MIDI Implementation

Model: BK-9 Date: August 30, 2013
Version: 1.00

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)

- Not received when MIDI "Rx" part parameters is "Off" (Initial value is On).

● Note on

Status	2nd byte	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 MIDI "Rx" part parameters is "Off" (Initial value is On).

● Polyphonic Key Pressure

Status	2nd byte	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)

- The resulting effect is determined by System Exclusive messages. With the initial settings, there will be no effect.

● Control Change

- 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 byte	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)

- Bank Select processing will be suspended until a Program Change message is received.
- Not received when "Program Change" Rx Event is Off
- Not received when MIDI "Rx" part parameters is "Off".

○ Modulation (Controller Number 1)

Status	2nd byte	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.
- Not received when MIDI "Rx" part parameters is "Off".

○ Portamento Time (Controller Number 5)

Status	2nd byte	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.
- Not received when MIDI "Rx" part parameters is "Off".

○ 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-ch.16)
mm, ll = the value of the parameter specified by RPN/NRPN
mm = MSB, ll = LSB

- Not received when MIDI "Rx" part parameters is "Off".

○ Volume (Controller Number 7)

Status	2nd byte	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 "Volume" RX Event is off.
- Not received when MIDI "Rx" part parameters is "Off".
-

○ Pan (Controller Number 10)

Status	2nd byte	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)

- Some Tones are not capable of being panned all the way to the left or right.
- Not received when "PanPot" RX Event is Off
- Not received when MIDI "Rx" part parameters is "Off".

○ Expression (Controller Number 11)

Status	2nd byte	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 "Expression" RX Event is Off.)
- Not received when MIDI "Rx" part parameters is "Off".

○ Noise Level (SuperNATURAL, Controller Number 16)

Status	2nd byte	3rd byte
BnH	10H	vvH

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

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

- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Play Stability (SuperNATURAL , Controller Number 17)

Status	2nd byte	3rd byte
BnH	11H	vvH

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

- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Growl Sens (SuperNATURAL , Controller Number 18)

Status	2nd byte	3rd byte
BnH	12H	vvH

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

- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Hold 1 (Controller Number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH

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

- Not received when "Hold" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".

○ Portamento (Controller Number 65)

Status	2nd byte	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 MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Sostenuto (Controller Number 66)

Status	2nd byte	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 "Sostenuto" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".

○ 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)

- Not received when "Soft" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".
- Some Tones will not exhibit any change.

○ Hold 2 (Controller Number 69)

Status	2nd byte	3rd byte
BnH	45H	vvH

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

- Not received when "Hold" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".

○ Filter Resonance (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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ 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 SuperNatural Tones will not exhibit any change.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Staccato (SuperNATURAL, Controller Number 80)

Status	2nd byte	3rd byte
BnH	50H	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 SuperNatural Tones will not exhibit any change.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Fall (SuperNATURAL, Controller Number 81)

Status	2nd byte	3rd byte
BnH	51H	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 SuperNatural Tones will not exhibit any change.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

○ Portamento Control (Controller Number 84)

Status	2nd byte	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.
- Not received when MIDI "Rx" part parameters is "Off".
- Not received when the "Other CC" parameter of the MIDI "Rx Event" group is "Off"

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)

- This message adjusts the Reverb Send Level of each Part.
- Not received when "Reverb" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".

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

Status	2nd byte	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.
- Not received when "Chorus" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".

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

Status	2nd byte	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

- The value set by NRPN will not be reset even if Program Change or Reset All Controllers is received.
- Not received when "NRPN" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".

NRPN
The NRPN (Non Registered Parameter Number) message allows an extended range of control changes to be used. On the BK-9, NRPN messages can be used to modify sound parameters, etc.
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. On the BK-9, Data entry LSB (Controller number 38) of NRPN is ignored, so it is no problem to send Data entry MSB (Controller number 6) only (without Data entry LSB).

On this instrument, NRPN can be used to modify the following parameters.

NRPN		Data entry
MSB LSB	MSB	Description
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 AttackTime (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 64H	mmH	TVF &TVA Envelope DecayTime (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 66H	mmH	TVF &TVA Envelope ReleaseTime (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)

MSB LSB	MSB	Description
18H rrH	mmH	Drum Instrument Pitch Coarse (relative change) rr: Drum Instrument note number mm: 00H~40H~7FH (-64~0~+63 semitone)
1AH rrH	mmH	Drum InstrumentTVA Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max)
1CH rrH	mmH	Drum Instrument Panpot (absolute change) rr: Drum Instrument note number mm: 00H, 01H~40H~7FH (random, left~center~ right)
1DH rrH	mmH	Drum Instr. Reverb Send (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max)
1EH rrH	mmH	Drum Instr. Chorus Send (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max)
60H rrH	mmH	Equalizer Switch rr: Drum Instrument note number mm: 00H~02H (Global, Instrument, Off)
61H rrH	mmH	Equalizer Low Frequency rr: Drum Instrument note number mm: 00H~05H (90, 150, 180, 300, 360, 600Hz)
62H rrH	mmH	Equalizer Low Gain rr: Drum Instrument note number mm: 00H~1EH (–15~0~+15dB)
63H rrH	mmH	Equalizer Mid Frequency rr: Drum Instrument note number mm: 00H~10H (200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000,5000, 6300, 8000Hz)
64H rrH	mmH	Equalizer Mid Gain rr: Drum Instrument note number mm: 00H~1EH (–15~0~+15dB)
65H rrH	mmH	Equalizer Mid Gain rr: Drum Instrument note number mm: 00H~04H (0.5, 1.0, 2.0, 4.0, 8.0)
66H rrH	mmH	Equalizer High Frequency rr: Drum Instrument note number mm: 00H~06H (1500, 2000, 3000, 4000, 6000, 8000, 12000Hz)
67H rrH	mmH	Equalizer High Gain rr: Drum Instrument note number mm: 00H~1EH (–15~0~+15dB)
4FH 10H	mmH	Part 4 On / Off (Upper 1) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 11H	mmH	Part 11 On / Off (Lower1) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 12H	mmH	Part 12 On / Off (Man Bass) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 13H	mmH	Part 6 On / Off (Upper 2) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 25H	mmH	Part 13 On / Off (Upper 3) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 27H	mmH	Part 14 On / Off (Lower 2) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 26H	mmH	Part 15 On / Off (Melody Int.) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 18H	mmH	Part 8 On / Off (Acc 5) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 19H	mmH	Part 9 On / Off (Acc 6) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1AH	mmH	Part 10 On / Off (Acc Drums) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1BH	mmH	Part 2 On / Off (Acc Bass) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1CH	mmH	Part 1 On / Off (Acc 1) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1DH	mmH	Part 3 On / Off (Acc2) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1EH	mmH	Part 5 On / Off (Acc3) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1FH	mmH	Part 7 On / Off (Acc 4) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 20H	mmH	Master Accompaniment On / Off mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 21h	mmH	Master Volume Upper (1-2-3) On / mm: 00H~7FH (00-3FH=Off - 40-7FH= On)
4FH 22H	mmH	Master Volume Lower (1-2) On / Off mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 23H	mmH	Master Volume Bass (Acc./Man.Bass) On / Off mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 24H	mmH	Master Volume Bass (Acc.Drums) On / Off mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)

- Part On/Off NRPN messages are received on the Basic MIDI Channel.

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

Status	2nd byte	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.
- Not received when MIDI "Rx" part parameters is "Off".

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 "Examples of Actual MIDI Messages" (p. 24).

On this instrument, RPN can be used to modify the following parameters.

RPN Data entry

MSB LSB	MSB LSB	Explanation
00H 00H	mmH ---	Pitch Bend Sensitivity mm: 00H-18H (0-24 semitones), InitialValue = 02H (2 semitones) ll: ignored (processed as 00h) specify up to 2 octaves in semitone steps
00H 01H	mmH llH	Master FineTuning mm, ll: 00 00H - 40 00H - 7F 7FH (-100 - 0 - +99.99 cents), InitialValue = 40 00H (0 cent) ll: ignored (processed as 00h) specify up to 2 octaves in semitone steps Refer to 4. Supplementary Material, "AboutTuning"
00H 02H	mmH ---	Master CoarseTuning mm: 28H - 40H - 58H (-24 - 0 - +24 semitones), InitialValue = 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 byte
CnH	ppH

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

- Not received when "Program Change" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".
- 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.

● Channel Pressure

Status	2nd byte
DnH	vvH

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

- Not received when "Caf" RX Event is Off.
- Not received when MIDI "Rx" part parameters is "Off".
- 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 byte
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 "Pitch Bender " RX Event is Off. (Initial value is ON)
- Not received when MIDI "Rx" part parameters is "Off".
- 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 byte
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 byte
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

● All Notes Off (Controller Number 123)

Status	2nd byte	3rd byte
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 byte
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 byte
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 byte
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 byte
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

● Timing Clock

Status
F8H

- STYLE: Received when Sync RX is On and the Sync Mode Style RX parameter (MIDI\Edit\System) is set to AUTO or MIDI.
- SONG: Received when Sync RX is On and the Sync Mode Song RX parameter (MIDI\Edit\System) is set to AUTO or MIDI.
- When "Timing Clock" message is received, the Style or Song is synchronized to an external clock according to the following table. Song/Style Sync RX Response

Internal	A Style/Song will neither start/stop nor follow the tempo of the external Timing Clock (F8) and "Start /Stop" (FA/FC) messages.
Auto	If a Style/Song receives MIDI "Start/Stop" (FA/FC), it will follow Internal or External clock, depending on whether "MIDI Clock" (F8) messages are received.
MIDI	If a Style/Song receives MIDI "Start/Stop" (FA/FC) it will follow External "MIDI Clock" (F8) messages and herefore wait until they are received.
Remote	If a Style/Song receives MIDI "Start/Stop" (FA/FC) it will follow only Internal tempo and thus ignore incoming "MIDI Clock" (F8) messages

● Start

Status
FAH

- STYLE: Received when Sync RX is On and the Sync Mode Style RX parameter (MENU->MIDI->Edit System) is set to AUTO, MIDI or REMOTE.
- SONG: Received when Sync RX is On and the Sync Mode Song RX parameter (MENU->MIDI->Edit System) is set to AUTO, MIDI or REMOTE.

● Continue (Song playback only)

Status
FBH

- Received when Sync RX is On and the Sync Mode Song RX parameter (MENU->MIDI->Edit System->Sync->Mode) is set to Auto, MIDI or Remote.
- When a "Continue" message is received, the Song continues playing from the current position

● Stop

Status
FCH

- STYLE: Received when Sync RX is On and the Sync Mode Style RX parameter (MENU->MIDI->Edit System->Sync->Mode) is set to AUTO, MIDI or REMOTE.
- SONG: Received when Sync RX is On and the Sync Mode Song RX parameter (MENU->MIDI->Edit System->Sync->Mode) is set to Auto, MIDI or Remote.
- When a "Stop" message is received, the Style or Song stops playing.

■ System Common Messages

● Song Position Pointer

Status	2nd byte	3rd byte
F2H	XXH	YYH

XX= Song Position (Bar) LSB
YY= Song Position (Bar) MSB

● 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 this instrument are; messages related to mode settings, Universal Realtime System Exclusive messages, Universal Non-realtime System Exclusive messages and Data Set (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).

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.
- Not received when RX SYSEX parameter (MENU->MIDI->Edit System-> Parameters) is OFF.
- Only for the Song parts

○ GM2 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 2).

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, this instrument 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.
- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF.
- Only for the Song parts

○ GM System Off

"GM System Off" is a command message that resets the internal state of this instrument from the GM state to its native condition. This instrument 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)
F7H	EOX (End of exclusive)

- There must be an interval of at least 50 ms between this message and the next.
- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF.
- Only for the Song parts

○ GS reset

GS Reset is a command message that resets the internal settings of a device to the GS initial state. This message appears 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 play back 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.
- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF
- Only for the Song parts

○ Exit GS Mode

"Exit GS Mode" resets the internal settings of the unit to Arranger Mode I initial state .

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

Byte Explanation

F0H	Exclusive status
41H	ID number (Roland)
	dev 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	AddressLSB
7FH	Data (Exit GS Mode)
42H	Checksum
F7H	EOX (End Of Exclusive)

- There must be an interval of at least 100 ms between this message and the next message.
- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF.
- Only for the Song parts

● 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)
llH:	ignored (processed as 00H)
mmH:	00H - 7FH 0 - 127

- The lower byte (llH) of Master Volume will be handled as 00H.
- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF

○ 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)
llH, mmH:	00 00H - 40 00H - 7F 7FH (-100 - 0 - +99.9 [cents])

- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF

○ 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])

- Not received when RX SYSEX parameter (MENU->MIDI->Edit System->Parameters) is OFF

● Global Parameter Control (Song parts)

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 (Room1)
	vv = 01H Medium Room (Room2)
	vv = 02H Large Room (Room3)
	vv = 03H Medium Hall (Hall1)
	vv = 04H Large Hall (Hall2)
	vv = 08H Plate (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)

2. Transmitted Data

■ 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)
• Not transmitted when MIDI "Tx" part parameters is "Off".

● Note On

Status	2nd byte	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 transmitted when MIDI "Tx" part parameters is "Off"

● 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-ch.16)
mm, ll = Bank number: 00H, 00H-7FH, 7FH (bank.1 bank.16384)
• Not transmitted when MIDI "Tx" part parameters is "Off".
• Not transmitted when the "Program Change" parameter of the MIDI "Tx Event" group is "Off"

○ Modulation (Controller number 1)

Status	2nd byte	3rd byte
BnH	01H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)
• Not transmitted when MIDI "Tx" part parameters is "Off".
• Not transmitted when the "Modulation" parameter of the MIDI "Tx Event" group is "Off"

○ Portamento Time (Controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)
• 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.
• Not transmitted when MIDI "Tx" part parameters is "Off".

○ Data Entry (Controller number 6, 38)

Status	2nd byte	3rd byte
BnH	06H	vvH
BnH	26H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)
mm, ll = the value of the parameter specified by RPN/NRPN
mm = MSB, ll = LSB
• Not transmitted when MIDI "Tx" part parameters is "Off".

○ Volume (Controller Number 7)

Status	2nd byte	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)

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Volume" parameter of the MIDI "Tx Event" group is "Off"

○ Pan (Controller Number 10)

Status	2nd byte	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)

- Some Tones are not capable of being panned all the way to the left or right.
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Panpot" parameter of the MIDI "Tx Event" group is "Off"

○ Expression (Controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Expression" parameter of the MIDI "Tx Event" group is "Off"

○ Noise Level (SuperNATURAL, Controller Number 16)

Status	2nd byte	3rd byte
BnH	10H	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Play Stability (SuperNATURAL , Controller Number 17)

Status	2nd byte	3rd byte
BnH	11H	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Growl Sens (SuperNATURAL , Controller Number 18)

Status	2nd byte	3rd byte
BnH	12H	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Hold 1 (Controller Number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Hold" parameter of the MIDI "Tx Event" group is "Off"

○ Portamento (Controller Number 65)

Status	2nd byte	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 transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Sostenuto (Controller Number 66)

Status	2nd byte	3rd byte
BnH	42H	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Sostenuto" parameter of the MIDI "Tx Event" group is "Off"

○ 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)

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Soft" parameter of the MIDI "Tx Event" group is "Off"

○ Hold 2 (Controller Number 69)

Status	2nd byte	3rd byte
BnH	45H	vvH

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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Hold" parameter of the MIDI "Tx Event" group is "Off"

○ Filter Resonance (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)

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ 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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Staccato (SuperNATURAL, Controller Number 80)

Status	2nd byte	3rd byte
BnH	50H	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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Fall (SuperNATURAL, Controller Number 81)

Status	2nd byte	3rd byte
BnH	51H	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)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

○ Portamento Control (Controller Number 84)

tatus	2nd byte	3rd byte
BnH	54H	kkH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
kk = source note number: 00H-7FH (0-127)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Other CC" parameter of the MIDI "Tx Event" group is "Off"

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

Status	2nd byte	3rd byte
BnH	5BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127)
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Reverb" parameter of the MIDI "Tx Event" group is "Off"

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

Status	2nd byte	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.
- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Chorus" parameter of the MIDI "Tx Event" group is "Off"

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

Status	2nd byte	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

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "NRPN" parameter of the MIDI "Tx Event" group is "Off"

NRPN
The NRPN (Non Registered Parameter Number) message allows you to use an extended range of control changes, which are not defined by the MIDI specification.
NRPNs provide a great deal of freedom, and can be used with any manufacturer's devices. As a result, any particular parameter number can easily mean one thing when used for a certain device, and mean something completely different on another device.
Note that RPNs and NRPNs require that a multiple number of messages be processed in the correct order. However, a majority of the sequencers currently on the market cannot always be relied on to consistently send messages in the proper order if the messages are located at almost exactly the same point in time.
On GS instruments, NRPN can be used to modify the following parameters. The range of values for relative change parameters will be different with certain models. Please see the explanation that follows the chart:

NRPN		Data entry
MSB LSB	MSB	Description
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 AttackTime (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
01H 64H	mmH	TVF &TVA Envelope DecayTime (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)

MSB LSB	MSB	Description
01H 66H	mmH	TVF &TVA Envelope ReleaseTime (relative change) mm: 0EH-40H-72H (-50 - 0 - +50)
18H rrH	mmH	Drum Instrument Pitch Coarse (relative change) rr: Drum Instrument note number mm: 00H~40H~7FH (-64~0~+63 semitone)
1AH rrH	mmH	Drum InstrumentTVA Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max)
1CH rrH	mmH	Drum Instrument Panpot (absolute change) rr: Drum Instrument note number mm: 00H, 01H~40H~7FH (random, left~center~ right)
1DH rrH	mmH	Drum Instr. Reverb Send (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max)
1EH rrH	mmH	Drum Instr. Chorus Send (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max)
60H rrH	mmH	Equalizer Switch rr: Drum Instrument note number mm: 00H~02H (Global, Instrument, Off)
61H rrH	mmH	Equalizer Low Frequency rr: Drum Instrument note number mm: 00H~05H (90, 150, 180, 300, 360, 600Hz)
62H rrH	mmH	Equalizer Low Gain rr: Drum Instrument note number mm: 00H~1EH (–15~0~+15dB)
63H rrH	mmH	Equalizer Mid Frequency rr: Drum Instrument note number mm: 00H~10H (200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000,5000, 6300, 8000Hz)
64H rrH	mmH	Equalizer Mid Gain rr: Drum Instrument note number mm: 00H~1EH (–15~0~+15dB)
65H rrH	mmH	Equalizer Mid Gain rr: Drum Instrument note number mm: 00H~04H (0.5, 1.0, 2.0, 4.0, 8.0)
66H rrH	mmH	Equalizer High Frequency rr: Drum Instrument note number mm: 00H~06H (1500, 2000, 3000, 4000, 6000, 8000, 12000Hz)
67H rrH	mmH	Equalizer High Gain rr: Drum Instrument note number mm: 00H~1EH (–15~0~+15dB)
4FH 10H	mmH	Part 4 On / Off (Upper 1) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 11H	mmH	Part 11 On / Off (Lower1) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 12H	mmH	Part 12 On / Off (Man Bass) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 13H	mmH	Part 6 On / Off (Upper 2) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 25H	mmH	Part 13 On / Off (Upper 3) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 27H	mmH	Part 14 On / Off (Lower 2) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 26H	mmH	Part 15 On / Off (Melody Int.) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 18H	mmH	Part 8 On / Off (Acc 5) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 19H	mmH	Part 9 On / Off (Acc 6) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1AH	mmH	Part 10 On / Off (Acc Drums) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1BH	mmH	Part 2 On / Off (Acc Bass) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1CH	mmH	Part 1 On / Off (Acc 1) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1DH	mmH	Part 3 On / Off (Acc2) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1EH	mmH	Part 5 On / Off (Acc3) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)
4FH 1FH	mmH	Part 7 On / Off (Acc 4) mm: 00H~7FH (00-3FH=Off - 40- 7FH= On)

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

Status	2nd byte	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 transmitted when "RPN" TX Event is Off.
- Not transmitted when MIDI "Tx" part parameters is "Off".

*RPN**
The RPN (Registered Parameter Number) messages are expanded control changes, and each function of an RPN is described by the MIDI Standard.
On the BK-7m, RPN can be used to modify the following parameters.
On this instrument, RPN can be used to modify the following parameters.

RPN Data entry

MSB LSB	MSB LSB	Explanation
00H 00H	mmH ---	Pitch Bend Sensitivity mm: 00H-18H (0-24 semitones), InitialValue = 02H (2 semitones) ll: ignored (processed as 00h) specify up to 2 octaves in semitone steps
00H 01H	mmH llH	Master FineTuning mm, ll: 00 00H - 40 00H - 7F 7FH (-100 - 0 - +99.99 cents), InitialValue = 40 00H (0 cent) ll: ignored (processed as 00h) specify up to 2 octaves in semitone steps Refer to 4. Supplementary Material, "AboutTuning"
00H 02H	mmH ---	Master CoarseTuning mm: 28H - 40H - 58H (-24 - 0 - +24 semitones), InitialValue = 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 byte
CnH	ppH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
pp = Program number: 00H~0DH: Treble Register 1~14
00H~1BH: Orchestra Register 1~28
00H~06H: Bass/Free Bass/Orch.Bass/ Orch Chord, Orch Free Bass Register 1~7
00H~63H: Set 1~100

- Not transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Program Change" parameter of the MIDI "Tx Event" group is "Off"

● Pitch Bend Change

Status	2nd byte	3rd byte
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 transmitted when MIDI "Tx" parameters is "Off".
- Not transmitted when the "Pitch Bender " parameter of the MIDI "Tx Event" group is "Off"

■ Channel Mode Messages

● MONO (Controller number 126)

Status	2nd byte	3rd byte
BnH	7FH	mmH

n= MIDI channel number: 0H~FH (Ch.1~16)
mm= mono number: 00H~10H (0~16)
• The corresponding channel is set to Mode 4 (M= 1).

● POLY (Controller number 127)

Status	2nd byte	3rd byte
BnH	7EH	mmH

n= MIDI channel number: 0H~FH (Ch.1~16)
• The corresponding channel is set to Mode 3.

■ System Realtime Message

● Realtime Clock

Status
F8H
• STYLE: Transmitted when MENU->MIDI->Edit System->Sync->"Rhythm Clock Tx" parameter is "On".
• SONG: Transmitted when MENU->MIDI->Edit System->Sync->"SMF Clock Tx" parameter is "On".

● Start

Status
FAH
• STYLE: Transmitted when MENU->MIDI->Edit System->Sync->"Rhythm Start/Stop Tx" parameter is "On".
• SONG: Transmitted when MENU->MIDI->Edit System->Sync->"SMF Start/Stop Tx" parameter is "On".

● Continue (Song playback only)

Status
FBH
• STYLE: Transmitted when MENU->MIDI->Edit System->Sync->"Rhythm Start/Stop Tx" parameter is "On".
• SONG: Transmitted when MENU->MIDI->Edit System->Sync->"SMF Start/Stop Tx" parameter is "On".
• This message is transmitted when the sequencer is not started from the beginning.

● Stop

Status
FCH
• STYLE: Transmitted when MENU->MIDI->Edit System->Sync->"Rhythm Start/Stop Tx" parameter is "On".
• SONG: Transmitted when MENU->MIDI->Edit System->Sync->"SMF Start/Stop Tx" parameter is "On".

● Active Sensing

Status
FEH
• This will be transmitted constantly at intervals of approximately 250 ms.

■ System Common Messages

● Song Position Point

Status	2nd byte	3rd byte
F2H	XXH	YYH

XX= Song Position (Bar) LSB
YY= Song Position (Bar) MSB
• Transmitted when MENU->MIDI->Edit System->Sync->"SMF Position Tx" parameter is "On".

■ System Exclusive Messages

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)
• Not transmitted when "Tx Sysex" parameter (MENU->MIDI->EDIT System->Parameter) is OFF.

○ GS reset

GS Reset is a message that resets the internal settings of a device to the GS initial state. This message appears 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 play back GS music data.

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

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	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)

• Not transmitted when TX SYSEX parameter (MENU/MIDI/EDIT/System/Param) is OFF.

3. Individual Parameters transmission

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 Exclusive messages

Data Set 1 (DT1) is the only System Exclusive messages transmitted by the BK-9.

● Data set 1 DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 42H, 12H, aaH, bbH, ccH, ddH, ... eeH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H~1FH, Initial value is 10H)
42H	Model ID (GS)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: middle byte of the starting address of the data to be sent
ccH	Address LSB: lower byte of the starting address of the data to be sent.
ddH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order 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 will be transmitted from the specified starting address and size.
• Data larger than 128 bytes will be divided into packets of 128 bytes or less, and each packet will be sent at an interval of about 40 ms.
• Regarding the checksum, please refer to on page "Example of an

Exclusive Message and Calculating a Checksum" (p. 24).

● Patch parameters

○ Patch Common 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 [cents]	00 04 00 00	0 [cents]
40 00 01#				Use nibblized data.		
40 00 02#						
40 00 03#						
• Refer to section "5. Supplementary Material" , "About Tuning" (p. 24)						
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 (Rx. only)		
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
40 01 37	00 00 01	00~7F	REVERB PREDELAY TIME	0~127 [ms]	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 their 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.

Address(H)	Size(H)	Data (H)	Parameter	Description	Default Value (H)	Description
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
40 01 40	00 00 01	00~7F	CHORUS SEND LEVEL TO DELAY	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.

○ Patch Part parameters

The BK-9 has 21 Parts: 5 parts assigned to the Keyboard, and 16 parts for Songs.
To control Keyboard parts, use the address [50 nX nn].

- (The Keyboard parts cannot be controlled via MIDI IN socket using the address [50 nX nn]. These parts can be controlled by System Exclusive messages located in a SMF songs only (using the using the address [50 nX nn]). The SMF songs must be played by BK-9 internal song player)

To control Song parts, use the address [40 nX nn].
The 21 Parts are:

Keyboard Parts			Song Parts			SysEx X=
Track	Name	MIDI Channel	Track	Name	MIDI Channel	
1	----	----	1	Part 1	1	X = 1
2	----	----	2	Part 2	2	X = 2
3	----	----	3	Part 3	3	X = 3
4	Upper 1	4	4	Part 4	4	X = 4
5	----	----	5	Part 5	5	X = 5
6	Upper 2	6	6	Part 6	6	X = 6
7	----	----	7	Part 7	7	X = 7
8	----	----	8	Part 8	8	X = 8
9	----	----	9	Part 9	9	X = 9
10	----	----	10	Part 10	10	X = 0
11	Lower	11	11	Part 11	11	X = A
12	M. Bass	12	12	Part 12	12	X = B
13	----	----	13	Part 13	13	X = C
14	----	----	14	Part 14	14	X = D
15	Melody Intelligent	15	15	Part 15	15	X = E
16	----	----	16	Part 16	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#00VALUE 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 (CAf)	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(PAf)	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*)
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 0	1	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 Mono/ Poly 01 Poly (=CC# 126 01/ CC# 127 00)			
40 1x 15	00 00 01	00~02	USE FOR RHYTHM PART	0 = OFF 1 = MAP1 2 = MAP2		OFF (Normal Part) MAP1 (Drum Part)
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 conventiona 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.
- Only for Song parts.

40 1x 19	00 00 01	00~7F	PART LEVEL	0~127	64	100
				(=CC# 7)		
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

Address (H)	Size (H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 1x 1C	00 00 01	00~7F	PART PANPOT	-64 (Left)~+63 (Right)	40 0	(CENTER)
40 1x 1D	00 00 01	00~7F	KEYBOARD RANGE	LOW (C-1)~(G9)	00	C-1
40 1x 1E	00 00 01	00~7F	KEYBOARD RANGE	HIGH (C-1)~(G9)	7F	G9
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	0~127 (=CC# 93)	00	0
40 1x 22	00 00 01	00~7F	REVERB SEND LEVEL	0~127 (=CC# 91)	28	40
40 1x 23	00 00 01	00~01	Rx.BANK SELECT	OFF/ON	01	ON
40 1x 24	00 00 01	00~01	RX BANK SELECT LSB	OFF/ON	01	ON
40 1x 2A 40 1x 2B#	00 00 02	00 00~40 00~7F 7F	PITCH FINETUNE	-100~0~+100 [cents] (= RPN#1)	40 00	0
40 1x 30	00 00 01	00~7F	TONE MODIFY Vibrato Rate	1 -64~+63 (=NRPN# 8/CC#76)	40	0
40 1x 31	00 00 01	00~7F	TONE MODIFY2 Vibrato Depth	-64~+63 (=NRPN# 9/CC#77)	40	0
40 1x 32	00 00 01	00~7F	TONE MODIFY3 TVF Cutoff Freq	-64~+63 (=NRPN# 32/CC#74)	40	0
40 1x 33	00 00 01	00~7F	TONE MODIFY4 TVF Resonance	-64~+63 (=NRPN# 33/CC#71)	40	0
40 1x 34	00 00 01	00~7F	TONE MODIFY5 TVF&TVA Env.attack	-64~+63 (=NRPN# 99/CC#73)	40	0
40 1x 35	00 00 01	00~7F	TONE MODIFY6 TVF&TVA Env.decay	-64~+63 (=NRPN# 100/CC#75)	40	0
40 1x 36	00 00 01	00~7F	TONE MODIFY7 TVF&TVA Env.release	-64~+63 (=NRPN# 102/CC#72)	40	0
40 1x 37	00 00 01	00~7F	TONE MODIFY8 Vibrato Delay	-64~+63 (=NRPN# 10/CC#78)	40	0
40 1x 40	00 00 0C	00~7F	SCALETUNING C	-64~+63 [cents]	40	0 [cents]
40 1x 41#		00~7F	SCALETUNING C#	-64~+63 [cents]	40	0 [cents]
40 1x 42#		00~7F	SCALETUNING D	-64~+63 [cents]	40	0 [cents]
40 1x 43#		00~7F	SCALETUNING D#	-64~+63 [cents]	40	0 [cents]
40 1x 44#		00~7F	SCALETUNING E	-64~+63 [cents]	40	0 [cents]
40 1x 45#		00~7F	SCALETUNING F	-64~+63 [cents]	40	0 [cents]
40 1x 46#		00~7F	SCALETUNING F#	-64~+63 [cents]	40	0 [cents]
40 1x 47#		00~7F	SCALETUNING G	-64~+63 [cents]	40	0 [cents]
40 1x 48#		00~7F	SCALETUNING G#	-64~+63 [cents]	40	0 [cents]
40 1x 49#		00~7F	SCALETUNING A	-64~+63 [cents]	40	0 [cents]
40 1x 4A#		00~7F	SCALETUNING A#	-64~+63 [cents]	40	0 [cents]
40 1x 4B#		00~7F	SCALETUNING B	-64~+63 [cents]	40	0 [cents]
• SCALETUNING 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 cents (40H) is equal temperament (p. 25).						
40 2x 00	00 00 01	28~58	MOD PITCH CONTROL	-24~+24 [semitones]	40	0 [semitones]
40 2x 01	00 00 01	00~7F	MODTVF CUTOFF CONTROL	-9600~+9600 [cents]	40	0 [cents]
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 [cents]	00	0 [cents]
40 2x 05	00 00 01	00~7F	MOD LFO1TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 06	00 00 01	00~7F	MOD LFO1TVA DEPTH	0~100.0 [%]	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 DEPTH	0~600 [cents]	00	0 [cents]
40 2x 09	00 00 01	00~7F	MOD LFO2TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 0A	00 00 01	00~7F	MOD LFO2TVA DEPTH	0~100.0 [%]	00	0 [%]
• All MOD control parameters are ignored whenever you use sounds (XV patches) with CC00 values ranging from 80 to 91.						
40 2x 10	00 00 01	40~58	BEND PITCH CONTROL	0~24 [semitones]	42	2 [semitones]
40 2x 11	00 00 01	00~7F	BENDTVF CUTOFF CONTROL	-9600~+9600 [cents]	40	0 [cents]
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 DEPTH	0~600 [cents]	00	0 [cents]
40 2x 15	00 00 01	00~7F	BEND LFO1TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 16	00 00 01	00~7F	BEND LFO1TVA DEPTH	0~100.0 [%]	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 DEPTH	0~600 [cents]	00	0 [cents]
40 2x 19	00 00 01	00~7F	BEND LFO2TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 1A	00 00 01	00~7F	BEND LFO2TVA DEPTH	0~100.0 [%]	00	0 [%]
• All BEND control parameters are ignored whenever you use sounds (XV patches) with CC00 values ranging from 80 to 91						
40 2x 20	00 00 01	28~58	CAf PITCH CONTROL	-24~+24 [semitones]	40 0 [semitones]	
40 2x 21	00 00 01	00~7F	CAfTVF CUTOFF CONTROL	-9600~+9600 [cents]	40 0 [cents]	
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 [cents]	00 0 [cents]	
40 2x 25	00 00 01	00~7F	CAf LFO1TVF DEPTH	0~2400 [cents]	00 0 [cents]	

Address (H)	Size (H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 2x 26	00 00 01	00~7F	CAf LFO1TVA 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 [cents]	00	0 [cents]
40 2x 29	00 00 01	00~7F	CAf LFO2TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 2A	00 00 01	00~7F	CAf LFO2TVA DEPTH	0~100.0 [%]	00	0 [%]
40 2x 30	00 00 01	28~58	PAf PITCH CONTROL	-24~+24 [semitones]	40	0 [semitones]
40 2x 31	00 00 01	00~7F	PAfTVF CUTOFF CONTROL	-9600~+9600 [cents]	40	0 [cents]
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 [cents]	00	0 [cents]
40 2x 35	00 00 01	00~7F	PAf LFO1TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 36	00 00 01	00~7F	PAf LFO1TVA 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 [cents]	00	0 [cents]
40 2x 39	00 00 01	00~7F	PAf LFO2TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 3A	00 00 01	00~7F	PAf LFO2TVA DEPTH	0~100.0 [%]	00	0 [%]
• All PAf control parameters are ignored whenever you use sounds (XV patches) with CC 00 values ranging from 80 to 91.						
40 2x 40	00 00 01	28~58	CC1 PITCH CONTROL	-24~+24 [semitones]	40	0 [semitones]
40 2x 41	00 00 01	00~7F	CC1TVF CUTOFF CONTROL	-9600~+9600 [cents]	40	0 [cents]
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 [cents]	00	0 [cents]
40 2x 45	00 00 01	00~7F	CC1 LFO1TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 46	00 00 01	00~7F	CC1 LFO1TVA 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 [cents]	00	0 [cents]
40 2x 49	00 00 01	00~7F	CC1 LFO2TVF DEPTH	0~2400 [cents]	00	0 [cents
40 2x 4A	00 00 01	00~7F	CC1 LFO2TVA DEPTH	0~100.0 [%]	00	0 [%]
• All CC01 control parameters are ignored whenever you use sounds (XV patches) with CC 00 values ranging from 80 to 91						
40 2x 50	00 00 01	28~58	CC2 PITCH CONTROL	-24~+24 [semitones]	40	0 [semitones]
40 2x 51	00 00 01	00~7F	CC2TVF CUTOFF CONTROL	-9600~+9600 [cents]	40	0 [cents]
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 [cents]	00	0 [cents]
40 2x 55	00 00 01	00~7F	CC2 LFO1TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 56	00 00 01	00~7F	CC2 LFO1TVA 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 [cents]	00	0 [cents]
40 2x 59	00 00 01	00~7F	CC2 LFO2TVF DEPTH	0~2400 [cents]	00	0 [cents]
40 2x 5A	00 00 01	00~7F	CC2 LFO2TVA DEPTH	0~100.0 [%]	00	0 [%]

• • All CC02 control parameters are ignored whenever you use sounds (XV patches) with CC 00 values ranging from 80 to 91

• You may not always be able to obtain the desired effect by modifying the LFO 1 and LFO 2 parameters.

4. INDIVIDUAL PARAMETER TRANSMISSION XV GENERATION (Model ID BK-9= 00H, 00H, 54H)

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 Exclusive messages

Data Set 1 (DT1) is the only System Exclusive messages transmitted by the BK-9.

● Data set 1 DT1 (12H)

Status	Data byte(H)	Status
F0H	1H, dev, 00H, 00H, 54H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Explanation
F0H	1H, dev, 00H, 00H, 54H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum
F0H	Exclusive status
41H	D number (Roland)
dev	Device ID (dev: 00H ~ 1FH, Initial value is 10H) 00H, 00H, 54H Model ID (BK-9)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: middle 1 byte of the starting address of the data to be sent
ccH	Address: middle 2 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.
- Data larger than 128 bytes will be divided into packets of 128 bytes or less, and each packet will be sent at an interval of about 40 ms.
- Regarding the checksum, please refer to p. 24.

○ Setup

Offest Address: aaH bbH ccH ddh

Offset Address	Data	Description
01 00 00 33	0000 000a	MFX 1 Switch (0 - 1) BYPASS, ON
01 00 00 34	0000 000a	MFX 2 Switch (0 - 1) BYPASS, ON
01 00 00 3C	0000 000a	MFX A Switch (0 - 1) OFF, ON
01 00 00 3D	0000 000a	MFX B Switch (0 - 1) OFF, ON
01 00 00 3E	0000 000a	MFX C Switch (0 - 1) OFF, ON
01 00 00 36	0000 000a	Chorus Switch (0 - 1) OFF, ON
01 00 00 37	0000 000a	Reverb Switch (0 - 1) OFF, ON

○ Common MFX 1/2 (Tone part effects)

Offset Address	Data	Description
18 00 02 00	0aaa aaaa	MFX Type (0 - 83)
18 00 02 01	0aaa aaaa	MFX Dry Send Level (0 - 127)
18 00 02 02	0aaa aaaa	MFX Chorus Send Level (0 - 127)
18 00 02 03	0aaa aaaa	MFX Reverb Send Level (0 - 127)
18 00 02 05	0aaa aaaa	MFX Control 1 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 02 06	0aaa aaaa	MFX Control 1 Sens (1 - 127) –63~+63
18 00 02 07	0aaa aaaa	MFX Control 2 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 02 08	0aaa aaaa	MFX Control 2 Sens (1 - 127) -63 - +63
18 00 02 09	0aaa aaaa	MFX Control 3 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 02 0A	0aaa aaaa	MFX Control 3 Sens (1 - 127) -63 - +63
18 00 02 0B	0aaa aaaa	MFX Control 4 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 02 0C	0aaa aaaa	MFX Control 4 Sens (1 - 127) -63 - +63
18 00 02 0D	000a aaaa	MFX Control Assign 1 (0 - 16) OFF, 1 - 16
18 00 02 0E	000a aaaa	MFX Control Assign 2 (0 - 16) OFF, 1 - 16
18 00 02 0F	000a aaaa	MFX Control Assign 3 (0 - 16) OFF, 1 - 16
18 00 02 10	000a aaaa	MFX Control Assign 4 (0 - 16) OFF, 1 - 16
#18 00 02 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 1 (12768~52768) –20000~+20000
#18 00 02 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 2 (12768~52768) –20000~+20000
#18 00 02 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 3 (12768~52768) –20000~+20000
#18 00 02 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 4 (12768~52768) –20000~+20000
#18 00 02 21	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 5 (12768~52768) –20000~+20000
#18 00 02 25	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 6 (12768~52768) –20000~+20000
#18 00 02 29	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 7 (12768~52768) –20000~+20000
#18 00 02 2D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 8 (12768~52768) –20000~+20000
#18 00 02 31	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 9 (12768~52768) –20000~+20000
#18 00 02 35	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 10 (12768~52768) –20000~+20000

Offset Address	Data	Description
#18 00 02 39	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 11 (12768~52768) –20000~+20000
#18 00 02 3D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 12 (12768~52768) –20000~+20000
#18 00 02 41	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 13 (12768~52768) –20000~+20000
#18 00 02 45	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 14 (12768~52768) –20000~+20000
#18 00 02 49	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 15 (12768~52768) –20000~+20000
#18 00 02 4D	0000 aaaa 0000 bbbb 0000 cccc	
	0000 dddd	MFX Parameter 16 (12768~52768) –20000~+20000
#18 00 02 51	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 17 (12768~52768) –20000~+20000
#18 00 02 55	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 18 (12768~52768) –20000~+20000
#18 00 02 59	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 19 (12768~52768) –20000~+20000
#18 00 02 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 20 (12768~52768) –20000~+20000
#18 00 02 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 21 (12768~52768) –20000~+20000
#18 00 02 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 22 (12768~52768) –20000~+20000
#18 00 02 69	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 23 (12768~52768) –20000~+20000
#18 00 02 6D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 24 (12768~52768) –20000~+20000
#18 00 02 71	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 25 (12768~52768) –20000~+20000
#18 00 02 75	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 26 (12768~52768) –20000~+20000
#18 00 02 79	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 27 (12768~52768) –20000~+20000
#18 00 02 7D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 28 (12768~52768) –20000~+20000
#18 00 03 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 29 (12768~52768) –20000~+20000
#18 00 03 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 30 (12768~52768) –20000~+20000
#18 00 03 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 31 (12768~52768) –20000~+20000
#18 00 03 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 32 (12768~52768) –20000~+20000

○ Common MFX A (Makeup Tools)

Offset Address	Data	Description
18 00 72 00	0aaa aaaa	MFX A Type (0 - 83)
18 00 72 01	0aaa aaaa	MFX A Dry Send Level (0 - 127)
18 00 72 02	0aaa aaaa	MFX A Chorus Send Level (0 - 127)
18 00 72 03	0aaa aaaa	MFX A Reverb Send Level (0 - 127)
18 00 72 05	0aaa aaaa	MFX A Control 1 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 72 06	0aaa aaaa	MFX A Control 1 Sens (1 - 127) –63~+63
18 00 72 07	0aaa aaaa	MFX A Control 2 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 72 08	0aaa aaaa	MFX A Control 2 Sens (1 - 127) -63 - +63
18 00 72 09	0aaa aaaa	MFX A Control 3 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 72 0A	0aaa aaaa	MFX A Control 3 Sens (1 - 127) -63 - +63
18 00 72 0B	0aaa aaaa	MFX A Control 4 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 72 0C	0aaa aaaa	MFX A Control 4 Sens (1 - 127) -63 - +63
18 00 72 0D	000a aaaa	MFX A Control Assign 1(0 - 16) OFF, 1 - 16
18 00 72 0E	000a aaaa	MFX A Control Assign 2(0 - 16) OFF, 1 - 16
18 00 72 0F	000a aaaa	MFX A Control Assign 3(0 - 16) OFF, 1 - 16
18 00 72 10	000a aaaa	MFX A Control Assign 4(0 - 16) OFF, 1 - 16
#18 00 72 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 1 (12768~52768) –20000~+20000
#18 00 72 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 2 (12768~52768) –20000~+20000

Offset Address	Data	Description
#18 00 72 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 3 (12768~52768) –20000~+20000
#18 00 72 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 4 (12768~52768) –20000~+20000
#18 00 72 21	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 5 (12768~52768) –20000~+20000
#18 00 72 25	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 6 (12768~52768) –20000~+20000
#18 00 72 29	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 7 (12768~52768) –20000~+20000
#18 00 72 2D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 8 (12768~52768) –20000~+20000
#18 00 72 31	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 9 (12768~52768) –20000~+20000
#18 00 72 35	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 10 (12768~52768) –20000~+20000
#18 00 72 39	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 11 (12768~52768) –20000~+20000
#18 00 72 3D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 12 (12768~52768) –20000~+20000
#18 00 72 41	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 13 (12768~52768) –20000~+20000
#18 00 72 45	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 14 (12768~52768) –20000~+20000
#18 00 72 49	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 15 (12768~52768) –20000~+20000
#18 00 72 4D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 16 (12768~52768) –20000~+20000
#18 00 72 51	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 17 (12768~52768) –20000~+20000
#18 00 72 55	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 18 (12768~52768) –20000~+20000

Offset Address	Data	Description
#18 00 72 59	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 19 (12768~52768) –20000~+20000
#18 00 72 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 20 (12768~52768) –20000~+20000
#18 00 72 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 21 (12768~52768) –20000~+20000
#18 00 72 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 22 (12768~52768) –20000~+20000
#18 00 72 69	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 23 (12768~52768) –20000~+20000
#18 00 72 6D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 24 (12768~52768) –20000~+20000
#18 00 72 71	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 25 (12768~52768) –20000~+20000
#18 00 72 75	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 26 (12768~52768) –20000~+20000
#18 00 72 79	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 27 (12768~52768) –20000~+20000
#18 00 72 7D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 28 (12768~52768) –20000~+20000
#18 00 73 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 29 (12768~52768) –20000~+20000
#18 00 73 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 30 (12768~52768) –20000~+20000
#18 00 73 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 31 (12768~52768) –20000~+20000
#18 00 73 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX A Parameter 32 (12768~52768) –20000~+20000

○ Common MFX B (Makeup Tools)

Offset Address	Data	Description
18 00 74 00	0aaa aaaa	MFX B Type (0 - 83)
18 00 74 01	0aaa aaaa	MFX B Dry Send Level (0 - 127)
18 00 74 02	0aaa aaaa	MFX B Chorus Send Level (0 - 127)
18 00 74 03	0aaa aaaa	MFX B Reverb Send Level (0 - 127)

Offset Address	Data	Description
18 00 74 05	0aaa aaaa	MFX B Control 1 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 74 06	0aaa aaaa	MFX B Control 1 Sens (1 - 127) –63~+63
18 00 74 07	0aaa aaaa	MFX B Control 2 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 74 08	0aaa aaaa	MFX B Control 2 Sens (1 - 127) -63 - +63
18 00 74 09	0aaa aaaa	MFX B Control 3 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 74 0A	0aaa aaaa	MFX B Control 3 Sens (1 - 127) -63 - +63
18 00 74 0B	0aaa aaaa	MFX B Control 4 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 74 0C	0aaa aaaa	MFX B Control 4 Sens (1 - 127) -63 - +63
18 00 74 0D	000a aaaa	MFX B Control Assign 1(0 - 16) OFF, 1 - 16
18 00 74 0E	000a aaaa	MFX B Control Assign 2(0 - 16) OFF, 1 - 16
18 00 74 0F	000a aaaa	MFX B Control Assign 3(0 - 16) OFF, 1 - 16
18 00 74 10	000a aaaa	MFX B Control Assign 4(0 - 16) OFF, 1 - 16
#18 00 74 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 1 (12768~52768) –20000~+20000
#18 00 74 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 2 (12768~52768) –20000~+20000
#18 00 74 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 3 (12768~52768) –20000~+20000
#18 00 74 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 4 (12768~52768) –20000~+20000
#18 00 74 21	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 5 (12768~52768) –20000~+20000
#18 00 74 25	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 6 (12768~52768) –20000~+20000
#18 00 74 29	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 7 (12768~52768) –20000~+20000
#18 00 74 2D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 8 (12768~52768) –20000~+20000
#18 00 74 31	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 9 (12768~52768) –20000~+20000
#18 00 74 35	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 10 (12768~52768) –20000~+20000
#18 00 74 39	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 11 (12768~52768) –20000~+20000
#18 00 74 3D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 12 (12768~52768) –20000~+20000
#18 00 74 41	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 13 (12768~52768) –20000~+20000
#18 00 74 45	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 14 (12768~52768) –20000~+20000
#18 00 74 49	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 15 (12768~52768) –20000~+20000
#18 00 74 4D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 16 (12768~52768) –20000~+20000
#18 00 74 51	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 17 (12768~52768) –20000~+20000
#18 00 74 55	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 18 (12768~52768) –20000~+20000
#18 00 74 59	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 19 (12768~52768) –20000~+20000
#18 00 74 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 20 (12768~52768) –20000~+20000
#18 00 74 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 21 (12768~52768) –20000~+20000
#18 00 74 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 22 (12768~52768) –20000~+20000
#18 00 74 69	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 23 (12768~52768) –20000~+20000
#18 00 74 6D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 24 (12768~52768) –20000~+20000
#18 00 74 71	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 25 (12768~52768) –20000~+20000
#18 00 74 75	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 26 (12768~52768) –20000~+20000

Offset Address	Data	Description
#18 00 74 79	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 27 (12768~52768) –20000~+20000
#18 00 74 7D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 28 (12768~52768) –20000~+20000
#18 00 75 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 29 (12768~52768) –20000~+20000
#18 00 75 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 30 (12768~52768) –20000~+20000
#18 00 75 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 31 (12768~52768) –20000~+20000
#18 00 75 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX B Parameter 32 (12768~52768) –20000~+20000

○ Common MFX C (Makeup Tools)

Offset Address	Data	Description
18 00 76 00	0aaa aaaa	MFX C Type (0 - 83)
18 00 76 01	0aaa aaaa	MFX C Dry Send Level (0 - 127)
18 00 76 02	0aaa aaaa	MFX C Chorus Send Level (0 - 127)
18 00 76 03	0aaa aaaa	MFX C Reverb Send Level (0 - 127)
18 00 76 05	0aaa aaaa	MFX C Control 1 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 76 06	0aaa aaaa	MFX C Control 1 Sens (1 - 127) –63~+63
18 00 76 07	0aaa aaaa	MFX C Control 2 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 76 08	0aaa aaaa	MFX C Control 2 Sens (1 - 127) -63 - +63
18 00 76 09	0aaa aaaa	MFX C Control 3 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 76 0A	0aaa aaaa	MFX C Control 3 Sens (1 - 127) -63 - +63
18 00 76 0B	0aaa aaaa	MFX C Control 4 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
18 00 76 0C	0aaa aaaa	MFX C Control 4 Sens (1 - 127) -63 - +63
18 00 76 0D	000a aaaa	MFX C Control Assign 1(0 - 16) OFF, 1 - 16
18 00 76 0E	000a aaaa	MFX C Control Assign 2(0 - 16) OFF, 1 - 16
18 00 76 0F	000a aaaa	MFX C Control Assign 3(0 - 16) OFF, 1 - 16
18 00 76 10	000a aaaa	MFX C Control Assign 4(0 - 16) OFF, 1 - 16
#18 00 76 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 1 (12768~52768) –20000~+20000
#18 00 76 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 2 (12768~52768) –20000~+20000
#18 00 76 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 3 (12768~52768) –20000~+20000
#18 00 76 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 4 (12768~52768) –20000~+20000
#18 00 76 21	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 5 (12768~52768) –20000~+20000
#18 00 76 25	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 6 (12768~52768) –20000~+20000
#18 00 76 29	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 7 (12768~52768) –20000~+20000
#18 00 76 2D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 8 (12768~52768) –20000~+20000
#18 00 76 31	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 9 (12768~52768) –20000~+20000
#18 00 76 35	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 10 (12768~52768) –20000~+20000
#18 00 76 39	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 11 (12768~52768) –20000~+20000
#18 00 76 3D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 12 (12768~52768) –20000~+20000
#18 00 76 41	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 13 (12768~52768) –20000~+20000
#18 00 76 45	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 14 (12768~52768) –20000~+20000
#18 00 76 49	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 15 (12768~52768) –20000~+20000
#18 00 76 4D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 16 (12768~52768) –20000~+20000
#18 00 76 51	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 17 (12768~52768) –20000~+20000
#18 00 76 55	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 18 (12768~52768) –20000~+20000

Offset Address	Data	Description
#18 00 76 59	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 19 (12768~52768) –20000~+20000
#18 00 76 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 20 (12768~52768) –20000~+20000
#18 00 76 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 21 (12768~52768) –20000~+20000
#18 00 76 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 22 (12768~52768) –20000~+20000
#18 00 76 69	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 23 (12768~52768) –20000~+20000
#18 00 76 6D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 24 (12768~52768) –20000~+20000
#18 00 76 71	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 25 (12768~52768) –20000~+20000
#18 00 76 75	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 26 (12768~52768) –20000~+20000
#18 00 76 79	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 27 (12768~52768) –20000~+20000
#18 00 76 7D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 28 (12768~52768) –20000~+20000
#18 00 77 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 29 (12768~52768) –20000~+20000
#18 00 77 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 30 (12768~52768) –20000~+20000
#18 00 77 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 31 (12768~52768) –20000~+20000
#18 00 77 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX C Parameter 32 (12768~52768) –20000~+20000

○ Keyboard/Style/Song Part Equalizer

Offset Address	Data	Description
18 00 2x 44	0000 000a	Equalizer Switch (0~1) OFF, ON
18 00 2x 45	0000 0aaa	Equalizer Low Freq (0~5) 90, 150, 180, 300, 360, 600 [Hz]
18 00 2x 46	000a aaaa	Equalizer Low Gain (0~30) –15~+15 [dB]
18 00 2x 47	000a aaaa	Equalizer Mid Freq (0~16) 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000 [Hz]
18 00 2x 48	000a aaaa	Equalizer Mid Gain (0~30) –15~+15 [dB]
18 00 2x 49	0000 0aaa	Equalizer Mid Q (0~4) 0.5, 1.0, 2.0, 4.0, 8.0
18 00 2x 4A	0000 0aaa	Equalizer Hi Freq (0~6) 1500, 2000, 3000, 4000, 6000, 8000, 12000 [Hz]
18 00 2x 4B	000a aaaa	Equalizer High Gain (0~30) –15~+15 [dB]

The offset addresses of Equalizer Parameters are as follow:

18 00 (2x) nn	Keyboard Name	Song Part	Style Part
20	----	Part 1	Acc1
21	----	Part 2	ABass
22	----	Part 3	Acc2
23	Upper 1	Part 4	----
24	----	Part 5	Acc3
25	Upper 2	Part 6	----
26	----	Part 7	Acc4
27	----	Part 8	Acc5
28	----	Part 9	Acc6-
29	----	Part 10	ADrum
2A	Lower	Part 11	----
2B	M. Bass	Part 12	----
2C	----	Part 13	----
2D	----	Part 14	----
2E	Melody Intelligent	Part 15	----
2E	----	Part 16	----

- Choose the appropriate MIDI Set to receive Equalizer parameters on Keyboard/Style or Song parts.

○ Common Chorus

Offset Address	Data	Description
18 00 04 00	0000 aaaa	Chorus Type (0~6)
18 00 04 01	0aaa aaaa	Chorus Level (0~127)
18 00 04 03	0000 00aa	Chorus Output Select (0~2) MAIN, REV, MAIN+REV
#18 00 04 04	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 1 (12768~52768) –20000~+20000
#18 00 04 08	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 2 (12768~52768) –20000~+20000
#18 00 04 0C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 3 (12768~52768) –20000~+20000
#18 00 04 10	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 4 (12768~52768) –20000~+20000
#18 00 04 14	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 5 (12768~52768) –20000~+20000

Offset Address	Data	Description
#18 00 04 18	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 6 (12768~52768) –20000~+20000
#18 00 04 1C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 7 (12768~52768) –20000~+20000

○ Common Reverb

Offset Address	Data	Description
18 00 06 00	0000 aaaa	Reverb Type (0~12)
18 00 06 01	0aaa aaaa	Reverb Level (0~127)
#18 00 06 03	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 1 (12768~52768) –20000~+20000
#18 00 06 07	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 2 (12768~52768) –20000~+20000
#18 00 06 0B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 3 (12768~52768) –20000~+20000
#18 00 06 0F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 4 (12768~52768) –20000~+20000
#18 00 06 13	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 5 (12768~52768) –20000~+20000
#18 00 06 17	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 6 (12768~52768) –20000~+20000
#18 00 06 1B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 7 (12768~52768) –20000~+20000
#18 00 06 1F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 8 (12768~52768) –20000~+20000
#18 00 06 23	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 9 (12768~52768) –20000~+20000
#18 00 06 27	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 10 (12768~52768) –20000~+20000

5. 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

D: decimal
H: hexadecimal

- 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 x 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 bbH - 40 00H = aa x 128 + bb - 64 x 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 x 16 + b.

<Example1>
What is the decimal expression of 5AH?
From the preceding table, 5AH = 90

<Example2>
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 x 128 + 52 = 2356

<Example3>
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 x 16 + 3) x 16 + 9) x 16 + 13 = 41885

<Example4>
What is the nibbled expression of the decimal value 1258?

16) 1258
16) 78... 10
16) 4... 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

<Example1> 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.

<Example2> 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).

<Example3> 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 x 128 + 0 = 8192) is 0, so this Pitch Bend Value is 28 00H - 40 00H = 40 x 128 + 0 - (64 x 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 x (-3072) / (-8192) = -75 cents of Pitch Bend is being applied to MIDI channel 11.

<Example4> 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 ources 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 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.

○ 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 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

(However, the checksum will be 0 if the remainder is 0.)

<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.

Hz at A4	cents	RPN #1	Sys.Ex. 40 00 00
445	19,56	4C 43 (+1603)	00 04 0C 04 (+196)
444	15,67	4A 03 (+1283)	00 04 09 0D (+157)
443	11,76	47 44 (+ 964)	00 04 07 06 (+118)
442	7,85	45 03 (+ 643)	00 04 04 0F (+79)
441	3,93	42 42 (+ 322)	00 04 02 07 (+39)
440	0	40 00 (0)	00 04 00 00 (0)
439	-3,94	3D 3D (- 323)	00 03 0D 09 (–39)
438	-7,89	3A 7A (- 646)	00 03 0B 01 (–79)

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

<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 this instrument, 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 Temperamen (Keytone C)	Arabic 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 on page 14 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 following data:

F0 41 10 42 12 40 11 40 3A 6D 3E 34 0D 38 6B 3C 6F 40 36 0F 76 F70

MIDI Implementation Chart

Backing Keyboard **Date: August 2013**

Model: BK-9 **Version: 1.00**

Function...		Transmitted		Recognized		Remarks
Basic	Default	1-16		1–16		Up1= Ch. 4, Up2= Ch. 6, Lower= Ch. 11,
Channel	Changed	1–16, Off		1–16, Off		M. Bass= Ch. 12, M.Intell= Ch. 15
Mode	Default	Mode 3		Mode 3		
	Messages	Mode 3, 4 (M=1)		Mode 3, 4 (M = 1)		*2
	Altered	**********				
Note		0~127		0–127		
Number :	True Voice	**********		0–127		
Velocity	Note On	O		O		
	Note Off	X		X		
After	Key's	X		O		
Touch	Channel's	O	*1	O	*1	
Pitch Bend		O	*1	O	*1	
Control Change	0, 32	O	*1	O	*1	Bank Select
	1	O	*1	O	*1	Modulation
	5	O		O		Portamento Time
	6, 38	O		O		Data Entry
	7	O	*1	O	*1	Volume
	10	O	*1	O	*1	Panpot
	11	O	*1	O	*1	Expression
	12	O	*1	O	*1	Effect Control 1 MSB
	13	O	*1	O	*1	Effect Control 2 MSB
	16	O	*1	O	*1	C1 - Noise level - Key Off Nose - Mallet Hardness *3
	64	O		O	*1	Hold 1
	65	O		O		Portamento
	66	O	*1	O	*1	Sostenuto
	67	O	*1	O	*1	Soft
	69	O		O		Hold 2
	71	O		O		Resonance
	72	O		O		Realease Time
	73	O		O		Attack Time
	74	O		O		Cutoff
	75	O		O		Decay Time
	76	O		O		Vibrato Rate
	77	O		O		Vibrato Depth
	78	O		O		Vibrato Delay
	80	O	*1	O	*1	Dead Stroke - Mute - Finger Piking - Staccato - *3
	81	O	*1	O	*1	Harmonics - Octave Tone - Fall - *3
	82	O	*1	O	*1	Subtone (Alto Sax)
	84	O		O		Portamento Control
	91	O	*1	O (Reverb)	*1	Effect 1 Depth
	93	O	*1	O (Chorus)	*1	Effect 3 Depth
	98, 99	O	*1	O	*1	NRPN LSB, MSB
	100, 101	O	*1	O	*1	RPN LSB, MSB
Program		O	*1	O		
Change	True Number	*****		0–127		Program No. 1–128
System Exclusive		O	*1	O		
System	Song Position Pointer	O	*1	O		
Common	Song Select	X		X		
	Tune Request	X		X		
System	Clock	O	*1	O		
Real Time	Commands	O	*1	O		
Aux	All Sound Off	X		O (120, 126, 127)		
	Reset All Controllers	X		O (121)		
Messages	Local On/Off	O	*1	O (Song parts)		
	All Notes Off	X		O (123–125)		
	Active Sensing	O		O		
	System Reset	X		X		
Notes		*1 O X is selectable *2 Recognized as M = 1 even if M ≠ 1. *3 It depends on the selected Super Natural tone				

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO O : Yes

Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO X : No