

Mark	Meaning	Range
n:	MIDI channel	0H-FH (ch.1 - ch.16)
vv:	Value, Velocity etc.	00H-7FH (0 - 127) (Only for note-on velocity, this will be 01H-7FH (1 - 127).)
kk:	Note Number	00H-7FH (0 - 127): C-1 - G9
xx:	ON/OFF	00H-3FH (0 - 63): OFF 40H-7FH (64 - 127): ON

1. MIDI messages received at MIDI IN

■ Channel voice messages

- * When MIDI Thru ([MIDI]) is other than OFF, MIDI messages arriving at MIDI IN will be re-transmitted from MIDI OUT.

● Note Off

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

- * Notes of the part whose Part MIDI Ch ([PART]) matches the MIDI channel of the received note-off will be turned off.
- * When the Individual Trigger Switch ([PFM COMMON]) is ON, and if MIDI channel number of received Note Off is coincident with Trigger Source Channel ([PFM COMMON]), and also the Note Number of received Note Off is coincident with Trigger Source Note ([PFM COMMON]), the Envelope of Trigger Destination ([PFM COMMON]) will be released.

● Note On

status	2nd byte	3rd byte
8nH	kkH	vvH

- * Notes of the part whose Part MIDI CH ([PART]) matches the MIDI channel of the received note-on will be sounded.
- * When the Individual Trigger Switch ([PFM COMMON]) is ON, and if MIDI channel number of received Note On is coincident with Trigger Source Channel ([PFM COMMON]), and also the Note Number of received Note On is coincident with Trigger Source Note ([PFM COMMON]), the Envelope of Trigger Destination will be started.

● Control Change

- * If Control Up/Control Down ([MIDI]) is set to a control change, this will function as controller up or down for the part whose Part MIDI CH ([PART]) matches the MIDI channel of the received control change message.
- * If Tx/Rx Edit SW ([MIDI]) is ON and Tx/Rx Edit Mode ([MIDI]) is set to MODE2, the Tx/Rx Setting ([MIDI]) setting will be valid. This will affect the value of the parameter which is assigned to the control change that was received by the part whose Part MIDI CH ([PART]) matches the MIDI channel of the received control change.
- * Tx/Rx settings ([MIDI]) can be made for controller numbers 1 to 31 and 33 to 95. Refer to Transmit/Receive Setting List (p.188) for the default settings.

○ Bank Select (Controller number 0, 32)

status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

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

- * This is received only when Tx/Rx ProgChg SW ([MIDI]) is BANK SEL + PC.
- * If this is received on the Perform Ctrl CH ([MIDI]), it will specify the performance bank. If this is received on the Part MIDI CH ([PART]), it will specify the patch bank for that part. If the Perform Ctrl CH and the Part MIDI CH are the same, it will specify only the performance bank.
- * Bank Select processing will be suspended until a Program Change message is received.

- * If an unavailable (nonexistent) Bank Select number is received it will be ignored, and only the Program Change will be received.

- * The Patches corresponding to each Bank Select are as follows.

Bank MSB	Select LSB	Program No.	Group	Patch No.
50H	00H	00H - 3FH	User A	11 - 88
	00H	40H - 7FH	User B	11 - 88
51H	00H	00H - 3FH	Preset 1 A	11 - 88
	00H	40H - 7FH	Preset 1 B	11 - 88
	01H	00H - 3FH	Preset 2 A	11 - 88
	01H	40H - 7FH	Preset 2 B	11 - 88
	02H	00H - 3FH	Preset 3 A	11 - 88
	02H	40H - 7FH	Preset 3 B	11 - 88
52H	00H	00H - 3FH	Card 01 A	11 - 88
	00H	40H - 7FH	Card 01 B	11 - 88
	01H	00H - 3FH	Card 02 A	11 - 88
	01H	40H - 7FH	Card 02 B	11 - 88
	:	:	:	:
	1FH	00H - 3FH	Card 32 A	11 - 88
	1FH	40H - 7FH	Card 32 B	11 - 88
	*) 20H	00H - 3FH	Card 33 A	11 - 88
	20H	40H - 7FH	Card 33 B	11 - 88
	21H	00H - 3FH	Card 34 A	11 - 88
	21H	40H - 7FH	Card 34 B	11 - 88
	:	:	:	:
	3FH	00H - 3FH	Card 64 A	11 - 88
	3FH	40H - 7FH	Card 64 B	11 - 88

- *) Bank Select LSB 20H - 3FH are available only with the S4M-5.

- * The Performances corresponding to each Bank Select are as follows.

Bank MSB	Select LSB	Program No.	Group	Perform No.
50H	00H	00H - 3FH	User	11 - 88
	00H	40H - 7FH	User	11 - 88
51H	00H	00H - 3FH	Preset 1	11 - 88
	01H	00H - 3FH	Preset 2	11 - 88
	02H	00H - 3FH	Preset 3	11 - 88
52H	00H	00H - 3FH	Card 01	11 - 88
	01H	00H - 3FH	Card 02	11 - 88
	02H	00H - 3FH	Card 03	11 - 88
	:	:	:	:
	1FH	00H - 3FH	Card 32	11 - 88
	*) 20H	00H - 3FH	Card 33	11 - 88
	:	:	:	:
	3FH	00H - 3FH	Card 64	11 - 88

- *) Bank Select LSB 20H - 3FH are available only with the S4M-5.

○ Modulation (Controller number 1)

status	2nd byte	3rd byte
BnH	01H	vvH

- * This will control the pitch, cutoff, or amplitude modulation depth for the respective PITCH/FILTER/AMP [DEPTH] parameter of the MODULATION (LFO2) in the patch of the part whose Part MIDI CH ([PART]) matches the channel on which the message was received.
- * This is not reset to the default value when a patch program change is received.
- * This will be reset to the default value when a performance program change is received.

○ Breath type (Controller number 2)

status	2nd byte	3rd byte
BnH	02H	vvH

○ Foot type (Controller number 4)

status	2nd byte	3rd byte
BnH	04H	vvH

○ Portamento Time (Controller number 5)

status	2nd byte	3rd byte
BnH	05H	vvH

- * This will modify the PORTAMENTO [TIME] value for the patch of the part whose Part MIDI CH ([PART]) matches the channel on which the message was received.

○ Data Entry (Controller number 6, 38)

status	2nd byte	3rd byte
BnH	06H	mmH
BnH	26H	llH

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

○ Volume (Controller number 7)

status	2nd byte	3rd byte
BnH	07H	vvH

* If this is received on the Perform Ctrl CH ([MIDI]), it will set the volume of the performance. If it is received on the Part MIDI CH ([PART]) it will set the volume of that part. If the Perform Ctrl CH and the Part MIDI CH are the same, only the volume of the performance will be set.

* This is not reset to the default value when a patch program change is received.

* This is reset to the default value when a performance program change is received.

○ Balance (Controller number 8)

status	2nd byte	3rd byte
BnH	08H	vvH

○ Panpot (Controller number 10)

status	2nd byte	3rd byte
BnH	0AH	vvH

○ Expression (Controller number 11)

status	2nd byte	3rd byte
BnH	0BH	vvH

* When this is received on the Perform Ctrl CH ([MIDI]), it will adjust the volume of the performance. When this is received on the Part MIDI CH ([PART]), it will adjust the volume of that part. If the Perform Ctrl CH and the Part MIDI CH are the same, only the volume of the performance will be adjusted.

* It can be used to independently from Volume messages. Expression messages are used for musical expression within a performance; e.g., expression pedal movements, crescendo and decrescendo.

* This is not reset to the default value when a patch program change is received.

* This is reset to the default value when a performance program change is received.

○ Effect Control1 (Controller number 12)

status	2nd byte	3rd byte
BnH	0CH	vvH

○ Effect Control2 (Controller number 13)

status	2nd byte	3rd byte
BnH	0DH	vvH

○ General Purpose Controller1–4 (Controller number 16–19)

status	2nd byte	3rd byte
BnH	10-13H	vvH

○ Hold1 (Controller number 64)

status	2nd byte	3rd byte
BnH	40H	xxH

* This holds the notes which are currently in a note-on state.

○ Portamento (Controller number 65)

status	2nd byte	3rd byte
BnH	41H	xxH

* This switches PORTAMENTO [ON] on/off.

○ Sound Controller1–10 (Controller number 70–79)

status	2nd byte	3rd byte
BnH	46-4FH	vvH

○ General Purpose Controllers 5–8 (Controller number 80–83)

status	2nd byte	3rd byte
BnH	50-53H	vvH

○ Portamento Control (Controller number 84)

status	2nd byte	3rd byte
BnH	54H	kkH

kk = Source Note Number: 00H - 7FH (C-1 - G9)

* For the part whose Part MIDI CH ([PART]) is the same as the channel on which this message was received, the note-on received immediately after Portamento Control will be sounded with a pitch that changes smoothly from the pitch of the Source Note Number.

* If a voice is already sounding at the same note number as the source note number, that voice will change pitch to the pitch of the newly received Note On, and continue sounding (i.e., will be played legato).

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

* The speed of the pitch change caused by Portamento is determined by the PORTAMENTO TIME parameter value.

○ Effects Depth 2–5 (Controller number 92–95)

status	2nd byte	3rd byte
BnH	5C-5FH	kkH

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

status	2nd byte	3rd byte
BnH	65H	mmH
BnH	64H	llH

mm=MSB of the parameter number specified by RPN

ll=LSB of the parameter number specified by RPN

<<< RPN >>>

Control Changes include RPN (Registered Parameter Numbers), which are extended parameters whose function is defined in the MIDI specification.

When using RPNs, first the RPN (Controller numbers 100 and 101; they can be sent in any order) is transmitted to specify the parameter you wish to control. Then, Data Entry messages (Controller numbers 6 and 38) are used to set the value of the specified parameter. Once a RPN parameter has been specified, all further Data Entry messages on that channel are considered to apply to that specified parameter. In order to prevent accidents, when the desired setting has been made for the parameter, it is recommended that RPN be set to Null.

This device receives the following RPNs.

RPN	Data entry	Notes
MSB LSB	MSB LSB	
00H 00H	mmH —	Pitch Bend Sensitivity mm : 00H - 18 H (0 - 24 semitones) ll : ignored (processed as 00H) Up to 1 octave can be specified in semitone steps.

* On the part whose Part MIDI CH ([PART]) matches the channel on which this message was received, the Bend Range Up and Bend Range Down ([PATCH]) settings will change simultaneously.

00H 01H	mmH llH	Master Fine Tuning mm, ll: 20 00H - 40 00H - 60 00H (-8192 *50 / 8192 - 0 - +8192 * 50 / 8192 cent)
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* When this is received on the Performance Control Channel ([MIDI]), the Master Tune setting ([SETUP]) will change. When this is received on the Part MIDI Channel ([PART]), it will be added to Master Tune and the Fine Tuning of the Part will change. If the Performance Control Channel matches the Part MIDI Channel, the Master Tune setting will change.

00H 02H	mmH llH	Master Coarse Tuning mm : 28H - 40H - 58H (-24 - 0 - +24 semitones) ll : ignored (processed as 00H)
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* This will change the Part Transpose ([PART]) setting of the part whose Part MIDI CH ([PART]) matches the channel of the data that was received.

7FH 7FH	— —	RPN null
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* RPN and NRPN will be set as “unspecified”. Once this setting has been made, subsequent Data Entry messages will be ignored. (It is not necessary to transmit Data Entry for RPN Null settings.) Parameter values that were previously set will not change.

mm, ll: ignored

● Program Change

status 2nd byte
CnH ppH

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

- * This is received when Tx/Rx ProgChg SW ([MIDI]) is PC or BANK SEL + PC.
- * If this is received on the Perform Ctrl CH ([MIDI]), the performance will change. If this is received on the Part MIDI CH ([PART]), the patch of that part will change. If the Perform Ctrl CH and the Part MIDI CH are the same, only the performance will change.
- * In the case of a performance change, program numbers outside the range of 00H - 3FH will be ignored.
- * When this message is received, all voices will be turned off.

● Channel Pressure

status 2nd byte
DnH vvH

- * The Tx/Rx Setting ([MIDI]) will be valid when Tx/Rx Edit SW ([MIDI]) is ON and Tx/Rx Edit Mode ([MIDI]) is set to MODE2. In this case, this message will change the value of the parameter assigned to AFTERTOUC in the part whose Part MIDI CH ([PART]) matches the MIDI channel of the channel pressure message which was received.
- * If Control Up/Control Down ([MIDI]) is set to AFTERTOUC, this message will operate as controller up or down for the part whose Part MIDI CH ([PART]) matches the MIDI channel on which the channel pressure message was received. With the factory settings, Control Up is set to AFTERTOUC.

● Pitch Bend Change

status 2nd byte 3rd byte
EnH llH mmH

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

- * This will modify the pitch of the notes of the part whose Part MIDI CH ([PART]) matches the MIDI channel on which the pitch bend change was received.
- * The width of pitch change will be according to the patch parameter Bend Range Up ([PATCH]) and Bend Range Down ([PATCH]). A pitch bend value in the range of 00 00H - 3F 7FH will follow the Bend Range Down setting, and a value in the range of 40 01H - 7F 7FH will follow the Bend Range Up setting.

■ Channel Mode messages

● All Sound Off (Controller number 120)

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

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

● Reset All Controllers (Controller number 121)

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

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

Controller	Reset value
Pitch Bend Change	±0 (center)
Modulation	0 (minimum)
Expression	127 (maximum)
Hold 1	0 (off)
RPN	Unset. Previously set data will not change (However, the Fine Tune of the Part is excepted.).
Control Up	0 (minimum) Default setting is Aftertouch.
Control Down	0 (minimum) Default setting is Breath.

● All Note Off (Controller number 123)

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

- * When All Note Off is received, all currently sounding notes of the corresponding channel will be turned off. However if Hold 1 is on, the sound will be held until these are turned off.

● Omni Off (Controller number 124)

status 2nd byte 3rd byte
BnH 7CH 00H

- * The same processing as when All Note Off is received will be done.

● Omni On (Controller number 125)

status 2nd byte 3rd byte
BnH 7DH 00H

- * The same processing as when All Note Off is received will be done.

● Mono (Controller number 126)

status 2nd byte 3rd byte
BnH 7EH mmH

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

- * The same processing as when All Note Off is received will be done, and the MONO Switch parameter will be set to ON.

● Poly (Controller number 127)

status 2nd byte 3rd byte
BnH 7FH 00H

- * The same processing as when All Note Off is received will be done, and the MONO Switch parameter will be set to OFF.

■ System Realtime messages

● Active Sensing

status
FEH

- * When an Active Sensing message is received, the unit will begin monitoring the intervals of all further messages. During monitoring, if more than 400 ms passes without a message being received, the same processing will be done as when All Sound Off, All Note Off, and Reset All Controllers messages are received. Then monitoring will be halted.

● Timing Clock

status
F8H

- * This is received when MIDI Sync ([MIDI]) is set to MIDI IN.

● Start

status
FAH

- * This is received when MIDI Sync ([MIDI]) is set to MIDI IN.

● Continue

status
FBH

- * This is received when MIDI Sync ([MIDI]) is set to MIDI IN.

● Stop

status
FCH

- * This is received when MIDI Sync ([MIDI]) is set to MIDI IN.

■ System Exclusive messages

- * When MIDI Thru is ON (ALL), messages arriving at MIDI IN will be re-transmitted from MIDI OUT without change.
- * These are not received when Rx Exclusive SW ([MIDI]) is OFF.

status	data byte	status
F0H	iiH, ddH,, eeH	F7H
F0H:	System Exclusive message status	
ii = ID number:	This is the ID number (manufacturer ID) that specifies the manufacturer whose exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are defined in an expansion of the MIDI standard as Universal Non-realtime messages (7EH) and Universal Realtime Messages (7FH).	
dd, ..., ee = data:	00H - 7FH (0 - 127)	
F7H:	EOX (End Of Exclusive)	

● Data Request 1 RQ1

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

status	data byte	status
F0H	41H, dev, 00H, 06H, 11H, aaH, bbH, ccH, ddH, ssH, ttH, uuH, vvH, sum	F7H
Byte	Remarks	
F0H	Exclusive status	
41H	ID number	(Roland)
dev	device ID	(dev: 10H - 1FH, factory setting is 10H)
00H	model ID	(JP-8080)
06H	model ID	(JP-8080)
11H	command ID	(RQ1)
aaH	address MSB	
bbH	address	
ccH	address	
ddH	address LSB	
ssH	size MSB	
ttH	size	
uuH	size	
vvH	size LSB	
sum	checksum	
F7H	EOX	(End Of Exclusive)

- * The size of data that can be transmitted at one time is fixed for each type of data, and data requests must be made with a fixed starting address and size. Refer to the address and size given in " 4. Parameter address map " (p.200)
- * For details on the address, size, and checksum values, refer to "Examples of exclusive messages and calculating the checksum" (p.206).

● Data Set 1 DT1

This message transmits the actual data, and is used when you wish to set the data of the receiving device.

status	data byte	status
F0H	41H, dev, 00H, 06H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H
Byte	Remarks	
F0H	Exclusive status	
41H	ID number	(Roland)
dev	device ID	(dev: 10H - 1FH, factory setting is 10H)
00H	model ID	(JP-8080)
06H	model ID	(JP-8080)
12H	command ID	(DT1)
aaH	address MSB	
bbH	address	
ccH	address	
ddH	address LSB	
eeH	data: The actual data to be transmitted. Multi-byte data is transmitted in the order of the address.	
:	:	
ffH	data	
sum	checksum	
F7H	EOX	(End Of Exclusive)

- * For details on the address, size, and checksum values, refer to "Examples of exclusive messages and calculating the checksum" (p.206).
- * Data whose size is greater than 256 bytes should be divided into packets of 256 bytes or less and transmitted. Successive "Data Set 1 messages should have at least 20 ms of time interval between them.

● Identity Request

status	data byte	status
F0H	7EH, dev, 06H, 01H	F7H
F0H	Exclusive status	
7EH	ID number	(Universal Non-Realtime Messages)
dev	device ID	(dev: 10H-1FH (1-32) or 7FH (Broadcast), default value is 10H (17))
06H	Sub ID#1	(General Information)
01H	Sub ID#2	(Identity Request)
F7H	EOX	(End Of Exclusive)

- * "dev" matches the unit's own device ID, or is 7FH (Broadcast).
- * Even if an identity request message is received with a setting of Broadcast, the reply will be sent using the unit's own device ID.

2. MIDI messages received at Remote Keyboard In

■ Channel voice messages

● Note Off

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

- * This is received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the note-off matches.
- * Note-off messages that are received will turn off notes of the part according to the PANEL SELECT and KEY MODE settings. At the same time, a note-off message will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) of that part.
- * If ARPEGGIATOR/RPS [ON] is on, the received note-off messages can control the arpeggiator or RPS.
- * If the Indv Trig Switch ([PFM COMMON]) is ON and KEY MODE is SPLIT, received note-off messages that are below the Split Point ([PFM COMMON]) will release the envelope specified by Indv Trig Dest ([PFM COMMON]).

● Note On

status	2nd byte	3rd byte
9nH	kkH	vvH

- * Received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the note-on message matches.
- * Note-on messages that are received will sound notes on the part according to the PANEL SELECT and KEY MODE settings. At the same time, a note-on message will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) of that part.
- * When ARPEGGIATOR/RPS [ON] is on, received note-on messages can control the arpeggiator or RPS.
- * When Indv Trig Switch ([PFM COMMON]) is ON and KEY MODE is SPLIT, received note-on messages that are below the Split Point ([PFM COMMON]) will start the envelope specified by Indv Trig Dest ([PFM COMMON]).

● Control Change

- * Received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the control change matches.
- * If Control Up/Control Down ([MIDI]) is set to control change, this message will function as controller up or down for the part specified by PANEL SELECT (when KEY MODE is SINGLE or SPLIT) or for both the Upper and Lower parts regardless of PANEL SELECT (when KEY MODE is DUAL). At the same time, a control change message will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) of that part.

* When Tx/Rx Editing ([MIDI]) is ON and Tx/Rx Edit Mode ([MIDI]) is set to MODE2, the Tx/Rx Setting ([MIDI]) will be valid. In this case, this message will change the value of the parameter assigned to the received control change for the part specified by PANEL SELECT. Also, a control change will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) of that part.

* Tx/Rx settings ([MIDI]) can be made for controller numbers 1 to 31 and 33 to 95. Refer to Transmit/Receive Setting List (p.188) for the default settings.

○ Bank Select (Controller number 0, 32)

status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

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

* Regardless of the Tx/Rx ProgChg SW ([MIDI]) setting, this is received when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the bank select message matches.

* If [PERFORM/PATCH SELECT] is off (PERFORM) when this message is received, the performance bank will be specified. If [PERFORM/PATCH SELECT] is on (PATCH), the bank of the patch for the part selected by PANEL SELECT will be specified.

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

* If an unavailable (nonexistent) Bank Select number is received it will be ignored, and only the Program Change will be received.

* The Patches corresponding to each Bank Select are as follows.

Bank MSB	Select LSB	Program No.	Group	Patch No.
50H	00H	00H - 3FH	User A	11 - 88
	00H	40H - 7FH	User B	11 - 88
51H	00H	00H - 3FH	Preset 1 A	11 - 88
	00H	40H - 7FH	Preset 1 B	11 - 88
	01H	00H - 3FH	Preset 2 A	11 - 88
	01H	40H - 7FH	Preset 2 B	11 - 88
	02H	00H - 3FH	Preset 3 A	11 - 88
	02H	40H - 7FH	Preset 3 B	11 - 88
52H	00H	00H - 3FH	Card 01 A	11 - 88
	00H	40H - 7FH	Card 01 B	11 - 88
	01H	00H - 3FH	Card 02 A	11 - 88
	01H	40H - 7FH	Card 02 B	11 - 88
	:	:	:	:
	1FH	00H - 3FH	Card 32 A	11 - 88
	1FH	40H - 7FH	Card 32 B	11 - 88
	*) 20H	00H - 3FH	Card 33 A	11 - 88
	20H	40H - 7FH	Card 33 B	11 - 88
	21H	00H - 3FH	Card 34 A	11 - 88
	21H	40H - 7FH	Card 34 B	11 - 88
	:	:	:	:
	3FH	00H - 3FH	Card 64 A	11 - 88
	3FH	40H - 7FH	Card 64 B	11 - 88

*) Bank Select LSB 20H - 3FH can be used only with the S4M-5.

* The Performances corresponding to each Bank Select are as follows.

Bank MSB	Select LSB	Program No.	Group	Perform No.
50H	00H	00H - 3FH	User	11 - 88
51H	00H	00H - 3FH	Preset 1	11 - 88
	01H	00H - 3FH	Preset 2	11 - 88
	02H	00H - 3FH	Preset 3	11 - 88
52H	00H	00H - 3FH	Card 01	11 - 88
	01H	00H - 3FH	Card 02	11 - 88
	02H	00H - 3FH	Card 03	11 - 88
	:	:	:	:
	1FH	00H - 3FH	Card 32	11 - 88
	*) 20H	00H - 3FH	Card 33	11 - 88
	:	:	:	:
	3FH	00H - 3FH	Card 64	11 - 88

*) Bank Select LSB 20H - 3FH can be used only with the S4M-5.

○ Modulation (Controller number 1)

status	2nd byte	3rd byte
BnH	01H	vvH

* This will control the pitch, cutoff, or amplitude modulation depth for the respective PITCH/FILTER/AMP[DEPTH] parameter of MODULATION(LFO2).

* This is not reset to the default value when a patch program change is received.

* This will be reset to the default value when a performance program change is received.

○ Breath type (Controller number 2)

status	2nd byte	3rd byte
BnH	02H	vvH

○ Foot type (Controller number 4)

status	2nd byte	3rd byte
BnH	04H	vvH

○ Portamento Time (Controller number 5)

status	2nd byte	3rd byte
BnH	05H	vvH

* This will modify the PORTAMENTO [TIME] value.

○ Data Entry (Controller number 6, 38)

status	2nd byte	3rd byte
BnH	06H	mmH
BnH	26H	llH

○ Volume (Controller number 7)

status	2nd byte	3rd byte
BnH	07H	vvH

○ Balance (Controller number 8)

status	2nd byte	3rd byte
BnH	08H	vvH

○ Panpot (Controller number 10)

status	2nd byte	3rd byte
BnH	0AH	vvH

○ Expression (Controller number 11)

status	2nd byte	3rd byte
BnH	0BH	vvH

* This adjusts the volume of the part. Expression messages are used to create variation in dynamics (expression pedal, crescendo, decrescendo etc.) while you play.

* This is not reset to the default value when a patch program change is received.

* This is reset to the default value when a performance program change is received.

○ Effect Control1 (Controller number 12)

status	2nd byte	3rd byte
BnH	0CH	vvH

○ Effect Control2 (Controller number 13)

status	2nd byte	3rd byte
BnH	0DH	vvH

○ General Purpose Controller1-4 (Controller number 16-19)

status	2nd byte	3rd byte
BnH	10-13H	vvH

○ Hold1 (Controller number 64)

status	2nd byte	3rd byte
BnH	40H	xxH

* This will hold notes which are currently in a note-on state.

○ Portamento (Controller number 65)

status	2nd byte	3rd byte
BnH	41H	xxH

* This switches PORTAMENTO [ON] on/off.

○ Sound Controller1-10 (Controller number 70-79)

status	2nd byte	3rd byte
BnH	46-4FH	vvH

○ General Purpose Controllers 5-8 (Controller number 80-83)

status	2nd byte	3rd byte
BnH	50-53H	vvH

○ Portamento Control

(Controller number 84)

status	2nd byte	3rd byte
BnH	54H	kkH

kk = Source Note Number: 00H - 7FH (C-1 - G9)

- * A Note On message received immediately after a Portamento control will be sounded with the pitch changing smoothly from the source note number.
- * If a voice is already sounding at the same note number as the source note number, that voice will change pitch to the pitch of the newly received Note On, and continue sounding (i.e., will be played legato).

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

- * The speed of the pitch change caused by Portamento is determined by the PORTAMENTO TIME parameter value.

○ Effects Depth 2-5

(Controller number 92-95)

status	2nd byte	3rd byte
BnH	5C-5FH	kkH

● Program Change

status	2nd byte
CnH	ppH

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

- * Regardless of the Tx/Rx ProgChg SW ([MIDI]) setting, this message is received if the system parameter Remote KBD CH ([MIDI]) is ALL or if the MIDI channel of the program change matches.
- * When this is received, a performance change will occur if [PERFORM/PATCH SELECT] is off (PERFORM). If [PERFORM/PATCH SELECT] is on (PATCH), the patch will change for the part selected by PANEL SELECT.
- * In the case of a performance change, program numbers outside the range of 00H - 3FH will be ignored.
- * When this message is received, all voices will be turned off.

● Channel Pressure

status	2nd byte
DnH	vvH

- * This is received only when Remote KBD CH ([MIDI]) is ALL or if the MIDI channel of the channel pressure matches.
- * When Tx/Rx Edit SW ([MIDI]) is ON and Tx/Rx Edit Mode ([MIDI]) is set to MODE2, the Tx/Rx Setting ([MIDI]) will be valid. In this case, the message will change the value of the parameter which is assigned to AFTERTOUCH for the part specified by PANEL SELECT. At the same time, a channel pressure message will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) of that part.
- * If Control Up/Control Down ([MIDI]) is set to AFTERTOUCH, this message will function as controller up or down for the part specified by PANEL SELECT (if KEY MODE is SINGLE or SPLIT), or for both Upper and Lower parts regardless of the PANEL SELECT setting (if KEY MODE is DUAL). With the factory settings, Control Up is set to AFTERTOUCH. At the same time, channel pressure messages will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) of that part.

● Pitch Bend Change

status	2nd byte	3rd byte
EnH	llH	mmH

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

- * This is received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the Pitch Bend Change matches.
- * Pitch bend change messages that are received will modify the pitch of the part specified by PANEL SELECT (if KEY MODE is SINGLE or SPLIT) or of both Upper and Lower parts regardless of the PANEL SELECT setting (if KEY MODE is DUAL). At the same time, pitch bend change messages will be transmitted from MIDI OUT on the Part MIDI CH ([PART]) for that part.
- * The range of pitch change will be according to the patch parameter Bend Range Up ([PATCH]) and Bend Range Down ([PATCH]). Pitch bend values in the range of 00 00H - 3F 7FH will apply according to Bend Range Down, and values in the range of 40 01H - 7F 7FH will apply according to Bend Range Up.

■ Channel Mode messages

● Reset All Controllers (Controller number 121)

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

- * This is received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the Reset All Controllers matches.
- * When this message is received, the values of the following controllers will be reset for the part selected by PANEL SELECT if KEY MODE is SINGLE or SPLIT, or for both Upper and Lower parts regardless of the PANEL SELECT setting if KEY MODE is DUAL.

Controller	Reset value
Pitch Bend Change	±0 (center)
Modulation	0 (minimum)
Expression	127 (maximum)
Hold 1	0 (off)
RPN	Unset. Previously set data will not change.
Control Up	0 (minimum) Default setting is Aftertouch.
Control Down	0 (minimum) Default setting is Breath.

● All Note Off (Controller number 123)

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

- * This is received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the All Note Off matches.
- * When this message is received, all notes of the part specified by PANEL SELECT which are currently on will be turned off. However if Hold 1 is on, the sound will continue until this is turned off.

● Omni Off (Controller number 124)

status	2nd byte	3rd byte
BnH	7CH	00H

- * The same processing as when All Note Off is received will be done.

● Omni On (Controller number 125)

status	2nd byte	3rd byte
BnH	7DH	00H

- * The same processing as when All Note Off is received will be done.

● Mono (Controller number 126)

status	2nd byte	3rd byte
BnH	7EH	mmH

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

- * This is received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the Mono message matches.
- * The mono number is always handled as 1.
- * The same processing will be performed as when All Note Off is received, and [MONO] will be turned on for the patch of the part specified by PANEL SELECT.

● Poly

(Controller number 127)

status	2nd byte	3rd byte
BnH	7FH	00H

- * This is received only when Remote KBD CH ([MIDI]) is ALL or when the MIDI channel of the poly message matches.
- * The same processing will be performed as when All Note Off is received, and [MONO] will be turned off for the patch of the part specified by PANEL.SELECT.

■ System Realtime messages

● Active Sensing

status
FEH

- * When an Active Sensing message is received, the unit will begin monitoring the intervals of all further messages. During monitoring, if more than 400 ms passes without a message being received, the same processing will be done as when All Note Off and Reset All Controllers messages are received. Then monitoring will be halted.

● Timing Clock

status
F8H

- * This is received when MIDI Sync ([MIDI]) is set to REMOTE KBD IN.

● Start

status
FAH

- * This is received when MIDI Sync ([MIDI]) is set to REMOTE KBD IN.

● Continue

status
FBH

- * This is received when MIDI Sync ([MIDI]) is set to REMOTE KBD IN.

● Stop

status
FCH

- * This is received when MIDI Sync ([MIDI]) is set to REMOTE KBD IN.

■ System Exclusive messages

- * Regardless of the Exclusive Receive Switch setting, REMOTE KBD IN will always receive exclusive messages for the parameters of the patch/performance in the temporary area. However, patch parameters and performance part parameters will be received by the part that is selected by Panel Select. No other exclusive messages will be received.

status	data byte	status
F0H	iiH, ddH,, eeH	F7H

F0H: System Exclusive message status
 ii = ID number: This is the ID number (manufacturer ID) that specifies the manufacturer whose exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are defined in an expansion of the MIDI standard as Universal Non-realtime messages (7EH) and Universal Realtime Messages (7FH).
 dd, ..., ee = data: 00H - 7FH (0 - 127)
 F7H: EOX (End Of Exclusive)

● Data Set 1 DT1

This message transmits the actual data, and is used when you wish to set the data of the receiving device.

status	data byte	status
F0H	41H, dev, 00H, 06H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	device ID (dev: 10H - 1FH, factory setting is 10H)
00H	model ID (JP-8080)
06H	model ID (JP-8080)
12H	command ID (DT1)
aaH	address MSB
bbH	address
ccH	address
ddH	address LSB
eeH	data: The actual data to be transmitted. Multi-byte data is transmitted in the order of the address.
:	:
ffH	data
sum	checksum
F7H	EOX (End Of Exclusive)

- * Only data set 1 for patch parameters and performance parameters is received. For patch parameters, this message will affect the patch parameters of the part selected by PANEL.SELECT at that time, regardless of the parameter address which was received.
- * For details on address, size, and checksum settings, refer to "Examples of exclusive messages and calculating the checksum" (p.206).
- * Data whose size is greater than 256 bytes should be divided into packets of 256 bytes or less and transmitted. Successive "Data Set 1 messages should have at least 20 ms of time interval between them.

3. MIDI messages transmitted from MIDI OUT

- * When MIDI Thru is ON (ALL), messages received at MIDI IN will be re-transmitted from MIDI OUT except for Active Sensing messages.
- * When MIDI Thru is ON (w/o Sys.Ex), MIDI messages received at MIDI IN will be re-transmitted from MIDI OUT except for Active Sensing and System Exclusive messages.

■ Channel voice messages

● Note Off

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

● Note On

status	2nd byte	3rd byte
9nH	kkH	vvH

● Control Change

- * When the Tx/Rx Edit SW ([MIDI]) is ON and Tx/Rx Edit Mode ([MIDI]) is set to MODE2, the Tx/Rx Setting ([MIDI]) setting will be valid. In this case, operating the sliders/knobs will cause the control change assigned to that parameter to be transmitted on the Part MIDI CH ([PART]) of the part specified by PANEL SELECT.
- * Tx/Rx settings ([MIDI]) can be made for controller numbers 1 to 31 and 33 to 95. Refer to Transmit/Receive Setting List (p.188) for the default settings.

○ Bank Select (Controller number 0,32)

status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

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

- * This is transmitted when Tx/Rx ProgChg SW ([MIDI]) is BANK SEL + PC.

- * The Patches corresponding to each Bank Select are as follows.

Bank MSB	Select LSB	Program No.	Group	Patch No.
50H	00H	00H - 3FH	User A	11 - 88
	00H	40H - 7FH	User B	11 - 88
51H	00H	00H - 3FH	Preset 1 A	11 - 88
	00H	40H - 7FH	Preset 1 B	11 - 88
	01H	00H - 3FH	Preset 2 A	11 - 88
	01H	40H - 7FH	Preset 2 B	11 - 88
	02H	00H - 3FH	Preset 3 A	11 - 88
	02H	40H - 7FH	Preset 3 B	11 - 88
52H	00H	00H - 3FH	Card 01 A	11 - 88
	00H	40H - 7FH	Card 01 B	11 - 88
	01H	00H - 3FH	Card 02 A	11 - 88
	01H	40H - 7FH	Card 02 B	11 - 88
	:	:	:	:
	1FH	00H - 3FH	Card 32 A	11 - 88
	1FH	40H - 7FH	Card 32 B	11 - 88
	*) 20H	00H - 3FH	Card 33 A	11 - 88
		40H - 7FH	Card 33 B	11 - 88
		00H - 3FH	Card 34 A	11 - 88
		40H - 7FH	Card 34 B	11 - 88
	:	:	:	:
	3FH	00H - 3FH	Card 64 A	11 - 88
	3FH	40H - 7FH	Card 64 B	11 - 88

- *) Bank Select LSB 20H - 3FH is available only with the S4M-5.

- * The Performances corresponding to each Bank Select are as follows.

Bank MSB	Select LSB	Program No.	Group	Perform No.
50H	00H	00H - 3FH	User	11 - 88
51H	00H	00H - 3FH	Preset 1	11 - 88
	01H	00H - 3FH	Preset 2	11 - 88
	02H	00H - 3FH	Preset 3	11 - 88
52H	00H	00H - 3FH	Card 01	11 - 88
	01H	00H - 3FH	Card 02	11 - 88
	02H	00H - 3FH	Card 03	11 - 88
	:	:	:	:
	1FH	00H - 3FH	Card 32	11 - 88
	*) 20H	00H - 3FH	Card 33	11 - 88
		:	:	:
		:	:	:
		3FH	Card 64	11 - 88
	:	:	:	:

- *) Bank Select LSB 20H - 3FH is available only with the S4M-5.

○ Modulation (Controller number 1)

status	2nd byte	3rd byte
BnH	01H	vvH

○ Breath type (Controller number 2)

status	2nd byte	3rd byte
BnH	02H	vvH

- * When Control Up/Control Down ([MIDI]) is assigned to BREATH, settings of

VOICE MODULATOR [ON]	ON
Vocal Morph Ctrl	ON
Vocal Morph Sens	-64 - -1
VocalMorph Thrsh	0 - 126

will mean that when audio is input to VOCAL/UPPER, breath type messages will be transmitted on the Part MIDI CH of the part specified by PANEL SELECT (when KEY MODE is SINGLE or SPLIT) or of both Upper and Lower parts regardless of PANEL SELECT (when KEY MODE is DUAL). With the factory settings, BREATH is assigned to Control Down.

○ Foot type (Controller number 4)

status	2nd byte	3rd byte
BnH	04H	vvH

○ Portamento Time (Controller number 5)

status	2nd byte	3rd byte
BnH	05H	vvH

○ Data Entry (Controller number 6, 38)

status	2nd byte	3rd byte
BnH	06H	mmH
BnH	26H	llH

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

mm=MSB, ll=LSB

○ Volume (Controller number 7)

status	2nd byte	3rd byte
BnH	07H	vvH

○ Balance (Controller number 8)

status	2nd byte	3rd byte
BnH	08H	vvH

○ Panpot (Controller number 10)

status	2nd byte	3rd byte
BnH	0AH	vvH

○ Expression (Controller number 11)

status	2nd byte	3rd byte
BnH	0BH	vvH

○ Effect Control1 (Controller number 12)

status	2nd byte	3rd byte
BnH	0CH	vvH

○ Effect Control2 (Controller number 3)

status	2nd byte	3rd byte
BnH	0DH	vvH

○ General Purpose Controller1-4 (Controller number 16-19)

status	2nd byte	3rd byte
BnH	10-13H	vvH

○ Hold1 (Controller number 64)

status	2nd byte	3rd byte
BnH	40H	xxH

○ Portamento (Controller number 65)

status	2nd byte	3rd byte
BnH	41H	xxH

○ Sound Controller1-10 (Controller number 70-79)

status	2nd byte	3rd byte
BnH	46-4FH	vvH

○ General Purpose Controllers 5–8

(Controller number 80–83)

status	2nd byte	3rd byte
BnH	50-53H	vvH

○ Portamento Control

(Controller number 84)

status	2nd byte	3rd byte
BnH	54H	kkH

kk = Source Note Number: 00H - 7FH (C-1 - G9)

- * This is transmitted when ARPEGGIATOR/RPS [ON] is turned on, ARPEGGIATOR / RPS [MODE] is set to UP/DOWN/UP&DOWN/RND, Arp Beat Pattern is set to PORTA-A1 - PORTA-B15 and you play an arpeggio.

○ Effects Depth 2-5

(Controller number 92–95)

status	2nd byte	3rd byte
BnH	5C-5FH	kkH

● Program Change

status	2nd byte
CnH	ppH

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

- * This is transmitted when Tx/Rx ProgChg ([MIDI]) is PC or BANK SEL + PC.
- * This is transmitted on the Perform Ctrl CH ([MIDI]) when a performance is changed, and on the Part MIDI CH ([PART]) of that part when a patch is changed.

● Channel Pressure

status	2nd byte
DnH	vvH

- * When Tx/Rx Edit SW ([MIDI]) is ON and Tx/Rx Edit Mode ([MIDI]) is set to MODE2, the Tx/Rx Setting ([MIDI]) setting will be valid. In this case when AFTERTOUCH is assigned to a controller (slider or knob), operating that controller will transmit Channel Pressure messages on the Part MIDI CH ([PART]) of that part. With the factory settings, AFTERTOUCH is not assigned to controllers.
- * When Control Up/Control Down ([MIDI]) is assigned to AFTERTOUCH, settings of
VOICE MODULATOR [ON] ON
Vocal Morph Ctrl ON
Vocal Morph Sens 1 - 63
VocalMorph Thrsh 0 - 126
will mean that when audio is input to VOCAL/UPPER, Channel Pressure messages will be transmitted on the Part MIDI CH of the part specified by PANEL SELECT (when KEY MODE is SINGLE or SPLIT) or of both Upper and Lower parts regardless of PANEL SELECT (when KEY MODE is DUAL). With the factory settings, AFTERTOUCH is assigned to Control Up.

● Pitch Bend Change

status	2nd byte	3rd byte
EnH	llH	mmH

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

- * When performance parameters are set as follows,
VOICE MODULATOR [ON] ON
Vocal Morph Ctrl ON
Vocal Morph Sens other than 0
VocalMorph Thrsh other than 127
and Morph Bend Assgn is also turned ON, inputting audio to VOCAL/UPPER will cause Pitch Bend Change messages to be transmitted on the Part MIDI CH of the part specified by PANEL SELECT (when KEY MODE is SINGLE or SPLIT) or of both Upper and Lower parts regardless of PANEL SELECT (when KEY MODE is DUAL).

■ System Realtime messages

● Active Sensing

status
FEH

- * This is transmitted at intervals of approximately 200 msec.

■ System Exclusive messages

status	data byte	status
F0H	iiH, ddH,, eeH	F7H

- F0H: System Exclusive message status
- ii = ID number: This is the ID number (manufacturer ID) that specifies the manufacturer whose exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are defined in an expansion of the MIDI standard as Universal Non-realtime messages (7EH) and Universal Realtime Messages (7FH).
- dd,...., ee = data: 00H - 7FH (0 - 127)
- F7H: EOX (End Of Exclusive)

● Data Set 1 DT1

This message transmits the actual data, and is used when you wish to set the data of the receiving device.

status	data byte	status
F0H	41H, dev, 00H, 06H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	device ID (dev: 10H - 1FH, factory setting is 10H)
00H	model ID (JP-8080)
06H	model ID (JP-8080)
12H	command ID (DT1)
aaH	address MSB
bbH	address
ccH	address
ddH	address LSB
eeH	data: The actual data to be transmitted. Multi-byte data is transmitted in the order of the address.
:	:
ffH	data
sum	checksum
F7H	EOX (End Of Exclusive)

- * For details on setting the address, size, and checksum, refer to "Examples of exclusive messages and calculating the checksum" (p.206).
- * Large-sized data must be divided into packets of 256 bytes or less, and transmitted at intervals of approximately 20 ms or longer.

● Identity Reply

status	data byte	status
F0H	7EH, dev, 06H, 02H, 41H, 06H, 01H, 00H, 01H, 00H, 02H, 00H, 00H	F7H

F0H	Exclusive status	
7EH	ID number	(Universal Non-Realtime Messages)
dev	device ID	(dev: 10H - 1FH, factory setting is 10H)
06H	Sub ID#1	(General Information)
02H	Sub ID#1	(Identity Reply)
41H	ID number	(Roland)
06H	Device Family Code	(LSB)
01H	Device Family Code	(MSB)
00H	Device Family Number Code	(LSB)
01H	Device Family Number Code	(MSB)
00H	Software Revision Level	
02H	Software Revision Level	
00H	Software Revision Level	
00H	Software Revision Level	
F7H	EOX	(End Of Exclusive)

- * Even when an identity request message is received with a setting of Broadcast, the unit's own device ID will be used in the reply.

4. Parameter address map

JP-8080 (Model ID = 00H 06H)

- * Data of addresses marked by # is divided into two bytes for transmission. If the most significant bit of the original data is 1, transmit 01H and the remaining 7 bits as is. If the most significant bit is 0, transmit 00H and the remaining 7 bits as is.

Example)

If the original data is BCH, the binary expression of BCH is 10111100. Thus, 01H is transmitted as the first byte. As the next byte, we transmit the remaining 0111100 = 3CH without change. For reception, data will be ignored if the two bytes are not received together.

- * Parameter names given as — are parameters which are used only by the JP-8000. They will be ignored if received by the JP-8080.

Start Address	Description	
00 00 00 00	System Area	4-1
01 00 00 00	Performance Temporary Area	4-2
02 00 00 00	User Patch (Patch U:All - U:B88)	4-4
03 00 00 00	User Performance (Performance U:11 - U:88)	4-5
09 00 00 00	Motion Control Data (Motion SET A)	4-6
0A 00 00 00	Motion Control Data (Motion SET B)	4-6

4-1. System Area

Offset Address	Description	
00 00 00 00	System Parameter	4-1-1
00 00 20 00	Motion Setup	4-1-2
00 00 30 00	Tx/Rx Setting	4-1-3

4-1-1. System Parameter

size = 19H (25 byte)

Offset Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00	Performance Bank	01h - 03h	USER, PRESET, CARD
00 00 00 01	Performance No.	00h - 3Fh	11 - 88
00 00 00 02	Performance Control Channel	00h - 10h	1 - 16, OFF
00 00 00 03	Power Up Mode	00h - 01h	PERFORM U-11, LAST-SET
00 00 00 04	MIDI Sync	00h - 02h	OFF, MIDI IN, REMOTE KBD IN
00 00 00 05	Local Switch	00h - 01h	OFF, ON
00 00 00 06	Tx/Rx Edit Mode	00h - 01h	MODEL, MODE2
00 00 00 07	Tx/Rx Edit Switch	00h - 01h	OFF, ON
00 00 00 08	Tx/Rx Program Change Switch	00h - 02h	OFF, PC, BANK SEL + PC
00 00 00 09	---	---	---
00 00 00 0A	Master Tune	00h - 64h	427.5 - 452.9 [Hz]
00 00 00 0B	Pattern Trigger Quantize	00h - 02h	OFF, BEAT, MEASURE
00 00 00 0C	Motion Restart	00h - 01h	OFF, ON
00 00 00 0D	Motion Set	00h - 01h	SET A, SET B
00 00 00 0E	Gate Time Ratio	00h - 05h	REAL, STACCATO, 33%, 50%, 66%, 100%
00 00 00 0F	Input Quantize	00h - 06h	OFF, 1/16(3), 1/16, 1/8(3), ..., 1/4
00 00 00 10	Pattern Metronome	00h - 08h	Beep VOL4 - 1, OFF, Click VOL1 - 4
00 00 00 11	Motion Metronome	00h - 08h	Beep VOL4 - 1, OFF, Click VOL1 - 4
00 00 00 12	---	---	---
00 00 00 13	---	---	---
00 00 00 14	---	---	---
00 00 00 15	---	---	---
00 00 00 16	---	---	---
00 00 00 17	Performance Group No.	00h - 3Fh	Group 1..64 (*)
00 00 00 18	Remote Keyboard Channel	00h - 10h	1 - 16, ALL

(*) The range of Performance Group numbers will be as follows depending on the Performance Bank value.

Perf. Bank	Perf Group No.
01H: USER	00H only
02H: PRESET	00H - 02H
03H: CARD (S2M-5)	00H - 1FH
(S4M-5)	00H - 3FH

4-1-2. Motion Setup

size = 04H (4 byte)

Offset Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00	Motion Control A1 Loop length	00h - 08h	PLAY ONCE, 1 - 8 [measure]
00 00 00 01	Motion Control A2 Loop length	00h - 08h	PLAY ONCE, 1 - 8 [measure]
00 00 00 02	Motion Control B1 Loop length	00h - 08h	PLAY ONCE, 1 - 8 [measure]
00 00 00 03	Motion Control B2 Loop length	00h - 08h	PLAY ONCE, 1 - 8 [measure]

4-1-3. Tx/Rx Setting

size = 2AH (42 byte)

Offset	Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00		Tx/Rx Setting (LFO1 Rate)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 01		Tx/Rx Setting (LFO1 Fade)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 02		Tx/Rx Setting (LFO2 Rate)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 03		Tx/Rx Setting (Cross Modulation Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 04		Tx/Rx Setting (Oscillator Balance)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 05		Tx/Rx Setting (OSC LFO1 Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 06		Tx/Rx Setting (Pitch LFO2 Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 07		Tx/Rx Setting (Pitch Env. Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 08		Tx/Rx Setting (Pitch Env. Attack Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 09		Tx/Rx Setting (Pitch Env. Decay Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 0A		Tx/Rx Setting (OSC1 Controll1)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 0B		Tx/Rx Setting (OSC1 Controll2)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 0C		Tx/Rx Setting (OSC2 Range)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 0D		Tx/Rx Setting (OSC2 Fine Tune)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 0E		Tx/Rx Setting (OSC2 Controll1)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 0F		Tx/Rx Setting (OSC2 Controll2)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 10		Tx/Rx Setting (Cutoff Frequency)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 11		Tx/Rx Setting (Resonance)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 12		Tx/Rx Setting (Cutoff Key Follow)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 13		Tx/Rx Setting (Filter LFO1 Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 14		Tx/Rx Setting (Filter LFO2 Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 15		Tx/Rx Setting (Filter Env Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 16		Tx/Rx Setting (Filter Env Attack Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 17		Tx/Rx Setting (Filter Env Decay Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 18		Tx/Rx Setting (Filter Env Sus. Level)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 19		Tx/Rx Setting (Filter Env Rel. Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 1A		Tx/Rx Setting (Amplifier Level)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 1B		Tx/Rx Setting (Amplifier LFO1 Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 1C		Tx/Rx Setting (Amplifier LFO2 Depth)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 1D		Tx/Rx Setting (Amp. Env. Attack Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 1E		Tx/Rx Setting (Amp. Env. Decay Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 1F		Tx/Rx Setting (Amp. Env. Sus. Level)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 20		Tx/Rx Setting (Amp. Env. Release Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 21		Tx/Rx Setting (Tone Control Bass)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 22		Tx/Rx Setting (Tone Control Treble)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 23		Tx/Rx Setting (Multi Effects Level)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 24		Tx/Rx Setting (Delay Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 25		Tx/Rx Setting (Delay Feedback)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 26		Tx/Rx Setting (Delay Level)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 27		Tx/Rx Setting (Portamento Time)	00h - 60h	OFF, CC#1-31, AFTER, CC#33-95, SYSEX
00 00 00 28		Tx/Rx Setting (Morph Control Up)	00h - 5Fh	OFF, CC#1-31, AFTER, CC#33-95
00 00 00 29		Tx/Rx Setting (Morph Control Down)	00h - 5Fh	OFF, CC#1-31, AFTER, CC#33-95

4-2. Performance

Offset	Address	Description
00 00 00 00		Performance Common
00 00 08 00		Voice Modulator
00 00 10 00		Part (Upper)
00 00 11 00		Part (Lower)
00 00 40 00		Patch (Upper)
00 00 42 00		Patch (Lower)

4-2-1. Performance Common

size = 25h (37 byte)

Offset	Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00		Performance Name 1	20h - 7Dh	ASCII Code
00 00 00 01		Performance Name 2	20h - 7Dh	ASCII Code
00 00 00 02		Performance Name 3	20h - 7Dh	ASCII Code
00 00 00 03		Performance Name 4	20h - 7Dh	ASCII Code
00 00 00 04		Performance Name 5	20h - 7Dh	ASCII Code
00 00 00 05		Performance Name 6	20h - 7Dh	ASCII Code
00 00 00 06		Performance Name 7	20h - 7Dh	ASCII Code
00 00 00 07		Performance Name 8	20h - 7Dh	ASCII Code
00 00 00 08		Performance Name 9	20h - 7Dh	ASCII Code
00 00 00 09		Performance Name 10	20h - 7Dh	ASCII Code
00 00 00 0A		Performance Name 11	20h - 7Dh	ASCII Code
00 00 00 0B		Performance Name 12	20h - 7Dh	ASCII Code
00 00 00 0C		Performance Name 13	20h - 7Dh	ASCII Code
00 00 00 0D		Performance Name 14	20h - 7Dh	ASCII Code
00 00 00 0E		Performance Name 15	20h - 7Dh	ASCII Code
00 00 00 0F		Performance Name 16	20h - 7Dh	ASCII Code
00 00 00 10		Key Mode	00h - 02h	SINGLE, DUAL, SPLIT
00 00 00 11		Split Point	00h - 7Fh	C-1 ~ G9 (only in SPLIT mode)
00 00 00 12		Panel Select	00h - 02h	UPPER, LOWER, UPPER&LOWER
00 00 00 13		Part Detune	00h - 64h	-50 ~ +50
00 00 00 14		Output Assign	00h - 01h	MIX OUT, PARALLEL OUT
00 00 00 15		Arpeggio Destination	00h - 02h	LOWER&UPPER, LOWER, UPPER (*)
00 00 00 16		Voice Assign	00h - 06h	8-2, 7-3, 5-5, 3-7, 2-8, 6-4, 4-6 (**)
00 00 00 17		Arpeggio Switch	00h - 01h	OFF, ON
00 00 00 18		Arpeggio Mode	00h - 04h	UP, DOWN, UP&DOWN, RANDOM, RPS
00 00 00 19		Arpeggio Beat Pattern	00h - 59h	1/4, 1/6, ... SEQUENCE-A1, ..., RANDOM
00 00 00 1A		Arpeggio Octave Range	00h - 03h	1 ~ 4 [octave]
00 00 00 1B		Arpeggio Hold	00h - 01h	OFF, ON
00 00 00 1C			-	-
00 00 00 1D		Individual Trigger Switch	00h - 01h	OFF, ON
00 00 00 1E		Individual Trigger Destination	00h - 02h	FILTER ENV, AMPLITUDE ENV, FILTER&
00 00 00 1F		Individual Trigger Source Channel	00h - 0Fh	1 ~ 16
#00 00 00 20		Individual Trigger Source Note	00h - 80h	0 ~ 127 as C-1 ~ G9, and 128 as ALL
#00 00 00 22		Tempo	14h - FAh	20 ~ 250 [beat per minute]
00 00 00 24		Vocal/Upper Input Jack Front/Rear	00h - 01h	REAR, FRONT

(*) "Arpeggio Destination" parameter is effective only when "Key Mode" parameter is DUAL.

(**) "Voice Assign" parameter is effective only when "Key Mode" parameter is DUAL or SPLIT.

4-2-2. Voice Modulator

size = 29h (41 byte)

Offset	Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00		Voice Modulator Switch	00h - 01h	OFF, ON
00 00 00 01		Voice Modulator Panel Mode	00h - 01h	OFF, ON
00 00 00 02		Algorithm	00h - 04h	SOLID, SMOOTH, ..., FILTER BANK NARROW
00 00 00 03		Voice Modulator Delay Type	00h - 04h	PANNING L->R - MONO LONG
00 00 00 04		Ensemble Type	00h - 0Eh	ENSEMBLE MILD, ..., FREEZE PHASE 2
00 00 00 05		External to Inst Send Switch	00h - 01h	OFF, ON
00 00 00 06		External to Vocal Send Switch	00h - 01h	OFF, ON
00 00 00 07		Vocal Morph Control Switch	00h - 01h	OFF, ON
00 00 00 08		Vocal Morph Threshold	00h - 7Fh	0 - 127
00 00 00 09		Vocal Morph Sensitivity	00h - 7Fh	-64 - +63
00 00 00 0A		Control 1 Assign	00h - 1Ah	ENSEMBLE LEVEL - CHARACTER 12
00 00 00 0B		Control 2 Assign	00h - 1Ah	ENSEMBLE LEVEL - CHARACTER 12
00 00 00 0C		Character 1	00h - 7Fh	0 - 127
00 00 00 0D		Character 2	00h - 7Fh	0 - 127
00 00 00 0E		Character 3	00h - 7Fh	0 - 127
00 00 00 0F		Character 4	00h - 7Fh	0 - 127
00 00 00 10		Character 5	00h - 7Fh	0 - 127
00 00 00 11		Character 6	00h - 7Fh	0 - 127
00 00 00 12		Character 7	00h - 7Fh	0 - 127
00 00 00 13		Character 8	00h - 7Fh	0 - 127
00 00 00 14		Character 9	00h - 7Fh	0 - 127
00 00 00 15		Character 10	00h - 7Fh	0 - 127
00 00 00 16		Character 11	00h - 7Fh	0 - 127
00 00 00 17		Character 12	00h - 7Fh	0 - 127
00 00 00 18		Vocal Mix	00h - 7Fh	0 - 127
00 00 00 19		Voice Modulator Release	00h - 7Fh	0 - 127
00 00 00 1A		Voice Modulator Resonance	00h - 7Fh	0 - 127
00 00 00 1B		Voice Modulator Pan	00h - 7Fh	L64 - R63
00 00 00 1C		Voice Modulator Level	00h - 7Fh	0 - 127
00 00 00 1D		Voice Modulator Noise Cutoff	00h - 7Fh	0 - 127
00 00 00 1E		Voice Modulator Noise Level	00h - 7Fh	0 - 127
00 00 00 1F		Gate Threshold	00h - 7Fh	0 - 127
00 00 00 20		Robot Pitch	00h - 7Fh	0 - 127
00 00 00 21		Robot Control	00h - 7Fh	0 - 127
00 00 00 22		Robot Level	00h - 7Fh	0 - 127
00 00 00 23		Ensemble Level	00h - 7Fh	0 - 127
00 00 00 24		Voice Modulator Delay Time	00h - 7Fh	0 - 127
00 00 00 25		Voice Modulator Delay Feedback	00h - 7Fh	0 - 127
00 00 00 26		Voice Modulator Delay Level	00h - 7Fh	0 - 127
00 00 00 27		Ensemble Sync	00h - 16h	OFF, 1/16, 1/8(3), ..., 8MEASURES
00 00 00 28		Voice Modulator Delay Sync	00h - 0Ah	OFF, 1/16, 1/8(3), ..., 1/2

4-2-3. Part

size = 08h (8 byte)

Offset	Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00		Patch Bank	00h - 03h	IN PERFORMANCE, USER, PRESET, CARD (*)
00 00 00 01		Patch No.	00h - 7Fh	All - B88 (*)
00 00 00 02		MIDI Channel	00h - 10h	1 - 16, OFF
00 00 00 03		Part Transpose	00h - 30h	-24 - + 24 [semitone]
00 00 00 04		Delay Sync	00h - 0Ah	OFF, 1/16, 1/8(3), ..., 1/2
00 00 00 05		LFO Sync	00h - 16h	OFF, 1/16, 1/8(3), ..., 8 MEAS
00 00 00 06		Chorus Sync	00h - 17h	OFF, 1/16, 1/8(3), ..., 8 MEAS, LFO1
00 00 00 07		Patch Group No.	00h - 3Fh	Group 1 - Group 64 (**)

(*) Patch No. is valid only when Patch Bank is other than IN PERFORMANCE.

(**) The range of Patch Group numbers will depend on the Patch Bank value, as follows.

Patch Bank	Patch Group No.
00H: IN PERFORMANCE	invalid
01H: USER	00H only
02H: PRESET	00H - 02H
03H: CARD (S2M-5)	00H - 1FH
(S4M-5)	00H - 3FH

4-3. Patch

size = 01h 78h (248 byte)

Offset	Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00 00 00 00		Patch Name 1	20h - 7Dh	ASCII Code
00 00 00 01		Patch Name 2	20h - 7Dh	ASCII Code
00 00 00 02		Patch Name 3	20h - 7Dh	ASCII Code
00 00 00 03		Patch Name 4	20h - 7Dh	ASCII Code
00 00 00 04		Patch Name 5	20h - 7Dh	ASCII Code
00 00 00 05		Patch Name 6	20h - 7Dh	ASCII Code
00 00 00 06		Patch Name 7	20h - 7Dh	ASCII Code
00 00 00 07		Patch Name 8	20h - 7Dh	ASCII Code
00 00 00 08		Patch Name 9	20h - 7Dh	ASCII Code
00 00 00 09		Patch Name 10	20h - 7Dh	ASCII Code
00 00 00 0A		Patch Name 11	20h - 7Dh	ASCII Code
00 00 00 0B		Patch Name 12	20h - 7Dh	ASCII Code
00 00 00 0C		Patch Name 13	20h - 7Dh	ASCII Code
00 00 00 0D		Patch Name 14	20h - 7Dh	ASCII Code
00 00 00 0E		Patch Name 15	20h - 7Dh	ASCII Code
00 00 00 0F		Patch Name 16	20h - 7Dh	ASCII Code
00 00 00 10		LF01 Waveform	00h - 03h	TRI, SAW, SQR, S/H
00 00 00 11		LF01 Rate	00h - 7Fh	0 - 127
00 00 00 12		LF01 Fade	00h - 7Fh	0 - 127
00 00 00 13		LF02 Rate	00h - 7Fh	0 - 127
00 00 00 14		LF02 Depth Select	00h - 02h	PITCH, FILTER, AMPLIFIER
00 00 00 15		Ring Modulator Switch	00h - 01h	OFF, ON
00 00 00 16		Cross Modulation Depth	00h - 7Fh	0 - 127
00 00 00 17		Oscillator Balance	00h - 7Fh	-64(OSC1) - +63(OSC2)
00 00 00 18		LF01 & Envelope Destination	00h - 02h	OSC1+2, OSC2, X-MOD DEPTH
00 00 00 19		OSC LF01 Depth	00h - 7Fh	-64 - +63
00 00 00 1A		Pitch LF02 Depth	00h - 7Fh	-64 - +63
00 00 00 1B		Pitch Envelope Depth	00h - 7Fh	-64 - +63
00 00 00 1C		Pitch Envelope Attack Time	00h - 7Fh	0 - 127
00 00 00 1D		Pitch Envelope Decay Time	00h - 7Fh	0 - 127
00 00 00 1E		OSC1 Waveform	00h - 06h	SUPER SAW, TWM, ..., PULSE, SAW, TRI
00 00 00 1F		OSC1 Control1	00h - 7Fh	0 - 127
00 00 00 20		OSC1 Control2	00h - 7Fh	0 - 127
00 00 00 21		OSC2 Waveform	00h - 03h	PULSE, TRI, SAW, NOISE (*)
00 00 00 22		OSC2 Sync Switch	00h - 01h	OFF, ON
00 00 00 23		OSC2 Range	00h - 32h	-WIDE, -24 - +24, +WIDE
00 00 00 24		OSC2 Fine/Wide	00h - 64h	-50 - +50 [cent]
00 00 00 25		OSC2 Control1	00h - 7Fh	0 - 127
00 00 00 26		OSC2 Control2	00h - 7Fh	0 - 127
00 00 00 27		Filter Type	00h - 02h	HFPF, BPF, LPF
00 00 00 28		Cutoff Slope	00h - 01h	-12, -24 [dB/oct]
00 00 00 29		Cutoff Frequency	00h - 7Fh	0 - 127
00 00 00 2A		Resonance	00h - 7Fh	0 - 127
00 00 00 2B		Cutoff Frequency Key Follow	00h - 7Fh	-64 - +63
00 00 00 2C		Filter LF01 Depth	00h - 7Fh	-64 - +63
00 00 00 2D		Filter LF02 Depth	00h - 7Fh	-64 - +63
00 00 00 2E		Filter Envelope Depth	00h - 7Fh	-64 - +63
00 00 00 2F		Filter Envelope Attack Time	00h - 7Fh	0 - 127
00 00 00 30		Filter Envelope Decay Time	00h - 7Fh	0 - 127
00 00 00 31		Filter Envelope Sustain Level	00h - 7Fh	0 - 127
00 00 00 32		Filter Envelope Release Time	00h - 7Fh	0 - 127
00 00 00 33		Amp Level	00h - 7Fh	0 - 127
00 00 00 34		Amp LF01 Depth	00h - 7Fh	-64 - +63 (**)
00 00 00 35		Amp LF02 Depth	00h - 7Fh	-64 - +63
00 00 00 36		Amp Envelope Attack Time	00h - 7Fh	0 - 127
00 00 00 37		Amp Envelope Decay Time	00h - 7Fh	0 - 127
00 00 00 38		Amp Envelope Sustain Level	00h - 7Fh	0 - 127
00 00 00 39		Amp Envelope Release Time	00h - 7Fh	0 - 127
00 00 00 3A		Auto Pan/Manual Pan Switch	00h - 02h	OFF, AUTO PAN, MANUAL PAN (**)
00 00 00 3B		Tone Control Bass	00h - 7Fh	-64 - +63
00 00 00 3C		Tone Control Treble	00h - 7Fh	-64 - +63
00 00 00 3D		Multi Effects Type	00h - 0Ch	SUPER CHORUS SLW, ..., DISTORTION
00 00 00 3E		Multi Effects Level	00h - 7Fh	0 - 127
00 00 00 3F		Delay Type	00h - 04h	PANNING L->R, ..., MONO LONG
00 00 00 40		Delay Time	00h - 7Fh	0 - 127
00 00 00 41		Delay Feedback	00h - 7Fh	0 - 127
00 00 00 42		Delay Level	00h - 7Fh	0 - 127
00 00 00 43		Bend Range Up	00h - 18h	0 - 24 [semitone]
00 00 00 44		Bend Range Down	00h - 18h	0 - 24 [semitone]
00 00 00 45		Portamento Switch	00h - 01h	OFF, ON
00 00 00 46		Portamento Time	00h - 7Fh	0 - 127
00 00 00 47		Mono Switch	00h - 01h	OFF, ON
00 00 00 48		Legato Switch	00h - 01h	OFF, ON
00 00 00 49		Oscillator Shift	00h - 04h	-2 - +2 [octave]
#00 00 00 4A		Control: LF01 Rate	00h - FEh	-127 - +127
#00 00 00 4C		Control: LF01 Fade	00h - FEh	-127 - +127
#00 00 00 4E		Control: LF02 Rate	00h - FEh	-127 - +127
#00 00 00 50		Control: Cross Modulation Depth	00h - FEh	-127 - +127
#00 00 00 52		Control: Oscillator Balance	00h - FEh	-127 - +127
#00 00 00 54		Control: Pitch LF01 Depth	00h - FEh	-127 - +127
#00 00 00 56		Control: Pitch LF02 Depth	00h - FEh	-127 - +127
#00 00 00 58		Control: Pitch Envelope Depth	00h - FEh	-127 - +127
#00 00 00 5A		Control: Pitch Envelope Attack Time	00h - FEh	-127 - +127
#00 00 00 5C		Control: Pitch Envelope Decay Time	00h - FEh	-127 - +127
#00 00 00 5E		Control: OSC1 Control1	00h - FEh	-127 - +127
#00 00 00 60		Control: OSC1 Control2	00h - FEh	-127 - +127
#00 00 00 62		Control: OSC2 Range	4Dh - B1h	- 50 - + 50
#00 00 00 64		Control: OSC2 Fine/Wide	1Bh - E3h	-100 - +100
#00 00 00 66		Control: OSC2 Control1	00h - FEh	-127 - +127
#00 00 00 68		Control: OSC2 Control2	00h - FEh	-127 - +127
#00 00 00 6A		Control: Cutoff Frequency	00h - FEh	-127 - +127
#00 00 00 6C		Control: Resonance	00h - FEh	-127 - +127
#00 00 00 6E		Control: Cutoff Freq. Key Follow	00h - FEh	-127 - +127
#00 00 00 70		Control: Filter LF01 Depth	00h - FEh	-127 - +127
#00 00 00 72		Control: Filter LF02 Depth	00h - FEh	-127 - +127
#00 00 00 74		Control: Filter Env. Depth	00h - FEh	-127 - +127
#00 00 00 76		Control: Filter Env. Attack Time	00h - FEh	-127 - +127
#00 00 00 78		Control: Filter Env. Decay Time	00h - FEh	-127 - +127
#00 00 00 7A		Control: Filter Env. Sustain Level	00h - FEh	-127 - +127
#00 00 00 7C		Control: Filter Env. Release Time	00h - FEh	-127 - +127
#00 00 00 7E		Control: Amp Level	00h - FEh	-127 - +127
#00 00 01 00		Control: Amp LF01 Depth	00h - FEh	-127 - +127
#00 00 01 02		Control: Amp LF02 Depth	00h - FEh	-127 - +127
#00 00 01 04		Control: Amp Env. Attack Time	00h - FEh	-127 - +127
#00 00 01 06		Control: Amp Env. Decay Time	00h - FEh	-127 - +127
#00 00 01 08		Control: Amp Env. Sustain Level	00h - FEh	-127 - +127
#00 00 01 0A		Control: Amp Env. Release Time	00h - FEh	-127 - +127
#00 00 01 0C		Control: Tone Control Bass	00h - FEh	-127 - +127
#00 00 01 0E		Control: Tone Control Treble	00h - FEh	-127 - +127
#00 00 01 10		Control: Multi Effects Level	00h - FEh	-127 - +127
#00 00 01 12		Control: Delay Time	00h - FEh	-127 - +127
#00 00 01 14		Control: Delay Feedback	00h - FEh	-127 - +127
#00 00 01 16		Control: Delay Level	00h - FEh	-127 - +127
00 00 01 18		Morph Bend Assign	00h - 01h	OFF, ON
#00 00 01 19		Control: Portamento Time	00h - FEh	-127 - +127

00 00 01 1B	Velocity Switch	00h - 01h	OFF, ON
#00 00 01 1C	Velocity: LFO1 Rate	00h - FEh	-127 - +127
#00 00 01 1E	Velocity: LFO1 Fade	00h - FEh	-127 - +127
#00 00 01 20	Velocity: LFO2 Rate	00h - FEh	-127 - +127
#00 00 01 22	Velocity: Cross Modulation Depth	00h - FEh	-127 - +127
#00 00 01 24	Velocity: Oscillator Balance	00h - FEh	-127 - +127
#00 00 01 26	Velocity: Pitch LFO1 Depth	00h - FEh	-127 - +127
#00 00 01 28	Velocity: Pitch LFO2 Depth	00h - FEh	-127 - +127
#00 00 01 2A	Velocity: Pitch Envelope Depth	00h - FEh	-127 - +127
#00 00 01 2C	Velocity: Pitch Envelope Attack Time	00h - FEh	-127 - +127
#00 00 01 2E	Velocity: Pitch Envelope Decay Time	00h - FEh	-127 - +127
#00 00 01 30	Velocity: OSC1 Control1	00h - FEh	-127 - +127
#00 00 01 32	Velocity: OSC1 Control2	00h - FEh	-127 - +127
#00 00 01 34	Velocity: OSC2 Range	4Dh - B1h	-50 - +50
#00 00 01 36	Velocity: OSC2 Fine/Wide	1Bh - E3h	-100 - +100
#00 00 01 38	Velocity: OSC2 Control1	00h - FEh	-127 - +127
#00 00 01 3A	Velocity: OSC2 Control2	00h - FEh	-127 - +127
#00 00 01 3C	Velocity: Cutoff Frequency	00h - FEh	-127 - +127
#00 00 01 3E	Velocity: Resonance	00h - FEh	-127 - +127
#00 00 01 40	Velocity: Cutoff Freq. Key Follow	00h - FEh	-127 - +127
#00 00 01 42	Velocity: Filter LFO1 Depth	00h - FEh	-127 - +127
#00 00 01 44	Velocity: Filter LFO2 Depth	00h - FEh	-127 - +127
#00 00 01 46	Velocity: Filter Env. Depth	00h - FEh	-127 - +127
#00 00 01 48	Velocity: Filter Env. Attack Time	00h - FEh	-127 - +127
#00 00 01 4A	Velocity: Filter Env. Decay Time	00h - FEh	-127 - +127
#00 00 01 4C	Velocity: Filter Env. Sus. Level	00h - FEh	-127 - +127
#00 00 01 4E	Velocity: Filter Env. Release Time	00h - FEh	-127 - +127
#00 00 01 50	Velocity: Amp Level	00h - FEh	-127 - +127
#00 00 01 52	Velocity: Amp LFO1 Depth	00h - FEh	-127 - +127
#00 00 01 54	Velocity: Amp LFO2 Depth	00h - FEh	-127 - +127
#00 00 01 56	Velocity: Amp Env. Attack Time	00h - FEh	-127 - +127
#00 00 01 58	Velocity: Amp Env. Decay Time	00h - FEh	-127 - +127
#00 00 01 5A	Velocity: Amp Env. Sustain Level	00h - FEh	-127 - +127
#00 00 01 5C	Velocity: Amp Env. Release Time	00h - FEh	-127 - +127
#00 00 01 5E	Velocity: Tone Control Bass	00h - FEh	-127 - +127
#00 00 01 60	Velocity: Tone Control Treble	00h - FEh	-127 - +127
#00 00 01 62	Velocity: Multi Effects Level	00h - FEh	-127 - +127
#00 00 01 64	Velocity: Delay Time	00h - FEh	-127 - +127
#00 00 01 66	Velocity: Delay Feedback	00h - FEh	-127 - +127
#00 00 01 68	Velocity: Delay Level	00h - FEh	-127 - +127
#00 00 01 6A	Velocity: Portamento Time	00h - FEh	-127 - +127
00 00 01 6C	Active Indicator of Bender	00h - 01h	NOT ACTIVE, ACTIVE (***)
00 00 01 6D	Active Indicator of Velocity Assign	00h - 01h	NOT ACTIVE, ACTIVE (***)
00 00 01 6E	Active Indicator of Control Assign	00h - 01h	NOT ACTIVE, ACTIVE (***)
00 00 01 6F	Envelope Type in Solo	00h - 01h	STANDARD, ANALOG
00 00 01 70	(reserved)	(reserved)	(reserved)
00 00 01 71	OSC2 External Input Switch	00h - 01h	OFF, ON (*)
00 00 01 72	Voice Modulator Send Switch	00h - 01h	OFF, ON
00 00 01 73	Unison Switch	00h - 01h	OFF, ON
00 00 01 74	Unison Detune	00h - 32h	0 - 50 [cent]
00 00 01 75	Patch Gain	00h - 02h	0dB, +6dB, +12dB
00 00 01 76	External Trigger Switch	00h - 01h	OFF, ON
00 00 01 77	External Trigger Destination	00h - 02h	FILTER, AMP, FILTER&

(*) OSC2 Waveform is invalid when OSC2 External Input Switch is ON.

(**) Amp LFO1 Depth will be handled as Pan LFO Depth if Auto Pan/Manual Pan Switch is set to AUTO PAN. Amp LFO1 Depth will be handled as Pan if Auto Pan/Manual Pan is set to MANUAL PAN.

(***) " Active Indicator of Bender ", " Active Indicator of Velocity Assign ", and " Active Indicator of Control Assign " messages can be transmitted, but can not be received.

4-4. User Patch Area

Offset	Address	Description
00 00 00 00	User Patch 1 (A11)	4-3
00 00 02 00	User Patch 2 (A12)	4-3
00 00 04 00	User Patch 3 (A13)	4-3
00 00 06 00	User Patch 4 (A14)	4-3
:	:	:
00 00 7C 00	User Patch 63 (A87)	4-3
00 00 7E 00	User Patch 64 (A88)	4-3
00 01 00 00	User Patch 65 (B11)	4-3
00 01 02 00	User Patch 66 (B12)	4-3
:	:	:
00 01 7C 00	User Patch 127 (B87)	4-3
00 01 7E 00	User Patch 128 (B88)	4-3

4-5. User Performance Area

Offset	Address	Description
00 00 00 00	User Performance 1 (11)	4-2
00 01 00 00	User Performance 2 (12)	4-2
00 02 00 00	User Performance 3 (13)	4-2
00 03 00 00	User Performance 4 (14)	4-2
:	:	:
00 3D 00 00	User Performance 62 (86)	4-2
00 3E 00 00	User Performance 63 (87)	4-2
00 3F 00 00	User Performance 64 (88)	4-2

4-6. Motion Control Data

Offset	Address	Description
00 00 00 00	Motion Control 1 Data	
00 40 00 00	Motion Control 2 Data	

Address block map

00 00 00 00	+-----+ System Area +-----+ refer to 4-1	00 00 00 00 00 00 20 00 00 00 30 00	+-----+ System refer to 4-1-1 +-----+ Motion Setup refer to 4-1-2 +-----+ Tx/Rx Setting refer to 4-1-3 +-----+	
01 00 00 00	+-----+ Perf. Temporary +-----+ refer to 4-2	00 00 00 00 00 00 08 00 00 00 10 00 00 00 11 00 00 00 40 00 00 00 42 00	+-----+ Perf. Common refer to 4-2-1 +-----+ Voice Modulator refer to 4-2-2 +-----+ Part (upper) refer to 4-2-3 +-----+ Part (lower) refer to 4-2-3 +-----+ Patch (upper) refer to 4-3 +-----+ Patch (lower) refer to 4-3 +-----+	
02 00 00 00	+-----+ User Patch +-----+ refer to 4-4	00 00 00 00 00 00 02 00 00 00 04 00 : 00 01 7E 00	+-----+ Patch U:A11 refer to 4-3 +-----+ Patch U:A12 refer to 4-3 +-----+ : +-----+ Patch U:B88 refer to 4-3 +-----+	
03 00 00 00	+-----+ User Perf. +-----+ refer to 4-5	00 00 00 00 00 01 00 00 00 02 00 00 00 03 00 00 : 00 3F 00 00	+-----+ Perf. U:11 00 00 00 00 +-----+ Perf. U:12 00 00 08 00 +-----+ Perf. U:13 00 00 10 00 +-----+ : +-----+ Perf. U:88 00 00 40 00 +-----+ 00 00 42 00	+-----+ Perf. Common refer to 4-2-1 +-----+ Voice Modulator refer to 4-2-2 +-----+ Part (upper) refer to 4-2-3 +-----+ Part (lower) refer to 4-2-3 +-----+ Patch (upper) refer to 4-3 +-----+ Patch (lower) refer to 4-3 +-----+
09 00 00 00	+-----+ Motion Data +-----+ refer to 4-6	00 00 00 00 00 40 00 00	+-----+ Motion Ctrl A +-----+ Motion Ctrl B +-----+	

5. Supplementary material

● Decimal/Hexadecimal table

(hexadecimal values are indicated by a following “H”)

MIDI uses 7-bit hexadecimal values to indicate data values and the address and size of exclusive messages. The following table shows the correspondence between decimal and hexadecimal 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 expressions such as used for MIDI channel, Bank Select, and Program Change will be the value 1 greater than the decimal value given in the above table.
- * Since each MIDI byte carries 7 significant data bits, each byte can express a maximum of 128 different values. Data for which higher resolution is required must be transmitted using two or more bytes. For example a value indicated as a two-byte value of aa bbH would have a value of $aa \times 128 + bb$.

<Example 1>

What is the decimal equivalent of 5AH?

From the above table, 5AH = 90.

<Example 2>

What is the decimal equivalent of the 7-bit hexadecimal values 12 34H?

From the above table, 12H = 18 and 34H = 52

Thus, $18 \times 128 + 52 = 2356$

○ Examples of actual MIDI messages

<Example 1> 92 3E 5F

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

<Example 2> CE 49

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

<Example 3> EA 00 28

EnH is the Pitch Bend Change status and 'n' is the MIDI channel number. The 2nd byte (00H=0) is the LSB of the Pitch Bend value, and the 3rd byte (28H=40) is the MSB. However since the Pitch Bend is a signed number with 0 at 40 00H (= $64 \times 128 + 0 = 8192$), the Pitch Bend value in this case is

$$28\ 00H - 40\ 00H = 40 \times 128 + 0 - (64 \times 128 + 0) = 5120 - 8192 = -3072$$

If we assume that the Pitch Bend Sensitivity is set to two semitones, the pitch will change only -200 cents for a Pitch Bend value of -8192 (00 00H). Thus, this message is specifying a Pitch Bend of $-200 \times (-3072) / (-8192) = -75$ cents on MIDI CH = 11.

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

BnH is the Control Change status, and 'n' is the MIDI channel number. In Control Change messages, the 2nd byte is the controller number, and the 3rd byte is the parameter value. MIDI allows what is known as “running status,” when if messages of the the same status follow each other, it is permitted to omit the second and following status bytes. In the message above, running status is being used, meaning that the message has the following content.

B3 64 00 MIDI CH = 4, RPN parameter number LSB: 00H
(B3) 65 00 MIDI CH = 4, RPN parameter number MSB: 00H
(B3) 06 0C MIDI CH = 4, parameter value MSB: 0CH
(B3) 26 00 MIDI CH = 4, parameter value LSB: 00H
(B3) 64 7F MIDI CH = 4, RPN parameter number LSB: 7FH
(B3) 65 7F MIDI CH = 4, RPN parameter number MSB: 7FH

Thus, this message transmits a parameter value of 0C 00H to RPN parameter number 00 00H on MIDI CH = 4, and then sets the RPN parameter number to 7F 7FH.

The function assigned to RPN parameter number 00 00H is Pitch Bend Sensitivity, and the MSB of the parameter value indicates semitone steps. Since the MSB of this parameter value is 0CH = 12, the maximum width of pitch bend is being set to ± 12 semitones (1 octave) (GS sound sources ignore the LSB of Pitch Bend Sensitivity, but it is best to transmit the LSB (parameter value 0) as well, so that the message can be correctly received by any device.

Once the parameter number has been set for RPN or NRPN, all subsequent Data Entry messages on that channel will be effective. Thus, it is recommended that after you have made the change you want, you set the parameter number to 7F 7FH (an 'unset' or 'null' setting). The final (B3) 64 7F (B3) 65 7F is for this purpose.

It is not a good idea to store many events within the data of a song (e.g., a Standard MIDI File song) using running status as shown in <Example 4>. When the song is paused, fast-forwarded or rewound, the sequencer may not be able to transmit the proper status, causing the sound source to misinterpret the data. It is best to attach the proper status byte to all events.

It is also important to transmit RPN or NRPN parameter number settings and parameter values in the correct order. In some sequencers, data events recorded in the same clock (or a nearby clock) can sometimes be transmitted in an order other than the order in which they were recorded. It is best to record such events at an appropriate interval (1 tick at TPQN=96, or 5 ticks at TPQN=480).

- * TPQN :Ticks Per Quarter Note (i.e., the time resolution of the sequencer)

○ Examples of exclusive messages and calculating the checksum

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

◇ How to calculate the checksum

(hexadecimal values are indicated by a 'H')

The checksum consists of a value whose lower 7 bits are 0 when the address, size and checksum itself are added.

The following formula shows how to calculate the checksum when the exclusive message to be transmitted has an address of aa bb cc ddH, and data or size of ee ffH.

$$\begin{aligned} &aa + bb + cc + dd + ee + ff = \text{total} \\ &\text{total} / 128 = \text{quotient} \dots \text{remainder} \\ &128 - \text{remainder} = \text{checksum} \end{aligned}$$

<Example 1>

Setting the Temporary Performance Upper Part Transpose to +5 (DT1).

The “Parameter address map” indicates that the starting address of the Temporary Performance is 01 00 00 00H, that Temporary Performance upper Part offset address is 10 00H, Part Transpose is 00 03H. Thus,the address is:

$$\begin{array}{r} 01\ 00\ 00\ 00H \\ \quad 10\ 00H \\ +) \quad 00\ 03H \\ \hline 01\ 00\ 10\ 03H \end{array}$$

Since +5 is parameter value 1DH,

F0	41	10	00 06	12	01 00 10 03	1D	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

- (1) Exclusive status (2) ID number (Roland) (3) device ID (17)
(4) model ID (JP-8080) (5) command ID (DT1) (6) EOX

Next we calculate the checksum.

$01H + 00H + 10H + 03H + 1DH = 1 + 0 + 16 + 3 + 29 = 49$ (sum)
 49 (total) $128 \div 0$ (quotient) ... 49 (remainder)
checksum = $128 - 49$ (quotient) = $79 = 4FH$

This means that the message transmitted will be F0 41 10 00 06 12 01 00 10 03 1D 4F F7 .

<Example 2>

Retrieving data for Patch of Performance USER: 13 Lower Part.

The "Parameter address map" indicates that the starting address of the User Performance is 03 00 00 00H, the start address of Performance USER:13 is 03 00 00 00H, and that the offset address of Performance Lower Patch is 00 00 42 00H. Thus, the address is:

```
03 00 00 00H
00 02 00 00H
+) 00 00 42 00H
-----
03 02 42 00H
```

Since the size of the Performance Patch is 00 00 01 78H,

F0	41	10	00 06	11	03 02 42 00	00 00 01 78	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

(1) Exclusive status (2) ID number (Roland) (3) device ID (17)
(4) model ID (JP-8080) (5) command ID (DT1) (6) EOX

Next we calculate the checksum.

$03H + 02H + 42H + 00H + 00H + 00H + 01H + 78H = 3 + 2 + 66 + 0 + 0 + 0 + 1 + 120 = 192$ (sum)
 192 (total) $\div 128 = 1$ (quotient) ... 64 (remainder)
checksum = $128 - 64$ (quotient) = $64 = 40H$

Thus, a message of F0 41 10 00 06 11 03 02 42 00 00 01 6D 40 F7 would be transmitted.

<Example 3> Retrieving data for Temporary Performance (RQ1)

The "Parameter address map" gives the following start addresses for Temporary Performance data.

01 00 00 00H Temporary Performance Common
01 00 08 00H Voice Modulator
01 00 10 00H Part (Upper)
01 00 11 00H Part (Lower)
01 00 40 00H Patch(Upper)
01 00 42 00H Patch(Lower)

Since Patch has a size of 00 00 01 78H, we add that size to the start address of the Temporary Patch Lower Part, resulting in:

```
01 00 42 00H
+) 00 00 01 78H
-----
01 00 43 78H
```

Thus, the Size for the retrieved data will be:

```
01 00 43 78H
-) 01 00 00 00H
-----
00 00 43 78H
```

F0	41	10	00 06	11	01 00 00 00	00 00 43 78	??	F7
(1)	(2)	(3)	(4)	(5)	address	size	checksum	(6)

(1) Exclusive status (2) ID number (Roland) (3) device ID (17)
(4) model ID (JP-8080) (5) command ID (RQ1) (6) EOX

Calculating the checksum as shown in <Example 2>, we get a message of F0 41 10 00 06 11 01 00 00 00 00 43 6FH 44 F7 to be transmitted.

● ASCII code table

Char	Hex.	Char	Hex.	Char	Hex.	Char	Hex.
SP	20H	a	61H	0	30H	:	3AH
A	41H	b	62H	1	31H	;	3BH
B	42H	c	63H	2	32H	<	3CH
C	43H	d	64H	3	33H	>	3DH
D	44H	e	65H	4	34H	=	3EH
E	45H	f	66H	5	35H	?	3FH
F	46H	g	67H	6	36H	@	40H
G	47H	h	68H	7	37H	[5BH
H	48H	i	69H	8	38H	\	5CH
I	49H	j	6AH	9	39H]	5DH
J	4AH	k	6BH	!	21H	^	5EH
K	4BH	l	6CH	"	22H	{	5FH
L	4CH	m	6DH	#	23H	~	60H
M	4DH	n	6EH	\$	24H	{	7BH
N	4EH	o	6FH	%	25H	}	7CH
O	4FH	p	70H	&	26H	}	7DH
P	50H	q	71H	'	27H		
Q	51H	r	72H	(28H		
R	52H	s	73H)	29H		
S	53H	t	74H	*	2AH		
T	54H	u	75H	+	2BH		
U	55H	v	76H	,	2CH		
V	56H	w	77H	-	2DH		
W	57H	x	78H	.	2EH		
X	58H	y	79H	/	2FH		
Y	59H	z	7AH				
Z	5AH						

Note: SP indicates "space".

MIDI Implementation Chart

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	
Mode	Default Messages Altered	Mode 3 x *****	Mode 3 Mode 3, 4 (M=1)	* 1
Note Number :	True Voice	0-127 *****	0-127 * 3 0-127 * 3	
Velocity	Note ON Note OFF	O O (8n, v=1-127)	O * 3 O	
After Touch	Key's Ch's	x O	x O * 2, * 4	
Pitch Bend		O	O	
Control Change	1-31, 33-95	O * 2	O * 2, * 4	See page 191, 194 Bank Select Modulation Portamento Time Volume Panpot Expression Hold 1 Portamento Portamento Control NRPN LSB, MSB RPN LSB, MSB
	0, 32	O * 2	x * 2	
	1	O	O	
	5	O	O * 4	
	7	O	O	
	10	O	O	
	11	O	O	
	64	O	O	
	65	O	O * 4	
	84	O	O	
	98, 99	x	x	
	100, 101	x	O	
Prog Change	: True #	O * 2 *****	O * 2 0-127	Program Number 1-128
System Exclusive		O	O * 2	
System Common	: Song Pos : Song Sel : Tune	x x x	O x x	
System Real Time	: Clock : Command : Start : Continue : Stop	x x x x x	O * 2 x O * 2 O * 2 O * 2	
Aux Message	: All sound off : Reset all controllers : Local ON/OFF : All Notes OFF : Active Sense : Reset	x x x x O x	O * 5 O x O (123-127) O x	
Notes		* 1 Recognized as M=1 even if M≠1. * 2 O x is selectable. * 3 RPS patterns can record these messages received from REMOTE KBD IN connector. * 4 Motions can record these messages received from REMOTE KBD IN connector. * 5 Only received from MIDI IN.		

Mode 1 : OMNI ON, POLY

Mode 2 : OMNI ON, MONO

O : Yes

Mode 3 : OMNI OFF, POLY

Mode 4 : OMNI OFF, MONO

X : No