MIDI IMPLEMENTATION

STUDIO EFFECTS PROCESSOR
Model SX-700

Date: Feb. 1. 1996
Version: 1.00

1. RECOGNIZED RECEIVE DATA

CHANNEL VOICE MESSAGE

Note On

Status	Second	Third
9nH	kkH	vvH

n = MIDI Channel	: 0H - FH	(ch.1 - ch.16)
kk = Note Number	:00H - 7FH	(0 - 127)
vv = Velocity	:00H - 7FH	(0 - 127)

* By specifying these messages as a source for "realtime parameter control" you can use Note On messages to control a target.

Control Change

Status	Second	Third
BnH	ccH	vvH

n = MIDI Channel	: 0H - FH	(ch.1 - ch.16)
cc = Control Number	:00H , 20H	(0 , 32)
	:01H - 1FH	(1 - 31)
	:40H - 5FH	(64 - 95)
vv = Control Value	:00H - 7FH	(0 - 127)

* A controller number of 00H or 20H is recognized as a Bank Select message. The Bank Select setting makes the callup of the Program Number change when a Program Change message is received.
  When 00H:
  If the values are 00H and 03H or more, the unit switches to the Program Change number of the Program Change Map when a Program Change message is received. If the value is 01H, the unit switches to a User Area patch from 1 to 128 when a Program Change message is received. If the value is 02H, the unit switches to a Preset Area patch from 1 to 128 when a Program Change message is received.
  When 20H:
  Received data is ignored, regardless of the value.

* Bank Select processing is held until a Program Change message is received.

* By specifying these messages as a source for "realtime parameter control" you can use Control Change messages to control a target.

Program Change

Status	Second
CnH	ppH

n = MIDI Channel	: 0H - FH	(ch.1 - ch.16)
pp = Program Number	:00H - 7FH	(No.1 - No.128)

* Patches will be selected according to the program number that is received.

* The Patch changes individually, according to the BANK SELECT value.

Channel pressure

Status	Second
DnH	vvH

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

* By specifying these messages as a source for "realtime parameter control" you can use Channel Pressure messages to control a target.

Pitch Bend Change

Status	Second	Third
EnH	llH	mmH

n = MIDI Channel	: 0H - FH	(ch.1 - ch.16)
ll = Data LSB	:00H - 7FH	(0 - 127)
mm = Data MSB	:00H - 7FH	(0 - 127)

* By specifying these messages as a source for "realtime parameter control" you can use Pitch Bend messages to control a target.

SYSTEM REAL TIME MESSAGE

Status
F8H

* When you set "MIDI" on "TpSrc(TEMPO Source)" parameter, you can control the delay time.

SYSTEM EXCLUSIVE MESSAGE

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

F0H =	System Exclusive		
ii =	Manufacturer ID	:41H	(Roland)
dd ,..ee =	Data	:00H - 7FH	(0 - 127)
F7H =	EOX (End of Exclusive/System common)		

* For more details, please refer to "Roland Exclusive Message".

2. TRANSMITTED DATA

SYSTEM EXCLUSIVE MESSAGE

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

F0H =	System Exclusive		
ii =	Manufacturer ID	:41H	(Roland)
dd ,..ee =	Data	:00H - 7FH	(0 - 127)
F7H =	EOX (End of Exclusive/System common)		

* For more details, please refer to "Roland Exclusive Message".

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3. EXCLUSIVE COMMUNICATION

On the SX-700, exclusive messages can be used as follows.
- Transmit/receive SX-700 system/patch data.

The model ID for SX-700 exclusive messages is 7AH.

ONE WAY COMMUNICATION

Request Data1 RQ1(11H)

Byte	Description
F0H	Exclusive Status
41H	Manufacturer ID(Roland)
Dev	Device ID(Dev=00H-1FH)
7AH	Model ID(SX-700)
11H	Command ID(RQ1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
ssH	Size MSB
ttH	Size
uuH	Size LSB
sum	Checksum
F7H	EOX(End of System Exclusive)

* SX-700 dose not transmit this message.

Data Set1 DT1(12H)

Byte	Description
F0H	Exclusive Status
41H	Manufacturer ID(Roland)
Dev	Device ID(Dev=00H-1FH)
7AH	Model ID(SX-700)
12H	Command ID(DT1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
eeH	Data
:	:
ffH	Data
sum	Checksum
F7H	EOX(End of System Exclusive)

4. ADDRESS MAPPING OF PARAMETERS (Model ID = 7AH)

The address and size are displayed under 7-bit hexadecimal notation.

Address	MSB		LSB
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7-bit Hexadecimal	AA	BB	CC

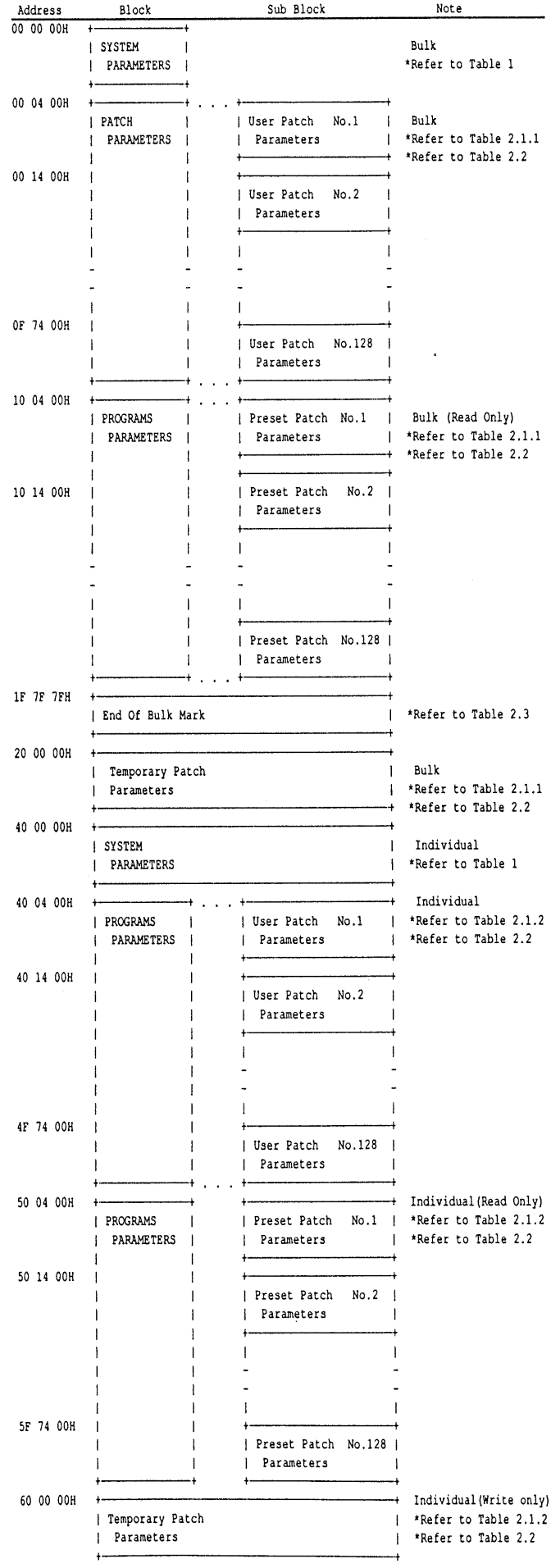
Size	MSB		LSB
Binary	0sss ssss	0ttt tttt	0uuu uuuu
7-bit Hexadecimal	SS	TT	UU

Parameter base address

* The actual address of each parameter is the start address of the block plus the offset address.

* You cannot use any address having "#" for the top address in a system exclusive message.

Address Block Map



61 00 00H	Temporary Patch Target Parameter Edit	Individual *Refer to Table 3
61 01 00H	Temporary Patch Sound Change Request	Individual *Refer to Table 4
61 02 00H	Information	Individual *Refer to Table 5
61 04 00H	Exclusive Program Change	Individual *Refer to Table 6

* The SX-700 has two types of communication: Individual Parameters and Bulk Dump.

* When using Bulk Dump, be sure to send an EOB (End of Bulk mark) at the end. When using Individual Parameters, be sure to state the value for one parameter in a packet from F0 to F7, with no excess or lack.

* A Sound Change Request (SCR) is valid only in the Temporary Area. To change data in the Temporary Area (Bulk) using Exclusive (SysEx) messages, it is necessary to first send the parameter data, then send the data to the SCR address.

Table-1. SYSTEM PARAMETERS

Offset(H)	Size(H)	Data(H)	Description
00 00 00	00 00 01	00 - 0A	STANDARD PITCH 435(0) - 440(5) - 445(10)
00 00 01	00 00 01	00 - 01	BYPASS MODE BYPASS(0) MUTE(1)
00 00 02	00 00 01	00 - 01	BYPASS OFF(0) ON(1)
00 00 03	00 00 01	00 - 01	PARAMETER HELP OFF(0) ON(1)
00 00 04	00 00 01	00 - 0E	LCD Contrast 1(0) - 15(14)
00 00 05	00 00 01	00 - 01	Rx. Program Change OFF(0) ON(1)
00 01 00	00 00 02	00 00	Program Change Map No.1 MSB (0-255)
00 01 01#		- 0F 0F	Program Change Map No.1 LSB
00 01 02	00 00 02	00 00	Program Change Map No.2 MSB (0-255)
00 01 03#		- 0F 0F	Program Change Map No.2 LSB
00 01 04	00 00 02	00 00	Program Change Map No.3 MSB (0-255)
00 01 05#		- 0F 0F	Program Change Map No.3 LSB
:	:	:	:
00 02 7A	00 00 02	00 00	Program Change Map No.126 MSB (0-255)
00 02 7B#		- 0F 0F	Program Change Map No.126 LSB
00 02 7C	00 00 02	00 00	Program Change Map No.127 MSB (0-255)
00 02 7D#		- 0F 0F	Program Change Map No.127 LSB
00 02 7E	00 00 02	00 00	Program Change Map No.128 MSB (0-255)
00 02 7F#		- 0F 0F	Program Change Map No.128 LSB
			*User 1(00h 00h) - 128(07h 0Fh)
			*Preset 1(08h 00h) - 128(0Fh 0Fh)
			*use nibblized data

Table-2.1.1 PATCH PARAMETERS(Bulk Area)

Address(H)	Data(H)	Description
00 04 00	0000_aaaaH	User Patch No.1 Parameters
00 14 00	0000_aaaaH	User Patch No.2 Parameters
:	:	:
:	:	:
0C 14 00	0000_aaaaH	User Patch No.98 Parameters
0C 24 00	0000_aaaaH	User Patch No.99 Parameters
0C 34 00	0000_aaaaH	User Patch No.100 Parameters
0C 44 00	0000_aaaaH	User Patch No.101 Parameters
:	:	:
:	:	:
0F 64 00	0000_aaaaH	User Patch No.127 Parameters
0F 74 00	0000_aaaaH	User Patch No.128 Parameters
10 04 00	0000_aaaaH	Preset Patch No.1 Parameters (Read Only)
10 14 00	0000_aaaaH	Preset Patch No.2 Parameters (Read Only)
:	:	:
:	:	:
1C 14 00	0000_aaaaH	Preset Patch No.98 Parameters (Read Only)
1C 24 00	0000_aaaaH	Preset Patch No.99 Parameters (Read Only)
1C 34 00	0000_aaaaH	Preset Patch No.100 Parameters (Read Only)
1C 44 00	0000_aaaaH	Preset Patch No.101 Parameters (Read Only)
:	:	:
:	:	:
1F 64 00	0000_aaaaH	Preset Patch No.127 Parameters (Read Only)
1F 74 00	0000_aaaaH	Preset Patch No.128 Parameters (Read Only)
20 00 00	0000_aaaaH	Temporary Patch Parameters

Table-2.1.2 PATCH PARAMETERS(Individual Area)

Address	Data(H)	Description
40 04 00	0000_aaaaH	User Patch No.1 Parameters
40 14 00	0000_aaaaH	User Patch No.2 Parameters
:	:	:
:	:	:
4C 14 00	0000_aaaaH	User Patch No.98 Parameters
4C 24 00	0000_aaaaH	User Patch No.99 Parameters
4C 34 00	0000_aaaaH	User Patch No.100 Parameters
4C 44 00	0000_aaaaH	User Patch No.101 Parameters
:	:	:
:	:	:
4F 64 00	0000_aaaaH	User Patch No.127 Parameters
4F 74 00	0000_aaaaH	User Patch No.128 Parameters
50 04 00	0000_aaaaH	Preset Patch No.1 Parameters (Read Only)
50 14 00	0000_aaaaH	Preset Patch No.2 Parameters (Read Only)
:	:	:
:	:	:
5C 14 00	0000_aaaaH	Preset Patch No.98 Parameters (Read Only)
5C 24 00	0000_aaaaH	Preset Patch No.99 Parameters (Read Only)
5C 34 00	0000_aaaaH	Preset Patch No.100 Parameters (Read Only)
5C 44 00	0000_aaaaH	Preset Patch No.101 Parameters (Read Only)
:	:	:
:	:	:
5F 64 00	0000_aaaaH	Preset Patch No.127 Parameters (Read Only)
5F 74 00	0000_aaaaH	Preset Patch No.128 Parameters (Read Only)
60 00 00	0000_aaaaH	Temporary patch Parameters

Table-2.2 Patch Parameters

Offset(H)	Size(H)	Data(H)	Description
[NAME] *Refer to Table 7 [NAME(ASCII) TABLE]			
00 00 00	00 00 20H	02 00 -	1st. Character of Patch Name(ASCII) MSB
00 00 01#		- 07 0F	LSB
00 00 02#		(20 - 7F)	2st. Character of Patch Name(ASCII) MSB
00 00 03#		:	LSB
00 00 04#		:	3st. Character of Patch Name(ASCII) MSB
00 00 05#		:	LSB
: #		:	:
00 00 1C#		:	15th. Character of Patch Name(ASCII) MSB
00 00 1D#		:	LSB
00 00 1E#		02 00 -	16th. Character of Patch Name(ASCII) MSB
00 00 1F#		- 07 0F	LSB
		(20 - 7F)	*use nibblized data
00 00 20#		00 00	Reserved
00 00 21#		- 00 00	Reserved
[COMMON]			
00 00 22	00 00 02H	00 00 -	Algorithm Number 00H-12H(0 - 18) MSB
00 00 23#		- 01 02	Type A1(00H) - Type A9(08H) LSB
			Type B1(09H) - Type B9(11H),Type C1(12H)
00 00 24	00 00 04	00 00 00 00	UNIT1 EFFECT MSB
00 00 25#		- 00 00 00 04	:
00 00 26#			:
00 00 27#			UNIT1 EFFECT LSB
			*Refer to Table 8 [UNIT EFFECT NUMBER]
00 00 28	00 00 04	00 00 00 00	UNIT2 EFFECT MSB
00 00 29#		- 00 00 00 04	:
00 00 2A#			:
00 00 2B#			UNIT2 EFFECT LSB
			*Refer to Table 8 [UNIT EFFECT NUMBER]
00 00 2C	00 00 04	00 00 00 00	UNIT3 EFFECT MSB
00 00 2D#		- 00 00 00 04	:
00 00 2E#			:
00 00 2F#			UNIT3 EFFECT LSB
			*Refer to Table 8 [UNIT EFFECT NUMBER]
00 00 30	00 00 04	00 00 00 00	UNIT4 EFFECT MSB
00 00 31#		- 00 00 00 04	:
00 00 32#			:
00 00 33#			UNIT4 EFFECT LSB
			*Refer to Table 8 [UNIT EFFECT NUMBER]
00 00 34	00 00 04	00 00 00 00	UNIT5 EFFECT MSB
00 00 35#		- 00 00 00 04	:
00 00 36#			:
00 00 37#			UNIT5 EFFECT LSB
			*Refer to Table 8 [UNIT EFFECT NUMBER]

00 00 38	00 00 04	00 00 00 00	Control1 Target Parameter	MSB
00 00 39#		- 0T 0T 0T 0T	:	
00 00 3A#			:	
00 00 3B#			Control1 Target Parameter	LSB
			*Refer to Table 9 [PARAMETER NUMBER]	
00 00 3C	00 00 04	00 00 00 00	Control1 Minimum Value	MSB
00 00 3D#		- 0V 0V 0V 0V	:	
00 00 3E#			:	
00 00 3F#			Control1 Minimum Value	LSB
00 00 40	00 00 04	00 00 00 00	Control1 Maximum Value	MSB
00 00 41#		- 0V 0V 0V 0V	:	
00 00 42#			:	
00 00 43#			Control1 Maximum Value	LSB
00 00 44	00 00 04	00 00 00 00	Control1 Source	MSB
00 00 45#		- 0S 0S 0S 0S	:	
00 00 46#			:	
00 00 47#			Control1 Source	LSB
			*Refer to Table 10 [CONTROL SOURCE NUMBER]	
00 00 48	00 00 04	00 00 00 00	Control1 Switch Mode	MSB
00 00 49#		- 00 00 00 0M	: 0:"Norml" Normal	
00 00 4A#			: 1:"Toggl" Toggle	
00 00 4B#			Control1 Switch Mode	LSB
00 00 4C	00 00 04	00 00 00 00	Control2 Target Parameter	MSB
00 00 4D#		- 0T 0T 0T 0T	:	
00 00 4E#			:	
00 00 4F#			Control2 Target Parameter	LSB
			*Refer to Table 9 [PARAMETER NUMBER]	
00 00 50	00 00 04	00 00 00 00	Control2 Minimum Value	MSB
00 00 51#		- 0V 0V 0V 0V	:	
00 00 52#			:	
00 00 53#			Control2 Minimum Value	LSB
00 00 54	00 00 04	00 00 00 00	Control2 Maximum Value	MSB
00 00 55#		- 0V 0V 0V 0V	:	
00 00 56#			:	
00 00 57#			Control2 Maximum Value	LSB
00 00 58	00 00 04	00 00 00 00	Control2 Source	MSB
00 00 59#		- 0S 0S 0S 0S	:	
00 00 5A#			:	
00 00 5B#			Control2 Source	LSB
			*Refer to Table 10 [CONTROL SOURCE NUMBER]	
00 00 5C	00 00 04	00 00 00 00	Control2 Switch Mode	MSB
00 00 5D#		- 00 00 00 0M	: 0:"Norml" Normal	
00 00 5E#			: 1:"Toggl" Toggle	
00 00 5F#			Control2 Switch Mode	LSB
00 00 60	00 00 04	00 00 00 00	Control3 Target Parameter	MSB
00 00 61#		- 0T 0T 0T 0T	:	
00 00 62#			:	
00 00 63#			Control3 Target Parameter	LSB
			*Refer to Table 9 [PARAMETER NUMBER]	
00 00 64	00 00 04	00 00 00 00	Control3 Minimum Value	MSB
00 00 65#		- 0V 0V 0V 0V	:	
00 00 66#			:	
00 00 67#			Control3 Minimum Value	LSB
00 00 68	00 00 04	00 00 00 00	Control3 Maximum Value	MSB
00 00 69#		- 0V 0V 0V 0V	:	
00 00 6A#			:	
00 00 6B#			Control3 Maximum Value	LSB
00 00 6C	00 00 04	00 00 00 00	Control3 Source	MSB
00 00 6D#		- 0S 0S 0S 0S	:	
00 00 6E#			:	
00 00 6F#			Control3 Source LSB	
			*Refer to Table 10 [CONTROL SOURCE NUMBER]	
00 00 70	00 00 04	00 00 00 00	Control3 Switch Mode	MSB
00 00 71#		- 00 00 00 0M	: 0:"Norml" Normal	
00 00 72#			: 1:"Toggl" Toggle	
00 00 73#			Control3 Switch Mode	LSB
			*use nibblized data	

[LEVEL] *Refer to [LEVEL PARAMETER GUIDE]

00 00 74	00 00 04	00 00 00 00	Output Level L	MSB
00 00 75#		- 00 00 0C 07	:	
00 00 76#			:	
00 00 77#			Output Level L	LSB
00 00 78	00 00 04	00 00 00 00	Output Level R	MSB
00 00 79#		- 00 00 0C 07	:	
00 00 7A#			:	
00 00 7B#			Output Level R	LSB
00 00 7C	00 00 04	00 00 00 00	Direct Level	MSB
00 00 7D#		- 00 00 06 05	:	
00 00 7E#			:	
00 00 7F#			Direct Level	LSB

00 01 00	00 00 04	00 00 00 00	Modulation Balance L	MSB
00 01 01#		- 00 00 06 04	:	
00 01 02#			:	
00 01 03#			Modulation Balance L	LSB
00 01 04	00 00 04	00 00 00 00	Modulation Balance R	MSB
00 01 05#		- 00 00 06 04	:	
00 01 06#			:	
00 01 07#			Modulation Balance R	LSB
00 01 08	00 00 04	00 00 00 00	Modulation Output Level	MSB
00 01 09#		- 00 00 06 04	:	
00 01 0A#			:	
00 01 0B#			Modulation Output Level	LSB
00 01 0C	00 00 04	00 00 00 00	Delay Balance L	MSB
00 01 0D#		- 00 00 06 04	:	
00 01 0E#			:	
00 01 0F#			Delay Balance L	LSB
00 01 10	00 00 04	00 00 00 00	Delay Balance R	MSB
00 01 11#		- 00 00 06 04	:	
00 01 12#			:	
00 01 13#			Delay Balance R	LSB
00 01 14	00 00 04	00 00 00 00	Delay Output Level	MSB
00 01 15#		- 00 00 06 04	:	
00 01 16#			:	
00 01 17#			Delay Output Level	LSB
00 01 18	00 00 04	00 00 00 00	Reverb Balance L	MSB
00 01 19#		- 00 00 06 04	:	
00 01 1A#			:	
00 01 1B#			Reverb Balance L	LSB
00 01 1C	00 00 04	00 00 00 00	Reverb Balance R	MSB
00 01 1D#		- 00 00 06 04	:	
00 01 1E#			:	
00 01 1F#			Reverb Balance R	LSB
00 01 20	00 00 04	00 00 00 00	Reverb Output Level	MSB
00 01 21#		- 00 00 06 04	:	
00 01 22#			:	
00 01 23#			Reverb Output Level	LSB
00 01 24	00 00 04	00 00 00 00	RSS Balance Level L	MSB
00 01 25#		- 00 00 06 04	:	
00 01 26#			:	
00 01 27#			RSS Balance Level L	LSB
00 01 28	00 00 04	00 00 00 00	RSS Balance Level R	MSB
00 01 29#		- 00 00 06 04	:	
00 01 2A#			:	
00 01 2B#			RSS Balance Level R	LSB
00 01 2C	00 00 04	00 00 00 00	RSS Output Level	MSB
00 01 2D#		- 00 00 06 04	:	
00 01 2E#			:	
00 01 2F#			RSS Output Level	LSB
			*use nibblized data	

[EQ] *Refer to [EQ PARAMETER GUIDE]

00 01 30	00 00 04	00 00 00 00	Equalizer On / Off	MSB
00 01 31#		- 00 00 00 01	:	
00 01 32#			:	
00 01 33#			Equalizer On / Off	LSB
00 01 34	00 00 04	00 00 00 00	EQ 1st. Parameter Value	MSB
00 01 35#		- 0v 0v 0v 0v	:	
00 01 36#			:	
00 01 37#			EQ 1st. Parameter Value	LSB
00 01 38	00 00 04	00 00 00 00	EQ 2nd. Parameter Value	MSB
00 01 39#		- 0v 0v 0v 0v	:	
00 01 3A#			:	
00 01 3B#			EQ 2nd. Parameter Value	LSB
	:	:		
	:	:		
00 01 58	00 00 04	00 00 00 00	EQ 10th. Parameter Value	MSB
00 01 59#		- 0v 0v 0v 0v	:	
00 01 5A#			:	
00 01 5B#			EQ 10th. Parameter Value	LSB
			*use nibblized data	

[MODULATION] *Refer to [MODULATION PARAMETER GUIDE]

00 01 5C	00 00 04	00 00 00 00	MODulation Effect On / Off	MSB
00 01 5D#		- 00 00 00 01	: :	
00 01 5E#			: :	
00 01 5F#			MODulation Effect On / Off	LSB
00 01 60	00 00 04	00 00 00 00	MODulation Effect Type	MSB
00 01 61#		- 00 00 00 09	:	
00 01 62#			:	
00 01 63#			MODulation Effect Type	LSB
00 01 64	00 00 04	00 00 00 00	MOD 1st. Parameter Value	MSB
00 01 65#		- 0v 0v 0v 0v	:	
00 01 66#			:	
00 01 67#			MOD 1st. Parameter Value	LSB

00 01 68	00 00 04	00 00 00 00	MOD 2nd. Parameter Value	MSB
00 01 69#		- 0v 0v 0v 0v	:	
00 01 6A#			:	
00 01 6B#			MOD 2nd. Parameter Value	LSB
:	:			
:	:			
00 02 30	00 00 04	00 00 00 00	MOD 20th. Parameter Value	MSB
00 02 31#		- 0v 0v 0v 0v	:	
00 02 32#			:	
00 02 33#			MOD 20th. Parameter Value	LSB
			*use nibblized data	

[DELAY] *Refer to [DELAY PARAMETER GUIDE]

00 02 34	00 00 04	00 00 00 00	Delay Effect On / Off	MSB
00 02 35#		- 00 00 00 01	:	
00 02 36#			:	
00 02 37#			Delay Effect On / Off	LSB
00 02 38	00 00 04	00 00 00 00	Delay Effect Type	MSB
00 02 39#		- 00 00 00 06	:	
00 02 3A#			:	
00 02 3B#			Delay Effect Type	LSB
00 02 3C	00 00 04	00 00 00 00	DLY 1st. Parameter Value	MSB
00 02 3D#		- 0v 0v 0v 0v	:	
00 02 3E#			:	
00 02 3F#			DLY 1st. Parameter Value	LSB
00 02 40	00 00 04	00 00 00 00	DLY 2nd. Parameter Value	MSB
00 02 41#		- 0v 0v 0v 0v	:	
00 02 42#			:	
00 02 43#			DLY 2nd. Parameter Value	LSB
:	:			
:	:			
00 03 18	00 00 04	00 00 00 00	DLY 24th. Parameter Value	MSB
00 03 19#		- 0v 0v 0v 0v	:	
00 03 1A#			:	
00 03 1B#			DLY 24th. Parameter Value	LSB
			*use nibblized data	

[REVERB] *Refer to [REVERB PARAMETER GUIDE]

00 03 1C	00 00 04	00 00 00 00	Reverb Effect On / Off	MSB
00 03 1D#		- 00 00 00 01	: :	
00 03 1E#			: :	
00 03 1F#			Reverb Effect On / Off	LSB
00 03 20	00 00 04	00 00 00 00	Reverb Effect Type	MSB
00 03 21#		- 00 00 00 07	: :	
00 03 22#			: :	
00 03 23#			Reverb Effect Type	LSB
00 03 24	00 00 04	00 00 00 00	REV 1st. Parameter Value	MSB
00 03 25#		- 0v 0v 0v 0v	:	
00 03 26#			:	
00 03 27#			REV 1st. Parameter Value	LSB
00 03 28	00 00 04	00 00 00 00	REV 2nd. Parameter Value	MSB
00 03 29#		- 0v 0v 0v 0v	:	
00 03 2A#			:	
00 03 2B#			REV 2nd. Parameter Value	LSB
:	:			
:	:			
00 03 60	00 00 04	00 00 00 00	REV 16th. Parameter Value	MSB
00 03 61#		- 0v 0v 0v 0v	:	
00 03 62#			:	
00 03 63#			REV 16th. Parameter Value	LSB
			*use nibblized data	

[RSS] *Refer to [RSS PARAMETER GUIDE]

00 03 64	00 00 04	00 00 00 00	RSS Effect On / Off	MSB
00 03 65#		- 00 00 00 01	:	
00 03 66#			:	
00 03 67#			RSS Effect On / Off	LSB
00 03 68	00 00 04	00 00 00 00	RSS Effect Type	MSB
00 03 69#		- 00 00 00 03	:	
00 03 6A#			:	
00 03 6B#			RSS Effect Type	LSB
00 03 6C	00 00 04	00 00 00 00	RSS 1st. Parameter Value	MSB
00 03 6D#		- 0v 0v 0v 0v	:	
00 03 6E#			:	
00 03 6F#			RSS 1st. Parameter Value	LSB
00 03 70	00 00 04	00 00 00 00	RSS 2nd. Parameter Value	MSB
00 03 71#		- 0v 0v 0v 0v	:	
00 03 72#			:	
00 03 73#			RSS 2nd. Parameter Value	LSB
:	:			
:	:			
00 04 18	00 00 04	00 00 00 00	RSS 12th. Parameter Value	MSB
00 04 19#		- 0v 0v 0v 0v	:	
00 04 1A#			:	
00 04 1B#			RSS 12th. Parameter Value	LSB
			*use nibblized data	

[Hamonist Scale Data] *Refer to Table 22 [HARMONIST SCALE INTERVAL]

			-4V-HR- -2V-HR-
00 04 1C	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) C
00 04 1D	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) C#
00 04 1E	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) D
00 04 1F	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) D#
00 04 20	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) E
00 04 21	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) F
00 04 22	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) F#
00 04 23	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) G
00 04 24	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) G#
00 04 25	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) A
00 04 26	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) A#
00 04 27	00 00 01	00 - 30	Scale Parameter Voice 1 (Voice 1V) B
00 04 28	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) C
00 04 29	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) C#
00 04 2A	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) D
00 04 2B	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) D#
00 04 2C	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) E
00 04 2D	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) F
00 04 2E	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) F#
00 04 2F	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) G
00 04 20	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) G#
00 04 31	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) A
00 04 32	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) A#
00 04 33	00 00 01	00 - 30	Scale Parameter Voice 2 (Voice 1v) B
00 04 34	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) C
00 04 35	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) C#
00 04 36	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) D
00 04 37	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) D#
00 04 38	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) E
00 04 39	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) F
00 04 3A	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) F#
00 04 3B	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) G
00 04 3C	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) G#
00 04 3D	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) A
00 04 3E	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) A#
00 04 3F	00 00 01	00 - 30	Scale Parameter Voice 3 (Voice 2V) B
00 04 40	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) C
00 04 41	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) C#
00 04 42	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) D
00 04 43	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) D#
00 04 44	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) E
00 04 45	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) F
00 04 46	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) F#
00 04 47	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) G
00 04 48	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) G#
00 04 49	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) A
00 04 4A	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) A#
00 04 4B	00 00 01	00 - 30	Scale Parameter Voice 4 (Voice 2v) B

Table-2.3 End Of Bulk Mark

Address	Data	Description
1F 7F 7FH	0000_0000B	End Of Bulk Mark

Table-3. Temporary Patch Target Parameter Edit (Write Only)

Address	Data	Description		
61 00 00H	0000_nnnnB	Parameter Number	n:00H-D4H(0 - 212)	MSB
61 00 01H#	0000_nnnnB	Parameter Number		LSB
61 00 02H#	0000_vvvvB	Parameter Value		MSB
61 00 03H#	0000_vvvvB	Parameter Value		:
61 00 04H#	0000_vvvvB	Parameter Value		:
61 00 05H#	0000_vvvvB	Parameter Value		LSB

v:0000H-FFFFH(-32768 - 32767)use nibblized data

Table-4. Temporary Sound Change Request (Write Only)

Address	Data	Description
61 01 00H	0000_0000B	Sound Change Request

* When this address is accessed after a Bulk Load has been performed in the Temporary Area, the loaded data is changed.
Accessing this address without performing a Bulk Load causes the original data to be changed when a Patch Change is performed.

Table-5. Information (Read Only)

Address	Data	Description
61 02 00H	0aaa_aaaaB	Software Version Number (ASCII) 20H-7FH(32-127)
61 02 01H	0aaa_aaaaB	Software Version Number (ASCII) 20H-7FH(32-127)
	:	:
61 02 07H	0aaa_aaaaB	Software Version Number (ASCII) 20H-7FH(32-127)

Table-6. Exclusive Patch Change (Write Only)

Address	Data	Description		
61 04 00H	0000_nnnnB	Patch number	n:00H-FFH(0 - 255)	MSB
61 04 01H#	0000_nnnnB			LSB
			*User Patch; Data=(Number-2)	
			*Preset Patch;Data=(Number-128)-2	
			*use nibblized data	

[LEVEL PARAMETER GUIDE]

Offset(H)	Description			
00 00 74	Output Level L	0	-	199
00 00 78	Output Level R	0	-	199
00 00 7C	Direct Level	0	-	100,Thru(101)
00 01 00	Modulation Balance L	100:0(0)	-	0:100(100)
00 01 04	Modulation Balance R	100:0(0)	-	0:100(100)
00 01 08	Modulation Output Level	0	-	100
00 01 0C	Delay Balance L	100:0(0)	-	0:100(100)
00 01 10	Delay Balance R	100:0(0)	-	0:100(100)
00 01 14	Delay Output Level	0	-	100
00 01 18	Reverb Balance L	100:0(0)	-	0:100(100)
00 01 1C	Reverb Balance R	100:0(0)	-	0:100(100)
00 01 20	Reverb Output Level	0	-	100
00 01 24	RSS Balance L	100:0(0)	-	0:100(100)
00 01 28	RSS Balance R	100:0(0)	-	0:100(100)
00 01 2C	RSS Output Level	0	-	100

[EQ PARAMETER GUIDE]

Offset(H)	Description			
00 01 30	EQ ON/OFF	OFF(0), ON(1)		
00 01 34	EQ Low Frequency	200	2.0k [Hz]	
		*Refer to Table 11 [FREQUENCY NUMBER]		
00 01 38	EQ Low Gain	-12.0	+12.0	[dB]
		*Refer to Table 11 [GAIN NUMBER]		
00 01 3C	EQ Low Q	Shelv(2), 0.3(3) - 10(100)		
00 01 40	EQ Middle Frequency	200	8.0k [Hz]	
		*Refer to Table 11		
00 01 44	EQ Middle Gain	-12.0	+12.0	[dB]
		*Refer to Table 12		
00 01 48	EQ Middle Q	0.3(3)	- 10(100)	
00 01 4C	EQ High Frequency	2.0k	20.1k	[Hz]
		*Refer to Table 11		
00 01 50	EQ High Gain	-12.0	+12.0	[dB]
		*Refer to Table 12		
00 01 54	EQ High Q	Shelv(2), 0.3(3) - 10(100)		
00 01 58	EQ Total Gain	-12.0	+12.0	[dB]
		*Refer to Table 12		

[MODULATION PARAMETER GUIDE]

It is possible to change the Modulation effect type. Refer to the parameter arrangement for each effect type, then make the data settings.
"5:Stereo 2Band Chorus", "6:4Voices Harmonist", "7:4Voices Pitch Shifter", "8:Rotary" and "9:Space Chorus" can be selected with algorithm type B1 to type B9.

< 0:Stereo Chorus >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect	On/Off	OFF(0), ON(1)
00 01 60	MdTyp	"Chors"(0)	<Stereo Chorus>	
00 01 64	Input	Input Mode	Mono(0),	Stero(1)
00 01 68	Rate	Rate	0	100
00 01 6C	Depth	Depth	0	100
00 01 70	CH-PD	Pre Delay	0.0(0)	50.0(500) [ms]
00 01 74	LFO	LFO Waveform	Tri(0), Sin(1)	
00 01 78	Phase	Phase	0	360 [deg]
00 01 7C	XMix	Cross Mix Level	0	100
00 02 00	MPanL	Pan L	100:0(0)	0:100(100)
00 02 04	MPanR	Pan R	100:0(0)	0:100(100)
00 02 08	Reserved			
00 02 0C	Reserved			
00 02 10	Reserved			
00 02 14	Reserved			
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 1:Stereo Flanger >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"Flang"(1)	<Stereo Flanger>	
00 01 64	Input	Input Mode	Mono(0), Stero(1)	
00 01 68	Rate	Rate	0	100
00 01 6C	Depth	Depth	0	100
00 01 70	Manu	Manual	0	100
00 01 74	Resnc	Resonance	-100(0)	100(200)
00 01 78	LFO	LFO Waveform	Tri(0), Sin(1), Exp(2), Ofw1(3), Ofw2(4)	
00 01 7C	Phase	Phase	0	360 [deg]
00 02 00	MGtMd	Gate Mode	" OFF"(0), " E "(1), " D+E "(2)	
00 02 04	MGtSp	Gate Slope	0	100
00 02 08	MGtRt	Gate Rate	0	100
00 02 0C	MGtWd	Gate Width	0	100
00 02 10	Reserved			
00 02 14	Reserved			
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 2:Stereo Phaser >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"Phase"(2)	<Stereo Phaser>	
00 01 64	Input	Input Mode	" Mono"(0), "Stero"(1)	
00 01 68	Mode	Phaser Type	"4Stag"(0), "8Stag"(1)	
00 01 6C	Rate	Rate	1	100
00 01 70	Depth	Depth	0	100
00 01 74	Manu	Manual	0	100
00 01 78	Resnc	Resonance	0	100
00 01 7C	Phase	Phase	0	360 [deg]
00 02 00	Reserved			
00 02 04	Reserved			
00 02 08	Reserved			
00 02 0C	Reserved			
00 02 10	Reserved			
00 02 14	Reserved			
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 3:2Voices Harmonist >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"HR-2V"(3)	<2Voices Harmonist>	
00 01 64	Scale	Scale	"Major"(0), "Minor"(1)	
00 01 68	Key		C(0)	B(11)
		*Refer to Table 13 [KEY NOTE NUMBER]		
00 01 6C	Invl1	Voice 1 Interval	-2Oct(0)	+2Oct(28)
		*Refer to Table 14 [HORMONIST INTERVAL NUMBER]		
00 01 70	Invl2	Voice 2 Interval	-2Oct(0)	+2Oct(28)
		*Refer to Table 14		
00 01 74	Lvl-1	Voice 1 Level	0	100
00 01 78	Pan-1	Voice 1 Pan	100:0(0)	0:100(100)
00 01 7C	Lvl-2	Voice 2 Level	0	100
00 02 00	Pan-2	Voice 2 Pan	100:0(0)	0:100(100)
00 02 04	Detct	Pitch Detect Ch	Norml(0), Lch(1), Rch(2)	
00 02 08	HrSrc	Harmonist Source	Gnrl1(0), Gnrl2(1), Vocal(2)	
00 02 0C	Reserved			
00 02 10	Reserved			
00 02 14	Reserved			
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 4:2Voices Pitch Shifter >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"PS-2V"(4)	<2Voices Pitch Shifter>	
00 01 64	Mode	Pitch Shifter Mode	1(0) -	5(4), Mono(5)
00 01 68	PCrm1	Voice 1 Pitch	-24(0)	+24(48)
00 01 6C	Fine1	Voice 1 Fine	-50(0)	+50(100)
00 01 70	PCrm2	Voice 2 Pitch	-24(0)	+24(48)
00 01 74	Fine2	Voice 2 Fine	-50(0)	+50(100)
00 01 78	Lvl-1	Voice 1 Level	0	100
00 01 7C	Pan-1	Voice 1 Pan	100:0(0)	0:100(100)
00 02 00	Lvl-2	Voice 2 Level	0	100
00 02 04	Pan-2	Voice 2 Pan	100:0(0)	0:100(100)
00 02 08	Detct	Pitch Detect Channel	Norml(0), L ch(1), R ch(2), * * *(Mode 1 - 5)	
00 02 0C	PsSrc	Input Source	Gnrl1(0), Gnrl2(1), Vocal(2), * * *(Mode 1 - 5)	
00 02 10	Reserved			
00 02 14	Reserved			
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 5:Stereo 2Band Chorus >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"2Band"(5)	<Stereo 2Band Chorus>	
00 01 64	Input	Input Mode	Mono(0), Stero(1)	
00 01 68	Lo-Rt	Low Band Rate	0	100
00 01 6C	Lo-Dp	Low Band Depth	0	100
00 01 70	Lo-PD	Low Band PreDly	0.0(0)	50.0(500) [ms]
00 01 74	LoLFO	Low LFO Waveform	Tri(0), Sin(1)	
00 01 78	Lo-Ph	Low Phase	0	360 [deg]
00 01 7C	Hi-Rt	High Band Rate	0	100
00 02 00	Hi-Dp	High Band Depth	0	100
00 02 04	Hi-PD	High Band PreDly	0.0(0)	50.0(500) [ms]
00 02 08	HiLFO	High LFO Waveform	Tri(0), Sin(1)	
00 02 0C	Hi-Ph	High Phase	0	360 [deg]
00 02 10	Xover	Crossover Frequency *Refer to Table 11	100	4.00k [Hz]
00 02 14	MxLev	Mix Level	100:0(0)	0:100(100)
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 6:4Voices Harmonist >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"HR-4V"(6)	<4Voices Harmonist>	
00 01 64	Scale	Scale	Major(0), Minor(1)	
00 01 68	Key	*Refer to Table 13 [KEY NOTE NUMBER]	C(0)	B(11)
00 01 6C	Invl1	Voice 1 Interval *Refer to Table 14 [HORMONIST INTERVAL NUMBER]	-2Oct(0)	+2Oct(28)
00 01 70	Invl2	Voice 2 Interval *Refer to Table 14	-2Oct(0)	+2Oct(28)
00 01 74	Invl3	Voice 3 Interval *Refer to Table 14	-2Oct(0)	+2Oct(28)
00 01 78	Invl4	Voice 4 Interval *Refer to Table 14	-2Oct(0)	+2Oct(28)
00 01 7C	Lvl-1	Voice 1 Level	0	100
00 02 00	Pan-1	Voice 1 Pan	100:0(0)	0:100(100)
00 02 04	Lvl-2	Voice 2 Level	0	100
00 02 08	Pan-2	Voice 2 Pan	100:0(0)	0:100(100)
00 02 0C	Lvl-3	Voice 3 Level	0	100
00 02 10	Pan-3	Voice 3 Pan	100:0(0)	0:100(100)
00 02 14	Lvl-4	Voice 4 Level	0	100
00 02 18	Pan-4	Voice 4 Pan	100:0(0)	0:100(100)
00 02 1C	Detct	Pitch Detect Ch	Norml(0), Lch(1), Rch(2)	
00 02 20	HrSrc	Harmonist Source	Gnrl1(0), Gnrl2(1), Vocal(2)	
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

< 7:4Voices Pitch Shifter >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Type	OFF(0), ON(1)	
00 01 60	MdTyp	"PS-4V"(7)	<4Voices Pitch Shifter>	
00 01 64	Mode	Pitch Shifter Mode	1(0), 2(1), 3(2), 4(3), 5(4), Mono(5)	
00 01 68	PCrm1	Voice 1 Pitch	-24(0)	+24(48)
00 01 6C	Fine1	Voice 1 Fine	-50(0)	+50(100)
00 01 70	PCrm2	Voice 2 Pitch	-24(0)	+24(48)
00 01 74	Fine2	Voice 2 Fine	-50(0)	+50(100)
00 01 78	PCrm3	Voice 3 Pitch	-24(0)	+24(48)
00 01 7C	Fine3	Voice 3 Fine	-50(0)	+50(100)
00 02 00	PCrm4	Voice 4 Pitch	-24(0)	+24(48)
00 02 04	Fine4	Voice 4 Fine	-50(0)	+50(100)
00 02 08	Lvl-1	Voice 1 Level	0	100
00 02 0C	Pan-1	Voice 1 Pan	100:0(0)	0:100(100)
00 02 10	Lvl-2	Voice 2 Level	0	100
00 02 14	Pan-2	Voice 2 Pan	100:0(0)	0:100(100)
00 02 18	Lvl-3	Voice 3 Level	0	100
00 02 1C	Pan-3	Voice 3 Pan	100:0(0)	0:100(100)
00 02 20	Lvl-4	Voice 4 Level	0	100
00 02 24	Pan-4	Voice 4 Pan	100:0(0)	0:100(100)
00 02 28	Detct	Pitch Detect Ch	Norml(0), L ch(1), R ch(2), * * *(Except Mono)	
00 02 2C	PsSrc	Input Source	Gnrl1(0), Gnrl2(1), Vocal(2), * * *(Except Mono)	
00 02 30	Reserved			

< 8:Rotary >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"Rotry"(8)	<Rotary>	
00 01 64	Speed	Speed Select	SLOW(0), FAST(1)	
00 01 68	HFast	Horn Speed<FAST>	5.00(500)	10.00(1000)[Hz]
00 01 6C	RFast	Rotor Speed<FAST>	5.00(500)	10.00(1000)[Hz]
00 01 70	HSlow	Horn Speed<SLOW>	0.05(5)	5.00(500) [Hz]
00 01 74	RSlow	Rotor Speed<SLOW>	0.05(5)	5.00(500) [Hz]
00 01 78	H-Ris	Rise Time;Horn	1	100
00 01 7C	R-Ris	Rise Time;Rotor	1	100
00 02 00	H-Fal	Fall Time;Horn	1	100
00 02 04	R-Fal	Fall Time;Rotor	1	100
00 02 08	R:H	R:H Mix Balance	90:10(10)	10:90(90)
00 02 0C	Mode	Mic Setting Mode	OfMic(0), OnMic(1)	
00 02 10	H-Dpt	Horn Depth	0	100
00 02 14	R-Dpt	Rotor Depth	0	100
00 02 18	H-Trm	Horn Tremolo	0	100
00 02 1C	R-Trm	Rotor Tremolo	0	100
00 02 20	Difsn	Diffusion	0	100
00 02 24	OD-SW	OverDrive On/Off	OFF(0), ON(1)	
00 02 28	Gain	OverDrive Gain	0	100, * * *(OD-SW OFF)
00 02 2C	Drive	OverDrive Drive	1	100, * * *(OD-SW OFF)
00 02 30	OD-Lv	OverDrive Level	0	100, * * *(OD-SW OFF)

< 9:Space Chorus >

Offset	Parameter	Description		
00 01 5C	MdCtl	Modulation Effect On/Off	OFF(0), ON(1)	
00 01 60	MdTyp	"Space"(9)	<Space Chorus>	
00 01 64	Input	Input Mode	Mono(0), Stero(1)	
00 01 68	Mode	Space Mode	1(0), 2(1), 3(2), 4(3), 1+4(4), 2+4(5), 3+4(6)	
00 01 6C	Reserved			
00 01 70	Reserved			
00 01 74	Reserved			
00 01 78	Reserved			
00 01 7C	Reserved			
00 02 00	Reserved			
00 02 04	Reserved			
00 02 08	Reserved			
00 02 0C	Reserved			
00 02 10	Reserved			
00 02 14	Reserved			
00 02 18	Reserved			
00 02 1C	Reserved			
00 02 20	Reserved			
00 02 24	Reserved			
00 02 28	Reserved			
00 02 2C	Reserved			
00 02 30	Reserved			

[DELAY PARAMETER GUIDE]

It is possible to change the Delay effect type. Refer to the parameter arrangement for each effect type, then make the data settings.
"4:Quad Delay", "5:Ducking Delay" and "6:Band Pass Delay" can be selected with algorithm type A1 to A9.

<0:Simple Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0),ON(1)	
00 02 38	DlTyp	"Simpl"(0)	<Simple Delay>	
00 02 3C	Delay	Delay Time	0.1(1)	1400(14000) [ms]
00 02 40	FbLvl	Feedback Level	-100(0)	100(200)
00 02 44	D_Pan	Delay Pan	100:0(0)	0:100(100)
00 02 48	LDpFq	Low Damp Frequency	50	4.00k [Hz]
		*Refer to Table 11		
00 02 4C	LDpGn	Low Damp Gain	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 50	HDpFq	High Damp Frequency	250	16.0k [Hz]
		*Refer to Table 11		
00 02 54	HDpGn	High Damp Gain	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 58	Tempo	Tempo	25	250
00 02 5C	TpSrc	Tempo Source	* * *, Manu, MIDI, CtlSW, MIDI C#1 - 31, 64 - 95	
		*Refer to Table 15 [TEMPO SOURCE NUMBER]		
00 02 60	Note	Delay Time as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 02 64	Reserved			
00 02 68	Reserved			
00 02 6C	Reserved			
00 02 70	Reserved			
00 02 74	Reserved			
00 02 78	Reserved			
00 02 7C	Reserved			
00 03 00	Reserved			
00 03 04	Reserved			
00 03 08	Reserved			
00 03 0C	Reserved			
00 03 10	Reserved			
00 03 14	Reserved			
00 03 18	Reserved			

<1:3Tap Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0), ON(1)	
00 02 38	DlTyp	"3 Tap"(1)	<3Tap Delay>	
00 02 3C	Dly-1	Delay Time 1	0.1(1)	1400(14000) [ms]
00 02 40	Dly-2	Delay Time 2	1(1)	200(200) [%]
00 02 44	Dly-3	Delay Time 3	1(1)	200(200) [%]
00 02 48	FbDly	Feedback Delay Time	1(1)	200(200) [%]
00 02 4C	FbLvl	Feedback Level	-100(0)	100(200)
00 02 50	D_Lv1	Delay Level 1	0	100
00 02 54	D_Lv2	Delay Level 2	0	100
00 02 58	D_Lv3	Delay Level 3	0	100
00 02 5C	DPan1	Delay Pan 1	100:0(0)	0:100(100)
00 02 60	DPan2	Delay Pan 2	100:0(0)	0:100(100)
00 02 64	DPan3	Delay Pan 3	100:0(0)	0:100(100)
00 02 68	LDpFq	Low Damp Frequency	50	4.0k [Hz]
		*Refer to Table 11		
00 02 6C	LDpGn	Low Damp Gain	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 70	HDpFq	High Damp Frequency	250	16.0k [Hz]
		*Refer to Table 11		
00 02 74	HDpGn	High Damp Gain	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 78	Tempo	Tempo	25	250
00 02 7C	TpSrc	Tempo Source	* * *, Manu, MIDI, CtlSW, MIDI C#1 - 31, 64 - 95	
		*Refer to Table 15 [TEMPO SOURCE NUMBER]		
00 03 00	Note1	Delay Time 1 as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 04	Reserved			
00 03 08	Reserved			
00 03 0C	Reserved			
00 03 10	Reserved			
00 03 14	Reserved			
00 03 18	Reserved			

<2:4Tap Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0), ON(1)	
00 02 38	DlTyp	"4 Tap"(2)	<4Tap Delay>	
00 02 3C	Dly-1	Delay Time 1	0.1(1)	1400(14000) [ms]
00 02 40	Dly-2	Delay Time 2	0.1(1)	1400(14000) [ms]
00 02 44	Dly-3	Delay Time 3	0.1(1)	1400(14000) [ms]
00 02 48	Dly-4	Delay Time 4	0.1(1)	1400(14000) [ms]
00 02 4C	FbDly	Feedback Delay Time	0.1(1)	1400(14000) [ms]
00 02 50	FbLvl	Feedback Level	-100(0)	100(200)
00 02 54	D_Lv1	Delay Level 1	0	100
00 02 58	D_Lv2	Delay Level 2	0	100
00 02 5C	D_Lv3	Delay Level 3	0	100
00 02 60	D_Lv4	Delay Level 4	0	100
00 02 64	DPan1	Delay Pan 1	100:0(0)	0:100(100)
00 02 68	DPan2	Delay Pan 2	100:0(0)	0:100(100)
00 02 6C	DPan3	Delay Pan 3	100:0(0)	0:100(100)
00 02 70	DPan4	Delay Pan 4	100:0(0)	0:100(100)
00 02 74	HDpFq	High Damp Frequency	250	16.0k [Hz]
		*Refer to Table 11		
00 02 78	HDpGn	High Damp Gain	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 7C	Tempo	Tempo	25	250
00 03 00	TpSrc	Tempo Source	* * *, Manu, MIDI, CtlSW, MIDI C#1 - 31, 64 - 95	
		*Refer to Table 15 [TEMPO SOURCE NUMBER]		
00 03 04	Note1	Delay Time 1 as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 08	Note2	Delay Time 2 as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 0C	Note3	Delay Time 3 as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 10	Note4	Delay Time 4 as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 14	NoteF	Feedback Time as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 18	Reserved			

<3:Stereo Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0), ON(1)	
00 02 38	DlTyp	"Stero"(3)	<Stereo Delay>	
00 02 3C	Dly-L	Delay Time L	0.1(1)	700(7000) [ms]
00 02 40	Dly-R	Delay Time R	0.1(1)	700(7000) [ms]
00 02 44	FbLvL	Feedback Level L	-100(0)	100(200)
00 02 48	FbLvR	Feedback Level R	-100(0)	100(200)
00 02 4C	D_LvL	Delay Level L	0	100
00 02 50	D_LvR	Delay Level R	0	100
00 02 54	DPanL	Delay Pan L	100:0(0)	0:100(100)
00 02 58	DPanR	Delay Pan R	100:0(0)	0:100(100)
00 02 5C	DpFqL	High Damp Frequency L	250	16.0k [Hz]
		*Refer to Table 11		
00 02 60	DpGnL	High Damp Gain L	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 64	DpFqR	High Damp Frequency R	250	16.0k [Hz]
		*Refer to Table 11		
00 02 68	DpGnR	HighDamp Gain R	-20.0	0.0 [dB]
		*Refer to Table 12		
00 02 6C	XFLvL	Cross Feedback Level L	-100(0)	100(200)
00 02 70	XFLvR	Cross Feedback Level R	-100(0)	100(200)
00 02 74	Tempo	Tempo	25	250
00 02 78	TpSrc	Tempo Source	* * *, Manu, MIDI, CtlSW, MIDI C#1 - 31, 64 - 95	
		*Refer to Table 15 [TEMPO SOURCE NUMBER]		
00 02 7C	NoteL	Delay Time L as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 00	NoteR	Delay Time R as Note	* * *, 1/4 - 1.0	
		*Refer to Table 16 [NOTE(Delay) NUMBER]		
00 03 04	Reserved			
00 03 08	Reserved			
00 03 0C	Reserved			
00 03 10	Reserved			
00 03 14	Reserved			
00 03 18	Reserved			

<4:Quad Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0), ON(1)	
00 02 38	DlTyp	"Quad "(4)	<Quad Delay>	
00 02 3C	Dly-1	Delay Time 1	0.1(1)	1400(14000)[ms]
00 02 40	Dly-2	Delay Time 2	0.1(1)	1400(14000)[ms]
00 02 44	Dly-3	Delay Time 3	0.1(1)	1400(14000)[ms]
00 02 48	Dly-4	Delay Time 4	0.1(1)	1400(14000)[ms]
00 02 4C	FbLv1	Feedback Level 1	-100(0)	100(200)
00 02 50	FbLv2	Feedback Level 2	-100(0)	100(200)
00 02 54	FbLv3	Feedback Level 3	-100(0)	100(200)
00 02 58	FbLv4	Feedback Level 4	-100(0)	100(200)
00 02 5C	D_Lv1	Delay Level 1	0	100
00 02 60	D_Lv2	Delay Level 2	0	100
00 02 64	D_Lv3	Delay Level 3	0	100
00 02 68	D_Lv4	Delay Level 4	0	100
00 02 6C	DPan1	Delay Pan 1	100:0(0)	0:100(100)
00 02 70	DPan2	Delay Pan 2	100:0(0)	0:100(100)
00 02 74	DPan3	Delay Pan 3	100:0(0)	0:100(100)
00 02 78	DPan4	Delay Pan 4	100:0(0)	0:100(100)
00 02 7C	HDpFq	High Damp Frequency *Refer to Table 11	250	16.0k [Hz]
00 03 00	HDpGn	High Damp Gain *Refer to Table 12	-20.0	0.0 [dB]
00 03 04	Reserved			
00 03 08	Reserved			
00 03 0C	Reserved			
00 03 10	Reserved			
00 03 14	Reserved			
00 03 18	Reserved			

<5:Ducking Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0), ON(1)	
00 02 38	DlTyp	"Duck "(5) <Ducking Delay>		
00 02 3C	Dly-1	Delay Time 1	0.1(1)	1400(14000)[ms]
00 02 40	Dly-2	Delay Time 2	0.1(1)	1400(14000)[ms]
00 02 44	Dly-3	Delay Time 3	0.1(1)	1400(14000)[ms]
00 02 48	FbDly	Feedback Delay Time	0.1(1)	1400(14000)[ms]
00 02 4C	FbLv1	Feedback Level	-100(0)	100(200)
00 02 50	D_Lv1	Delay Level 1	0	100
00 02 54	D_Lv2	Delay Level 2	0	100
00 02 58	D_Lv3	Delay Level 3	0	100
00 02 5C	DPan1	Delay Pan 1	100:0(0)	0:100(100)
00 02 60	DPan2	Delay Pan 2	100:0(0)	0:100(100)
00 02 64	DPan3	Delay Pan 3	100:0(0)	0:100(100)
00 02 68	HDpFq	High Damp Frequency *Refer to Table 11	250	16.0k [Hz]
00 02 6C	HDpGn	High Damp Gain *Refer to Table 12	-20.0	0.0 [dB]
00 02 70	DckMd	Ducking Mode	OFF(0), ON(1)	
00 02 74	DckSs	Ducking Sensitivity	0	100
00 02 78	DckDp	Ducking Depth	0	100
00 02 7C	DckRs	Ducking Rise Time	0	100
00 03 00	Tempo	Tempo	25	250
00 03 04	TpSrc	Tempo Source *Refer to Table 15 [TEMPO SOURCE NUMBER]	* * *, Manu, MIDI, CtlSW, MIDI C#1 - 31, 64 - 95	
00 03 08	Note1	Delay Time 1 as Note *Refer to Table 16 [NOTE(Delay) NUMBER]	* * *, 1/4 - 1.0	
00 03 0C	Note2	Delay Time 2 as Note *Refer to Table 16 [NOTE(Delay) NUMBER]	* * *, 1/4 - 1.0	
00 03 10	Note3	Delay Time 3 as Note *Refer to Table 16 [NOTE(Delay) NUMBER]	* * *, 1/4 - 1.0	
00 03 14	NoteF	Feedback Time as Note *Refer to Table 16 [NOTE(Delay) NUMBER]	* * *, 1/4 - 1.0	
00 03 18	Reserved			

<6:Band Pass Delay>

Offset	Parameter	Description		
00 02 34	DlCtl	Delay Effect On/Off	OFF(0), ON(1)	
00 02 38	DlTyp	"BPF_D"(6)	<Band Pass Delay>	
00 02 3C	Dly-1	Delay Time 1	0.1(1)	1400(14000)[ms]
00 02 40	Dly-2	Delay Time 2	0.1(1)	1400(14000)[ms]
00 02 44	Dly-3	Delay Time 3	0.1(1)	1400(14000)[ms]
00 02 48	Dly-4	Delay Time 4	0.1(1)	1400(14000)[ms]
00 02 4C	Dly-5	Delay Time 5	0.1(1)	1400(14000)[ms]
00 02 50	FbLv1	Feedback Level	-100(0)	100(200)
00 02 54	D_Lv1	Delay Level 1	0	100
00 02 58	D_Lv2	Delay Level 2	0	100
00 02 5C	D_Lv3	Delay Level 3	0	100
00 02 60	D_Lv4	Delay Level 4	0	100
00 02 64	D_Lv5	Delay Level 5	0	100
00 02 68	DPan1	Delay Pan 1	100:0(0)	0:100(100)
00 02 6C	DPan2	Delay Pan 2	100:0(0)	0:100(100)
00 02 70	DPan3	Delay Pan 3	100:0(0)	0:100(100)
00 02 74	DPan4	Delay Pan 4	100:0(0)	0:100(100)
00 02 78	DPan5	Delay Pan 5	100:0(0)	0:100(100)
00 02 7C	Freq1	BPF 1 Frequency *Refer to Table 17 [BPF FREQUENCY NUMBER]	C0/16.4	C8/4.19k Note/[Hz]
00 03 00	Freq2	BPF 2 Frequency *Refer to Table 17 [BPF FREQUENCY NUMBER]	C0/16.4	C8/4.19k Note/[Hz]
00 03 04	Freq3	BPF 3 Frequency *Refer to Table 17 [BPF FREQUENCY NUMBER]	C0/16.4	C8/4.19k Note/[Hz]
00 03 08	Freq4	BPF 4 Frequency *Refer to Table 17 [BPF FREQUENCY NUMBER]	C0/16.4	C8/4.19k Note/[Hz]
00 03 0C	Freq5	BPF 5 Frequency *Refer to Table 17 [BPF FREQUENCY NUMBER]	C0/16.4	C8/4.19k Note/[Hz]
00 03 10	Q_1_2	BPF 1/2 Q *Refer to Table 18 [BPF Q NUMBER]	1.0	24.0
00 03 14	Q_345	BPF 3/4/5 Q *Refer to Table 18 [BPF Q NUMBER]	1.0	24.0
00 03 18	FlMix	BPF Mix Balance	100:0(0)	0:100(100)

[REVERB PARAMETER GUIDE]

It is possible to change the Reverb effect type. Refer to the parameter arrangement for each effect type, then make the data settings.

<0:Room1 >

Offset	Parameter	Description		
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)	
00 03 20	RvTyp	0:"Room1"	<Room 1>	
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200) [ms]
00 03 2C	RSize	Reverb Room Size	5.6(56)	32.6(326) [m]
00 03 30	Dnsty	Density	0	99
00 03 34	ERLvl	ER Level	0	99
00 03 38	RlDns	Release Density	0	99
00 03 3C	LoDFq	Low Damp Freq *Refer to Table 11	50	4.00k [Hz]
00 03 40	LoDmp	Low Damp Gain *Refer to Table 12	-36.0	0.0 [dB]
00 03 44	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k [Hz]
00 03 48	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0 [dB]
00 03 4C	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k [Hz]
00 03 50	GtMod	Gate Mode	Thru(0), Duck(1), Gate(2)	
00 03 54	GtThr	Gate Threshold	0	100
00 03 58	GtATm	Gate Attack Time	1	100
00 03 5C	GtHTm	Gate Hold Time	1	100
00 03 60	GtRTm	Gate Release	1	100

<1:Room2 >

Offset	Parameter	Description		
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)	
00 03 20	RvTyp	"Room2"(1)	<Room2>	
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200) [ms]
00 03 2C	RSize	Reverb Room Size	1(0)	10(9)
00 03 30	Dnsty	Density	0	99
00 03 34	ERLvl	ER Level	0	99
00 03 38	LoDFq	Low Damp Frequency *Refer to Table 11	50	4.00k [Hz]
00 03 3C	LoDmp	Low Damp Gain *Refer to Table 12	-36.0	0.0 [dB]
00 03 40	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k [Hz]
00 03 44	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0 [dB]
00 03 48	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k [Hz]
00 03 4C	Reserved			
00 03 50	Reserved			
00 03 54	Reserved			
00 03 58	Reserved			
00 03 5C	Reserved			
00 03 60	Reserved			

<2:Room3 >

Offset	Parameter	Description			
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)		
00 03 20	RvTyp	"Room3"(2)	<Room3>		
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)	[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200)	[ms]
00 03 2C	RSize	Reverb Room Size	1(0)	8(7)	
00 03 30	Dnsty	Density	0	99	
00 03 34	ERLvl	ER Level	0	99	
00 03 38	RlDns	Release Density	0	99	
00 03 3C	LoDFq	Low Damp Frequency *Refer to Table 11	50	4.0k	[Hz]
00 03 40	LoDmp	Low Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 44	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k	[Hz]
00 03 48	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 4C	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k	[Hz]
00 03 50	Reserved				
00 03 54	Reserved				
00 03 58	Reserved				
00 03 5C	Reserved				
00 03 60	Reserved				

<3:Hall1 >

Offset	Parameter	Description			
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)		
00 03 20	RvTyp	"Hall1"(3)	<Hall1>		
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)	[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200)	[ms]
00 03 2C	RSize	Reverb Room Size	1(0)	10(9)	
00 03 30	Dnsty	Density	0	99	
00 03 34	ERLvl	ER Level	0	99	
00 03 38	LoDFq	Low Damp Frequency *Refer to Table 11	50	4.00k	[Hz]
00 03 3C	LoDmp	Low Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 40	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k	[Hz]
00 03 44	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 48	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k	[Hz]
00 03 4C	Reserved				
00 03 50	Reserved				
00 03 54	Reserved				
00 03 58	Reserved				
00 03 5C	Reserved				
00 03 60	Reserved				

<4:Hall2>

Offset	Parameter	Description			
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)		
00 03 20	RvTyp	"Hall2"(4)	<Hall2>		
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)	[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200)	[ms]
00 03 2C	RSize	Reverb Room Size	1(0)	8(7)	
00 03 30	Dnsty	Density	0	99	
00 03 34	ERLvl	ER Level	0	99	
00 03 38	RlDns	Release Density	0	99	
00 03 3C	LoDFq	Low Damp Frequency *Refer to Table 11	50	4.00k	[Hz]
00 03 40	LoDmp	Low Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 44	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k	[Hz]
00 03 48	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 4C	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k	[Hz]
00 03 50	Reserved				
00 03 54	Reserved				
00 03 58	Reserved				
00 03 5C	Reserved				
00 03 60	Reserved				

<5:Garage >

Offset	Parameter	Description			
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)		
00 03 20	RvTyp	"Garge"(5)	<Garage>		
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)	[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200)	[ms]
00 03 2C	RSize	Reverb Room Size	1(0)	8(7)	
00 03 30	Dnsty	Density	0	99	
00 03 34	ERLvl	ER Level	0	99	
00 03 38	RlDns	Release Density	0	99	
00 03 3C	LoDFq	Low Damp Frequency *Refer to Table 11	50	4.00k	[Hz]
00 03 40	LoDmp	Low Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 44	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k	[Hz]
00 03 48	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 4C	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k	[Hz]
00 03 50	Reserved				
00 03 54	Reserved				
00 03 58	Reserved				
00 03 5C	Reserved				
00 03 60	Reserved				

<6:Plate >

Offset	Parameter	Description			
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)		
00 03 20	RvTyp	"Plate"(6)	<Plate>		
00 03 24	RevTm	Reverb Time	0.06(6)	32.0(3200)	[s]
00 03 28	PrDly	Reverb Pre Delay	0(0)	200(200)	[ms]
00 03 2C	RSize	Reverb Room Size	1(0)	6(5)	
00 03 30	Plate	Plate Type	1(0)	4(3)	
00 03 34	Brill	Plate Brilliance	0	100	
00 03 38	Depth	Plate Depth	0	100	
00 03 3C	Dnsty	Density	0	99	
00 03 40	ERLvl	ER Level	0	99	
00 03 44	LoDFq	Low Damp Frequency *Refer to Table 11	50	4.00k	[Hz]
00 03 48	LoDmp	Loq Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 4C	HiDFq	High Damp Frequency *Refer to Table 11	4.00k	20.1k	[Hz]
00 03 50	HiDmp	High Damp Gain *Refer to Table 12	-36.0	0.0	[dB]
00 03 54	HiCut	High Cut Frequency *Refer to Table 11	200	20.1K	[Hz]
00 03 58	Reserved				
00 03 5C	Reserved				
00 03 60	Reserved				

<7:Non-Linear >

Offset	Parameter	Description			
00 03 1C	RvCtl	Reverb Effect On/Off	OFF(0), ON(1)		
00 03 20	RvTyp	" NLR "(7)	<Non-Linear>		
00 03 24	PrDly	Reverb Pre Delay	0(0)	200(200)	[ms]
00 03 28	Dnsty	Density	0	99	
00 03 2C	ERLvl	ER Level	0	99	
00 03 30	NLR<>	NLR Type	L->R(0), Norml(1), L<-R(2)		
00 03 34	Ratio	Envelope Time Ratio	50(50)	120(120)	[%]
00 03 38	EnvT1	Envelope Time 1	0(0)	1000(1000)	[ms]
00 03 3C	EnvT2	Envelope Time 2	0(0)	1000(1000)	[ms]
00 03 40	EnvT3	Envelope Time 3	0(0)	1000(1000)	[ms]
00 03 44	EnvT4	Envelope Time 4	0(0)	1000(1000)	[ms]
00 03 48	EnvL1	Envelope Level 1	0	100	
00 03 4C	EnvL2	Envelope Level 2	0	100	
00 03 50	EnvL3	Envelope Level 3	0	100	
00 03 54	FbDly	NLR Feedback Time	1(1)	1000(1000)	
00 03 58	FbLvl	NLR Feedback Level	-100(0)	100(200)	
00 03 5C	HiCut	High Cut Frequency *Refer to Table 11	200	20.1k	[Hz]
00 03 60	Reserved				

[RSS PARAMETER GUIDE]

It is possible to change the RSS effect type. Refer to the parameter arrangement for each effect type, then make the data settings.

"3:Quad 3D" can be selected with algorithm type A1 to A9.

<0:3D Panner>

Offset	Parameter	Description		
00 03 64	RsCtl	RSS Effect On/Off	OFF(0), ON(1)	
00 03 68	RSTyp	RSS Effect Type	"Paner"(0)	<3D Panner>
00 03 6C	Speed	Panner Speed	1(1)	10(10)
00 03 70	Dir	Panner Direction	CW 5(0)	CCW 5(11)
		*Refer to Table 19 [RSS 3D PANNER DIRECTION NUMBER]		
00 03 74	Start	Start Position	L180(0)	R180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 03 78	Elev	Elevation	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 03 7C	Trig	Panner Trigger	* * *(0), CtlSW(1), Signl(2)	
00 04 00	Reserved			
00 04 04	Reserved			
00 04 08	Reserved			
00 04 0C	Reserved			
00 04 10	Reserved			
00 04 14	Reserved			
00 04 18	Reserved			

<1:Single 3D >

Offset	Parameter	Description		
00 03 64	RsCtl	RSS Effect On/Off	OFF(0), ON(1)	
00 03 68	RSTyp	RSS Effect Type	"Singl"(1)	<Single>
00 03 6C	Azmt	Azimuth	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 03 70	Elev	Elevation	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 03 74	Reserved			
00 03 78	Reserved			
00 03 7C	Reserved			
00 04 00	Reserved			
00 04 04	Reserved			
00 04 08	Reserved			
00 04 0C	Reserved			
00 04 10	Reserved			
00 04 14	Reserved			
00 04 18	Reserved			

<2:Dual 3D >

Offset	Parameter	Description		
00 03 64	RsCtl	RSS Effect On/Off	OFF(0), ON(1)	
00 03 68	RsTyp	RSS Effect Type	"Dual "(2)	<Dual 3D>
00 03 6C	Azmt1	Azimuth 1	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 03 70	Azmt2	Azimuth 2	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 03 74	Elev1	Elevation 1	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 03 78	Elev2	Elevation 2	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 03 7C	RsLv1	RSS Level 1	0	100
00 04 00	RsLv2	RSS Level 2	0	100
00 04 04	Reserved			
00 04 08	Reserved			
00 04 0C	Reserved			
00 04 10	Reserved			
00 04 14	Reserved			
00 04 18	Reserved			

<3:Quad 3D >

Offset	Parameter	Description		
00 03 64	RsCtl	RSS Effect On/Off	OFF(0), ON(1)	
00 03 68	RSTyp	RSS Effect Type	"Quad "(3)	<Quad 3D>
00 03 6C	Azmt1	Azimuth 1	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 03 70	Elev1	Elevation 1	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 03 74	RsLv1	RSS Level 1	0	100
00 03 78	Azmt2	Azimuth 2	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 03 7C	Elev2	Elevation 2	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 04 00	RsLv2	RSS Level 2	0	100
00 04 04	Azmt3	Azimuth 3	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 04 08	Elev3	Elevation 3	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 04 0C	RsLv3	RSS Level 3	0	100
00 04 10	Azmt4	Azimuth 4	R180(0)	L180(60)
		*Refer to Table 20 [RSS AZIMUTH NUMBER]		
00 04 14	Elev4	Elevation 4	-54(0)	54(6)
		*Refer to Table 21[RSS ELEVATION NUMBER]		
00 04 18	RsLv4	RSS Level 4	0	100

Table-7. [Name(ASCII) Table]

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

Table-8. [UNIT EFFECT NUMBER]

Data(H)	Description
00:	EQ
01:	DELAY
02:	REVERB
03:	MODULATION
04:	RSS

The some Effector cannot be assigned to two or more units at the same time.

Table-9. [PARAMETER NUMBER]

Data(H)	Description	
00 :	"UNIT1"	*EFFECT UNIT1
01 :	"UNIT2"	*EFFECT UNIT2
02 :	"UNIT3"	*EFFECT UNIT3
03 :	"UNIT4"	*EFFECT UNIT4
04 :	"UNIT5"	*EFFECT UNIT5
05 :	"C1Trg"	*Control1 Target Parameter
06 :	"C1Min"	*Control1 Minimum
07 :	"C1Max"	*Control1 Maximum
08 :	"C1Src"	*Control1 Source
09 :	"C1Mod"	*Control1 Switch Mode
0A :	"C2Trg"	*Control2 Target Parameter
0B :	"C2Min"	*Control2 Minimum
0C :	"C2Max"	*Control2 Maximum
0D :	"C2Src"	*Control2 Source
0E :	"C2Mod"	*Control2 Switch Mode
0F :	"C3Trg"	*Control3 Target Parameter
10 :	"C3Min"	*Control3 Minimum
11 :	"C3Max"	*Control3 Maximum
12 :	"C3Src"	*Control3 Source
13 :	"C3Mod"	*Control3 Switch Mode
14 :	"DBalL"	Delay Balance L
15 :	"DBalR"	Delay Balance R
16 :	"MBalL"	Modulation Balance L
17 :	"MBalR"	Modulation Balance R
18 :	"RBalL"	Reverb Balance L
19 :	"RBalR"	Reverb Balance R
1A :	"3BalL"	Rss Balance L
1B :	"3BalR"	Rss Balance R
1C :	"OUT_L"	Output L
1D :	"OUT_R"	Output R
1E :	"DIRCT"	Direct Level
1F :	"EqCtl"	EQ On/Off
20 :	"EQ_Gn"	EQ Out Level
21 :	"LowFq"	EQ Low Frequency
22 :	"LowGn"	EQ Low Gain
23 :	"Low_Q"	EQ Low Q
24 :	"MidFq"	EQ Mid Frequency
25 :	"MidGn"	EQ Mid Gain
26 :	"Mid_Q"	EQ Mid Q
27 :	"HigFq"	EQ High Frequency
28 :	"HigGn"	EQ High Gain
29 :	"Hig_Q"	EQ High Q
2A :	"DlCtl"	Delay Effect On/Off
2B :	"DlTyp"	*Delay Effect Type
2C :	"Delay"	Delay Time
2D :	"Dly-L"	Delay Time L
2E :	"Dly-R"	Delay Time R
2F :	"Dly-1"	Delay Time 1
30 :	"Dly-2"	Delay Time 2
31 :	"Dly-3"	Delay Time 3
32 :	"Dly-4"	Delay Time 4
33 :	"Dly-5"	Delay Time 5
34 :	"FbDly"	FB Delay Time
35 :	"FbLvl"	FB Delay Level
36 :	"FbLvL"	FB Delay Level L
37 :	"FbLvR"	FB Delay Level R
38 :	"FbLv1"	FB Delay Level 1
39 :	"FbLv2"	FB Delay Level 2
3A :	"FbLv3"	FB Delay Level 3
3B :	"FbLv4"	FB Delay Level 4
3C :	"D_Out"	Delay Level
3D :	"D_LvL"	Delay Level L
3E :	"D_LvR"	Delay Level R
3F :	"D_Lv1"	Delay Level 1
40 :	"D_Lv2"	Delay Level 2
41 :	"D_Lv3"	Delay Level 3
42 :	"D_Lv4"	Delay Level 4
43 :	"D_Lv5"	Delay Level 5
44 :	"LDpFq"	Low Damp Frequency
45 :	"LDpGn"	Low Damp Gain
46 :	"HDpFq"	High Damp Frequency
47 :	"HDpGn"	High Damp Gain
48 :	"DpFqL"	FB HFDMP Frequency L
49 :	"DpFqR"	FB HFDMP Frequency R
4A :	"DpGnL"	FB HFDMP Gain L
4B :	"DpGnR"	FB HFDMP Gain R
4C :	"D_Pan"	Delay Pan
4D :	"DPanL"	Delay Pan L
4E :	"DPanR"	Delay Pan R
4F :	"DPan1"	Delay Pan 1
50 :	"DPan2"	Delay Pan 2
51 :	"DPan3"	Delay Pan 3
52 :	"DPan4"	Delay Pan 4
53 :	"DPan5"	Delay Pan 5
54 :	"XFLvL"	Cross FB Level L
55 :	"XFLvR"	Cross FB Level R
56 :	"Tempo"	Tempo
57 :	"TpSrc"	Tempo Source
58 :	" Note"	Delay Time as Note
59 :	"NoteL"	Delay Time L as Note
5A :	"NoteR"	Delay Time R as Note
5B :	"Note1"	Delay Time 1 as Note
5C :	"Note2"	Delay Time 2 as Note
5D :	"Note3"	Delay Time 3 as Note
5E :	"Note4"	Delay Time 4 as Note
5F :	"NoteF"	Delay Time FB as Note
60 :	"DckMd"	Ducking Mode
61 :	"DckSs"	Ducking Sense
62 :	"DckDp"	Ducking Depth
63 :	"DckRs"	Ducking Rise Time
64 :	"Freq1"	BPF 1 Frequency
65 :	"Freq2"	BPF 2 Frequency
66 :	"Freq3"	BPF 3 Frequency
67 :	"Freq4"	BPF 4 Frequency
68 :	"Freq5"	BPF 5 Frequency
69 :	"Q_1_2"	BPF 1 2/Q
6A :	"Q_345"	BPF 3/4/5 Q
6B :	"FlMix"	BPF Filter Mix Balance
6C :	"RvCtl"	REVERB ON/OFF
6D :	"RvTyp"	*REVERB EFFECT TYPE
6E :	"RSize"	Reverb Size
6F :	"PrDly"	Reverb Pre Delay
70 :	"HiCut"	Reverb Post HiCut Filter
71 :	"RevTm"	Reverb Time
72 :	"Dnsty"	Density
73 :	"ERLvl"	ER Level
74 :	"RlDns"	Release Density
75 :	"LoDFq"	LFDMP Frequency
76 :	"LoDmp"	LFDMP Gain
77 :	"HiDFq"	HFDMP Frequency
78 :	"HiDmp"	HFDMP Gain
79 :	"R_Out"	Reverb Level
7A :	"Plate"	Plate Type
7B :	"Brill"	Plate Brilliance
7C :	"Depth"	Plate Depth
7D :	"NLR<>"	NLR Type
7E :	"EnvT1"	NLR Envelope Time 1
7F :	"EnvT2"	NLR Envelope Time 2
80 :	"EnvT3"	NLR Envelope Time 3
81 :	"EnvT4"	NLR Envelope Time 4
82 :	"EnvL1"	NLR Envelope Level 1
83 :	"EnvL2"	NLR Envelope Level 2
84 :	"EnvL3"	NLR Envelope Level 3
85 :	"Ratio"	NLR Envelope Time Ratio
86 :	"FbLvl"	Delay FB Level
87 :	"FbDly"	Delay FB Time
88 :	"GtMod"	Rev Gate Mode
89 :	"GtThr"	Rev Gate Threshold Level
8A :	"GtATm"	Rev Gate Attack Time
8B :	"GtHTm"	Rev Gate Hold Time
8C :	"GtRTm"	Rev Gate Release
8D :	"MdCtl"	Modulation On/Off
8E :	"MdTyp"	*Modulation Effect Type
8F :	" Rate"	Rate
90 :	"Lo-Rt"	Low Rate
91 :	"Hi-Rt"	High Rate
92 :	"Depth"	Depth
93 :	"Lo-Dp"	Low Depth
94 :	"Hi-Dp"	High Depth
95 :	"CH-PD"	Pre Delay
96 :	"Lo-PD"	Low Pre Delay
97 :	"Hi-PD"	High Pre Delay
98 :	" LFO "	LFO Waveform
99 :	"LoLFO"	Low LFO Waveform
9A :	"HiLFO"	High LFO Waveform
9B :	"Phase"	Phase
9C :	"Lo-Ph"	Low Phase
9D :	"Hi-Ph"	High Phase
9E :	" XMix"	Cross Mix Level
9F :	"MPanL"	Pan L
A0 :	"MPanR"	Pan R
A1 :	"Xover"	Crossover Frequency
A2 :	"Input"	INPUT MODE
A3 :	"M_Out"	Chorus Level
A4 :	"Speed"	Speed Select
A5 :	"HFast"	Horn(fast)
A6 :	"RFast"	Rotor(fast)

A7 :	"HSlow"	Horn(slow)
A8 :	"RSlow"	Rotor(slow)
A9 :	"H-Ris"	Rise Time:Horn
AA :	"R-Ris"	Rise Time:Rotor
AB :	"H-Fal"	Fall Time:Horn
AC :	"R-Fal"	Fall Time:Rotor
AD :	" R:H "	Rotary Mix Balance
AE :	" Mode"	Rotary Mic Setting Mode
AF :	" Mode"	Phaser 4STAGE/8STAGE
B0 :	" Mode"	Pitch Shifter MODE
B1 :	" Mode"	Space Chorus MODE
B2 :	"H-Dpt"	Horn Depth
B3 :	"R-Dpt"	Rotor Depth
B4 :	"H-Trm"	Horn Tremolo
B5 :	"R-Trm"	Rotor Tremolo
B6 :	"OD-SW"	Overdrive On/Off
B7 :	" Gain"	Overdrive Gain
B8 :	"Drive"	Overdrive Drive
B9 :	"OD-Lv"	Overdrive Level
BA :	"Difsn"	Diffusion
BB :	" Manu"	Manual
BC :	"Resnc"	Resonance
BD :	"Detct"	Pitch Detect Ch
BE :	"Scale"	Scale
BF :	" Key "	Key Note
C0 :	"Invl1"	Voice1 Interval
C1 :	"Invl2"	Voice2 Interval
C2 :	"Invl3"	Voice3 Interval
C3 :	"Invl4"	Voice4 Interval
C4 :	"Fine1"	Voice1 Fine
C5 :	"Fine2"	Voice2 Fine
C6 :	"Fine3"	Voice3 Fine
C7 :	"Fine4"	Voice4 Fine
C8 :	"Lvl-1"	Voice1 Level
C9 :	"Lvl-2"	Voice2 Level
CA :	"Lvl-3"	Voice3 Level
CB :	"Lvl-4"	Voice4 Level
CC :	"Pan-1"	Voice1 Pan
CD :	"Pan-2"	Voice2 Pan
CE :	"Pan-3"	Voice3 Pan
CF :	"Pan-4"	Voice4 Pan
D0 :	"[TBL]"	*User Scale Table
D1 :	"PCrm1"	Voice1 Pitch Shift
D2 :	"PCrm2"	Voice2 Pitch Shift
D3 :	"PCrm3"	Voice3 Pitch Shift
D4 :	"PCrm4"	Voice4 Pitch Shift
D5 :	"MGtMd"	Mod Gate Mode
D6 :	"MGtSp"	Mod Gate Type
D7 :	"MGtRt"	Mod Gate Rate
D8 :	"MGtWd"	Mod Gate Duty
D9 :	"RsCtl"	RSS ON/OFF
DA :	"RsTyp"	*RSS EFFECT TYPE
DB :	"Speed"	Speed
DC :	" Dir "	Direction
DD :	"Start"	Start
DE :	"Trig "	Trigger
DF :	" Azmt"	Azimuth
E0 :	"Azmt1"	Azimuth 1
E1 :	"Azmt2"	Azimuth 2
E2 :	"Azmt3"	Azimuth 3
E3 :	"Azmt4"	Azimuth 4
E4 :	" Elev"	Elevation
E5 :	"Elev1"	Elevation 1
E6 :	"Elev2"	Elevation 2
E7 :	"Elev3"	Elevation 3
E8 :	"Elev4"	Elevation 4
E9 :	"3_Out"	Level
EA :	"RsLv1"	Level 1
EB :	"RsLv2"	Level 2
EC :	"RsLv3"	Level 3
ED :	"RsLv4"	Level 4
EE :	"HRSrc"	Harmonist Input Source
EE :	"PsSrc"	Pitch Shifter Input Source
EF :	"BYPAS"	Bypass Control

* Parameters indicated by an asterisk("*") cannot selected with control a target.

Table-10. [CONTROL SOURCE NUMBER]

Data(H)	Description	
FFFF(-1):	" ... "	Control Off
0:	"ExPdl"	Expression Pedal
1:	"CtlSW"	Control Switch
2:	"PtBnd"	Pitch Bender
3:	"AfTch"	After Touch
4:	"Note#"	Note Number
5:	"Veloc"	Velocity
6:	"#C001"	Control Change #1
		:
		:
24:	"#C031"	Control Change #31
45:	"#C064"	Control Change #64
		:
		:
64:	"#C095"	Control Change #95

Table-11. [EQ/Damp Frequency Table]

Data(H)	Description	
00 :	" 20"	
01 :	" 23"	
02 :	" 24"	
03 :	" 25"	
04 :	" 27"	
05 :	" 28"	
06 :	" 30"	
07 :	" 32"	
08 :	" 34"	
09 :	" 36"	
0A :	" 38"	
0B :	" 40"	
0C :	" 42"	
0D :	" 45"	
0E :	" 47"	
0F :	" 50"	
10 :	" 53"	
11 :	" 56"	DLY&REV
12 :	" 59"	Low Damp
13 :	" 63"	Freq.
14 :	" 67"	
15 :	" 71"	
16 :	" 75"	
17 :	" 80"	
18 :	" 84"	
19 :	" 89"	
1A :	" 94"	
1B :	" 100"	
1C :	" 106"	
1D :	" 112"	2Band Chorus
1E :	" 118"	Cross Over Freq.
1F :	" 126"	
20 :	" 133"	
21 :	" 141"	
22 :	" 150"	
23 :	" 158"	
24 :	" 167"	
25 :	" 177"	
26 :	" 188"	
27 :	" 200"	
28 :	" 211"	
29 :	" 223"	EQ Low Freq. / EQ Mid Freq. / Reverb HiCut Freq.
2A :	" 236"	
2B :	" 250"	
2C :	" 265"	
2D :	" 281"	DLY&REV
2E :	" 298"	Hi Damp
2F :	" 315"	Freq.
30 :	" 334"	
31 :	" 354"	
32 :	" 375"	
33 :	" 397"	
34 :	" 421"	
35 :	" 446"	
36 :	" 472"	
37 :	" 500"	
38 :	" 530"	
39 :	" 562"	
3A :	" 595"	
3B :	" 630"	
3C :	" 668"	
3D :	" 708"	

3E :	" 750"							
3F :	" 794"							
40 :	" 841"							
41 :	" 891"							
42 :	" 944"							
43 :	"1.00k"							
44 :	"1.06k"							
45 :	"1.12k"							
46 :	"1.19k"							
47 :	"1.26k"							
48 :	"1.33k"							
49 :	"1.42k"							
4A :	"1.49k"							
4B :	"1.58k"							
4C :	"1.68k"							
4D :	"1.78k"							
4E :	"1.88k"							
4F :	"2.00k"	-o-	-o-					
50 :	"2.19k"							
51 :	"2.24k"		EQ					
52 :	"2.38k"		High Freq.					
53 :	"2.52k"							
54 :	"2.67k"							
55 :	"2.83k"							
56 :	"2.99k"							
57 :	"3.17k"							
58 :	"3.36k"							
59 :	"3.56k"							
5A :	"3.77k"							
5B :	"4.00k"	---o---	---o---	---o---				
5C :	"4.24k"							
5D :	"4.49k"							
5E :	"4.75k"							
5F :	"5.04k"							
60 :	"5.34k"							
61 :	"5.65k"							
62 :	"5.99k"							
63 :	"6.35k"							
64 :	"6.73k"							
65 :	"7.12k"							
66 :	"7.55k"							
67 :	"8.00k"							
68 :	"8.46k"							
69 :	"8.98k"							
6A :	"9.51k"							
6B :	"10.1k"							
6C :	"10.6k"							
6D :	"11.3k"							
6E :	"11.9k"							
6F :	"12.7k"							
70 :	"13.4k"							
71 :	"14.2k"							
72 :	"15.1k"							
73 :	"16.0k"	----------	----------	----------	----------	---o---		
74 :	"16.9k"							
75 :	"17.9k"							
76 :	"19.0k"							
77 :	"20.1k"	----------	----------	----------	----------	----------	----------	---o---

Table-12. [EQ/Damp Gain Table]

Data(H)	Description			
00 :	"-36.0"	----------	---o---	
01 :	"-35.0"			
02 :	"-34.0"		Reverb Lo&Hi Damp Gain	
03 :	"-33.0"			
04 :	"-32.0"			
05 :	"-31.0"			
06 :	"-30.0"			
07 :	"-29.0"			
08 :	"-28.0"			
09 :	"-27.0"			
0A :	"-26.0"			
0B :	"-25.0"			
0C :	"-24.0"			
0D :	"-23.0"			
0E :	"-22.0"			
0F :	"-21.0"			
10 :	"-20.0"	----------	----------	---o---
11 :	"-19.0"			
12 :	"-18.0"			Delay Lo&Hi Damp Gain
13 :	"-17.0"			
14 :	"-16.0"			
15 :	"-15.0"			
16 :	"-14.0"			
17 :	"-13.0"			
18 :	"-12.0"	-o-		
19 :	"-11.5"			
1A :	"-11.0"	EQ Gain		
1B :	"-10.5"			
1C :	"-10.0"			
1D :	" -9.5"			
1E :	" -9.0"			
1F :	" -8.5"			
20 :	" -8.0"			
21 :	" -7.5"			
22 :	" -7.0"			
23 :	" -6.5"			
24 :	" -6.0"			
25 :	" -5.5"			
26 :	" -5.0"			
27 :	" -4.5"			
28 :	" -4.0"			
29 :	" -3.5"			
2A :	" -3.0"			
2B :	" -2.5"			
2C :	" -2.0"			
2D :	" -1.5"			
2E :	" -1.0"			
2F :	" -0.5"			
30 :	" 0.0"	-	----------	---o---
31 :	" +0.5"			
32 :	" +1.0"			
33 :	" +1.5"			
34 :	" +2.0"			
35 :	" +2.5"			
36 :	" +3.0"			
37 :	" +3.5"			
38 :	" +4.0"			
39 :	" +4.5"			
3A :	" +5.0"			
3B :	" +5.5"			
3C :	" +6.0"			
3D :	" +6.5"			
3E :	" +7.0"			
3F :	" +7.5"			
40 :	" +8.0"			
41 :	" +8.5"			
42 :	" +9.0"			
43 :	" +9.5"			
44 :	"+10.0"			
45 :	"+10.5"			
46 :	"+11.0"			
47 :	"+11.5"			
48 :	"+12.0"	-o-		

Table-13. [KEY NOTE NUMBER]

Data(H)	Description
00 :	" C ",
01 :	" C♯ ",
02 :	" D ",
03 :	" D♯ ",
04 :	" E ",
05 :	" F ",
06 :	" F♯ ",
07 :	" G ",
08 :	" G♯ ",
09 :	" A ",
0A :	" A♯ ",
0B :	" B ",

Table-14. [HARMONIST INTERVAL NUMBER]

Data(H)	Description
00 :	"▼ Oct",
01 :	"▼ 7th",
02 :	"▼ 6th",
03 :	"▼ 5th",
04 :	"▼ 4th",
05 :	"▼ 3rd",
07 :	"▼ 2nd",
06 :	"▼ Oct",
08 :	"- 7th",
09 :	"- 6th",
0A :	"- 5th",
0B :	"- 4th",
0C :	"- 3rd",
0D :	"- 2nd",
0E :	"Unisn",
0F :	"+ 2nd",
10 :	"+ 3rd",
11 :	"+ 4th",
12 :	"+ 5th",
13 :	"+ 6th",
14 :	"+ 7th",
15 :	"▲ Oct",
16 :	"▲ 2th",
17 :	"▲ 3rd",
18 :	"▲ 4th",
19 :	"▲ 5th",
1A :	"▲ 6th",
1B :	"▲ 7th",
1C :	"▲ Oct",

Table-15. [TEMPO SOURCE NUMBER]

Data(H)	Description	
00 :	" ... "	Off
01 :	" Manu"	Manual
02 :	"CtlSW"	Control Switch
03 :	" MIDI"	MIDI TIMING CLOCK(F8H)
04 :	"#C001"	Control Change #1
:		
:		
22 :	"#C031"	Control Change #31
43 :	"#C064"	Control Change #64
:		
:		
62 :	"#C095"	Control Change #95

Table-16. [NOTE (Delay) NUMBER]

Data(H)	Description
00 :	" ... "
01 :	"<♪ "
02 :	"♪ 1/4"
03 :	"♪3 1/3"
04 :	"♪. 3/8"
05 :	"♪ 1/2"
06 :	"♩3 2/3"
07 :	"♩. 3/4"
08 :	"♩ 1.0"

Table-17. [BPF FREQUENCY NUMBER]

Data(H)	Description Frequency, Note	Data(H)	Description Frequency, Note
00 :	" 16.4" / "C (0)"	30 :	"261.6" / "C (4)"
01 :	" 17.3" / "C♯(0)"	31 :	"277.2" / "C♯(4)"
02 :	" 18.4" / "D (0)"	32 :	"293.7" / "D (4)"
03 :	" 19.4" / "D♯(0)"	33 :	"311.1" / "D♯(4)"
04 :	" 20.6" / "E (0)"	34 :	"329.6" / "E (4)"
05 :	" 21.8" / "F (0)"	35 :	"349.2" / "F (4)"
06 :	" 23.1" / "F♯(0)"	36 :	"370.0" / "F♯(4)"
07 :	" 24.5" / "G (0)"	37 :	"392.0" / "G (4)"
08 :	" 25.9" / "G♯(0)"	38 :	"415.3" / "G♯(4)"
09 :	" 27.5" / "A (0)"	39 :	"440.0" / "A (4)"
0A :	" 29.1" / "A♯(0)"	3A :	"466.2" / "A♯(4)"
0B :	" 30.8" / "B (0)"	3B :	"493.9" / "B (4)"
0C :	" 32.7" / "C (1)"	3C :	"523.3" / "C (5)"
0D :	" 34.6" / "C♯(1)"	3D :	"554.4" / "C♯(5)"
0E :	" 36.7" / "D (1)"	3E :	"587.3" / "D (5)"
0F :	" 38.9" / "D♯(1)"	3F :	"622.3" / "D♯(5)"
10 :	" 41.2" / "E (1)"	40 :	"659.3" / "E (5)"
11 :	" 43.7" / "F (1)"	41 :	"698.5" / "F (5)"
12 :	" 46.2" / "F♯(1)"	42 :	"740.0" / "F♯(5)"
13 :	" 49.0" / "G (1)"	43 :	"784.0" / "G (5)"
14 :	" 51.9" / "G♯(1)"	44 :	"830.6" / "G♯(5)"
15 :	" 55.0" / "A (1)"	45 :	"880.0" / "A (5)"
16 :	" 58.3" / "A♯(1)"	46 :	"932.3" / "A♯(5)"
17 :	" 61.7" / "B (1)"	47 :	"987.8" / "B (5)"
18 :	" 65.4" / "C (2)"	48 :	"1.05k" / "C (6)"
19 :	" 69.3" / "C♯(2)"	49 :	"1.11k" / "C♯(6)"
1A :	" 73.4" / "D (2)"	4A :	"1.17k" / "D (6)"
1B :	" 77.8" / "D♯(2)"	4B :	"1.24k" / "D♯(6)"
1C :	" 82.4" / "E (2)"	4C :	"1.32k" / "E (6)"
1D :	" 87.3" / "F (2)"	4D :	"1.40k" / "F (6)"
1E :	" 92.4" / "F♯(2)"	4E :	"1.48k" / "F♯(6)"
1F :	" 97.9" / "G (2)"	4F :	"1.57k" / "G (6)"
20 :	"103.8" / "G♯(2)"	50 :	"1.66k" / "G♯(6)"
21 :	"110.0" / "A (2)"	51 :	"1.76k" / "A (6)"
22 :	"116.5" / "A♯(2)"	52 :	"1.86k" / "A♯(6)"
23 :	"123.5" / "B (2)"	53 :	"1.98k" / "B (6)"
24 :	"130.8" / "C (3)"	54 :	"2.09k" / "C (7)"
25 :	"138.6" / "C♯(3)"	55 :	"2.22k" / "C♯(7)"
26 :	"146.8" / "D (3)"	56 :	"2.35k" / "D (7)"
27 :	"155.6" / "D♯(3)"	57 :	"2.49k" / "D♯(7)"
28 :	"164.8" / "E (3)"	58 :	"2.64k" / "E (7)"
29 :	"174.6" / "F (3)"	59 :	"2.79k" / "F (7)"
2A :	"185.0" / "F♯(3)"	5A :	"2.96k" / "F♯(7)"
2B :	"196.0" / "G (3)"	5B :	"3.15k" / "G (7)"
2C :	"207.7" / "G♯(3)"	5C :	"3.33k" / "G♯(7)"
2D :	"220.0" / "A (3)"	5D :	"3.52k" / "A (7)"
2E :	"233.1" / "A♯(3)"	5E :	"3.73k" / "A♯(7)"
2F :	"246.9" / "B (3)"	5F :	"3.95k" / "B (7)"
		60 :	"4.19k" / "C (8)"

Table-18. [BPF Q NUMBER]

Data(H)	Description
00 :	" 1.0"
01 :	" 1.4"
02 :	" 2.0"
03 :	" 2.8"
04 :	" 4.0"
05 :	" 5.6"
06 :	" 8.0"
07 :	" 11.2"
08 :	" 16.0"
09 :	" 24.0"

Table-19. [RSS 3D PANNER DIRECTION NUMBER]

Data(H)	Description
00 :	" CW 5",
01 :	" CW 4",
02 :	" CW 3",
03 :	" CW 2",
04 :	" CW 1",
05 :	" CW ",
06 :	"CCW ",
07 :	"CCW 1",
08 :	"CCW 2",
09 :	"CCW 3",
0A :	"CCW 4",
0B :	"CCW 5",

Table-20. [RSS AZIMUTH NUMBER]

Data(H)	Description
00 :	" L180"
01 :	" L174"
02 :	" L168"
03 :	" L162"
04 :	" L156"
05 :	" L150"
06 :	" L144"
07 :	" L138"
08 :	" L132"
09 :	" L126"
0A :	" L120"
0B :	" L114"
0C :	" L108"
0D :	" L102"
0E :	" L 96"
0F :	" L 90"
10 :	" L 84"
11 :	" L 78"
12 :	" L 72"
13 :	" L 66"
14 :	" L 60"
15 :	" L 54"
16 :	" L 48"
17 :	" L 42"
18 :	" L 36"
19 :	" L 30"
1A :	" L 24"
1B :	" L 18"
1C :	" L 12"
1D :	" L 6"
1E :	" 0"
1F :	" R 6"
20 :	" R 12"
21 :	" R 18"
22 :	" R 24"
23 :	" R 30"
24 :	" R 36"
25 :	" R 42"
26 :	" R 48"
27 :	" R 54"
28 :	" R 60"
29 :	" R 66"
2A :	" R 72"
2B :	" R 78"
2C :	" R 84"
2D :	" R 90"
2E :	" R 96"
2F :	" R102"
30 :	" R108"
31 :	" R114"
32 :	" R120"
33 :	" R126"
34 :	" R132"
35 :	" R138"
36 :	" R144"
37 :	" R150"
38 :	" R156"
39 :	" R162"
3A :	" R168"
3B :	" R174"
3C :	" R180"

Table-21. [RSS ELEVATION NUMBER]

Data(H)	Description
00 :	" -54"
01 :	" -36"
02 :	" -18"
03 :	" 0"
04 :	" +18"
05 :	" +36"
06 :	" +54"

Table-22. [HARMONIST SCALE INTERVAL]

Data(H)	Description
00 :	Pitch = -24
01 :	Pitch = -23
02 :	Pitch = -22
03 :	Pitch = -21
04 :	Pitch = -20
05 :	Pitch = -19
06 :	Pitch = -18
07 :	Pitch = -17
08 :	Pitch = -16
09 :	Pitch = -15
0A :	Pitch = -14
0B :	Pitch = -13
0C :	Pitch = -12
0D :	Pitch = -11
0E :	Pitch = -10
0F :	Pitch = -9
10 :	Pitch = -8
11 :	Pitch = -7
12 :	Pitch = -6
13 :	Pitch = -5
14 :	Pitch = -4
15 :	Pitch = -3
16 :	Pitch = -2
17 :	Pitch = -1
18 :	Pitch = 0
19 :	Pitch = +1
1A :	Pitch = +2
1B :	Pitch = +3
1C :	Pitch = +4
1D :	Pitch = +5
1E :	Pitch = +6
1F :	Pitch = +7
20 :	Pitch = +8
21 :	Pitch = +9
22 :	Pitch = +10
23 :	Pitch = +11
24 :	Pitch = +12
25 :	Pitch = +13
26 :	Pitch = +14
27 :	Pitch = +15
28 :	Pitch = +16
29 :	Pitch = +17
2A :	Pitch = +18
2B :	Pitch = +19
2C :	Pitch = +20
2D :	Pitch = +21
2E :	Pitch = +22
2F :	Pitch = +23
30 :	Pitch = +24

For Reference

Examples of Exclusive (SysEx) messages and an explanation of how checksums are calculated

Several methods are available for using SysEx messages to edit the SX-700's Patch data.

1. Edit the data in the Temporary Area.
When editing the data for a Patch that is currently being output, the data is set into the Temporary Area. The sounds being output can be controlled in real time by editing this portion of the data.
Make the setting for Indio Visual or Bulk Area. When set for Bulk Area, the SCR must be sent after the setting has been made (see Example 6).

2. Set the data to the User Area.
* The sounds being output are not changed by just making the setting, so the program should be changed by a Program Change message or key operations after the data has been sent.

3. Read in the data to the SX-700, use the editor to change the settings, then send the data to the unit.
* Data cannot be written to the Preset Area.
* The sounds being output are not changed by just sending the data, so the program should be changed by a Program Change message or key operation after the data has been sent.

Example 1)
Setting the EQ Low Band gain for an effect sound being output at -12 dB

Two methods are introduced:
1. Set the data to the parameter's address.
2. Set the parameter and data to a specific address.

In either case, the data in the Temporary Area is edited.

1. Add the parameter offset address to the temporary Patch parameters in the Individual Area, and set the data to this address.

Refer to:
Table 2.1.2 PROGRAM PARAMETERS (Individual Area)
Table 2.2 Patch Parameters and [EQ PARAMETER GUIDE], and calculate the actual address from the base address 60 00 00H of the temporary Patch parameters and the offset address 00 01 38H of the EQ Low Gain.

```
  60 00 00H    Base address
+ 00 01 38H    Offset address
  60 01 38H
```

From Table 12 [Gain Table], the value when at -12 dB is calculated to be 18H. The value is the 4-byte nibbled setting, and so:

16-bit	4-bit MSB			LSB
0000_0000_0001_1000B	0000_0000B	0000_0000B	0000_0001B	0000_1000B
0018H	00H	00H	01H	08H

(1) through (6) are set according to Roland's format for Exclusive (SysEx) messages. Refer to the form in Table 2.2 to set the value sequentially in 4-byte nibbles from MSB to LSB.

```
F0  41  00  7A  12  60  01  38  00  00  01  08  ???  F7
                    ^^^^^^^^^^  ^^^^^^^^^^^^^^  ^^^
(1) (2) (3) (4) (5)    (6)           (7)         (8)  (9)

(1)Exclusive Status
(2)Manufacturer ID (Roland)
(3)Device ID (DEV:  00H to 1FH)
(4)Model ID (SX-700)
(5)Common ID (DT1)
(6)Address
(7)Data (4-bit nibbled, MSB first)
(8)Checksum
(9)End of Exclusive
```

Next, the checksum (8) is calculated.

```
(6) Address + (7) Data =

60H + 01H + 38H + 00H + 00H + 01H + 08H = 60H (sum)
96  +  1  + 56  +  0  +  0  +  1  +  8  = 162

162 (sum) / 128 = 1 (quotient) ··· (remainder)
Checksum = 128 - 34 (remainder) = 94 = 5EH
```

Consequently, this message sends:
F0 41 00 7A 12 60 01 38 00 00 01 08 5E F7.

2. The parameter number and parameter value are set at Temporary Patch Target Parameter Edit (Write Only). In this case, be sure to send the parameter number and parameter value together.

Table 9 [PARAMETER NUMBER] shows that the EQ Low Gain is 22H, and

The parameter number is set with 2-byte nibbling, and so:

Decimal	8-bit	4-bit MSB	LSB
LowGn	0010_0010B	0000_0010B	0000_0010B
34	22H	02H	02H

The value 18H when at -12 dB is determined from Table 12 [Gain Table].

The parameter value is the 4-byte nibbled setting, and so:

16-bit	4-bit MSB			LSB
0000_0000_0001_1000B	0000_0000B	0000_0000B	0000_0001B	0000_1000B
0018H	00H	00H	01H	08H

(1) through (6) are set according to Roland's format for Exclusive (SysEx) messages. Refer to the form in Table 3 to set the number and the value sequentially in nibbles from MSB to LSB.

```
F0  41  00  7A  12  61  00  00  02  02  00  00  01  08  ???  F7
                    ^^^^^^^^^^  ^^^^^^  ^^^^^^^^^^^^^^  ^^^
(1) (2) (3) (4) (5)    (6)        (7)          (8)        (9)  (10)

(1)Exclusive Status
(2)Manufacturer ID (Roland)
(3)Device ID (DEV: 00H to 1FH)
(4)Model ID (SX-700)
(5)Common ID (DT1)
(6)Address
(7)Data (4-bit nibbled, MSB first)
(8)Data (4-bit nibbled, MSB first)
(9)Checksum
(10)End of Exclusive
```

Next, the checksum (9) is calculated.

```
(6) Address + (7) + (8) Data =

61H + 00H + 00H + 02H + 02H + 00H + 00H + 01H + 08H = 6CH(sum)
97  +  0  +  0  +  2  +  2  +  0  +  0  +  1  +  8  = 110

110 (sum) / 128 = 0 (quotient) ··· 110 (remainder)
Checksum = 128 - 110 (remainder) = 18 = 12H
```

Consequently, this message sends:
F0 41 00 7A 12 61 00 00 02 02 00 00 01 08 12 F7.

Example 2)
Using Exclusive Program Change messages to change the Program Number to factory preset No. 25

Because the User Area is "Data = (Number - 2)" and the Factory Area is "Data - (Number - 128) -2", Factory preset No. 26 is P-026 (152: 98h).

The data is in 2-byte nibbled format, and so:

Decimal	8-bit	4-bit MSB	LSB
P-026	1001_1000B	0000_1001B	0000_1000B
152	98H	09H	08H

(1) through (6) are set according to Roland's format for Exclusive (SysEx) messages. Refer to the form in Table 6 to set the Program Number sequentially in 4-byte nibbles from MSB to LSB.

```
F0  41  00  7A  12  61  04  00  09  08  ???  F7
                    ^^^^^^^^^^  ^^^^^^  ^^^
(1) (2) (3) (4) (5)    (6)        (7)    (8)  (9)
```

Next, the checksum (8) is calculated.

```
(6) Address + (7) Data =

61H + 04H + 00H + 09H + 08H = 76H (sum)
97  +  4  +  0  +  9  +  8  = 118

118 (sum) / 128 = 0 (quotient) ··· 118 (remainder)
Checksum = 128 - 118 (remainder) = 10 = 0AH
```

Consequently, this message sends:
F0 41 00 7A 12 61 04 00 09 08 0A F7.

Example 3)
Changing the Reverb type for User Number 15 to "Plate"

* The settings in the unit's memory are changed by sending this data, but the sounds being output do not change.
  This is valid when the patch has been changed to "User 15 (U-015)" by a Program Change message or key operation.

Determine the address.
According to the "Parameter Address Map," the base address for user patch 15 is:

```
01 64 00H
```

Refer to Table 2.2 to determine the offset address.
The offset address for the Reverb type is:

```
00 03 20H
```

```
  01 64 00H    Base address
+ 00 03 20H    Offset address
  01 67 20H
```

Next, refer to the REVERB PARAMETER GUIDE to determine the value for "Plate."

<6:Plate>

The value is the 4-byte nibbled setting, and so:

16-bit	4-bit MSB			LSB
0000_0000_0000_0110B	0000_0000B	0000_0000B	0000_0000B	0000_0110B
0006H	00H	00H	00H	06H

Refer to the form in Table 2.2 to set the number and the value sequentially in 4-byte nibbles from MSB to LSB.

```
F0  41  00  7A  12  01  67  20  00  00  00  06  sum  F7
                    ^^^^^^^^^^  ^^^^^^^^^^^^^^  ^^^
(1) (2) (3) (4) (5)    (6)         (7)            (8) (9)
```

Next, the checksum (8) is calculated.

```
(6) Address + (7) Data =

01H + 67H + 20H + 00H + 00H + 00H + 06H = 8EH (sum)
1  + 103 +  32 +  0  +  0  +  0  +  6  = 142

142 (sum) / 128 = 1 (quotient) ··· 14 (remainder)
Checksum = 128 - 14 (remainder) = 114 = 72H
```

Consequently, this message sends:

```
F0 41 00 7A 12 01 67 20 00 00 00 06 72 F7.
```

Example 4)
Sending a data request to call a program for a User Patch from the unit

For User Patch No. 99:

```
F0  41  00  7A  11  0C  24  00  00  04  4B  sum  F7
                    ^^^^^^^^^^  ^^^^^^^^^^  ^^^
(1) (2) (3) (4) (5)    (6)         (7)      (8) (9)

(1)Exclusive Status
(2)Manufacturer ID (Roland)
(3)Device ID (Dev:  00H to 1FH)
(4)Model ID (SX-700)
(5)Command ID (RQ1)
(6)Address     User Patch "No. 99" Address
               (Implementation Table 2.1.1)
(7)Size        Size of Parameters of one Patch
               (Implementation Table 2.2)
(8)Checksum    80H - |(0CH + 24H + 00H + 00H + 04H + 4BH) & 7FH|
(9)End of Exclusive
```

This message sends F0 41 00 7A 11 0C 24 00 00 04 4B 01 F7.

How to calculate the address:

```
User Patch 1 to 128:   '00 10 00' * (N - 1) + '00 04 00'
Preset Patch 1 to 128: '00 10 00' * (N - 1) + '10 04 00'
              N:  Number of Patch(es)
```

Example 5)
Sending the following data at the end of the sent data when data has been sent to the Bulk Area.

```
F0  41  00  7A  12  1F  7F  7F  00  sum  F7
                    ^^^^^^^^^^  ^^  ^^^
(1) (2) (3) (4) (5)    (6)      (7) (8) (9)

(1)Exclusive Status
(2)Manufacturer ID (Roland)
(3)Device ID (Dev: 00H to 1FH)
(4)Model ID (SX-700)
(5)Command ID (DT1)
(6)Address     (End of Bulk mark)
(7)Data (00H)
(8)Checksum    80H - |(1FH + 7FH + 7FH + 00H) & 7FH |
(9)EOX
```

This message sends F0 41 00 7A 12 1F 7F 7F 00 63 F7.

Example 6)
How to send an SCR (Sound Change Request)

When data has been sent to the Bulk Area for a Temporary Patch, the data is held until an SCR is received.
The following data must be sent at the end of the sent data in order for the data that has been set to be made valid.

```
F0  41  00  7A  12  61  01  00  00  sum  F7
                    ^^^^^^^^^^  ^^  ^^^
(1) (2) (3) (4) (5)    (6)      (7) (8) (9)

(1)Exclusive Status
(2)Manufacturer ID (Roland)
(3)Device ID (Dev:  00H to 1FH)
(4)Model ID (SX-700)
(5)Command ID (DT1)
(6)Address     (Sound Change Request)
(7)Data (00H)
(8)Checksum    80H - |(61H + 01H + 00H + 00H) & 7FH |
(9)EOX
```

This message sends F0 41 00 7A 12 61 01 00 00 1E F7.

Reference Material

Two's complement in 16-bit value

10-bit	16-bit	10-bit	16-bit	10-bit	16-bit
0	0000h	-13	FFF3h	-25	FFE7h
-1	FFFFh	-14	FFF2h	-26	FFE6h
-2	FFFEh	-15	FFF1h	-27	FFE5h
-3	FFFDh	-16	FFF0h	-28	FFE4h
-4	FFFCh	-17	FFEFh	-29	FFE3h
-5	FFFBh	-18	FFEEh	-30	FFE2h
-6	FFFAh	-19	FFEDh	-31	FFE1h
-7	FFF9h	-20	FFECh	-32	FFE0h
-8	FFF8h	-21	FFEBh	-33	FFDFh
-9	FFF7h	-22	FFEAh	-34	FFDEh
-10	FFF6h	-23	FFE9h	-35	FFDDh
-11	FFF5h	-24	FFE8h	-36	FFDCh
-12	FFF4h				

ROLAND EXCLUSIVE MESSAGES

1. Data Format for Exclusive Messages

Roland's MIDI implementation uses the following data format for all Exclusive messages (type IV):

Byte	Description
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Main data
F7H	End of exclusive

•MIDI status: F0H, F7H

An Exclusive message must be flanked by a pair of status codes, starting with a Manufacturer ID immediately after F0H (MIDI version 1.0).

•Manufacturer ID: 41H

The Manufacturer ID identifies the manufacturer of a MIDI instrument that sends an Exclusive message. Value 41H represents Roland's Manufacturer ID.

•Device ID: DEV

The Device ID contains a unique value that identifies individual devices in the implementation of several MIDI instruments. It is usually set to 00H–0FH, a value smaller by one than that of a basic channel, but value 00H–1FH may be used for a device with several basic channels.

•Model ID: MDL

The Model ID contains a value that identifies one model from another. Different models, however, may share an identical Model ID if they handle similar data.

The Model ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Model IDs, each representing a unique model:

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

•Command ID: CMD

The Command ID indicates the function of an Exclusive message. The Command ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Command IDs, each representing a unique function:

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

•Main data: BODY

This field contains a message to be exchanged across an interface. The exact data size and content will vary with the Model ID and Command ID.

2. Address-mapped Data Transfer

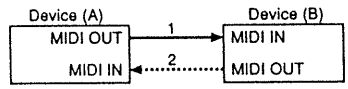
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory-resident records—waveform and tone data, switch status, and parameters, for example, to specific locations in a machine-dependent address space, thereby allowing access to data residing at the address a message specifies.

Address-mapped data transfer is therefore independent of models and data categories. This technique allows use of two different transfer procedures: one-way transfer and handshake transfer.

•One-way transfer procedure (See Section 3 for details.)

This procedure is suited to the transfer of a small amount of data. It sends out an Exclusive message completely independent of the receiving device's status.

Connection Diagram

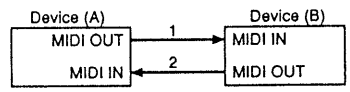


Connection at point 2 is essential for "Request data" procedures. (See Section 3.)

•Handshake-transfer procedure (This device does not use this procedure)

This procedure initiates a predetermined transfer sequence (handshaking) across the interface before data transfer takes place. Handshaking ensures that reliability and transfer speed are high enough to handle a large amount of data.

Connection Diagram



Connection at points 1 and 2 is essential.

Notes on the above procedures

* *There are separate Command IDs for different transfer procedures.*
* *Devices A and B cannot exchange data unless they use the same transfer procedure, share identical Device ID and Model ID, and are ready for communication.*

3. One-way Transfer Procedure

This procedure sends out data until it has all been sent and is used when the messages are so short that answerbacks need not be checked. For longer messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts 20 milliseconds intervals.

Types of Messages

Message	Command ID
Request data 1	RQ1 (11H)
Data set 1	DT1 (12H)

•Request data 1: RQ1 (11H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQ1 message, the remote device checks its memory for the data address and size that satisfy the request.

If it finds them and is ready for communication, the device will transmit a "Data set 1 (DT1)" message, which contains the requested data. Otherwise, the device won't send out anything.

Byte	Description
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
11H	Command ID
aaH	Address MSB
|	|
|	|
	LSB
ssH	Size MSB
|	|
|	|
	LSB
sum	Check sum
F7H	End of exclusive

* ***The size of the requested data does not indicate the number of bytes that will make up a DT1 message, but represents the address fields where the requested data resides.***
* ***Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.***
* ***The same number of bytes comprises address and size data, which, however, vary with the Model ID.***
* ***The error-checking process uses a checksum that provides a bit pattern where the last 7 bits are zero when values for an address, size, and that checksum are summed.***

•Data set 1: DT1 (12H)

This message corresponds to the actual data transfer process.

Because every byte in the data is assigned a unique address, a DT1 message can convey the starting address of one or more bits of data as well as a series of data formatted in an address-dependent order.

The MIDI standards inhibit non real-time messages from interrupting an Exclusive one. This fact is inconvenient for devices that support a "soft-thru" function. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate 'segments'.

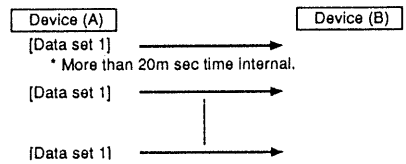
Byte	Description
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
12H	Command ID
aaH	Address MSB
|	|
|	|
	LSB
ddH	Data MSB
|	|
|	|
	LSB
sum	Check sum
F7H	End of exclusive

* ***A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.***
* ***Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.***
* ***The number of bytes comprising address data varies from one Model ID to another.***
* ***The error-checking process uses a checksum that provides a bit pattern where the last 7 bits are zero when values for an address, data, and that checksum are summed.***

•Example of Message Transactions

•Device A sending data to Device B

Transfer of a DT1 message is all that takes place.



•Device B requesting data from Device A

Device B sends an RQ1 message to Device A.

Checking the message, Device A sends a DT1 message back to Device B.

