MIDI Implementation

Model: MC-909 (sampling groovebox)
Date: Sep. 20, 2002
Version: 1.00

Symbol	Description	Range
n	MIDI Channel	0H - FH (ch.1 - ch.16)
vv	Control value	00H - 7FH (0 - 127)
kk	Note Number	00H - 7FH (0 - 127)
xx	ON / OFF	00H - 3FH (0 - 63: OFF), 40H - 7FH (64 - 127: ON)

1. Data Reception (Sound Generator Section)

■Channel Voice Messages

●Note off

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

vv = note off velocity: 00H - 7FH (0 - 127)

* Not received when the Tone Env Mode parameter (Patch / General, Rhythm / General) is NSUS.

●Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH

vv = note on velocity: 01H - 7FH (1 - 127)

●Polyphonic Key Pressure

Status	2nd byte	3rd byte
AnH	kkH	vvH

vv = Polyphonic Key Pressure: 00H - 7FH (0 - 127)

●Control Change

❍Bank Select (Controller number 0, 32)

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

mm, ll = Bank number: 00 00H - 7F 7FH (bank.1 - bank.16384)

* Not received when the Receive Bank Select (System - MIDI Rx) is OFF.
* The Patches, and Rhythms corresponding to each Bank Select are as follows.
* The SRX series corresponding to each Bank Select are to see the SRX series owner's manual.

BANK SELECT MSB	LSB	PROGRAM NUMBER	GROUP	NUMBER
081	000	001 - 128	User Patch	001 - 128
	001	001 - 128	User Patch	129 - 256
	032	001 - 128	Card Patch	001 - 128
	033	001 - 128	Card Patch	129 - 256
	064	001 - 128	Preset Patch A	001 - 128
	065	001 - 128	Preset Patch B	001 - 128
	:		:	
	070	001 - 032	Preset Patch G	001 - 032
082	000	001 - 128	User Rhythm	001 - 128
	032	001 - 128	Card Rhythm	001 - 128
	064	001 - 072	Preset Rhythm	001 - 072
092	000 -	001 -	SRX Rhythm	001 -
	:		:	
093	000 -	001 -	SRX Patch	001 -
	:		:	

❍Modulation (Controller number 1)

Status	2nd byte	3rd byte
BnH	01H	vvH

vv = Modulation depth: 00H - 7FH (0 - 127)

❍Breath type (Controller number 2)

Status	2nd byte	3rd byte
BnH	02H	vvH

❍Foot type (Controller number 4)

Status	2nd byte	3rd byte
BnH	04H	vvH

❍Portamento Time (Controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH

❍Data Entry (Controller number 6, 38)

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

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

* The Part Level parameter (PART MIXER) will change.

❍Balance (Controller number 8)

Status	2nd byte	3rd byte
BnH	08H	vvH

❍Panpot (Controller number 10)

Status	2nd byte	3rd byte
BnH	0AH	vvH

vv = Panpot: 00H - 40H - 7FH (Left - Center - Right)

* The Part Pan parameter (PART MIXER) will change.

❍Expression (Controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH

❍Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	xxH

❍Portamento (Controller number 65)

Status	2nd byte	3rd byte
BnH	41H	xxH

❍Sostenuto (Controller number 66)

Status	2nd byte	3rd byte
BnH	42H	xxH

❍Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	xxH

❍Legato Foot Switch (Controller number 68)

Status	2nd byte	3rd byte
BnH	44H	xxH

❍Hold 2 (Controller number 69)

Status	2nd byte	3rd byte
BnH	45H	vvH

* A hold movement isn't done.

❍Resonance (Controller number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

❍Release Time (Controller number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH

❍Attack time (Controller number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH

❍Cutoff (Controller number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

❍Decay Time (Controller number 75)

Status	2nd byte	3rd byte
BnH	4BH	vvH

❍General Purpose Controller 5 (Controller number 80)

Status	2nd byte	3rd byte
BnH	50H	vvH

❍General Purpose Controller 6 (Controller number 81)

Status	2nd byte	3rd byte
BnH	51H	vvH

❍General Purpose Controller 7 (Controller number 82)

Status	2nd byte	3rd byte
BnH	52H	vvH

❍General Purpose Controller 8 (Controller number 83)

Status	2nd byte	3rd byte
BnH	53H	vvH

❍Portamento control (Controller number 84)

Status	2nd byte	3rd byte
BnH	54H	kkH

kk = source note number: 00H - 7FH (0 - 127)

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

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

Status	2nd byte	3rd byte
BnH	5BH	vvH

* The Part Reverb Level parameter (PART MIXER) will change.

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

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

mm = upper byte (MSB) of parameter number specified by RPN
ll = lower byte (LSB) of parameter number specified by RPN

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

This device receives the following RPNs.

RPN MSB, LSB	Data entry MSB, LSB	Notes
00H, 00H	mmH, llH	Pitch Bend Sensitivity mm: 00H - 18H (0 - 24 semitones) ll: ignored (processed as 00H) Up to 2 octave can be specified in semitone steps.
00H, 01H	mmH, llH	Channel Fine Tuning mm, ll: 20 00H - 40 00H - 60 00H (-4096 x 100 / 8192 - 0 - +4096 x 100 / 8192 cent)
00H, 02H	mmH, llH	Channel Coarse Tuning mm: 10H - 40H - 70H (-48 - 0 - +48 semitones) ll: ignored (processed as 00H) * The Part Key Shift parameter (PART MIXER) will change.
7FH, 7FH	---, ---	RPN null RPN and NRPN will be set as "unspecified." Once this setting has been made, subsequent Parameter values that were previously set will not change. mm, ll: ignored

●Program Change

Status	2nd byte
CnH	ppH

pp = Program number: 00H - 7FH (prog.1 - prog.128)

* Not received when the Receive Program Change parameter (System - MIDI Rx) is OFF.

●Channel Pressure

Status	2nd byte
DnH	vvH

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH

mm, ll = Pitch Bend value:00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

■Channel Mode Messages

●All Sounds Off (Controller number 120)

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

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

●Reset All Controllers (Controller number 121)

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

* 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)
Breath Type	0 (min)
Expression	127 (max) However the controller will be at minimum.
Hold 1	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
Hold 2	0 (off)
RPN	unset; previously set data will not change
NRPN	unset; previously set data will not change

●All Notes Off (Controller number 123)

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

* 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

* 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

* 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

mm = mono number: 00H - 10H (0 - 16)

* The same processing will be carried out as when All Notes Off is received.
* The Patch Mono / Poly parameter (Patch - Solo / Porta) will change.

●POLY (Controller number 127)

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

* The same processing will be carried out as when All Notes Off is received.
* The Mono / Poly parameter (Patch - Solo / Porta) will change.

■System Realtime Message

●Active Sensing

Status
FEH

* When Active Sensing is received, the unit will begin monitoring the intervals of all further messages. While monitoring, if the interval between messages exceeds 420 ms, the same processing will be carried out as when All Sounds Off, All Notes Off and Reset All Controllers are received, and message interval monitoring will be halted.

■System Exclusive Message

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

F0H:	System Exclusive Message status
ii = ID number:	an ID number (manufacturer ID) to indicate the manufacturer whose Exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are extensions of the MIDI standard; Universal Non-realtime Messages (7EH) and Universal Realtime Messages (7FH).
dd,...,ee = data:	00H - 7FH (0 - 127)
F7H:	EOX (End Of Exclusive)

Of the System Exclusive messages received by this device, the Universal Non-realtime messages and the Universal Realtime messages and the Data Request (RQ1) messages and the Data Set (DT1) messages will be set automatically.

●Universal Non-realtime System Exclusive Messages

❍Identity Request Message

Status	Data byte	Status
F0H	7EH, dev, 06H, 01H	F7H

Byte	Remarks
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (dev: 10H - 1FH, 7FH)
06H	Sub ID#1 (General Information)
01H	Sub ID#2 (Identity Request)
F7H	EOX (End Of Exclusive)

* When this message is received, Identity Reply message (p. 5) will be transmitted.

●Universal Realtime System Exclusive Messages

❍Master Volume

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

Byte	Remarks
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
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.
* The Master Level parameter (System - Sound) will change.

❍Master Fine Tuning

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

Byte	Remarks
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])

* The Master Tune parameter (System - Sound) will change.

❍Master Coarse Tuning

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

Byte	Remarks
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)

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

* The Master Key Shift parameter (System - Sound) will change.

●Data Transmission

This instrument can use exclusive messages to exchange many varieties of internal settings with other devices.
The model ID of the exclusive messages used by this instrument is 00H 59H.

❍Data Request 1 RQ1 (11H)

This message requests the other device to transmit data. The address and size indicate the type and amount of data that is requested.
When a Data Request message is received, if the device is in a state in which it is able to transmit data, and if the address and size are appropriate, the requested data is transmitted as a Data Set 1 (DT1) message. If the conditions are not met, nothing is transmitted.

Status	data byte	status
F0H	41H, dev, 00H, 59H, 11H, aaH, bbH, ccH, ddH, ssH, ttH, uuH, vvH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	device ID (dev: 10H - 1FH, 7FH)
00H	model ID #1 (MC-909)
59H	model ID #2 (MC-909)
11H	command ID (RQ1)
aaH	address MSB
bbH	address
ccH	address
ddH	address LSB
ssH	size MSB
ttH	size
uuH	size
vvH	size LSB
sum	checksum
F7H	EOX (End Of Exclusive)

* The size of data that can be transmitted at one time is fixed for each type of data. And data requests must be made with a fixed starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 7).
* For the checksum, refer to (p. 16).
* Not received when the Receive Exclusive parameter (System - MIDI Rx) is OFF.

❍Data set 1 DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 00H, 59H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H - 1FH, 7FH)
00H	Model ID #1 (MC-909)
59H	Model ID #2 (MC-909)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: upper middle byte of the starting address of the data to be sent
ccH	Address: lower middle byte of the starting address of the data to be sent
ddH	Address LSB: lower byte of the starting address of the data to be sent.
eeH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
ffH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in “Parameter Address Map” (p. 7).
* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.
* Regarding the checksum, please refer to (p. 16)
* Not received when the Receive Exclusive parameter (System - MIDI Rx) is OFF.

2. Data Transmission (Sound Generator Section)

■Channel Voice Messages

●Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH

vv = note off velocity: 00H - 7FH (0 - 127)

●Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH

vv = note on velocity: 01H - 7FH (1 - 127)

●Control Change

❍Bank Select (Controller number 0, 32)

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

mm, ll = Bank number: 00 00H - 7F 7FH (bank.1 - bank.16384)

* These messages are transmitted when Patch, Rhythm Set is selected. But not transmitted when Transmit Program Change or Transmit Bank Select parameter (System - MIDI Tx) is OFF.
* The Bank Select Numbers corresponding to SRX series should be referred to the SRX series owner’s manual.

❍Modulation (Controller number 1)

Status	2nd byte	3rd byte
BnH	01H	vvH

vv = Modulation depth: 00H - 7FH (0 - 127)

❍Breath type (Controller number 2)

Status	2nd byte	3rd byte
BnH	02H	vvH

❍Portamento Time (Controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH

❍Volume (Controller number 7)

Status	2nd byte	3rd byte
BnH	07H	vvH

❍Panpot (Controller number 10)

Status	2nd byte	3rd byte
BnH	0AH	vvH

vv = Panpot: 00H - 40H - 7FH (Left - Center - Right)

❍Expression (Controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH

❍Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	xxH

❍Portamento (Controller number 65)

Status	2nd byte	3rd byte
BnH	41H	xxH

❍Resonance (Controller number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

❍Release Time (Controller number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH

❍Attack time (Controller number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH

❍Cutoff (Controller number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

❍General Purpose Controller 5 (Controller number 80)

Status	2nd byte	3rd byte
BnH	50H	vvH

❍General Purpose Controller 6 (Controller number 81)

Status	2nd byte	3rd byte
BnH	51H	vvH

❍General Purpose Controller 7 (Controller number 82)

Status	2nd byte	3rd byte
BnH	52H	vvH

❍General Purpose Controller 8 (Controller number 83)

Status	2nd byte	3rd byte
BnH	53H	vvH

❍Portamento control (Controller number 84)

Status	2nd byte	3rd byte
BnH	54H	kkH

kk = source note number: 00H - 7FH (0 - 127)

●Program Change

Status	2nd byte
CnH	ppH

pp = Program number: 00H - 7FH (prog.1 - prog.128)

* These messages are transmitted when Patch, Rhythm Set is selected. But not transmitted when Transmit Program Change parameter (System - MIDI Tx) is OFF.

●Channel Pressure

Status	2nd byte
DnH	vvH

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH

mm, ll = Pitch Bend value: 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

■Channel Mode Messages

●MONO (Controller number 126)

Status	2nd byte	3rd byte
BnH	7EH	mmH

mm = mono number: 00H - 10H (0 - 16)

●POLY (Controller number 127)

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

■System Realtime Messages

●Active Sensing

Status
FEH

* This message is transmitted at intervals of approximately 250 msec.

* This message is not sent when Transmit Active Sensing parameter (System - MIDI Tx) is OFF.

■System Exclusive Messages

Universal Non-realtime System Exclusive Message" and Data Set 1 (DT1) are the only System Exclusive messages transmitted by the MC-909.

●Universal Non-realtime System Exclusive Message

❍Identity Reply Message

Receiving Identity Request Message, the MC-909 send this message.

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 59H, 01H, 00H, 00H, 00H, 03H, 00H, 00H	F7H

Byte	Remarks
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (dev: 10H - 1FH)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Reply)
41H	ID number (Roland)
59H 01H	Device family code
00H 00H	Device family number code
00H 03H 00H 00H	Software revision level
F7H	EOX (End of Exclusive)

●Data Transmission

❍Data set 1 DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 00H, 59H, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H - 1FH, 7FH)
00H	Model ID #1 (MC-909)
59H	Model ID #2 (MC-909)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: upper middle byte of the starting address of the data to be sent
ccH	Address: lower middle byte of the starting address of the data to be sent
ddH	Address LSB: lower byte of the starting address of the data to be sent
eeH	Data: The actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
ffH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in "Parameter Address Map" (p. 7).

* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.

3. Data Reception (Sequencer Section)

3.1 Messages recorded during recording

■Channel Voice messages

●Note Off

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

vv=Note Off velocity: 00H - 7FH (0 - 127)

●Note On

Status	2nd byte	3rd byte
9nH	kkH	vvH

vv=Note On velocity: 01H - 7FH (1 - 127)

●Polyphonic Aftertouch

Status	2nd byte	3rd byte
AnH	kkH	vvH

●Control Change

Status	2nd byte	3rd byte
BnH	kkH	vvH

kk=Controller number: 00H - 78H (0 - 120)

●Program Change

Status	2nd byte
CnH	ppH

pp=Program number: 00H - 7FH (prog.1 - prog.128)

●Channel Aftertouch

Status	2nd byte
DnH	vvH

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH

mm, ll=Pitch Bend value: 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

■Channel Mode messages

●All Sound Off (Controller number 120)

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

●Reset All Controllers (Controller number 121)

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

●Omni Off (Controller number 124)

Status	2nd byte	3rd byte
BnH	7CH	00H

* The same processing will be done as when an All Note Off message is received.

●Omni On (Controller number 125)

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

* The same processing will be done as when an All Note Off message is received.

●Mono (Controller number 126)

Status	2nd byte	3rd byte
BnH	7EH	mmH

mm=mono number: 00H - 10H (0 - 16)

* The same processing will be done as when an All Note Off message is received.

●Poly (Controller number 127)

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

* The same processing will be done as when an All Note Off message is received.

■System Exclusive messages

Status	data byte	status
F0H	iiH, ddH, ..., eeH	F7H

F0H: System Exclusive message status

ii = ID number: This is the ID number (manufacturer ID) that specifies the manufacturer whose exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are defined in an expansion of the MIDI standard as Universal Non-realtime messages (7EH) and Universal Realtime Messages (7FH).

dd, ..., ee = data: 00H - 7FH (0 - 127)

F7H: EOX (End Of Exclusive)

3.2 Messages not recorded during recording

■Channel Mode messages

●Local On/Off (Controller number 122)

Status	2nd byte	3rd byte
BnH	7AH	vvH

vv=value: 00H, 7FH (Local off, Local on)

●All Note Off (Controller number 123)

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

* When an All Note Off message is received, all notes of the corresponding channel that are on will be sent Note Off's, and the resulting Note Off messages will be recorded.

3.3 Messages acknowledged for synchronization

■System Common messages

●Song Position Pointer

Status	2nd byte	3rd byte
F2H	mmH	llH

mm, ll=value: 00 00H - 7F 7FH (0 - 16383)

* This message will be received if the Sync Mode parameter is SLAVE or REMOTE.

■System Realtime messages

●Timing Clock

Status
F8H

* This message will be received if the Sync Mode parameter is SLAVE.

●Start

Status
FAH

* This message will be received if the Sync Mode parameter is SLAVE or REMOTE.

●Continue

Status
FBH

* This message will be received if the Sync Mode parameter is SLAVE or REMOTE.

●Stop

Status
FCH

* This message will be received if the Sync Mode parameter is SLAVE or REMOTE.

4. Data Transmission (Sequencer Section)

4.1 Recorded messages are transmitted during playback.

4.2 If the Soft Through parameter is ON, received messages (except for System Common messages and System Realtime messages) will be transmitted.

4.3 Messages that are generated and transmitted

4.3.1 Messages generated and transmitted when the Sync Output parameter is ON

■System Common messages

●Song Position Pointer

Status	2nd byte	3rd byte
F2H	mmH	llH

mm, ll=value: 00 00H - 7F 7FH (0 - 16383)

* This message is transmitted if the Sync Output parameter is ON.

■System Realtime messages

●Timing Clock

Status
F8H

* This message is transmitted if the Sync Output parameter is ON.

●Start

Status
FAH

* This message is transmitted if the Sync Output parameter is ON.

●Continue

Status
FBH

* This message is transmitted if the Sync Output parameter is ON.

●Stop

Status
FCH

* This message is transmitted if the Sync Output parameter is ON.

5. Parameter Address Map

* Transmission of "#" marked address is divided to some packets. For example, ABH in hexadecimal notation will be divied to 0AH and 0BH, and is sent/received in this order.
* "<*>" marked adddress or parameters are ignored when the MC-909 received them.

■1. MC-909 (Model ID = 00H 59H)

Start Address	Description
01 00 00 00	Setup
02 00 00 00	System
10 00 00 00	Part Info
11 00 00 00	Temporary Patch/Rhythm (Part 1)
11 20 00 00	Temporary Patch/Rhythm (Part 2)
:	
14 60 00 00	Temporary Patch/Rhythm (Part 16)
15 00 00 00	Temporary Arpeggio
18 00 00 00	Temporary Chord

❍System

Offset Address	Description
00 00 00	System Common
00 02 00	System Mastering
00 10 00	System Part (Part 1)
00 11 00	System Part (Part 2)
:	
00 1F 00	System Part (Part 16)
00 40 00	System Controller

❍Temporary Patch/Rhythm

Offset Address	Description
00 00 00	Temporary Patch
10 00 00	Temporary Rhythm

❍Part Info

Offset Address	Description
00 00 00	Part Info Common
00 02 00	Part Info Common MFX1
00 04 00	Part Info Common MFX2
00 06 00	Part Info Common Reverb
00 08 00	Part Info Common Comp/EQ
00 0A 00	Part Info Common External Input
00 20 00	Part Info Part (Part 1)
00 21 00	Part Info Part (Part 2)
:	
00 2F 00	Part Info Part (Part 16)

❍Patch

Offset Address	Description
00 00 00	Patch Common
00 10 00	Patch TMT (Tone Mix Table)
00 20 00	Patch Tone (Tone 1)
00 22 00	Patch Tone (Tone 2)
00 24 00	Patch Tone (Tone 3)
00 26 00	Patch Tone (Tone 4)

❍Rhythm

Offset Address	Description
00 00 00	Rhythm Common
00 5C 00	Rhythm Tone (Key # 59)
00 5E 00	Rhythm Tone (Key # 60)
:	
00 7A 00	Rhythm Tone (Key # 74)

❍Arpeggio

Offset Address	Description
00 00 00	Arpeggio Common
00 10 00	Arpeggio Pattern (Note 1)
00 11 00	Arpeggio Pattern (Note 2)
:	
00 1F 00	Arpeggio Pattern (Note 16)

❍Chord

Offset Address	Description
00 00 00	Chord Pattern

❍Setup

Offset Address		Description	
00 00	0000 000a	Compressor Switch	(0 – 1) OFF, ON
00 01	0000 000a	MFX1 Switch	(0 – 1) OFF, ON
00 02	0000 000a	MFX2 Switch	(0 – 1) OFF, ON
00 03	0000 000a	Reverb Switch	(0 – 1) OFF, ON
00 04	0000 aaaa	Octave Shift	(60 – 68) –4 – +4
00 05	0000 000a	Beam1 Switch	(0 – 1) OFF, ON
00 06	0000 000a	Beam2 Switch	(0 – 1) OFF, ON
00 07	0000 000a	Arpeggio Switch	(0 – 1) OFF, ON
00 08	0aaa aaaa	Arpeggio Patch Style	(0 – 127) 1 – 128
00 09	0aaa aaaa	Arpeggio Grid	(0 – 8) 04_, 08_, 08L, 08H, 08t, 16_, 16L, 16H, 16t
00 0A	0aaa aaaa	Arpeggio Motif	(0 – 9) UP/L, UP/H, UP/_, dn/L, dn/H, dn/_, Ud/L, Ud/H, Ud/_, rn/L
00 0B	0aaa aaaa	Arpeggio Duration	(0 – 9) 30, 40, 50, 60, 70, 80, 90, 100, 120, FUL
00 0C	0000 0aaa	Arpeggio Octave Range	(61 – 67) –3 – +3
00 0D	0aaa aaaa	Arpeggio Patch Group	(0 – 1) USER, PRESET
00 0E	0000 000a	Chord Switch	(0 – 1) OFF, ON
00 0F	0aaa aaaa	Chord Form	(0 – 127) 1 – 128
00 10	0aaa aaaa	Chord Group	(0 – 1) USER, PRESET
00 00 00 11	Total Size		

❍System Common

Offset Address		Description	
# 00 00	0000 aaaa 0000 bbbb 0000 cccc		
	0000 dddd	Master Tune	(24 – 2024) –100.0 – 100.0 [cent]
00 04	00aa aaaa	Master Key Shift	(40 – 88) –24 – +24
00 05	0aaa aaaa	Master Level	(0 – 127)
00 06	0000 000a	Scale Tune Switch	(0 – 1) OFF, ON
00 07	0000 000a	Patch Remain	(0 – 1) OFF, ON
00 08	0000 000a	Receive Program Change	(0 – 1) OFF, ON
00 09	0000 000a	Receive Bank Select	(0 – 1) OFF, ON
00 00 00 0A	Total Size		

❍System Mastering

Offset Address		Description	
00 00	0000 000a	Mastering Switch	(0 – 1) OFF, ON
00 01	0aaa aaaa	Low band Attack time	(0 – 100)
00 02	0aaa aaaa	Low band Release time	(0 – 100)
00 03	00aa aaaa	Low band Threshold	(0 – 36) –36, –35, –34, –33, –32, –31, –30, –29, –28, –27, –26, –25, –24, –23, –22, –21, –20, –19, –18, –17, –16, –15, –14, –13, –12, –11, –10, –9, –8, –7, –6, –5, –4, –3, –2, –1, 0 [dB]
00 04	0000 aaaa	Low band Ratio	(0 – 13) 1:1.0, 1:1.1, 1:1.2, 1:1.4, 1:1.6, 1:1.8, 1:2.0, 1:2.5, 1:3.2, 1:4.0, 1:5.6, 1:8.0, 1:16, 1:INF
00 05	000a aaaa	Low band Level	(0 – 24) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 [dB]
00 06	0aaa aaaa	Mid band Attack time	(0 – 100)
00 07	0aaa aaaa	Mid band Release time	(0 – 100)
00 08	00aa aaaa	Mid band Threshold	(0 – 36) –36, –35, –34, –33, –32, –31, –30, –29, –28, –27, –26, –25, –24, –23, –22, –21, –20, –19, –18, –17, –16, –15, –14, –13, –12, –11, –10, –9, –8, –7, –6, –5, –4, –3, –2, –1, 0 [dB]
00 09	0000 aaaa	Mid band Ratio	(0 – 13) 1:1.0, 1:1.1, 1:1.2, 1:1.4, 1:1.6, 1:1.8, 1:2.0, 1:2.5, 1:3.2, 1:4.0, 1:5.6, 1:8.0, 1:16, 1:INF
00 0A	000a aaaa	Mid band Level	(0 – 24) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 [dB]
00 0B	0aaa aaaa	High band Attack time	(0 – 100)
00 0C	0aaa aaaa	High band Release time	(0 – 100)
00 0D	00aa aaaa	High band Threshold	(0 – 36) –36, –35, –34, –33, –32, –31, –30, –29, –28, –27, –26, –25, –24, –23, –22, –21, –20, –19, –18, –17, –16, –15, –14, –13, –12, –11, –10, –9, –8, –7, –6, –5, –4, –3, –2, –1, 0 [dB]
00 0E	0000 aaaa	High band Ratio	(0 – 13) 1:1.0, 1:1.1, 1:1.2, 1:1.4, 1:1.6, 1:1.8, 1:2.0, 1:2.5, 1:3.2, 1:4.0, 1:5.6, 1:8.0, 1:16, 1:INF
00 0F	000a aaaa	High band Level	(0 – 24) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 [dB]
00 10	0000 0aaa	Split Freq Low	(0 – 6) 200, 250, 315, 400, 500, 630, 800 [Hz]
00 11	0000 0aaa	Split Freq High	(0 – 6) 2000, 2500, 3150, 4000, 5000, 6300, 8000 [Hz]
00 00 00 12	Total Size		

❍System Part

Offset Address		Description	
00 00	0aaa aaaa	Scale Tune for C	(0 – 127) –64 – +63
00 01	0aaa aaaa	Scale Tune for C#	(0 – 127) –64 – +63
00 02	0aaa aaaa	Scale Tune for D	(0 – 127) –64 – +63
00 03	0aaa aaaa	Scale Tune for D#	(0 – 127) –64 – +63
00 04	0aaa aaaa	Scale Tune for E	(0 – 127) –64 – +63
00 05	0aaa aaaa	Scale Tune for F	(0 – 127) –64 – +63
00 06	0aaa aaaa	Scale Tune for F#	(0 – 127) –64 – +63
00 07	0aaa aaaa	Scale Tune for G	(0 – 127) –64 – +63
00 08	0aaa aaaa	Scale Tune for G#	(0 – 127) –64 – +63
00 09	0aaa aaaa	Scale Tune for A	(0 – 127) –64 – +63
00 0A	0aaa aaaa	Scale Tune for A#	(0 – 127) –64 – +63
00 0B	0aaa aaaa	Scale Tune for B	(0 – 127) –64 – +63
00 00 00 0C	Total Size		

❍System Controller

Offset Address		Description	
00 00	0000 000a	Transmit Program Change	(0 – 1) OFF, ON
00 01	0000 000a	Transmit Bank Select	(0 – 1) OFF, ON
00 02	0aaa aaaa	Pad Velocity	(0 – 127) REAL, 1 – 127
00 03	0aaa aaaa	D Beam 1 Solo Synth Bank MSB	(0 – 127)
00 04	0aaa aaaa	D Beam 1 Solo Synth Bank LSB	(0 – 127)
00 05	0aaa aaaa	D Beam 1 Solo Synth PC	(0 – 127)
00 06	0aaa aaaa	D Beam 1 Solo Synth Note Number	(0 – 127) C–1 – G9
00 07	0aaa aaaa	D Beam 2 Solo Synth Scale	(0 – 1) FREE, CHROMATIC
00 08	0aaa aaaa	D Beam 2 Solo Synth Range	(0 – 1) 2OCTAVE, 4OCTAVE
00 09	0aaa aaaa	(reserve)	
00 0A	0aaa aaaa	(reserve)	
00 0B	0aaa aaaa	D Beam 1 Cut+Reso Range Lower	(0 – 127)
00 0C	0aaa aaaa	D Beam 1 Cut+Reso Range Upper	(0 – 127)
00 0D	0aaa aaaa	(reserve)	
00 0E	0aaa aaaa	(reserve)	
00 0F	0aaa aaaa	D Beam 2 Cut+Reso Range Lower	(0 – 127)
00 10	0aaa aaaa	D Beam 2 Cut+Reso Range Upper	(0 – 127)
00 11	0aaa aaaa	(reserve)	
00 12	0aaa aaaa	(reserve)	
00 13	0aaa aaaa	D Beam 1 TTE BPM Type	(0 – 1) DOWN, UP
00 14	0aaa aaaa	(reserve)	
00 15	0aaa aaaa	(reserve)	
00 16	0aaa aaaa	(reserve)	
00 17	0aaa aaaa	D Beam 2 TTE Pitch Type	(0 – 1) DOWN, UP
00 18	0aaa aaaa	(reserve)	
00 19	0aaa aaaa	(reserve)	
00 1A	0aaa aaaa	(reserve)	
00 1B	0aaa aaaa	D Beam 1 Asgn Type	(0 – 18) CC, BEND–UP, BEND–DW, BEND–BOTH, AFT, START–STOP, GRIS, ADLIB, ARP–OCT–UP, ARP–OCT–DW, ARP–OCT–BOTH, ARP–DUR, BPM–UP, BPM–DW, PCH–UP, PCH–DW, EFCT1, EFCT2, ALL–MUTE
00 1C	0aaa aaaa	D Beam 1 Asgn CC#	(0 – 93) CC01 – CC31, CC33 – CC95
00 1D	0aaa aaaa	D Beam 1 Asgn Range Lower	(0 – 127)
00 1E	0aaa aaaa	D Beam 1 Asgn Range Upper	(0 – 127)
00 1F	0aaa aaaa	D Beam 2 Asgn Type	(0 – 18) CC, BEND–UP, BEND–DW, BEND–BOTH, AFT, START–STOP, GRIS, ADLIB, ARP–OCT–UP, ARP–OCT–DW, ARP–OCT–BOTH, ARP–DUR, BPM–UP, BPM–DW, PCH–UP, PCH–DW, EFCT1, EFCT2, ALL–MUTE
00 20	0aaa aaaa	D Beam 2 Asgn CC#	(0 – 93) CC01 – CC31, CC33 – CC95
00 21	0aaa aaaa	D Beam 2 Asgn Range Lower	(0 – 127)
00 22	0aaa aaaa	D Beam 2 Asgn Range Upper	(0 – 127)
00 23	0000 00aa	TTE Type	(0 – 2) TTE, BEND, MODULATION
# 00 24	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	TTE Range	(12768 – 52768) –20000 – +20000
00 00 00 28	Total Size		

❍Part Info Common

Offset Address		Description	
00 00	0aaa aaaa	Voice Reserve 1	(0 – 64) 0 – 63, FULL
00 01	0aaa aaaa	Voice Reserve 2	(0 – 64) 0 – 63, FULL
00 02	0aaa aaaa	Voice Reserve 3	(0 – 64) 0 – 63, FULL
00 03	0aaa aaaa	Voice Reserve 4	(0 – 64) 0 – 63, FULL
00 04	0aaa aaaa	Voice Reserve 5	(0 – 64) 0 – 63, FULL
00 05	0aaa aaaa	Voice Reserve 6	(0 – 64) 0 – 63, FULL
00 06	0aaa aaaa	Voice Reserve 7	(0 – 64) 0 – 63, FULL
00 07	0aaa aaaa	Voice Reserve 8	(0 – 64) 0 – 63, FULL
00 08	0aaa aaaa	Voice Reserve 9	(0 – 64) 0 – 63, FULL
00 09	0aaa aaaa	Voice Reserve 10	(0 – 64) 0 – 63, FULL
00 0A	0aaa aaaa	Voice Reserve 11	(0 – 64) 0 – 63, FULL
00 0B	0aaa aaaa	Voice Reserve 12	(0 – 64) 0 – 63, FULL
00 0C	0aaa aaaa	Voice Reserve 13	(0 – 64) 0 – 63, FULL
00 0D	0aaa aaaa	Voice Reserve 14	(0 – 64) 0 – 63, FULL
00 0E	0aaa aaaa	Voice Reserve 15	(0 – 64) 0 – 63, FULL
00 0F	0aaa aaaa	Voice Reserve 16	(0 – 64) 0 – 63, FULL
00 00 00 10	Total Size		

❍Part Info Common MFX1

Offset Address		Description	
00 00	0aaa aaaa	MFX Type	(0 – 38) 0 – 63
00 01	0aaa aaaa	MFX Reverb Send Level	(0 – 127)
00 02	0000 000a	MFX1 Output Assign	(0 – 1) DRY, MFX2
# 00 03	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 1	(12768 – 52768) –20000 – +20000
# 00 07	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 2	(12768 – 52768) –20000 – +20000
# 00 0B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 3	(12768 – 52768) –20000 – +20000
# 00 0F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 4	(12768 – 52768) –20000 – +20000
# 00 13	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 5	(12768 – 52768) –20000 – +20000
# 00 17	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 6	(12768 – 52768) –20000 – +20000
# 00 1B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 7	(12768 – 52768) –20000 – +20000
# 00 1F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 8	(12768 – 52768) –20000 – +20000
# 00 23	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 9	(12768 – 52768) –20000 – +20000
# 00 27	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 10	(12768 – 52768) –20000 – +20000
# 00 2B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 11	(12768 – 52768) –20000 – +20000
# 00 2F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 12	(12768 – 52768) –20000 – +20000
# 00 33	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 13	(12768 – 52768) –20000 – +20000
# 00 37	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 14	(12768 – 52768) –20000 – +20000
# 00 3B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 15	(12768 – 52768) –20000 – +20000
# 00 3F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 16	(12768 – 52768) –20000 – +20000
# 00 43	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 17	(12768 – 52768) –20000 – +20000
# 00 47	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 18	(12768 – 52768) –20000 – +20000
# 00 4B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 19	(12768 – 52768) –20000 – +20000
# 00 4F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 20	(12768 – 52768) –20000 – +20000
# 00 53	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 21	(12768 – 52768) –20000 – +20000
# 00 57	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 22	(12768 – 52768) –20000 – +20000

Offset Address	Description		
# 00 5B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 23	(12768 – 52768) –20000 – +20000
# 00 5F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 24	(12768 – 52768) –20000 – +20000
# 00 63	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 25	(12768 – 52768) –20000 – +20000
# 00 67	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 26	(12768 – 52768) –20000 – +20000
# 00 6B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 27	(12768 – 52768) –20000 – +20000
# 00 6F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 28	(12768 – 52768) –20000 – +20000
# 00 73	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 29	(12768 – 52768) –20000 – +20000
# 00 77	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 30	(12768 – 52768) –20000 – +20000
# 00 7B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 31	(12768 – 52768) –20000 – +20000
# 00 7F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 32	(12768 – 52768) –20000 – +20000
00 00 01 03	Total Size		

❍Part Info Common MFX2

Offset Address	Description		
00 00	0aaa aaaa	MFX Type	(0 – 47)
00 01	0aaa aaaa	MFX Reverb Send Level	0 – 63 (0 – 127)
# 00 02	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 1	(12768 – 52768) –20000 – +20000
# 00 06	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 2	(12768 – 52768) –20000 – +20000
# 00 0A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 3	(12768 – 52768) –20000 – +20000
# 00 0E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 4	(12768 – 52768) –20000 – +20000
# 00 12	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 5	(12768 – 52768) –20000 – +20000
# 00 16	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 6	(12768 – 52768) –20000 – +20000
# 00 1A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 7	(12768 – 52768) –20000 – +20000
# 00 1E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 8	(12768 – 52768) –20000 – +20000
# 00 22	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 9	(12768 – 52768) –20000 – +20000
# 00 26	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 10	(12768 – 52768) –20000 – +20000
# 00 2A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 11	(12768 – 52768) –20000 – +20000
# 00 2E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 12	(12768 – 52768) –20000 – +20000
# 00 32	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 13	(12768 – 52768) –20000 – +20000
# 00 36	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 14	(12768 – 52768) –20000 – +20000
# 00 3A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 15	(12768 – 52768) –20000 – +20000
# 00 3E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 16	(12768 – 52768) –20000 – +20000
# 00 42	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 17	(12768 – 52768) –20000 – +20000
# 00 46	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 18	(12768 – 52768) –20000 – +20000
# 00 4A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 19	(12768 – 52768) –20000 – +20000
# 00 4E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 20	(12768 – 52768) –20000 – +20000
# 00 52	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 21	(12768 – 52768) –20000 – +20000
# 00 56	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 22	(12768 – 52768) –20000 – +20000
# 00 5A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 23	(12768 – 52768) –20000 – +20000
# 00 5E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 24	(12768 – 52768) –20000 – +20000
# 00 62	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 25	(12768 – 52768) –20000 – +20000
# 00 66	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 26	(12768 – 52768) –20000 – +20000
# 00 6A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 27	(12768 – 52768) –20000 – +20000
# 00 6E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 28	(12768 – 52768) –20000 – +20000
# 00 72	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 29	(12768 – 52768) –20000 – +20000
# 00 76	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 30	(12768 – 52768) –20000 – +20000
# 00 7A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 31	(12768 – 52768) –20000 – +20000
# 00 7E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 32	(12768 – 52768) –20000 – +20000
00 00 01 02	Total Size		

❍Part Info Common Reverb

Offset Address	Description		
00 00	0000 aaaa	Reverb Type	(0 – 4)
# 00 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 1	(12768 – 52768) –20000 – +20000
# 00 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 2	(12768 – 52768) –20000 – +20000
# 00 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 3	(12768 – 52768) –20000 – +20000
# 00 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 4	(12768 – 52768) –20000 – +20000
# 00 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 5	(12768 – 52768) –20000 – +20000
# 00 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 6	(12768 – 52768) –20000 – +20000
# 00 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 7	(12768 – 52768) –20000 – +20000
# 00 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 8	(12768 – 52768) –20000 – +20000
# 00 21	0000 aaaa 0000 bbbb		

		0000 cccc		
		0000 dddd	Reverb Parameter 9	(12768 – 52768) –20000 – +20000
#	00 25	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 10	(12768 – 52768) –20000 – +20000
#	00 29	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 11	(12768 – 52768) –20000 – +20000
#	00 2D	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 12	(12768 – 52768) –20000 – +20000
#	00 31	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 13	(12768 – 52768) –20000 – +20000
#	00 35	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 14	(12768 – 52768) –20000 – +20000
#	00 39	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 15	(12768 – 52768) –20000 – +20000
#	00 3D	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 16	(12768 – 52768) –20000 – +20000
#	00 41	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 17	(12768 – 52768) –20000 – +20000
#	00 45	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 18	(12768 – 52768) –20000 – +20000
#	00 49	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 19	(12768 – 52768) –20000 – +20000
#	00 4D	0000 aaaa 0000 bbbb 0000 cccc		
		0000 dddd	Reverb Parameter 20	(12768 – 52768) –20000 – +20000
00 00 00 51		Total Size		

❍Part Info Common Comp/EQ

Offset Address		Description	
00 00	0aaa aaaa	Comp Reverb Send Level	(0 – 127)
00 01	0000 00aa	Comp Output Assign	(0 – 2) DRY, MFX1, MFX2
00 02	000a aaaa	Comp Attack time	(0 – 31)
00 03	000a aaaa	Comp Release time	(0 – 23)
00 04	000a aaaa	Comp Output Gain	(0 – 24)
00 05	0aaa aaaa	Comp Threshold	(0 – 127)
00 06	000a aaaa	Comp Ratio	(0 – 19)
00 07	0000 000a	Comp Low Freq	(0 – 1)
00 08	000a aaaa	Comp Low Gain	(0 – 30)
00 09	0000 00aa	Comp High Freq	(0 – 2)
00 0A	000a aaaa	Comp High Gain	(0 – 30)
00 0B	0aaa aaaa	Comp Level	(0 – 127)
00 00 00 0C	Total Size		

❍Part Info Common External Input

Offset Address		Description	
00 00	0000 00aa	External Output Select	(0 – 3) DRY, MFX1, MFX2, COMP
00 01	0aaa aaaa	External Level L	(0 – 127)
00 02	0aaa aaaa	External Level R	(0 – 127)
00 03	0aaa aaaa	External Reverb Send Level	(0 – 127)
00 00 00 04	Total Size		

❍Part Info Part

Offset Address		Description	
00 00	0000 000a	Receive Switch	(0 – 1) OFF, ON
00 01	0aaa aaaa	Patch Bank Select MSB (CC# 0)	(0 – 127)
00 02	0aaa aaaa	Patch Bank Select LSB (CC# 32)	(0 – 127)
00 03	0aaa aaaa	Patch Program Number (PC)	(0 – 127)
00 04	0aaa aaaa	Part Level (CC# 7)	(0 – 127)
00 05	0aaa aaaa	Part Pan (CC# 10)	(0 – 127) L64 – 63R
00 06	0aaa aaaa	Part Coarse Tune (RPN# 2)	(16 – 112) –48 – +48
00 07	0aaa aaaa	Part Fine Tune (RPN# 1)	(14 – 114) –50 – +50
00 08	0aaa aaaa	Part Dry Send Level	(0 – 127)
00 09	0aaa aaaa	Part Reverb Send Level (CC# 91)	(0 – 127)
00 0A	0000 0aaa	Part Output Select	(0 – 6) DRY, MFX1, MFX2, COMP, DIR1, DIR2, RHYTHM
00 0B	0000 000a	Part Auto Sync Switch	(0 – 1) OFF, ON
00 00 00 0C	Total Size		

❍Patch Common

Offset Address		Description	
00 00	0aaa aaaa	Patch Name 1	(32 – 127) 32 – 127 [ASCII]
00 01	0aaa aaaa	Patch Name 2	(32 – 127) 32 – 127 [ASCII]
00 02	0aaa aaaa	Patch Name 3	(32 – 127) 32 – 127 [ASCII]
00 03	0aaa aaaa	Patch Name 4	(32 – 127) 32 – 127 [ASCII]
00 04	0aaa aaaa	Patch Name 5	(32 – 127) 32 – 127 [ASCII]
00 05	0aaa aaaa	Patch Name 6	(32 – 127) 32 – 127 [ASCII]
00 06	0aaa aaaa	Patch Name 7	(32 – 127) 32 – 127 [ASCII]
00 07	0aaa aaaa	Patch Name 8	(32 – 127) 32 – 127 [ASCII]
00 08	0aaa aaaa	Patch Name 9	(32 – 127) 32 – 127 [ASCII]
00 09	0aaa aaaa	Patch Name 10	(32 – 127) 32 – 127 [ASCII]
00 0A	0aaa aaaa	Patch Name 11	(32 – 127) 32 – 127 [ASCII]
00 0B	0aaa aaaa	Patch Name 12	(32 – 127) 32 – 127 [ASCII]
00 0C	0aaa aaaa	Patch Category	(0 – 127)
00 0D	0000 000a	Tone Type<*>	(0 – 1) 4TONES, MULTI–PARTIAL
00 0E	0aaa aaaa	Patch Level	(0 – 127)
00 0F	0aaa aaaa	Patch Pan	(0 – 127) L64 – 63R
00 10	0000 000a	Patch Priority	(0 – 1) LAST, LOUDEST
00 11	0aaa aaaa	Patch Coarse Tune	(16 – 112) –48 – +48
00 12	0aaa aaaa	Patch Fine Tune	(14 – 114) –50 – +50
00 13	0000 0aaa	Octave Shift	(61 – 67) –3 – +3
00 14	0000 00aa	Stretch Tune Depth	(0 – 3) OFF, 1 – 3
00 15	0aaa aaaa	Analog Feel	(0 – 127)
00 16	0000 000a	Mono/Poly	(0 – 1) MONO, POLY
00 17	0000 000a	Legato Switch	(0 – 1) OFF, ON
00 18	0000 000a	Legato Retrigger	(0 – 1) OFF, ON
00 19	0000 000a	Portamento Switch	(0 – 1) OFF, ON
00 1A	0000 000a	Portamento Mode	(0 – 1) NORMAL, LEGATO
00 1B	0000 000a	Portamento Type	(0 – 1) RATE, TIME
00 1C	0000 000a	Portamento Start	(0 – 1) PITCH, NOTE
00 1D	0aaa aaaa	Portamento Time	(0 – 127)
00 1E	0000 000a	(reserve)	
# 00 1F	0000 aaaa 0000 bbbb	(reserve)	
00 21	0000 000a	(reserve)	
00 22	0aaa aaaa	Cutoff Offset	(1 – 127) –63 – +63
00 23	0aaa aaaa	Resonance Offset	(1 – 127) –63 – +63
00 24	0aaa aaaa	Attack Time Offset	(1 – 127) –63 – +63
00 25	0aaa aaaa	Release Time Offset	(1 – 127) –63 – +63
00 26	0aaa aaaa	Velocity Sens Offset	(1 – 127) –63 – +63
00 27	0000 aaaa	(reserve)	
00 28	0000 000a	TMT Control Switch	(0 – 1) OFF, ON
00 29	00aa aaaa	Pitch Bend Range Up	(0 – 48)
00 2A	00aa aaaa	Pitch Bend Range Down	(0 – 48)
00 2B	0aaa aaaa	Matrix Control 1 Source	(0 – 109) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT–ENV, TVF–ENV, TVA–ENV
00 2C	00aa aaaa	Matrix Control 1 Destination 1	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ––––, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 2D	0aaa aaaa	Matrix Control 1 Sens 1	(1 – 127) –63 – +63
00 2E	00aa aaaa	Matrix Control 1 Destination 2	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ––––, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 2F	0aaa aaaa	Matrix Control 1 Sens 2	(1 – 127) –63 – +63
00 30	00aa aaaa	Matrix Control 1 Destination 3	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ––––, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 31	0aaa aaaa	Matrix Control 1 Sens 3	(1 – 127) –63 – +63
00 32	00aa aaaa	Matrix Control 1 Destination 4	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ––––, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM

00 33	0aaa aaaa	Matrix Control 1 Sens 4	(1 – 127) –63 – +63
00 34	0aaa aaaa	Matrix Control 2 Source	(0 – 109) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT–ENV, TVF–ENV, TVA–ENV
00 35	00aa aaaa	Matrix Control 2 Destination 1	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 36	0aaa aaaa	Matrix Control 2 Sens 1	(1 – 127) –63 – +63
00 37	00aa aaaa	Matrix Control 2 Destination 2	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 38	0aaa aaaa	Matrix Control 2 Sens 2	(1 – 127) –63 – +63
00 39	00aa aaaa	Matrix Control 2 Destination 3	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 3A	0aaa aaaa	Matrix Control 2 Sens 3	(1 – 127) –63 – +63
00 3B	00aa aaaa	Matrix Control 2 Destination 4	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 3C	0aaa aaaa	Matrix Control 2 Sens 4	(1 – 127) –63 – +63
00 3D	0aaa aaaa	Matrix Control 3 Source	(0 – 109) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT–ENV, TVF–ENV, TVA–ENV
00 3E	00aa aaaa	Matrix Control 3 Destination 1	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 3F	0aaa aaaa	Matrix Control 3 Sens 1	(1 – 127) –63 – +63
00 40	00aa aaaa	Matrix Control 3 Destination 2	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 41	0aaa aaaa	Matrix Control 3 Sens 2	(1 – 127) –63 – +63
00 42	00aa aaaa	Matrix Control 3 Destination 3	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 43	0aaa aaaa	Matrix Control 3 Sens 3	(1 – 127) –63 – +63
00 44	00aa aaaa	Matrix Control 3 Destination 4	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 45	0aaa aaaa	Matrix Control 3 Sens 4	(1 – 127) –63 – +63
00 46	0aaa aaaa	Matrix Control 4 Source	(0 – 109) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT–ENV, TVF–ENV, TVA–ENV
00 47	00aa aaaa	Matrix Control 4 Destination 1	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 48	0aaa aaaa	Matrix Control 4 Sens 1	(1 – 127) –63 – +63
00 49	00aa aaaa	Matrix Control 4 Destination 2	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 4A	0aaa aaaa	Matrix Control 4 Sens 2	(1 – 127) –63 – +63
00 4B	00aa aaaa	Matrix Control 4 Destination 3	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 4C	0aaa aaaa	Matrix Control 4 Sens 3	(1 – 127) –63 – +63
00 4D	00aa aaaa	Matrix Control 4 Destination 4	(0 – 29) OFF, PCH, CUT, RES, LEV, PAN, DRY, ———, REV, PIT–LFO1, PIT–LFO2, TVF–LFO1, TVF–LFO2, TVA–LFO1, TVA–LFO2, PAN–LFO1, PAN–LFO2, LFO1–RATE, LFO2–RATE, PIT–ATK, PIT–DCY, PIT–REL, TVF–ATK, TVF–DCY, TVF–REL, TVA–ATK, TVA–DCY, TVA–REL, TMT, FXM
00 4E	0aaa aaaa	Matrix Control 4 Sens 4	(1 – 127) –63 – +63
00 4F	0000 000a	Unison Switch	(0 – 1) OFF, ON
00 50	0aaa aaaa	Unison Fat Level	(0 – 127)
00 00 00 51	Total Size		

❍Patch TMT (Tone Mix Table)

Offset Address		Description	
00 00	0000 aaaa	Structure Type 1 & 2	(0 – 9) 1 – 10
00 01	0000 00aa	Booster 1 & 2	(0 – 3) 0, +6, +12, +18 [dB]
00 02	0000 aaaa	Structure Type 3 & 4	(0 – 9) 1 – 10
00 03	0000 00aa	Booster 3 & 4	(0 – 3) 0, +6, +12, +18 [dB]
00 04	0000 00aa	TMT Velocity Control	(0 – 2) OFF, ON, RANDOM
00 05	0000 000a	TMT1 Tone Switch	(0 – 1) OFF, ON
00 06	0aaa aaaa	TMT1 Keyboard Range Lower	(0 – 127) C–1 – UPPER
00 07	0aaa aaaa	TMT1 Keyboard Range Upper	(0 – 127) LOWER – G9
00 08	0aaa aaaa	TMT1 Keyboard Fade Width Lower	(0 – 127)
00 09	0aaa aaaa	TMT1 Keyboard Fade Width Upper	(0 – 127)
00 0A	0aaa aaaa	TMT1 Velocity Range Lower	(1 – 127) 1 – UPPER
00 0B	0aaa aaaa	TMT1 Velocity Range Upper	(1 – 127) LOWER – 127
00 0C	0aaa aaaa	TMT1 Velocity Fade Width Lower	(0 – 127)
00 0D	0aaa aaaa	TMT1 Velocity Fade Width Upper	(0 – 127)
00 0E	0000 000a	TMT2 Tone Switch	(0 – 1) OFF, ON
00 0F	0aaa aaaa	TMT2 Keyboard Range Lower	(0 – 127) C–1 – UPPER
00 10	0aaa aaaa	TMT2 Keyboard Range Upper	(0 – 127) LOWER – G9
00 11	0aaa aaaa	TMT2 Keyboard Fade Width Lower	(0 – 127)
00 12	0aaa aaaa	TMT2 Keyboard Fade Width Upper	(0 – 127)
00 13	0aaa aaaa	TMT2 Velocity Range Lower	(1 – 127) 1 – UPPER
00 14	0aaa aaaa	TMT2 Velocity Range Upper	(1 – 127) LOWER – 127
00 15	0aaa aaaa	TMT2 Velocity Fade Width Lower	(0 – 127)
00 16	0aaa aaaa	TMT2 Velocity Fade Width Upper	(0 – 127)
00 17	0000 000a	TMT3 Tone Switch	(0 – 1) OFF, ON
00 18	0aaa aaaa	TMT3 Keyboard Range Lower	(0 – 127) C–1 – UPPER
00 19	0aaa aaaa	TMT3 Keyboard Range Upper	(0 – 127) LOWER – G9
00 1A	0aaa aaaa	TMT3 Keyboard Fade Width Lower	(0 – 127)
00 1B	0aaa aaaa	TMT3 Keyboard Fade Width Upper	(0 – 127)
00 1C	0aaa aaaa	TMT3 Velocity Range Lower	(1 – 127) 1 – UPPER
00 1D	0aaa aaaa	TMT3 Velocity Range Upper	(1 – 127) LOWER – 127
00 1E	0aaa aaaa	TMT3 Velocity Fade Width Lower	(0 – 127)
00 1F	0aaa aaaa	TMT3 Velocity Fade Width Upper	(0 – 127)
00 20	0000 000a	TMT4 Tone Switch	(0 – 1) OFF, ON
00 21	0aaa aaaa	TMT4 Keyboard Range Lower	(0 – 127) C–1 – UPPER
00 22	0aaa aaaa	TMT4 Keyboard Range Upper	(0 – 127) LOWER – G9
00 23	0aaa aaaa	TMT4 Keyboard Fade Width Lower	(0 – 127)
00 24	0aaa aaaa	TMT4 Keyboard Fade Width Upper	(0 – 127)
00 25	0aaa aaaa	TMT4 Velocity Range Lower	(1 – 127) 1 – UPPER
00 26	0aaa aaaa	TMT4 Velocity Range Upper	(1 – 127) LOWER – 127
00 27	0aaa aaaa	TMT4 Velocity Fade Width Lower	(0 – 127)
00 28	0aaa aaaa	TMT4 Velocity Fade Width Upper	(0 – 127)
00 00 00 29	Total Size		

❍Patch Tone

Offset Address		Description	
00 00	0aaa aaaa	Tone Level	(0 – 127)
00 01	0aaa aaaa	Tone Coarse Tune	(16 – 112) –48 – +48
00 02	0aaa aaaa	Tone Fine Tune	(14 – 114) –50 – +50
00 03	000a aaaa	Tone Random Pitch Depth	(0 – 30) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200
00 04	0aaa aaaa	Tone Pan	(0 – 127) L64 – 63R
00 05	000a aaaa	Tone Pan Keyfollow	(54 – 74) –100 – +100
00 06	00aa aaaa	Tone Random Pan Depth	(0 – 63)

	00 07	0aaa aaaa	Tone Alternate Pan Depth	(1 – 127) L63 – 63R
	00 08	0000 000a	Tone Env Mode	(0 – 1) NO–SUS, SUSTAIN
	00 09	0000 00aa	Tone Delay Mode	(0 – 3) NORMAL, HOLD, KEY–OFF–NORMAL, KEY–OFF–DECAY
#	00 0A	0000 aaaa 0000 bbbb	Tone Delay Time	(0 – 149) 0 – 127, MUSICAL–NOTES
	00 0C	0aaa aaaa	Tone Dry Send Level	(0 – 127)
	00 0D	0aaa aaaa	(reserve)	
	00 0E	0aaa aaaa	Tone Reverb Send Level (MFX)	(0 – 127)
	00 0F	0aaa aaaa	(reserve)	
	00 10	0aaa aaaa	Tone Reverb Send Level (non MFX)	(0 – 127)
	00 11	0000 aaaa	(reserve)	
	00 12	0000 000a	Tone Receive Bender	(0 – 1) OFF, ON
	00 13	0000 000a	Tone Receive Expression	(0 – 1) OFF, ON
	00 14	0000 000a	Tone Receive Hold–1	(0 – 1) OFF, ON
	00 15	0000 000a	Tone Receive Pan Mode	(0 – 1) CONTINUOUS, KEY–ON
	00 16	0000 000a	Tone Redamper Switch	(0 – 1) OFF, ON
	00 17	0000 00aa	Tone Control 1 Switch 1	(0 – 2) OFF, ON, REVERSE
	00 18	0000 00aa	Tone Control 1 Switch 2	(0 – 2) OFF, ON, REVERSE
	00 19	0000 00aa	Tone Control 1 Switch 3	(0 – 2) OFF, ON, REVERSE
	00 1A	0000 00aa	Tone Control 1 Switch 4	(0 – 2) OFF, ON, REVERSE
	00 1B	0000 00aa	Tone Control 2 Switch 1	(0 – 2) OFF, ON, REVERSE
	00 1C	0000 00aa	Tone Control 2 Switch 2	(0 – 2) OFF, ON, REVERSE
	00 1D	0000 00aa	Tone Control 2 Switch 3	(0 – 2) OFF, ON, REVERSE
	00 1E	0000 00aa	Tone Control 2 Switch 4	(0 – 2) OFF, ON, REVERSE
	00 1F	0000 00aa	Tone Control 3 Switch 1	(0 – 2) OFF, ON, REVERSE
	00 20	0000 00aa	Tone Control 3 Switch 2	(0 – 2) OFF, ON, REVERSE
	00 21	0000 00aa	Tone Control 3 Switch 3	(0 – 2) OFF, ON, REVERSE
	00 22	0000 00aa	Tone Control 3 Switch 4	(0 – 2) OFF, ON, REVERSE
	00 23	0000 00aa	Tone Control 4 Switch 1	(0 – 2) OFF, ON, REVERSE
	00 24	0000 00aa	Tone Control 4 Switch 2	(0 – 2) OFF, ON, REVERSE
	00 25	0000 00aa	Tone Control 4 Switch 3	(0 – 2) OFF, ON, REVERSE
	00 26	0000 00aa	Tone Control 4 Switch 4	(0 – 2) OFF, ON, REVERSE
	00 27	0000 00aa	Wave Group Type	(0 – 3) INT, ——, SRX, SAMPLE
#	00 28	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Wave Group ID	(0 – 16384) OFF, 1 – 16384
#	00 2C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Wave Number L (Mono)	(0 – 16384) OFF, 1 – 16384
#	00 30	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Wave Number R	(0 – 16384) OFF, 1 – 16384
	00 34	0000 00aa	Wave Gain	(0 – 3) –6, 0, +6, +12 [dB]
	00 35	0000 000a	Wave FXM Switch	(0 – 1) OFF, ON
	00 36	0000 00aa	Wave FXM Color	(0 – 3) 1 – 4
	00 37	000a aaaa	Wave FXM Depth	(0 – 16)
	00 38	0000 000a	Wave Tempo Sync	(0 – 1) OFF, ON
	00 39	00aa aaaa	Wave Pitch Keyfollow	(44 – 84) –200 – +200
	00 3A	000a aaaa	Pitch Env Depth	(52 – 76) –12 – +12
	00 3B	0aaa aaaa	Pitch Env Velocity Sens	(1 – 127) –63 – +63
	00 3C	0aaa aaaa	Pitch Env Time 1 Velocity Sens	(1 – 127) –63 – +63
	00 3D	0aaa aaaa	Pitch Env Time 4 Velocity Sens	(1 – 127) –63 – +63
	00 3E	000a aaaa	Pitch Env Time Keyfollow	(54 – 74) –100 – +100
	00 3F	0aaa aaaa	Pitch Env Time 1	(0 – 127)
	00 40	0aaa aaaa	Pitch Env Time 2	(0 – 127)
	00 41	0aaa aaaa	Pitch Env Time 3	(0 – 127)
	00 42	0aaa aaaa	Pitch Env Time 4	(0 – 127)
	00 43	0aaa aaaa	Pitch Env Level 0	(1 – 127) –63 – +63
	00 44	0aaa aaaa	Pitch Env Level 1	(1 – 127) –63 – +63
	00 45	0aaa aaaa	Pitch Env Level 2	(1 – 127) –63 – +63
	00 46	0aaa aaaa	Pitch Env Level 3	(1 – 127) –63 – +63
	00 47	0aaa aaaa	Pitch Env Level 4	(1 – 127) –63 – +63
	00 48	0000 0aaa	TVF Filter Type	(0 – 6) OFF, LPF, BPF, HPF, PKG, LPF2, LPF3
	00 49	0aaa aaaa	TVF Cutoff Frequency	(0 – 127)
	00 4A	00aa aaaa	TVF Cutoff Keyfollow	(44 – 84) –200 – +200
	00 4B	0000 0aaa	TVF Cutoff Velocity Curve	(0 – 7) FIXED, 1 – 7
	00 4C	0aaa aaaa	TVF Cutoff Velocity Sens	(1 – 127) –63 – +63
	00 4D	0aaa aaaa	TVF Resonance	(0 – 127)
	00 4E	0aaa aaaa	TVF Resonance Velocity Sens	(1 – 127) –63 – +63
	00 4F	0aaa aaaa	TVF Env Depth	(1 – 127) –63 – +63
	00 50	0000 0aaa	TVF Env Velocity Curve	(0 – 7) FIXED, 1 – 7
	00 51	0aaa aaaa	TVF Env Velocity Sens	(1 – 127) –63 – +63
	00 52	0aaa aaaa	TVF Env Time 1 Velocity Sens	(1 – 127) –63 – +63
	00 53	0aaa aaaa	TVF Env Time 4 Velocity Sens	(1 – 127) –63 – +63
	00 54	000a aaaa	TVF Env Time Keyfollow	(54 – 74) –100 – +100
	00 55	0aaa aaaa	TVF Env Time 1	(0 – 127)
	00 56	0aaa aaaa	TVF Env Time 2	(0 – 127)
	00 57	0aaa aaaa	TVF Env Time 3	(0 – 127)
	00 58	0aaa aaaa	TVF Env Time 4	(0 – 127)
	00 59	0aaa aaaa	TVF Env Level 0	(0 – 127)
	00 5A	0aaa aaaa	TVF Env Level 1	(0 – 127)
	00 5B	0aaa aaaa	TVF Env Level 2	(0 – 127)
	00 5C	0aaa aaaa	TVF Env Level 3	(0 – 127)
	00 5D	0aaa aaaa	TVF Env Level 4	(0 – 127)
	00 5E	000a aaaa	Bias Level	(54 – 74) –100 – +100
	00 5F	0aaa aaaa	Bias Position	(0 – 127) C–1 – G9
	00 60	0000 00aa	Bias Direction	(0 – 3) LOWER, UPPER, LOWER&UPPER, ALL
	00 61	0000 0aaa	TVA Level Velocity Curve	(0 – 7) FIXED, 1 – 7
	00 62	0aaa aaaa	TVA Level Velocity Sens	(1 – 127) –63 – +63
	00 63	0aaa aaaa	TVA Env Time 1 Velocity Sens	(1 – 127) –63 – +63
	00 64	0aaa aaaa	TVA Env Time 4 Velocity Sens	(1 – 127) –63 – +63
	00 65	000a aaaa	TVA Env Time Keyfollow	(54 – 74) –100 – +100
	00 66	0aaa aaaa	TVA Env Time 1	(0 – 127)
	00 67	0aaa aaaa	TVA Env Time 2	(0 – 127)
	00 68	0aaa aaaa	TVA Env Time 3	(0 – 127)
	00 69	0aaa aaaa	TVA Env Time 4	(0 – 127)
	00 6A	0aaa aaaa	TVA Env Level 1	(0 – 127)
	00 6B	0aaa aaaa	TVA Env Level 2	(0 – 127)
	00 6C	0aaa aaaa	TVA Env Level 3	(0 – 127)
	00 6D	0000 aaaa	(reserve)	
#	00 6E	0000 aaaa 0000 bbbb	LFO1 Rate	(0 – 149) 0 – 127, MUSICAL–NOTES
	00 70	0000 0aaa	LFO1 Offset	(0 – 4) –100, –50, 0, +50, +100
	00 71	0aaa aaaa	LFO1 Rate Detune	(0 – 127)
	00 72	0aaa aaaa	LFO1 Delay Time	(0 – 127)
	00 73	000a aaaa	LFO1 Delay Time Keyfollow	(54 – 74) –100 – +100
	00 74	0000 00aa	LFO1 Fade Mode	(0 – 3) ON–IN, ON–OUT, OFF–IN, OFF–OUT
	00 75	0aaa aaaa	LFO1 Fade Time	(0 – 127)
	00 76	0000 000a	LFO1 Key Trigger	(0 – 1) OFF, ON
	00 77	0aaa aaaa	LFO1 Pitch Depth	(1 – 127) –63 – +63
	00 78	0aaa aaaa	LFO1 TVF Depth	(1 – 127) –63 – +63
	00 79	0aaa aaaa	LFO1 TVA Depth	(1 – 127) –63 – +63
	00 7A	0aaa aaaa	LFO1 Pan Depth	(1 – 127) –63 – +63
	00 7B	0000 aaaa	(reserve)	
#	00 7C	0000 aaaa 0000 bbbb	LFO2 Rate	(0 – 149) 0 – 127, MUSICAL–NOTES
	00 7E	0000 0aaa	LFO2 Offset	(0 – 4) –100, –50, 0, +50, +100
	00 7F	0aaa aaaa	LFO2 Rate Detune	(0 – 127)
	01 00	0aaa aaaa	LFO2 Delay Time	(0 – 127)
	01 01	000a aaaa	LFO2 Delay Time Keyfollow	(54 – 74) –100 – +100
	01 02	0000 00aa	LFO2 Fade Mode	(0 – 3) ON–IN, ON–OUT, OFF–IN, OFF–OUT
	01 03	0aaa aaaa	LFO2 Fade Time	(0 – 127)
	01 04	0000 000a	LFO2 Key Trigger	(0 – 1) OFF, ON
	01 05	0aaa aaaa	LFO2 Pitch Depth	(1 – 127) –63 – +63
	01 06	0aaa aaaa	LFO2 TVF Depth	(1 – 127) –63 – +63
	01 07	0aaa aaaa	LFO2 TVA Depth	(1 – 127) –63 – +63
	01 08	0aaa aaaa	LFO2 Pan Depth	(1 – 127) –63 – +63
	01 09	0aaa aaaa	LFO1 Waveform Morphing	(0 – 127) SIN, TRI, SAW–UP, SAW–DW, SQR, RND, BEND–UP, BEND–DW, TRP, S&H, CHS, XSIN, TWM, STRS, VSIN, 15 – 127
	01 0A	0aaa aaaa	LFO2 Waveform Morphing	(0 – 127) SIN, TRI, SAW–UP, SAW–DW, SQR, RND, BEND–UP, BEND–DW, TRP, S&H, CHS, XSIN, TWM, STRS, VSIN, 15 – 127
	00 00 01 0B	Total Size		

❍Rhythm Common

Offset Address		Description	
00 00	0aaa aaaa	Rhythm Name 1	(32 – 127) 32 – 127 [ASCII]
00 01	0aaa aaaa	Rhythm Name 2	(32 – 127) 32 – 127 [ASCII]
00 02	0aaa aaaa	Rhythm Name 3	(32 – 127) 32 – 127 [ASCII]
00 03	0aaa aaaa	Rhythm Name 4	(32 – 127) 32 – 127 [ASCII]
00 04	0aaa aaaa	Rhythm Name 5	(32 – 127) 32 – 127 [ASCII]
00 05	0aaa aaaa	Rhythm Name 6	(32 – 127) 32 – 127 [ASCII]
00 06	0aaa aaaa	Rhythm Name 7	(32 – 127) 32 – 127 [ASCII]
00 07	0aaa aaaa	Rhythm Name 8	(32 – 127) 32 – 127 [ASCII]
00 08	0aaa aaaa	Rhythm Name 9	(32 – 127) 32 – 127 [ASCII]
00 09	0aaa aaaa	Rhythm Name 10	(32 – 127) 32 – 127 [ASCII]
00 0A	0aaa aaaa	Rhythm Name 11	(32 – 127) 32 – 127 [ASCII]
00 0B	0aaa aaaa	Rhythm Name 12	(32 – 127) 32 – 127 [ASCII]
00 0C	0aaa aaaa	Rhythm Level	(0 – 127)
00 0D	0000 000a	(reserve)	
00 0E	0000 aaaa		
	0000 bbbb	(reserve)	
00 10	0000 000a	(reserve)	

	00 11	0000 aaaa	Rhythm Output Assign (0 – 6) DRY, MFX1, MFX2, COMP, DIR1, DIR2, TONE
00 00 00 12	Total Size		

❍Rhythm Tone

Offset Address		Description	
	00 00	0aaa aaaa	Tone Name 1 (32 – 127) 32 – 127 [ASCII]
	00 01	0aaa aaaa	Tone Name 2 (32 – 127) 32 – 127 [ASCII]
	00 02	0aaa aaaa	Tone Name 3 (32 – 127) 32 – 127 [ASCII]
	00 03	0aaa aaaa	Tone Name 4 (32 – 127) 32 – 127 [ASCII]
	00 04	0aaa aaaa	Tone Name 5 (32 – 127) 32 – 127 [ASCII]
	00 05	0aaa aaaa	Tone Name 6 (32 – 127) 32 – 127 [ASCII]
	00 06	0aaa aaaa	Tone Name 7 (32 – 127) 32 – 127 [ASCII]
	00 07	0aaa aaaa	Tone Name 8 (32 – 127) 32 – 127 [ASCII]
	00 08	0aaa aaaa	Tone Name 9 (32 – 127) 32 – 127 [ASCII]
	00 09	0aaa aaaa	Tone Name 10 (32 – 127) 32 – 127 [ASCII]
	00 0A	0aaa aaaa	Tone Name 11 (32 – 127) 32 – 127 [ASCII]
	00 0B	0aaa aaaa	Tone Name 12 (32 – 127) 32 – 127 [ASCII]
	00 0C	0000 000a	Assign Type (0 – 1) MULTI, SINGLE
	00 0D	000a aaaa	Mute Group (0 – 31) OFF, 1 – 31
	00 0E	0aaa aaaa	Tone Level (0 – 127)
	00 0F	0aaa aaaa	Tone Coarse Tune (0 – 127) C–1 – G9
	00 10	0aaa aaaa	Tone Fine Tune (14 – 114) –50 – +50
	00 11	000a aaaa	Tone Random Pitch Depth (0 – 30) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200
	00 12	0aaa aaaa	Tone Pan (0 – 127) L64 – 63R
	00 13	00aa aaaa	Tone Random Pan Depth (0 – 63)
	00 14	0aaa aaaa	Tone Alternate Pan Depth (1 – 127) L63 – 63R
	00 15	0000 000a	Tone Env Mode (0 – 1) NO–SUS, SUSTAIN
	00 16	0aaa aaaa	Tone Dry Send Level (0 – 127)
	00 17	0aaa aaaa	(reserve)
	00 18	0aaa aaaa	Tone Reverb Send Level (0 – 127)
	00 19	0aaa aaaa	(reserve)
	00 1A	0aaa aaaa	Tone Reverb Send Level (non MFX) (0 – 127)
	00 1B	0000 aaaa	Tone Output Assign (0 – 5) DRY, MFX1, MFX2, COMP, DIR1, DIR2
	00 1C	00aa aaaa	Tone Pitch Bend Range (0 – 48)
	00 1D	0000 000a	Tone Receive Expression (0 – 1) OFF, ON
	00 1E	0000 000a	Tone Receive Hold–1 (0 – 1) OFF, ON
	00 1F	0000 000a	Tone Receive Pan Mode (0 – 1) CONTINUOUS, KEY–ON
	00 20	0000 00aa	WMT Velocity Control (0 – 2) OFF, ON, RANDOM
	00 21	0000 000a	WMT1 Wave Switch (0 – 1) OFF, ON
	00 22	0000 00aa	WMT1 Wave Group Type (0 – 3) INT, ——, SRX, SAMPLE
#	00 23	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT1 Wave Group ID (0 – 16384) OFF, 1 – 16384
#	00 27	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT1 Wave Number L (Mono) (0 – 16384) OFF, 1 – 16384
#	00 2B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT1 Wave Number R (0 – 16384) OFF, 1 – 16384
	00 2F	0000 00aa	WMT1 Wave Gain (0 – 3) –6, 0, +6, +12 [dB]
	00 30	0000 000a	WMT1 Wave FXM Switch (0 – 1) OFF, ON
	00 31	0000 00aa	WMT1 Wave FXM Color (0 – 3) 1 – 4
	00 32	000a aaaa	WMT1 Wave FXM Depth (0 – 16)
	00 33	0000 000a	WMT1 Wave Tempo Sync (0 – 1) OFF, ON
	00 34	0aaa aaaa	WMT1 Wave Coarse Tune (16 – 112) –48 – +48
	00 35	0aaa aaaa	WMT1 Wave Fine Tune (14 – 114) –50 – +50
	00 36	0aaa aaaa	WMT1 Wave Pan (0 – 127) L64 – 63R
	00 37	0000 000a	WMT1 Wave Random Pan Switch (0 – 1) OFF, ON
	00 38	0000 00aa	WMT1 Wave Alternate Pan Switch (0 – 2) OFF, ON, REVERSE
	00 39	0aaa aaaa	WMT1 Wave Level (0 – 127)
	00 3A	0aaa aaaa	WMT1 Velocity Range Lower (1 – 127) 1 – UPPER
	00 3B	0aaa aaaa	WMT1 Velocity Range Upper (1 – 127) LOWER – 127
	00 3C	0aaa aaaa	WMT1 Velocity Fade Width Lower (0 – 127)
	00 3D	0aaa aaaa	WMT1 Velocity Fade Width Upper (0 – 127)
	00 3E	0000 000a	WMT2 Wave Switch (0 – 1) OFF, ON
	00 3F	0000 00aa	WMT2 Wave Group Type (0 – 3) INT, ——, SRX, SAMPLE
#	00 40	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT2 Wave Group ID (0 – 16384) OFF, 1 – 16384
#	00 44	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT2 Wave Number L (Mono) (0 – 16384) OFF, 1 – 16384
#	00 48	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT2 Wave Number R (0 – 16384) OFF, 1 – 16384
	00 4C	0000 00aa	WMT2 Wave Gain (0 – 3) –6, 0, +6, +12 [dB]
	00 4D	0000 000a	WMT2 Wave FXM Switch (0 – 1) OFF, ON
	00 4E	0000 00aa	WMT2 Wave FXM Color (0 – 3) 1 – 4
	00 4F	000a aaaa	WMT2 Wave FXM Depth (0 – 16)
	00 50	0000 000a	WMT2 Wave Tempo Sync (0 – 1) OFF, ON
	00 51	0aaa aaaa	WMT2 Wave Coarse Tune (16 – 112) –48 – +48
	00 52	0aaa aaaa	WMT2 Wave Fine Tune (14 – 114) –50 – +50
	00 53	0aaa aaaa	WMT2 Wave Pan (0 – 127) L64 – 63R
	00 54	0000 000a	WMT2 Wave Random Pan Switch (0 – 1) OFF, ON
	00 55	0000 00aa	WMT2 Wave Alternate Pan Switch (0 – 2) OFF, ON, REVERSE
	00 56	0aaa aaaa	WMT2 Wave Level (0 – 127)
	00 57	0aaa aaaa	WMT2 Velocity Range Lower (1 – 127) 1 – UPPER
	00 58	0aaa aaaa	WMT2 Velocity Range Upper (1 – 127) LOWER – 127
	00 59	0aaa aaaa	WMT2 Velocity Fade Width Lower (0 – 127)
	00 5A	0aaa aaaa	WMT2 Velocity Fade Width Upper (0 – 127)
	00 5B	0000 000a	WMT3 Wave Switch (0 – 1) OFF, ON
	00 5C	0000 00aa	WMT3 Wave Group Type (0 – 3) INT, ——, SRX, SAMPLE
#	00 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT3 Wave Group ID (0 – 16384) OFF, 1 – 16384
#	00 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT3 Wave Number L (Mono) (0 – 16384) OFF, 1 – 16384
#	00 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT3 Wave Number R (0 – 16384) OFF, 1 – 16384
	00 69	0000 00aa	WMT3 Wave Gain (0 – 3) –6, 0, +6, +12 [dB]
	00 6A	0000 000a	WMT3 Wave FXM Switch (0 – 1) OFF, ON
	00 6B	0000 00aa	WMT3 Wave FXM Color (0 – 3) 1 – 4
	00 6C	000a aaaa	WMT3 Wave FXM Depth (0 – 16)
	00 6D	0000 000a	WMT3 Wave Tempo Sync (0 – 1) OFF, ON
	00 6E	0aaa aaaa	WMT3 Wave Coarse Tune (16 – 112) –48 – +48
	00 6F	0aaa aaaa	WMT3 Wave Fine Tune (14 – 114) –50 – +50
	00 70	0aaa aaaa	WMT3 Wave Pan (0 – 127) L64 – 63R
	00 71	0000 000a	WMT3 Wave Random Pan Switch (0 – 1) OFF, ON
	00 72	0000 00aa	WMT3 Wave Alternate Pan Switch (0 – 2) OFF, ON, REVERSE
	00 73	0aaa aaaa	WMT3 Wave Level (0 – 127)
	00 74	0aaa aaaa	WMT3 Velocity Range Lower (1 – 127) 1 – UPPER
	00 75	0aaa aaaa	WMT3 Velocity Range Upper (1 – 127) LOWER – 127
	00 76	0aaa aaaa	WMT3 Velocity Fade Width Lower (0 – 127)
	00 77	0aaa aaaa	WMT3 Velocity Fade Width Upper (0 – 127)
	00 78	0000 000a	WMT4 Wave Switch (0 – 1) OFF, ON
	00 79	0000 00aa	WMT4 Wave Group Type (0 – 3) INT, ——, SRX, SAMPLE
#	00 7A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT4 Wave Group ID (0 – 16384) OFF, 1 – 16384
#	00 7E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT4 Wave Number L (Mono) (0 – 16384) OFF, 1 – 16384
#	01 02	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT4 Wave Number R (0 – 16384) OFF, 1 – 16384
	01 06	0000 00aa	WMT4 Wave Gain (0 – 3) –6, 0, +6, +12 [dB]
	01 07	0000 000a	WMT4 Wave FXM Switch (0 – 1) OFF, ON
	01 08	0000 00aa	WMT4 Wave FXM Color (0 – 3) 1 – 4
	01 09	000a aaaa	WMT4 Wave FXM Depth (0 – 16)
	01 0A	0000 000a	WMT4 Wave Tempo Sync (0 – 1) OFF, ON
	01 0B	0aaa aaaa	WMT4 Wave Coarse Tune (16 – 112) –48 – +48
	01 0C	0aaa aaaa	WMT4 Wave Fine Tune (14 – 114) –50 – +50
	01 0D	0aaa aaaa	WMT4 Wave Pan (0 – 127) L64 – 63R
	01 0E	0000 000a	WMT4 Wave Random Pan Switch (0 – 1) OFF, ON
	01 0F	0000 00aa	WMT4 Wave Alternate Pan Switch (0 – 2) OFF, ON, REVERSE
	01 10	0aaa aaaa	WMT4 Wave Level (0 – 127)
	01 11	0aaa aaaa	WMT4 Velocity Range Lower (1 – 127) 1 – UPPER
	01 12	0aaa aaaa	WMT4 Velocity Range Upper (1 – 127) LOWER – 127
	01 13	0aaa aaaa	WMT4 Velocity Fade Width Lower (0 – 127)
	01 14	0aaa aaaa	WMT4 Velocity Fade Width Upper (0 – 127)
	01 15	000a aaaa	Pitch Env Depth (52 – 76) –12 – +12
	01 16	0aaa aaaa	Pitch Env Velocity Sens (1 – 127) –63 – +63
	01 17	0aaa aaaa	Pitch Env Time 1 Velocity Sens (1 – 127) –63 – +63
	01 18	0aaa aaaa	Pitch Env Time 4 Velocity Sens (1 – 127) –63 – +63
	01 19	0aaa aaaa	Pitch Env Time 1 (0 – 127)
	01 1A	0aaa aaaa	Pitch Env Time 2 (0 – 127)
	01 1B	0aaa aaaa	Pitch Env Time 3 (0 – 127)
	01 1C	0aaa aaaa	Pitch Env Time 4 (0 – 127)
	01 1D	0aaa aaaa	Pitch Env Level 0 (1 – 127) –63 – +63

01 1E	0aaa aaaa	Pitch Env Level 1	(1 – 127) –63 – +63
01 1F	0aaa aaaa	Pitch Env Level 2	(1 – 127) –63 – +63
01 20	0aaa aaaa	Pitch Env Level 3	(1 – 127) –63 – +63
01 21	0aaa aaaa	Pitch Env Level 4	(1 – 127) –63 – +63
01 22	0000 0aaa	TVF Filter Type	(0 – 6) OFF, LPF, BPF, HPF, PKG, LPF2, LPF3
01 23	0aaa aaaa	TVF Cutoff Frequency	(0 – 127)
01 24	0000 0aaa	TVF Cutoff Velocity Curve	(0 – 7) FIXED, 1 – 7
01 25	0aaa aaaa	TVF Cutoff Velocity Sens	(1 – 127) –63 – +63
01 26	0aaa aaaa	TVF Resonance	(0 – 127)
01 27	0aaa aaaa	TVF Resonance Velocity Sens	(1 – 127) –63 – +63
01 28	0aaa aaaa	TVF Env Depth	(1 – 127) –63 – +63
01 29	0000 0aaa	TVF Env Velocity Curve Type	(0 – 7) FIXED, 1 – 7
01 2A	0aaa aaaa	TVF Env Velocity Sens	(1 – 127) –63 – +63
01 2B	0aaa aaaa	TVF Env Time 1 Velocity Sens	(1 – 127) –63 – +63
01 2C	0aaa aaaa	TVF Env Time 4 Velocity Sens	(1 – 127) –63 – +63
01 2D	0aaa aaaa	TVF Env Time 1	(0 – 127)
01 2E	0aaa aaaa	TVF Env Time 2	(0 – 127)
01 2F	0aaa aaaa	TVF Env Time 3	(0 – 127)
01 30	0aaa aaaa	TVF Env Time 4	(0 – 127)
01 31	0aaa aaaa	TVF Env Level 0	(0 – 127)
01 32	0aaa aaaa	TVF Env Level 1	(0 – 127)
01 33	0aaa aaaa	TVF Env Level 2	(0 – 127)
01 34	0aaa aaaa	TVF Env Level 3	(0 – 127)
01 35	0aaa aaaa	TVF Env Level 4	(0 – 127)
01 36	0000 0aaa	TVA Level Velocity Curve	(0 – 7) FIXED, 1 – 7
01 37	0aaa aaaa	TVA Level Velocity Sens	(1 – 127) –63 – +63
01 38	0aaa aaaa	TVA Env Time 1 Velocity Sens	(1 – 127) –63 – +63
01 39	0aaa aaaa	TVA Env Time 4 Velocity Sens	(1 – 127) –63 – +63
01 3A	0aaa aaaa	TVA Env Time 1	(0 – 127)
01 3B	0aaa aaaa	TVA Env Time 2	(0 – 127)
01 3C	0aaa aaaa	TVA Env Time 3	(0 – 127)
01 3D	0aaa aaaa	TVA Env Time 4	(0 – 127)
01 3E	0aaa aaaa	TVA Env Level 1	(0 – 127)
01 3F	0aaa aaaa	TVA Env Level 2	(0 – 127)
01 40	0aaa aaaa	TVA Env Level 3	(0 – 127)
00 00 01 41	Total Size		

❍Arpeggio Common

Offset Address		Description	
# 00 00	0000 aaaa 0000 bbbb	End Step	(1 – 32)
00 00 00 02	Total Size		

❍Arpeggio Pattern

Offset Address		Description	
# 00 00	0000 aaaa 0000 bbbb	Original Note	(0 – 128)
# 00 02	0000 aaaa 0000 bbbb	Step1 Data	(0 – 128)
# 00 04	0000 aaaa 0000 bbbb	Step2 Data	(0 – 128)
# 00 06	0000 aaaa 0000 bbbb	Step3 Data	(0 – 128)
# 00 08	0000 aaaa 0000 bbbb	Step4 Data	(0 – 128)
# 00 0A	0000 aaaa 0000 bbbb	Step5 Data	(0 – 128)
# 00 0C	0000 aaaa 0000 bbbb	Step6 Data	(0 – 128)
# 00 0E	0000 aaaa 0000 bbbb	Step7 Data	(0 – 128)
# 00 10	0000 aaaa 0000 bbbb	Step8 Data	(0 – 128)
# 00 12	0000 aaaa 0000 bbbb	Step9 Data	(0 – 128)
# 00 14	0000 aaaa 0000 bbbb	Step10 Data	(0 – 128)
# 00 16	0000 aaaa 0000 bbbb	Step11 Data	(0 – 128)
# 00 18	0000 aaaa 0000 bbbb	Step12 Data	(0 – 128)
# 00 1A	0000 aaaa 0000 bbbb	Step13 Data	(0 – 128)
# 00 1C	0000 aaaa 0000 bbbb	Step14 Data	(0 – 128)
# 00 1E	0000 aaaa 0000 bbbb	Step15 Data	(0 – 128)
# 00 20	0000 aaaa 0000 bbbb	Step16 Data	(0 – 128)
# 00 22	0000 aaaa 0000 bbbb	Step17 Data	(0 – 128)
# 00 24	0000 aaaa 0000 bbbb	Step18 Data	(0 – 128)
# 00 26	0000 aaaa 0000 bbbb	Step19 Data	(0 – 128)
# 00 28	0000 aaaa 0000 bbbb	Step20 Data	(0 – 128)
# 00 2A	0000 aaaa 0000 bbbb	Step21 Data	(0 – 128)
# 00 2C	0000 aaaa 0000 bbbb	Step22 Data	(0 – 128)
# 00 2E	0000 aaaa 0000 bbbb	Step23 Data	(0 – 128)
# 00 30	0000 aaaa 0000 bbbb	Step24 Data	(0 – 128)
# 00 32	0000 aaaa 0000 bbbb	Step25 Data	(0 – 128)
# 00 34	0000 aaaa 0000 bbbb	Step26 Data	(0 – 128)
# 00 36	0000 aaaa 0000 bbbb	Step27 Data	(0 – 128)
# 00 38	0000 aaaa 0000 bbbb	Step28 Data	(0 – 128)
# 00 3A	0000 aaaa 0000 bbbb	Step29 Data	(0 – 128)
# 00 3C	0000 aaaa 0000 bbbb	Step30 Data	(0 – 128)
# 00 3E	0000 aaaa 0000 bbbb	Step31 Data	(0 – 128)
# 00 40	0000 aaaa 0000 bbbb	Step32 Data	(0 – 128)
00 00 00 42	Total Size		

❍Chord Pattern

Offset Address		Description	
00 00	0000 000a	Chord Note1	(0 – 1) OFF, ON
00 01	0000 000a	Chord Note2	(0 – 1) OFF, ON
00 02	0000 000a	Chord Note3	(0 – 1) OFF, ON
00 03	0000 000a	Chord Note4	(0 – 1) OFF, ON
00 04	0000 000a	Chord Note5	(0 – 1) OFF, ON
00 05	0000 000a	Chord Note6	(0 – 1) OFF, ON
00 06	0000 000a	Chord Note7	(0 – 1) OFF, ON
00 07	0000 000a	Chord Note8	(0 – 1) OFF, ON
00 08	0000 000a	Chord Note9	(0 – 1) OFF, ON
00 09	0000 000a	Chord Note10	(0 – 1) OFF, ON
00 0A	0000 000a	Chord Note11	(0 – 1) OFF, ON
00 0B	0000 000a	Chord Note12	(0 – 1) OFF, ON
00 0C	0000 000a	Chord Note13	(0 – 1) OFF, ON
00 0D	0000 000a	Chord Note14	(0 – 1) OFF, ON
00 0E	0000 000a	Chord Note15	(0 – 1) OFF, ON
00 0F	0000 000a	Chord Note16	(0 – 1) OFF, ON
00 10	0000 000a	Chord Note17	(0 – 1) OFF, ON
00 11	0000 000a	Chord Note18	(0 – 1) OFF, ON
00 12	0000 000a	Chord Note19	(0 – 1) OFF, ON
00 13	0000 000a	Chord Note20	(0 – 1) OFF, ON
00 14	0000 000a	Chord Note21	(0 – 1) OFF, ON
00 15	0000 000a	Chord Note22	(0 – 1) OFF, ON
00 16	0000 000a	Chord Note23	(0 – 1) OFF, ON
00 17	0000 000a	Chord Note24	(0 – 1) OFF, ON
00 18	0000 000a	Chord Note25	(0 – 1) OFF, ON
00 19	0000 000a	Chord Note26	(0 – 1) OFF, ON
00 1A	0000 000a	Chord Note27	(0 – 1) OFF, ON
00 1B	0000 000a	Chord Note28	(0 – 1) OFF, ON
00 1C	0000 000a	Chord Note29	(0 – 1) OFF, ON
00 1D	0000 000a	Chord Note30	(0 – 1) OFF, ON
00 1E	0000 000a	Chord Note31	(0 – 1) OFF, ON
00 1F	0000 000a	Chord Note32	(0 – 1) OFF, ON
00 20	0000 000a	Chord Note33	(0 – 1) OFF, ON
00 21	0000 000a	Chord Note34	(0 – 1) OFF, ON
00 22	0000 000a	Chord Note35	(0 – 1) OFF, ON
00 23	0000 000a	Chord Note36	(0 – 1) OFF, ON
00 24	0000 000a	Chord Note37	(0 – 1) OFF, ON
00 25	0000 000a	Chord Note38	(0 – 1) OFF, ON
00 26	0000 000a	Chord Note39	(0 – 1) OFF, ON
00 27	0000 000a	Chord Note40	(0 – 1) OFF, ON
00 28	0000 000a	Chord Note41	(0 – 1) OFF, ON
00 29	0000 000a	Chord Note42	(0 – 1) OFF, ON
00 2A	0000 000a	Chord Note43	(0 – 1) OFF, ON
00 2B	0000 000a	Chord Note44	(0 – 1) OFF, ON
00 2C	0000 000a	Chord Note45	(0 – 1) OFF, ON
00 2D	0000 000a	Chord Note46	(0 – 1) OFF, ON
00 2E	0000 000a	Chord Note47	(0 – 1) OFF, ON
00 2F	0000 000a	Chord Note48	(0 – 1) OFF, ON
00 30	0000 000a	Chord Note49	(0 – 1) OFF, ON
00 31	0000 000a	Chord Note50	(0 – 1) OFF, ON
00 32	0000 000a	Chord Note51	(0 – 1) OFF, ON
00 33	0000 000a	Chord Note52	(0 – 1) OFF, ON
00 34	0000 000a	Chord Note53	(0 – 1) OFF, ON
00 35	0000 000a	Chord Note54	(0 – 1) OFF, ON
00 36	0000 000a	Chord Note55	(0 – 1) OFF, ON
00 37	0000 000a	Chord Note56	(0 – 1) OFF, ON
00 38	0000 000a	Chord Note57	(0 – 1) OFF, ON
00 39	0000 000a	Chord Note58	(0 – 1) OFF, ON
00 3A	0000 000a	Chord Note59	(0 – 1) OFF, ON
00 3B	0000 000a	Chord Note60	(0 – 1) OFF, ON
00 3C	0000 000a	Chord Note61	(0 – 1) OFF, ON

00 3D	0000 000a	Chord Note62	(0 – 1) OFF, ON
00 3E	0000 000a	Chord Note63	(0 – 1) OFF, ON
00 3F	0000 000a	Chord Note64	(0 – 1) OFF, ON
00 40	0000 000a	Chord Note65	(0 – 1) OFF, ON
00 41	0000 000a	Chord Note66	(0 – 1) OFF, ON
00 42	0000 000a	Chord Note67	(0 – 1) OFF, ON
00 43	0000 000a	Chord Note68	(0 – 1) OFF, ON
00 44	0000 000a	Chord Note69	(0 – 1) OFF, ON
00 45	0000 000a	Chord Note70	(0 – 1) OFF, ON
00 46	0000 000a	Chord Note71	(0 – 1) OFF, ON
00 47	0000 000a	Chord Note72	(0 – 1) OFF, ON
00 48	0000 000a	Chord Note73	(0 – 1) OFF, ON
00 49	0000 000a	Chord Note74	(0 – 1) OFF, ON
00 4A	0000 000a	Chord Note75	(0 – 1) OFF, ON
00 4B	0000 000a	Chord Note76	(0 – 1) OFF, ON
00 4C	0000 000a	Chord Note77	(0 – 1) OFF, ON
00 4D	0000 000a	Chord Note78	(0 – 1) OFF, ON
00 4E	0000 000a	Chord Note79	(0 – 1) OFF, ON
00 4F	0000 000a	Chord Note80	(0 – 1) OFF, ON
00 50	0000 000a	Chord Note81	(0 – 1) OFF, ON
00 51	0000 000a	Chord Note82	(0 – 1) OFF, ON
00 52	0000 000a	Chord Note83	(0 – 1) OFF, ON
00 53	0000 000a	Chord Note84	(0 – 1) OFF, ON
00 54	0000 000a	Chord Note85	(0 – 1) OFF, ON
00 55	0000 000a	Chord Note86	(0 – 1) OFF, ON
00 56	0000 000a	Chord Note87	(0 – 1) OFF, ON
00 57	0000 000a	Chord Note88	(0 – 1) OFF, ON
00 58	0000 000a	Chord Note89	(0 – 1) OFF, ON
00 59	0000 000a	Chord Note90	(0 – 1) OFF, ON
00 5A	0000 000a	Chord Note91	(0 – 1) OFF, ON
00 5B	0000 000a	Chord Note92	(0 – 1) OFF, ON
00 5C	0000 000a	Chord Note93	(0 – 1) OFF, ON
00 5D	0000 000a	Chord Note94	(0 – 1) OFF, ON
00 5E	0000 000a	Chord Note95	(0 – 1) OFF, ON
00 5F	0000 000a	Chord Note96	(0 – 1) OFF, ON
00 60	0000 000a	Chord Note97	(0 – 1) OFF, ON
00 61	0000 000a	Chord Note98	(0 – 1) OFF, ON
00 62	0000 000a	Chord Note99	(0 – 1) OFF, ON
00 63	0000 000a	Chord Note100	(0 – 1) OFF, ON
00 64	0000 000a	Chord Note101	(0 – 1) OFF, ON
00 65	0000 000a	Chord Note102	(0 – 1) OFF, ON
00 66	0000 000a	Chord Note103	(0 – 1) OFF, ON
00 67	0000 000a	Chord Note104	(0 – 1) OFF, ON
00 68	0000 000a	Chord Note105	(0 – 1) OFF, ON
00 69	0000 000a	Chord Note106	(0 – 1) OFF, ON
00 6A	0000 000a	Chord Note107	(0 – 1) OFF, ON
00 6B	0000 000a	Chord Note108	(0 – 1) OFF, ON
00 6C	0000 000a	Chord Note109	(0 – 1) OFF, ON
00 6D	0000 000a	Chord Note110	(0 – 1) OFF, ON
00 6E	0000 000a	Chord Note111	(0 – 1) OFF, ON
00 6F	0000 000a	Chord Note112	(0 – 1) OFF, ON
00 70	0000 000a	Chord Note113	(0 – 1) OFF, ON
00 71	0000 000a	Chord Note114	(0 – 1) OFF, ON
00 72	0000 000a	Chord Note115	(0 – 1) OFF, ON
00 73	0000 000a	Chord Note116	(0 – 1) OFF, ON
00 74	0000 000a	Chord Note117	(0 – 1) OFF, ON
00 75	0000 000a	Chord Note118	(0 – 1) OFF, ON
00 76	0000 000a	Chord Note119	(0 – 1) OFF, ON
00 77	0000 000a	Chord Note120	(0 – 1) OFF, ON
00 78	0000 000a	Chord Note121	(0 – 1) OFF, ON
00 79	0000 000a	Chord Note122	(0 – 1) OFF, ON
00 7A	0000 000a	Chord Note123	(0 – 1) OFF, ON
00 7B	0000 000a	Chord Note124	(0 – 1) OFF, ON
00 7C	0000 000a	Chord Note125	(0 – 1) OFF, ON
00 7D	0000 000a	Chord Note126	(0 – 1) OFF, ON
00 7E	0000 000a	Chord Note127	(0 – 1) OFF, ON
00 7F	0000 000a	Chord Note128	(0 – 1) OFF, ON
00 00 01 00	Total Size		

■2. MC-909 Quick SysEx (Model ID = 5DH)

F0H 41H dev 5DH 12H aaH bbH ccH ddH sum F7H

F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev:10H-1FH)
5DH	Model ID (MC-909Quick)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address LSB: lower byte of the starting address of the data to be sent
ccH	Data 0
ddH	Data 1
sum	Checksum
F7H	EOX (End Of Exclusive)

❍Quick SysEx Patch/Rhythm

Start address	Description
00 00	Quick SysEx Patch
20 00	Quick SysEx Rhythm
40 00	Quick SysEx Sequencer

❍Quick SysEx Patch/Rhythm Part

Offset address	Description
00 00	Quick SysEx Patch/Rhythm Part 1
01 00	Quick SysEx Patch/Rhythm Part 2
:	
0E 00	Quick SysEx Patch/Rhythm Part 15
0F 00	Quick SysEx Patch/Rhythm Part 16

❍Quick SysEx Sequencer Part

00 00	Quick SysEx Sequencer Part 1
01 00	Quick SysEx Sequencer Part 2
:	
0E 00	Quick SysEx Sequencer Part 15
0F 00	Quick SysEx Sequencer Part 16

❍Quick SysEx Patch

Offset address	Size Data0	Data1 (*1)	Description	
00	0aaa aaaa	0000 aaaa	(Reserved)	(Level(OLD))
01	0aaa aaaa	0000 aaaa	Pan	(0 – 127) L64 – 63R
02	0aaa aaaa	0000 aaaa	Random Pan Depth	(0 – 63)
03	0aaa aaaa	0000 aaaa	(Reserved)	(Coarse Tune(OLD))
04	0aaa aaaa	0000 aaaa	(Reserved)	(Fine Tune(OLD))
05	0aaa aaaa	0000 aaaa	Pitch Envelope Depth	(52 – 76) –12 – +12
06	0aaa aaaa	0000 aaaa	Pitch Envelope Time1	(0 – 127)
07	0aaa aaaa	0000 aaaa	Pitch Envelope Time3	(0 – 127)
08	0aaa aaaa	0000 aaaa	Pitch Envelope Level3	(1 – 127) –63 – +63
09	0aaa aaaa	0000 aaaa	Pitch Envelope Time4	(0 – 127)
0A	0aaa aaaa	0000 aaaa	TVF Filter Type	(0 – 6)
0B	0aaa aaaa	0000 aaaa	TVF Cutoff	(0 – 127)
0C	0aaa aaaa	0000 aaaa	TVF Resonance	(0 – 127)
0D	0aaa aaaa	0000 aaaa	TVF Envelope Depth	(1 – 127) –63 – +63
0E	0aaa aaaa	0000 aaaa	TVF Envelope Time1	(0 – 127)
0F	0aaa aaaa	0000 aaaa	TVF Envelope Time3	(0 – 127)
10	0aaa aaaa	0000 aaaa	TVF Envelope Level3	(0 – 127)
11	0aaa aaaa	0000 aaaa	TVF Envelope Time4	(0 – 127)
12	0aaa aaaa	0000 aaaa	TVA Envelope Time1	(0 – 127)
13	0aaa aaaa	0000 aaaa	TVA Envelope Time3	(0 – 127)
14	0aaa aaaa	0000 aaaa	TVA Envelope Level3	(0 – 127)
15	0aaa aaaa	0000 aaaa	TVA Envelope Time4	(0 – 127)
16	0aaa aaaa	0000 aaaa	LFO1 Wave Form	(0 – 127)(*2)
17	0aaa aaaa	0000 aaaa	LFO1 Rate	(0 – 127)
18	0aaa aaaa	0000 aaaa	LFO1 Pitch Depth	(1 – 127) –63 – +63
19	0aaa aaaa	0000 aaaa	LFO1 TVF Depth	(1 – 127) –63 – +63
1A	0aaa aaaa	0000 aaaa	LFO1 TVA Depth	(1 – 127) –63 – +63

(*1) Specifies the Tone. Multiple Tones can be specified simultaneously.

```
0000 aaaa
     |||+- TONE1 (0: No value set / 1: Value set)
     ||+-- TONE2 (0: No value set / 1: Value set)
     |+--- TONE3 (0: No value set / 1: Value set)
     +---- TONE4 (0: No value set / 1: Value set)
```

(*2) 0 - 14: SIN, TRI, SAW UP, SAW DW, SQR, RND, BEND UP, BEND DW, TRP, S&H, CHS, XSIN, TWM, STRS, VSIN

15 - 127: MORPHING

❍Quick SysEx Rhythm

Offset address	Size Data0	Data1 (*3)	Description	
00	0aaa aaaa	0111 1111	(Reserved)	(Level(OLD))
01	0aaa aaaa	0111 1111	Pan	(0 – 127) L64 – 63R
02	0aaa aaaa	0111 1111	Random Pan Depth	(0 – 63)
03	0aaa aaaa	0111 1111	(Reserved)	
04	0aaa aaaa	0111 1111	(Reserved)	
05	0aaa aaaa	0111 1111	Pitch Envelope Depth	(52 – 76) –12 – +12

06	0aaa aaaa 0111 1111	Pitch Envelope Time1	(0 – 127)
07	0aaa aaaa 0111 1111	Pitch Envelope Time3	(0 – 127)
08	0aaa aaaa 0111 1111	Pitch Envelope Level3	(1 – 127) –63 – +63
09	0aaa aaaa 0111 1111	Pitch Envelope Time4	(0 – 127)
0A	0aaa aaaa 0111 1111	TVF Filter Type	(0 – 6)
0B	0aaa aaaa 0111 1111	TVF Cutoff	(0 – 127)
0C	0aaa aaaa 0111 1111	TVF Resonance	(0 – 127)
0D	0aaa aaaa 0111 1111	TVF Envelope Depth	(1 – 127) –63 – +63
0E	0aaa aaaa 0111 1111	TVF Envelope Time1	(0 – 127)
0F	0aaa aaaa 0111 1111	TVF Envelope Time3	(0 – 127)
10	0aaa aaaa 0111 1111	TVF Envelope Level3	(0 – 127)
11	0aaa aaaa 0111 1111	TVF Envelope Time4	(0 – 127)
12	0aaa aaaa 0111 1111	TVA Envelope Time1	(0 – 127)
13	0aaa aaaa 0111 1111	TVA Envelope Time3	(0 – 127)
14	0aaa aaaa 0111 1111	TVA Envelope Level3	(0 – 127)
15	0aaa aaaa 0111 1111	TVA Envelope Time4	(0 – 127)

(*3) For extending functionality

❍Quick SysEx Sequencer

Offset address	Size Data0 Data1	Description	
00	0000 000a 0000 0000	Mute switch	(0 – 1) MUTE, PLAY

6. Supplementary material

■Examples of MIDI messages

<Example1> 92 3E 5F

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

<Example2> C9 49

CnH is the Program Change status and 'n' is the MIDI channel number. Since 9H = 9, and 49H = 73, this is a Program Change message of MIDI CH = 10, Program number 74.

<Example3> E6 00 28

EnH is the Pitch Bend Change status and 'n' is the MIDI channel number. The 2nd byte (00H=0) is the LSB of the Pitch Bend value, and the 3rd byte (28H=40) is the MSB. However since the Pitch Bend is a signed number with 0 at 40 00H (= 64 x 128 + 0 = 8192), the Pitch Bend value in this case is

28 00H - 40 00H = 40 x 128 + 0 - (64 x 128 + 0) = 5120 - 8192 = -3072

If we assume that the Pitch Bend Sensitivity is set to two semitones, the pitch will change only -200 cents for a Pitch Bend value of -8192 (00 00H). Thus, this message is specifying a Pitch Bend of -200 x (-3072) ? (-8192) = -75 cents on MIDI CH = 7.

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

BnH is the Control Change status, and 'n' is the MIDI channel number. In Control Change messages, the 2nd byte is the controller number, and the 3rd byte is the parameter value. MIDI allows what is known as "running status," when if messages of the the same status follow each other, it is permitted to omit the second and following status bytes. In the message above, running status is being used, meaning that the message has the following content.

B3 64 00	MIDI CH = 4, RPN parameter number LSB: 00H
(B3) 65 00	MIDI CH = 4, RPN parameter number MSB: 00H
(B3) 06 0C	MIDI CH = 4, parameter value MSB: 0CH
(B3) 26 00	MIDI CH = 4, parameter value LSB: 00H
(B3) 64 7F	MIDI CH = 4, RPN parameter number LSB: 7FH
(B3) 65 7F	MIDI CH = 4, RPN parameter number MSB: 7FH

■Examples of system exclusive messages and calculating the checksum

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

●How to calculate the checksum

The checksum consists of a value whose lower 7 bits are 0 when the address, size and checksum itself are added.
The following formula shows how to calculate the checksum when the exclusive message to be transmitted has an address of aa bb cc ddH, and data or size of ee ffH.

aa + bb + cc + dd + ee + ff = total
total ÷ 128 = quotient ... remainder
128 - remainder = checksum

<Example1> Setting the REVERB to SRV Room (DT1)

Referring to "Parameter Address Map," the starting address for Part Info is 10 00 00 00H, and offset address of Part Info Common Reverb is 00 06 00H, and the Reverb Type address is 00 00H. Therefore, the address will be

```
   10 00 00 00H
      00 06 00H
+)    ------ 00H
   10 00 06 00H
```

Since SRV Room is parameter value 02H,

F0	41	10	00	59	12	10 00 06 00	02	??	F7
(1)	(2)	(3)	(4)	(5)	(6)	address	data	checksum	(7)

(1) Exclusive status (2) ID number (Roland) (3) Device ID (17)
(4), (5) Model ID (MC-909) (6) Command ID (DT1) (7) EOX

Next we calculate the checksum.

10H + 00H + 06H + 00H + 02H = 16 + 0 + 6 + 0 + 2 = 24 (sum)
24 (total) ÷ 128 = 0 (quotient)...24 (remainder)
checksum = 128 - 24 (remainder) = 104 = 68H

This means that the message transmitted will be F0 41 10 00 59 12 10 00 06 00 02 68 F7.

<Example2> Obtaining part information data (RQ1)

Referring to "Parameter Address Map," the starting addresses for Part Information are assigned as follows.

```
10 00 00 00H    Part Info Common
10 00 02 00H    Part Info MFX1
10 00 04 00H    Part Info MFX2
10 00 06 00H    Part Info Reverb
10 00 08 00H    Part Info Comp/EQ
10 00 0A 00H    Part Info External Input
10 00 20 00H    Part Info Part 1
10 00 21 00H    Part Info Part 2
      :
10 00 2F 00H    Part Info Part 16
```

Since the size of Part Info Part is 00 00 00 0CH, this size is added to the starting address of Part Info Part 16, to obtain

```
   10 00 2F 00H
+) 00 00 00 0CH
   10 00 2F 0CH
```

Therefore, the size of the data to be obtained is

```
   10 00 2F 0CH
-) 10 00 00 00H
   00 00 2F 0CH
```

F0	41	10	00	59	11	10 00 00 00	00 00 2F 0C	??	F7
(1)	(2)	(3)	(4)	(5)	(6)	address	data	checksum	(7)

(1) Exclusive status (2) ID number (Roland) (3) Device ID (17)
(4), (5) Model ID (MC-909) (6) Command ID (RQ1) (7) EOX

When the checksum is calculated in the same way as in <Example 1>, we have the following message to be transmitted: F0 41 10 00 59 11 10 00 00 00 00 00 2F 0C 35 F7.

Received/Transmitted Data List

	Parameter	Transmit Patch Edit Type		Value
		TYPE-QUICK	TYPE-CC	
Pitch	Patch Coarse Tune	EXCLUSIVE	CC#21	16–112 (Center = 64)
	Rhythm Tone Coarse Tune	EXCLUSIVE	CC#21	0–127 (Center C4 = 60)
	Patch Fine Tune	CC#77	CC#77	14–114 (Center = 64)
	Rhythm Tone Fine Tune	CC#77	CC#77	14–114 (Center = 64)
Filter	Filter Type	EXCLUSIVE	CC#34	0–6
	Cutoff Frequency	CC#74	CC#74	0–127
	Resonance	CC#71	CC#71	0–127
Amp	Patch Level	EXCLUSIVE	CC#36	0–127
	Rhythm Tone Level	EXCLUSIVE	CC#36	0–127
	Tone Pan	EXCLUSIVE	CC#35	0–127 (Center = 64)
	Random Pan Depth	EXCLUSIVE	CC#37	0–63
Pitch Envelope	P-Env Depth	EXCLUSIVE	CC#25	52–76 (Center = 64)
	A (P-Env Time1)	EXCLUSIVE	CC#26	0–127
	D (P-Env Time3)	EXCLUSIVE	CC#27	0–127
	S (P-Env Level3)	EXCLUSIVE	CC#39	1–127 (Center = 64)
	R (P-Env Time4)	EXCLUSIVE	CC#40	0–127
Filter Envelope	F-Env Depth	CC#81	CC#81	1–127 (Center = 64)
	A (F-Env Time1)	CC#82	CC#82	0–127
	D (F-Env Time3)	CC#83	CC#83	0–127
	S (F-Env Level3)	EXCLUSIVE	CC#28	0–127
	R (F-Env Time4)	EXCLUSIVE	CC#29	0–127
Amp Envelope	A (A-Env Time1)	CC#73	CC#73	0–127
	D (A-Env Time3)	CC#75	CC#75	0–127
	S (A-Env Level3)	EXCLUSIVE	CC#31	0–127
	R (A-Env Time4)	CC#72	CC#72	0–127
LFO1	Waveform	EXCLUSIVE	CC#15	0–127
	Rate	CC#16	CC#16	0–127
	Pitch Depth	CC#18	CC#18	1–127 (Center = 64)
	Filter Depth	CC#19	CC#19	1–127 (Center = 64)
	Amp Depth	CC#80	CC#80	1–127 (Center = 64)
	Pan Depth	EXCLUSIVE	CC#9	1–127 (Center = 64)
Portamento	Portamento Switch	CC#65	CC#65	0–63 (OFF), 64–127 (ON)
	Portamento Time	CC#5	CC#5	0–127
Solo	Mono/Poly	CC#126/127	CC#126/127	126 = 1 (ON), 127 = 0 (OFF)
Unison	Unison Switch	EXCLUSIVE	CC#89	0–63 (OFF), 64–127 (ON)
	Unison Fat Level	EXCLUSIVE	CC#90	0–127
Part Edit	Level	CC#7	CC#7	0–127
	Pan	CC#10	CC#10	0–127 (Center = 64)
	Key Shift	CC#85	CC#85	16–112 (Center = 64)
	Reverb Level	CC#91	CC#91	0–127
	Output Select	EXCLUSIVE	CC#86	0–6
	Auto Sync Switch	EXCLUSIVE	CC#87	0–63 (OFF), 64–127 (ON)
Sequencer	Part Mute	EXCLUSIVE	CC#88	0–63 (MUTE), 64–127 (PLAY)