HANDSONIC
HPD-20

MIDI Implementation

Roland

MIDI Implementation

Model: HandSonic HPD-20
Date: AUG. 01, 2013
Version: 1.00

1. Receive Data

■ Channel Voice Messages

* Following Channel Voice Messages can be received in MIDI Channel (MENU --> SYS --> MIDI --> MIDI).
* Not received when MIDI Channel is set to "OFF."

● 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)

* When the pad or D-BEAM TriggerMode (MENU --> INST --> SETUP) is set to "GATE," only the note number set for the pad or D-BEAM is received, using GATE to function in the same manner as releasing the pad or taking your hand away from D-BEAM.

● 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)

* Received only the note numbers which are specified by the kit.

● 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)

* Received only the note numbers which are specified by the kit.
* Not received when Pressure Rx (MENU --> SYS --> MIDI --> MIDI) is set to "OFF."
* When a note number for an external pad is received, if the external pad TriggerMode (MENU --> INST --> SETUP) is set to "SHOT" and value of the received key pressure is 40H (64) or higher, the decay of the sound produced by the external pad is shortened.

● Control Change

* Not received when Control Change Rx (MENU --> SYS --> MIDI --> MIDI) is set to "OFF."

❍ 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 = bank number MSB: 00H–01H
ll = bank number LSB: processed as 00H

* Bank Select processing will be suspended until a Program Change message is received.

❍ Foot Controller (Controller Number 4)

Status	2nd byte	3rd byte
BnH	04H	vvH

n = MIDI channel number: 0H–FH (ch.1–ch.16)
vv = control value 00H–7FH (0–127: Open–Close)

* This adjusts the hi-hat control pedal position.

❍ Effect Controller 1 (Controller Number 12)

Status	2nd byte	3rd byte
BnH	0CH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT1 (12)," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT1 (12)," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT1 (12)," this message is used as Realtime Modify (EFFECT) control information.

❍ Effect Controller 2 (Controller Number 13)

Status	2nd byte	3rd byte
BnH	0DH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT2 (13)," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT2 (13)," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT2 (13)," this message is used as Realtime Modify (EFFECT) control information.

❍ General Purpose Controller 1 (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: Center–Edge)

* This message is used as Pad M1 position information.

❍ General Purpose Controller 2 (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: Center–Edge)

* This message is used as Pad M2 position information.

❍ General Purpose Controller 3 (Controller Number 18, 50)

Status	2nd byte	3rd byte
BnH	12H	mmH
BnH	32H	llH

n = MIDI channel number: 0H–FH (ch.1–ch.16)
mm = control value MSB 0H–CH (0–12: Pad M1–S8)
ll = control value LSB 00H–7FH (0–127: Open–Close)

* This message is used as hi-hat open–close information.

❍ General Purpose Controller 4 (Controller Number 19)

Status	2nd byte	3rd byte
BnH	13H	vvH

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

* This message is used as Realtime Modify (PITCH) on/off information.

❍ 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 (0–63: OFF, 64–127: ON)

* This message is used as Roll on/off information.

❍ Sound Controller 1 (Controller Number 70)

Status	2nd byte	3rd byte
BnH	46H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND1 (70) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND1 (70) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND1 (70) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 2 (Controller Number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND2 (71) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND2 (71) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND2 (71) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 3 (Controller Number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND3 (72) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND3 (72) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND3 (72) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 4 (Controller Number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND4 (73) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND4 (73) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND4 (73) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 5 (Controller Number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND5 (74)," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND5 (74) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND5 (74) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 6 (Controller Number 75)

Status	2nd byte	3rd byte
BnH	4BH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND6 (75) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND6 (75) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND6 (75) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 7 (Controller Number 76)

Status	2nd byte	3rd byte
BnH	4CH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND7 (76) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND7 (76) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND7 (76) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 8 (Controller Number 77)

Status	2nd byte	3rd byte
BnH	4DH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND8 (77) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND8 (77) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND8 (77) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 9 (Controller Number 78)

Status	2nd byte	3rd byte
BnH	4EH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND9 (78) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND9 (78) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND9 (78) ," this message is used as Realtime Modify (EFFECT) control information.

❍ Sound Controller 10 (Controller Number 79)

Status	2nd byte	3rd byte
BnH	4FH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND10 (79) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND10 (79) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND10 (79) ," this message is used as Realtime Modify (EFFECT) control information.

❍ General Purpose Controller 5 (Controller Number 80)

Status	2nd byte	3rd byte
BnH	50H	vvH

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

* This message is used as Realtime Modify (EFFECT) on/off information.

❍ General Purpose Controller 6 (Controller Number 81)

Status	2nd byte	3rd byte
BnH	51H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL6 (81) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL6 (81) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL6 (81) ," this message is used as Realtime Modify (EFFECT) control information.

❍ General Purpose Controller 7 (Controller Number 82)

Status	2nd byte	3rd byte
BnH	52H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL7 (82) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL7 (82) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL7 (82) ," this message is used as Realtime Modify (EFFECT) control information.

❍ General Purpose Controller 8 (Controller Number 83)

Status	2nd byte	3rd byte
BnH	53H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL8 (83) ," this message is used as D-BEAM position information.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL8 (83) ," this message is used as Realtime Modify (PITCH) control information.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL8 (83) ," this message is used as Realtime Modify (EFFECT) control information.

● 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)

* The sound will change beginning with the next note on after the Program Change is received.
* Not received when Program Change Rx (MENU --> SYS --> MIDI --> MIDI) is set to "OFF."

Bank Select MSB / LSB	Program Number	Kit Number
000 / 000	001–128	001–128
001 / 000	001–072	129–200

● 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)

* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "PITCH BEND," this message is used as Realtime Modify (PITCH) control information.

■ Channel Mode Messages

* Following Channel Voice Messages can be received in MIDI Channel (MENU --> SYS --> MIDI --> MIDI).

● All Sound 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 Controller (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
Polyphonic key pressure	0
Foot Controller	0 (Open)
Hold 1	0 (Off)
General Purpose Controller 4, 5	0 (Off)
General Purpose Controller 6–8	Depends on Realtime Modify settings
Effect Controller 1, 2	Depends on Realtime Modify settings
Sound Controller 1–10	Depends on Realtime Modify settings
Pitch Bend	Depends on Realtime Modify settings

● All Note Off (Controller Number 123)

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

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

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

● 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 Sound 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)

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

● MONO (Controller Number 126)

Status	2nd byte	3rd byte
BnH	7EH	00H

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

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

● 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 Sound Off is received.

■ System Realtime Messages

● 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 is received, and message interval monitoring will be halted.

■ System Exclusive Messages

Status	Data byte	Status
F0H	iiH, ddH, ..., eeH	F7H

F0H: System Exclusive Messages Status
ii = ID number: 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 Universal Non-realtime System Exclusive messages.

● Universal Non-Realtime System Exclusive Messages

❍ Identity Request Message

Status	Data byte	Status
F0H	7EH, dev, 06H, 01H	F7H

Byte	Explanation
F0H	Exclusive Status
7EH	ID number (Universal Non-realtime messages)
dev	Device ID (10H or 7FH)
06H	Sub ID#1 (General Information)
01H	Sub ID#2 (Identity Request)
F7H	EOX (End Of Exclusive)

* When Identity Request is received, Identity Reply message will be transmitted

2. Data Transmission

■ Channel Voice Messages

* The following channel voice messages are transmitted on the channel specified as the MIDI Channel (MENU --> SYS --> MIDI --> MIDI).
* Not transmitted when MIDI Channel is set to "OFF."
* Channel Voice messages linked to the D-BEAM are not transmitted when the [D-BEAM] button is OFF.

● 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)

* Transmitted the note numbers which are specified by the kit.
* When the pad or D-BEAM TriggerMode (MENU --> INST --> SETUP) is set to "GATE," note off is transmitted after the interval specified in GateTime (MENU --> KIT --> MIDI --> GATE).
* When the pad or D-BEAM TriggerMode is set to "GATE," note off is transmitted when the pad is released or the user's hand is removed from the D-BEAM.
* When the D-BEAM TriggerMode is set to "GATE," note off is transmitted before note on when the pad is tapped while being pressed down.

● 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)

* Transmitted the note numbers which are specified by the kit.
* This is transmitted when the pad/external pad is tapped or the D-BEAM/hi-hat control pedal is used.

● 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)

* Transmitted using the note number set for the pad when the pad is pressed.
* When the rim of a pad connected to TRIG IN is pressed, 7FH is transmitted using the note number set for the pad; 00H is transmitted when the rim is released (when using a pad compatible with choking).
* Not transmitted when Pressure Tx (MENU --> SYS --> MIDI --> MIDI) is set to "OFF."

● Control Change

* Not transmitted when Control Change Tx (MENU --> SYS --> MIDI --> MIDI) is set to "OFF."

❍ 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 = bank number MSB: 00H–01H
ll = bank number LSB: Fixed as 00H

* When a kit is selected, the corresponding bank select is transmitted.

❍ Foot Controller (Controller Number 4)

Status	2nd byte	3rd byte
BnH	04H	vvH

n = MIDI channel number: 0H–FH (ch.1–ch.16)
vv = control value 00H–7FH (0–127: Open–Close)

* When the hi-hat control pedal is adjusted, this message is transmitted.

❍ Effect Controller 1 (Controller Number 12)

Status	2nd byte	3rd byte
BnH	0CH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT1 (12) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT1 (12) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT1 (12) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Effect Controller 2 (Controller Number 13)

Status	2nd byte	3rd byte
BnH	0DH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT2 (13) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT2 (13) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "EFFECT2 (13) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ General Purpose Controller 1 (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: Center–Edge)

* This is the strike position data for Pad M1. It is transmitted before its note on message.
* 00H is transmitted when Position Area (MENU --> SYS --> PAD SETTINGS --> POSI) is set to "OFF."

❍ General Purpose Controller 2 (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: Center–Edge)

* This is the strike position data for Pad M2. It is transmitted before its note on message.
* 00H is transmitted when Position Area (MENU --> SYS --> PAD SETTINGS --> POSI) is set to "OFF."

❍ General Purpose Controller 3 (Controller Number 18, 50)

Status	2nd byte	3rd byte
BnH	12H	mmH
BnH	32H	llH

n = MIDI channel number: 0H–FH (ch.1–ch.16)
mm = control value MSB 0H–CH (0–12: Pad M1–S8)
ll = control value LSB 00H–7FH (0–127: Open–Close)

* This is transmitted as hi-hat open–close information when the pad is tapped.

❍ General Purpose Controller 4 (Controller Number 19)

Status	2nd byte	3rd byte
BnH	13H	vvH

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

* This is transmitted when the [PITCH] button is pressed.

❍ 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 (0–63: OFF, 64–127: ON)

* This is transmitted when the [ROLL] button is pressed.

❍ Sound Controller 1 (Controller Number 70)

Status	2nd byte	3rd byte
BnH	46H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND1 (70) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND1 (70) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND1 (70) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 2 (Controller Number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND2 (71) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND2 (71) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND2 (71) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 3 (Controller Number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND3 (72) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND3 (72) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND3 (72) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 4 (Controller Number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND4 (73) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND4 (73) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND4 (73) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 5 (Controller Number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND5 (74) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND5 (74) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND5 (74) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 6 (Controller Number 75)

Status	2nd byte	3rd byte
BnH	4BH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND6 (75) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND6 (75) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND6 (75) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 7 (Controller Number 76)

Status	2nd byte	3rd byte
BnH	4CH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND7 (76) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND7 (76) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND7 (76) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 8 (Controller Number 77)

Status	2nd byte	3rd byte
BnH	4DH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND8 (77) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND8 (77) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND8 (77) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 9 (Controller Number 78)

Status	2nd byte	3rd byte
BnH	4EH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND9 (78) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND9 (78) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND9 (78) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ Sound Controller 10 (Controller Number 79)

Status	2nd byte	3rd byte
BnH	4FH	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND10 (79) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND10 (79) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "SOUND10 (79) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ General Purpose Controller 5 (Controller Number 80)

Status	2nd byte	3rd byte
BnH	50H	vvH

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

* This is transmitted when the [EFFECT] button is pressed.

❍ General Purpose Controller 6 (Controller Number 81)

Status	2nd byte	3rd byte
BnH	51H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL6 (81) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL6 (81) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL6 (81) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ General Purpose Controller 7 (Controller Number 82)

Status	2nd byte	3rd byte
BnH	52H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL7 (82) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL7 (82) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL7 (82) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

❍ General Purpose Controller 8 (Controller Number 83)

Status	2nd byte	3rd byte
BnH	53H	vvH

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

* When D-BEAM CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL8 (83) ," this is transmitted when D-BEAM is used.
* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL8 (83) ," this is transmitted when Realtime Modify (PITCH) is adjusted.
* When Realtime Modify Effect CC# (MENU --> SYS --> MIDI --> MIDI) setting is "GENERAL8 (83) ," this is transmitted when Realtime Modify (EFFECT) is adjusted.

● 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)

* When a kit is selected, the corresponding program number is transmitted.
* Not transmitted when Program Change Tx (MENU --> SYS --> MIDI --> MIDI) is set to "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)

* When Realtime Modify Pitch CC# (MENU --> SYS --> MIDI --> MIDI) setting is "PITCH BEND," this is transmitted when Realtime Modify (PITCH) is adjusted.

■ Channel Mode Messages

* The following channel mode messages are transmitted on the channel specified as the MIDI Channel (MENU --> SYS --> MIDI --> MIDI).

● All Sound Off (Controller Number 120)

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

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

* This is transmitted when the ALL SOUND OFF ([SHIFT] + [EXIT]) is used.

● Reset All Controller (Controller Number 121)

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

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

* This is transmitted when the Factory Reset (MENU --> SYS --> Factory Reset) is executed.

■ System Realtime Messages

● Active Sensing

Status
FEH

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

■ System Exclusive Messages

Identity Reply, V-LINK message, and MIDI Visual Control message are the only System Exclusive messages transmitted by this device.

● Universal Non-Realtime System Exclusive Messages

❍ Identity Reply Message

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 78H, 02H, 00H, 00H, 00H, 01H, 00H, 00H	F7H

Byte	Explanation
F0H	Exclusive Status
7EH	ID number (Universal Non-Realtime Message)
dev	Device ID (10H fixed)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Request)
41H	ID Number (Roland)
78H 02H	Device Family Cord
00H 00H	Device Family Number Code
00H 01H 00H 00H	Software Revision Level
F7H	EOX (End Of Exclusive)

* When Identity Request is received, Identity Reply message will be transmitted.

● V-LINK Messages

❍ V-LINK ON

Transmitted when entering V-LINK mode.

Status	Data byte	Status
F0H	41H, 10H, 00H, 51H, 12H, 10H, 00H, 00H, 01H, nnH, 10H, 02H, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	ID Number (Roland)
10H	Device ID (10H fixed)
00H	Model ID#1 (V-LINK)
51H	Model ID#2 (V-LINK)
12H	Command ID (DT1)
10H 00H 00H	Address
01H	Data (V-LINK ON)
nnH	Data (Clip Control Rx MIDI Ch. (00H-0FH (ch.1-ch.16)) Initial Value = 0FH (ch.16))
10H	Data (Color Control Rx MIDI Ch. (OFF))
02H	Data (Note Message Enabled (Assignable))
sum	Check Sum
F7H	EOX (End Of Exclusive)

* The unit will enter V-LINK mode if Control Mode (MENU --> SYS --> MIDI --> VISUAL) is set to "V-LINK" and MIDI Visual Control (MENU --> SYS --> MIDI --> VISUAL) is turned "ON."
* MIDI Channel (MENU --> SYS --> MIDI --> VISUAL) setting is used as the Clip Control Rx MIDI Ch.
* Only the Clip Control Rx MIDI Ch address (10H 00H 01H) and data are transmitted when the MIDI Channel setting is made in V-LINK mode.

❍ V-LINK OFF

Transmitted when exiting V-LINK mode.

Status	Data byte	Status
F0H	41H, 10H, 00H, 51H, 12H, 10H, 00H, 00H, 00H, 70H,	F7H

Byte	Explanation
F0H	Exclusive Status
41H	ID Number (Roland)
10H	Device ID (10H fixed)
00H	Model ID#1 (V-LINK)
51H	Model ID#2 (V-LINK)
12H	Command ID (DT1)
10H 00H 00H	Address
00H	Data (V-LINK OFF)
70H	Check Sum
F7H	EOX (End Of Exclusive)

* The unit will exit V-LINK mode if the MIDI Visual Control (MENU --> SYS --> MIDI --> VISUAL) is turned "OFF" or if the Control Mode (MENU --> SYS --> MIDI --> VISUAL) is set to "MVC."

● MIDI Visual Control Messages

❍ MIDI Visual Control ON

Transmitted when entering MIDI Visual Control mode.

Status	Data byte	Status
F0H	7EH, 00H, 0CH, 01H, 10H, 00H, 00H, 01H, nnH, 10H, 01H, sum	F7H

Byte	Explanation
F0H	Exclusive Status
7EH	ID Number (Roland)
00H	Device ID (00H fixed)
0CH	Model ID#1
01H	Model ID#2
10H 00H 00H	Address
01H	Data (MIDI Visual Control ON)
nnH	Data (Clip Control Rx MIDI Ch. (00H-0FH (ch.1-ch.16)) Initial Value = 0FH (ch.16))
10H	Data (Effect Control Rx MIDI Ch. (OFF))
01H	Data (Note Message Enabled (ON))
sum	Check Sum
F7H	EOX (End Of Exclusive)

* The unit will enter MIDI Visual Control mode if Control Mode (MENU --> SYS --> MIDI --> VISUAL) is set to "MVC" and MIDI Visual Control (MENU --> SYS --> MIDI --> VISUAL) is turned "ON."
* MIDI Channel (MENU --> SYS --> MIDI --> VISUAL) setting is used as the Clip Control Rx MIDI Ch.
* Only the Clip Control Rx MIDI Ch address (10H 00H 01H) and data are transmitted when the MIDI Channel setting is made in MIDI Visual Control mode.

❍ MIDI Visual Control OFF

Transmitted when exiting MIDI Visual Control mode.

Status	Data byte	Status
F0H	7EH, 00H, 0CH, 01H, 10H, 00H, 00H, 00H, 70H,	F7H

Byte	Explanation
F0H	Exclusive Status
7EH	ID Number (Roland)
00H	Device ID (00H fixed)
00H	Model ID#1
0CH	Model ID#2
01H	Command ID (DT1)
10H 00H 00H	Address
00H	Data (MIDI Visual Control OFF)
70H	Check Sum
F7H	EOX (End Of Exclusive)

* The unit will exit MIDI Visual Control mode if the MIDI Visual Control (MENU --> SYS --> MIDI --> VISUAL) is turned "OFF" or if Control Mode (MENU --> SYS --> MIDI --> VISUAL) is set to "V-LINK."

3. 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.

D	H	D	H	D	H	D	H
0	00H	32	20H	64	40H	96	60H
1	01H	33	21H	65	41H	97	61H
2	02H	34	22H	66	42H	98	62H
3	03H	35	23H	67	43H	99	63H
4	04H	36	24H	68	44H	100	64H
5	05H	37	25H	69	45H	101	65H
6	06H	38	26H	70	46H	102	66H
7	07H	39	27H	71	47H	103	67H
8	08H	40	28H	72	48H	104	68H
9	09H	41	29H	73	49H	105	69H
10	0AH	42	2AH	74	4AH	106	6AH
11	0BH	43	2BH	75	4BH	107	6BH
12	0CH	44	2CH	76	4CH	108	6CH
13	0DH	45	2DH	77	4DH	109	6DH
14	0EH	46	2EH	78	4EH	110	6EH
15	0FH	47	2FH	79	4FH	111	6FH
16	10H	48	30H	80	50H	112	70H
17	11H	49	31H	81	51H	113	71H
18	12H	50	32H	82	52H	114	72H
19	13H	51	33H	83	53H	115	73H
20	14H	52	34H	84	54H	116	74H
21	15H	53	35H	85	55H	117	75H
22	16H	54	36H	86	56H	118	76H
23	17H	55	37H	87	57H	119	77H
24	18H	56	38H	88	58H	120	78H
25	19H	57	39H	89	59H	121	79H
26	1AH	58	3AH	90	5AH	122	7AH
27	1BH	59	3BH	91	5BH	123	7BH
28	1CH	60	3CH	92	5CH	124	7CH
29	1DH	61	3DH	93	5DH	125	7DH
30	1EH	62	3EH	94	5EH	126	7EH
31	1FH	63	3FH	95	5FH	127	7FH

D: decimal
H: hexadecimal

* Decimal values such as MIDI channel, 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

● 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.)

Digital Hand Percussion
Model: HandSonic HPD-20

MIDI Implementation Chart

Date: AUG. 01, 2013
Version: 1.00

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1–16, OFF	1–16, OFF	Memorized
	Changed	1–16, OFF	1–16, OFF	
Mode	Default	Mode 3	Mode 3	
	Messages	X	X	
	Altered	**********	**********	
Note Number	: True Voice	0–127	0–127	
		**********	0–127	
Velocity	Note On	O 9nH v = 1–127	O	
	Note Off	O 8nH v = 0–127	O	
After Touch	Key's	O *1	O *1	
	Channel's	X	X	
Pitch Bend		O	O	
Control Change	0, 32	O	O	Bank Select
	1	X	X	Modulation
	2	X	X	Breath Controller
	4	O *2	O *2	Foot Controller
	6, 38	X	X	Data Entry
	7	X	X	Volume
	10	X	X	Pan
	11	X	X	Expression
	12, 13	O *3	O *3	Effect Controller 1, 2
	16, 17	O *4	O *4	General Purpose Controller 1, 2
	18, 50	O *5	O *5	General Purpose Controller 3
	19, 80	O *6	O *6	General Purpose Controller 4, 5
	64	O *7	O *7	Hold 1
	70–79	O *3	O *3	Sound Controller 1–10
	81–83	O *3	O *3	General Purpose Controller 6–8
	91	X	X	General Purpose Effect 1
	93	X	X	General Purpose Effect 3
	100, 101	X	X	RPN LSB, MSB
Program Change	: True Number	O *1	O *1	
		**********	0–127	Program Number: 1–128
System Exclusive		O	O	
System Common	: Song Position	X	X	
	: Song Select	X	X	
	: Tune Request	X	X	
System Real Time	: Clock	X	X	
	: Commands	X	X	
Aux Messages	: All Sound Off	O	O	
	: Reset All Controllers	O	O	
	: Local ON/OFF	X	X	
	: All Note Off	X	O (123–127)	
	: Active Sensing	O	O	
	: System Reset	X	X	
Notes		*1: OX is selectable.		
		*2: Position data for hi-hat control pedal		
		*3: Position data for D-BEAM or control information for Realtime Modify knob		
		*4: Strike position data for pads		
		*5: Open-close data for pads		
		*6: On/off information for Realtime Modify buttons		
		*7: On/off information for [Roll] button		

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

O : Yes
X : NO