	8-41
00h / 00h / 0Ch	GS Marimba	1	8-42
00h / 48h / 0Ch	Marimba*	1	
08h / 00h / 0Ch	Marimba	1	4-3 8-43
08h / 40h / 0Ch	Balafon	1	
00h / 00h / 0Dh	Xylophone	1	4-7 8-44
00h / 48h / 0Dh	Xylophone*	1	
00h / 00h / 0Eh	Tubular-bell	1	4-9 8-45
00h / 48h / 0Eh	Tubularbell*	1	
08h / 00h / 0Eh	Church Bell	1	8-46
09h / 00h / 0Eh	Carillon	1	8-47
09h / 48h / 0Eh	Carillon*	1	
00h / 00h / 0Fh	GS Santur	1	8-48
00h / 40h / 0Fh	Santur	2	4-6
00h / 48h / 0Fh	Santur*	1	
00h / 00h / 10h	Organ 1	1	8-49
00h / 41h / 10h	Full Organ 1	1	5-4
00h / 42h / 10h	Lower Organ1	1	
00h / 43h / 10h	Full Organ 5	2	
00h / 48h / 10h	Organ 1*	1	
08h / 00h / 10h	Detuned Or.1	2	8-52
08h / 40h / 10h	Pop Organ 2	1	
08h / 42h / 10h	Lower Organ2	1	
08h / 43h / 10h	Full Organ 6	2	
08h / 44h / 10h	Detuned Or.1	2	
09h / 00h / 10h	Full Organ 2	1	
10h / 00h / 10h	Pop Organ 1	1	8-51
10h / 41h / 10h	Full Organ 3	1	
10h / 42h / 10h	Lower Organ3	1	
10h / 43h / 10h	Full Organ 7	2	
10h / 48h / 10h	Pop Organ 1*	1	
12h / 00h / 10h	Pop Organ	1	5-6
20h / 00h / 10h	Full Organ 4	1	8-57
20h / 40h / 10h	VS Organ	2	
20h / 42h / 10h	Metalic Org.	2	
20h / 43h / 10h	Full Organ 8	1	
20h / 44h / 10h	Organ 4	2	
00h / 00h / 11h	Organ 2	1	8-50
00h / 40h / 11h	Jazz Organ1	2	5-3
00h / 41h / 11h	Jazz Organ4	2	
00h / 42h / 11h	Jazz Organ 5	2	
00h / 48h / 11h	Organ 2*	1	
01h / 00h / 11h	Jazz Organ3	2	
08h / 00h / 11h	Detuned Or.2	2	8-53
08h / 41h / 11h	Organ Bass	2	
08h / 42h / 11h	Jazz Organ 6	2	
20h / 00h / 11h	Jazz Organ1	2	8-58
20h / 40h / 11h	Jazz Organ2	2	
20h / 41h / 11h	Pipe Org. Bs	2	
20h / 42h / 11h	Jazz Organ 7	2	
20h / 43h / 11h	Organ 5	2	
00h / 00h / 12h	Rock Organ2	2	8-59
00h / 40h / 12h	Rock Organ1	2	
00h / 41h / 12h	Rotary Org.S	1	
00h / 42h / 12h	Rotary Org.F	1	
00h / 48h / 12h	Rock Organ2*	2	
00h / 00h / 13h	Church Org.1	1	8-54
00h / 40h / 13h	Organ Flute	1	
00h / 48h / 13h	ChurchOrg.1*	1	
08h / 00h / 13h	Church Org.2	2	8-55
08h / 40h / 13h	Trem.Flute	2	
08h / 41h / 13h	Church Organ	2	5-2
10h / 00h / 13h	Church Org.3	2	8-56
10h / 40h / 13h	Theater Org.	2	
10h / 42h / 13h	Nason flt 8'	1	5-1
00h / 00h / 14h	Reed Organ	1	8-60
00h / 40h / 14h	Digi Church	2	
00h / 48h / 14h	Reed Organ*	1	

00h / 00h / 15h	Accordion Fr	2		8-61
00h / 40h / 15h	Accordion	1	5-5	
00h / 48h / 15h	AccordionFr*	2		
08h / 00h / 15h	Accordion It	2		8-62
00h / 00h / 16h	GS Harmonica	1		8-63
00h / 40h / 16h	Harmonica	1	5-7	
00h / 48h / 16h	Harmonica*	1		
00h / 00h / 17h	Bandoneon	2		8-64
00h / 48h / 17h	Bandoneon*	2		
00h / 00h / 18h	GS Nylon Gt.	1		8-65
00h / 40h / 18h	Nylon Guitar	1	3-3	
00h / 42h / 18h	Chord Gt1	1		
00h / 48h / 18h	Nylon-strGt*	1		
08h / 00h / 18h	Ukulele	1		8-68
08h / 40h / 18h	Cut Guitar	1		
10h / 00h / 18h	Nylon Gt.o	2		8-67
20h / 00h / 18h	Nylon Guitar	1		8-66
20h / 40h / 18h	Nylon Gt.2	1		
00h / 00h / 19h	Steel-str.Gt	1	3-4	8-69
00h / 40h / 19h	Steel Guitar	1		
00h / 48h / 19h	Steel-strGt*	1		
08h / 00h / 19h	12-str.Gt	2		8-70
08h / 40h / 19h	12str Guitar	2		
08h / 41h / 19h	Nylon+Steel	2		
10h / 00h / 19h	GS Mandolin	1		8-71
10h / 40h / 19h	Mandolin	1	3-5	
10h / 41h / 19h	Steel Gt.2	1		
00h / 00h / 1Ah	Jazz Guitar	1	3-7	8-72
00h / 48h / 1Ah	Jazz Guitar*	1		
08h / 00h / 1Ah	Hawaiian	1		8-73
08h / 40h / 1Ah	Hawaiian Gt.	1		
00h / 00h / 1Bh	Clean Gt.	1		8-74
00h / 40h / 1Bh	JC E.Guitar	2		
00h / 48h / 1Bh	Clean Gt.*	1		
08h / 00h / 1Bh	Chorus Gt.	2		8-75
00h / 00h / 1Ch	Muted Gt.	1		8-76
00h / 40h / 1Ch	Muted Dis.Gt	1		
00h / 48h / 1Ch	Muted Gt.*	1		
08h / 00h / 1Ch	Funk Gt.	1		8-77
08h / 48h / 1Ch	Funk Gt.*	1		
10h / 00h / 1Ch	Funk Gt.2	2		8-78
00h / 00h / 1Dh	Overdrive Gt	1	3-8	8-79
00h / 48h / 1Dh	OverdriveGt*	1		
00h / 00h / 1Eh	DistortionGt	1	3-9	8-80
00h / 40h / 1Eh	DistortionGt2	1		
00h / 41h / 1Eh	Dazed Guitar	2		
00h / 42h / 1Eh	Rock Rhythm2	2		
00h / 48h / 1Eh	Dist.Guitar*	1		
08h / 00h / 1Eh	Feedback Gt.	2		8-81
08h / 40h / 1Eh	Power Gt.2	2		
08h / 41h / 1Eh	Power Guitar	2		
08h / 42h / 1Eh	Rock Rhythm	2		
00h / 00h / 1Fh	Gt.Harmonics	1		8-82
00h / 48h / 1Fh	Gt.Harmo*	1		
08h / 00h / 1Fh	Gt. Feedback	1		8-83
00h / 00h / 20h	GS Ac.Bass	1		8-84
00h / 40h / 20h	Acoustic Bs.	2		
00h / 41h / 20h	A.Bass+Cymb1	2		
00h / 48h / 20h	Acoustic Bs*	1		
00h / 00h / 21h	GS Fing.Bass	1		8-85
00h / 40h / 21h	Fingered Bs.	1		
00h / 48h / 21h	Fingered Bs*	1		
00h / 00h / 22h	GS Picked Bs	1		8-86
00h / 40h / 22h	Picked Bs.	1		
00h / 41h / 22h	Mute PickBs.	1		
00h / 48h / 22h	Picked Bs.*	1		
00h / 00h / 23h	Fretless Bs.	1		8-87
00h / 48h / 23h	Fretless Bs*	1		

00h / 48h / 24h	Slap Bass 1*	1		
00h / 00h / 25h	Slap Bass 2	1		8-89
00h / 48h / 25h	Slap Bass 2*	1		
00h / 00h / 26h	Synth Bass 1	1		8-91
00h / 48h / 26h	Synth Bass1*	1		
01h / 00h / 26h	SynthBass101	1		8-90
08h / 00h / 26h	Synth Bass 3	1		8-93
00h / 00h / 27h	Synth Bass 2	2		8-92
00h / 48h / 27h	Synth Bass2*	2		
08h / 00h / 27h	Synth Bass 4	2		8-94
10h / 00h / 27h	Rubber Bass	2		8-95
10h / 40h / 27h	SH101 Bass	1		
10h / 48h / 27h	Rubber Bass*	2		
00h / 00h / 28h	GS Violin	1		8-96
00h / 40h / 28h	Violin	1	6-2	
00h / 48h / 28h	Violin*	1		
08h / 00h / 28h	Slow Violin	1		8-97
00h / 00h / 29h	Viola	1		8-98
00h / 48h / 29h	Viola*	1		
00h / 00h / 2Ah	GS Cello	1		8-99
00h / 40h / 2Ah	Cello	1	6-3	
00h / 48h / 2Ah	Cello*	1		
00h / 00h / 2Bh	Contrabass	1		8-100
00h / 48h / 2Bh	Contrabass*	1		
00h / 00h / 2Ch	Tremolo Str	1		8-101
00h / 48h / 2Ch	Tremolo Str*	1		
00h / 00h / 2Dh	PizzicatoStr	1		8-102
00h / 48h / 2Dh	Pizzicato*	1		
00h / 00h / 2Eh	GS Harp	1		8-103
00h / 40h / 2Eh	Harp	1	6-6	
00h / 48h / 2Eh	Harp*	1		
00h / 00h / 2Fh	Timpani	1		8-104
00h / 48h / 2Fh	Timpani*	1		
00h / 00h / 30h	GS Strings	1		8-105
00h / 40h / 30h	Strings	2	6-1	
00h / 42h / 30h	Oct Strings	2	6-4	
00h / 48h / 30h	Strings*	1		
08h / 00h / 30h	Orchestra	2	6-7	5-106
00h / 00h / 31h	GS Sl.Str	1		8-107
00h / 40h / 31h	Slow Strings	2	6-5	
00h / 41h / 31h	SlowStrings2	2		
00h / 48h / 31h	SlowStrings*	1		
00h / 00h / 32h	Syn.Strings1	1		8-108
00h / 40h / 32h	Syn.Strings1	1	6-8	
00h / 48h / 32h	Syn.Str 1*	1		
08h / 00h / 32h	Syn.Strings3	2		8-110
00h / 00h / 33h	Syn.Strings2	2		8-109
00h / 48h / 33h	Syn.Str 2*	2		
00h / 00h / 34h	Choir Aahs	1		8-111
00h / 48h / 34h	Choir Aahs*	1		
20h / 00h / 34h	Choir	1	7-2	8-112
00h / 00h / 35h	Pop Voice	1	7-3	8-113
00h / 40h / 35h	Jazz Voices	1	7-1	
00h / 41h / 35h	Doos Voice	1		
00h / 42h / 35h	Thum Voice	1		
00h / 43h / 35h	Doot Accent	1		
00h / 44h / 35h	Dat Accent	1		
00h / 45h / 35h	Bop Accent	1		
00h / 46h / 35h	Doos & Doot	2		
00h / 47h / 35h	Dat & Bop	2		
00h / 48h / 35h	Pop Voice*	1		

00h / 00h / 36h	SynVox	1	7-5	8-114
00h / 40h / 36h	Choir Oohs	2	7-4	
00h / 48h / 36h	SynVox*	1		
00h / 00h / 37h	OrchestraHit	2		8-115
00h / 48h / 37h	Orche.Hit*	2		
00h / 00h / 38h	GS Trumpet	1		8-116
00h / 40h / 38h	Trumpet	1	8-3	
00h / 48h / 38h	Trumpet*	1		
00h / 00h / 39h	GS Trombone	1		8-117
00h / 40h / 39h	TromboneSoft	1	8-4	
00h / 48h / 39h	Trombone*	1		
01h / 00h / 39h	Trombone 2	2		8-118
00h / 00h / 3Ah	Tuba	1		8-119
00h / 48h / 3Ah	Tuba*	1		
00h / 00h / 3Bh	MutedTrumpet	1	8-13	8-120
00h / 48h / 3Bh	M.Trumpet*	1		
00h / 00h / 3Ch	GS French Horn	2		8-121
00h / 40h / 3Ch	French Horn	1	8-5	
00h / 48h / 3Ch	FrenchHorns*	2		
01h / 00h / 3Ch	Fr.Horn 2	2		8-122
00h / 00h / 3Dh	Brass 1	1		8-123
00h / 40h / 3Dh	Brass 1	1	8-10	
00h / 48h / 3Dh	Brass 1*	1		
08h / 00h / 3Dh	Brass 2	2		8-124
00h / 00h / 3Eh	Synth Brass1	2		8-125
00h / 48h / 3Eh	SynthBrass1*	2		
08h / 00h / 3Eh	Synth Brass3	2		8-127
10h / 00h / 3Eh	AnalogBrass1	2		8-129
10h / 48h / 3Eh	A.Brass 1*	2		
00h / 00h / 3Fh	Synth Brass2	2		8-126
00h / 48h / 3Fh	SynthBrass2*	2		
08h / 00h / 3Fh	Synth Brass4	1		8-128
10h / 00h / 3Fh	AnalogBrass2	2		8-130
00h / 00h / 40h	GS Sop.Sax	1		8-131
00h / 40h / 40h	Soprano Sax	1	8-8	
00h / 48h / 40h	Soprano Sax*	1		
00h / 00h / 41h	Alto Sax	1	8-11	8-132
00h / 48h / 41h	Alto Sax*	1		
08h / 00h / 41h	Blow Sax	1		
00h / 00h / 42h	Tenor Sax	1		8-133
00h / 40h / 42h	Blow Sax	1	8-9	
00h / 48h / 42h	Tenor Sax*	1		
00h / 00h / 43h	Baritone Sax	1		8-134
00h / 48h / 43h	BaritoneSax*	1		
00h / 00h / 44h	GS Oboe	1		8-135
00h / 40h / 44h	Oboe	1	8-2	
00h / 48h / 44h	Oboe*	1		
01h / 40h / 44h	Tune Oboe	1		
00h / 00h / 45h	English Horn	1		8-136
00h / 48h / 45h	EnglishHorn*	1		
00h / 00h / 46h	Bassoon	1	8-12	8-137
00h / 48h / 46h	Bassoon*	1		
00h / 00h / 47h	Clarinet	1	8-14	8-138
00h / 48h / 47h	Clarinet*	1		
00h / 00h / 48h	Piccolo	1		8-139
00h / 48h / 48h	Piccolo*	1		
00h / 00h / 49h	GS Flute	1		8-140
00h / 40h / 49h	Flute	1	8-1	
00h / 48h / 49h	Flute*	1		

00h / 00h / 4Ah	Recorder	1		8-141
00h / 48h / 4Ah	Recorder*	1		
00h / 00h / 4Bh	Pan Flute	1	8-15	8-142
00h / 40h / 4Bh	Blow Pipe	1		
00h / 48h / 4Bh	Pan Flute*	1		
00h / 00h / 4Ch	Bottle Blow	2		8-143
00h / 48h / 4Ch	Bottle Blow*	2		
00h / 00h / 4Dh	Shakuhachi	2		8-144
00h / 48h / 4Dh	Shakuhachi*	2		
00h / 00h / 4Eh	Whistle	1		8-145
00h / 48h / 4Eh	Whistle*	1		
00h / 00h / 4Fh	Ocarina	1		8-146
00h / 48h / 4Fh	Ocarina*	1		
00h / 00h / 50h	Square Wave	2		8-147
00h / 40h / 50h	Syn.Square	2		
00h / 41h / 50h	CC Solo	2	7-11	
00h / 48h / 50h	Square Wave*	2		
01h / 00h / 50h	Square	1		8-148
01h / 40h / 50h	FM Lead 1	2		
08h / 00h / 50h	Sine Wave	1		8-149
08h / 40h / 50h	JP8 Square	1		
00h / 00h / 51h	Saw Wave	2		8-150
00h / 40h / 51h	Mg Lead	1		
00h / 48h / 51h	Saw Wave*	2		
01h / 00h / 51h	Saw	1		8-151
01h / 40h / 51h	P5 Saw Lead	1		
08h / 00h / 51h	Doctor Solo	2		8-152
08h / 40h / 51h	Rhythmic Saw	2		
08h / 48h / 51h	Doctor Solo*	2		
00h / 00h / 52h	Syn.Calliope	2		8-153
00h / 40h / 52h	JP8 Pulse	2		
00h / 48h / 52h	SynCalliope*	2		
00h / 00h / 53h	Chiffer Lead	2		8-154
00h / 40h / 53h	Cheese Saw	1		
00h / 48h / 53h	ChifferLead*	2		
00h / 00h / 54h	Charang	2		8-155
00h / 40h / 54h	Reso Saw	1		
00h / 48h / 54h	Charang*	2		
00h / 00h / 55h	Solo Vox	1		8-156
00h / 40h / 55h	RAVE Vox	2		
00h / 48h / 55h	Solo Vox*	2		
00h / 00h / 56h	5th Saw Wave	2		8-157
00h / 40h / 56h	5th Lead	2		
00h / 48h / 56h	5th SawWave*	2		
00h / 00h / 57h	Bass & Lead	2		8-158
00h / 40h / 57h	FM Lead 2	1		
00h / 48h / 57h	Bass & Lead*	2		
00h / 00h / 58h	Fantasia	2	7-6	8-159
00h / 40h / 58h	Fantasia 2	2		
00h / 42h / 58h	Chord Syn1	2		
00h / 48h / 58h	Fantasia*	2		
00h / 00h / 59h	Warm Pad	1	7-10	8-160
00h / 40h / 59h	Soft Pad	2		
00h / 48h / 59h	Warm Pad*	1		
00h / 00h / 5Ah	Polysynth	2		8-161
00h / 40h / 5Ah	P5 Poly	2		
00h / 48h / 5Ah	Polysynth*	2		
00h / 00h / 5Bh	Space Voice	1		8-162
00h / 40h / 5Bh	Heaven II	2		
00h / 48h / 5Bh	Space Voice*	1		

00h / 00h / 5Ch	Bowed Glass	2		8-163
00h / 48h / 5Ch	Bowed Glass*	2		
00h / 00h / 5Dh	Metal Pad	2		8-164
00h / 40h / 5Dh	Tine Pad	2		
00h / 41h / 5Dh	Panner Pad	2		
00h / 48h / 5Dh	Metal Pad*	2		
00h / 00h / 5Eh	Halo Pad	2		8-165
00h / 40h / 5Eh	JP8 Sqr Pad	2		
00h / 48h / 5Eh	Halo Pad*	2		
00h / 00h / 5Fh	Sweep Pad	1		8-166
00h / 40h / 5Fh	Sweep Pad 2	2		
00h / 41h / 5Fh	Polar Pad	1		
00h / 42h / 5Fh	Converge	1		
00h / 48h / 5Fh	Sweep Pad*	1		
00h / 00h / 60h	Ice Rain	2		8-167
00h / 40h / 60h	LFO RAVE	2		
00h / 48h / 60h	Ice Rain*	2		
00h / 00h / 61h	Soundtrack	2		8-168
00h / 40h / 61h	Ancestral	2		
00h / 41h / 61h	Prologue	2		
00h / 48h / 61h	Soundtrack*	2		
00h / 00h / 62h	Crystal	2	7-8	8-169
00h / 40h / 62h	Vibra Bells	2	4-2	
00h / 41h / 62h	Clear Bells	2		
00h / 42h / 62h	ChristmasBel	2		
00h / 48h / 62h	Crystal*	2		
01h / 00h / 62h	Syn Mallet	1		8-170
01h / 48h / 62h	Syn Mallet*	1		
00h / 00h / 63h	Atmosphere	2		8-171
00h / 40h / 63h	Harpvox	2	7-9	
00h / 41h / 63h	Nylon Harp	2		
00h / 42h / 63h	Nylon+Rhodes	2		
00h / 48h / 63h	Atmosphere*	2		
00h / 00h / 64h	Brightness	2	7-7	8-172
00h / 48h / 64h	Brightness*	2		
00h / 00h / 65h	Goblin	2		8-173
00h / 40h / 65h	Calculating	2		
00h / 41h / 65h	Goblinson	2		
00h / 42h / 65h	50's Sci-Fi	2		
00h / 48h / 65h	Goblin*	2		
00h / 00h / 66h	Echo Drops	1		8-174
00h / 40h / 66h	Big Panner	2		
00h / 48h / 66h	Echo Drops*	1		
01h / 00h / 66h	Echo Bell	2		8-175
01h / 40h / 66h	Ai-yai-a	2		
02h / 00h / 66h	Echo Pan	2		8-176
02h / 40h / 66h	Echo Pan 2	2		
02h / 41h / 66h	Water Piano	2		
00h / 00h / 67h	Star Theme	2		8-177
00h / 48h / 67h	Star Theme*	2		
00h / 00h / 68h	Sitar	1		8-178
00h / 48h / 68h	Sitar*	1		
01h / 00h / 68h	Sitar 2	2		8-179
00h / 00h / 69h	Banjo	1	3-6	8-180
00h / 48h / 69h	Banjo*	1		
00h / 00h / 6Ah	GS Shamisen	1		8-181
00h / 40h / 6Ah	Shamisen	2	3-10	
00h / 48h / 6Ah	Shamisen*	1		
00h / 00h / 6Bh	Koto	1	3-11	8-182
00h / 48h / 6Bh	Koto*	1		
08h / 00h / 6Bh	Taisho Koto	2		8-183
08h / 48h / 6Bh	Taisho Koto*	2		
00h / 00h / 6Ch	Kalimba	1	4-11	8-184
00h / 48h / 6Ch	Kalimba*	1		

00h / 00h / 6Dh	Bagpipe	1		8-185
00h / 48h / 6Dh	Bagpipe*	1		
00h / 00h / 6Eh	Fiddle	1		8-186
00h / 48h / 6Eh	Fiddle*	1		
00h / 00h / 6Fh	Shanai	1		8-187
00h / 48h / 6Fh	Shanai*	1		
00h / 00h / 70h	Tinkle Bell	1		8-188
00h / 48h / 70h	Tinkle Bell*	1		
00h / 00h / 71h	Agogo	1		8-189
00h / 48h / 71h	Agogo*	1		
00h / 00h / 72h	Steel Drums	1	4-10	8-190
00h / 48h / 72h	Steel Drums*	1		
00h / 00h / 73h	Woodblock	1		8-191
00h / 48h / 73h	Woodblock*	1		
08h / 00h / 73h	Castanets	1		8-192
00h / 00h / 74h	Taiko	1		8-193
00h / 48h / 74h	Taiko*	1		
08h / 00h / 74h	Concert BD	1		8-194
08h / 48h / 74h	Concert BD*	1		
00h / 00h / 75h	Melo. Tom 1	1		8-195
00h / 48h / 75h	Melo. Tom 1*	1		
08h / 00h / 75h	Melo. Tom 2	1		8-196
00h / 00h / 76h	Synth Drum	1		8-197
00h / 48h / 76h	Synth Drum*	1		
08h / 00h / 76h	808 Tom	1		8-198
09h / 00h / 76h	Elec Perc.	1		8-199
00h / 00h / 77h	Reverse Cym.	1		8-200
00h / 48h / 77h	ReverseCym.*	1		
00h / 00h / 78h	Gt.FretNoise	1		8-201
00h / 48h / 78h	Fret Noise*	1		
01h / 00h / 78h	Gt.Cut Noise	1		8-202
02h / 00h / 78h	String Slap	1		8-203
06h / 40h / 78h	Pick Scrape	1		
00h / 00h / 79h	Breath Noise	1		8-204
00h / 48h / 79h	BreathNoise*	1		
01h / 00h / 79h	FL.Key Click	1		8-205
00h / 00h / 7Ah	Seashore	1		8-206
00h / 48h / 7Ah	Seashore*	1		
01h / 00h / 7Ah	Rain	1		8-207
02h / 00h / 7Ah	Thunder	1		8-208
02h / 40h / 7Ah	Thunder Bell	2		
03h / 00h / 7Ah	Wind	1		8-209
04h / 00h / 7Ah	Stream	2		8-210
05h / 00h / 7Ah	Bubble	2		8-211
00h / 00h / 7Bh	Bird	2		8-212
00h / 48h / 7Bh	Bird*	2		
01h / 00h / 7Bh	Dog	1		8-213
02h / 00h / 7Bh	Horse-Gallop	1		8-214
03h / 00h / 7Bh	Bird 2	1		8-215
04h / 40h / 7Bh	Cat	1		
00h / 00h / 7Ch	Telephone 1	1		8-216
00h / 48h / 7Ch	Telephone 1*	1		
01h / 00h / 7Ch	Telephone 2	1		8-217
02h / 00h / 7Ch	DoorCreaking	1		8-218
03h / 00h / 7Ch	Door	1		8-219
04h / 00h / 7Ch	Scratch	1		8-220
05h / 00h / 7Ch	Windchime	2		8-221
05h / 40h / 7Ch	Bar Chimes	1		
00h / 00h / 7Dh	Helicopter	1		8-222
00h / 48h / 7Dh	Helicopter*	1		
01h / 00h / 7Dh	Car-Engine	1		8-223
02h / 00h / 7Dh	Car-Stop	1		8-224
03h / 00h / 7Dh	Car-Pass	1		8-225
04h / 00h / 7Dh	Car-Crash	2		8-226
05h / 00h / 7Dh	Siren	1		8-237

06h / 00h / 7Dh	Train	1	8-238
07h / 00h / 7Dh	Jetplane	2	8-239
07h / 40h / 7Dh	Falling Down	2	
08h / 00h / 7Dh	Starship	2	8-240
09h / 00h / 7Dh	Burst Noise	2	8-241

00h / 00h / 7Eh	Applause	2	8-242
00h / 48h / 7Eh	Applause*	2	
01h / 00h / 7Eh	Laughing	1	8-243
02h / 00h / 7Eh	Screaming	1	8-244
03h / 00h / 7Eh	Punch	1	8-245
04h / 00h / 7Eh	Heart Beat	1	8-246
05h / 00h / 7Eh	Footsteps	1	8-247
05h / 41h / 7Eh	Finger Snap	1	

00h / 00h / 7Fh	Gun Shot	1	8-248
00h / 48h / 7Fh	Gun Shot*	1	
01h / 00h / 7Fh	Machine Gun	1	8-249
02h / 00h / 7Fh	Lasergun	1	8-250
03h / 00h / 7Fh	Explosion	2	8-251

○KR-337 Drum MAPPING

CC0 / CC32 / PC#	Tone Name	Notes
00h / 40h / 00h	STANDARD	8-6
00h / 40h / 08h	ROOM	8-242
00h / 00h / 10h	POWER	8-243
00h / 00h / 18h	ELECTRONIC	8-244
00h / 00h / 19h	TR-808	8-245
00h / 40h / 19h	DANCE	8-246
00h / 00h / 20h	JAZZ	8-247
00h / 40h / 28h	BRUSH	8-248
00h / 00h / 30h	ORCHESTRA	8-249
00h / 00h / 00h	GS STANDARD	8-250
00h / 00h / 08h	GS ROOM	8-251
00h / 00h / 28h	GS BRUSH	8-252
00h / 00h / 38h	SOUND EFFECT	8-7

*The tones which marked in Notes can be selected from panel.

+----- Tone group number
 | +---- Tone variation number
 | |
 8-10

○Tone groups number as follows,

- 1:Piano
- 2:E.Piano
- 3:Harpsi
- 4:Vibes
- 5:Organ
- 6:Strings
- 7:Voice
- 8:Flute