MIDI Implementation

Model VM-3100 / VM-3100Pro Version 1.01 Jun. 02 1999

1. TRANSMITTED DATA AND RECOGNIZED RECEIVE DATA

■Channel Voice Message

●Note On/Off

When "MIDI Transport (*1)" in the SYSTEM parameters is "USER1-3", MIDI note number / velocity of MIDI channel number which is designated with "MIDI ControlCh(*1) is transmitted.

Ignored when received.

Status	Second	Third
9nH	mmH	llH

n = MIDI Channel No. : 0H - FH (ch.1-ch.16)
mm = Note No. : 00H - 7FH (0 - 127)
ll = Velocity : 01H - 7FH (1 - 127) / 00H = NOTE OFF

(*1) See "2. Address Map for Data Transfer" section.

●Control Change

VM-3100"s mixer parameters can be received and transmitted by the control change messages when "MIDI Control Type (*1)" in the SYSTEM parameter is set to "C.C." or "NRPM."

When “MIDI Transport (*1)” in the SYSTEM parameters is “USER1-3,” control change message of MIDI channel number which is designated with “MIDI ControlCh(*1) is transmitted.

Status	Second	Third
BnH	mmH	llH

n = MIDI Channel No. : 0H - FH (ch.1-ch.16)
mm = Mixer Parameter No. : (see below)
ll = Mixer Parameter Value : 00H - 7FH (0 - 127) (*1)

When “MIDI C.C. Type(*1)” in the SYSTEM parameter is set to “Mono.”

When “MIDI Control Type(*1)” in the SYSTEM parameter is set to “C.C.,” Level parameter / Switch parameter / Pan parameter of the MIXER parameters were transmitted and received according to the following “Mixer Parameters and Control Change # Assignment.”
The transmitted MIDI channel is set by the “MIDI Control Channel(*1)” in the System parameters.

Mixer Parameters and Control Change # Assignment

C.C.#	Control Parameter	C.C.#	Control Parameter
0	----------	64	
1	Channel 1 Level	65	Channel 1 Mute Sw
2	Channel 2 Level	66	Channel 2 Mute Sw
3	Channel 3 Level	67	Channel 3 Mute Sw
4	Channel 4 Level	68	Channel 4 Mute Sw
5	Channel 5 Level	69	Channel 5 Mute Sw
6	Channel 6 Level	70	Channel 6 Mute Sw
7	Channel 7 Level	71	Channel 7 Mute Sw
8	Channel 8 Level	72	Channel 8 Mute Sw
9	Channel 9 Level	73	Channel 9 Mute Sw
10	Channel 10 Level	74	Channel 10 Mute Sw
11	Channel 11 Level	75	Channel 11 Mute Sw
12	Channel 12 Level	76	Channel 12 Mute Sw
13	Channel 13 Level	77	Channel 13 Mute Sw
14	Channel 14 Level	78	Channel 14 Mute Sw
15	Channel 15 Level	79	Channel 15 Mute Sw
16	Channel 16 Level	80	Channel 16 Mute Sw
17	Channel 17 Level	81	Channel 17 Mute Sw
18	Channel 18 Level	82	Channel 18 Mute Sw
19	Channel 19 Level	83	Channel 19 Mute Sw
20	Channel 20 Level	84	Channel 20 Mute Sw
21	Master Level	85	
22		86	
23		87	
24		88	
25		89	
26		90	
27		91	
28		92	
29		93	
30		94	
31		95	
32	----------	96	----------
33	Channel 1 Pan	97	----------
34	Channel 2 Pan	98	----------
35	Channel 3 Pan	99	----------
36	Channel 4 Pan	100	----------
37	Channel 5 Pan	101	----------
38	Channel 6 Pan	102	
39	Channel 7 Pan	103	
40	Channel 8 Pan	104	
41	Channel 9 Pan	105	
42	Channel 10 Pan	106	
43	Channel 11 Pan	107	
44	Channel 12 Pan	108	
45	Channel 13 Pan	109	
46	Channel 14 Pan	110	
47	Channel 15 Pan	111	
48	Channel 16 Pan	112	
49	Channel 17 Pan	113	
50	Channel 18 Pan	114	
51	Channel 19 Pan	115	
52	Channel 20 Pan	116	
53	Master Balance	117	
54		118	
55		119	
56		120	----------
57		121	----------
58		122	----------
59		123	----------
60		124	----------
61		125	----------
62		126	----------
63		127	----------

When the "MIDI C.C. Type(*1)" in the SYSTEM parameters is set to "Multi."

When the "MIDI C.C. Type(*1)" in the SYSTEM parameters is set to "C.C.," the MIXER parameters are transmitted and received through the several MIDI channels.

Mixer Parameter and MIDI Channel/Control Change No.

<Channel Strip>

Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIDI channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Level	7	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Pan	10	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Freq.	12	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ L Gain	13	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ M Freq.	14	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ M Gain	15	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ M Q	16	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Freq.	17	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
EQ H Gain	18	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
FX1 Send Level	19	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
FX2 Send Level	20	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus1/2 Send Level	21	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus3/4 Send Level	22	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus5/6 Send Level	23	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Bus7/8 Send Level	24	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->
Channel Mute Sw	25	->	->	->	->	->	->	->	->	->	->	->	->	->	->	->

Channel	17	18	19	20
MIDI channel	1	2	3	4
Level	68	->	->	->
Pan	70	->	->	->
EQ L Freq.	71	->	->	->
EQ L Gain	72	->	->	->
EQ M Freq.	73	->	->	->

Channel	17	18	19	20
MIDI channel	1	2	3	4
EQ M Gain	74	->	->	->
EQ M Q	75	->	->	->
EQ H Freq.	76	->	->	->
EQ H Gain	77	->	->	->
FX1 Send Level	78	->	->	->
FX2 Send Level	79	->	->	->
Bus1/2 Send Level	80	->	->	->
Bus3/4 Send Level	81	->	->	->
Bus5/6 Send Level	82	->	->	->
Bus7/8 Send Level	83	->	->	->
Channel Mute Sw	84	->	->	->

<Track Out Block>

Track Number	1	2	3	4	5	6	7	8
MIDI channel	5	6	7	8	9	10	11	12
Output Level	68	->	->	->	->	->	->	->

<Master Block> MIDI ch.= 16

Master Level	68
Master Balance	70
Monitor Level	71
Monitor Balance	72
FX1 Output Level	73
FX2 Output Level	74
AUX SEND 1/2 Level	75
AUX SEND 1/2 Balance	76
BUS OUT Level	77
BUS OUT Balance	78
Digital OUT-A Level	79
Digital OUT-A Balance	80
Digital OUT-B Level	81
Digital OUT-B Balance	82

(*1) See "2. Address Map for Data Transfer"

❍NRPN(MSB/LSB)

Status	Second	Third
BnH	62H	llH
BnH	63H	mmH

n = MIDI Channel No. : 0H - FH (ch.1 - ch.16)
mm = upper byte of the parameter number to be assigned with NRPN : 00H - 7FH (0 - 127)
ll = lower byte of the parameter number to be assigned with NRPN : 00H - 7FH (0 - 127)

This message is received at the following case.
When the "MIDI Control Type(*1)" is set to "NRPN" and moreover the MIDI channel of this message is same as the "MIDI Control Channel(*1)."
After received this message, it is memorized as the "None Registered Parameter Number."

"None Registered Parameter Number" value is equal to the "Start Address" in "2. Address Map for Data Transfer" section.

This message is transmitted at the following case.
When the "MIDI Control Type(*1)" is set to "NRPN" and moreover a parameter is modified.

This message is transmitted with the MIDI channel set as the "MIDI Control Channel(*1)."

"None Registered Parameter Number" value is equal to the "Start Address" in "2. Address Map for Data Transfer" section.

(*1) See "2. Address Map for Data Transfer"

❍Data Entry (MSB/LSB)

Status	Second	Third
BnH	06H	mmH
BnH	26H	llH

n = MIDI Channel No. : 0H - FH (ch.1 - ch.16)
mm = upper byte corresponding to the parameter assigned with NRPN
ll = lower byte corresponding to the parameter assigned with NRPN

<Ex> mmH llH = 40H 00H = -8192
= 7FH 7FH = -1
= 00H 00H = 0
= 3FH 7FH = +8191

This message is received at the following case.
When the "MIDI Control Type(*1)" parameter is set to "NRPN" and moreover the MIDI channel value with the message is same as the "MIDI Control Channel(*1)."
After this message was received, the parameter is modified referring to the "None Registered Parameter Number."

When the "None Registered Parameter Number" is not set, this message was ineffective.
The setting value of each parameter number is different.
See "2. Address Map for Data Transfer" section.

This message is transmitted at the following case.
When "MIDI Control Type(*1)" is set to "NRPN" and moreover the parameter is modified.
This message is transmitted with the MIDI channel set as "MIDI Control Channel(*1)."

(*1) See "2. Address Map for Data Transfer"

❍Data Increment

This message is received at the following case.
When the "MIDI Control Type(*1)" parameter is set to "NRPN" and moreover the MIDI channel value is same as the "MIDI Control Channel(*1)" value.
After this message was received, the parameter is increased referring to the "None Registered Parameter Number."
VM-3100 doesn"t transmit this message.

Status	Second	Third
BnH	60H	00H

n = MIDI Channel No. : 0H - FH (ch.1 - ch.16)

Increment the effect parameter selected with NRPN.

See "2. Address Map for Data Transfer" section.

❍Data Decrement

This message is received at the following case.
When the "MIDI Control Type(*1)" parameter is set to "NRPN" and moreover the MIDI channel value is same as the "MIDI Control Channel(*1)" value.
After this message was received, the parameter is decreased referring to the "None Registered Parameter Number."
VM-3100 doesn"t transmit this message.

Status	Second	Third
BnH	61H	00H

n = MIDI Channel No. : 0H - FH (ch.1-ch.16)

Decrement the effect parameter selected with NRPN.

See "2. Address Map for Data Transfer" section.

●Program Change

Works as scene switch when the MIDI channel number is same as "MIDI Scene Channel(*1)" parameter value.

When "MIDI Transport (*1)" in the SYSTEM parameters is "USER1-3", control change message of MIDI channel number which is designated with "MIDI ControlCh(*1) is transmitted.

Status	Second
CnH	ppH

n = MIDI Channel No. : 0H - FH (ch.1 - ch.16)
pp = Program No. : 00H - 20H (01-1 - 08-4)(*2)

(*1) See "2. Address Map for Data Transfer" section.
(*2) Only receiving for scene switch

■System Common Messages

●Song Position Pointer

Received when "MIDI TimingMonitor(*1)" in system parameters is "MEASURE."

Transmitted when "MIDI Transport(*1)" in the system parameters is "SEQUENCER", and any of the transport buttons [REW][FF][STOP] is pressed.

Status	Second	Third
F2H	mmH	nnH

mm,nn = Song Position Point : 00H 00H - 7FH 7FH

■System Realtime Message

Received when "MIDI TimingMonitor(*1)" in system parameters is "MEASURE."

Corresponding message is transmitted when "MIDI Transport(*1)" in the system parameters is "SEQUENCER," and any of the transport buttons [REW], [FF], [STOP] is pressed.

●Timing Clock

Status
F8H

●Start

Status
FAH

●Continue

Status
FBH

●Stop

Status
FCH

■System Exclusive Message

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

Byte	Description	
F0H	Status of System Exclusive Message	
iiH	Manufacturer ID	
	41H Roland"s Manufacturer ID	
	7EH Universal Non Realtime Message	
	7FH Universal Realtime Message	
ddH	Data :	00H - 7FH (0-127)
:	:	
eeH	Data	
F7H	EOX (End of System Exclusive Message)	

The VM-3100 can transfer and receive the internal parameters information using system exclusive messages, and also can be controlled by the external devices using system exclusive messages.
The VM-3100 can transmit and receive Universal System Exclusive messages, Data Request(RQ1) and Data set(DT1) as the System Exclusive message.

❍About Model ID

For Data Request (RQ1) and Data Set (DT1), VM-3100 uses 00H 15H as a Model ID.

❍About Device ID

System Exclusive messages are not assigned to any particular MIDI channel.
Instead, they have their own special control parameter called device ID.
The Roland system exclusive messages use device IDs to specify multiple VM-3100 units.
The VM-3100 sends system exclusive messages with the device ID set with "MIDI Device ID(*1)", and receives the system exclusive messages whose device ID is same as its device ID and 7FH.

(*1) See "2. Address Map for Data Transfer" section.

●Universal System Exclusive Message

❍INQUIRY MESSAGE

Identity Request

Status	Data Byte	Status
F0H	7EH, Dev, 06H, 01H	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7EH	Universal System Exclusive Message Non Realtime Header	
Dev	Device ID	(or 7FH)
06H	General Information	(sub ID #1)
01H	Identify Request	(sub ID #2)
F7H	EOX (End of System Exclusive Message)	

The message is used to request the particular information of the VM-3100.
The VM-3100 does not transmit the message.
If the VM-3100 received the message and the device ID of the message is same as its device ID or 7FH, the VM-3100 transmits the following Identity Reply message.

Identity Reply

Status	Data Bytes	Status
F0H	7EH, Dev, 06H, 02H, 41H, 15H, 01H, nnH, 00H, vvH, 00H, ssH, ssH	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7EH	Universal System Exclusive Message Non Realtime Header	
Dev	Device ID	
06H	General Information	(sub ID #1)
02H	Identify Request	(sub ID #2)
41H	Manufacturer ID	(Roland)
15H 01H	Device Family Code	(V-Mixer)
nnH 00H	Device Family No.	(VM-xxxxx)
00H		
00H		
ssH ssH	Software Revision Level	
F7H	EOX (End of System Exclusive Message)	

MIDI Machine Control Commands

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, aaH, ..., bbH	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
aaH	Command	
:	:	
bbH	Command	
F7H	EOX (End of System Exclusive Message)	

(*) see "3. MIDI Machine Control" section

MIDI Machine Control Responses

Status	Data Bytes	Status
F0H	7FH, Dev, 07H, aaH, ..., bbH	F7H

Byte	Description
F0H	Status of System Exclusive Message
7FH	Universal System Exclusive Message Realtime Header
Dev	Device ID
07H	MMC Response Message
aaH	Response
:	:
bbH	Response
F7H	EOX (End of System Exclusive Message)

(*) see "3. MIDI Machine Control" section

●Data Transfer (RQ1, DT1)

❍Data Request (RQ1)

Status	Data Bytes	Status
F0H	41H, Dev, 00H, 15H, 11H, aaH, bbH, ..., ssH, ssH, ..., Sum	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
41H	Manufacturer ID (Roland)	
Dev	Device ID	
00H 15H	ModelID	(V-Mixer)
11H	Command ID	(RQ1)
aaH	Address MSB	
bbH	Address MID	
ccH	Address LSB	
ssH	Size MSB	
ssH	Size MID	
ssH	Size LSB	
Sum	Check Sum	
F7H	EOX (End of System Exclusive Message)	

The message is used to request data to the VM-3100.
The VM-3100 does not transmit this message.
The VM-3100 transmits the requested data using Data Set(DT1) under following condition when it received the message.

The requested address correspond to the specified parameter base address of the VM-3100.
The requested size is over 1 byte.

❍Data Set (DT1)

Status	Data Bytes	Status
F0H	41H, Dev, 00H, 15H, 12H, aaH, bbH, ddH, ..., eeH, Sum	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
41H	Manufacturer ID (Roland)	
Dev	Device ID	
00H 15H	Model ID	(VM-3100)
12H	Command ID	(DT1)
aaH	Address MSB	
bbH	Address MID	
ddH	Data	
:	:	
eeH	Data	
Sum	Check Sum	
F7H	EOX (End of System Exclusive Message)	

The message is received under the following condition.

If the device ID on the message is same as that of the receive device, and the address on the message correspond to the specified parameter base address, the received data are stored from the specified parameter base address.
If the interval of received messages is shorter than 20 msec, the VM-3100 can not work the receive message procedure correctly.

The message is transmitted under the following condition.

When the VM-3100 transmit the data on the requested parameter after receiving the Data Request message(RQ1).

(*)see "2. Data Transfer Address Map" for more details of the transfer parameters.

2. Data Transfer Address Map

The each address value is expressed as a 7bit hex number.

Address	MSB	LSB
Binary	0aaa aaaa	0bbb bbbb
7-bit Hex	AA	BB

■Parameter Address Block

<Model ID = 00H 15H>

Start Address	Contents and Remarks
00 00 00	System Parameter
00 10 00	Mixer Parameter - Common
00 11 00	Mixer Parameter - Channel 1
00 12 00	Mixer Parameter - Channel 2
:	
00 24 00	Mixer Parameter - Channel 20
00 30 00	Compressor Parameter - COMP 1
00 32 00	Compressor Parameter - COMP 2
00 34 00	Effect Parameter - FX1
00 36 00	Effect Parameter - FX2
01 00 00	User EZ Routing Set Bulk Dump
:	(17 - 32)
01 20 00	User EQ Library Bulk Dump
:	(17 - 32)
01 40 00	User Compressor Library Bulk Dump
:	(17 - 32)
02 00 00	User Effects Patches Bulk Dump
:	(U00 - U99)
03 00 00	Scene Memory Bulk Dump
:	(Bank01-1 - 08-4)

● System Parameter

Start Address	Data	Contents and Remarks	
00 00	00 - 03	Master Clock	INTERNAL, DIN-A, DIN-B, RMDB-2
00 01	00 - 01	Phantom Power	OFF, ON
00 02	00 - 01	Peak Hold Switch	OFF, ON
00 03	00 - 01	Meter Select	Pre, Pst
00 04	00 - 03	Solo Mode	PreEQ,PostEQ,AFL,InPlace
00 05	00 - 15	Display Contrast	1,,,16
00 06	00 - 02	Foot Switch Type	NORMAL, REVERSE, GPI
00 07	00 - 04	Foot Switch Function	SCENE+, SCENE-, ALL MUTE, SHIFT, JUMP SCR
00 08	00 - 01	Jump To Screen #	EQ, PAN

00 09	00 - 01	Fader Controller Match	JUMP, NULL
00 0A	00 - 02	Shift Lock	OFF, ONCE, ON
00 0B	00 - 03	Switch Hold Time	0.5, 1.0, 1.5, 2.0
00 0C	00 - 01	Screen Jump	OFF, ON
00 0D	00 - 02	Digital Copy Protect	THRU, OFF, ON
00 0E	00 - 01	Effects Knob Sw	OFF, ON
00 0F	00 - 7F	Scene Item Select	0 x x x - x x x x | | | | | | +— Fader | | | | | +—— Pan | | | | +——— Send | | | +———— Routing | | +————— EQ | +—————— Comp +——————— Effects
00 10	00 - 64	Scene Speed	0.0,,,10.0sec
00 11	00 - 01	Digital Boost 9/10 Ch	OFF, ON
00 12	00 - 02	Digital Boost 11/12 Ch	OFF, ON
00 13	00 - 01	EQ Controller Match	JUMP, NULL
00 14 : 00 1F	00 - 00 -	(Reserved)	
00 20	00 - 03	MIDI Control Type	OFF, C.C., NRPN, SYS-EX
00 21	00 - 0F	MIDI Control Channel	1,,,16
00 22	00 - 01	MIDI C.C Type	MONO, MULTI
00 23	00 - 1F	MIDI Device ID (*1)	1,,,32
00 24	00 - 01	MIDI Local Switch	OFF, ON
00 25	00 - 0F	MIDI Scene Rx Channel	1,,,16
00 26	00 - 01	MIDI Out/Thru Select (*1)	OUT, THRU
00 27	00 - 01	MIDI Timing Monitor	OFF, ON
00 28	00 - 3F	MIDI Timing Monitor Beat	1/1,,,16/8
00 29	00 - 05	MIDI Transport	OFF, SEQUENCER, RECORDER, USER1,,,3
00 2A	00 - 01	MIDI Locate Type	MEASURE, TIMECODE
00 2B	00 - 7F	MIDI Shift Key	OFF, C-1,,,F#9
00 2C : 00 2F	00 - 00 -	(Reserved)	
00 30	00 - 03	Transport User1 [PLAY] Status	OFF,NOTE,C.C.,P.C.
00 31	00 - 7F	Transport User1 [PLAY] Data1	0,,,127
00 32	00 - 7F	Transport User1 [PLAY] Data2	0,,,127
00 33	00 - 03	Transport User1 [STOP] Status	OFF,NOTE,C.C.,P.C.
00 34	00 - 7F	Transport User1 [STOP] Data1	0,,,127
00 35	00 - 7F	Transport User1 [STOP] Data2	0,,,127
00 36	00 - 03	Transport User1 [ZERO] Status	OFF,NOTE,C.C.,P.C.
00 37	00 - 7F	Transport User1 [ZERO] Data1	0,,,127
00 38	00 - 7F	Transport User1 [ZERO] Data2	0,,,127
00 39	00 - 03	Transport User1 [REW] Status	OFF,NOTE,C.C.,P.C.
00 3A	00 - 7F	Transport User1 [REW] Data1	0,,,127
00 3B	00 - 7F	Transport User1 [REW] Data2	0,,,127
00 3C	00 - 03	Transport User1 [FF] Status	OFF,NOTE,C.C.,P.C.
00 3D	00 - 7F	Transport User1 [FF] Data1	0,,,127
00 3E	00 - 7F	Transport User1 [FF] Data2	0,,,127
00 3F	00 - 03	Transport User1 [REC] Status	OFF,NOTE,C.C.,P.C.
00 40	00 - 7F	Transport User1 [REC] Data1	0,,,127
00 41	00 - 7F	Transport User1 [REC] Data2	0,,,127
00 42	00 - 03	Transport User2 [PLAY] Status	OFF,NOTE,C.C.,P.C.
00 43	00 - 7F	Transport User2 [PLAY] Data1	0,,,127
00 44	00 - 7F	Transport User2 [PLAY] Data2	0,,,127
00 45	00 - 03	Transport User2 [STOP] Status	OFF,NOTE,C.C.,P.C.
00 46	00 - 7F	Transport User2 [STOP] Data1	0,,,127
00 47	00 - 7F	Transport User2 [STOP] Data2	0,,,127
00 48	00 - 03	Transport User2 [ZERO] Status	OFF,NOTE,C.C.,P.C.
00 49	00 - 7F	Transport User2 [ZERO] Data1	0,,,127
00 4A	00 - 7F	Transport User2 [ZERO] Data2	0,,,127
00 4B	00 - 03	Transport User2 [REW] Status	OFF,NOTE,C.C.,P.C.
00 4C	00 - 7F	Transport User2 [REW] Data1	0,,,127
00 4D	00 - 7F	Transport User2 [REW] Data2	0,,,127
00 4E	00 - 03	Transport User2 [FF] Status	OFF,NOTE,C.C.,P.C.
00 4F	00 - 7F	Transport User2 [FF] Data1	0,,,127
00 50	00 - 7F	Transport User2 [FF] Data2	0,,,127
00 51	00 - 03	Transport User2 [REC] Status	OFF,NOTE,C.C.,P.C.
00 52	00 - 7F	Transport User2 [REC] Data1	0,,,127
00 53	00 - 7F	Transport User2 [REC] Data2	0,,,127
00 54	00 - 03	Transport User3 [PLAY] Status	OFF,NOTE,C.C.,P.C.
00 55	00 - 7F	Transport User3 [PLAY] Data1	0,,,127
00 56	00 - 7F	Transport User3 [PLAY] Data2	0,,,127
00 57	00 - 03	Transport User3 [STOP] Status	OFF,NOTE,C.C.,P.C.
00 58	00 - 7F	Transport User3 [STOP] Data1	0,,,127
00 59	00 - 7F	Transport User3 [STOP] Data2	0,,,127
00 5A	00 - 03	Transport User3 [ZERO] Status	OFF,NOTE,C.C.,P.C.
00 5B	00 - 7F	Transport User3 [ZERO] Data1	0,,,127
00 5C	00 - 7F	Transport User3 [ZERO] Data2	0,,,127
00 5D	00 - 03	Transport User3 [REW] Status	OFF,NOTE,C.C.,P.C.
00 5E	00 - 7F	Transport User3 [REW] Data1	0,,,127
00 5F	00 - 7F	Transport User3 [REW] Data2	0,,,127

	00 60	00 - 03	Transport User3 [FF] Status OFF,NOTE,C.C.,P.C.
	00 61	00 - 7F	Transport User3 [FF] Data1 0,,,127
	00 62	00 - 7F	Transport User3 [FF] Data2 0,,,127
	00 63	00 - 03	Transport User3 [REC] Status OFF,NOTE,C.C.,P.C.
	00 64	00 - 7F	Transport User3 [REC] Data1 0,,,127
	00 65	00 - 7F	Transport User3 [REC] Data2 0,,,127
	00 66	00 - 17	Locate 1 Time Code Hour 0,,,23 Off=127
	00 67	00 - 3B	Locate 1 Time Code Minites 0,,,59 Off=127
	00 68	00 - 3B	Locate 1 Time Code Second 0,,,59 Off=127
	00 69	00 - 1D	Locate 1 Time Code Frame 0,,,29 Off=127
	00 6A	00 - 17	Locate 2 Time Code Hour 0,,,23 Off=127
	00 6B	00 - 3B	Locate 2 Time Code Minites 0,,,59 Off=127
	00 6C	00 - 3B	Locate 2 Time Code Second 0,,,59 Off=127
	00 6D	00 - 1D	Locate 2 Time Code Frame 0,,,29 Off=127
	00 6E	00 - 17	Locate 3 Time Code Hour 0,,,23 Off=127
	00 6F	00 - 3B	Locate 3 Time Code Minites 0,,,59 Off=127
	00 70	00 - 3B	Locate 3 Time Code Second 0,,,59 Off=127
	00 71	00 - 1D	Locate 3 Time Code Frame 0,,,29 Off=127
	00 72	00 - 17	Locate 4 Time Code Hour 0,,,23 Off=127
	00 73	00 - 3B	Locate 4 Time Code Minites 0,,,59 Off=127
	00 74	00 - 3B	Locate 4 Time Code Second 0,,,59 Off=127
	00 75	00 - 1D	Locate 4 Time Code Frame 0,,,29 Off=127
	00 76	0aaaaaaa	Locate 1 Song Position Pointer
	00 77#	0bbbbbbb	0,,,16382 Off=16383
	00 78	0aaaaaaa	Locate 2 Song Position Pointer
	00 79#	0bbbbbbb	0,,,16382 Off=16383
	00 7A	0aaaaaaa	Locate 3 Song Position Pointer
	00 7B#	0bbbbbbb	0,,,16382 Off=16383
	00 7C	0aaaaaaa	Locate 4 Song Position Pointer
	00 7D#	0bbbbbbb	0,,,16382 Off=16383

(*1)Read Only Parameters.

● Mixer Common Parameter

cc= Mixer Channel Number : 10H (Common Channel)

Start Address	Data	Contents and Remarks
cc 00	00 - 01	Comp 1 Switch OFF, ON
cc 01	00 -	(Reserved)
cc 02	00 - 15	Comp 1 Location OFF,CH1,,,CH20,Master
cc 03	00 -	(Reserved)
cc 04	00 - 01	Comp 2 Switch OFF, ON
cc 05	00 -	(Reserved)
cc 06	00 - 14	Comp 2 Location OFF,CH1,,,CH20,Master
cc 07	00 -	(Reserved)
cc 08	00 - 01	FX1 Switch OFF, ON
cc 09	00 -	(Reserved)
cc 0A	00 -	(Reserved)
cc 0B	00 - 15	FX1 Location Send/Return,CH1,,,CH20,Master
cc 0C	00 - 7F	FX1 Input Level 0,,,127
cc 0D	00 -	(Reserved)
cc 0E	00 - 7F	FX1 Output Level 0,,,127
cc 0F	00 -	(Reserved)
cc 10	00 - 01	FX1 Return To MIX Switch OFF, ON
cc 11	00 - 01	FX1 Return To Bus 1/2(AUX SEND) Switch OFF, ON
cc 12	00 - 01	FX1 Return To Bus 3/4(BUS OUT) Switch OFF, ON
cc 13	00 - 01	FX1 Return To Bus 5/6 Switch OFF, ON
cc 14	00 - 01	FX1 Return To Bus 7/8 Switch OFF, ON
cc 15 : cc 17	00 -	(Reserved)
cc 18	00 - 01	FX2 Switch OFF, ON
cc 19	00 -	(Reserved)
cc 1A	00 -	(Reserved)
cc 1B	00 - 15	FX2 Location Send/Return,CH1,,,CH20,Master
cc 1C	00 - 7F	FX2 Input Level 0,,,127
cc 1D	00 -	(Reserved)
cc 1E	00 - 7F	FX2 Output Level 0,,,127
cc 1F	00 -	(Reserved)
cc 20	00 - 01	FX2 Return To MIX Switch OFF, ON
cc 21	00 - 01	FX2 Return To Bus 1/2(AUX SEND) Switch OFF, ON
cc 22	00 - 01	FX2 Return To Bus 3/4(BUS OUT) Switch OFF, ON
cc 23	00 - 01	FX2 Return To Bus 5/6 Switch OFF, ON
cc 24	00 - 01	FX2 Return To Bus 7/8 Switch OFF, ON
cc 25 : cc 27	00 -	(Reserved)
cc 28	00 - 01	Master Source MIX, MON
cc 29	00 - 7F	Master Level 0,,,127
cc 2A	01 - 7F	Master Balance L63,,,R63
cc 2B	00 - 07	Monitor Source Master,Bus1,Bus2,Bus3/4 Bus5/6,Bus7/8,FxSend1,FxSend2
cc 2C	00 - 7F	Monitor Level 0,,,127
cc 2D	01 - 7F	Monitor Balance L63,,,R63

cc 2E	00 - 02	Bus 1/2(AUX SEND) Type	BUS, SendS, SendM
cc 2F	00 -	(Reserved)	
cc 30	00 - 7F	AUX1/2 SEND Level	0,,,127
cc 31	01 - 7F	AUX1/2 SEND Balance	L63,,,R63
cc 32	00 - 7F	AUX1 SEND Level	0,,,127
cc 33	00 - 7F	AUX2 SEND Level	0,,,127
cc 34	00 - 01	Bus 3/4(BUS OUT) Type	BUS, SendS
cc 35	00 -	(Reserved)	
cc 36	00 - 7F	BUS OUT Level	0,,,127
cc 37	01 - 7F	BUS OUT Balance	L63,,,R63
cc 38	00 - 02	Bus 5/6 Type	BUS, SendS
cc 39	00 - 05	DIGITAL OUT A Source	Bus1/2, Bus3/4, Bus5/6, Bus7/8, MIX, MON
cc 3A	00 - 7F	DIGITAL OUT A Level	0,,,127
cc 3B	01 - 7F	DIGITAL OUT B Balance	L63,,,R63
cc 3C	00 - 03	Bus 7/8 Type	BUS, SendS
cc 3D	00 - 05	DIGITAL OUT B Source	Bus1/2, Bus3/4, Bus5/6, Bus7/8, MIX, MON
cc 3E	00 - 7F	DIGITAL OUT B Level	0,,,127
cc 3F	01 - 7F	DIGITAL OUT B Balance	L63,,,R63
cc 40	00 - 1D	TRACK OUT 1 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 41	00 - 7F	TRACK OUT 1 Level	0,,,127
cc 42	00 - 1D	TRACK OUT 2 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 43	00 - 7F	TRACK OUT 2 Level	0,,,127
cc 44	00 - 1D	TRACK OUT 3 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 45	00 - 7F	TRACK OUT 3 Level	0,,,127
cc 46	00 - 1D	TRACK OUT 4 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 47	00 - 7F	TRACK OUT 4 Level	0,,,127
cc 48	00 - 1D	TRACK OUT 5 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 49	00 - 7F	TRACK OUT 5 Level	0,,,127
cc 4A	00 - 1D	TRACK OUT 6 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 4B	00 - 7F	TRACK OUT 6 Level	0,,,127
cc 4C	00 - 1D	TRACK OUT 7 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 4D	00 - 7F	TRACK OUT 7 Level	0,,,127
cc 4E	00 - 1D	TRACK OUT 8 Source	Bus1,,,8,MixL,MixR,Ch1,,,20
cc 4F	00 - 7F	TRACK OUT 8 Level	0,,,127
cc 50	00 - 01	Digital In Monitor	Off,On

● Mixer Channel Parameters

cc= Mixer Channel Number : 11H - 24H (Channel 1 - 20)

Start Address	Data	Contents and Remarks
cc 00	00 - 13	Channel Input Source IN01,,IN11(DIN-L),IN12(DIN-R),TR01,,TR08
cc 01	00 - 04	Channel Input ATT -18, -12, -6, -3, 0(dB)
cc 02	00 - 01	Channel Input Phase NORM, INV
cc 03	00 - 01	Channel EQ Switch OFF, ON
cc 04	00 -	(Reserved)
cc 05	00 - 7F	Channel EQ High Freq 400Hz,,,20kHz (*2)
cc 06	00 - 7F	Channel EQ High Gain -12,,,+12dB (*2)
cc 07	00 - 7F	Channel EQ Mid Freq 200Hz,,,8.0kHz (*2)
cc 08	00 - 7F	Channel EQ Mid Gain -12,,,+12dB (*2)
cc 09	00 - 7F	Channel EQ Mid Q 0.5,1,2,4,8 (*2)
cc 0A	00 - 7F	Channel EQ Low Freq 20Hz,,,2.0kHz (*2)
cc 0B	00 - 7F	Channel EQ Low Gain -12,,,+12dB (*2)
cc 0C	00 - 7F	Channel Level 0,,,127
cc 0D	01 - 7F	Channel Pan L63,,,R63
cc 0E	00 -	(Reserved)
cc 0F	01 - 7F	Channel Link Pan Offset L63,,,R63
cc 10	00 - 02	Channel FX1 Send Switch Off,Pre,Pst
cc 11	00 - 7F	Channel FX1 Send Level 0,,,127
cc 12	00 -	(Reserved)
cc 13	00 - 02	Channel FX2 Send Switch Off,Pre,Pst
cc 14	00 - 7F	Channel FX2 Send Level 0,,,127
cc 15	00 -	(Reserved)
cc 16	00 - 02	Channel Bus 1/2(AUX SEND) Send Sw Off,Pre,Pst
cc 17	00 - 7F	Channel Bus 1/2(AUX SEND) Send Level 0,,,127
cc 18	00 -	(Reserved)
cc 19	00 - 02	Channel Bus 1(AUX SEND 1) Off,Pre,Pst
cc 1A	00 - 7F	Channel Bus 1(AUX SEND 1) Send Level 0,,,127
cc 1B	00 - 02	Channel Bus 2(AUX SEND 2) Send Sw Off,Pre,Pst
cc 1C	00 - 7F	Channel Bus 2(AUX SEND 2) Send Level 0,,,127
cc 1D	00 - 02	Channel Bus 3/4(BUS OUT) Send Sw Off,Pre,Pst
cc 1E	00 - 7F	Channel Bus 3/4(BUS OUT) Send Level 0,,,127
cc 1F	00 -	(Reserved)
cc 20	00 - 02	Channel Bus 5/6 Send Switch Off,Pre,Pst
cc 21	00 - 7F	Channel Bus 5/6 Send Level 0,,,127
cc 22	00 -	(Reserved)

cc 23	00 - 02	Channel Bus 7/8 Send Switch	Off,Pre,Pst
cc 24	00 - 7F	Channel Bus 7/8 Send Level	0,,,127
cc 25	00 -	(Reserved)	
cc 26	00 - 01	Channel Link Switch	OFF, ON
cc 27	00 - 01	Channel Mute Switch	OFF, ON
cc 28	00 -	(Reserved)	
cc 29	00 - 01	Channel Bus 1/2(AUX SEND) Assign	OFF, ON
cc 2A	00 - 01	Channel Bus 3/4(BUS OUT) Assign	OFF, ON
cc 2B	00 - 01	Channel Bus 5/6 Assign	OFF, ON
cc 2C	00 - 01	Channel Bus 7/8 Assign	OFF, ON

(*2) See Table as follows for EQ settings.

MIDI Data - EQ Frequency Table

Data	High(Hz)	Mid (Hz)	Low (Hz)	Data	High(Hz)	Mid (Hz)	Low (Hz)
00H -	400	200	20	40H -	2.92k	1.30k	207
02H -	425	212	21	42H -	3.10k	1.38k	223
04H -	452	224	23	44H -	3.30k	1.46k	240
06H -	481	238	24	46H -	3.52k	1.55k	258
08H -	512	252	26	48H -	3.74k	1.65k	277
0AH -	545	268	28	4AH -	3.98k	1.75k	298
0CH -	580	284	31	4CH -	4.23k	1.85k	321
0EH -	617	301	33	4EH -	4.51k	1.96k	346
10H -	657	319	35	50H -	4.79k	2.08k	372
12H -	699	338	38	52H	5.10k	2.21k	400
14H -	744	359	41	54H -	5.43k	2.34k	430
16H -	791	380	44	56H -	5.78k	2.48k	463
18H -	842	403	48	58H -	6.15k	2.63k	498
1AH -	896	428	51	5AH -	6.54k	2.79k	536
1CH -	954	453	55	5CH -	6.96k	2.96k	577
1EH -	1.02k	481	59	5EH -	7.41k	3.13k	621
20H -	1.08k	510	64	60H -	7.88k	3.32k	668
22H -	1.15k	541	69	62H -	8.38k	3.52k	718
24H -	1.22k	573	74	64H -	8.92k	3.74k	773
26H -	1.30k	608	80	66H -	9.49k	3.96k	831
28H -	1.38k	645	86	68H -	10.10k	4.20k	895
2AH -	1.47k	683	92	6AH -	10.75k	4.45k	962
2CH -	1.57k	725	99	6CH -	11.44k	4.72k	1.04k
2EH -	1.67k	768	107	6EH -	12.17k	5.01k	1.11k
30H -	1.78k	815	115	70H -	12.95k	5.31k	1.20k
32H -	1.89k	864	124	72H -	13.78k	5.63k	1.29k
34H -	2.01k	916	133	74H -	14.66k	5.97k	1.39k
36H -	2.14k	971	143	76H -	15.60k	6.33k	1.49k
38H -	2.28k	1.03k	154	78H -	16.60k	6.71k	1.61k
3AH -	2.42k	1.09k	166	7AH -	17.66k	7.12k	1.73k
3CH -	2.58k	1.16k	179	7CH -	18.80k	7.55k	1.86k
3EH -	2.74k	1.23k	192	7EH -	20.00k	8.00k	2.00k

MIDI Data - EQ Gain Table

Data	Gain(dB)
00H -	-12
05H -	-11
0AH -	-10
0FH -	- 9
14H -	- 8
19H -	- 7
1EH -	- 6
23H -	- 5
28H -	- 4
2DH -	- 3
32H -	- 2
37H -	- 1
40H -	0
48H -	1
4DH -	2
52H -	3
57H -	4
5CH -	5
61H -	6
66H -	7
6BH -	8
70H -	9
75H -	10
7AH -	11
7FH -	12

MIDI Data - EQ Mid Quality Table

Data	Q
00H -	0.5
2AH -	1
2AH -	2
3FH -	4
54H -	8

● Compressor Parameter

cc=Compressor Number : 30H, 32H (COMP 1, COMP 2)

Start Address	Data	Contents and Remarks	
cc 00	20 - 7F	Compressor Library Name - 1	(ASCII)
:	:	:	
cc 09	20 - 7F	Compressor Library Name -10	
cc 0A	00 -	(Reserved)	
cc 0B	00 - 01	Compressor Link Switch	OFF, ON
cc 0C	44 - 00	Compressor Threshold	-60,,,0dB
cc 0D	00 - 64	Compressor Attack	0,,,100
cc 0E	00 - 64	Compressor Release	0,,,100
cc 0F	00 - 03	Compressor Ratio	1.5:1,2:1,4:1,100:1
cc 10	44 - 0C	Compressor Level	-60,,,+12dB

● Effect Parameter

cc= Effect Number : 34H, 36H (FX1, FX2)

Start Address	Data	Contents and Remarks	
cc 00	20 - 7F	Effects Patch Name - 1	(ASCII)
:	:	:	
cc 09	20 - 7F	Effects Patch Name -10	
cc 0A	00 - ??	Effects Algorithm Number	
		0:Reverb + Gate	
		1:Ez Delay	
		2:Vocal Multi	
		3:Guitar Multi	
		4:Keyboard Multi	
		5:Reverb 2	
		6:Stereo Delay Chorus	
		7:Stereo Pitch Shifter	
		8:Chorus RSS	
		9:Delay RSS	
		10:Panner RSS	
		11:Mic Simulator	
		12:Guitar Amp Simulator	
		13:Stereo Dynamics Processor	
		14:Dynamics Processor x2	
		15:4Band Parametric Equalizer	

		16:10Band Graphic Equalizer
		17:4 Button Chorus
		18:Stereo Flanger
		19:80"s Phaser
		20:Hum Canceler
		21:Center Canceler
		22:Isolator & Filter
		51:Speaker Modeling
cc 0B	00 - 7F	Effects Parameters
:	:	
cc 3F	00 - 7F	

Algorithm 0 Reverb + Gate

cc 0B	00 -	(Reserved)
cc 0C	00 - 01	EQ: SW 0,1 = Off,On
cc 0D	00 - 01	EQ: Low EQ Type 0,1 = Shelving, Peaking
cc 0E	00 - 01	EQ: High EQ Type 0,1 = Shelving, Peaking
cc 0F	74 - 0C	EQ: Low EQ Gain -12,,,12dB
cc 10	74 - 0C	EQ: Mid EQ Gain -12,,,12dB
cc 11	74 - 0C	EQ: High EQ Gain -12,,,12dB
cc 12	0aaaaaaa	EQ: Low EQ Frequency
cc 13#	0bbbbbbb	2,,,200 = 20,,,2000Hz
cc 14	0aaaaaaa	EQ: Mid EQ Frequency
cc 15#	0bbbbbbb	20,,,800 = 200,,,8000Hz
cc 16	0aaaaaaa	EQ: High EQ Frequency
cc 17#	0bbbbbbb	14,,,200 = 1.4,,,20.0kHz
cc 18	03 - 64	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
cc 19	03 - 64	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
cc 1A	03 - 64	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
cc 1B	44 - 0C	EQ: Out Level -60,,,+12dB
cc 1C	00 - 01	Reverb: SW 0,1 = Off,On
cc 1D	05 - 28	Reverb: Type (Room Size) 5,,,40m
cc 1E	0aaaaaaa	Reverb: Reverb Time
cc 1F#	0bbbbbbb	1,,,320 = 0.1,,,32.0s
cc 20	00 - 64	Reverb: Effect Level 0,,,100
cc 21	00 - 64	Reverb: Direct Level 0,,,100
cc 22	0aaaaaaa	Reverb: Pre Delay
cc 23#	0bbbbbbb	0,,,200 = 0,,,200ms
cc 24	00 - 64	Reverb: Diffusion 0,,,100
cc 25	00 - 64	Reverb: Density 0,,,100
cc 26	00 - 64	Reverb: Early Reflection Level 0,,,100
cc 27	00 -	(Reserved)
cc 28	0aaaaaaa	Reverb: LF Damp Frequency
cc 29#	0bbbbbbb	5,,,400 = 50,,,4000Hz
cc 2A	5C - 00	Reverb: LF Damp Gain -36,,,0dB
cc 2B	00 -	(Reserved)
cc 2C	0aaaaaaa	Reverb: HF Damp Frequency
cc 2D#	0bbbbbbb	10,,,200 = 1.0,,,20.0kHz
cc 2E	5C - 00	Reverb: HF Damp Gain -36,,,0dB
cc 2F	00 -	(Reserved)
cc 30	0aaaaaaa	Reverb: HI Cut Frequency
cc 31#	0bbbbbbb	2,,,200 = 0.2,,,20.0kHz
cc 32	00 - 01	Gate: SW 0,1 = Off,On
cc 33	00 - 01	Gate: Mode 0,1 = Gate,Duck
cc 34	00 - 64	Gate: Threshold 0,,,100
cc 35	00 - 64	Gate: Attack 0,,,100
cc 36	00 - 64	Gate: Hold 0,,,100
cc 37	00 - 64	Gate: Release 0,,,100
cc 38	00	(Reserved)
:	:	
cc 3F	00	

Algorithm 1 Ez Delay

cc 0B	00 - 01	Filter: SW 0,1 = Off,On
cc 0C	00 - 03	Filter: Type 0,,,3 = LPF,BPF,HPF,Notch
cc 0D	00 - 01	Filter: Slope 0,1 = -12,-24
cc 0E	00 - 64	Filter: Cut Off Frequency 0,,,100
cc 0F	00 - 64	Filter: Resonance 0,,,100
cc 10	00 - 18	Filter: Gain 0,,,24dB
cc 11	00 - 01	Delay: SW 0,1 = Off,On
cc 12	00 - 02	Delay: Mode 0,1,2 = Stereo,Mono,Alt
cc 13	00 -	(Reserved)
cc 14	0aaaaaaa	Delay: Delay Time
cc 15#	0bbbbbbb	1,,,1200ms
cc 16	0aaaaaaa	Delay: L-R Shift
cc 17#	0bbbbbbb	-1199,,,1199 = L1199,,,R1199ms
cc 18	00 - 01	Delay: L-R Order 0,1 = L>>R,L<<R
cc 19	00 - 64	Delay: Feedback 0,,,100
cc 1A	00 - 64	Delay: Effect Level 0,,,100
cc 1B	00 - 64	Delay: Direct Level 0,,,100
cc 1C	0aaaaaaa	Delay: LF Damp Frequency
cc 1D#	0bbbbbbb	5,,,400 = 50,,,4000Hz
cc 1E	5C - 00	Delay: LF Damp Gain -36,,,0dB
cc 1F	00 -	(Reserved)
cc 20	0aaaaaaa	Delay: HF Damp Frequency
cc 21#	0bbbbbbb	10,,,200 = 1.0,,,20.0kHz
cc 22	5C - 00	Delay: HF Damp Gain -36,,,0dB
cc 23	00 - 01	Gate: SW 0,1 = Off,On
cc 24	00 - 01	Gate: Mode 0,1 = Gate,Duck
cc 25	00 - 64	Gate: Threshold 0,,,100
cc 26	00 - 64	Gate: Attack 0,,,100

	cc 27	00 - 64	Gate: Hold 0,,,100
	cc 28	00 - 64	Gate: Release 0,,,100
	cc 29	00	(Reserved)
:	:		
	cc 3F	00	

* (Delay Time) + (Absolute value of L-R Shift) should be 1200 or less.

Algorithm 2 Vocal Multi

	cc 0B	00 - 01	Noise Suppressor: SW 0,1 = Off,On
	cc 0C	00 - 64	Noise Suppressor: Threshold 0,,,100
	cc 0D	00 - 64	Noise Suppressor: Release 0,,,100
	cc 0E	00 - 01	Limiter/De-esser: SW 0,1 = Off,On
	cc 0F	00 - 01	Limiter/De-esser: Mode 0,1 = Limiter,De-esser
	cc 10	44 - 0C	Limiter: Out Level -60,,,+12dB
	cc 11	44 - 00	Limiter: Threshold -60,,,0dB
	cc 12	00 - 64	Limiter: Release 0,,,100
	cc 13	00 - 64	De-esser: Sens 0,,,100
	cc 14	0A - 64	De-esser: Frequency 10,,,100 = 1.0,,,10.0kHz
	cc 15	00 - 01	Enhancer: SW 0,1 = Off,On
	cc 16	00 - 64	Enhancer: Sens 0,,,100
	cc 17	0A - 64	Enhancer: Frequency 10,,,100 = 1.0,,,10.0kHz
	cc 18	00 - 64	Enhancer: Mix Level 0,,,100
	cc 19	00 - 64	Enhancer: Out Level 0,,,100
	cc 1A	00 - 01	EQ: SW 0,1 = Off,On
	cc 1B	00 - 01	EQ: Low EQ Type 0,1 = Shelving, Peaking
	cc 1C	00 - 01	EQ: High EQ Type 0,1 = Shelving, Peaking
	cc 1D	74 - 0C	EQ: Low EQ Gain -12,,,12dB
	cc 1E	74 - 0C	EQ: Mid EQ Gain -12,,,12dB
	cc 1F	74 - 0C	EQ: High EQ Gain -12,,,12dB
	cc 20	0aaaaaaa	EQ: Low EQ Frequency
	cc 21#	0bbbbbbb	2,,,200 = 20,,,2000Hz
	cc 22	0aaaaaaa	EQ: Mid EQ Frequency
	cc 23#	0bbbbbbb	20,,,800 = 200,,,8000Hz
	cc 24	0aaaaaaa	EQ: High EQ Frequency
	cc 25#	0bbbbbbb	14,,,200 = 1.4,,,20.0kHz
	cc 26	03 - 64	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
	cc 27	03 - 64	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
	cc 28	03 - 64	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
	cc 29	44 - 0C	EQ: Out Level -60,,,+12dB
	cc 2A	00 - 01	Pitch Shifter: SW 0,1 = Off,On
	cc 2B	74 - 0C	Pitch Shifter: Pitch -12,,,12
	cc 2C	0aaaaaaa	Pitch Shifter: Fine
	cc 2D#	0bbbbbbb	-100,,,100cent
	cc 2E	00 - 64	Pitch Shifter: Effect Level 0,,,100
	cc 2F	00 - 64	Pitch Shifter: Direct Level 0,,,100
	cc 30	00 - 01	Delay: SW 0,1 = Off,On
	cc 31	01 - 02	Delay: Mode 1,2 = Mono,Alt
	cc 32	0aaaaaaa	Delay: Delay Time
	cc 33#	0bbbbbbb	1,,,1200ms
	cc 34	00 - 64	Delay: Feedback 0,,,100
	cc 35	00 - 64	Delay: Effect Level 0,,,100
	cc 36	00 - 64	Delay: Direct Level 0,,,100
	cc 37	00 - 01	Chorus: SW 0,1 = Off,On
	cc 38	00 - 01	Chorus: Modulation LR Phase 0,1 = Nor,Inv
	cc 39	00 - 64	Chorus: Depth 0,,,100
	cc 3A	00 - 64	Chorus: Rate 0,,,100
	cc 3B	00 - 64	Chorus: Effect Level 0,,,100
	cc 3C	00 - 64	Chorus: Direct Level 0,,,100
	cc 3D	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 3 Guitar Multi

	cc 0B	00 - 01	Compressor: SW 0,1 = Off,On
	cc 0C	00 - 64	Compressor: Attack 0,,,100
	cc 0D	00 - 64	Compressor: Level 0,,,100
	cc 0E	00 - 64	Compressor: Sustain 0,,,100
	cc 0F	00 - 64	Compressor: Tone 0,,,100
	cc 10	00 - 01	Auto/Touch Wah: SW 0,1 = Off,On
	cc 11	00 - 01	Auto/Touch Wah: Filter Type 0,1 = LPF,BPF
	cc 12	00 - 64	Auto/Touch Wah: Frequency 0,,,100
	cc 13	00 - 64	Auto/Touch Wah: Peak 0,,,100
	cc 14	00 - 01	Auto/Touch Wah: Polarity 0,1 = Up,Down
	cc 15	00 - 64	Touch Wah: Trigger Sens 0,,,100
	cc 16	00 - 64	Auto Wah: LFO Depth 0,,,100
	cc 17	00 - 64	Auto Wah: LFO Rate 0,,,100
	cc 18	00 - 01	Driver: SW 0,1 = Off,On
	cc 19	00 - 02	Driver: Type 0,1,2 = OD,DS,METAL
	cc 1A	00 - 64	Driver: Gain 0,,,100
	cc 1B	00 - 64	Driver: Level 0,,,100
	cc 1C	00 - 64	OD/DS: Tone 0,,,100
	cc 1D	00 - 64	METAL: High Gain 0,,,100
	cc 1E	00 - 64	METAL: Middle Gain 0,,,100

cc 1F	00 - 64	METAL: Low Gain	0,,,100
cc 20	00 - 01	Amp Simulator: SW	0,1 = Off,On
cc 21	00 - 02	Amp Simulator: Type	0,1,2,3 = Small,Biltin,2Stack,3Stack
cc 22	00 - 01	Noise Suppressor: SW	0,1 = Off,On
cc 23	00 - 64	Noise Suppressor: Threshold	0,,,100
cc 24	00 - 64	Noise Suppressor: Release	0,,,100
cc 25	00 -	(Reserved)	
cc 26	00 - 01	Delay: SW	0,1 = Off,On
cc 27	01 - 02	Delay: Mode	1,2 = Mono,Alt
cc 28	0aaaaaaa	Delay: Delay Time	
cc 29#	0bbbbbbb		1,,,1200ms
cc 2A	00 - 64	Delay: Feedback	0,,,100
cc 2B	00 - 64	Delay: Effect Level	0,,,100
cc 2C	00 - 64	Delay: Direct Level	0,,,100
cc 2D	00 - 01	Chorus/Flanger: SW	0,1 = Off,On
cc 2E	00 - 01	Chorus/Flanger: Mode	0,1 = Chorus,Flanger
cc 2F	00 - 01	Chorus/Flanger: Modulation LR Phase	0,1 = Nor,Inv
cc 30	00 - 64	Chorus/Flanger: Depth	0,,,100
cc 31	00 - 64	Chorus/Flanger: Rate	0,,,100
cc 32	00 - 64	Flanger: Manual	0,,,100
cc 33	00 - 64	Flanger: Resonance	0,,,100
cc 34	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 4 Keyboard Multi

cc 0B	00 - 01	Ring Modulator: SW	0,1 = Off,On
cc 0C	00 - 64	Ring Modulator: Osc. Frequency	0,,,100
cc 0D	00 - 64	Ring Modulator: Effect Level	0,,,100
cc 0E	00 - 64	Ring Modulator: Direct Level	0,,,100
cc 0F	00 -	(Reserved)	
cc 10	00 - 01	EQ: SW	0,1 = Off,On
cc 11	00 - 01	EQ: Low EQ Type	0,1 = Shelving, Peaking
cc 12	00 - 01	EQ: High EQ Type	0,1 = Shelving, Peaking
cc 13	74 - 0C	EQ: Low EQ Gain	-12,,,12dB
cc 14	74 - 0C	EQ: Mid EQ Gain	-12,,,12dB
cc 15	74 - 0C	EQ: High EQ Gain	-12,,,12dB
cc 16	0aaaaaaa	EQ: Low EQ Frequency	
cc 17#	0bbbbbbb		2,,,200 = 20,,,2000Hz
cc 18	0aaaaaaa	EQ: Mid EQ Frequency	
cc 19#	0bbbbbbb		20,,,800 = 200,,,8000Hz
cc 1A	0aaaaaaa	EQ: High EQ Frequency	
cc 1B#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
cc 1C	03 - 64	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
cc 1D	03 - 64	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 1E	03 - 64	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
cc 1F	44 - 0C	EQ: Out Level	-60,,,+12dB
cc 20	00 - 01	Noise Suppressor: SW	0,1 = Off,On
cc 21	00 - 64	Noise Suppressor: Threshold	0,,,100
cc 22	00 - 64	Noise Suppressor: Release	0,,,100
cc 23	00 - 01	Phaser: SW	0,1 = Off,On
cc 24	00 - 64	Phaser: Center Frequency	0,,,100
cc 25	00 - 64	Phaser: Resonance	0,,,100
cc 26	00 - 64	Phaser: Depth	0,,,100
cc 27	00 - 64	Phaser: Rate	0,,,100
cc 28	00 - 64	Phaser: Separation	0,,,100
cc 29	00 - 01	Delay: SW	0,1 = Off,On
cc 2A	0aaaaaaa	Delay: Delay Time	
cc 2B#	0bbbbbbb		1,,,1200ms
cc 2C	00 - 64	Delay: Feedback	0,,,100
cc 2D	00 - 64	Delay: Effect Level	0,,,100
cc 2E	00 - 64	Delay: Direct Level	0,,,100
cc 2F	00 - 01	Chorus: SW	0,1 = Off,On
cc 30	00 - 01	Chorus: Modulation LR Phase	0,1 = Nor,Inv
cc 31	00 - 64	Chorus: Depth	0,,,100
cc 32	00 - 64	Chorus: Rate	0,,,100
cc 33	00 - 64	Chorus: Effect Level	0,,,100
cc 34	00 - 64	Chorus: Direct Level	0,,,100
cc 35	00 - 32	Chorus: Pre Delay	0,,,50ms
cc 36	04 - 50	Chorus: Lo Cut Frequency	
			4,,,80 = Thru,50,,,800Hz
cc 37	05 - 7E	Chorus: Hi Cut Frequency	
			5,,,126 = 0.5,,,12.5kHz,Thru
cc 38	00 - 01	Tremolo/Pan: SW	0,1 = Off,On
cc 39	00 - 03	Tremolo/Pan: Mode	
			0,1,2,3 = TRM-S,TRM-T,PAN-S,PAN-T
cc 3A	00 - 64	Tremolo/Pan: Depth	0,,,100
cc 3B	00 - 64	Tremolo/Pan: Rate	0,,,100
cc 3C	01 - 7F	Tremolo/Pan: L-R Balance	1,,,127 = L63,,,R63
cc 3D	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 5 Reverb 2

cc 0B	00 -	(Reserved)	
cc 0C	00 - 01	EQ: SW	0,1 = Off,On
cc 0D	00 - 01	EQ: Low EQ Type	0,1 = Shelving, Peaking
cc 0E	00 - 01	EQ: High EQ Type	0,1 = Shelving, Peaking
cc 0F	74 - 0C	EQ: Low EQ Gain	-12,,,12dB
cc 10	74 - 0C	EQ: Mid EQ Gain	-12,,,12dB
cc 11	74 - 0C	EQ: High EQ Gain	-12,,,12dB
cc 12	0aaaaaaa	EQ: Low EQ Frequency	
cc 13#	0bbbbbbb		2,,,200 = 20,,,2000Hz
cc 14	0aaaaaaa	EQ: Mid EQ Frequency	
cc 15#	0bbbbbbb		20,,,800 = 200,,,8000Hz
cc 16	0aaaaaaa	EQ: High EQ Frequency	
cc 17#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
cc 18	03 - 64	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
cc 19	03 - 64	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 1A	03 - 64	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
cc 1B	44 - 0C	EQ: Out Level	-60,,,+12dB
cc 1C	00 - 01	Reverb: SW	0,1 = Off,On
cc 1D	01 - 0A	Reverb: Type	1,,,10
cc 1E	05 - 28	Reverb: Room Size	5,,,40m
cc 1F	00 -	(Reserved)	
cc 20	0aaaaaaa	Reverb: Reverb Time	
cc 21#	0bbbbbbb		1,,,320 = 0.1,,,32.0s
cc 22	00 - 64	Reverb: Effect Level	0,,,100
cc 23	00 - 64	Reverb: Direct Level	0,,,100
cc 24	0aaaaaaa	Reverb: Pre Delay	
cc 25#	0bbbbbbb		0,,,200 = 0,,,200ms
cc 26	00 - 64	Reverb: Density	0,,,100
cc 27	00 - 64	Reverb: Early Reflection Level	0,,,100
cc 28	0aaaaaaa	Reverb: LF Damp Frequency	
cc 29#	0bbbbbbb		5,,,400 = 50,,,4000Hz
cc 2A	5C - 00	Reverb: LF Damp Gain	-36,,,0dB
cc 2B	00 -	(Reserved)	
cc 2C	0aaaaaaa	Reverb: HF Damp Frequency	
cc 2D#	0bbbbbbb		10,,,200 = 1.0,,,20.0kHz
cc 2E	5C - 00	Reverb: HF Damp Gain	-36,,,0dB
cc 2F	00 -	(Reserved)	
cc 30	0aaaaaaa	Reverb: HI Cut Frequency	
cc 31#	0bbbbbbb		2,,,200 = 0.2,,,20.0kHz
cc 32	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 6 Stereo Delay Chorus

cc 0B	00 - 01	Delay: SW	0,1 = Off,On
cc 0C	0aaaaaaa	Delay: Delay Time Lch	
cc 0D#	0bbbbbbb		1,,,1200ms
cc 0E	0aaaaaaa	Delay: Delay Time Rch	
cc 0F#	0bbbbbbb		1,,,1200ms
cc 10	00 - 64	Delay: Feedback Lch	0,,,100
cc 11	00 - 64	Delay: Feedback Rch	0,,,100
cc 12	00 - 64	Delay: Effect Level	0,,,100
cc 13	00 - 64	Delay: Direct Level	0,,,100
cc 14	0aaaaaaa	Delay: Hi Cut Frequency	
cc 15#	0bbbbbbb		2,,,201 = 0.2,,,20.0kHz,Thru
cc 16	5C - 00	Delay: Hi Damp Gain	-36,,,0dB
cc 17	00 - 01	Chorus: SW	0,1 = Off,On
cc 18	00 - 01	Chorus: Modulation LR Phase	0,1 = Nor,Inv
cc 19	00 - 64	Chorus: Depth	0,,,100
cc 1A	00 - 64	Chorus: Rate	0,,,100
cc 1B	00 - 64	Chorus: Effect Level	0,,,100
cc 1C	00 - 64	Chorus: Direct Level	0,,,100
cc 1D	00 - 32	Chorus: Pre Delay	0,,,50ms
cc 1E	04 - 50	Chorus: Lo Cut Frequency	
			4,,,80 = Thru,50,,,800Hz
cc 1F	05 - 7E	Chorus: Hi Cut Frequency	
			5,,,126 = 0.5,,,12.5kHz,Thru
cc 20	00 - 01	EQ: SW	0,1 = Off,On
cc 21	00 - 01	EQ: Low EQ Type	0,1 = Shelving, Peaking
cc 22	00 - 01	EQ: High EQ Type	0,1 = Shelving, Peaking
cc 23	74 - 0C	EQ: Low EQ Gain	-12,,,12dB
cc 24	74 - 0C	EQ: Mid EQ Gain	-12,,,12dB
cc 25	74 - 0C	EQ: High EQ Gain	-12,,,12dB
cc 26	0aaaaaaa	EQ: Low EQ Frequency	
cc 27#	0bbbbbbb		2,,,200 = 20,,,2000Hz
cc 28	0aaaaaaa	EQ: Mid EQ Frequency	
cc 29#	0bbbbbbb		20,,,800 = 200,,,8000Hz
cc 2A	0aaaaaaa	EQ: High EQ Frequency	
cc 2B#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
cc 2C	03 - 64	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
cc 2D	03 - 64	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 2E	03 - 64	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
cc 2F	44 - 0C	EQ: Out Level	-60,,,+12dB
cc 30	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 7 Stereo Pitch Shifter

cc 0B	00 - 01	Pitch Shifter: SW	0,1 = Off,On
cc 0C	00 - 01	Pitch Shifter: Stereo Link	0,1 = Off,On
cc 0D	00 - 04	Pitch Shifter: Grade	1,,,5
cc 0E	00 -	(Reserved)	
cc 0F	74 - 0C	Pitch Shifter: Pitch	-12,,,12
cc 10	0aaaaaaa	Pitch Shifter: Fine	
cc 11#	0bbbbbbb		-100,,,100cent
cc 12	00 -	(Reserved)	
cc 13	74 - 0C	Pitch Shifter: Pitch	-12,,,12
cc 14	0aaaaaaa	Pitch Shifter: Fine	
cc 15#	0bbbbbbb		-100,,,100cent
cc 16	00 - 64	Pitch Shifter: Effect Level	0,,,100
cc 17	00 - 64	Pitch Shifter: Direct Level	0,,,100
cc 18	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 8 Chorus RSS

cc 0B	00 - 01	Chorus: SW	0,1 = Off,On
cc 0C	00 - 01	Chorus: Modulation LR Phase	0,1 = Nor,Inv
cc 0D	00 - 64	Chorus: Depth	0,,,100
cc 0E	00 - 64	Chorus: Rate	0,,,100
cc 0F	00 - 64	Chorus: Effect Level	0,,,100
cc 10	00 - 64	Chorus: Direct Level	0,,,100
cc 11	00 - 32	Chorus: Pre Delay	0,,,50ms
cc 12	04 - 50	Chorus: Lo Cut Frequency	
			4,,,80 = Thru,50,,,800Hz
cc 13	05 - 7E	Chorus: Hi Cut Frequency	
			5,,,126 = 0.5,,,12.5kHz,Thru
cc 14	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 9 Delay RSS

cc 0B	00 - 01	Delay: SW	0,1 = Off,On
cc 0C	0aaaaaaa	Delay: Delay Time	
cc 0D#	0bbbbbbb		1,,,1200ms
cc 0E	0aaaaaaa	Delay: RSS Shift	
cc 0F#	0bbbbbbb		-1199,,,1199ms
cc 10	0aaaaaaa	Delay: L-R Shift	
cc 11#	0bbbbbbb		-1199,,,1199 = L1199,,,R1199ms
cc 12	00 - 64	Delay: Feedback	0,,,100
cc 13	00 - 64	Delay: Effect Level	0,,,100
cc 14	00 - 64	Delay: Mono Delay Level	0,,,100
cc 15	00 - 64	Delay: RSS Delay Level	0,,,100
cc 16	00 - 64	Delay: Direct Level	0,,,100
cc 17	00 -	(Reserved)	
cc 18	0aaaaaaa	Delay: LF Damp Frequency	
cc 19#	0bbbbbbb		5,,,400 = 50,,,4000Hz
cc 1A	5C - 00	Delay: LF Damp Gain	-36,,,0dB
cc 1B	00 -	(Reserved)	
cc 1C	0aaaaaaa	Delay: HF Damp Frequency	
cc 1D#	0bbbbbbb		10,,,200 = 1.0,,,20.0kHz
cc 1E	5C - 00	Delay: HF Damp Gain	-36,,,0dB
cc 1F	00	(Reserved)	
:	:		
cc 3F	00		

* (Delay Time) + (Absolute value of L-R Shift) should be 1200 or less.

Algorithm 10 Panner RSS

cc 0B	00 - 01	Panner: SW	0,1 = Off,On
cc 0C	00 - 64	Panner: Speed	0,,,100
cc 0D	00 - 01	Panner: Direction	0,1 = CW,CCW
cc 0E	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 11 Mic Simulator

cc 0B	00 - 01	Mic Simulator: Stereo Link SW	0,1 = Off,On
cc 0C	00 - 01	Mic Simulator A: SW	0,1 = Off,On
cc 0D	00 - 01	Mic Converter A: Switch	0,1 = Off,On
cc 0E	00 - 04	Mic Converter A: Input	
			0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
cc 0F	00 - 06	Mic Converter A: Output	
			0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
cc 10	00 - 01	Mic Converter A: Phase	0,1 = Nor,Inv
cc 11	00 - 01	Bass Cut A: Switch	0,1 = Off,On
cc 12	0aaaaaaa	Bass Cut A: Frequency	
cc 13#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
cc 14	00 - 01	Position A: Switch	0,1 = Off,On
cc 15	74 - 0C	Position A: Proximity Effect	-12,,,+12
cc 16	0aaaaaaa	Position A: Distance	
cc 17#	0bbbbbbb		0,,,1000 = 0,,,3000cm
cc 18	00 - 01	Mic Simulator B: SW	0,1 = Off,On
cc 19	00 - 01	Mic Converter B: Switch	0,1 = Off,On
cc 1A	00 - 04	Mic Converter B: Input	
			0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
cc 1B	00 - 06	Mic Converter B: Output	
			0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat

cc 1C	00 - 01	Mic Converter B: Phase	0,1 = Nor,Inv
cc 1D	00 - 01	Bass Cut B: Switch	0,1 = Off,On
cc 1E cc 1F#	0aaaaaaa 0bbbbbbb	Bass Cut B: Frequency	1,,,200 = Thru,20,,,2000Hz
cc 20	00 - 01	Position B: Switch	0,1 = Off,On
cc 21	74 - 0C	Position B: Proximity Effect	-12,,,+12
cc 22 cc 23#	0aaaaaaa 0bbbbbbb	Position B: Distance	0,,,1000 = 0,,,3000cm
cc 24	00	(Reserved)	
:	:		
cc 7F	00		

* When Mic Converter Input = MinCn, Output is fixed to SmlDy or LrgCn.
* When Link SW = On, Bch corresponds to Ach.

Algorithm 12 Guitar Amp Simulator

cc 0B	00 - 01	Noise Suppressor: SW	0,1 = Off,On
cc 0C	00 - 64	Noise Suppressor: Threshold	0,,,100
cc 0D	00 - 64	Noise Suppressor: Release	0,,,100
cc 0E	00 - 01	Pre Amp: SW	0,1 = Off,On
cc 0F	00 - 0D	Pre Amp: Type	0,,,13 = JC-120,Clean Twin,Match Drive,BG Lead, MS1959(I), MS1959(II), MS1959(I+II), SLDN Lead, Metal 5150, Metal Lead, OD-1, OD-2Turbo, Distortion, Fuzz
cc 10	00 - 64	Pre Amp: Volume	0,,,100
cc 11	00 - 64	Pre Amp: Bass	0,,,100
cc 12	00 - 64	Pre Amp: Middle	0,,,100
cc 13	00 - 64	Pre Amp: Treble	0,,,100
cc 14	00 - 64	Pre Amp: Presence	0,,,100
cc 15	00 - 64	Pre Amp: Master	0,,,100
cc 16	00 - 01	Pre Amp: Bright	0,1 = Off,On
cc 17	00 - 02	Pre Amp: Gain	0,1,2 = Low,Middle,High
cc 18	00 - 01	Speaker: SW	0,1 = Off,On
cc 19	00 - 0C	Speaker: Type	0,,,11 = Small. Middle, JC-120, Built In 1, Built In 2,Built In 3, Built In 4, BG Stack 1, BG Stack 2, MS Stack 1, MS Stack 2, Metal Stack
cc 1A	01 - 03	Speaker: MIC Setting	1,,,3
cc 1B	00 - 64	Speaker: MIC Level	0,,,100
cc 1C	00 - 64	Speaker: Direct Level	0,,,100
cc 1D	00	(Reserved)	
:	:		
cc 7F	00		

* Pre Amp Middle is invalid when the Mode = Match Drive.
* When the Mode = Match Drive, Pre Amp Presence works counter to the value (-100,,,0).
* Pre Amp Bright is available only when the Mode = JC-120, Clean Twin, or BG Lead.

Algorithm 13 Stereo Dynamics Processor

cc 0B	00 - 01	Compressor/Limiter: SW	0,1 = Off,On
cc 0C	44 - 00	Compressor/Limiter: Threshold	-60,,,0dB
cc 0D	00 - 64	Compressor/Limiter: Attack	0,,,100
cc 0E	00 - 64	Compressor/Limiter: Release	0,,,100
cc 0F	00 - 03	Compressor/Limiter: Ratio	0,,,3 = 1.5:1,2:1,4:1,100:1
cc 10	44 - 0C	Compressor/Limiter: Out Level	-60,,,+12dB
cc 11	00 - 01	Enhancer: SW	0,1 = Off,On
cc 12	00 - 64	Enhancer: Sens	0,,,100
cc 13	0A - 64	Enhancer: Frequency	10,,,100 = 1.0,,,10.0kHz
cc 14	00 - 64	Enhancer: Mix Level	0,,,100
cc 15	00 - 64	Enhancer: Out Level	0,,,100
cc 16	00 - 01	EQ: SW	0,1 = Off,On
cc 17	00 - 01	EQ: Low EQ Type	0,1 = Shelving, Peaking
cc 18	00 - 01	EQ: High EQ Type	0,1 = Shelving, Peaking
cc 19	74 - 0C	EQ: Low EQ Gain	-12,,,12dB
cc 1A	74 - 0C	EQ: Mid EQ Gain	-12,,,12dB
cc 1B	74 - 0C	EQ: High EQ Gain	-12,,,12dB
cc 1C cc 1D#	0aaaaaaa 0bbbbbbb	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
cc 1E cc 1F#	0aaaaaaa 0bbbbbbb	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
cc 20 cc 21#	0aaaaaaa 0bbbbbbb	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
cc 22	03 - 64	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
cc 23	03 - 64	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 24	03 - 64	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
cc 25	44 - 0C	EQ: Out Level	-60,,,+12dB
cc 26	00 - 01	Noise Suppressor: SW	0,1 = Off,On
cc 27	00 - 64	Noise Suppressor: Threshold	0,,,100
cc 28	00 - 64	Noise Suppressor: Release	0,,,100
cc 29	00	(Reserved)	
:	:		
cc 3F	00		

Algorithm 14 Dynamics Processor x2

cc 0B	00 - 01	Dynamics A: SW	0,1 = Off,On
cc 0C	00 - 01	Compressor/Limiter A: Switch	0,1 = Off,On
cc 0D	44 - 00	Compressor/Limiter A: Threshold	-60,,,0dB
cc 0E	00 - 64	Compressor/Limiter A: Attack	0,,,100
cc 0F	00 - 64	Compressor/Limiter A: Release	0,,,100

cc 10	00 - 03	Compressor/Limiter A: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1	
cc 11	44 - 0C	Compressor/Limiter A: Out Level	-60,,,+12dB
cc 12	00 - 01	Enhancer A: Switch	0,1 = Off,On
cc 13	00 - 64	Enhancer A: Sens	0,,,100
cc 14	0A - 64	Enhancer A: Frequency	10,,,100 = 1.0,,,10.0kHz
cc 15	00 - 64	Enhancer A: Mix Level	0,,,100
cc 16	00 - 64	Enhancer A: Out Level	0,,,100
cc 17	00 - 01	EQ A: Switch	0,1 = Off,On
cc 18 cc 19#	0aaaaaaa 0bbbbbbb	EQ A: Low EQ Frequency	2,,,200 = 20,,,2000Hz
cc 1A cc 1B#	0aaaaaaa 0bbbbbbb	EQ A: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
cc 1C cc 1D#	0aaaaaaa 0bbbbbbb	EQ A: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
cc 1E	74 - 0C	EQ A: Low EQ Gain	-12,,,12dB
cc 1F	74 - 0C	EQ A: Mid EQ Gain	-12,,,12dB
cc 20	74 - 0C	EQ A: High EQ Gain	-12,,,12dB
cc 21	03 - 64	EQ A: Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 22	44 - 0C	EQ A: Out Level	-60,,,+12dB
cc 23	00 - 01	Noise Suppressor A: Switch	0,1 = Off,On
cc 24	00 - 64	Noise Suppressor A: Threshold	0,,,100
cc 25	00 - 64	Noise Suppressor A: Release	0,,,100
cc 26	00 - 01	Compressor/Limiter B: Switch	0,1 = Off,On
cc 27	44 - 00	Compressor/Limiter B: Threshold	-60,,,0dB
cc 28	00 - 64	Compressor/Limiter B: Attack	0,,,100
cc 29	00 - 64	Compressor/Limiter B: Release	0,,,100
cc 2A	00 - 03	Compressor/Limiter B: Ratio 0,,,3 = 1.5:1,2:1,4:1,100:1	
cc 2B	44 - 0C	Compressor/Limiter B: Out Level	-60,,,+12dB
cc 2C	00 - 01	Enhancer B: Switch	0,1 = Off,On
cc 2D	00 - 64	Enhancer B: Sens	0,,,100
cc 2E	0A - 64	Enhancer B: Frequency	10,,,100 = 1.0,,,10.0kHz
cc 2F	00 - 64	Enhancer B: Mix Level	0,,,100
cc 30	00 - 64	Enhancer B: Out Level	0,,,100
cc 31	00 - 01	EQ B: Switch	0,1 = Off,On
cc 32 cc 33#	0aaaaaaa 0bbbbbbb	EQ B: Low EQ Frequency	2,,,200 = 20,,,2000Hz
cc 34 cc 35#	0aaaaaaa 0bbbbbbb	EQ B: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
cc 36 cc 37#	0aaaaaaa 0bbbbbbb	EQ B: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
cc 38	74 - 0C	EQ B: Low EQ Gain	-12,,,12dB
cc 39	74 - 0C	EQ B: Mid EQ Gain	-12,,,12dB
cc 3A	74 - 0C	EQ B: High EQ Gain	-12,,,12dB
cc 3B	03 - 64	EQ B: Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 3C	44 - 0C	EQ B: Out Level	-60,,,+12dB
cc 3D	00 - 01	Noise Suppressor B: Switch	0,1 = Off,On
cc 3E	00 - 64	Noise Suppressor B: Threshold	0,,,100
cc 3F	00 - 64	Noise Suppressor B: Release	0,,,100

Algorithm 15 Parametric Equalizer

cc 0B	00 - 01	EQ: Stereo Link SW	0,1 = Off,On
cc 0C	00 - 01	EQ A: SW	0,1 = Off,On
cc 0D	44 - 0C	EQ A: In Level	-60,,,+12dB
cc 0E	00 - 01	EQ A: Low EQ Type	0,1 = Shelving, Peaking
cc 0F	00 - 01	EQ A: High EQ Type	0,1 = Shelving, Peaking
cc 10	74 - 0C	EQ A: Low EQ Gain	-12,,,12dB
cc 11	74 - 0C	EQ A: Low Mid EQ Gain	-12,,,12dB
cc 12	74 - 0C	EQ A: High Mid EQ Gain	-12,,,12dB
cc 13	74 - 0C	EQ A: High EQ Gain	-12,,,12dB
cc 14 cc 15#	0aaaaaaa 0bbbbbbb	EQ A: Low EQ Frequency	2,,,200 = 20,,,2000Hz
cc 16 cc 17#	0aaaaaaa 0bbbbbbb	EQ A: Low Mid EQ Frequency	20,,,800 = 200,,,8000Hz
cc 18 cc 19#	0aaaaaaa 0bbbbbbb	EQ A: High Mid EQ Frequency	20,,,800 = 200,,,8000Hz
cc 1A cc 1B#	0aaaaaaa 0bbbbbbb	EQ A: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
cc 1C	03 - 64	EQ A: Low EQ Q	3,,,100 = 0.3,,,10.0
cc 1D	03 - 64	EQ A: Low Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 1E	03 - 64	EQ A: High Mid EQ Q	3,,,100 = 0.3,,,10.0
cc 1F	03 - 64	EQ A: High EQ Q	3,,,100 = 0.3,,,10.0
cc 20	44 - 0C	EQ A: Out Level	-60,,,+12dB
cc 21	00 -	(Reserved)	
cc 22	00 - 01	EQ A: SW	0,1 = Off,On
cc 23	44 - 0C	EQ A: In Level	-60,,,+12dB
cc 24	00 - 01	EQ A: Low EQ Type	0,1 = Shelving, Peaking
cc 25	00 - 01	EQ A: High EQ Type	0,1 = Shelving, Peaking
cc 26	74 - 0C	EQ A: Low EQ Gain	-12,,,12dB
cc 27	74 - 0C	EQ A: Low Mid EQ Gain	-12,,,12dB
cc 28	74 - 0C	EQ A: High Mid EQ Gain	-12,,,12dB
cc 29	74 - 0C	EQ A: High EQ Gain	-12,,,12dB
cc 2A cc 2B#	0aaaaaaa 0bbbbbbb	EQ A: Low EQ Frequency	2,,,200 = 20,,,2000Hz

	cc 2C	0aaaaaaa	EQ A: Low Mid EQ Frequency
	cc 2D#	0bbbbbbb	20,,,800 = 200,,,8000Hz
	cc 2E	0aaaaaaa	EQ A: High Mid EQ Frequency
	cc 2F#	0bbbbbbb	20,,,800 = 200,,,8000Hz
	cc 30	0aaaaaaa	EQ A: High EQ Frequency
	cc 31#	0bbbbbbb	14,,,200 = 1.4,,,20.0kHz
	cc 32	03 - 64	EQ A: Low EQ Q 3,,,100 = 0.3,,,10.0
	cc 33	03 - 64	EQ A: Low Mid EQ Q 3,,,100 = 0.3,,,10.0
	cc 34	03 - 64	EQ A: High Mid EQ Q 3,,,100 = 0.3,,,10.0
	cc 35	03 - 64	EQ A: High EQ Q 3,,,100 = 0.3,,,10.0
	cc 36	44 - 0C	EQ A: Out Level -60,,,+12dB
	cc 37	00	(Reserved)
:	:		
	cc 3F	00	

* The settings of the Ch.B are refered to those of the Ch.A, when Link Sw is On.

Algorithm 16 Graphic Equalizer

	cc 0B	00 - 01	EQ: Stereo Link SW 0,1 = Off,On
	cc 0C	00 - 01	EQ A: SW 0,1 = Off,On
	cc 0D	44 - 0C	EQ A: In Level -60,,,+12dB
	cc 0E	74 - 0C	EQ A: 31.25 Hz Gain -12,,,12dB
	cc 0F	74 - 0C	EQ A: 62.5 Hz Gain -12,,,12dB
	cc 10	74 - 0C	EQ A: 125 Hz Gain -12,,,12dB
	cc 11	74 - 0C	EQ A: 250 Hz Gain -12,,,12dB
	cc 12	74 - 0C	EQ A: 500 Hz Gain -12,,,12dB
	cc 13	74 - 0C	EQ A: 1 kHz Gain -12,,,12dB
	cc 14	74 - 0C	EQ A: 2 kHz Gain -12,,,12dB
	cc 15	74 - 0C	EQ A: 4 kHz Gain -12,,,12dB
	cc 16	74 - 0C	EQ A: 8 kHz Gain -12,,,12dB
	cc 17	74 - 0C	EQ A: 16 kHz Gain -12,,,12dB
	cc 18	44 - 0C	EQ A: Out Level -60,,,+12dB
	cc 19	00 - 01	EQ B: SW 0,1 = Off,On
	cc 1A	44 - 0C	EQ B: In Level -60,,,+12dB
	cc 1B	74 - 0C	EQ B: 31.25 Hz Gain -12,,,12dB
	cc 1C	74 - 0C	EQ B: 62.5 Hz Gain -12,,,12dB
	cc 1D	74 - 0C	EQ B: 125 Hz Gain -12,,,12dB
	cc 1E	74 - 0C	EQ B: 250 Hz Gain -12,,,12dB
	cc 1F	74 - 0C	EQ B: 500 Hz Gain -12,,,12dB
	cc 20	74 - 0C	EQ B: 1 kHz Gain -12,,,12dB
	cc 21	74 - 0C	EQ B: 2 kHz Gain -12,,,12dB
	cc 22	74 - 0C	EQ B: 4 kHz Gain -12,,,12dB
	cc 23	74 - 0C	EQ B: 8 kHz Gain -12,,,12dB
	cc 24	74 - 0C	EQ B: 16 kHz Gain -12,,,12dB
	cc 25	44 - 0C	EQ B: Out Level -60,,,+12dB
	cc 26	00	(Reserved)
:	:		
	cc 3F	00	

* The settings of the Ch.B are refered to those of the Ch.A, when Link Sw is On.

Algorithm 17 4 Button Chorus

	cc 0B	00 - 01	4 Button Chorus: SW 0,1 = Off,On
	cc 0C	00 - 01	4 Button Chorus: Input Type 0,1 = Mono,Stereo
	cc 0D	00 - 06	4 Button Chorus: Mode 0,,,6 = 1,2,3,4,1+4,2+4,3+4
	cc 0E	00 - 64	4 Button Chorus: Mix Balance 0,,,100
	cc 0F	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 18 Stereo Flanger

	cc 0B	00 - 01	Flanger: SW 0,1 = Off,On
	cc 0C	00 - 01	Flanger: Model 0,1 = Norm,HiBand
	cc 0D	00 - 64	Flanger: Manual 0,,,100
	cc 0E	00 - 64	Flanger: Depth 0,,,100
	cc 0F	00 - 64	Flanger: Rate 0,,,100
	cc 10	00 - 64	Flanger: Resonance 0,,,100
	cc 11	00 -	(Reserved)
	cc 12	0aaaaaaa	Flanger: LFO Phase
	cc 13#	0bbbbbbb	0,,,180deg
	cc 14	0aaaaaaa	Flanger: Cross Feedback
	cc 15#	0bbbbbbb	-100,,,100
	cc 16	0aaaaaaa	Flanger: Cross Mix
	cc 17#	0bbbbbbb	-100,,,100
	cc 18	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 19 80"s Phaser

	cc 0B	00 - 01	Phaser: SW 0,1 = Off,On
	cc 0C	00 - 01	Phaser: Shift Mode 0,1 = 4Stage,8Stage
	cc 0D	00 - 64	Phaser: Center Frequency 0,,,100
	cc 0E	00 - 64	Phaser: Resonance 0,,,100
	cc 0F	00 - 64	Phaser: LFO 1 Depth 0,,,100
	cc 10	00 - 64	Phaser: LFO 1 Rate 0,,,100
	cc 11	00 - 01	Phaser: LFO 1 Phase 0,1 = Nor,Inv
	cc 12	00 - 64	Phaser: LFO 2 Depth 0,,,100

	cc 13	00 - 64	Phaser: LFO 2 Rate 0,,,100
	cc 14	00 - 01	Phaser: LFO 2 Phase 0,1 = Nor,Inv
	cc 15	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 20 Hum Canceler

	cc 0B	00 - 01	Hum Canceler: SW 0,1 = Off,On
	cc 0C	0aaaaaaa	Hum Canceler: Frequency
	cc 0D#	0bbbbbbb	200,,,8000 = 20.0,,,800.0Hz
	cc 0E	0A - 28	Hum Canceler: Width 10,,,40%
	cc 0F	00 - 64	Hum Canceler: Depth 0,,,100
	cc 10	00 - 64	Hum Canceler: Threshold 0,,,100
	cc 11	00 -	(Reserved)
	cc 12	0aaaaaaa	Hum Canceler: Lo Frequency Limit
	cc 13#	0bbbbbbb	1,,,200 = Thru,20,,,2000Hz
	cc 14	0aaaaaaa	Hum Canceler: Hi Frequency Limit
	cc 15#	0bbbbbbb	10,,,201 = 1.0,,,20,0kHz,Thru
	cc 16	00 - 01	Noise Suppressor: SW 0,1 = Off,On
	cc 17	00 - 64	Noise Suppressor: Threshold 0,,,100
	cc 18	00 - 64	Noise Suppressor: Release 0,,,100
	cc 19	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 21 Center Canceler

	cc 0B	00 - 01	Center Canceler: SW 0,1 = Off,On
	cc 0C	47 - 32	Center Canceler: Position -50,,,50
	cc 0D	00 -	(Reserved)
	cc 0E	0aaaaaaa	Center Canceler: Lo Frequency Limit
	cc 0F#	0bbbbbbb	1,,,200 = Thru,20,,,2000Hz
	cc 10	0aaaaaaa	Center Canceler: Hi Frequency Limit
	cc 11#	0bbbbbbb	10,,,201 = 1.0,,,20,0kHz,Thru
	cc 12	00 - 01	EQ: SW 0,1 = Off,On
	cc 13	00 - 01	EQ: Low EQ Type 0,1 = Shelving, Peaking
	cc 14	00 - 01	EQ: High EQ Type 0,1 = Shelving, Peaking
	cc 15	74 - 0C	EQ: Low EQ Gain -12,,,12dB
	cc 16	74 - 0C	EQ: Mid EQ Gain -12,,,12dB
	cc 17	74 - 0C	EQ: High EQ Gain -12,,,12dB
	cc 18	0aaaaaaa	EQ: Low EQ Frequency
	cc 19#	0bbbbbbb	2,,,200 = 20,,,2000Hz
	cc 1A	0aaaaaaa	EQ: Mid EQ Frequency
	cc 1B#	0bbbbbbb	20,,,800 = 200,,,8000Hz
	cc 1C	0aaaaaaa	EQ: High EQ Frequency
	cc 1D#	0bbbbbbb	14,,,200 = 1.4,,,20.0kHz
	cc 1E	03 - 64	EQ: Low EQ Q 3,,,100 = 0.3,,,10.0
	cc 1F	03 - 64	EQ: Mid EQ Q 3,,,100 = 0.3,,,10.0
	cc 20	03 - 64	EQ: High EQ Q 3,,,100 = 0.3,,,10.0
	cc 21	44 - 0C	EQ: Out Level -60,,,+12dB
	cc 22	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 22 Isolator & Filter

	cc 0B	00 - 01	Isolator: SW 0,1 = Off,On
	cc 0C	44 - 04	Isolator: High Volume -60,,,+4dB
	cc 0D	44 - 04	Isolator: Middle Volume -60,,,+4dB
	cc 0E	44 - 04	Isolator: Low Volume -60,,,+4dB
	cc 0F	00 - 01	Isolator: Anti Phase Middle Switch 0,1 = Off,On
	cc 10	00 - 64	Isolator: Anti Phase Middle Level 0,,,100
	cc 11	00 - 01	Isolator: Anti Phase Low Switch 0,1 = Off,On
	cc 12	00 - 64	Isolator: Anti Phase Low Level 0,,,100
	cc 13	00 - 01	Filter: SW 0,1 = Off,On
	cc 14	00 - 03	Filter: Type 0,,,3 = LPF,BPF,HPF,Notch
	cc 15	00 - 01	Filter: Slope 0,1 = -12,-24
	cc 16	00 - 64	Filter: Cut Off Frequency 0,,,100
	cc 17	00 - 64	Filter: Resonance 0,,,100
	cc 18	00 - 18	Filter: Gain 0,,,24dB
	cc 19	00	(Reserved)
:	:		
	cc 3F	00	

Algorithm 23 Speaker Modeling

	cc 0B	00 - 01	Speaker Modeling: SW 0,1 = Off,On
	cc 0C	00 - 0B	Speaker Modeling: Model 0,,,11 = Thru,Flat, PwdBlk,PwdE-B,PwdMac,SmlCube,WhCone, WhTisue,Radio,SmlTv,BoomBox,BoomLoB
	cc 0D	00 - 05	Speaker Modeling: Out Speaker 0,,,5 = DS-90, MS-50,SST-151,SST251,151+351,251+351
	cc 0E	00 - 01	Speaker Modeling: Phase 0,1 = Nor,Inv
	cc 0F	00 - 01	Bass Cut: SW 0,1 = Off,On
	cc 10	0aaaaaaa	Bass Cut: Lo Cut Frequency
	cc 11#	0bbbbbbb	1,,,200 = Thru,20,,,2000Hz,
	cc 12	00 - 01	Low Freq Trim: SW 0,1 = Off,On
	cc 13	74 - 0C	Low Freq Trim: Gain -12,,,12dB
	cc 14	0aaaaaaa	Low Freq Trim: Frequency
	cc 15#	0bbbbbbb	2,,,200 = 20,,,2000Hz,
	cc 16	00 - 01	High Freq Trim: SW 0,1 = Off,On
	cc 17	74 - 0C	High Freq Trim: Gain -12,,,12dB

	cc 18	0aaaaaaa	High Freq Trim: Frequency
	cc 19#	0bbbbbbb	10,,,200 = 1.0,,,20,0kHz
	cc 1A	00 - 01	Limiter: SW 0,1 = Off,On
	cc 1B	44 - 00	Limiter: Threshold -60,,,0dB
	cc 1C	00 - 64	Limiter: Release 0,,,100
	cc 1D	44 - 18	Limiter: Out Level -60,,,+24dB
	cc 1E	00	(Reserved)
	:	:	:
	cc 3F	00	

3. MIDI Machine Control

■MIDI Machine Control Details

●STOP(MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 01H	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
01H	STOP	(MCS)
F7H	EOX (End of System Exclusive Message)	

Transmitted when "MIDI Transport(*1)" in system parameters is "RECORDER," and the transport button [STOP] is pressed on VM-3100.

●DEFERRED PLAY(MCS)

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 03H	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
03H	DEFERRED PLAY	(MCS)
F7H	EOX (End of System Exclusive Message)	

Transmitted when "MIDI Transport(*1)" in system parameters is "RECORDER," and the transport button [PLAY] is pressed on VM-3100.

●FAST FORWARD(MCS)

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 04H	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
04H	FAST FORWARD	(MCS)
F7H	EOX (End of System Exclusive Message)	

Transmitted when "MIDI Transport(*1)" in system parameters is "RECORDER," and the transport button [FF] is pressed on VM-3100.

●REWIND(MCS)

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 05H	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
05H	REWIND	(MCS)
F7H	EOX (End of System Exclusive Message)	

Transmitted when "MIDI Transport(*1)" in system parameters is "RECORDER," and the transport button [REW] is pressed on VM-3100.

●RECORD STROBE

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 06H	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
06H	RECORD STROBE	
F7H	EOX (End of System Exclusive Message)	

Transmitted when "MIDI Transport(*1)" in system parameters is "RECORDER," and the [SHIFT] and transport button [PLAY] are pressed on VM-3100.

●MMC RESET

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 0DH	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
0DH	MMC RESET	
F7H	EOX (End of System Exclusive Message)	

When "MIDI Transport(*1)" in system parameters is "RECORDER," device ID is transmitted as 7FH upon turning power on, etc.

●LOCATE(MCP)

❍Format 2 - LOCATE[TARGET]

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 44H, 06H, 01H, hrH, mnH, scH, frH, ffH	F7H

Byte	Description	
F0H	Status of System Exclusive Message	
7FH	Universal System Exclusive Message Realtime Header	
Dev	Device ID	(or 7FH)
06H	MMC Command Message	
44H	LOCATE	(MCP)
06H	Number of Bytes	
01H	"TARGET" sub command	
hrH, mnH, scH, frH, ffH	Standard Time with Sub Frame	
F7H	EOX (End of System Exclusive Message)	

When "MIDI Transport(*1)" is "RECORDER," and the transport button [TO TOP] is pressed on VM-3100, the time "00h 00m 00s 00frame" is transmitted with device ID : 7FH.

●The efficient Information Field

There is no efficient Information Field names on VM-3100.

4. Appendices

●Decimal and Hexadecimal table

(Hexadecimal number is shown with H.)
In MIDI documentation, data values and addresses / sizes of system 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 (1) greater than the values given in the above table.

* A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa x 128 + bb.

* In the case of values which have a +/- sign, 00H = -64, 40H = +/-0, and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = +/-0, and 7F 7FH = +8191.

* Data marked "nibbled" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of a x 16 + b.

<Ex.1> What is 5AH in decimal system?
5AH = 90 according to the above table.

<Ex.2>What in decimal system is 12034H in hexadecimal of every 7 bit?
12H = 18, 34H = 52 according to the above table. So 18 x 128 + 52 = 2356.

<Ex.3> What in decimal system is 0A 03 09 0D in nibble system?
0AH = 10, 03H = 3, 09H = 9, 0DH = 13 according to the table.
So ((10 x 16 + 3) x 16 + 9) x 16 + 13 = 41885.

<Ex. 4> What in nibble system is 1258 in decimal system?

```
      ____
   16)1258
   16)  78 ... 10
   16)   4 ... 14
         0 ...  4
```

0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH According to the table.
So it is 00 04 0E 0AH.

●Example of system exclusive message and Checksum calculation

On Roland system exclusive message (DT1), checksum is added at the end of transmitted data (in front of F7) to check the message is received correctly. Value of checksum is defined by address and data (or size) of the system exclusive message to be transmitted.

How to calculate checksum
(Hexadecimal number is shown with H.)
Checksum is a value which lower 7 bit of the sum of address, size and checksum itself turns to be 0.
If the address of the system exclusive message to be transmitted is aa bb ccH and data or size is dd ee ffH,

aa + bb + cc + dd + ee + ff = sum
sum / 128 = quotient and odd
When odd is 0, 0 = checksum
When odd is other than 0, 128 - odd = checksum

■ MIDI Machine Control (MMC) Command, Information Field / Response Reference

●Commands Recognized

not available

●Commands Transmitted

Command	Action
01H STOP	STOP
03H DEFERRED PLAY	PLAY
04H FAST FORWARD	FF
05H REWIND	REW
06H RECORD STROBE	REC
0DH MMC RESET	RESET
44H 01H LOCATE TARGET	LOCATE

●Valid Information Fields / Response

not available

V-MIXING STATION
Model VM-3100

MIDI Implementation Chart

Date : Jun. 02, 1999
Version : 1.01

Function...		Transmitted	Recognized	Remarks
Basic	Default	1–16	1–16	
Channel	Changed	1–16	**********	
Mode	Default	Mode 3	Mode 3	
	Messages	x	x	
	Altered	**********	x	
Note Number :	True Voice	0–127 * 1	x	
		**********	x	
Velocity	Note ON	x	x	
	Note OFF	x	x	
After Touch	Key's	x	x	
	Ch's	x	x	
Pitch Bend		x	x	
Control Change	1–31	O * 4	O	
	33–95	O * 4	O	
	6, 38	O * 5	O	Data Entry MSB, LSB
	96, 97	x	O	Data Inc, Dec
	98, 99	O * 5	O	NRPN LSB, MSB
	102–119	O * 4	O	
Prog Change	: True #	O * 1	O	
		0–127	0–31	Scene 1-1 – 8-4
System Exclusive		O * 3, * 6	O	
System Common	Quarter Frame	x	O * 8	
	: Song Pos	O * 2	O * 7	
	: Song Sel	x	x	
	: Tune	x	x	
System Real Time	: Clock	x	O * 7	
	: Command	O * 2	O * 7	
Aux Message	: All sound off	x	x	
	: Reset all controllers	x	x	
	: Local ON/OFF	x	x	
	: All Notes OFF	x	x	
	: Active Sense	x	x	
	: Reset	x	x	
Notes		* 1 MIDI Transport = USER 1-3 only * 2 MIDI Transport = SEQUENCER only * 3 MIDI Transport = RECORDER only * 4 MIDI Control Type = C.C. only * 5 MIDI Control Type = NRPN only * 6 When MIDI Control Type = SYS-EX, mixer settings * 7 MIDI Timing Monitor = MEASURE only * 8 MIDI Timing Monitor = TIMECODE only		

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