E-A7 MIDI Implementation

1. Received data

■ Channel Voice Messages

● Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH
9nH	kkH	00H

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

● Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH

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

- Not received when Rx.NOTE MESSAGE= OFF. (Initial value is ON)

● Polyphonic Key Pressure

Status	2nd byte	3rd byte
AnH	kkH	vvH

n= MIDI channel number: 0H–FH (Ch.1–16)
kk= note number: 00H–7FH (0–127)
vv= key pressure: 00H–7FH (0–127)

- The resulting effect is determined by System Exclusive messages. With the initial settings, there will be no effect.

● 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 byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

n= MIDI channel number: 0H–FH (Ch.1–16)
mm= Bank number MSB: 00H–7FH, Initial value= 00H
ll= Bank number LSB: 00H–7FH

- Bank Select processing is suspended until a program change is received.
- Not received when Program Change RX event is Off.

○ 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)

- 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.

○ 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), Initial value= 00H (0)

- 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	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), Initial value= 64H (100)

- Volume messages are used to adjust the volume balance of each Part.
- Not received when “Volume” RX Event is off.

○ Pan (Controller number 10)

Status	2nd byte	3rd byte
BnH	0AH	vvH

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

- Not received when “PanPot” RX Event is Off

○ 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), Initial value= 7FH (127)

- Not received when “Expression” RX Event is Off.

○ C1 (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)

- Not received when “Hold” RX Event is Off.

○ 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

- Not received when “Sostenuto” RX Event is Off.

○ 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

- Not received when “Soft” RX Event is Off.

○ Filter Resonance (Timbre/Harmonic Intensity) (Controller number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

n= MIDI channel number: 0H–FH(Ch.1–16)
vv= Resonance value 00H–7FH(-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value=40H (no change)

○ Cutoff (Controller number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

n= MIDI channel number: 0H–FH (Ch.1–16)
vv= Cutoff value 00H–7FH(-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial Value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value=40H (no change)

○ 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.

Example 1

On MIDI	Description	Result
90 3C 40	Note on C4	C4 on
B0 54 3C	Portamento Control from C4	no change
90 40 40	Note on E4 glide from	C4 to E4
80 3C 40	Note off C4	no change
80 40 40	Note off E4	E4 off

Example 2

On MIDI	Description	Result
B0 54 3C	Portamento Control from C4	no change
90 40 40	Note on E4	E4 is played with glide from C4 to E4
80 40 40	Note off E4	E4 off

○ 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)

- This message adjusts the Reverb Send Level of each Part.
- Not received when “Reverb” RX Event is Off.

○ 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)

- This message adjusts the Chorus Send Level of each Part.
- Not received when “Chorus” RX Event is Off.

○ NRPN MSB/LSB (Controller number 99, 98)

Status	2nd byte	3rd byte
BnH	63H	mmH
BnH	62H	llH

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

- The value set by NRPN will not be reset even if Program Change or Reset All Controllers is received.
- Not received when “NRPN” RX Event is Off.

NRPN

The NRPN (Non Registered Parameter Number) message allows an extended range of control changes to be used. On the E-A7, 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 “[Example 4]” on page 14.

On the E-A7, 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 E-A7, NRPN can be used to modify the following parameters:

NRPN	Data entry	
MSB LSB	**MSB**	**Function and range**
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 (rel. change) mm: 00H–40H–7FH (-64–0–+63)
01H 64H	mmH	TVF&TVA Envelope Decay Time (rel. change) mm: 00H–40H–7FH (-64–0–+63)
01H 66H	mmH	TVF&TVA Env. 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: 01H–40H–7FH (left–center–right)
1DH rrH	mmH	Drum Instr. Reverb Send (absolute change) rr: Drum Instrument note number mm: 00H–7FH (0–max)
1EH rrH	mmH	Drum Instr. Chorus Send (absolute change) rr: Drum Instrument note number mm: 00H–7FH (0–max)
60H rrH	mmH	Equalizer Switch rr: Drum Instrument note number mm: 01H–02H (Instrument, Off)
61H rrH	mmH	Equalizer Low Frequency rr: Drum Instrument note number mm: 00H–05H (90, 150, 180, 300, 360, 600Hz)
62H rrH	mmH	Equalizer Low Gain rr: Drum Instrument note number mm: 00H–1EH (-15–0–+15dB)
63H rrH	mmH	Equalizer Mid Frequency rr: Drum Instrument note number mm: 00H–10H (200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000Hz)
64H rrH	mmH	Equalizer Mid Gain rr: Drum Instrument note number mm: 00H–1EH (-15–0–+15dB)
65H rrH	mmH	Equalizer Mid Q rr: Drum Instrument note number mm: 00H–04H (0.5, 1.0, 2.0, 4.0, 8.0)
66H rrH	mmH	Equalizer High Frequency rr: Drum Instrument note number mm: 00H–06H (1500, 2000, 3000, 4000, 6000, 8000, 12000Hz)
67H rrH	mmH	Equalizer High Gain rr: Drum Instrument note number mm: 00H–1EH (-15–0–+15dB)
4FH 10H	mmH	Part 4 On/Off (Upper 1) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 11H	mmH	Part 11 On/Off (Lower) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 13H	mmH	Part 6 On/Off (Upper 2) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 25H	mmH	Part 13 On/Off (Upper 3) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 26H	mmH	Part 15 On/Off (Melody Int.) 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)
4FH 1CH	mmH	Part 1 On/Off (Acc 1) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 1DH	mmH	Part 3 On/Off (Acc2) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 1EH	mmH	Part 5 On/Off (Acc3) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 1FH	mmH	Part 7 On/Off (Acc 4) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 20H	mmH	Master Accompaniment On/Off mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 21H	mmH	Master Volume Upper (1–2–3) On/Off mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 22H	mmH	Master Volume Lower On/Off mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 23H	mmH	Master Volume Bass (Acc.Bass) On/Off mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 24H	mmH	Master Volume Acc.Drum On/Off mm: 00H–7FH (00–3FH=Off, 40–7FH= On)

- Part On/Off NRPN messages are received on the Basic MIDI Channel.

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

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

- Not received when “RPN” RX Event is Off.
- 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 (Controller number 101 and 100, their order does not matter) to specify the parameter to be controlled, and then use Data Entry messages (Controller number 6, 38) 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 to Null (RPN Number= 7FH 7FH) when you have finished setting the value of the desired parameter.
Refer to “[Example 4]” on page 14.
On the E-A7, RPN can be used to modify the following parameters.

RPN	Data entry	
MSB LSB	**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) Up to 2 octaves can be specified in semitone steps.
00H 01H	mmH llH	Channel Fine Tuning mm, ll: 00 00H–40 00H–7F 7FH (–100–0–+99.99 cents), Initial value= 40 00H (+/- 0 cent) Refer to “About the Tuning” on page 15.
00H 02H	mmH ---	Channel Coarse Tuning mm: 28H–40H–58H (-24–0–+24 semitones), Initial value= 40H (+/-0 semitone) ll: ignored (processed as 00H)
00H 05H	mmH llH	Modulation Depth Range mm: 00H–04H (0–4 semitones) ll: 00H–7FH (0–100 cents) 100/128 Cent/Value
7FH 7FH	--- ---	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

● Program Change

Status	2nd byte
CnH	ppH

n= MIDI channel number: 0H–FH (Ch.1–16)
pp= Program number: 00H–7FH (prog.1–prog.128)

- Not received when “Program Change” RX Event is Off.
- 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.

● Channel Pressure

Status	2nd byte
DnH	vvH

n= MIDI channel number: 0H–FH (Ch.1–16)
vv= Channel Pressure: 00H–7FH (0–127)

- Not received when “Channel Pressure” RX Event is Off.
- The resulting effect is determined by System Exclusive messages. With the initial settings there will be no effect.

● 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)

- Not received when “Pitch Bender ” RX Event is Off.
- The resulting effect is determined by System Exclusive messages. With the initial settings the effect is Pitch Bend.

■ 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 the 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)
Polyphonic Key Pressure	0 (off)
Channel Pressure	0 (off)
Modulation	0 (off)
Expression	127 (max)
Hold 1	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
RPN	unset; previously set data do not change
NRPN	unset; previously set data do 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 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).”

● 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.

■ System Realtime Messages

● 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.

● Timing Clock

Status
F8H

* STYLE: Received when Sync RX is On and the Sync Mode Style RX parameter (MIDI\Edit System) is set to AUTO or MIDI.

* SONG: Received when Sync RX is On and the Sync Mode Song RX parameter (MIDI\Edit System) is set to AUTO or MIDI.

- When “Timing Clock” message is received, the Style or Song is synchronized to an external clock according to the following table.

Song/Style Sync RX	Response
Internal	A Style/Song will neither start/stop nor follow the tempo of the external Timing Clock (F8) and “Start /Stop” (FA/FC) messages.
Auto	If a Style/Song receives MIDI “Start/Stop” (FA/FC), it will follow Internal or External clock, depending on whether “MIDI Clock” (F8) messages are received.
MIDI	If a Style/Song receives MIDI “Start/Stop” (FA/FC) it will follow External “MIDI Clock” (F8) messages and therefore wait until they are received.
Remote	If a Style/Song receives MIDI “Start/Stop” (FA/FC) it will follow only Internal tempo and thus ignore incoming “MIDI Clock” (F8) messages.

● Start

Status
FAH

* STYLE: Received when Sync RX is On and the Sync Mode Style RX parameter (MIDI\Edit System) is set to AUTO, MIDI or REMOTE.

* SONG: Received when Sync RX is On and the Sync Mode Song RX parameter (MIDI\Edit System) is set to AUTO, MIDI or REMOTE.

● Continue (Song playback only)

Status
FBH

- Received when Sync RX is On and the Sync Mode Song RX parameter (MIDI\Edit System) is set to AUTO, MIDI or REMOTE.
- When a “Continue” message is received, the Song continues playing from the current position.

● Stop

Status
FCH

* STYLE: Received when Sync RX is On and the Sync Mode Style RX parameter (MIDI\Edit System) is set to AUTO, MIDI or REMOTE.

* SONG: Received when Sync RX is On and the Sync Mode Song RX parameter (MIDI\Edit System) is set to AUTO, MIDI or REMOTE.

- When a “Stop” message is received, the Style or Song stops playing.

■ System Common Messages

● Song Position Pointer

Status	2nd byte	3rd byte
F2H	XXH	YYH

XX= Song Position (Bar) LSB
YY= Song Position (Bar) MSB

■ System Exclusive Messages

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)

○ GM1 System On

This message resets the internal settings of the unit to the General MIDI 1 initial state.

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)

- 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.
- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/ Param) is OFF.
- Only for the Song parts.

○ 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)

- When this message is received, the E-A7 will be able to receive the messages specified by General MIDI 2, and use the General MIDI 2 sound map.
- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/ Param) is OFF.
- Only for the Song parts.

○ GM System Off

GM System Off is a command message that resets the internal state of the E-A7 from the GM state to its native condition. The E-A7 will reset to the GS default state.

Status	Data byte	Status
F0H	F0H 7EH 7FH 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)

- When this message is received, the E-A7 will reset to the GS default state.
- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/ Param) is OFF.
- Only for the Song parts.

○ 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	Data byte	Status
F0H	41H, dev, 42H, 12H, 40H, 00H, 7FH, 00H, 41H	F7H

Byte	Explanation
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.
- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/ Param) is OFF.
- Only for the Song parts.

○ Exit GS Mode

"Exit GS Mode" resets the internal settings of the unit to Arranger Mode I initial state .

Status	Data byte	Status
F0H	41H, dev, 42H, 12H, 40H, 00H, 7FH, 7FH, 42H	F7H

Byte	Explanation
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)

- There must be an interval of at least 100 ms between this message and the next message.
- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/ Param) is OFF.
- Only for the Song parts.

● 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.
- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/ Param) is OFF.

○ Master Fine Tuning

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

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

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

- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/Param) is OFF.

○ Master Coarse Tuning

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

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

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

- Not received when RX SYSEX parameter (MENU/MIDI/Edit System/Param) is OFF.

● Global Parameter Control (Song part)

Global Parameter Control messages are newly provided for General MIDI 2.

○ Reverb Parameters

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.
F7H	EOX (End Of Exclusive)

pp=0	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)
pp=1	Reverb Time vv= 00H–7FH0–127

○ 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.
F7H	EOX (End Of Exclusive)

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

○ 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
F7H	EOX (End Of Exclusive)

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%

○ 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
F7H	EOX (End Of Exclusive)

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%

○ Scale/Octave Tuning Adjust

Status	Data byte	Status
F0H	7EH, 7FH, 08H, 08H, ffH, ggH, hhH, ssH…	F7

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 byte1 bits 0–1= channel 15 to 16 bit 2 to 6= Undefined
ggH	Channel byte2 bits 0–6= channel 8 to 14
hhH	Channel byte3 bits 0–6= 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)

2. Transmitted data

■ Channel Voice Messages (Style part & Song part)

● Note off

Status	2nd byte	3rd byte
9nH	kkH	00H

n= MIDI channel number: 0H–FH (Ch.1–16)
kk= note number: 00H–7FH (0–127)

● Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH

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

● Control Change

- 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 byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

n= MIDI channel number: 0H–FH (Ch.1–16)
mm= Bank number MSB: 00H–7FH
ll= Bank number LSB: 00H–7FH

- Not transmitted when “Program Change” Tx Event is Off.

○ 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)

- Not transmitted when “Modulation” TX Event= OFF.

○ 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), Initial value= 00H (0)

- 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	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), Initial value= 64H (100)

- Volume messages are used to adjust the volume balance of each Part.
- Not transmitted when “Volume” TX Event is off.

○ Pan (Controller number 10)

Status	2nd byte	3rd byte
BnH	0AH	vvH

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

- The stereo position can be adhusted in 127 steps.
- Not transmitted when “PanPot” TX Event is Off.

○ 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), Initial value= 7FH (127)

- 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.
- Not transmitted when “Expression” TX Event is Off.

○ C1 (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)

- Not transmitted when “Hold” TX Event is Off.

○ 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

- Not transmitted when “Sostenuto” TX Event is Off.

○ 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

- Not transmitted when “Soft” TX Event is Off.

○ Filter Resonance (Timbre/Harmonic Intensity) (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), Initial value= 40H (no change)

○ 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), Initial value= 40H (no change)

○ 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), Initial value=40H (no change)

○ 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), Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial Value= 40H (no change)

○ 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 00H–7FH (-64–0–+63),
(relative change): Initial value=40H (no change)

○ 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)

○ 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)

- This message adjusts the Reverb Send Level of each Part.
- Not transmitted when “Reverb” TX Event is Off.

○ 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)

- This message adjusts the Chorus Send Level of each Part.
- Not transmitted when “Chorus” TX Event is Off.

○ NRPN MSB/LSB (Controller number 99, 98)

Status	2nd byte	3rd byte
BnH	63H	mmH
BnH	62H	llH

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

- Not transmitted when “NRPN” TX Event is Off.

NRPN

The NRPN (Non Registered Parameter Number) message allows you to use an extended range of control changes, which are not defined by 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 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 Data entry

MSB LSB	MSB	Function and range
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 (rel. change) mm: 00H–40H–7FH (-64–0–+63)
01H 64H	mmH	TVF&TVA Envelope Decay Time (rel. change) mm: 00H–40H–7FH (-64–0–+63)
01H 66H	mmH	TVF&TVA Env. 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: 01H–40H–7FH (left–center–right)
1DH rrH	mmH	Drum Instr. Reverb Send (absolute change) rr: Drum Instrument note number mm: 00H–7FH (0–max)
1EH rrH	mmH	Drum Instr. Chorus Send (absolute change) rr: Drum Instrument note number mm: 00H–7FH (0–max)
60H rrH	mmH	Equalizer Switch rr: Drum Instrument note number mm: 01H–02H (Instrument, Off)
61H rrH	mmH	Equalizer Low Frequency rr: Drum Instrument note number mm: 00H–05H (90, 150, 180, 300, 360, 600Hz)
62H rrH	mmH	Equalizer Low Gain rr: Drum Instrument note number mm: 00H–1EH (-15–0–+15dB)
63H rrH	mmH	Equalizer Mid Frequency rr: Drum Instrument note number mm: 00H–10H (200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000, 6300, 8000Hz)
64H rrH	mmH	Equalizer Mid Gain rr: Drum Instrument note number mm: 00H–1EH (-15–0–+15dB)
65H rrH	mmH	Equalizer Mid Q rr: Drum Instrument note number mm: 00H–04H (0.5, 1.0, 2.0, 4.0, 8.0)
66H rrH	mmH	Equalizer High Frequency rr: Drum Instrument note number mm: 00H–06H (1500, 2000, 3000, 4000, 6000, 8000, 12000Hz)
67H rrH	mmH	Equalizer High Gain rr: Drum Instrument note number mm: 00H–1EH (-15–0–+15dB)
4FH 10H	mmH	Part 4 On/Off (Upper 1) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 11H	mmH	Part 11 On/Off (Lower) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 13H	mmH	Part 6 On/Off (Upper 2) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 25H	mmH	Part 13 On/Off (Upper 3) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 26H	mmH	Part 15 On/Off (Melody Int.) 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)
4FH 1CH	mmH	Part 1 On/Off (Acc 1) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 1DH	mmH	Part 3 On/Off (Acc 2) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 1EH	mmH	Part 5 On/Off (Acc 3) mm: 00H–7FH (00–3FH=Off, 40–7FH= On)
4FH 1FH	mmH	Part 7 On/Off (Acc 4) mm: 00H–7FH (00-3FH=Off - 40-7FH= On)

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

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

- Not transmitted when “RPN” RX Event is Off.

RPN
The RPN (Registered Parameter Number) messages are expanded control changes, and each function of an RPN is described by the MIDI Standard. On the E-A7, RPN can be used to modify the following parameters.

RPN	Data entry	
MSB LSB	**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) Up to 2 octaves can be specified in semitone steps.
00H 01H	mmH llH	Channel Fine Tuning mm, ll: 00 00H–40 00H–7F 7FH (–100–0–+99.99 cents), Initial value= 40 00H (+/- 0 cent) Refer to “About the Tuning” on page 15.
00H 02H	mmH ---	Channel Coarse Tuning mm: 28H–40H–58H (-24–0–+24 semitones), Initial value= 40H (+/-0 semitone) ll: ignored (processed as 00H)
7FH 7FH	--- ---	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

● Program Change

Status	**2nd byte**
CnH	ppH

n= MIDI channel number: 0H–FH (Ch.1–16)
pp= Program number: 00H–7FH (prog.1–prog.128)

- Not transmitted when “Program Change” TX Event is Off.

● Pitch Bend Change

Status	**2nd byte**	**3rd byte**
EnH	llH	mmH

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

- Not transmitted when “Pitch Bender” TX Event is Off.

■ Channel Mode Messages

● 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 corresponding channel is set to Mode 4 (M= 1).

● POLY (Controller number 127)

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

n= MIDI channel number: 0H–FH (Ch.1–16)

- The corresponding channel is set to Mode 3.

■ System Realtime Messages

● Active Sensing

Status
FEH

- This message is transmitted at intervals of approximately 250 ms.

● Timing Clock

Status
F8H

● Start

Status
FAH

* STYLE: Transmitted when MIDI/Edit System/Sync/Sty.strt-stp parameter is “On”.
* SONG: Transmitted when MIDI/Edit System/Sync/SMF strt-stp parameter is “On”.

● Continue (Song playback only)

Status
FBH

- Transmitted when MIDI/Edit System/Sync/SMF strt-stp is “On”.
- This message is transmitted when the sequencer is not started from the beginning.

● Stop

Status
FCH

* STYLE: Transmitted when MIDI/Edit System/Sync/Sty.strt-stp parameter is “On”. parameter is “On”.
* SONG: Transmitted when MIDI/Edit System/Sync/SMF strt-stp parameter is “On”. parameter is “On”.

■ System Common Messages

● Song Position Pointer

Status	**2nd byte**	**3rd byte**
F2H	XXH	YYH

XX= Song Position (Bar) LSB
YY= Song Position (Bar) MSB

- Transmitted when MIDI/Edit System/Sync/SMF Pos.Tx parameter is On.

● System Exclusive Messages

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)	

- Not transmitted when TX SYSEX parameter (MENU/MIDI/Edit System/Param) is OFF.

○ 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	**Data byte**	**Status**
F0H	41H, dev, 42H, 12H, 40H, 00H, 7FH, 00H, 41H	F7H

Byte	**Explanation**
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)

- Not transmitted when TX SYSEX parameter (MENU/MIDI/Edit System/Param) is OFF.

3. Individual parameter transmission

Individual Parameter Transmission transmits data (or requests data) for one parameter as one exclusive message (one packet of “F0 ..... F7”).

In Individual Parameter Transmission, you must use the Address and Size listed in the following “Parameter Address Map”. Addresses marked at “#” cannot be used as starting addresses.

■ System Exclusive messages

Data Set 1 (DT1) is the only System Exclusive messages transmitted by the E-A7.

● Data set 1 DT1 (12H)

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

Byte	**Explanation**
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H–1FH, Initial value is 10H)
42H	Model ID (GS)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: middle byte of the starting address of the data to be sent
ccH	Address LSB: lower byte of the starting address of the data to be sent.
ddH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
eeH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

- The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size.
- 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, please refer to “Example of an Exclusive message checksum calculation” on page 14.

○ Common parameters

Parameters that apply to all Parts of each module are called “Common” 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 [cents]	00 04 00 00	0 [cents]
40 00 01#				Use nibblized data.		
40 00 02#						
40 00 03#						

- Refer to “About the Tuning” on page 15.

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 00 7F	00 00 01	00	MODE SET	00 = GS Reset (Rx. only)		
40 01 30	00 00 01	00–07	REVERB MACRO	00: Room 1 01: Room 2 02: Room 3 03: Hall 1 04: Hall 2 05: Plate 06: Delay 07: Panning Delay	04	Hall 2
40 01 31	00 00 01	00–07	REVERB CHARACTER	0–7	04	4
40 01 32	00 00 01	00–07	REVERB PRE-LPF	0–7	00	0
40 01 33	00 00 01	00–7F	REVERB LEVEL	0–127	40	64
40 01 34	00 00 01	00–7F	REVERB TIME	0–127	40	64
40 01 35	00 00 01	00–7F	REVERB DELAY FEEDBACK	0–127	00	0
40 01 37	00 00 01	00–7F	REVERB PREDELAY TIME	0–127 [ms]	00	0

- REVERB MACRO is a macro parameter that allows global setting of reverb parameters. When you select the reverb type with REVERB MACRO, each reverb parameter will be set to their most suitable value.
- REVERB CHARACTER is a parameter that changes the reverb algorithm. The value of REVERB CHARACTER corresponds to the REVERB MACRO of the same number.

Address(H)	Size(H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 01 38	00 00 01	00–07	CHORUS MACRO	00: Chorus 1 01: Chorus 2 02: Chorus 3 03: Chorus 4 04: Feedback Chorus 05: Flanger 06: Short Delay 07: Short Delay(FB)	02	Chorus 3
40 01 39	00 00 01	00–07	CHORUS PRE-LPF	0–7	00	0
40 01 3A	00 00 01	00–7F	CHORUS LEVEL	0–127	40	64
40 01 3B	00 00 01	00–7F	CHORUS FEEDBACK	0–127	08	8
40 01 3C	00 00 01	00–7F	CHORUS DELAY	0–127	50	80
40 01 3D	00 00 01	00–7F	CHORUS RATE	0-127	03	3
40 01 3E	00 00 01	00–7F	CHORUS DEPTH	0-127	13	19
40 01 3F	00 00 01	00–7F	CHORUS SEND LEVEL TO REVERB	0-127	00	0

- CHORUS MACRO is a macro parameter that allows global setting of chorus parameters. When you select the chorus type with CHORUS MACRO, each chorus parameter will be set to their most suitable value.

○ Part parameters

The E-A7 has 21 Parts: 5 parts assigned to the Keyboard, and 16 parts for Songs.
For Keyboard part control, use the address [50 xx xx]
For Song part control, use the address [40 xx xx]
The 21 Parts are:

Keyboard parts			Song parts			
Track	Name	MIDI channel	Track	Name	MIDI channel	SysEx X=
1	–	–	1	Part 1	1	X= 1
2	–	–	2	Part 2	2	X= 2
3	–	–	3	Part 3	3	X= 3
4	Upper1	4	4	Part 4 UP1	4	X= 4
5	–	–	5	Part 5	5	X= 5
6	Upper 2	6	6	Part 6 UP2	6	X= 6
7	–	–	7	Part 7	7	X= 7
8	–	–	8	Part 8	8	X= 8
9	–	–	9	Part 9	9	X= 9
10	–	–	10	Part 10	10	X= 0
11	Lower	11	11	Part 11 LW1	11	X= A
12	–	–	12	Part 12	12	X= B
13	Upper 3	13	13	Part 13 UP3	13	X= C
14	–	–	14	Part 14	14	X= D
15	Melody Intell	15	15	Part 15 MI	15	X= E
16	–	–	16	Part 16	16	X= F

The relation between Part number and Block number is as follows.

x...BLOCK NUMBER (0–F)	Part 1	(default MIDI ch = 1)	x=1
	Part 2	(default MIDI ch = 2)	x=2
	:	:	:
	Part 9	(default MIDI ch = 9)	x=9
	Part10	(default MIDI ch =10)	x=0
	Part11	(default MIDI ch =11)	x=A
	Part12	(default MIDI ch =12)	x=B
	:	:	:
	Part16	(default MIDI ch =16)	x=F

- n... MIDI channel number (0–F) of the BLOCK.

In the following map, the control numbers of the control changes are indicated as CC#.

Address(H)	Size(H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 1x 00	00 00 02	00–7F	TONE NUMBER	CC#00 VALUE 0–127	00	0
40 1x 01#		00–7F		P.C. VALUE 1–128	00	1
40 1x 02	00 00 01	00–10	Rx. CHANNEL	1–16, OFF	Same as the Part Number	
40 1x 03	00 00 01	00–01	Rx. PITCH BEND	OFF/ON	01	ON
40 1x 04	00 00 01	00–01	Rx. CH PRESSURE (CAf)	OFF/ON	01	ON
40 1x 05	00 00 01	00–01	Rx. PROGRAM CHANGE	OFF/ON	01	ON
40 1x 06	00 00 01	00–01	Rx. CONTROL CHANGE	OFF/ON	01	ON
40 1x 07	00 00 01	00–01	Rx. POLY PRESSURE(PAf)	OFF/ON	01	ON
40 1x 08	00 00 01	00–01	Rx. NOTE MESSAGE	OFF/ON	01	ON
40 1x 09	00 00 01	00–01	Rx. RPN	OFF/ON	01	ON
40 1x 0A	00 00 01	00–01	Rx. NRPN	OFF/ON	00 (01*)	OFF (ON*)
40 1x 0B	00 00 01	00–01	Rx. MODULATION	OFF/ON	01	ON
40 1x 0C	00 00 01	00–01	Rx. VOLUME	OFF/ON	01	ON
40 1x 0D	00 00 01	00–01	Rx. PANPOT	OFF/ON	01	ON
40 1x 0E	00 00 01	00–01	Rx. EXPRESSION	OFF/ON	01	ON
40 1x 0F	00 00 01	00–01	Rx. HOLD1	OFF/ON	01	ON
40 1x 10	00 00 01	00–01	Rx. PORTAMENTO	OFF/ON	01	ON
40 1x 11	00 00 01	00–01	Rx. SOSTENUTO	OFF/ON	01	ON
40 1x 12	00 00 01	00–01	Rx. SOFT	OFF/ON	01	ON
40 1x 13	00 00 01	00–01	MONO/POLY MODE (=CC# 126 01/CC# 127 00)	Mono/Poly	01	Poly
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 (Normal Part) MAP1 (Drum Part)

- This parameter sets the Drum Map of the Part used as the Drum Part. The E-A7 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)).
- Only for Song parts.

Address(H)	Size(H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 1x 16	00 00 01	28–58	PITCH KEY SHIFT	-24–+24 [semitones]	40	0 [semitones]
40 1x 17	00 00 02	08–F8	PITCH OFFSET FINE	-12.0–+12.0 [Hz]	08 00	0 [Hz]
40 1x 18#				Use nibblized data.		

- PITCH OFFSET FINE allows you to alter, by a specified frequency amount, the pitch at which notes will sound. This parameter differs from the conventional Fine Tuning (RPN #1) parameter in that the amount of frequency alteration (in Hertz) will be identical no matter which note is played. When a multiple number of Parts, each of which has been given a different setting for PITCH OFFSET FINE, are sounded by means of an identical note number, you can obtain a Celeste effect.
- Only for Song parts.

40 1x 19	00 00 01	00–7F	PART LEVEL	0–127 (=CC# 7)	64	100
40 1x 1A	00 00 01	00–7F	VELOCITY SENSE DEPTH	0–127	40	64
40 1x 1B	00 00 01	00–7F	VELOCITY SENSE OFFSET	0–127	40	64
40 1x 1C	00 00 01	00–7F	PART PANPOT	-64 (Left)–+63 (Right)	40	0 (CENTER)
40 1x 1D	00 00 01	00–7F	KEYBOARD RANGE LOW	(C-1)–(G9)	00	C-1
40 1x 1E	00 00 01	00–7F	KEYBOARD RANGE HIGH	(C-1)–(G9)	7F	G9
40 1x 1F	00 00 01	00–5F	CC1 CONTROLLER NUMBER	0–95	10	16
40 1x 20	00 00 01	00–5F	CC2 CONTROLLER NUMBER	0–95	11	17
40 1x 21	00 00 01	00–7F	CHORUS SEND LEVEL	0–127 (=CC# 93)	00	0
40 1x 22	00 00 01	00–7F	REVERB SEND LEVEL	0–127 (=CC# 91)	28	40
40 1x 23	00 00 01	00–01	Rx.BANK SELECT	OFF/ON	01	ON
40 1x 24	00 00 01	00–01	RX BANK SELECT LSB	OFF/ON	01	ON
40 1x 2A	00 00 02	00 00–40 00–7F 7F	PITCH FINE TUNE	-100–0–+100 [cents] (= RPN#1)	40 00	0
40 1x 2B#						
40 1x 30	00 00 01	00–7F	TONE MODIFY1 Vibrato Rate	-64–+63 (=NRPN# 8/CC#76)	40	0
40 1x 31	00 00 01	00–7F	TONE MODIFY2 Vibrato Depth	-64–+63 (=NRPN# 9/CC#77)	40	0
40 1x 32	00 00 01	00–7F	TONE MODIFY3 TVF Cutoff Freq	-64–+63 (=NRPN# 32/CC#74)	40	0
40 1x 33	00 00 01	00–7F	TONE MODIFY4 TVF Resonance	-64–+63 (=NRPN# 33/CC#71)	40	0
40 1x 34	00 00 01	00–7F	TONE MODIFY5 TVF&TVA Env.attack	-64–+63 (=NRPN# 99/CC#73)	40	0
40 1x 35	00 00 01	00–7F	TONE MODIFY6 TVF&TVA Env.decay	-64–+63 (=NRPN# 100/CC#75)	40	0
40 1x 36	00 00 01	00–7F	TONE MODIFY7 TVF&TVA Env.release	-64–+63 (=NRPN# 102/CC#72)	40	0
40 1x 37	00 00 01	00–7F	TONE MODIFY8 Vibrato Delay	-64–+63 (=NRPN# 10/CC#78)	40	0
40 1x 40	00 00 0C	00–7F	SCALE TUNING C	-64–+63 [cents]	40	0 [cents]
40 1x 41#		00–7F	SCALE TUNING C#	-64–+63 [cents]	40	0 [cents]
40 1x 42#		00–7F	SCALE TUNING D	-64–+63 [cents]	40	0 [cents]
40 1x 43#		00–7F	SCALE TUNING D#	-64–+63 [cents]	40	0 [cents]
40 1x 44#		00–7F	SCALE TUNING E	-64–+63 [cents]	40	0 [cents]
40 1x 45#		00–7F	SCALE TUNING F	-64–+63 [cents]	40	0 [cents]
40 1x 46#		00–7F	SCALE TUNING F#	-64–+63 [cents]	40	0 [cents]
40 1x 47#		00–7F	SCALE TUNING G	-64–+63 [cents]	40	0 [cents]
40 1x 48#		00–7F	SCALE TUNING G#	-64–+63 [cents]	40	0 [cents]
40 1x 49#		00–7F	SCALE TUNING A	-64–+63 [cents]	40	0 [cents]
40 1x 4A#		00–7F	SCALE TUNING A#	-64–+63 [cents]	40	0 [cents]
40 1x 4B#		00–7F	SCALE TUNING B	-64–+63 [cents]	40	0 [cents]

- 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 cents (40H) is equal temperament (page 15).

Address(H)	Size(H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 2x 00	00 00 01	28–58	MOD PITCH CONTROL	-24–+24 [semitones]	40	0 [semitones]
40 2x 01	00 00 01	00–7F	MOD TVF CUTOFF CONTROL	-9600–+9600 [cents]	40	0 [cents]
40 2x 02	00 00 01	00–7F	MOD AMPLITUDE CONTROL	-100.0–+100.0 [%]	40	0 [%]
40 2x 03	00 00 01	00–7F	MOD LFO1 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 04	00 00 01	00–7F	MOD LFO1 PITCH DEPTH	0–600 [cents]	0A	10 [cents]
40 2x 05	00 00 01	00–7F	MOD LFO1 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 06	00 00 01	00–7F	MOD LFO1 TVA DEPTH	0–100.0 [%]	00	0 [%]

40 2x 07	00 00 01	00–7F	MOD LFO2 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 08	00 00 01	00–7F	MOD LFO2 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 09	00 00 01	00–7F	MOD LFO2 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 0A	00 00 01	00–7F	MOD LFO2 TVA DEPTH	0–100.0 [%]	00	0 [%]

- All MOD control parameters are ignored whenever you use sounds with CC00 values ranging from 80 to 91.

Address(H)	Size(H)	Data (H)	Parameter	Description	Default Value (H)	Description
40 2x 10	00 00 01	40–58	BEND PITCH CONTROL	0–24 [semitones]	42	2 [semitones]
40 2x 11	00 00 01	00–7F	BEND TVF CUTOFF CONTROL	-9600–+9600 [cents]	40	0 [cents]
40 2x 12	00 00 01	00–7F	BEND AMPLITUDE CONTROL	-100.0–+100.0 [%]	40	0 [%]
40 2x 13	00 00 01	00–7F	BEND LFO1 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 14	00 00 01	00–7F	BEND LFO1 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 15	00 00 01	00–7F	BEND LFO1 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 16	00 00 01	00–7F	BEND LFO1 TVA DEPTH	0–100.0 [%]	00	0 [%]
40 2x 17	00 00 01	00–7F	BEND LFO2 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 18	00 00 01	00–7F	BEND LFO2 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 19	00 00 01	00–7F	BEND LFO2 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 1A	00 00 01	00–7F	BEND LFO2 TVA DEPTH	0–100.0 [%]	00	0 [%]

- All BEND control parameters are ignored whenever you use sounds with CC00 values ranging from 80 to 91.

40 2x 20	00 00 01	28–58	CAf PITCH CONTROL	-24–+24 [semitones]	40	0 [semitones]
40 2x 21	00 00 01	00–7F	CAf TVF CUTOFF CONTROL	-9600–+9600 [cents]	40	0 [cents]
40 2x 22	00 00 01	00–7F	CAf AMPLITUDE CONTROL	-100.0–+100.0 [%]	40	0 [%]
40 2x 23	00 00 01	00–7F	CAf LFO1 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 24	00 00 01	00–7F	CAf LFO1 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 25	00 00 01	00–7F	CAf LFO1 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 26	00 00 01	00–7F	CAf LFO1 TVA DEPTH	0–100.0 [%]	00	0 [%]
40 2x 27	00 00 01	00–7F	CAf LFO2 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 28	00 00 01	00–7F	CAf LFO2 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 29	00 00 01	00–7F	CAf LFO2 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 2A	00 00 01	00–7F	CAf LFO2 TVA DEPTH	0–100.0 [%]	00	0 [%]
40 2x 30	00 00 01	28–58	PAf PITCH CONTROL	-24–+24 [semitones]	40	0 [semitones]
40 2x 31	00 00 01	00–7F	PAf TVF CUTOFF CONTROL	-9600–+9600 [cents]	40	0 [cents]
40 2x 32	00 00 01	00–7F	PAf AMPLITUDE CONTROL	-100.0–+100.0 [%]	40	0 [%]
40 2x 33	00 00 01	00–7F	PAf LFO1 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 34	00 00 01	00–7F	PAf LFO1 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 35	00 00 01	00–7F	PAf LFO1 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 36	00 00 01	00–7F	PAf LFO1 TVA DEPTH	0–100.0 [%]	00	0 [%]
40 2x 37	00 00 01	00–7F	PAf LFO2 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 38	00 00 01	00–7F	PAf LFO2 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 39	00 00 01	00–7F	PAf LFO2 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 3A	00 00 01	00–7F	PAf LFO2 TVA DEPTH	0–100.0 [%]	00	0 [%]

- All PAf control parameters are ignored whenever you use sounds with CC 00 values ranging from 80 to 91.

40 2x 40	00 00 01	28–58	CC1 PITCH CONTROL	-24–+24 [semitones]	40	0 [semitones]
40 2x 41	00 00 01	00–7F	CC1 TVF CUTOFF CONTROL	-9600–+9600 [cents]	40	0 [cents]
40 2x 42	00 00 01	00–7F	CC1 AMPLITUDE CONTROL	-100.0–+100.0 [%]	40	0 [%]
40 2x 43	00 00 01	00–7F	CC1 LFO1 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 44	00 00 01	00–7F	CC1 LFO1 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 45	00 00 01	00–7F	CC1 LFO1 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 46	00 00 01	00–7F	CC1 LFO1 TVA DEPTH	0–100.0 [%]	00	0 [%]
40 2x 47	00 00 01	00–7F	CC1 LFO2 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 48	00 00 01	00–7F	CC1 LFO2 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 49	00 00 01	00–7F	CC1 LFO2 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 4A	00 00 01	00–7F	CC1 LFO2 TVA DEPTH	0–100.0 [%]	00	0 [%]

- All CC01 control parameters are ignored whenever you use sounds with CC 00 values ranging from 80 to 91.

40 2x 50	00 00 01	28–58	CC2 PITCH CONTROL	-24–+24 [semitones]	40	0 [semitones]
40 2x 51	00 00 01	00–7F	CC2 TVF CUTOFF CONTROL	-9600–+9600 [cents]	40	0 [cents]
40 2x 52	00 00 01	00–7F	CC2 AMPLITUDE CONTROL	-100.0–+100.0 [%]	40	0 [%]
40 2x 53	00 00 01	00–7F	CC2 LFO1 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 54	00 00 01	00–7F	CC2 LFO1 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 55	00 00 01	00–7F	CC2 LFO1 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 56	00 00 01	00–7F	CC2 LFO1 TVA DEPTH	0–100.0 [%]	00	0 [%]
40 2x 57	00 00 01	00–7F	CC2 LFO2 RATE CONTROL	-10.0–+10.0 [Hz]	40	0 [Hz]
40 2x 58	00 00 01	00–7F	CC2 LFO2 PITCH DEPTH	0–600 [cents]	00	0 [cents]
40 2x 59	00 00 01	00–7F	CC2 LFO2 TVF DEPTH	0–2400 [cents]	00	0 [cents]
40 2x 5A	00 00 01	00–7F	CC2 LFO2 TVA DEPTH	0–100.0 [%]	00	0 [%]

- All CC02 control parameters are ignored whenever you use sounds with CC 00 values ranging from 80 to 91.
- You may not always be able to obtain the desired effect by modifying the LFO 1 and LFO 2 parameters.

4. Supplementary material

● Decimal and Hexadecimal table

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

Dec.	Hex.	Dec.	Hex.	Dec.	Hex.	Dec.	Hex.
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

- 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 ... 10
16) 4 ... 14
0 … 4
Since from the preceding table, 0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH, the result is: 00 04 0E 0AH.

● Examples of actual MIDI messages

[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 -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 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 checksum calculation

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

○ How to calculate the checksum (hexadecimal numbers are indicated by "H")

The checksum is a value derived by adding the address, size, and checksum itself and inverting the lower 7 bits.
Here's an example of how the checksum is calculated. We will assume that in the exclusive (SysEx) 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 1] Setting REVERB MACRO to "ROOM 3"
According to the "Common parameters" on page 11, the REVERB MACRO Address is "40 01 30H", and ROOM 3 corresponds to "02H". Thus…

```
F0   41   10   42   12   40 01 30 02   ??        F7
(1)  (2)  (3)  (4)  (5)  address data  checksum  (6)

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

Next, we calculate the checksum.

```
40H+01H+30H+02H = 64+1+48+2 = 115 (sum)
115 (sum) ÷ 128 = 0 (quotient) ... 115 (remainder)
checksum = 128 - 115 (remainder) = 13 = 0DH
```

This means that F0 41 10 42 12 40 01 30 02 0D F7 is the message we need to transmit.

[Example 2] Setting REVERB LEVEL to "12"

According to the "Common parameters" on page 11, the REVERB LEVEL Address is "40 01 33H", and the parameter value is "0CH". Thus,

```
F0  41  10  42  12  40 01 33 0C  ??       F7
(1  (2) (3) (4) (5) address data checksum (6)

(1) Exclusive Status  (2) ID (Roland)       (3) Device ID (17)
(4) Model ID (GS)     (5) Command ID (DT1)  (6) EOX
```

Next we calculate the checksum.

```
40H + 01H + 33H + 0CH=64 + 1 + 51 + 12=128 (sum)
128 (sum) ÷ 128 = 0 (quotient) ... 0 (remainder)
checksum = 128 - 0 (remainder) = 128 = 80H
```

In this case, however, the checksum value should be 00H, not 80H. You should use 00H if the remainder is 0. This means that F0 41 10 42 12 40 01 33 0C 00 F7 is the message we transmit.

● About the Tuning

In MIDI, individual Parts are tuned by sending RPN #1 (Channel 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 (Channel 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 at A4	cents	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	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] Setting 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 01     MIDI ch.3, lower byte of RPN parameter number:  01H
(B2) 65 00   (MIDI ch.3) upper byte of RPN parameter number: 00H
(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 or 50 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 the E-A7, the default settings for the Scale Tune feature produce equal temperament.

○ Just Temperament (Tonic of C)

The principal triads 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 keynote.

○ Arabic 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 Arabic scale.

Example Settings

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

The values in the table are given in cents. Refer to the explanation of Scale Tuning on page 12 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 following data:

F0 41 10 42 12 40 11 40 3A 6D 3E 34 0D 38 6B 3C 6F 40 36 0F 76 F7

INDIVIDUAL PARAMETER TRANSMISSION (Model ID E-A7 = 00H, 00H, 00H, 1FH)

■ System Exclusive messages

Data Set 1 (DT1) is the only System Exclusive messages transmitted by the E-A7.

● Data set 1 DT1 (12H)

Status	**Data byte**	**Status**
F0H	41H, dev, 00H, 00H, 00H, 1FH, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	**Explanation**
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H – 1FH, Initial value is 10H)
	00H, 00H, 00H, 1FH Model ID (E-A7)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: middle 1 byte of the starting address of the data to be sent
ccH	Address: middle 2 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)

Expandable Arranger
Model: E-A7

MIDI Implementation Chart

Date: Nov. 20, 2015
Version: 1.00

Function...		Transmitted	Recognized	Remarks
Basic	Default	1–16	1–16	Up1= Ch.4, Up2= Ch. 6, Up3= Ch. 13
Channel	Changed	1–16, Off	1–16, Off	Lower= Ch. 11, M.Intell= Ch. 15
	Default	Mode 3	Mode 3	
Mode	Messages	Mode 3, 4 (M=1)	Mode 3, 4 (M=1)	*2
	Altered	*****		
Note		0–127	0–127	
Number	True Voice	*****	0–127	
Velocity	Note On	O	O	
	Note Off	X	X	
After	Key's	X	O *1	
Touch	Channel's	X	O *1	
Pitch Bend		O *1	O *1	
Control Change	0,32	O *1	O *1	Bank Select
	1	O *1	O *1	Modulation
	5	O	O	Portamento Time
	6, 38	O	O *1	Data Entry
	7	O *1	O *1	Volume
	10	O *1	O *1	Panpot
	11	O *1	O *1	Expression
	16	O *1	O *1	C1
	64	O	O *1	Hold 1
	65	O	O *1	Portamento
	66	O *1	O *1	Sostenuto
	67	O *1	O *1	Soft
	71	O	O	Resonance
	72	O	O	Release Time
	73	O	O	Attack Time
	74	O	O	Cutoff
	75	O	O	Decay Time
	76	O	O	Vibrato Rate
	77	O	O	Vibrato Depth
	78	O	O	Vibrato Delay
	84	O	O	Portamento Control
	91	O *1	O (Reverb) *1	Effect 1 Depth
	93	O *1	O (Chorus) *1	Effect 3 Depth
	98, 99	O *1	O *1	NRPN LSB, MSB
	100, 101	O *1	O *1	RPN LSB, MSB
Program		O *1	O *1	Program Number 1–128
Change	True #	*****	0–127	
System Exclusive		O *1	O *1	
System	Song Position Pointer	O *1	O	
Common	Song Sel	X	X	
	Tune	X	X	
System	Clock	O *1	O	
Real Time	Commands	O *1	O	
	All Sounds Off	X	O (120, 126, 127)	
	Reset All Controllers	X	O (121)	
Aux	Local On/Off	O *1	O (Song parts)	
Messages	All Notes Off	X	O (123-125)	
	Active Sensing	O	O	
	Reset	X	X	
Notes	*1 O X is selectable			
	*2 Recognized as M= 1 even if M≠ 1			

Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO O : Yes
Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO X : No