

Model: RD-300SX (Digital Piano)  
Date: Nov. 1, 2004  
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)	

- \* Some instruments are not received in Rhythm set.
- \* The velocity values of Note Off messages are ignored.

#### ● 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:	00 00H - 7F 7FH (bank.1 - bank.16384)	

- \* The SETUP, Rhythms, and Tones corresponding to each Bank Select are as follows.

BANK MSB	SELECT LSB	PROGRAM NUMBER	GROUP	NUMBER
000		001 - 128	GM Tone	
:		:	:	:
032		001 - 128	GM Tone	
085	000	001 - 032	SETUP	S.11 - S.84
086	064	001 - 005	Rhythm Set	1 - 5
087	064	001 - 010	Tone (PIANO)	1 - 10
	065	001 - 010	Tone (E.PIANO)	1 - 10
	066	001 - 007	Tone (ORGAN)	1 - 7
	067	001 - 012	Tone (STRINGS/PAD)	1 - 12
	068	001 - 013	Tone (GTR/BASS)	1 - 13
	069	001 - 010	Tone (BRASS/WINDS)	1 - 10
	070	001 - 008	Tone (VOICE/SYNTH)	1 - 8
120		001 - 057	GM2 Rhythm	6 - 14
121	000 -	001 - 128	GM2 Tone	15 - 270

##### ○ 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)	

##### ○ Portamento Time (Controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Portamento Time:	00H - 7FH (0 - 127)	

##### ○ Data Entry (Controller number 6, 38)

Status	2nd byte	3rd byte
BnH	06H	mmH
BnH	26H	llH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm, ll = the value of the parameter specified by RPN/NRPN		
mm = MSB, ll = LSB		

##### ○ Volume (Controller number 7)

Status	2nd byte	3rd byte
BnH	07H	vvH
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)	

##### ○ General Purpose Controller 1 (Controller number 16)

Status	2nd byte	3rd byte
BnH	10H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	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	

##### ○ Portamento (Controller number 65)

Status	2nd byte	3rd byte
BnH	41H	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	

##### ○ Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON	

##### ○ Legato Foot Switch (Controller number 68)

Status	2nd byte	3rd byte
BnH	44H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON	

##### ○ Resonance (Controller number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Resonance value (relative change):	00H - 7FH (-64 - 0 - +63)	

##### ○ Release Time (Controller number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Release Time value (relative change):	00H - 7FH (-64 - 0 - +63)	

##### ○ Attack time (Controller number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Attack time value (relative change):	00H - 7FH (-64 - 0 - +63)	

##### ○ Cutoff (Controller number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Cutoff value (relative change):	00H - 7FH (-64 - 0 - +63)	

# RD-300SX MIDI Implementation

## ○Decay Time (Controller number 75)

Status            2nd byte            3rd byte  
 BnH                4BH                    vvH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 vv = Decay Time value (relative change): 00H - 7FH (-64 - 0 - +63)

## ○Vibrato Rate (Controller number 76)

Status            2nd byte            3rd byte  
 BnH                4CH                    vvH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 vv = Vibrato Rate value (relative change): 00H - 7FH (-64 - 0 - +63)

## ○Vibrato Depth (Controller number 77)

Status            2nd byte            3rd byte  
 BnH                4DH                    vvH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 vv = Vibrato Depth Value (relative change): 00H - 7FH (-64 - 0 - +63)

## ○Vibrato Delay (Controller number 78)

Status            2nd byte            3rd byte  
 BnH                4EH                    vvH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 vv = Vibrato Delay value (relative change): 00H - 7FH (-64 - 0 - +63)

## ○Portamento Control (Controller number 84)

Status            2nd byte            3rd byte  
 BnH                54H                    kkH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 kk = source note number:    00H - 7FH (0 - 127)

- \* A Note-on received immediately after a Portamento Control message will change continuously in pitch, starting from the pitch of the Source Note Number.
- \* If a voice is already sounding for a note number identical to the Source Note Number, this voice will continue sounding (i.e., legato) and will, when the next Note-on is received, smoothly change to the pitch of that Note-on.
- \* The rate of the pitch change caused by Portamento Control is determined by the Portamento Time value.

## ○Effect 1 (Reverb Send Level) (Controller number 91)

Status            2nd byte            3rd byte  
 BnH                5BH                    vvH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 vv = Reverb Send Level:    00H - 7FH (0 - 127)

## ○Effect 3 (Chorus Send Level) (Controller number 93)

Status            2nd byte            3rd byte  
 BnH                5DH                    vvH  
 n = MIDI channel number:    0H - FH (ch.1 - 16)  
 vv = Chorus Send Level:    00H - 7FH (0 - 127)

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

Status            2nd byte            3rd byte  
 BnH                65H                    mmH  
 BnH                64H                    llH  
 n = MIDI channel number: 0H - FH (ch.1 - 16)  
 mm = upper byte (MSB) of parameter number specified by RPN  
 ll = lower byte (LSB) of parameter number specified by RPN

<<< RPN >>>

Control Changes include RPN (Registered Parameter Numbers), which are extended. When using RPNs, first RPN (Controller numbers 100 and 101; they can be sent in any order) should be sent in order to select the parameter, then Data Entry (Controller numbers 6 and 38) should be sent to set the value. Once RPN messages are received, Data Entry messages that is received at the same MIDI channel after that are recognized as changing toward the value of the RPN messages. In order not to make any mistakes, transmitting RPN Null is recommended after setting parameters you need.

This device receives the following RPNs.

RPN	Data entry	Notes
MSB_LSB	MSB_LSB	Notes
00H, 00H	mmH, llH	Pitch Bend Sensitivity mm: 00H - 18H (0 - 24 semitones) ll: ignored (processed as 00H) Up to 2 octave can be specified in semitone steps. * The Bend Range parameter (Tone Info:Bend Range) will change.

00H, 01H	mmH, llH	Channel Fine Tuning mm, ll: 20 00H - 40 00H - 60 00H (-4096 x 100 / 8192 - 0 - +4096 x 100 / 8192 cent) * The Fine Tune parameter (Tone Info:Fine Tune) will change.
----------	----------	---

00H, 02H	mmH, llH	Channel Coarse Tuning mm: 10H - 40H - 70H (-48 - 0 - +48 semitones) ll: ignored (processed as 00H) * The Coarse Tune parameter (Tone Info:Coarse Tune) will change.
----------	----------	--

00H, 05H	mmH, llH	Modulation Depth Range mm, ll: 00 00H - 06 00H (0 - 16384 * 600 / 16384 cent)
----------	----------	--

7FH, 7FH	---, ---	RPN null RPN and NRPN will be set as "unspecified." Once this setting has been made, subsequent Parameter values that were previously set will not change. mm, ll: ignored
----------	----------	--

## ●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)

## ●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

### ●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)
Channel Pressure	0 (off)
Modulation	0 (off)
Breath Type	0 (min)
Expression	127 (max)
Hold 1	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
Hold 2	0 (off)
RPN	unset; previously set data will not change
NRPN	unset; previously set data will not change

### ●All Notes Off (Controller number 123)

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

## ●MONO (Controller number 126)

Status	2nd byte	3rd byte
BnH	7EH	mmH
n = MIDI channel number:		0H - FH (ch.1 - 16)
mm = mono number:		00H - 10H (0 - 16)

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

## ●POLY (Controller number 127)

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

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

## ■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 - 1FH (1 - 32), the initial value is 10H (17).)
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. 7) will be transmitted.

### ○GM1 System On

Status	Data byte	Status
F0H	7EH, 7FH, 09H, 01H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
01H	Sub ID#2 (General MIDI 1 On)
F7H	EOX (End Of Exclusive)

### ○GM2 System On

Status	Data byte	Status
F0H	7EH 7FH 09H 03H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
03H	Sub ID#2 (General MIDI 2 On)
F7H	EOX (End Of Exclusive)

### ○GM System Off

Status	Data byte	Status
F0H	7EH, 7F, 09H, 02H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
02H	Sub ID#2 (General MIDI Off)
F7H	EOX (End Of Exclusive)

## ●Universal Realtime System Exclusive Messages

### ○Master Volume

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 01H, 11H, mmH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control messages)
01H	Sub ID#2 (Master Volume)
11H	Master Volume lower byte
mmH	Master Volume upper byte
F7H	EOX (End Of Exclusive)

\* The lower byte (11H) of Master Volume will be handled as 00H.

\* The Master Volume parameter (EDIT:System:Master Volume) will change.

### ○Master Fine Tuning

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 03H, 11H, 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)
11H	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])	

# RD-300SX MIDI Implementation

## ○Master Coarse Tuning

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 04H, 11H, mmH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
04H	Sub ID#2 (Master Coarse Tuning)
11H	Master Coarse Tuning LSB
mmH	Master Coarse Tuning MSB
F7H	EOX (End Of Exclusive)

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

## ●Global Parameter Control

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 05H, 01H, 01H, 01H, 01H, 01H, ppH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
05H	Sub ID#2 (Global Parameter Control)
01H	Slot path length
01H	Parameter ID width
01H	Value width
01H	Slot path MSB
01H	Slot path LSB (Effect 0101: Reverb)
ppH	Parameter to be controlled.
vvH	Value for the parameter.
	pp=0 Reverb Type
	vv = 00H Small Room
	vv = 01H Medium Room
	vv = 02H Large Room
	vv = 03H Medium Hall
	vv = 04H Large Hall
	vv = 08H Plate
	pp=1 Reverb Time
	vv = 00H - 7FH 0 - 127
F7H	EOX (End Of Exclusive)

## ○Chorus Parameters

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 05H, 01H, 01H, 01H, 01H, 02H, ppH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
05H	Sub ID#2 (Global Parameter Control)
01H	Slot path length
01H	Parameter width
01H	Value width
01H	Slot path MSB
02H	Slot path LSB (Effect 0102: Chorus)
ppH	Parameter to be controlled.
vvH	Value for the parameter.
	pp=0 Chorus Type
	vv=0 Chorus1
	vv=1 Chorus2
	vv=2 Chorus3
	vv=3 Chorus4
	vv=4 FB Chorus
	vv=5 Flanger
	pp=1 Mod Rate
	vv= 00H - 7FH 0 - 127
	pp=2 Mod Depth
	vv = 00H - 7FH 0 - 127
	pp=3 Feedback
	vv = 00H - 7FH 0 - 127

pp=4 Send To Reverb  
 vv = 00H - 7FH 0 - 127  
 EOX (End Of Exclusive)

F7H

## ○Channel Pressure

Status	Data byte	Status
F0H	7FH, 7FH, 09H, 01H, 0nH, ppH, rrH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (Controller Destination Setting)
01H	Sub ID#2 (Channel Pressure)
0nH	MIDI Channel (00 - 0F)
ppH	Controlled parameter
rrH	Controlled range
	pp=0 Pitch Control
	rr = 28H - 58H -24 - +24 [semitones]
	pp=1 Filter Cutoff Control
	rr = 00H - 7FH -9600 - +9450 [cents]
	pp=2 Amplitude Control
	rr = 00H - 7FH 0 - 200%
	pp=3 LFO Pitch Depth
	rr = 00H - 7FH 0 - 600 [cents]
	pp=4 LFO Filter Depth
	rr = 00H - 7FH 0 - 2400 [cents]
	pp=5 LFO Amplitude Depth
	rr = 00H - 7FH 0 - 100%
F7H	EOX (End Of Exclusive)

## ○Controller

Status	Data byte	Status
F0H	7FH, 7FH, 09H, 03H, 0nH, ccH, ppH, rrH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (Controller Destination Setting)
03H	Sub ID#2 (Control Change)
0nH	MIDI Channel (00 - 0F)
ccH	Controller number (01 - 1F, 40 - 5F)
ppH	Controlled parameter
rrH	Controlled range
	pp=0 Pitch Control
	rr = 28H - 58H -24 - +24 [semitones]
	pp=1 Filter Cutoff Control
	rr = 00H - 7FH -9600 - +9450 [cents]
	pp=2 Amplitude Control
	rr = 00H - 7FH 0 - 200%
	pp=3 LFO Pitch Depth
	rr = 00H - 7FH 0 - 600 [cents]
	pp=4 LFO Filter Depth
	rr = 00H - 7FH 0 - 2400 [cents]
	pp=5 LFO Amplitude Depth
	rr = 00H - 7FH 0 - 100%
F7H	EOX (End Of Exclusive)

## ○Scale/Octave Tuning Adjust

Status	Data byte	Status
F0H	7EH, 7FH, 08H, 08H, ffH, ggH, hhH, ssH...	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
08H	Sub ID#1 (MIDI Tuning Standard)
08H	Sub ID#2 (scale/octave tuning 1-byte form)
ffH	Channel/Option byte 1
	bits 0 to 1 = channel 15 to 16
	bit 2 to 6 = Undefined
ggH	Channel byte 2
	bits 0 to 6 = channel 8 to 14
hhH	Channel byte 3
	bits 0 to 6 = channel 1 to 7
ssH	12 byte tuning offset of 12 semitones from C to B
	00H = -64 [cents]

40H = 0 [cents] (equal temperament)  
 7FH = +63 [cents]

F7H EOX (End Of Exclusive)

### ○Key-based Instrument Controllers

Status	Data byte	Status
F0H	7FH, 7FH, 0AH, 01H, 0nH, kkH, nnH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
0AH	Sub ID#1 (Key-Based Instrument Control)
01H	Sub ID#2 (Controller)
0nH	MIDI Channel (00 - 0F)
kkH	Key Number
nnH	Control Number
vvH	Value
nn=07H	Level
vv = 00H - 7FH	0 - 200% (Relative)
nn=0AH	Pan
vv = 00H - 7FH	Left - Right (Absolute)
nn=5BH	Reverb Send
vv = 00H - 7FH	0 - 127 (Absolute)
nn=5D	Chorus Send
vv = 00H - 7FH	0 - 127 (Absolute)
:	:
F7	EOX (End Of Exclusive)

\* This parameter affects drum instruments only.

### ●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 04H.

#### ○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, 03H, 11H, aaH, bbH, ccH, ddH, ssH, ttH, uuH, vvH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	Devdevice ID (dev: 10H - 1FH, 7FH)
00H	Model ID #1 (RD-300SX)
00H	Model ID #2 (RD-300SX)
04H	model ID #3 (RD-300SX)
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. 7).

\* For the checksum, refer to 10 page.

#### ○Data set 1 DT1

This is the message that actually performs data transmission, and is used when you wish to transmit the data.

Status	Data byte	Status
F0H	41H, dev, 00H, 00H, 04H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 10H - 1FH, 7FH, Initial value is 10H)
00H	Model ID #1 (RD-300SX)
00H	Model ID #2 (RD-300SX)
04H	Model ID #3 (RD-300SX)
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. 7).

\* 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. 10.

# RD-300SX MIDI Implementation

## 2. Data Transmission

### ■ Channel Voice Messages

#### ● Note off

Status	2nd byte	3rd byte
8nH	kkH	40H
n = MIDI channel number:		0H - FH (ch.1 - 16)
kk = note number:		00H - 7FH (0 - 127)

\* Note off message is sent out with the velocity of 40H.

#### ● 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

\* By selecting a controller number that corresponds to the setting of parameters of controllers (Slider Assign, FC1/2 Pedal Assign), the RD-300SX can transmit any control change message.

\* These messages are not transmitted when EXTERNAL Zone Parameter is OFF.

#### ○ Bank Select (Controller number 0, 32)

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

#### ○ 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)

#### ○ 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

\* These messages are transmitted when Damper pedal is operated.

#### ○ 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

#### ○ Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Control value:		00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON

#### ○ Effect 1 (Reverb Send Level) (Controller number 91)

Status	2nd byte	3rd byte
BnH	5BH	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Reverb Send Level:		00H - 7FH (0 - 127)

#### ○ Effect 3 (Chorus Send Level) (Controller number 93)

Status	2nd byte	3rd byte
BnH	5DH	vvH
n = MIDI channel number:		0H - FH (ch.1 - 16)
vv = Reverb Send Level:		00H - 7FH (0 - 127)

#### ● 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)

#### ● 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.

### ■ System Exclusive Messages

Universal Non-realtime System Exclusive Message™ and Data Set 1 (DT1) are the only System Exclusive messages transmitted by the RD-300SX.

#### ● Universal Non-realtime System Exclusive Message

##### ○ Identity Reply Message

Receiving Identity Request Message, the RD-300SX send this message.

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 04H, 02H,	F7H
	00H, 00H, 00H, 01H, 00H, 00H	

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (use the same as the device ID of Roland)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Reply)
41H	ID number (Roland)
04H 02H	Device family code (RD-300SX)
00H 00H	Device family number code (RD-300SX)
00H 01H 00H 00H	Software revision level
F7H	EOX (End of Exclusive)

## ●Data Transmission

### ○Data set 1DT1 (12H)

Status	Data byte	Status
FOH	41H, dev, 00H, 00H, 04H, 12H, aaH, bbH, F7H	
	ccH, ddH, eeH, ... ffH, sum	

Byte	Explanation
FOH	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H - 1FH, Initial value is 10H)
00H	Model ID #1 (RD-300SX)
00H	Model ID #2 (RD-300SX)
04H	Model ID #3 (RD-300SX)
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. 7).
- \* 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 divided to some packets. For example, ABH in hexadecimal notation will be divided to 0AH and 0BH, and is sent/received in this order.

### 1 RD-300SX (Model ID = 00H 00H 04H)

#### ○Individual Parameters

- \* These messages are transmitted when Bulk Dump Temporary function is executed.
- \* Please don't use a parameter or a address marked <Reserved>.
- \* The parameters for Setup are temporary. If you want to leave the parameters after the RD-300SX is turned off, execute SETUP Write.

Start Address	Description
00 00 00 00	System
10 00 00 00	SETUP (Temporary)

#### \* System

Offset Address	Description
00 00 00 00	System Common
00 00 02 00	System Sound Control
00 00 04 00	System V-Link

#### \* SETUP

Offset Address	Description
10 00 00 00	SETUP Common
10 00 02 00	SETUP Rhythm
10 00 03 00	SETUP MFx
10 00 07 00	SETUP Chorus
10 00 08 00	SETUP Reverb
10 00 10 00	SETUP Internal Zone (Upper)
10 00 11 00	SETUP Internal Zone (Lower)
10 00 14 00	SETUP External Zone (Upper)
10 00 15 00	SETUP External Zone (Lower)
10 00 20 00	SETUP Part (Part: 01)
10 00 21 00	SETUP Part (Part: 02)
10 00 2F 00	SETUP Part (Part: 16)

#### \* System Common

Offset Address	Description
#00 00 00 00	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd Master Tune (24 - 2024) -100.0 - 100.0 [cent]
00 00 00 04	000a aaaa SETUP Control Channel (0 - 16) 1 - 16, OFF
00 00 00 05	0000 000a Damper Polarity (0 - 1) STANDARD, REVERSE
00 00 00 06	0000 000a Foot Controller Polarity (0 - 1) STANDARD, REVERSE
00 00 00 07	Total Size

#### \* System Sound Control

Offset Address	Description
00 00 02 00	0aaa aaaa Low band Attack time (0 - 100)
00 00 02 01	0aaa aaaa Low band Release time (0 - 100)
00 00 02 02	00aa aaaa Low band Threshold (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 02 03	0000 aaaa Low band Ratio (0 - 13) 1:1.0, 1:1.1, 1:1.2, 1:1.4, 1:1.6, 1:1.8, 1:2.0, 1:2.5, 1:3.2, 1:4.0, 1:5.6, 1:8.0, 1:16, 1:INF
00 00 02 04	000a aaaa Low band Level (0 - 24) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,11,12,13,14,15,16,17,18,19, 20,21,22,23,24 [dB]
00 00 02 05	0aaa aaaa Mid band Attack time (0 - 100)
00 00 02 06	0aaa aaaa Mid band Release time (0 - 100)
00 00 02 07	00aa aaaa Mid band Threshold (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 02 08	0000 aaaa Mid band Ratio (0 - 13) 1:1.0, 1:1.1, 1:1.2, 1:1.4, 1:1.6, 1:1.8, 1:2.0, 1:2.5, 1:3.2, 1:4.0, 1:5.6, 1:8.0, 1:16, 1:INF
00 00 02 09	000a aaaa Mid band Level (0 - 24) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,11,12,13,14,15,16,17,18,19, 20,21,22,23,24 [dB]
00 00 02 0A	0aaa aaaa High band Attack time (0 - 100)
00 00 02 0B	0aaa aaaa High band Release time (0 - 100)
00 00 02 0C	00aa aaaa High band Threshold (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 02 0D	0000 aaaa High band Ratio (0 - 13) 1:1.0, 1:1.1, 1:1.2, 1:1.4, 1:1.6, 1:1.8, 1:2.0, 1:2.5, 1:3.2, 1:4.0, 1:5.6, 1:8.0, 1:16, 1:INF
00 00 02 0E	000a aaaa High band Level (0 - 24) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,11,12,13,14,15,16,17,18,19, 20,21,22,23,24 [dB]
00 00 02 0F	0000 0aaa Split Freq Low (0 - 16) 200, 250, 315, 400, 500, 630, 800 [Hz]

# RD-300SX MIDI Implementation

00 00 02 10	0000 0aaa	Split Freq High	(0 - 6)
			2000, 2500, 3150, 4000, 5000, 6300, 8000 [Hz]
00 00 00 11	Total Size		

## \* System V-Link

Offset Address	Description	
00 00 04 00	0000 000a	Switch (0 - 1) OFF, ON
00 00 04 01	0000 aaaa	Transmit Channel (0 - 15) 1 - 16
00 00 00 02	Total Size	

## \* SETUP Common

Offset Address	Description	
#10 00 00 00	0000 aaaa 0000 bbbb	SETUP Tempo (10 - 250)
#10 00 00 02	0000 000a 0000 bbbb	Upper [PIANO] Tone Number (0 - 9)
#10 00 00 05	0000 cccc 0000 000a 0000 bbbb	Upper [E.PIANO] Tone Number (0 - 9)
#10 00 00 08	0000 000a 0000 bbbb	Upper [ORGAN] Tone Number (0 - 6)
#10 00 00 0B	0000 cccc 0000 000a 0000 bbbb	Upper [STRINGS/PAD] Tone Number (0 - 11)
#10 00 00 0E	0000 000a 0000 bbbb	Upper [GTR/BASS] Tone Number (0 - 12)
#10 00 00 11	0000 cccc 0000 000a 0000 bbbb	Upper [BRASS/WINDS] Tone Number (0 - 9)
#10 00 00 14	0000 000a 0000 bbbb	Upper [VOICE/SYNTH] Tone Number (0 - 7)
#10 00 00 17	0000 cccc 0000 000a 0000 bbbb	Upper [RHY/GM2] Tone Number (0 - 269)
#10 00 00 1A	0000 000a 0000 bbbb	Lower [PIANO] Tone Number (0 - 9)
#10 00 00 1D	0000 cccc 0000 000a 0000 bbbb	Lower [E.PIANO] Tone Number (0 - 9)
#10 00 00 20	0000 000a 0000 bbbb	Lower [ORGAN] Tone Number (0 - 6)
#10 00 00 23	0000 cccc 0000 000a 0000 bbbb	Lower [STRINGS/PAD] Tone Number (0 - 11)
#10 00 00 26	0000 000a 0000 bbbb	Lower [GTR/BASS] Tone Number (0 - 12)
#10 00 00 29	0000 cccc 0000 000a 0000 bbbb	Lower [BRASS/WINDS] Tone Number (0 - 9)
#10 00 00 2C	0000 000a 0000 bbbb	Lower [VOICE/SYNTH] Tone Number (0 - 7)
#10 00 00 2F	0000 cccc 0000 000a 0000 bbbb	Lower [RHY/GM2] Tone Number (0 - 269)
10 00 00 32	0000 0aaa	Foot Controller Assign (0 - 5) SOFT, SOSTENUTO, EXPRESSION, RHYTHM START STOP, MPX ON/OFF, MODULATION
10 00 00 33	0aaa aaaa	Key Touch Velocity (0 - 127) REAL, 1 - 127
10 00 00 34	0000 0aaa	Key Touch Curve Type (2 - 4) LIGHT, MEDIUM, HEAVY
10 00 00 35	0000 000a	(reserved)
10 00 00 36	0aaa aaaa	(reserved)
10 00 00 37	0000 000a	Split Switch (0 - 1) OFF, ON
10 00 00 38	0000 000a	(reserved)
10 00 00 39	0000 000a	MPX Switch (0 - 1) OFF, ON
10 00 00 3A	0000 000a	MPX Source (0 - 1) UPPER, LOWER
10 00 00 3B	0000 000a	Reverb Switch (0 - 1) OFF, ON
10 00 00 3C	0000 000a	(reserved)
10 00 00 3D	0000 000a	(reserved)
00 00 00 3E	Total Size	

## \* SETUP Rhythm

Offset Address	Description	
#10 00 02 00	0000 aaaa	(0 - 184)
#10 00 02 01	0000 bbbb	Rhythm Pattern 1 - 185
10 00 02 01	0aaa aaaa	(reserved)
10 00 02 05	0000 aaaa	(reserved)
00 00 00 06	Total Size	

## \* SETUP MPX

Offset Address	Description	
10 00 03 00	0aaa aaaa	MPX Type (0 - 78)
10 00 03 01	0aaa aaaa	(reserved)
10 00 03 08	000a aaaa	(reserved)
#10 00 03 09	0000 aaaa	MPX Parameter (1-32) (12768 - 52768)
	0000 dddd	-20000 - +20000
00 00 01 09	Total Size	

## \* SETUP Chorus

Offset Address	Description	
10 00 07 00	0000 aaaa	Chorus Type (0 - 3)
10 00 07 01	0aaa aaaa	Chorus Level OFF, CHORUS, DELAY, GM2 CHORUS
10 00 07 02	0000 00aa	(reserved) (0 - 127)
#10 00 07 04	0000 aaaa	Chorus Parameter (1-20) (12768 - 52768)
#10 00 07 53	0000 aaaa	-20000 - +20000
00 00 00 53	Total Size	

## \* SETUP Reverb

Offset Address	Description	
10 00 08 00	0000 aaaa	Reverb Type (0 - 7)
10 00 08 01	0aaa aaaa	OFF, REVERB, SRV ROOM, SRV HALL, SRV PLATE, GM2 REVERB, CATHEDRAL
10 00 08 02	0000 00aa	(reserved) (0 - 127)
#10 00 08 03	0000 aaaa	Reverb Parameter (1-20) (12768 - 52768)
#10 00 08 52	0000 aaaa	-20000 - +20000
00 00 00 53	Total Size	

## \* SETUP Internal Zone

(Upper Zone : z=0, Lower Zone: z=1)

Offset Address	Description	
10 00 1z 00	0aaa aaaa	Keyboard Range Lower (0 - 87) A0 - UPPER
10 00 1z 01	0aaa aaaa	Keyboard Range Upper (0 - 87) LOWER - C8
10 00 1z 02	0aaa aaaa	(reserved)
10 00 1z 03	0aaa aaaa	(reserved)
10 00 1z 04	0aaa aaaa	(reserved)
10 00 1z 05	0aaa aaaa	(reserved)
10 00 1z 06	0aaa aaaa	keyboard Transpose (16 - 112) -48 - +48
10 00 1z 07	0000 000a	Zone Switch (0 - 1) OFF, ON
10 00 1z 08	0000 000a	Damper Switch (0 - 1) OFF, ON
10 00 1z 09	0000 000a	Foot Contolloer Switch (0 - 1) OFF, ON
10 00 1z 0A	0000 000a	Modulation Switch (0 - 1) OFF, ON
10 00 1z 0B	0000 000a	Bender Switch (0 - 1) OFF, ON
00 00 00 0C	Total Size	

## \* SETUP External Zone

(Upper Zone : z=4 Lower Zone: z=5)

Offset Address	Description	
10 00 1z 00	0aaa aaaa	(reserved)
10 00 1z 05	0aaa aaaa	(reserved)
10 00 1z 06	0aaa aaaa	keyboard Transpose (16 - 112) -48 - +48
10 00 1z 07	0000 000a	(reserved)
10 00 1z 0E	0000 00aa	(reserved)
10 00 1z 0F	0000 aaaa	Transmit Channel (0 - 15) 1 - 16
10 00 1z 10	0000 000a	Transmit Bank Select MSB Switch (0 - 1) OFF, ON
10 00 1z 11	0aaa aaaa	Transmit Bank Select MSB (CC# 0) (0 - 127)
10 00 1z 12	0000 000a	Transmit Bank Select LSB Switch (0 - 1) OFF, ON
10 00 1z 13	0aaa aaaa	Transmit Bank Select LSB (CC# 32) (0 - 127)
10 00 1z 14	0000 000a	Transmit Program Change Switch (0 - 1) OFF, ON
10 00 1z 15	0aaa aaaa	Transmit Program Change# (0 - 127)
10 00 1z 16	0000 000a	Transmit Level Switch (0 - 1) OFF, ON
10 00 1z 17	0aaa aaaa	Transmit Level (CC# 7) (0 - 127)
10 00 1z 18	0000 000a	Transmit Pan Switch (0 - 1) OFF, ON
10 00 1z 19	0aaa aaaa	Transmit Pan(CC# 10) (0 - 127) L64 - R63
10 00 1z 1A	0000 000a	Transmit Coarse Tune Switch (0 - 1) OFF, ON
10 00 1z 1B	0aaa aaaa	Transmit Coarse Tune (16 - 112) -48 - +48
10 00 1z 1C	0000 000a	Transmit Fine Tune Switch (0 - 1) OFF, ON
10 00 1z 1D	0aaa aaaa	Transmit Fine Tune (14 - 114) -50 - +50
10 00 1z 1E	0000 000a	Transmit Cutoff Switch (0 - 1) OFF, ON
10 00 1z 1F	0aaa aaaa	Transmit Cutoff (0 - 127) -64 - +63
10 00 1z 20	0000 000a	Transmit Resonance Switch (0 - 1) OFF, ON
10 00 1z 21	0aaa aaaa	Transmit Resonance (0 - 127) -64 - +63
10 00 1z 22	0000 000a	Transmit Attack Time Switch (0 - 1) OFF, ON
10 00 1z 23	0aaa aaaa	Transmit Attack Time (0 - 127) -64 - +63
10 00 1z 24	0000 000a	Transmit Decay Time Switch (0 - 1) OFF, ON
10 00 1z 25	0aaa aaaa	Transmit Decay Time (0 - 127) -64 - +63
10 00 1z 26	0000 000a	Transmit Release Time Switch (0 - 1) OFF, ON
10 00 1z 27	0aaa aaaa	Transmit Release Time (0 - 127) -64 - +63

# RD-300SX MIDI Implementation

10 00 1z 28	0000 000a	Transmit Pitch Bend Range Switch	(0 - 1) OFF, ON
10 00 1z 29	00aa aaaa	Transmit Pitch Bend Range	(0 - 48)
10 00 1z 2A	0000 000a	Transmit Modulation Depth Switch	(0 - 1) OFF, ON
10 00 1z 2B	0aaa aaaa	Transmit Modulation Depth	(0 - 127) 0 - 100 Cent
10 00 1z 2C	0000 000a	Transmit Chorus Level Switch	(0 - 1) OFF, ON
10 00 1z 2D	0aaa aaaa	Transmit Chorus Level	(0 - 127)
10 00 1z 2E	0000 000a	Transmit Reverb Level Switch	(0 - 1) OFF, ON
10 00 1z 2F	0aaa aaaa	Transmit Reverb Level	(0 - 127)
00 00 00 30	Total Size		

\* SETUP Part  
(Part1: p=0, Part2:p=1 ... Part16: p=F)

Offset	Address	Description	
10 00 2p 00	0000 aaaa	Receive Channel	(0 - 15)
10 00 2p 01	0000 000a	Mute Switch	(0 - 1) OFF, ON
10 00 2p 02	0aaa aaaa	Tone Bank Select MSB (CC# 0)	(0 - 127)
10 00 2p 03	0aaa aaaa	Tone Bank Select LSB (CC# 32)	(0 - 127)
10 00 2p 04	0aaa aaaa	Tone Program Change#	(0 - 127)
10 00 2p 05	0aaa aaaa	Part Level (CC# 7)	(0 - 127)
10 00 2p 06	0aaa aaaa	Part Pan (CC# 10)	(0 - 127) L64 - 63R
10 00 2p 07	0aaa aaaa	Coarse Tune	(16 - 112)
10 00 2p 08	0aaa aaaa	Fine Tune	-48 - +48 (14 - 114)
10 00 2p 09	0000 00aa	Mono/Poly	(0 - 2) MONO, POLY, MONO/LEGATO
10 00 2p 0A	000a aaaa	Pitch Bend Range	(0 - 24)
10 00 2p 0B	0000 000a	Portamento Switch	(0 - 1) OFF, ON
#10 00 2p 0C	0000 aaaa	Portamento Time	(0 - 127)
10 00 2p 0E	0aaa aaaa	Cutoff	(0 - 127)
10 00 2p 0F	0aaa aaaa	Resonance	-63 - +63
10 00 2p 10	0aaa aaaa	Attack Time	-63 - +63
10 00 2p 11	0aaa aaaa	Decay Time	(0 - 127)
10 00 2p 12	0aaa aaaa	Release Time	-63 - +63
10 00 2p 13	0aaa aaaa	Chorus Amount	(0 - 127)
10 00 2p 14	0aaa aaaa	Reverb Amount	(0 - 127)
10 00 2p 15	0aaa aaaa	MPX Type	(0 - 125)
10 00 2p 16	0000 000a	Part MPX Switch	(0 - 1) OFF, ON
10 00 2p 17	0000 000a	Receive Bank Select Switch	(0 - 1) OFF, ON
10 00 2p 18	0000 000a	Receive Program Change Switch	(0 - 1) OFF, ON
10 00 2p 19	0000 000a	Receive Bender Switch	(0 - 1) OFF, ON
10 00 2p 1A	0000 000a	Receive Modulation Switch	(0 - 1) OFF, ON
10 00 2p 1B	0000 000a	Receive Volume Switch	(0 - 1) OFF, ON
10 00 2p 1C	0000 000a	Receive Pan Switch	(0 - 1) OFF, ON
10 00 2p 1D	0000 000a	Receive Hold-1 Switch	(0 - 1) OFF, ON
10 00 2p 1E	0000 000a	Receive Expression	(0 - 1) OFF, ON
00 00 00 1F	Total Size		

## 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 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 = 41885

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

```

16 ) 1258
    ) 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.

# RD-300SX MIDI Implementation

## ■ Examples of Actual MIDI Messages

### <Example1> 92 3E 5F

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

### <Example2> CE 49

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

### <Example3> EA 00 28

EnH is the Pitch Bend Change status, and n is the MIDI channel number. The 2nd byte (00H = 0) is the LSB and the 3rd byte (28H = 40) is the MSB, but Pitch Bend Value is a signed number in which 40 00H (= 64 x 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) ÷ (-8192) = -75 cents of Pitch Bend is being applied to MIDI channel 11.

### <Example4> B3 64 00 65 00 06 0C 26 00 64 7F 65 7F

BnH is the Control Change status, and n is the MIDI channel number. For Control Changes, the 2nd byte is the control number, and the 3rd byte is the value. In a case in which two or more messages consecutive messages have the same status, MIDI has a provision called "running status" which allows the status byte of the second and following messages to be omitted. Thus, the above messages have the following meaning.

B3	64 00	MIDI ch.4, lower byte of RPN parameter number:	00H
(B3)	65 00	(MIDI ch.4) upper byte of RPN parameter number:	00H
(B3)	06 0C	(MIDI ch.4) upper byte of parameter value:	0CH
(B3)	26 00	(MIDI ch.4) lower byte of parameter value:	00H
(B3)	64 7F	(MIDI ch.4) lower byte of RPN parameter number:	7FH
(B3)	65 7F	(MIDI ch.4) upper byte of RPN parameter number:	7FH

In other words, the above messages specify a value of 0C 00H for RPN parameter number 00 00H on MIDI channel 4, and then set the RPN parameter number to 7F 7FH.

RPN parameter number 00 00H is Pitch Bend Sensitivity, and the MSB of the value indicates semitone units, so a value of 0CH = 12 sets the maximum pitch bend range to ±12 semitones (1 octave). (On GS sound generators the LSB of Pitch Bend Sensitivity is ignored, but the LSB should be transmitted anyway (with a value of 0) so that operation will be correct on any device.)

Once the parameter number has been specified for RPN or NRPN, all Data Entry messages transmitted on that same channel will be valid, so after the desired value has been transmitted, it is a good idea to set the parameter number to 7F 7FH to prevent accidents. This is the reason for the (B3) 64 7F (B3) 65 7F at the end.

It is not desirable for Performance data (such as Standard MIDI File data) to contain many events with running status as given in <Example 4>. This is because if playback is halted during the song and then rewound or fast-forwarded, the sequencer may not be able to transmit the correct status, and the sound generator will then misinterpret the data. Take care to give each event its own status.

It is also necessary that the RPN or NRPN parameter number setting and the value setting be done in the proper order. On some sequencers, events occurring in the same (or consecutive) clock may be transmitted in an order different than the order in which they were received. For this reason it is a good idea to slightly skew the time of each event (about 1 tick for TPQN = 96, and about 5 ticks for TPQN = 480).

\* TPQN: Ticks Per Quarter Note

## ■ Example of an Exclusive Message and Calculating a Checksum

Roland Exclusive messages (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 check sum 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 fffH.

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

### <Example1> Setting Reverb Level to 100 (DT1)

According to the "Parameter Address Map" (p. 7), the address of Reverb Level is 10 00 08 01H, and the hexadecimal expression of 100 is 64H.

So the system exclusive message should be sent is;

F0	41	10	00 00 04	12	10 00 08 01	64	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

- (1) Exclusive Status            (2) ID (Roland)                    (3) Device ID (17)
- (4) Model ID (RD-300SX)    (5) Command ID (DT1)            (6) End of Exclusive

Then calculate the checksum.

$$\begin{aligned} &10H + 00H + 08H + 01H + 64H = 16 + 0 + 8 + 1 + 100 = 125 (\text{sum}) \\ &125 (\text{sum}) \div 128 = 0 (\text{quotient}) \dots 3 (\text{remainder}) \\ &\text{checksum} = 128 - 125 (\text{remainder}) = 3 = 03H \end{aligned}$$

This means that F0 41 10 00 04 12 10 00 08 01 64 03 F7 is the message should be sent.

### <Example2> Getting Temporary SETUP Common data (RQ1)

According to the "Parameter Address Map" (p. 7), the start address of Temporary Setup is 10 00 00 00H.

As the data size of Setup Common is 00 00 00 3EH, therefore the system exclusive message should be sent is;

F0	41	10	00 00 04	11	10 00 00 00	00 00 00 3E	??	F7
(1)	(2)	(3)	(4)	(5)	address	data(size)	checksum	(6)

- (1) Exclusive Status            (2) ID (Roland)                    (3) Device ID (17)
- (4) Model ID (RD-300SX)    (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 04 11 10 00 00 00 00 00 3E 7C F7 to be transmitted.

## ■ ASCII Code Table

Setup Name 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.