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You can read the recommendations in the user guide, the technical guide or the installation guide for ROLAND EXR-5. You'll find the answers to all your questions on the ROLAND EXR-5 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

## User manual ROLAND EXR-5 User guide ROLAND EXR-5 Operating instructions ROLAND EXR-5 Instructions for use ROLAND EXR-5 Instruction manual ROLAND EXR-5

EXR-5/EXR-3 MIDI Implementation

### EXR-5/EXR-3 MIDI Implementation

#### 1. Receive data

##### Channel Voice Messages

● **Note off**

Status	Data 1	Data 2
94H	00H	00H
95H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 k = note number (00-127) (0-127)  
 v = note off velocity (00-127) (0-127)  
 \* For Drum Parts, these messages are received when the NOTE OFF + ON for each instrument.  
 \* The velocity value of Note Off messages is ignored.

● **Note on**

Status	Data 1	Data 2
90H	00H	00H
91H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 k = note number (00-127) (0-127)  
 v = note on velocity (00-127) (0-127)  
 \* Not received when the POLY PRESSURE (PR) + OFF (initial value is ON).  
 \* The resulting effect is determined by System Exclusive messages. (While the initial settings, there will be an effect.)

● **Polyphonic Key Pressure**

Status	Data 1	Data 2
A0H	00H	00H
A1H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 k = note number (00-127) (0-127)  
 v = key pressure (00-127) (0-127)  
 \* Not received when the POLY PRESSURE (PR) + OFF (initial value is ON).  
 \* The resulting effect is determined by System Exclusive messages. (While the initial settings, there will be an effect.)

● **Control Change**

When the CONTROL CHANGE + OFF, all control change messages except for Channel Select messages will be ignored.  
 \* The data specified by a Control Change message will not be retained by a power-on reset.

○ **Bank Select (Controller number 32)**

Status	Data 1	Data 2
00H	00H	00H
01H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 m = Bank number (00-127) (0-127)  
 Initial value = 00H  
 \* The BANK SELECT is set to 00H by "System On" and Bank Select messages.

● **Bank number LSB**

Status	Data 1	Data 2
02H	00H	00H
03H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 m = Bank number (00-127) (0-127)  
 Initial value = 00H  
 \* The BANK SELECT is set to 00H by "System On" and Bank Select messages.  
 \* When the BANK SELECT + LSB + OFF, Bank number LSB will be handled as 00H regardless of the received value. However, when sending Bank Select messages, you must send both the MSB (01H) and LSB (02H) if the value should be 02H or higher.  
 \* Bank Select processing will be suspended until a Program Change message is received.  
 \* The 02H error Variation number is the value of the Bank Select MSB (Controller number 33) when the value is 02H.  
 \* The 03H error Variation number is the value of the Bank Select LSB (Controller number 32) when the value is 03H.  
 \* The 04H error Variation number is the value of the Bank Select LSB (Controller number 32) when the value is 04H.

○ **Modulation (Controller number 1)**

Status	Data 1	Data 2
06H	00H	00H
07H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 v = modulation depth (00-127) (0-127)  
 \* Not received when the MODULATE + OFF (initial value is ON).  
 \* The resulting effect is determined by System Exclusive messages. (While the initial settings, this is the Modulate On.)

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

Status	Data 1	Data 2
08H	00H	00H
09H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Portamento Time (00-127) (0-127)  
 Initial value = 00H (0)  
 \* This adjusts the value of pitch change when Portamento is ON when using the Performance Control. A value of 0 results in the fastest change.

○ **Omni On (Controller number 6, 36)**

Status	Data 1	Data 2
0AH	00H	00H
0BH	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 om = On, the value of the parameter specified by PERFORMANCE (00 = OFF, 01 = ON)

○ **Volume (Controller number 7)**

Status	Data 1	Data 2
0BH	00H	00H
0CH	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 v = Volume (00-127) (0-127)  
 Initial value = 64H (100)  
 \* Volume messages are used to adjust the volume of individual notes.  
 \* Not received when the VOLUME + OFF (initial value is ON).

○ **Pan (Controller number 10)**

Status	Data 1	Data 2
0DH	00H	00H
0EH	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = pan (00-127) (0-127)  
 Initial value = 64H (Center)  
 \* The stereo position can be adjusted over 127 steps.  
 \* For Drum Parts, Pan is a relative adjustment of each instrument's pan setting.  
 \* Not received when the PAN + OFF (initial value is ON).

○ **Expression (Controller number 11)**

Status	Data 1	Data 2
0FH	00H	00H
10H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Expression (00-127) (0-127)  
 Initial value = 7FH (127)  
 \* This digit has the function of a filter. It can be used independently from Volume messages. Expression messages are used for musical expression such as performance, e.g. expression pedal movements, crescendos and decrescendos.  
 \* Not received when the EXPRESSION + OFF (initial value is ON).

○ **Hold 1 (Controller number 65)**

Status	Data 1	Data 2
39H	00H	00H
3AH	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Control value (00-127) (0-127)  
 \* Not received when the HOLD 1 + OFF (initial value is ON).

○ **Portamento (Controller number 66)**

Status	Data 1	Data 2
3BH	00H	00H
3CH	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Control value (00-127) (0-127) (0-127)  
 \* Not received when the PORTAMENTO + OFF (initial value is ON).

○ **Sustain (Controller number 67)**

Status	Data 1	Data 2
3DH	00H	00H
3EH	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Control value (00-127) (0-127) (0-127)  
 \* Not received when the SUSTAIN + OFF (initial value is ON).

○ **Soft (Controller number 67)**

Status	Data 1	Data 2
3FH	00H	00H
40H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Control value (00-127) (0-127) (0-127)  
 \* Not received when the SOFT + OFF (initial value is ON).

○ **Release (Tie) (Controller number 71)**

Status	Data 1	Data 2
44H	00H	00H
45H	00H	00H

n = MIDI channel number (01-16) (Ch 1-16)  
 w = Release time (00-127) (0-127)  
 Initial value = 00H (no change)



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**Manual abstract:**

@@@@ (Initial value is ON) · For Drum Parts, these messages are not received when Rx.NOTE ON = OFF for each Instrument. · Volume messages are used to adjust the volume balance of each Part. · Not received when Rx.VOLUME = OFF. (Initial value is ON) Pan (Controller number 10) Status BnH 2nd byte 0AH 3rd byte vvH 0H~FH (Ch.1~16) 00H~40H~7FH (Left~Center~Right), Initial value = 40H (Center) q Polyphonic Key Pressure Status AnH 2nd byte kkH 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 00H~7FH (0~127) n = MIDI channel number: vv = pan: n = MIDI channel number: kk = note number: vv = key pressure: · Not received when Rx.POLY PRESSURE (PAf) = OFF. (Initial value is ON) · The resulting effect is determined by System Exclusive messages.

With the initial settings, there will be no effect. · The stereo position can be adjusted over 127 steps. @@ · Not received when Rx.PANPOT = OFF.

@@@@@ 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. · Not received when Rx.EXPRESSION = OFF.

(Initial value is ON) Hold 1 (Controller number 64) Status BnH 2nd byte 40H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 0H~FH (Ch.1~16) 00H~7FH (GS Variation number 0~127) Initial value = 00H "120" = GM2 Drum Set "121" = GM2 instrument II = Bank number LSB: 00H/02H (MAP), Initial value = 00H · Not received when Rx.BANK SELECT = OFF. · "Rx.BANK SELECT" is set to OFF by "GM1 System On," and Bank Select messages will be ignored. · Rx.BANK SELECT is set to ON by "GM2 System On." · Rx.BANK SELECT is set to ON by power-on reset or by receiving "GS Reset.

· When Rx.BANK SELECT LSB = OFF, Bank number LSB (IIH) will be handled as 00H regardless of the received value. However, when sending Bank Select messages, you have to send both the MSB (mmH) and LSB (IIH), the value should be 00H together. · Bank Select processing will be suspended until a Program Change message is received. · The GS format "Variation number" is the value of the Bank Select MSB (Controller number 0) expressed in decimal. · After receiving "XG Lite On", MSB= 00 selects "Melody", MSB= 127 selects "Rhythm", LSB can be set to 00H~7FH (default: 00H). · Some other GS devices do not recognize the Bank Select LSB (Controller number 32). Modulation (Controller number 1) Status BnH 2nd byte 01H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) n = MIDI channel number: mm = Bank number MSB: n = MIDI channel number: vv = Control value: · Not received when Rx.HOLD1 = OFF.

(Initial value is ON) Portamento (Controller number 65) Status BnH 2nd byte 41H 3rd byte vvH n = MIDI channel number: 0H~FH (Ch.1~16) vv = Control value: 00H~7FH (0~127) 0~63 = OFF, 64~127 = ON · Not received when Rx.PORTAMENTO = OFF. (Initial value is ON) Sostenuato (Controller number 66) Status BnH 2nd byte 42H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 0~63 = OFF, 64~127 = ON n = MIDI channel number: vv = Control value: · Not received when Rx.

SOSTENUTO = OFF. (Initial value is ON) Soft (Controller number 67) Status BnH 2nd byte 43H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 0~63 = OFF, 64~127 = ON n = MIDI channel number: vv = Modulation depth: · Not received when Rx.MODULATION = OFF (Initial value is ON) · The resulting effect is determined by System Exclusive messages. With the initial settings, this is Pitch Modulation Depth.

n = MIDI channel number: vv = Control value: · Not received when Rx.SOFT = OFF. (Initial value is ON) Filter Resonance (Timbre/Harmonic Intensity) (Controller number 71) Status BnH 2nd byte 47H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (-64~0~+63), Initial value = 40H (no change) n = MIDI channel number: vv = Resonance value (relative change): 1 EXR-5/EXR-3 MIDI Implementation Release Time (Controller number 72) Status BnH 2nd byte 48H 3rd byte vvH Effect 3 (Chorus Send Level) (Controller number 93) Status BnH 2nd byte 5DH 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127), Initial value = 00H (0) n = MIDI channel number: 0H~FH (Ch.1~16) vv = Release Time value (relative 00H~7FH (-64~0~+63), change): Initial value = 40H (no change) Attack time (Controller number 73) Status BnH 2nd byte 49H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (-64~0~+63), Initial value = 40H (no change) n = MIDI channel number: vv = Chorus Send Level: · This message adjusts the Chorus Send Level of each Part. NRPN MSB/LSB (Controller number 99, 98) Status BnH BnH 2nd byte 63H 62H 3rd byte mmH IIH n = MIDI channel number: vv = Attack time value (relative change): Cutoff (Controller number 74) Status BnH 2nd byte 4AH n = MIDI channel number: 0H~FH (Ch.1~16) mm = upper byte (MSB) of the parameter number specified by NRPN II = lower byte (LSB) of the parameter number specified by NRPN · Rx.NRPN is set to OFF by power-on reset or by receiving "GM1 System On", "GM2 System On", or "XG Lite System On", and NRPN message will be ignored.

NRPN message will be received when Rx.NRPN = ON, or by receiving "GS RESET." · The value set by NRPN will not be reset even if Program Change or Reset All Controllers is received. \*\*NRPN\*\* The NRPN (Non Registered Parameter Number) message allows an extended range of control changes to be used. On the EXR-5/EXR-3, NRPN messages can be used to modify sound parameters, etc. To use these messages, you must first use NRPN messages (Controller number 98 and 99, their order does not matter) to specify the parameter to be controlled, and then use Data Entry messages (Controller number 6) to specify the value of the specified parameter. Once an NRPN 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 "4. Supplementary material", Examples of actual MIDI messages, [Example 4] (page 18).

On the EXR-5/ EXR-3, Data entry LSB (Controller number 38) of NRPN is ignored, so it is no problem to send Data entry MSB (Controller number 6) only (without Data entry LSB). On the EXR-5/EXR-3, NRPN can be used to modify the following parameters. NRPN Data entry MSB LSB Function and range MSB 01H 08H mmH Vibrato Rate (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 09H mmH Vibrato Depth (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 0AH mmH Vibrato Delay (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 20H mmH TVF Cutoff Frequency (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 21H mmH TVF Resonance (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 63H mmH TVF&TVA Envelope Attack Time (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 64H mmH TVF&TVA Envelope Decay Time (relative change) mm: 00H~40H~7FH (-64~0~+63) 01H 66H mmH TVF&TVA Envelope Release Time (relative change) mm: 00H~40H~7FH (-64~0~+63) 18H rrH mmH Drum Instrument Pitch Coarse (relative change) rr: Drum Instrument note number mm: 00H~40H~7FH (-64~0~+63 semitone) 1AH rrH mmH Drum Instrument TVA Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max) 1CH rrH mmH Drum Instrument Panpot (absolute change) rr: Drum Instrument note number mm: 00H, 01H~40H~7FH (random, left~center~right) 1DH rrH mmH Drum Instrument Reverb Send Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max) 1EH rrH mmH Drum Instrument Chorus Send Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max) 4FH 10H mmH Part 4 On / Off (Main) [EXR-5/EXR-3] mm: 00H~7FH (00-3FH = Off~40-7FH = On) 4FH 11H mmH Part 11 On / Off (Split) mm: 00H~7FH (00-3FH = Off~40-7FH = On) 4FH 12H mmH Part 12 On / Off (Auto Bass) mm: 00H~7FH (00-3FH = Off~40-7FH = On) 4FH 13H mmH Part 6 On / Off (Dual) mm: 00H~7FH (00-3FH = Off~40-7FH = On) 4FH 14H mmH Part 16 On / Off (Main Drums) mm: 00H~7FH (00-3FH = Off~40-7FH = On) 4FH 27H mmH Part 14 On / Off (V-Link) mm: 00H~7FH (00-3FH = Off~40-7FH = On) 4FH 26H mmH Part 15 On / Off (Melody Int.

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) mm: 00H~7FH (00-3FH =Off~40-7FH= On) 4FH 18H mmH Part 8 On / Off (Acc 5) mm: 00H~7FH (00-3FH =Off~40-7FH= On) 4FH 19H mmH Part 9 On / Off (Acc 6) mm: 00H~7FH (00-3FH =Off~40-7FH= On) 4FH 1AH mmH Part 10 On / Off (Acc Drums) mm: 00H~7FH (00-3FH =Off~40-7FH= On) 4FH 1BH mmH Part 2 On / Off (Acc Bass) mm: 00H~7FH (00-3FH =Off~40-7FH= On) 3rd byte vvH n = MIDI channel number: 0H~FH (Ch.1~16) vv= Cutoff value (relative change): 00H~7FH (-64~0~+63), Initial value = 40H (no change) Decay Time (Controller number 75) Status BnH 2nd byte 4BH 3rd byte vvH 0H~FH (Ch.

1~16) 00H~7FH (-64~0~+63), Initial value = 40H (no change) n = MIDI channel number: vv= Decay Time value (relative change): Vibrato Rate (Controller number 76) Status BnH 2nd byte 4CH 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (-64~0~+63), Initial value = 40H (no change) n = MIDI channel number: vv= Vibrato Rate value (relative change): Vibrato Depth (Controller number 77) Status BnH 2nd byte 4DH 3rd byte vvH n = MIDI channel number: 0H~FH (Ch.1~16) vv= Vibrato Depth value (relative 00H~7FH (-64~0~+63), change): Initial value = 40H (no change) Vibrato Delay (Controller number 78) Status BnH 2nd byte 4EH 3rd byte vvH n = MIDI channel number: 0H~FH (Ch.1~16) vv= Vibrato Delay value (relative 00H~7FH (-64~0~+63), change): Initial value = 40H (no change) Portamento control (Controller number 84) Status BnH 2nd byte 54H 3rd byte kkH 0H~FH (Ch.1~16) 00H~7FH (0~127) n = MIDI channel number: kk = source note number: · 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. Example 1. On MIDI 90 3C 40 B0 54 3C 90 40 40 80 3C 40 80 40 40 Example 2. On MIDI B0 54 3C 90 40 40 80 40 40 Description Portamento Control from C4 Note on E4 Note off E4 Result no change E4 is played with a glide from C4 to E4 E4 off Description Note on C4 Portamento Control from C4 Note on E4 Note off C4 Note off E4 Result C4 on no change glide from C4 to E4 no change E4 off Effect 1 (Reverb Send Level) (Controller number 91) Status BnH 2nd byte 5BH 3rd byte vvH n = MIDI channel number: 0H~FH (Ch.1~16) vv = Reverb Send Level: 00HnoRock 1 57 8 ThumpRck 1 58 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 FeverDnc 80sTekno EuroDnce IbizaDnce KeepOnDc 90sTekno DJTechno HrdTekno 90sHouse BigHouse ClubHous Hip'nHop NowHipHp CoolRap PianoRap Twostep PianoBal Soul Bal ClassBal StoryBal HappyBal SimpleBl AlClapBl LayBakBl MorninBl PoppinBl UKLiteBl Cute Pop UpTempBl SmilePop German P Easy Pop Soul Pop WayURPop NightPop Cool Pop Guitar P LatinPop LightPop USGroove FeelGood Busy Pop Groovy P VibeyPop SunnyPop JzBallad BigBand JazzClub BgBndBld 30BigBnd LuvBossa MidBossa UpBossa UpSamba DiscSamba Salsa Merengue Bachata Cool6\_8 Oldie6\_8 Poprock GoGoRock PolkaPop CntryPop Schlager 70sDisco BigSamba Cha-cha Mambo SwingFox Rockin' Boogie Twist EngWaltz W'Waltz Tango 2 2 2 2 2 2 2 2 2 2 2 33 33 2 6 6 54 54 6 6 6 6 6 6 0 6 7 7 7 7 7 7 7 7 28 7 7 7 7 7 13 14 12 14 14 22 22 27 27 25 59 59 5 5 39 10 19 16 5 66 27 24 38 50 10 9 10 18 17 26 102 118 119 120 101 98 121 122 97 123 124 125 126 11 12 127 61 69 70 6 7 7 7 7 7 73 74 75 76 62 77 0 78 72 80 70 73 67 74 75 76 14 68 77 69 78 79 20 15 29 16 17 37 23 24 13 14 12 8 9 22 24 17 27 22 13 30 1 20ound will be continued until these are turned off. q OMNI OFF (Controller number 124) Status BnH 2nd byte 7CH 3rd byte 00H dd,..

.,ee = data: F7H: System Exclusive Message status an ID number (manufacturer ID) to indicate the manufacturer whose Exclusive message this is. Roland's manufacturer ID is 41H. @@00H~7FH (0~127) EOX (End Of Exclusive) The System Exclusive Messages received by the EXR-5/EXR-3 are: messages related to mode settings, Universal Realtime System Exclusive messages and Data Set (DT1). n = MIDI channel number: 0H~FH (Ch.1~16) · The same processing will be carried out as when All Notes Off is received. q System Exclusive messages related to mode settings These messages are used to initialize a device to GS or General MIDI mode, or change the operating mode. When creating performance data, a "GM1 System On" message should be inserted at the beginning of a General MIDI 1 score, a "GM2 System On" message at the beginning of a General MIDI 2 score, an "XG Lite System On" message at the beginning of an XG Lite score, and a "GS Reset" message at the beginning of a GS music data. Each song should contain only one mode message as appropriate for the type of data. (Do not insert two or more mode setting messages in a single song.

) "GM System On" uses Universal Non-realtime Message format. "GS Reset" uses Roland system Exclusive format "Data Set 1 (DT1)." GM1 System On This is a command message that resets the internal settings of the unit to the General MIDI 1 initial state. After receiving this message, the EXR-5/EXR-3 will automatically be set to the proper condition for correctly playing a General MIDI score. Status F0H Data byte 7EH, 7FH, 09H, 01H Status F7H q OMNI ON (Controller number 125) Status BnH 2nd byte 7DH 3rd byte 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. q MONO (Controller number 126) Status BnH 2nd byte 7EH 3rd byte mmH 0H~FH (Ch.1~16) 00H~10H (0~16) n = MIDI channel number: mm = mono number: · 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 "mm (mono number)." q 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 Sounds Off and All Notes Off is received, and the corresponding channel will be set to Mode 3. Explanation Byte 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) · When this message is received, Rx.BANK SELECT will be OFF and Rx.NRPN will be OFF. · There must be an interval of at least 50 ms between this message and the next message. 4 EXR-5/EXR-3 MIDI Implementation GM2 System On Status F0H Data byte 7EH 7FH 09H 03H Status F7H q Universal Realtime System Exclusive Messages Master Volume Status F0H Data byte 7FH, 7FH, 04H, 01H, llH, mmH Status F7H Explanation Byte 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) · When this message is received, the EXR-5/EXR-3 will be able to receive the messages specified by General MIDI 2, and use the General MIDI 2 sound map.



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GM System Off "GM System Off" is a command message that resets the internal state of the EXR-5/ EXR-3 from the GM state to its native condition. The EXR-5/EXR-3 will reset to the GS default state. Status F0H Data byte 7EH,7F,09H,02H Status F7H Explanation Byte 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. q Global Parameter Control Parameters of the Global Parameter Control are newly provided for the General MIDI 2.

Reverb Parameters Status F0H Byte F0H 7FH 7FH 04H 05H 01H 01H 01H 01H 01H ppH vvH F7H pp=0 Data byte 7FH,7FH,04H,05H,01H,01H,01H,01H,ppH,vvH Explanation Exclusive status ID number (universal realtime message) Device ID (Broadcast) Sub ID#1 (Device Control) Sub ID#2 (Global Parameter Control) Slot path length Parameter ID width Value width Slot path MSB Slot path LSB (Effect 0101: Reverb) Parameter to be controlled. Value for the parameter. EOX (End Of Exclusive) Status F7H Explanation Byte 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) · When this message is received, the EXR-5/ EXR-3 will reset to the GS default state. XG System On "XG System On" is a command message that resets the internal settings of the EXR-5/ EXR-3 from its internal to the XG state. The EXR-5/EXR-3 actually uses the XG Lite mode. Status F0H Byte F0H 43H dev 4CH 00H 00H 7EH 00H F7H Data byte 43H, dev, 4CH, 00H, 00H, 7EH, 00H Explanation Exclusive status ID number (Yamaha) Device ID (initial value= 10H) Model ID Address Hi Address Middle Address Low Checksum EOX (End Of Exclusive) Status F7H Reverb Type vv = 00H Small Room (Room1) vv = 01H Medium Room (Room2) vv = 02H Large Room (Room3) vv = 03H Medium Hall (Hall1) vv = 04H Large Hall (Hall2) vv = 08H Plate (Plate) · The EXR-5/EXR-3 displays Reverb Type as described in the parentheses. Reverb Time vv = 00H~7FH0~127 GS Reset GS Reset is a message that resets the internal settings of a device to the GS initial state. This message appears at the beginning of GS music data, and a GS device that receives this message will automatically be set to the proper state to correctly play back GS music data. Status F0H Data byte 41H, dev, 42H, 12H, 40H, 00H, 7FH, 00H, 41H Status F7H pp=1 Chorus Parameters Status F0H Byte F0H 7FH 7FH 04H 05H 01H 01H 01H 02H ppH vvH F7H pp=0 Data byte 7FH,7FH,04H,05H,01H,01H,01H,02H,ppH,vvH Explanation Exclusive status ID number (universal realtime message) Device ID (Broadcast) Sub ID#1 (Device Control) Sub ID#2 (Global Parameter Control) Slot path length Parameter width Value width Slot path MSB Slot path LSB (Effect 0102: Chorus) Parameter to be controlled. Value for the parameter.

EOX (End Of Exclusive) Chorus Type vv=0 Chorus1 vv=1 Chorus2 vv=2 Chorus3 vv=3 Chorus4 vv=4 FB Chorus vv=5 Flanger Mod Rate vv= 00H~7FH0~127 Mod Depth vv = 00H~7FH0~127 Feedback vv = 00H~7FH0~127 Send To Reverb vv = 00H~7FH0~127 Status F7H Explanation Byte F0H Exclusive status 41H ID number (Roland) dev Device ID (dev: 00H~1FH (1~32), Initial value is 10H (17)) 42H Model ID (GS) 12H Command ID (DT1) 40H Address MSB 00H Address 7FH Address LSB 00H Data (GS reset) 41H Checksum F7H EOX (End Of Exclusive) · When this message is received, Rx.NRPN will be ON. · There must be an interval of at least 50 ms between this message and the next. Exit GS Mode "Exit GS Mode" is a command message that resets the internal settings of the unit to the Arranger Mode 1 initial state. Status F0H Data byte 41H, dev, 42H, 12H, 40H, 00H, 7FH, 7FH, 42H Status F7H Explanation Byte F0H Exclusive status 41H ID number (Roland) dev Device ID (dev: 00H~1FH (1~32) Initial value is 10H (17)) 42H Model ID (GS) 12H Command ID (DT1) 40H Address MSB 00H Address 7FH Address LSB 7FH Data (Exit GS Mode) 42H Checksum F7H EOX (End Of Exclusive) · When this message is received, the unit changes from "General MIDI" mode to EXR-5/EXR-3 default mode.

(Arranger mode) · There must be an interval of at least 100 ms between this message and the next message. pp=1 pp=2 pp=3 pp=4 Channel Pressure Status F0H Byte F0H 7FH 7FH 09H 01H Data byte 7FH,7FH,09H,01H,0nH,ppH,rrH Explanation Exclusive status ID number (universal realtime message) Device ID (Broadcast) Sub ID#1 (Controller Destination Setting) Sub ID#2 (Channel Pressure) Status F7H 5 EXR-5/EXR-3 MIDI Implementation Status 0nH ppH rrH F7H pp=0 pp=1 pp=2 pp=3 pp=4 pp=5 Controller Status F0H Byte F0H 7FH 7FH 09H 03H 0nH ccH ppH rrH F7H pp=0 pp=1 pp=2 pp=3 pp=4 pp=5 Data byte MIDI Channel (00~0F) Controlled parameter Controlled range EOX (End Of Exclusive) Pitch Control rr= 28H~58H -24~+24 [semitones] Filter Cutoff Control rr = 00H~7FH -9600~+9450 [cents] Amplitude Control rr = 00H~7FH 0~200% LFO Pitch Depth rr = 00H~7FH 0~600 [cents] LFO Filter Depth rr = 00H~7FH 0~2400 [cents] LFO Amplitude Depth rr = 00H~7FH0~100% Status Key-Based Instrument Controllers Status F0H Byte F0H 7FH 7FH 0AH 01H 0nH kkH nnH vvH F7H nn=07H Data byte 7FH,7FH,0AH,01H,0nH,kkH,nnH,vvH Explanation Exclusive status ID number (universal realtime message) Device ID (Broadcast) Sub ID#1 (Key-Based Instrument Control) Sub ID#2 (Controller) MIDI Channel (00~0F) Key Number Control Number Value EOX (End Of Exclusive) Status ...F7H Data byte 7FH,7FH,09H,03H,0nH,ccH,ppH,rrH Explanation Exclusive status ID number (universal realtime message) Device ID (Broadcast) Sub ID#1 (Controller Destination Setting) Sub ID#2 (Control Change) MIDI Channel (00~0F) Controller number (01~1F, 40~5F) Controlled parameter Controlled range EOX (End Of Exclusive) Pitch Control rr = 28H~58H -24~+24 [semitones] Filter Cutoff Control rr = 00H~7FH -9600~+9450 [cents] Amplitude Control rr = 00H~7FH 0~200% LFO Pitch Depth rr = 00H~7FH 0~600 [cents] LFO Filter Depth rr = 00H~7FH 0~2400 [cents] LFO Amplitude Depth rr = 00H~7FH 0~100% Status F7H 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) · This parameter affects drum instruments only.

Scale/Octave Tuning Adjust Status F0H Byte F0H 7EH 7FH 08H 08H ffH Data byte 7EH,7FH,08H,08H,ffH,ggH,hhH,ssH... Explanation Exclusive status ID number (Universal Non-realtime Message) Device ID (Broadcast) Sub ID#1 (MIDI Tuning Standard) Sub ID#2 (scale/octave tuning 1-byte form) Channel/Option byte1 bits 0 to 1 = channel 15 to 16 bit 2 to 6 = Undefined Channel byte2 bits 0 to 6 = channel 8 to 14 Channel byte3 bits 0 to 6 = channel 1 to 7 12 byte tuning offset of 12 semitones from C to B 00H = -64 [cents] 40H = 0 [cents] (equal temperament) 7FH = +63 [cents] EOX (End Of Exclusive) Status F7 ggH hhH ssH F7H 6 EXR-5/EXR-3 MIDI Implementation 2.



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Transmit data s Channel Voice Messages q Note off Status 9nH 2nd byte kkH 3rd byte 00H 0H~FH (Ch.1~16) 00H~7FH (0~127) 00H (0) Hold 1 (Controller number 64) Status BnH 2nd byte 40H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) n = MIDI channel number: vv = Control value: Portamento (Controller number 65) Status 2nd byte 3rd byte n = MIDI channel number: kk = note number: vv = note off velocity: n = MIDI channel number: vv = Control value: 0H~FH (Ch.1~16) 00H~7FH (0~127) 0~63 = OFF, 64~127 = ON q Note on Status 9nH 2nd byte kkH 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 01H~7FH (1~127) Sostenuato (Controller number 66) Status BnH 2nd byte 42H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 0~63 = OFF, 64~127 = ON n = MIDI channel number: kk = note number: vv = note on velocity: n = MIDI channel number: vv = Control value: Soft (Controller number 67) Status q Control Change Bank Select (Controller number 0, 32) Status BnH BnH 2nd byte 00H 20H 3rd byte mmH llH 0H~FH (Ch.

1~16) 00H~7FH (GS Variation number 0~127) 02H (MAP) BnH 2nd byte 43H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127) 0~63 = OFF, 64~127 = ON n = MIDI channel number: vv = Control value: n = MIDI channel number: mm = Bank number MSB: ll = Bank number LSB: Portamento control (Controller number 84) Status BnH 2nd byte 54H 3rd byte kkH 0H~FH (Ch.1~16) 00H~7FH (0~127) · Not transmitted when "Program Change" Tx Filter is set to "Off". · Some other GS devices do not recognize the Bank Select LSB (Controller number 32). Modulation (Controller number 1) Status BnH 2nd byte 01H 3rd byte vvH n = MIDI channel number: kk = source note number: Effect 1 (Reverb Send Level) (Controller number 91) Status BnH 2nd byte 5BH 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127), Initial value = 28H (40) n = MIDI channel number: 0H~FH (Ch.1~16) vv = Modulation depth: 00H~7FH (0~127) · Not transmitted when "Modulation" Tx Filter is On. Portamento Time (Controller number 5) Status BnH 2nd byte 05H 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127), Initial value = 00H (0) n = MIDI channel number: vv = Reverb Send Level: · This message adjusts the Reverb Send Level of each Part. Effect 3 (Chorus Send Level) (Controller number 93) Status BnH 2nd byte 5DH 3rd byte vvH 0H~FH (Ch. 1~16) 00H~7FH (0~127), Initial value = 00H (0) n = MIDI channel number: vv = Portamento Time: n = MIDI channel number: vv = Chorus Send Level: · This adjusts the rate of pitch change when Portamento is ON or when using the Portamento Control. A value of 0 results in the fastest change. Data Entry (Controller number 6, 38) Status BnH BnH 2nd byte 06H 26H 3rd byte mmH llH · This message adjusts the Chorus Send Level of each Part. NRPN MSB/LSB (Controller number 99, 98) Status BnH BnH 2nd byte 63H 62H 3rd byte mmH 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 BnH 2nd byte 07H 3rd byte vvH 0H~FH (Ch. 1~16) 00H~7FH (0~127), Initial value = 64H (100) n = MIDI channel number: 0H~FH (Ch.1~16) mm = upper byte (MSB) of the parameter number specified by NRPN ll = lower byte (LSB) of the parameter number specified by NRPN \*\*NRPN\*\* The NRPN (Non Registered Parameter Number) message allows an extended range of control changes to be used, letting you use control functions which are not defined in the MIDI Specification. NRPNs provide a great deal of freedom, and can be used with any manufacturer's devices. As a result, any particular parameter number can easily mean one thing when used for a certain device, and mean something completely different on another device. Note that RPNs and NRPNs require that a multiple number of messages be processed in the correct order.

However, a majority of the sequencers currently on the market cannot always be relied on to consistently send messages in the proper order if the messages are located at almost exactly the same point in time. On the GS instruments, NRPN can be used to modify the following parameters. The range of values for relative change parameters will be different with certain models. Please see the explanation that follows the chart. NRPN MSB LSB 01H 08H 01H 09H 01H 0AH 01H 20H 01H 21H 01H 63H Data Entry Function and range MSB mmH Vibrato Rate (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH Vibrato Depth (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH Vibrato Delay (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH TVF Cutoff Frequency (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH TVF Resonance (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH TVF&TVA Envelope Attack Time (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH TVF&TVA Envelope Decay Time (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH TVF&TVA Envelope Release Time (relative change) mm: 00H~40H~7FH (-64~0~+63) mmH Drum Instrument Pitch Coarse (relative change) rr: Drum Instrument note number mm: 00H~40H~7FH (-64~0~+63 semitone) n = MIDI channel number: vv = Volume: · Volume messages are used to adjust the volume balance of each Part. Pan (Controller number 10) Status BnH 2nd byte 0AH 3rd byte vvH 0H~FH (Ch.1~16) 00H~40H~7FH (Left~Center~Right), Initial value = 40H (Center) · The stereo position can be adjusted over 127 steps. Expression (Controller number 11) Status BnH 2nd byte 0BH 3rd byte vvH 0H~FH (Ch.1~16) 00H~7FH (0~127), Initial value = 7FH (127) n = MIDI channel number: vv = pan: n = MIDI channel number: vv = Expression: · This adjusts the volume of a Part. 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. CC22, 23, 24, 25 (only if V-Link is on) Status BnH BnH BnH BnH 2nd byte 16H n = Ch. 14 17H n = Ch. 13 18H n = Ch. 14 19H n = Ch. 14 3rd byte vvH vvH vvH vvH 01H 64H 01H 66H 18H rrH vv = video effects (16H, 18H, 19H) or dissolve time (17H) [00H~7FH in all cases] · These control changes are only received by an Edirol DV-7PR. 7 EXR-5/EXR-3 MIDI Implementation NRPN MSB LSB 1AH rrH Data Entry Function and range MSB mmH Drum Instrument TVA Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max) 1CH rrH mmH Drum Instrument Panpot (absolute change) rr: Drum Instrument note number mm: 00H, 01H~40H~7FH (random, left~center~right) 1DH rrH mmH Drum Instrument Reverb Send Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max) 1EH rrH mmH Drum Instrument Chorus Send Level (absolute change) rr: Drum Instrument note number mm: 00H~7FH (0~max) · Parameters marked "relative change" will change relatively to the preset value(40H). Even among different GS devices, "relative change" parameters may sometimes differ in the way the sound changes or in the range of change.



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· Parameters marked "absolute change" will be set to the absolute value of the parameter, regardless of the preset value. · Data entry LSB (llH) is ignored. RPN MSB/LSB (Controller number 101, 100) Status · When this message is transmitted, the following controllers will be set to their reset values. Controller Pitch Bend Change Channel Pressure Modulation Hold 1 Sostenuto Soft Reset value +/-0 (center) 0 (off) 0 (off) 0 (off) 0 (off) 0 (off) q MONO (Controller number 126) Status BnH 2nd byte 7EH 3rd byte mmH 0H~FH (Ch.1~16) 00H~10H (0~16) n = MIDI channel number: mm = mono number: · The corresponding channel will be set to Mode 4 (M=1).

q POLY (Controller number 127) Status 2nd byte 3rd byte BnH 7FH 00H n = MIDI channel number: 0H~FH (Ch.1~16) · The corresponding channel will be set to Mode 3. BnH BnH 2nd byte 65H 64H 3rd byte mmH 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\*\* The RPN (Registered Parameter Number) message allows an extended range of control changes to be used, letting you use additional control functions which are part of the MIDI Specification. On the EXR-5/EXR-3, RPN can be used to modify the following parameters.

RPN Data Entry MSB LSB Explanation MSB 00H 00H mmH --Pitch Bend Sensitivity mm: 00H~18H (0~24 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) Refer to "4. Supplementary material", About the Tuning (page 19). 00H 02H mmH --Master Coarse Tuning mm: 28H~40H~58H (-24~0~+24 semitones), Initial value = 40H (+/- 0 semitone) ll: ignored (processed as 00H) Modulation Depth Range mm: 00H~04H (0~4 semitones) ll: 00H~7FH (0~100 cents) 100/128 Cent/Value RPN null Set condition where RPN and NRPN are 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 s System Realtime Messages Active Sensing Status FEH Transmitted about every 250ms. Song/Style Start Status FAH · This message is transmitted when the internal sequencer is started. Song/Style Stop Status FCH · This message is transmitted when the internal sequencer is stopped.

Song Continue Status FBH · This message is transmitted when the sequencer is started not from the beginning. Song Position Pointer Status 2nd byte F2H XXH XX = Song Position (Bar) LSB YY = Song Position (Bar) MSB Timing Clock Status F8H 3rd byte YYH 00H 05H mmH llH 7FH 7FH --- --- q System Exclusive messages related to mode settings These messages are used to initialize a device to GS or General MIDI mode, or change the operating mode. When creating performance data, a "GM1 System On" message should be inserted at the beginning of a General MIDI 1 score, a "GM2 System On" message at the beginning of a General MIDI 2 score, and a "GS Reset" message at the beginning of a GS music data. Each song should contain only one mode message as appropriate for the type of data. (Do not insert two or more mode setting messages in a single song.) "GM System On" uses the Universal Non-realtime Message format. "GS Reset" uses Roland system Exclusive format "Data Set 1 (DT1)." GM1 System On This is a command message that resets the internal settings of the unit to the General MIDI 1 initial state. After receiving this message, the EXR-5/EXR-3 will automatically be set to the proper condition for correctly playing a General MIDI score. Status F0H Data byte 7EH, 7FH, 09H, 01H Status F7H q Program Change Status CnH 2nd byte ppH 0H~FH (Ch. 1~16) 00H~7FH (prog.1~prog.128) n = MIDI channel number: pp = Program number: · Not transmitted when "Program Change" Tx Filter is set to "Off". · See also the table on page 3 for transmitted Style program changes. (They are not transmitted, when "Style PC" is set to "Off".)

) q Pitch Bend Change Status EnH 2nd byte llH 3rd byte mmH 0H~FH (Ch.1~16) 00 00H~40 00H~7F 7FH (-8192~0~+8191) n = MIDI channel number: mm, ll = Pitch Bend value: · Not transmitted when "Pitch Bender" Tx Filter is On. s Channel Mode Messages q 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 transmitted, all currently sounding notes on the corresponding channel will be turned off immediately. Explanation Byte 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) · When this message is received, Rx.

BANK SELECT will be OFF and Rx.NRPN will be OFF. · There must be an interval of at least 50 ms between this message and the next message. GM2 System On Status F0H Byte F0H 7EH 7FH Data byte 7EH 7FH 09H 03H Explanation Exclusive status ID number (Universal Non-realtime Message) Device ID (Broadcast) Status F7H q Reset All Controllers (Controller number 121) Status 2nd byte 3rd byte BnH 79H 00H n = MIDI channel number: 0H~FH (Ch.1~16) 8 EXR-5/EXR-3 MIDI Implementation Status Data byte Status 09H Sub ID#1 (General MIDI Message) 03H Sub ID#2 (General MIDI 2 On) F7H EOX (End Of Exclusive) · When this message is received, the EXR-5/EXR-3 will be able to receive the messages specified by General MIDI 2, and use the General MIDI 2 sound map. GM System Off "GM System Off" is a command message that resets the internal state of the EXR-5/ EXR-3 from the GM state to its native condition. The EXR-5/EXR-3 will reset to the GS default state. Status F0H Data byte 7EH,7F,09H,02H Status F7H Explanation Byte 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) · When this message is received, the EXR-5/EXR-3 will reset to the GS default state. GS Reset GS Reset is a command message that resets the internal settings of a device to the GS initial state. This message appears at the beginning of GS music data, and a GS device that receives this message will automatically be set to the proper state to correctly play back GS music data.

Status F0H Data byte 41H, dev, 42H, 12H, 40H, 00H, 7FH, 00H, 41H Status F7H Explanation Byte F0H Exclusive status 41H ID number (Roland) dev Device ID (dev: 00H~1FH (1~32), Initial value is 10H (17)) 42H Model ID (GS) 12H Command ID (DT1) 40H Address MSB 00H Address 7FH Address LSB 00H Data (GS reset) 41H Checksum F7H EOX (End Of Exclusive) · When this message is received, Rx.



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NRPN will be ON. @@Roland's manufacturer ID is 41H. @@@@F7"). @@@@H Data: the actual data to be sent. @: : eEH  
Data sum Checksum F7H EOX (End Of Exclusive) \* The amount of data that can be transmitted at one time depends on the type of data, and data will be  
transmitted from the specified starting address and size. \* Data larger than 128 bytes will be divided into packets of 128 bytes or less, and each packet will be  
sent at an interval of about 40 ms. \* Regarding the checksum, refer to "4. Supplementary material", Example of an Exclusive message and calculating a  
checksum, (page 18). 10 EXR-5/EXR-3 MIDI Implementation q Patch parameters If you like to send messages to the 16 Parts relative to Arranger and  
Keyboard, you have to use the address 50 xx xx (if "MIDI TxRx" = "ALL"; use "40 xx xx" if "MIDI TxRx" = "STL").  
If you like to send messages to the 16 Parts relative to Songs, you have to use the address 40 xx xx (if "MIDI TxRx" = "ALL" or "SNG").  
@@@Supplementary material", About the Tuning (page 19). @@@@00~7F Value Hex. @00~7F Value Hex.  
@00~7F Value Hex. @00~7F Value Hex. @00~7F Value Hex. @00~7F Value Hex. @00~7F Value Hex.  
@00~7F Value Hex. @00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 22 1A F7 F0 41 10 42 12 40 03 0D 00 30 F7 F0 41 10 42 12 40 03 16  
7F 28 F7 Rotary (Slow) Value Hex. 00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 22 1A F7 F0 41 10 42 12 40 03 0D 7F 31 F7 F0 41 10 42 12 40 03  
16 7F 28 F7 Rotary (Fast) Value Hex. 00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 23 19 F7 F0 41 10 42 12 40 03 06 0B 2C F7 F0 41 10 42 12 40  
03 08 68 4D F7 Stereo Flanger Value Hex. 00~7F Value Hex. 0F~71 F0 41 10 42 12 40 03 00 01 24 18 F7 F0 41 10 42 12 40 03 06 27 10 F7 F0 41 10 42 12  
40 03 08 36 7F F7 Step Flanger Value Hex. 0F~71 Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 30 0C F7 F0 41 10 42 12 40 03 15 40 68 F7 F0 41 10 42 12 40 03 16 68 3F F7 Compressor Value Hex. 00~7F Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 31 0B F7 F0 41 10 42 12 40 03 15 40 68 F7 F0 41 10 42 12 40 03 16 7F 28 F7 Limiter Value Hex. 00~7F Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 40 7C F7 F0 41 10 42 12 40 03 04 20 19 F7 F0 41 10 42 12 40 03 12 40 6B F7 Hexa Chorus Value Hex. 00~7F Value  
Hex. 00~7F F0 41 10 42 12 40 03 00 01 41 7B F7 F0 41 10 42 12 40 03 07 3C 7A F7 F0 41 10 42 12 40 03 12 37 74 F7 Tremolo Chorus Value Hex. 00~7F  
Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 42 7A F7 F0 41 10 42 12 40 03 06 10 27 F7 F0 41 10 42 12 40 03 12 28 03 F7 Stereo Chorus Value Hex.  
00~7F Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 43 79 F7 F0 41 10 42 12 40 03 04 10 29 F7 F0 41 10 42 12 40 03 12 40 6B F7 Space D Value Hex. 00~7F Value Hex.  
00~7F 12 EXR-5/EXR-3 MIDI Implementation 21 St Delay Effect Type Feedback = 80 Balance = 40 22 Mod Delay Effect Type Mod Rate = 12 Balance = 40  
23 3Tap Delay Effect Type Feedback = 80 Balance = 48 24 4Tap Delay Effect Type Feedback = 41 Balance = 48 25 TmCtrDly Effect Type Dly Time = 60  
Feedback = 41 26 Reverb Effect Type Time = 100 Balance = 50 27 GteRevNr Effect Type Type Norm Balance = 33 Level = 120 28 GteRevRv Effect Type  
Type Reverse Balance = 42 Level = 112 29 GteRevS1 Effect Type Type Sweep1 Balance = 35 Level = 120 30 GteRevS2 Effect Type Type Sweep2 Balance =  
42 Level = 112 31 PitchShf Effect Type Coarse1 = 71 Coarse2 = 59 32 Fb P.Shift Effect Type P.Coarse = 71 Feedback = 76 33 ODChors Effect Type OD  
Pan = 64 Cho Bal = 64 34 ODFlger Effect Type OD Pan = 64 FL Bal = 32 35 ODDelay Effect Type OD Pan = 64 Dly Bal = 48 36 DSChors Effect Type DS  
Pan = 64 Cho Bal = 64 37 DSFlger Effect Type DS Pan = 64 FL Bal = 32 38 DSDelay Effect Type DS Pan = 64 Dly Bal = 48 39 EHChors Effect Type EH  
Sens = 64 Cho Bal = 64 F0 41 10 42 12 40 03 00 01 50 6C F7 F0 41 10 42 12 40 03 05 50 68 F7 F0 41 10 42 12 40 03 12 28 03 F7 Stereo Delay Value Hex.  
0F~71 Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 51 6B F7 F0 41 10 42 12 40 03 07 0C 2A F7 F0 41 10 42 12 40 03 12 28 03 F7 Mod Delay Value Hex.  
00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 52 6A F7 F0 41 10 42 12 40 03 06 50 67 F7 F0 41 10 42 12 40 03 12 30 7B F7 3 Tap Delay Value Hex.  
0F~71 Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 53 69 F7 F0 41 10 42 12 40 03 0B 29 09 F7 F0 41 10 42 12 40 03 12 30 7B F7 4 Tap Delay Value Hex. 0F~71 Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 54 68 F7 F0 41 10 42 12 40 03 03 3C 7E F7 F0 41 10 42 12 40 03 05 29 0F F7 Tm Ctrl Delay Value Hex. 00~7F Value  
Hex. 00~7F F0 41 10 42 12 40 03 00 01 55 67 F7 F0 41 10 42 12 40 03 05 64 54 F7 F0 41 10 42 12 40 03 12 32 79 F7 Reverb Value Hex. 00~7F Value Hex.  
00~7F F0 41 10 42 12 40 03 00 01 56 66 F7 F0 41 10 42 12 40 03 03 00 3A F7 F0 41 10 42 12 40 03 12 21 0A F7 F0 41 10 42 12 40 03 16 78 2F F7 Gate  
Reverb Norm (Default) Value Hex. 00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 01 56 66 F7 F0 41 10 42 12 40 03 03 01 39 F7 F0 41 10 42 12 40 03  
12 2A 01 F7 F0 41 10 42 12 40 03 16 70 37 F7 Gate Reverb Reverse Value Hex. 00~7F Value Hex.  
@00~7F Value Hex. @00~7F Value Hex. @28~4C Value Hex. @28~4C Value Hex. @00~7F Value Hex. @00~7F Value Hex. @00~7F  
Value Hex. @00~7F Value Hex. @00~7F Value Hex. @00~7F Value Hex.  
@00~7F Value Hex. 00~7F 13 EXR-5/EXR-3 MIDI Implementation 40 EHF1lger Effect Type EH Sens = 64 FL Bal = 48 41 EHDelay Effect Type EH Sens  
= 64 Dly Bal = 48 42 ChoDly Effect Type Cho Bal = 64 Dly Bal = 48 43 FLDelay Effect Type FL Fb = 104 Dly Bal = 48 44 ChoFlger Effect Type Cho Bal =  
64 FL Bal = 64 45 Cho/Delay Effect Type Cho Bal = 64 Dly Bal = 40 46 FL/Delay Effect Type FL Bal = 64 Dly Bal = 48 47 Cho/Flger Effect Type Cho Bal  
= 64 FL Bal = 64 F0 41 10 42 12 40 03 00 02 07 34 F7 F0 41 10 42 12 40 03 03 40 7A F7 F0 41 10 42 12 40 03 0C 30 01 F7 EHFlanger Value Hex. 00~7F  
Value Hex. 00~7F F0 41 10 42 12 40 03 00 02 08 33 F7 F0 41 10 42 12 40 03 03 40 7A F7 F0 41 10 42 12 40 03 0C 30 01 F7 EHDelay Value Hex. 00~7F  
Value Hex.  
00~7F F0 41 10 42 12 40 03 00 02 09 32 F7 F0 41 10 42 12 40 03 07 40 76 F7 F0 41 10 42 12 40 03 0C 30 01 F7 ChoDelay Value Hex. 00~7F Value Hex.  
00~7F F0 41 10 42 12 40 03 00 02 0A 31 F7 F0 41 10 42 12 40 03 06 68 4F F7 F0 41 10 42 12 40 03 0C 30 01 F7 FLDelay Value Hex. 0F~71 Value Hex.  
00~7F F0 41 10 42 12 40 03 00 02 0B 30 F7 F0 41 10 42 12 40 03 07 40 76 F7 F0 41 10 42 12 40 03 0C 40 71 F7 ChoFlanger Value Hex.  
00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 11 00 2C F7 F0 41 10 42 12 40 03 07 40 76 F7 F0 41 10 42 12 40 03 0C 28 09 F7 Cho / Delay Value Hex.  
00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 11 01 2B F7 F0 41 10 42 12 40 03 07 40 76 F7 F0 41 10 42 12 40 03 0C 30 01 F7 FL / Delay Value Hex.  
00~7F Value Hex. 00~7F F0 41 10 42 12 40 03 00 11 02 2A F7 F0 41 10 42 12 40 03 07 40 76 F7 F0 41 10 42 12 40 03 0C 40 71 F7 Cho / Flanger Value  
Hex.



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16-13 bit3-0: Drums ch. 12-9 bit3-0: Drums ch. 8-5 bit3-0: Drums ch. 4-1 bit3-0: Bass ch. 16-13 bit3-0: Bass ch.  
12-9 bit3-0: Bass ch. 8-5 bit3-0: Bass ch. 4-1 bit3-0: Others ch. 16-13 bit3-0: Others ch. 12-9 bit3-0: Others ch. 7-4 bit3-0: Others ch. 4-1 bit3-0: Left ch.  
16-13 bit3-0: Left ch. 12-9 bit3-0: Left ch. 8-5 bit3-0: Left ch.

4-1 bit3-0: Right ch. 16-13 bit3-0: Right ch. 12-9 bit3-0: Right ch. 8-5 bit3-0: Right ch. 4-1 Default Value (H) 00 Description All Minus One Off 01 00 01# 01  
00 02# 01 00 03# 01 00 04# 01 00 05# 01 00 06# 01 00 07# 01 00 08# 01 00 09# 01 00 0A# 01 00 0B# 01 00 0C# 01 00 0D# 01 00 0E# 01 00 0F# 01 00 10#  
01 00 11# 01 00 12# 01 00 13# 01 00 14# 00-0F  
00-0F 00-0F 00-0F 00-0F MINUS ONE CHANNEL 00 02 00 00 00 00 02 0F 0D 0F 01 00 00 00 04 00 00 08 Channel 10 Channel 2 Ch. 16~11, 9~5,  
1 Channel 3 Channel 4 COVER SysEx (only for internal Standard MIDI File use; or received via MIDI) Address(H) 01 00 15 Size(H) 00 00 01 Data(H)  
00~04 Parameter COVER NO. Description 0: Acoustic 1: Pop 2: Rock 3: Dance 4: Ethnic Default Value (H) -- Description 17 EXR-5/EXR-3 MIDI  
Implementation 4. Supplementary material s 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. Dec. 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 25 26 27 28 29  
30 31 Hex. 00H 01H 02H 03H 04H 05H 06H 07H 08H 09H 0AH 0BH 0CH 0DH 0EH 0FH 10H 11H 12H 13H 14H 15H 16H 17H 18H 19H 1AH 1BH 1CH  
1DH 1EH 1FH Dec. 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 Hex.

20H 21H 22H 23H 24H 25H 26H 27H 28H 29H 2AH 2BH 2CH 2DH 2EH 2FH 30H 31H 32H 33H 34H 35H 36H 37H 38H 39H 3AH 3BH 3CH 3DH 3EH  
3FH Dec. 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 Hex. 40H 41H 42H 43H 44H 45H 46H 47H  
48H 49H 4AH 4BH 4CH 4DH 4EH 4FH 50H 51H 52H 53H 54H 55H 56H 57H 58H 59H 5AH 5BH 5CH 5DH 5EH 5FH Dec. 96 97 98 99 100 101 102 103  
104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 Hex. 60H 61H 62H 63H 64H 65H 66H 67H 68H 69H  
6AH 6BH 6CH 6DH 6EH 6FH 70H 71H 72H 73H 74H 75H 76H 77H 78H 79H 7AH 7BH 7CH 7DH 7EH 7FH s Examples of actual MIDI messages

[Example 1] 92 3E 5F 9n is the Note-on status, and n is the MIDI channel number.

Since 2H = 2, 3EH = 62, and 5FH = 95, this is a Note-on message with MIDI CH = 3, note number 62 (note name is D4), and velocity 95. [Example 2] CE  
49 CnH is the Program Change status, and n is the MIDI channel number. Since EH = 14 and 49H = 73, this is a Program Change message with MIDI CH =  
15, program number 74 (Flute in GS). [Example 3] EA 00 28 EnH is the Pitch Bend Change status, and n is the MIDI channel number. The 2nd byte (00H =  
0) is the LSB 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 by -200 cents, so in this case -200 x (-3072) ÷ (-8192) = -75 cents of Pitch Bend is being applied to MIDI channel 11. [Example 4]  
B3 64 00 65 00 06 0C 26 00 64 7F 65 7F BnH is the Control Change status, and n is the MIDI channel number. 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 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  
(B3) (B3) (B3) (B3) (B3) 64 00 65 00 06 0C 26 00 64 7F 65 7F MIDI ch.

4, lower byte of RPN parameter number: (MIDI ch.4) upper byte of RPN parameter number: (MIDI ch.4) upper byte of parameter value: (MIDI ch.4) lower  
byte of parameter value: (MIDI ch.4) lower byte of RPN parameter number: (MIDI ch.4) upper byte of RPN parameter number: 00H 00H 0CH 00H 7FH  
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 · Decimal values such as MIDI channel, bank select, and program change are listed as one greater than the values given in the above table. · A  
7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two  
hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa x 128+bb.

· In the case of values which have a +/- sign, 00H = -64, 40H = +/-0, and 7FH = +63, so that the decimal expression would be 64 less than the value given  
in the above chart. In the case of two types, 00 00H = -8192, 40 00H = +/-0, and 7F 7FH = +8191. For example, if aa bbH were expressed as decimal, this  
would be aa bbH - 40 00H = aa x 128+bb - 64 x 128. · Data marked "Use nibbled data" is expressed in hexadecimal in 4-bit units. A value expressed as a  
2-byte nibble 0a 0bH has the value of a x 16+b. [Example 1] What is the decimal expression of 5AH? From the preceding table, 5AH = 90 [Example 2] 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 [Example 3] 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 [Example 4] What is the nibbled expression of the decimal value 1258? 16) 1258 16) 78 .



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