Section 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-ch.16)
kk = note number: 00H-7FH (0-127)
vv = note off velocity: 00H-7FH (0-127)

* The velocity values of Note Off messages are ignored.

●Note on

Status	2nd bytes	3rd byte
9nH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
kk = note number: 00H-7FH (0-127)
vv = note on velocity: 01H-7FH (1-127)

●Control Change

* The value specified by a Control Change message will not be reset even by a Program Change, etc.

❍Bank Select (Controller number 0, 32)

Status	2nd bytes	3rd byte
BnH	00H	mmH
BnH	20H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm, ll = Bank number: 00 00H-7F 7FH (bank.1-bank.16384), Initial Value = 00 00H (bank.1)

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

❍Data Entry (Controller number 6, 38)

Status	2nd bytes	3rd byte
BnH	06H	mmH
BnH	26H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm, ll = the value of the parameter specified by RPN

❍Volume (Controller number 7)

Status	2nd bytes	3rd byte
BnH	07H	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Volume: 00H-7FH (0-127), Initial Value = 64H (100)

* Volume messages are used to adjust the volume balance of each Part.

❍Pan (Controller number 10)

Status	2nd bytes	3rd byte
BnH	0AH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = pan: 00H-40H-7FH (Left-Center-Right), Initial Value = 40H (Center)

* For Rhythm Parts, this is a relative adjustment of each Instruments pan setting.'

❍Expression (Controller number 11)

Status	2nd bytes	3rd byte
BnH	0BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Expression: 00H-7FH (0-127), Initial Value = 7FH (127)

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

❍Hold 1 (Controller number 64)

Status	2nd bytes	3rd byte
BnH	40H	vvH

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

❍Sostenuto (Controller number 66)

Status	2nd bytes	3rd byte
BnH	42H	vvH

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

❍Soft (Controller number 67)

Status	2nd bytes	3rd byte
BnH	43H	vvH

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

❍Effect 1 (Reverb Send Level) (Controller number 91)

Status	2nd bytes	3rd byte
BnH	5BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127), Initial Value = 28H (40)

* This message adjusts the Reverb Send Level of each Part.

❍Effect 3 (Chorus Send Level) (Controller number 93)

Status	2nd bytes	3rd byte
BnH	5DH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Control value: 00H-7FH (0-127), Initial Value = 00H (0)

* This message adjusts the Chorus Send Level of each Part.

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

Status	2nd bytes	3rd byte
BnH	65H	mmH
BnH	64H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm = upper byte of parameter number specified by RPN
ll = lower byte of parameter number specified by RPN

* The value specified by RPN will not be reset even by messages such as Program Change or Reset All Controller.

RPN
The RPN (Registered Parameter Number) messages are expanded control changes, and each function of an RPN is described by the MIDI Standard.
To use these messages, you must first use RPN MSB and RPN LSB messages to specify the parameter to be controlled, and then use Data Entry messages to specify the value of the specified parameter. Once an RPN parameter has been specified, all Data Entry messages received on that channel will modify the value of that parameter. To prevent accidents, it is recommended that you set RPN Null (RPN Number = 7FH/7FH) when you have finished setting the value of the desired parameter.Refer to Section 4. “Examples of actual MIDI messages” <Example 4> (p. 7).
On the FP-3, RPN can be used to modify the following parameters.

RPN MSB LSB	Data entry MSB LSB	Explanation
00H 00H	mmH ---	Pitch Bend Sensitivity mm: 00H-18H (0-24 semitones), Initial Value = 02H (2 semitones) ll: ignored (processed as 00h) specify up to 2 octaves in semitone steps
00H 01H	mmH llH	Master Fine Tuning mm, ll: 00 00H - 40 00H - 7F 7FH (-100 - 0 - +99.99 cents), Initial Value = 40 00H (0 cent) ll: ignored (processed as 00h) specify up to 2 octaves in semitone steps Refer to 4. Supplementary material, “About tuning” (p. 8)
00H 02H	mmH ---	Master Coarse Tuning mm: 28H - 40H - 58H (-24 - 0 - +24 semitones), Initial Value = 40H (0 cent) ll: ignored (processed as 00h)
7FH 7FH	--- ---	RPN null Set condition where an RPN is unspecified. The data entry messages after set RPN null will be ignored. (No Data entry messages are required after RPN null). Settings already made will not change. mm, ll: ignored

●Program Change

Status	2nd bytes
CnH	ppH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
pp = Program number: 00H-25H,3FH (prog.1-prog.38, prog.64)

* After a Program Change message is received, the sound will change beginning with the next Note-on. Voices already sounding when the Program Change message was received will not be affected.

●Pitch Bend Change

Status	2nd byte	3rd bytes
EnH	llH	mmH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm, ll = Pitch Bend value: 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

■Channel Mode Messages

●All Sounds Off (Controller number 120)

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

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

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

●Reset All Controllers (Controller number 121)

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

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

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

Controller	Reset value
Pitch Bend Change	+-0 (Center)
Expression	127 (max)
Hold 1	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
RPN	unset; previously set data will not change

●All Notes Off (Controller number 123)

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

n = MIDI channel number: 0H-FH (ch.1-ch.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 bytes
BnH	7CH	00H

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

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

●OMNI ON (Controller number 125)

Status	2nd byte	3rd bytes
BnH	7DH	00H

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

* OMNI ON is only recognized as "All notes off;" the Mode doesn't change (OMNI OFF remains).

●MONO (Controller number 126)

Status	2nd byte	3rd bytes
BnH	7EH	mmH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm = mono number: 00H-10H (0-16)

* The same processing will be carried out as when All Sounds Off and All Notes Off is received, and the corresponding channel will be set to Mode 4 (M = 1) regardless of the value of "mono number."

●POLY (Controller number 127)

Status	2nd byte	3rd bytes
BnH	7FH	00H

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

* The same processing will be carried out as when All Sounds Off and All Notes Off is received, and the corresponding channel will be set to Mode 3.

■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. Rolands manufacturer ID is 41H.
ID numbers 7EH and 7FH are extensions of the MIDI standard; Universal Non-realtime Messages (7EH) and Universal Realtime Messages (7FH).
dd,...,ee = data: 00H-7FH (0-127)
F7H: EOX (End Of Exclusive)

The System Exclusive Messages received by the FP-3 are Universal Realtime System Exclusive messages and Data Set (DT1).

●Universal Realtime System Exclusive Messages

❍Master volume

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

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

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

●Universal Non-realtime System Exclusive Messages

❍Identity Request Message

Status	Data byte	Status
F0H	7FH, 10H, 06H, 01H	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
10H	Device ID
06H	Sub ID#1 (General Information)
01H	Sub ID#2 (Identity Request)
F7H	EOX (End Of Exclusive)

* The Device ID is 10H or 7FH (Broadcast).

●Data transmission

FP-3 can receive the various parameters using System Exclusive messages.
The exclusive message of data has a model ID of 42H and a device ID of 10H (17).

❍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, 10H, 42H, 12H, aaH, bbH, ccH, ddH, ... eeH, sum	F7H

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

* The amount of data that can be transmitted at one time depends on the type of data, and data can be received only from the specified starting address and size. Refer to the Address and Size given in Section 3 (p. 5).
* Data larger than 128 bytes must be divided into packets of 128 bytes or less. If "Data Set 1" is transmitted successively, there must be an interval of at least 40 ms between packets.
* Regarding the checksum please refer to section 4 (p. 7).

Section 2. Transmit data

* The following messages are transmitted on MIDI channel 10 (ch. 10) when a Drum Set tone is selected on the panel.

* In Split mode, only the note messages of the performance data from the left-hand side are transmitted on MIDI channel 3 (ch. 3)

■Channel Voice Messages

●Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
kk = note number: 00H-7FH (0-127)
vv = note off velocity: 00H-7FH (0-127)

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

●Note on

Status	2nd bytes	3rd byte
9nH	kkH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
kk = note number: 00H-7FH (0-127)
vv = note on velocity: 01H-7FH (1-127)

●Control Change

❍Bank Select (Controller number 0, 32)

Status	2nd bytes	3rd byte
BnH	00H	mmH
BnH	20H	llH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
mm, ll = Bank number: 00H-7FH (bank.1-bank.16384)

* Not transmitted when MIDI Out Mode is set to 2.

❍Expression (Controller number 11)

Status	2nd bytes	3rd byte
BnH	0BH	vvH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
vv = Expression: 00H-7FH (0-127)

❍Hold 1 (Controller number 64)

Status	2nd bytes	3rd byte
BnH	40H	vvH

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

❍Sostenuto (Controller number 66)

Status	2nd bytes	3rd byte
BnH	42H	vvH

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

❍Soft (Controller number 67)

Status	2nd bytes	3rd byte
BnH	43H	vvH

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

❍Effect 1 (Reverb Send Level) (Controller number 91)

Status	2nd bytes	3rd byte
BnH	5BH	vvH

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

* Not transmitted when MIDI Out Mode is set to 2.

❍Effect 3 (Chorus Send Level) (Controller number 93)

Status	2nd bytes	3rd byte
BnH	5DH	vvH

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

* Not transmitted when MIDI Out Mode is set to 2.

●Program Change

Status	2nd bytes
CnH	ppH

n = MIDI channel number: 0H-FH (ch.1-ch.16)
pp = Program number: 00H-25H,3FH (prog.1-prog.38, prog.64)

* Not transmitted when MIDI Out Mode is set to 2.

■System Realtime Message

●Realtime Clock

Status
F8H

●Active sensing

Status
FEH

* This will be transmitted constantly at intervals of approximately 250 ms.

■System exclusive messages

●Universal Non-realtime System Exclusive Messages

❍Identity Reply

Status	Data byte	Status
F0H	7EH, 10H, 06H, 02H, 41H, 3AH, 01H, 00H, 00H, 00H, 01H, 00H, 00H, F7H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (universal non-realtime message)
10H	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)
3AH	Device family code (LSB)
01H	Device family code (MSB)
00H	Device family number code (LSB)
00H	Device family number code (MSB)
00H	Software revision level
01H	Software revision level
00H	Software revision level
00H	Software revision level
F7H	EOX (End of Exclusive)

Section 3. Parameter Address Map (Model ID = 42H)

This map indicates address, size, Data (range), Parameter, Description, and Default Value of parameters which can be transferred using and "Data set 1 (DT1)."
All the numbers of address, size, Data, and Default Value are indicated in 7-bit Hexadecimal-form.

* Addresses marked at "#" cannot be used as starting addresses.

●System Parameters

Parameters related to the system of the device are called System Parameters.

Address (H)	Size (H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 00 00	00 00 04	0018-07E8	MASTER TUNE	-100.0 - +100.0 [cent]	00 04 00 00	0 [cent]
40 00 01#				Use nibblized data.		
40 00 02#						
40 00 03#						

* Refer to section 4. Supplementary material, "About tuning" (p. 8).

40 00 04	00 00 01	00-7F	MASTER VOLUME	0-127 (= F0 7F 7F 04 01 00 vv F7)	7F	127
40 00 05	00 00 01	28-58	MASTER KEY-SHIFT	-24 - +24 [semitones]	40	0 [semitones]
40 00 06	00 00 01	01-7F	MASTER PAN	-63 (LEFT) - +63 (RIGHT)	40	0 (CENTER)
40 01 10	00 00 10	00-40	VOICE RESERVE	Part 10 (Drum Part)	02	2
40 01 11#				Part 1	06	6
40 01 12#				Part 2	02	2
40 01 13#				Part 3	02	2
40 01 14#				Part 4	02	2
40 01 15#				Part 5	02	2
40 01 16#				Part 6	02	2
40 01 17#				Part 7	02	2
40 01 18#				Part 8	02	2
40 01 19#				Part 9	02	2
40 01 1A#				Part 11	00	0
40 01 :#				:		
40 01 1F#				Part 16	00	0

* The sum total of voices in the voice reserve function must be equal to or less than the number of the maximum polyphony. The maximum polyphony of the FP-3 is 64.

40 01 30	00 00 01	00-05	REVERB MACRO	00	04	
40 03 00	00 00 02	00-7F	EFX TYPE (MSB, LSB)	00 00 - 7F 7F 00 00: Thru 00 40: Sympathetic Resonance 01 22: Rotary	00 01	Thru

* This EFX Type is current EFX type of this system. When part EFX type is same to this EFX type, that part connect to EFX.

40 03 1B	00 00 01	00-7F	EFX Control Source	00: OFF 01-5F: Control Change No. 72: Bender	00	
40 03 1C	00 00 01	00-7F	EFX Control Depth		7F	-100% - +100%

* You can control the amount of Sympathetic Resonance or speed of the rotary effect in real time by means of the event that is assigned to EFX Control Source. If you set Sympathetic Resonance (MSB: 00h; LSB: 40h) to EFX type, 40h to EFX Control Source, and 7Fh to EFX Control Depth, you can control the amount of Sympathetic Resonance by means of Damper messages.

●Part Parameters

FP-3 has 16 parts. Parameters that can be set individually for each Part are called Part parameters.
If you use exclusive messages to set Part parameters, specify the address by Block number rather than Part Number (normally the same number as the MIDI channel). The Block number can be specified as one of 16 blocks, from 0 (H) to F (H).
The relation between Part number and Block number is as follows.

x...BLOCK NUMBER (0-F),

Part 1 (MIDI ch = 1) x = 1 (H)
Part 2 (MIDI ch = 2) x = 2 (H)
: : :
Part 9 (MIDI ch = 9) x = 9 (H)
Part10 (MIDI ch = 10) x = 0 (H)
Part11 (MIDI ch = 11) x = A (H)
Part12 (MIDI ch = 12) x = B (H)
: : :
Part16 (MIDI ch = 16) x = F (H)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 1x 14	00 00 01	00-02	ASSIGN MODE	0 = SINGLE 1 = LIMITED-MULTI 2 = FULL-MULTI	00 at x = 0 01 at x ≠ 0	SINGLE at x = 0 LIMITED-MULTI at x ≠ 0

* ASSIGN MODE is the parameter that determines how voice assignment will be handled when sounds overlap on identical note numbers in the same channel (i.e., repeatedly struck notes). This is initialized to a mode suitable for each Part, so for general purposes there is no need to change this.

40 1x 15	00 00 01	00-02	USE FOR RHYTHM PART	0 = OFF 1 = MAP1 2 = MAP2	00 at x ≠ 0 01 at x = 0	OFF at x ≠ 0 MAP1 at x = 0

* This parameter sets the Drum Map of the Part used as the Drum Part. FP-3 can simultaneously (in different Parts) use up to two Drum Maps (MAP1, MAP2). With the initial settings, Part10 (MIDI CH = 10, x = 0) is set to MAP1 (1), and other Parts are set to normal instrumental Parts (OFF (0)).

40 1x 40	00 00 0C	00-7F	SCALE TUNING C	-64 - +63 [cent]	40	0 [cent]
40 1x 41#		00-7F	SCALE TUNING C#	-64 - +63 [cent]	40	0 [cent]
40 1x 42#		00-7F	SCALE TUNING D	-64 - +63 [cent]	40	0 [cent]
40 1x 43#		00-7F	SCALE TUNING D#	-64 - +63 [cent]	40	0 [cent]
40 1x 44#		00-7F	SCALE TUNING E	-64 - +63 [cent]	40	0 [cent]
40 1x 45#		00-7F	SCALE TUNING F	-64 - +63 [cent]	40	0 [cent]
40 1x 46#		00-7F	SCALE TUNING F#	-64 - +63 [cent]	40	0 [cent]
40 1x 47#		00-7F	SCALE TUNING G	-64 - +63 [cent]	40	0 [cent]
40 1x 48#		00-7F	SCALE TUNING G#	-64 - +63 [cent]	40	0 [cent]
40 1x 49#		00-7F	SCALE TUNING A	-64 - +63 [cent]	40	0 [cent]
40 1x 4A#		00-7F	SCALE TUNING A#	-64 - +63 [cent]	40	0 [cent]
40 1x 4B#		00-7F	SCALE TUNING B	-64 - +63 [cent]	40	0 [cent]

* SCALE TUNING is a function that allows fine adjustment to the pitch of each note in the octave. The pitch of each identically-named note in all octaves will change simultaneously. A setting of ± 0 cent (40H) is equal temperament. Refer to section 4. Supplementary material, “The Scale Tune Feature” (p. 8).

40 4x 23	00 00 02	00 - 7F	PART EFX TYPE (MSB, LSB)	00 00 - 7F 7F	00 00	0

* This EFX type is same to EFX type of System Parameter. When this EFX type is same to EFX type of System parameter (see p. 5), the part is connected to EFX.

40 4x 25#	00 00 01	00 - 7F	PART EFX MACRO	00 00		0

* When EFX type is set to Sympathetic Resonance, you can set the depth of the resonance level. The higher the setting is, the deeper the resonance becomes.
* When the EFX type is set to Rotary, you can switch the rotary speed. (00H: Slow; 40H: Fast)

40 4x 26#	00 00 01	00 - 7F	PART EFX DEPTH	00 00		0

Section 4. Supplementary material

●Decimal and Hexadecimal table

In MIDI documentation, data values and addresses/sizes of exclusive messages etc. are expressed as hexadecimal values for each 7 bits.
The following table shows how these correspond to decimal numbers.

Dec.	Hex.	Dec.	Hex.	Dec.	Hex.	Dec.	Hex.
00	0H	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	69	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

* Decimal values such as MIDI channel, bank select, and program change are listed as one (1) greater than the values given in the above table.
* A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa x 128 + bb.
* In the case of values which have a ± sign, 00H = -64, 40H = ± 0, and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = ± 0, and 7F 7FH = +8191. For example if aa bbH were expressed as decimal, this would be aa bbH - 40 00H = aa x 128 + bb - 64 x 128.
* Data marked "nibbled" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of a x 16 + b.

<Example1> What is the decimal expression of 5AH?

From the preceding table, 5AH = 90

<Example2> What is the decimal expression of the value 12 34H given as hexadecimal for each 7 bits?

From the preceding table, since 12H = 18 and 34H = 52
18 x 128 + 52 = 2356

<Example3> What is the decimal expression of the nibbled value 0A 03 09 0D?

From the preceding table, since 0AH = 10, 03H = 3, 09H = 9, 0DH = 13
((10 x 16 + 3) x 16 + 9) x 16 + 13 = 41885

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

16) 1258

16) 78 ... 10

16) 4 ... 14

0 ... 4

Since from the preceding table, 0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH, the answer is 00 04 0E 0AH.

●Examples of actual MIDI messages

<Example1> 92 3E 5F

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

<Example2> CE 24

CnH is the Program Change status, and n is the MIDI channel number. Since EH = 14 and 24H = 36, this is a Program Change message with MIDI CH = 15, program number 37 (Flute in FP-3).

<Example3> EA 00 28

EnH is the Pitch Bend Change status, and n is the MIDI channel number. The 2nd byte (00H = 0) is the LSB and the 3rd byte (28H = 40) is the MSB, but Pitch Bend Value is a signed number in which 40 00H (= 64 x 128 + 0 = 8192) is 0, so this Pitch Bend Value is
28 00H - 40 00H = 40 x 128 + 0 - (64 x 128 + 0) = 5120 - 8192 = -3072
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 b
e 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).

Once the parameter number has been specified for the RPN, 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 source will then misinterpret the data. Take care to give each event its own status.

It is also necessary that the RPN 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 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.
Heres 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 ccH and the data or size is dd ee ffH.

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

<Example> Setting REVERB MACRO to type 3

According to the "Parameter Address Map," the REVERB MACRO Address is 40 01 30H, and value is 03H. Thus,

F0	41	10	42	12	40 01 30	03	??	F7
(1)	(2)	(3)	(4)	(5)	Address	data	Checksum	(6)

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

Next we calculate the checksum.
40H + 01H + 30H + 03H = 64 + 1 + 48 + 3 = 116 (sum)
116 (sum) / 128 = 0 (quotient) ... 116 (remainder)
checksum = 128 - 116 (remainder) = 12 = 0CH

This means that F0 41 10 42 12 40 01 30 03 0C F7 is the message we transmit.

●About tuning

In MIDI, individual Parts are tuned by sending RPN #1 (Master Fine Tuning) to the appropriate MIDI channel.
In MIDI, an entire device is tuned by either sending RPN #1 to all MIDI channels being used, or by sending a System Exclusive MASTER TUNE (address 40 00 00H).
RPN #1 allows tuning to be specified in steps of approximately 0.012 cents (to be precise, 100/8192 cent), and System Exclusive MASTER TUNE allows tuning in steps of 0.1 cent. One cent is 1/100th of a semitone.
The values of RPN #1 (Master Fine Tuning) and System Exclusive MASTER TUNE are added together to determine the actual pitch sounded by each Part.
Frequently used tuning values are given in the following table for your reference. Values are in hexadecimal (decimal in parentheses).

Hz in A4	cent	RPN #1	Sys.Ex. 40 00 00
445.0	+19.56	4C 43 (+1603)	00 04 0C 04 (+196)
444.0	+15.67	4A 03 (+1283)	00 04 09 0D (+157)
443.0	+11.76	47 44 (+ 964)	00 04 07 06 (+118)
442.0	+ 7.85	45 03 (+ 643)	00 04 04 0F (+ 79)
441.0	+ 3.93	42 42 (+ 322)	00 04 02 07 (+ 39)
440.0	0.00	40 00 (0)	00 04 00 00 (0)
439.0	- 3.94	3D 3D (- 323)	00 03 0D 09 (- 39)
438.0	- 7.89	3A 7A (- 646)	00 03 0B 01 (- 79)

<Example> Set the tuning of MIDI channel 3 to A4 = 442.0 Hz

Send RPN#1 to MIDI channel 3. From the above table, the value is 45 03H.

B2 64 00	MIDI ch.3, lower byte of RPN parameter number: 00H
(B2) 65 01	(MIDI ch.3) upper byte of RPN parameter number: 01H
(B2) 06 45	(MIDI ch.3) upper byte of parameter value: 45H
(B2) 26 03	(MIDI ch.3) lower byte of parameter value: 03H
(B2) 64 7F	(MIDI ch.3) lower byte of RPN parameter number: 7FH
(B2) 65 7F	(MIDI ch.3) upper byte of RPN parameter number: 7FH

●The Scale Tune Feature (address: 40 1x 40)

The scale Tune feature allows you to finely adjust the individual pitch of the notes from C through B. Though the settings are made while working with one octave, the fine adjustments will affect all octaves. By making the appropriate Scale Tune settings, you can obtain a complete variety of tuning methods other than equal temperament. As examples, three possible types of scale setting are explained below.

❍Equal Temperament

This method of tuning divides the octave into 12 equal parts. It is currently the most widely used form of tuning,
especially in occidental music. On FP-3, the default settings for the Scale Tune feature produce equal temperament.

❍Just Temperament (Keytone C)

The three main chords resound much more beautifully than with equal temperament, but this benefit can only be obtained in one key. If transposed, the chords tend to become ambiguous. The example given involves settings for a key in which C is the keytone.

❍Arabian Scale

By altering the setting for Scale Tune, you can obtain a variety of other tunings suited for ethnic music. For example, the settings introduced below will set the unit to use the Arabian Scale.

Example Settings

Note name	Equal Temperament	Just Temperament (Keytone C)	Arabian Scale
C	0	+14	-6
C#	0	-14	+45
D	0	+18	-2
D#	0	+30	-12
E	0	+2	-51
F	0	+12	-8
F#	0	-16	+43
G	0	+16	-4
G#	0	-12	+47
A	0	0	0
A#	0	+32	-10
B	0	+4	-49

The values in the table are given in cents. Refer to the explanation of Scale Tuning on p. 6 to convert these values to hexadecimal, and transmit them as exclusive data.
For example, to set the tune (C-B) of the Part1 Arabian Scale, send the data as follows:
F0 41 10 42 12 40 11 40 3A 6D 3E 34 0D 38 6B 3C 6F 40 36 0F 50 F7

●Tone List

FP-3 TONE MAPPING

PC# / CC0 / CC32	Tone Name	Voices	Notes
00h / 50h / 00h	Grand Piano 1	2-3	1-1
01h / 50h / 00h	Grand Piano 2	2-3	1-2
02h / 50h / 00h	Rock Piano	2-3	1-3
03h / 50h / 00h	Honky-tonk	2-3	1-4
04h / 50h / 00h	Upright Piano	1-2	1-5
05h / 50h / 00h	Harpsichord	1	1-6
06h / 50h / 00h	Stage Rhodes	2	2-1
07h / 50h / 00h	Dyno Rhodes	1	2-2
08h / 50h / 00h	E.Piano	2	2-3
09h / 50h / 00h	Suitcase	1	2-4
0Ah / 50h / 00h	Wurly	2	2-5
0Bh / 50h / 00h	Clavi	1	2-6
0Ch / 50h / 00h	Vibraphone	1	2-7
0Dh / 50h / 00h	Vibra Bell	2	2-8
0Eh / 50h / 00h	Jazz Organ	2	3-1
0Fh / 50h / 00h	Rock Organ	4	3-2
10h / 50h / 00h	Full Organ	1	3-3
11h / 50h / 00h	Lower Organ	1	3-4
12h / 50h / 00h	Church Organ	2	3-5
13h / 50h / 00h	Nason Flute 8'	1	3-6
14h / 50h / 00h	Acoustic Guitar	1	4-1
15h / 50h / 00h	Jazz Guitar	1	4-2
16h / 50h / 00h	Acoustic Bass	4	4-3
17h / 50h / 00h	Acoustic Bass + Cymbal	2	4-4
18h / 50h / 00h	Fingered Bass	1	4-5
19h / 50h / 00h	Thum Voice	1	4-6
1Ah / 50h / 00h	Slow Strings	2	5-1
1Bh / 50h / 00h	Strings	2	5-2
1Ch / 50h / 00h	Warm JP Strings	2	5-3
1Dh / 50h / 00h	Holy Voice	4	5-4
1Eh / 50h / 00h	Sugar Key	2	5-5
1Fh / 50h / 00h	Harp	1	5-6
20h / 50h / 00h	Jazz Scat	1	6-1
21h / 50h / 00h	Rich Choir	2	6-2
22h / 50h / 00h	Dreamy Choir	2	6-3
23h / 50h / 00h	Alto Sax	2	6-4
24h / 50h / 00h	Flute	1	6-5
25h / 50h / 00h	Trumpet	1	6-6

FP-3 Drum MAPPING

PC# / CC0 / CC32	Drum Set Name	Notes
03h / 00h / 40h	Pop Drum Set	6-7
3Fh / 00h / 40h	Vox Drum Set	6-8

* The tones which marked in Notes can be selected from panel.

```
+------- Tone group number
| +---- Page Number
| |
1-1
```

❍Tone groups number as follows,

1: Piano
2: E.Piano
3: Organ
4: Guitar/Bass
5: Strings/Pad
6: Voice/Winds

● MIDI Out Mode

You can select the MIDI data that will be output when you make tone changes on the FP-3's panel.
Additionally, performance data that has been recorded on the FP-3 can be sent out from the MIDI Out connector.
Please refer to the Owner's Manual for information on setting the MIDI Out Mode.

❍MIDI Out Mode 1:

The MIDI messages shown below are output when you perform a tone change on the FP-3.
This setting is suitable when connecting a sequencer, and recording/playing performances.

- Program Change/Bank Select
- Reverb Macro/Reverb Send Level
- Chorus Send Level
- System EFX Type/Part EFX Type/Part EFX Macro/Part EFX Depth

❍MIDI Out Mode 2:

The MIDI messages listed above will NOT be output when you perform a tone change on the FP-3.
This mode is suitable when you don't want to change the tones or effects of a connected sound module when the FP-3 is operated.

❍MIDI Out Mode 3:

When the FP-3 contains recorded performance data, the performance data is transmitted from the MIDI Out connector when the [Play] button on the FP-3 is pressed.
You can transmit the data recorded on the FP-3 to external devices, and play an external sound module.
In this mode, the same MIDI messages as those output in MIDI Out Mode 1 will be output when you perform a tone change on the FP-3.