SH-201 MIDI Implementation

Model: SH-201
Date: March 1, 2006
Version: 1.00

1. Receive data

■Channel Voice Messages

●Note off

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

●Note on

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

●Control Change

* If the corresponding Controller number is selected for the Patch Control Source 1, 2, 3, 4, 5, 6, 7 or 8 parameter (PATCH Edit Com Matrix Ctrl), the corresponding effect will occur.

❍Bank Select (Controller number 0, 32)

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

* Not received when the BANK SELECT RECEIVE SW (SYSTEM COMMON MIDI) is OFF.
* The Patches corresponding to each Bank Select are as follows.

BANK SELECT MSB	BANK SELECT LSB	PROGRAM NUMBER	PATCH NUMBER
087	000	001 - 032	PRESET A-1 - D-8
	020	001 - 032	USER A-1 - D-8

❍Volume (Controller number 7)

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

❍Panpot (Controller number 10)

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

❍Expression (Controller number 11)

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

❍Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Control value:		00H - 7FH (0 - 127) 0-63 = OFF, 64-127 = ON

❍Sostenuto (Controller number 66)

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

●Program Change

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

* Not received when the PROGRAM CHANGE RECEIVE SWITCH parameter (SYSTEM COMMON MIDI) is OFF.

●Pitch Bend Change

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

■Channel Mode Messages

* Not received in when the Receive Switch parameter (SYSTEM Com Part MIDI) is OFF.

●All Sounds Off (Controller number 120)

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

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

●Reset All Controllers (Controller number 121)

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

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

Controller	Reset value	
Pitch Bend Change	+/-0 (center)	
Modulation	0 (off)	
Expression	127 (max)	However the controller will be at minimum.
Hold 1	0 (off)	
Sostenuto	0 (off)	

●All Notes Off (Controller number 123)

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

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

●OMNI OFF (Controller number 124)

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

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

●OMNI ON (Controller number 125)

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

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

Copyright © 2006 ROLAND CORPORATION
No part of this publication may be reproduced in any form without the written permission of ROLAND CORPORATION.

■System Realtime Message

●Active Sensing

Status
FEH

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

■System Exclusive Message

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

F0H:	System Exclusive Message status
ii = ID number:	an ID number (manufacturer ID) to indicate the manufacturer whose Exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are extensions of the MIDI standard; Universal Non-realtime Messages (7EH) and Universal Realtime Messages (7FH).
dd,...,ee = data:	00H - 7FH (0 - 127)
F7H:	EOX (End Of Exclusive)

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

●Universal Non-realtime System Exclusive Messages

❍Identity Request Message

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

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

* When this message is received, Identity Reply message (p. 4) will be transmitted.

●Universal Realtime System Exclusive Messages

❍Master Volume

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

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

* The lower byte (llH) of Master Volume will be handled as 00H.
* The Master Level parameter (SYSTEM COMMON MASTER LEVEL) will change.

❍Master Fine Tuning

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

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

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

* The Master Tune parameter (SYSTEM COMMON MASTER TUNE) will change.

❍Master Coarse Tuning

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 04H, llH, mmH	F7

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

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

* The Master Key Shift parameter (SYSTEM COMMON MASTER KEY SHIFT) will change.

●Data Transmission

This instrument can use exclusive messages to exchange many varieties of internal settings with other devices.
The model ID of the exclusive messages used by this instrument is 00H 00H 16H.

❍Data Request 1 RQ1 (11H)

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

Status	data byte	status
F0H	41H, dev, 00H, 00H, 16H, 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 - 17H, 7FH)
00H	model ID #1 (SH-201)
00H	model ID #2 (SH-201)
16H	model ID #3 (SH-201)
11H	command ID (RQ1)
aaH	address MSB
bbH	address
ccH	address
ddH	address LSB
ssH	size MSB
ttH	size
uuH	size
vvH	size LSB
sum	checksum
F7H	EOX (End Of Exclusive)

* The size of data that can be transmitted at one time is fixed for each type of data. And data requests must be made with a fixed starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 4).
* For the checksum, refer to (p. 7).

❍Data set 1 DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 00H, 00H, 16H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H - 17H, 7FH)
00H	Model ID #1 (SH-201)
00H	Model ID #2 (SH-201)
16H	Model ID #3 (SH-201)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: upper middle byte of the starting address of the data to be sent
ccH	Address: lower middle byte of the starting address of the data to be sent
ddH	Address LSB: lower byte of the starting address of the data to be sent.
eeH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
ffH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 4).
* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.
* Regarding the checksum, please refer to (p. 7)

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

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 10H - 1FH, 7FH)
42H	Model ID (GS)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the transmitted data
bbH	Address: middle byte of the starting address of the transmitted data
ccH	Address LSB: lower byte of the starting address of the transmitted data
ddH	Data: the actual data to be transmitted. Multiple bytes of data are transmitted starting from the address.
:	:
eeH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 4).
* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.
* Regarding the checksum, please refer to (p. 7)

2. Data Transmission

■Channel Voice Messages

●Note off

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

●Note on

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

●Control Change

❍Bank Select (Controller number 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH
n = MIDI channel number:		0H - FH (ch.1 - 16)
mm, ll = Bank number:		87 00H - 87 20H (bank.17281, bank.17313)

* These messages are transmitted when Patch is selected. But not transmitted when PROGRAM CHANGE TRANSMIT SWITCH or BANK SELECT TRANSMIT SWITCH parameter (SYSTEM COMMON MIDI) is OFF.
* The Patches corresponding to each Bank Select are as follows.

BANK SELECT MSB	BANK SELECT LSB	PROGRAM NUMBER	PATCH NUMBER
087	000	001 - 032	PRESET A-1 - D-8
	020	001 - 032	USER A-1 - D-8

❍Modulation (Controller number 1)

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

❍Volume (Controller number 7)

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

❍Panpot (Controller number 10)

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

❍Expression (Controller number 11)

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

❍Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Control value:		00H - 7FH (0 - 127) 0-63 = OFF, 64-127 = ON

●Program Change

Status	2nd byte	
CnH	ppH	
n = MIDI channel number:		0H - FH (ch.1 - 16)
pp = Program number:		00H - 1FH (prog.1 - prog.32)

* These messages are transmitted when Patch is selected. But not transmitted when PROGRAM CHANGE TRANSMIT SWITCH parameter (SYSTEM COMMON MIDI) is OFF.

●Pitch Bend Change

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

■System Realtime Messages

●Active Sensing

Status
FEH

* This message is transmitted at intervals of approximately 250 msec.
* This message is not sent when ACTIVE SENSING TRANSMIT SWITCH parameter (SYSTEM COMMON MIDI) is OFF.

■System Exclusive Messages

Universal Non-realtime System Exclusive Message and Data Set 1 (DT1) are the only System Exclusive messages transmitted by the SH-201.

●Universal Non-realtime System Exclusive Message

❍Identity Reply Message

Receiving Identity Request Message, the SH-201 send this message.

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 16H, 02H, 00H, 00H, 00H, 03H, 00H, 00H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (dev: 10H - 1FH)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Reply)
41H	ID number (Roland)
16H 02H	Device family code
00H 00H	Device family number code
00H 03H 00H 00H	Software revision level
F7H	EOX (End of Exclusive)

●Data Transmission

❍Data set 1 DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 00H, 00H, 16H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H - 1FH, 7FH)
00H	Model ID #1 (SH-201)
00H	Model ID #2 (SH-201)
16H	Model ID #3 (SH-201)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: upper middle byte of the starting address of the data to be sent
ccH	Address: lower middle byte of the starting address of the data to be sent
ddH	Address LSB: lower byte of the starting address of the data to be sent.
eeH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
ffH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 4).
* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.

3. Parameter Address Map

* Transmission of "#" marked address is diviedd to some packets. For example, ABH in hexadecimal notation will be divied to 0AH and 0BH, and is sent/received in this order.

■SH-201 (ModelID = 00H 00H 16H)

Start Address	Description
01 00 00 00	System
10 00 00 00	Temporary Patch
20 00 00 00	User Patch (001)
20 01 00 00	User Patch (002)
:	
20 1F 00 00	User Patch (032)

❍System

Offset Address	Description
00 00 00	System Common

❍Temporary Patch

Offset Address	Description
00 00 00	Temporary Patch

❍Patch

Offset Address	Description
00 00 00	Patch Common
00 01 00	Patch Tone (1:Upper)
00 02 00	Patch Tone (2:Lower)
00 03 00	Patch Delay
00 04 00	Patch Reverb
00 05 00	Patch Arpeggio Common
00 06 00	Patch Arpeggio Pattern (Note 1)
00 07 00	Patch Arpeggio Pattern (Note 2)
:	
00 15 00	Patch Arpeggio Pattern (Note 16)

❍System Common

Offset Address		Description	
00 00	0aaa aaaa	Patch Bank Select MSB (CC# 0)	(0 – 127)
00 01	0aaa aaaa	Patch Bank Select LSB (CC# 32)	(0 – 127)
00 02	0aaa aaaa	Patch Program Number (PC)	(0 – 127)
00 03	0000 aaaa	Patch Rx/Tx Channel	(0 – 15) 1 – 16
00 04	0000 000a	Patch Remain	(0 – 1) OFF, ON
# 00 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Master Tune	(24 – 2024) –100.0 – 100.0 [cent]
00 09	00aa aaaa	Master Key Shift	(40 – 88) –24 – +24
00 0A	0aaa aaaa	Master Level	(0 – 127)
00 0B	0000 00aa	System Clock Source	(0 – 3) PATCH, SYSTEM, MIDI, USB
# 00 0C	0000 aaaa 0000 bbbb 0000 cccc	System Tempo	(5 – 300) 5 – 300 [BPM]
00 0F	0000 000a	Receive Program Change	(0 – 1) OFF, ON
00 10	0000 000a	Receive Bank Select	(0 – 1) OFF, ON
00 11	0000 000a	Transmit Edit Data	(0 – 1) OFF, ON
00 12	0000 000a	Soft Through	(0 – 1) OFF, ON
00 13	0000 000a	MIDI–USB Thru	(0 – 1) OFF, ON
00 14	0000 000a	Transmit Program Change	(0 – 1) OFF, ON
00 15	0000 000a	Transmit Bank Select	(0 – 1) OFF, ON
00 16	0000 000a	Transmit Active Sensing	(0 – 1) OFF, ON
00 17	0000 0aaa	Octave Shift	(61 – 67) –3 – +3
00 18	0000 aaaa	Transpose Value	(59 – 70) –5 – +6
00 19	0000 000a	Local Switch	(0 – 1) OFF, ON
00 1A	0000 000a	Remote Keyboard Switch	(0 – 1) OFF, ON
00 1B	0000 000a	Pedal Polarity	(0 – 1) STANDARD, REVERSE
00 1C	0000 0aaa	Pedal Assign	(0 – 7) HOLD, MODULATION, VOLUME, BALANCE, PAN, EXPRESSION, START/STOP, ARP–SW
00 1D	0000 aaaa	D Beam Sens	(1 – 8)
00 1E	0000 000a	Recorder Sync Output	(0 – 1) OFF, ON
00 1F	0000 0aaa	Recorder Metronome Mode	(0 – 3) OFF, REC–ONLY, REC&PLAY, ALWAYS
00 20	0000 0aaa	Recorder Metronome Level	(0 – 7)
00 00 00 21	Total Size		

❍Patch Common

	Offset Address		Description	
	00 00	0aaa aaaa	Patch Name 1	(32 – 127) 32 – 127 [ASCII]
	00 01	0aaa aaaa	Patch Name 2	(32 – 127) 32 – 127 [ASCII]
	00 02	0aaa aaaa	Patch Name 3	(32 – 127) 32 – 127 [ASCII]
	00 03	0aaa aaaa	Patch Name 4	(32 – 127) 32 – 127 [ASCII]
	00 04	0aaa aaaa	Patch Name 5	(32 – 127) 32 – 127 [ASCII]
	00 05	0aaa aaaa	Patch Name 6	(32 – 127) 32 – 127 [ASCII]
	00 06	0aaa aaaa	Patch Name 7	(32 – 127) 32 – 127 [ASCII]
	00 07	0aaa aaaa	Patch Name 8	(32 – 127) 32 – 127 [ASCII]
	00 08	0aaa aaaa	Patch Name 9	(32 – 127) 32 – 127 [ASCII]
	00 09	0aaa aaaa	Patch Name 10	(32 – 127) 32 – 127 [ASCII]
	00 0A	0aaa aaaa	Patch Name 11	(32 – 127) 32 – 127 [ASCII]
	00 0B	0aaa aaaa	Patch Name 12	(32 – 127) 32 – 127 [ASCII]
	00 0C	0aaa aaaa	Patch Level	(0 – 127)
	00 0D	0aaa aaaa	Tone Balance	(1 – 127) –63(LOWER) – +63(UPPER)
#	00 0E	0000 aaaa 0000 bbbb 0000 cccc	Patch Tempo	(5 – 300) 5 – 300 [BPM]
	00 11	0000 00aa	Keyboard Mode	(0 – 2) SINGLE, DUAL, SPLIT
	00 12	0000 000a	Keyboard Part (for Single Mode)	(0 – 1) UPPER, LOWER
	00 13	0aaa aaaa	Split Point	(21 – 108) A0 – C8
	00 14	0000 00aa	Split Arpeggio	(0 – 2) UPPER, LOWER, BOTH
	00 15	0000 00aa	Modulation Destination	(0 – 2) UPPER, LOWER, BOTH
	00 16	0000 00aa	D Beam Destination	(0 – 2) UPPER, LOWER, BOTH
	00 17	0000 00aa	Pitch Bend Destination	(0 – 2) UPPER, LOWER, BOTH
	00 18	0000 00aa	Expression Destination	(0 – 2) UPPER, LOWER, BOTH
	00 19	0000 000a	Active Expression Switch	(0 – 1) OFF, ON
	00 1A	0000 000a	Arpeggio Switch	(0 – 1) OFF, ON
	00 1B	0000 000a	Arpeggio Hold	(0 – 1) OFF, ON
	00 1C	0000 000a	Delay Switch	(0 – 1) OFF, ON
	00 1D	0000 000a	Reverb Switch	(0 – 1) OFF, ON
	00 1E	0000 aaaa	Modulation Assign	(0 – 7) OSC1&OSC2, OSC1, OSC2, PW1, PW2, FILTER, AMP, AUDIO–FILTER
	00 1F	00aa aaaa	D Beam Assign	(0 – 36) OSC1–PITCH, OSC1–DETUNE, OSC1–PW, OSC2–PITCH, OSC2–DETUNE, OSC2–PW, MIX/MOD–BALANCE, FILTER–CUTOFF, FILTER–RESONANCE, FILTER–CUTOFF–KEYFOLLOW, AMP–LEVEL, AUDIO–FILTER–CUTOFF, AUDIO–FILTER–RESONANCE, PITCH–ENV–A, PITCH–ENV–D, OSC1–PITCH–ENV–DEPTH, OSC2–PITCH–ENV–DEPTH, LFO1–RATE, LFO1–DEPTH1, LFO1–DEPTH2, LFO2–RATE, LFO2–DEPTH1, LFO2–DEPTH2, FILTER–ENV–A, FILTER–ENV–D, FILTER–ENV–S, FILTER–ENV–R, FILTER–ENV–DEPTH, AMP–ENV–A, AMP–ENV–D, AMP–ENV–S, AMP–ENV–R, EFFECTS–DELAY–TIME, EFFECTS–DELAY–DEPTH, EFFECTS–REVERB–TIME, EFFECTS–REVERB–DEPTH, BENDER
	00 20	0000 000a	D Beam Polarity	(0 – 1) NORMAL, REVERSE
	00 00 00 21		Total Size	

❍Patch Tone

Offset Address		Description	
00 00	0000 aaaa	OSC1 Waveform	(0 – 8) SAW, SQU, PW–SQU, TRI, SINE, NOISE, FB–OSC, SUPER–SAW, EXT–IN
00 01	0000 000a	OSC1 Pitch Wide Switch	(0 – 1) OFF, ON
00 02	0aaa aaaa	OSC1 Coarse Tune	(28 – 100) –36 – +36
00 03	0aaa aaaa	OSC1 Fine Tune	(14 – 114) –50 – +50
00 04	0aaa aaaa	OSC1 Pulse Width	(0 – 127)
00 05	0aaa aaaa	OSC1 Pitch Env Depth	(1 – 127) –63 – +63
00 06	0000 aaaa	OSC2 Waveform	(0 – 8) SAW, SQU, PW–SQU, TRI, SINE, NOISE, FB–OSC, SUPER–SAW, EXT–IN
00 07	0000 000a	OSC2 Pitch Wide Switch	(0 – 1) OFF, ON
00 08	0aaa aaaa	OSC2 Coarse Tune	(28 – 100) –36 – +36
00 09	0aaa aaaa	OSC2 Fine Tune	(14 – 114) –50 – +50
00 0A	0aaa aaaa	OSC2 Pulse Width	(0 – 127)
00 0B	0aaa aaaa	OSC2 Pitch Env Depth	(1 – 127) –63 – +63
00 0C	0aaa aaaa	Pitch Env Attack Time	(0 – 127)
00 0D	0aaa aaaa	Pitch Env Decay	(0 – 127)
00 0E	0000 00aa	MIX/MOD Type	(0 – 2) MIX, SYNC, RING
00 0F	0aaa aaaa	MIX/MOD Balance	(1 – 127) –63 – +63
00 10	0000 00aa	MIX/MOD Low Freq	(0 – 2) FLAT, BOOST, CUT
00 11	0000 00aa	FILTER Type	(0 – 3) BYPASS, LPF, HPF, BPF
00 12	0000 000a	FILTER Slope	(0 – 1) –12, –24 [dB]
00 13	0aaa aaaa	FILTER Cutoff Frequency	(0 – 127)
00 14	00aa aaaa	FILTER Cutoff Keyfollow	(44 – 84) –200 – +200
00 15	0aaa aaaa	FILTER Cutoff Velocity Sens	(1 – 127) –63 – +63
00 16	0aaa aaaa	FILTER Resonance	(0 – 127)
00 17	0aaa aaaa	FILTER Env Attack Time	(0 – 127)
00 18	0aaa aaaa	FILTER Decay Time	(0 – 127)
00 19	0aaa aaaa	FILTER Sustain Level	(0 – 127)
00 1A	0aaa aaaa	FILTER Release Time	(0 – 127)
00 1B	0aaa aaaa	FILTER Env Depth	(1 – 127) –63 – +63
00 1C	0000 000a	AMP Overdrive Switch	(0 – 1) OFF, ON
00 1D	0aaa aaaa	AMP Overdrive Drive	(0 – 127)
00 1E	0aaa aaaa	AMP Level	(0 – 127)
00 1F	0aaa aaaa	AMP Level Velocity Sens	(1 – 127) –63 – +63
00 20	0aaa aaaa	AMP Pan	(0 – 127) L64 – 63R
00 21	0aaa aaaa	AMP Env Attack Time	(0 – 127)
00 22	0aaa aaaa	AMP Env Decay Time	(0 – 127)
00 23	0aaa aaaa	AMP Env Sustain Level	(0 – 127)
00 24	0aaa aaaa	AMP Env Release Time	(0 – 127)
00 25	0aaa aaaa	Delay Depth	(0 – 127)
00 26	0aaa aaaa	Reverb Depth	(0 – 127)
00 27	0000 0aaa	LFO1 Shape	(0 – 6) TRI, SIN, SAW, SQR, TRP, S&H, RND
00 28	0aaa aaaa	LFO1 Rate	(0 – 127)
00 29	0000 000a	LFO1 Tempo Sync Switch	(0 – 1) ON, OFF
00 2A	000a aaaa	LFO1 Tempo Sync Note	(0 – 19) 16, 12, 8, 4, 2, 1, 3/4, 2/3, 1/2, 3/8, 1/3, 1/4, 3/16, 1/6, 1/8, 3/32, 1/12, 1/16, 1/24, 1/32
00 2B	0aaa aaaa	LFO1 Fade Time	(0 – 127)
00 2C	0000 000a	LFO1 Key Trigger	(0 – 1) OFF, ON
00 2D	0000 00aa	LFO1 Destination 1	(0 – 3) PITCH1, PW1, FILTER, AUDIO–FILTER
00 2E	0aaa aaaa	LFO1 Depth 1	(1 – 127) –63 – +63
00 2F	0000 00aa	LFO1 Destination 2	(0 – 2) PITCH2, PW2, AMP
00 30	0aaa aaaa	LFO1 Depth 2	(1 – 127) –63 – +63
00 31	0000 0aaa	LFO2 Shape	(0 – 6) TRI, SIN, SAW, SQR, TRP, S&H, RND
00 32	0aaa aaaa	LFO2 Rate	(0 – 127)
00 33	0000 000a	LFO2 Tempo Sync Switch	(0 – 1) ON, OFF
00 34	000a aaaa	LFO2 Tempo Sync Note	(0 – 19) 16, 12, 8, 4, 2, 1, 3/4, 2/3, 1/2, 3/8, 1/3, 1/4, 3/16, 1/6, 1/8, 3/32, 1/12, 1/16, 1/24, 1/32
00 35	0aaa aaaa	LFO2 Fade Time	(0 – 127)
00 36	0000 000a	LFO2 Key Trigger	(0 – 1) OFF, ON
00 37	0000 00aa	LFO2 Destination 1	(0 – 3) PITCH1, PW1, FILTER, AUDIO–FILTER
00 38	0aaa aaaa	LFO2 Depth 1	(1 – 127) –63 – +63
00 39	0000 00aa	LFO2 Destination 2	(0 – 2) PITCH2, PW2, AMP
00 3A	0aaa aaaa	LFO2 Depth 2	(1 – 127) –63 – +63
00 3B	000a aaaa	Pitch Bend Range	(0 – 24)
00 3C	0000 0aaa	Octave Shift	(61 – 67) –3 – +3
00 3D	0000 000a	Portamento Switch	(0 – 1) OFF, ON
00 3E	0aaa aaaa	Portamento Time	(0 – 127)
00 3F	0000 00aa	Mono/Solo Select	(0 – 2) POLY, SOLO+LEGATO, SOLO
00 00 00 40		Total Size	

❍Patch Delay

Offset Address		Description	
00 00	0aaa aaaa	Time	(0 – 127)
00 01	0aaa aaaa	Feedback	(0 – 98) –98 – +98 [%]
00 02	000a aaaa	HF Damp	(0 – 17) 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000, BYPASS [Hz]
00 03	0aaa aaaa	Modulation Rate	(0 – 127)
00 04	0aaa aaaa	Modulation Depth	(0 – 127)
00 00 00 05		Total Size	

❍Patch Reverb

Offset Address		Description	
00 00	0aaa aaaa	Time	(0 – 127)
00 01	0aaa aaaa	Pre Delay	(0 – 125) 0.0 – 100 [msec]
00 02	0000 0aaa	Size	(0 – 7) 1, 2, 3, 4, 5, 6, 7, 8
00 03	000a aaaa	High Cut	(0 – 20) 160, 200, 250, 320, 400, 500, 640, 800, 1000, 1250, 1600, 2000, 2500, 3200, 4000, 5000, 6400, 8000, 10000, 12500, BYPASS [Hz]
00 04	0aaa aaaa	Density	(0 – 127)
00 05	0aaa aaaa	Diffusion	(0 – 127)
00 06	000a aaaa	LF Damp Frequency	(0 – 19) 50, 64, 80, 100, 125, 160, 200, 250, 320, 400, 500, 640, 800, 1000, 1250, 1600, 2000, 2500, 3200, 4000 [Hz]
00 07	00aa aaaa	LF Damp Gain	(0 – 36) –36, –35, –34, –33, –32, –31, –30, –29, –28, –27, –26, –25, –24, –23, –22, –21, –20, –19, –18, –17, –16, –15, –14, –13, –12, –11, –10, –9, –8, –7, –6, –5, –4, –3, –2, –1, 0 [dB]
00 08	0000 0aaa	HF Damp Frequency	(0 – 5) 4000, 5000, 6400, 8000, 10000, 12500 [Hz]
00 09	00aa aaaa	HF Damp Gain	(0 – 36) –36, –35, –34, –33, –32, –31, –30, –29, –28, –27, –26, –25, –24, –23, –22, –21, –20, –19, –18, –17, –16, –15, –14, –13, –12, –11, –10, –9, –8, –7, –6, –5, –4, –3, –2, –1, 0 [dB]
00 00 00 0A		Total Size	

❍Patch Arpeggio Common

Offset Address		Description	
00 00	0aaa aaaa	Arpeggio Grid	(0 – 8) 04_, 08_, 08L, 08H, 08t, 16_, 16L, 16H, 16t
00 01	0aaa aaaa	Arpeggio Duration	(0 – 9) 30, 40, 50, 60, 70, 80, 90, 100, 120, FUL
00 02	0aaa aaaa	Arpeggio Motif	(0 – 11) UP/L, UP/L&H, UP/_, DOWN/L, DOWN/L&H, DOWN/_, UP&DOWN/L, UP&DOWN/L&H, UP&DOWN/_, RANDOM/L, RANDOM/_, PHRASE
00 03	0000 0aaa	Arpeggio Octave Range	(61 – 67) –3 – +3
00 04	0aaa aaaa	Arpeggio Accent Rate	(0 – 100)
00 05	0aaa aaaa	Arpeggio Velocity	(0 – 127) REAL, 1 – 127
# 00 06	0000 aaaa 0000 bbbb	End Step	(1 – 32)
00 00 00 08		Total Size	

❍Patch Arpeggio Pattern

Offset Address		Description	
# 00 00	0000 aaaa 0000 bbbb	Original Note	(0 – 128)
# 00 02	0000 aaaa 0000 bbbb	Step1 Data	(0 – 128)
# 00 04	0000 aaaa 0000 bbbb	Step2 Data	(0 – 128)
# 00 06	0000 aaaa 0000 bbbb	Step3 Data	(0 – 128)
# 00 08	0000 aaaa 0000 bbbb	Step4 Data	(0 – 128)
# 00 0A	0000 aaaa 0000 bbbb	Step5 Data	(0 – 128)
# 00 0C	0000 aaaa 0000 bbbb	Step6 Data	(0 – 128)
# 00 0E	0000 aaaa 0000 bbbb	Step7 Data	(0 – 128)
# 00 10	0000 aaaa 0000 bbbb	Step8 Data	(0 – 128)
# 00 12	0000 aaaa 0000 bbbb	Step9 Data	(0 – 128)
# 00 14	0000 aaaa 0000 bbbb	Step10 Data	(0 – 128)
# 00 16	0000 aaaa 0000 bbbb	Step11 Data	(0 – 128)
# 00 18	0000 aaaa 0000 bbbb	Step12 Data	(0 – 128)
# 00 1A	0000 aaaa 0000 bbbb	Step13 Data	(0 – 128)
# 00 1C	0000 aaaa 0000 bbbb	Step14 Data	(0 – 128)
# 00 1E	0000 aaaa 0000 bbbb	Step15 Data	(0 – 128)
# 00 20	0000 aaaa 0000 bbbb	Step16 Data	(0 – 128)
# 00 22	0000 aaaa 0000 bbbb	Step17 Data	(0 – 128)
# 00 24	0000 aaaa 0000 bbbb	Step18 Data	(0 – 128)
# 00 26	0000 aaaa 0000 bbbb	Step19 Data	(0 – 128)
# 00 28	0000 aaaa 0000 bbbb	Step20 Data	(0 – 128)
# 00 2A	0000 aaaa 0000 bbbb	Step21 Data	(0 – 128)
# 00 2C	0000 aaaa 0000 bbbb	Step22 Data	(0 – 128)
# 00 2E	0000 aaaa 0000 bbbb	Step23 Data	(0 – 128)
# 00 30	0000 aaaa 0000 bbbb	Step24 Data	(0 – 128)
# 00 32	0000 aaaa 0000 bbbb	Step25 Data	(0 – 128)
# 00 34	0000 aaaa 0000 bbbb	Step26 Data	(0 – 128)
# 00 36	0000 aaaa 0000 bbbb	Step27 Data	(0 – 128)
# 00 38	0000 aaaa 0000 bbbb	Step28 Data	(0 – 128)
# 00 3A	0000 aaaa 0000 bbbb	Step29 Data	(0 – 128)
# 00 3C	0000 aaaa 0000 bbbb	Step30 Data	(0 – 128)
# 00 3E	0000 aaaa 0000 bbbb	Step31 Data	(0 – 128)
# 00 40	0000 aaaa 0000 bbbb	Step32 Data	(0 – 128)
00 00 00 42		Total Size	

4. Supplementary Material

■Decimal and Hexadecimal Table

(An "H" is appended to the end of numbers in hexadecimal notation.)
In MIDI documentation, data values and addresses/sizes of Exclusive messages, etc. are expressed as hexadecimal values for each 7 bits.
The following table shows how these correspond to decimal numbers.

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

D: decimal
H: hexadecimal

* Decimal values such as MIDI channel, bank select, and program change are listed as one greater than the values given in the above table.
* A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa 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 "Use nibbled data" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of a 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 result 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 19

CnH is the Program Change status, and n is the MIDI channel number. Since EH = 14 and 19H = 25, this is a Program Change message with MIDI CH = 15, program number 26.

<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 12+80 = 8192) is 0, so this Pitch Bend Value is
28 00H - 40 00H = 40 x 12 + 80 - (64 x 12 + 80) = 5120 - 8192 = -3072

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

■Example of an Exclusive Message and Calculating a Checksum

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

●How to calculate the checksum

(hexadecimal numbers are indicated by "H")
The checksum is a value derived by adding the address, size, and checksum itself and inverting the lower 7 bits.
Here's an example of how the checksum is calculated. We will assume that in the Exclusive message we are transmitting, the address is aa bb cc ddH and the data or size is ee ffH.

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

<Example1> Setting REVERB SIZE of PATCH to 1 (DT1)

According to the "Parameter Address Map" (p. 4), the start address of Temporary Patch is 10 00 00 00H, the offset address of PATCH REVERB at PATCH is 04 00H, and the address of REVERB SIZE is 00 02H. Therefore the address of REVERB SIZE of PATCH REVERB is;

```
   10 00 00 00H
         04 00H
+)       00 02H
   10 00 04 02H
```

REVERB SIZE 1 has the value of 01H.
So the system exclusive message should be sent is;

F0	41	10	00 00 16	12	10 00 04 02	00	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

(1) Exclusive Status (2) ID (Roland) (3) Device ID (17)
(4) Model ID (SH-201) (5) Command ID (DT1) (6) End of Exclusive

Then calculate the checksum.

10H + 00H + 04H + 02H + 00H = 16 + 0 + 4 + 2 + 0 = 22 (sum)
22 (sum) ÷ 128 = 0 (quotient) ... 22 (remainder)
checksum = 128 - 22 (remainder) = 106 = 6AH

This means that F0 41 10 00 00 16 12 10 00 04 02 00 6A F7 is the message should be sent.

<Example2> Getting the data (RQ1) of PATCH DELAY in USER PATCH:003

According to the "Parameter Address Map" (p. 4), the start address of PATCH:003 is 20 02 00 00H, and the offset address of PATCH MFX is 00 02 00H.
Therefore the start address of PATCH DELAY in USER PATCH:003 is;

```
   20 02 00 00H
+)    00 03 00H
   20 02 03 00H
```

As the size of PATCH DELAY is 00 00 00 05H, the system exclusive message should be sent is;

F0	41	10	00 00 16	11	20 02 03 00	00 00 00 05	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

(1) Exclusive Status (2) ID (Roland) (3) Device ID (17)
(4) Model ID (SH-201) (5) Command ID (RQ1) (6) End of Exclusive

Then calculate the checksum.

20H + 02H + 02H + 00H + 00H + 00H + 01H + 04H = 32 + 2 + 3 + 0 + 0 + 0 + 0 + 5 = 42 (sum)
42 (sum) ÷ 128 = 0 (quotient) ... 42 (remainder)
checksum = 128 - 42 (remainder) = 86 = 56H

This means that F0 41 10 00 00 16 11 20 02 03 00 00 00 00 05 56 F7 is the message should be sent.

<Example3> Getting Temporary Patch data (RQ1)

According to the "Parameter Address Map" (p. 4), the start address of Temporary Patch is assigned as following:

10 00 00 00	Temporary Patch

The offset address of Patch is also assigned as follows:

00 00 00	Patch Common
:	
00 01 00	Patch Tone (1:Upper)
:	
00 02 00	Patch Tone (2:Lower)
:	
00 03 00	Patch Delay
:	
00 04 00	Patch Reverb
:	
00 05 00	Patch Arpeggio Common
:	
00 06 00	Patch Arpeggio Pattern (Note 1)
:	
00 15 00	Patch Arpeggio Pattern (Note 16)

As the data size of Patch Arpeggio Pattern is 00 00 00 42H, summation of the size and the start address of Temporary Patch Arpeggio Pattern (Note 16) will be;

```
   10 00 00 00H
   00 00 15 00H
+) 00 00 00 42H
   10 00 15 42H
```

And the size that have to be got should be;

```
   10 00 15 42H
-) 10 00 00 00H
   00 00 15 42H
```

Therefore the system exclusive message should be sent is;

F0	41	10	00 00 16	11	10 00 00 00	00 00 15 42	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

(1) Exclusive Status (2) ID (Roland) (3) Device ID (17)
(4) Model ID (SH-201) (5) Command ID (RQ1) (6) End of Exclusive

Calculating the checksum as shown in <Example 2>, we get a message of F0 41 10 00 00 16 11 10 00 00 00 00 00 15 42 19 F7 to be transmitted.

■ASCII Code Table

Patch Name and Performance Name, etc., of MIDI data are described the ASCII code in the table below.

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

D: decimal
H: hexadecimal

* "SP" is space.

SYNTHESIZER

Date : March 1, 2006

Model SH-201

Version : 1.00

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default	1–16	1–16	
	Changed	1–16	1–16	
Mode	Default	Mode 3	Mode 3	
	Messages	X	Mode 3, 4 (M = 1)	* 2
	Altered	**********		
Note Number :	True Voice	0–120	0–127	
		**********	0–127	
Velocity	Note On	O	O	
	Note Off	O	O	
After Touch	Key's	X	X	
	Channel's	X	X	
Pitch Bend		O	O *1	
Control Change	0–4	O *1	O *1	* 3
	7–32	O	O *1	
	64	O	O *1	
	66	X	O *1	
	69–83	O	O *1	
	84	X	O *1	
	85–95	O	O *1	
Program Change	: True Number	O	O *1	
		**********	0–31	Program No. 1–32
System Exclusive		O	O *1	
System Common	: Song Position	X	X	
	: Song Select	X	X	
	: Tune Request	X	X	
System Real Time	: Clock	X	X *1	
	: Commands	X	X	
Aux Messages	: All Sound Off	X	O (120, 126, 127)	
	: Reset All Controllers	X	O	
	: Local On/Off	X	X	
	: All Notes Off	X	O (123–127)	
	: Active Sensing	O *1	O	
	: System Reset	X	X	
Notes		* 1 O X is selectable. * 2 Recognized as M=1 even if M≠1.	* 3 Refer to "Control change message list" (Owner's Manual p. 72) about function of each controller number.	

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

O : Yes
X : No