KORG EMX-1 MIDI IMPLEMENTATION Version 1.1 (Sep.09.'03)

1.TRANSMITTED DATA

1-1 CHANNEL MESSAGES [H]:Hex, [D]:Decimal

Status [H]	Second [H] [D]	Third [H] [D]	Description		ENA
8n	kk (kk)	40 (64)	Note Off		N
9n	kk (kk)	vv (vv)	Note On vv=1~127		N
Bn	00 (00)	mm (mm)	Program Bank Select(MSB)	[NOTE1]	P
Bn	06 (06)	dm (dm)	Data Entry(MSB)	[TABLE1]	C
Bn	20 (32)	bb (bb)	Program Bank Select(LSB)	[NOTE1]	P
Bn	26 (38)	dl (dl)	Data Entry(LSB)	[TABLE1]	C
Bn	62 (98)	nl (nl)	NRPN LSB	[TABLE1]	C
Bn	63 (99)	nm (nm)	NRPN MSB	[TABLE1]	C
Bn	cc (cc)	vv (vv)	Panel Control	[TABLE2]	C
Cn	pp (pp)	-- --	Program Change	[NOTE1]	P

n : MIDI Channel (0~15)
vv : Value
cc : Control Number 01~05,07~31,33~37,39~95

ENA = P : Enabled when Program MIDI Filter is "o"
C : Enabled when Control MIDI Filter is "o"
E : Enabled when Exclusive MIDI Filter is "o"
N : Enabled when Note MIDI Filter is "o"

1-2 SYSTEM COMMON MESSAGES

Status [H]	Second [H]	Third [H]	Description	
F2	pp	pp	Song Position Pointer	*1,*2
F3	ss	--	Song Select ss : Song No. = 0~63	*3

*1 This message is transmitted when in Song mode and the "Clock" is set to "INT".
*2 This message isn't transmitted when Song Position exceeds the range of Song Position Pointer.
*3 This message is transmitted when in Song mode.

1-3 SYSTEM REALTIME MESSAGES

Status [H]	Description	
F8	Timing Clock	*
FA	Start	*
FB	Continue	*
FC	Stop	*
FE	Active Sensing	

* :Transmitted when
the "Clock" is set to "INT".
the "Clock" is set to "AUTO" and Timeing Clock Message isn't received.

1-4 UNIVERSAL SYSTEM EXCLUSIVE MESSAGES

(1) DEVICE INQUIRY REPLY

Byte [H]	Description		
F0	Exclusive Status		
7E	Non Realtime Message		
0g	Global MIDI Channel	(Device ID)	*
06	Inquiry Message		
02	Identity reply		
42	KORG ID	(Manufacturers ID)	
69	EMX-1 ID	(Family ID (LSB))	
00		(Family ID (MSB))	
00		(Member ID (LSB))	
00		(Member ID (MSB))	
xx		(Minor Ver. (LSB))	
xx		(Minor Ver. (MSB))	
xx		(Major Ver. (LSB))	
xx		(Major Ver. (MSB))	
F7	End of Exclusive		

This message is transmitted whenever a INQUIRY MESSAGE REQUEST is received.

* 0g : Global MIDI Channel = Synth Part1 MIDI Channel

1-5 SYSTEM EXCLUSIVE MESSAGES

Function ID [H]		R	D	E
40	CURRENT PATTERN DATA DUMP	o		
58	CURRENT SONG DATA DUMP	o		
4C	PATTERN DATA DUMP	o	o	
57	ALL SONG DATA DUMP	o	o	
51	GLOBAL DATA DUMP	o	o	
26	DATA FORMAT ERROR			o
23	DATA LOAD COMPLETED			o
24	DATA LOAD ERROR			o
21	WRITE COMPLETED			o
22	WRITE ERROR			o

Transmitted when
R : Request message is received
D : Data dump from MIDI dump page
E : Exclusive message is received

All messages can always be transmitted when in MIDI dump page.
(It doesn't respond to "MIDI Filter E" parameter.)

2.RECOGNIZED RECEIVE DATA

2-1 CHANNEL MESSAGES

Status [H]	Second [H] [D]	Third [H] [D]	Description		ENA
8n	kk (kk)	vv (vv)	Note Off vv=0~127		N
9n	kk (kk)	00 (00)	Note Off		N
9n	kk (kk)	vv (vv)	Note On vv=1~127		N
Bn	00 (00)	mm (mm)	Program Bank Select(MSB)	[NOTE1]	P
Bn	06 (06)	dm (dm)	Data Entry(MSB)	[TABLE1]	C
Bn	20 (32)	bb (bb)	Program Bank Select(LSB)	[NOTE1]	P
Bn	26 (38)	dl (dl)	Data Entry(LSB)	[TABLE1]	C
Bn	62 (98)	nl (nl)	NRPN LSB	[TABLE1]	C
Bn	63 (99)	nm (nm)	NRPN MSB	[TABLE1]	C
Bn	79 (121)	00 (00)	Reset All Controllers		A
Bn	7B (123)	00 (00)	All Note Off	*1	A
Bn	cc (cc)	vv (vv)	Panel Control	*2 [TABLE2]	C
Cn	pp (pp)	-- --	Program Change	[NOTE1]	P
En	bb (bb)	bb (bb)	Pitch Bender Change		C

n : MIDI Channel No.(0~15)

*1 : This message is effective only in Keyboard Part, and isn't effective in Drum Part.
*2 : cc = Control Number 01~05,07~31,33~37,39~95

ENA = A : Always Enabled
P : Enabled when Program MIDI Filter is "o"
C : Enabled when Control MIDI Filter is "o"
E : Enabled when Exclusive MIDI Filter is "o"
N : Enabled when Note MIDI Filter is "o"

2-2 SYSTEM REALTIME MESSAGES

Status [H]	Description	
F8	Timing Clock	*
FA	Start	*
FB	Continue	*
FC	Stop	*
FE	Active Sensing	

* :This message is recognized when the "Clock" is set to "EXT" or "Auto".

2-3 UNIVERSAL SYSTEM EXCLUSIVE MESSAGE (NON REALTIME)

(1) DEVICE INQUIRY MESSAGE REQUEST

Byte [H]	Description
F0	Exclusive Status
7E	Non Realtime Message
cc	MIDI Channel
06	Inquiry Message
01	Inquiry Request
F7	End of Exclusive

When receive this message and transmits Inquiry Reply Message.
cc = 00 ~ 0F : Global Channel
7F : Any Channel

This message can always be received when in MIDI dump page.
(It doesn't respond to "MIDI Filter E" parameter.)

2-4 UNIVERSAL SYSTEM EXCLUSIVE MESSAGE (REALTIME)

(1) MASTER FINE TUNE

Byte [H]	Description
F0	Exclusive Status
7F	Realtime Message
cc	MIDI Channel (Device ID)
04	Device Control ID
03	Master Fine Tune
ll	Value (LSB)
mm	Value (MSB)
F7	End of Exclusive

cc = 00 ~ 0F : Global Channel
7F : Any Channel
mm,ll = 00,00 ~ 40,00 ~ 7F,7F : -100 ~ 0 ~ +100

2-5 SYSTEM EXCLUSIVE MESSAGE

Function ID [H]	Function
10	CURRENT PATTERN DATA DUMP REQUEST
1C	PATTERN DATA DUMP REQUEST
0A	CURRENT SONG DATA DUMP REQUEST
0B	ALL SONG DATA DUMP REQUEST
0E	GLOBAL DATA DUMP REQUEST
11	PATTERN WRITE REQUEST
1A	SONG WRITE REQUEST
40	CURRENT PATTERN DATA DUMP
4C	PATTERN DATA DUMP
51	GLOBAL DATA DUMP
58	CURRENT SONG DATA DUMP
57	ALL SONG DATA DUMP

All messages are received when Sequencer is not running.

All messages can always be received when in MIDI dump page.
(It doesn't respond to "MIDI Filter E" parameter.)

MIDI EXCLUSIVE FORMAT (R:Receive, T:Transmit)

(1) CURRENT PATTERN DATA DUMP REQUEST R

Byte	Description
F0,42,3g,69	EXCLUSIVE HEADER
0001 0000 (10)	CURRENT PATTERN DATA DUMP REQUEST 10H
1111 0111 (F7)	EOX

When this message is received, the CURRENT PATTERN DATA DUMP(Function:40h) message will be transmitted.

(2) PATTERN DATA DUMP REQUEST R

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0001 1100 (1C)	PATTERN DATA DUMP REQUEST	1CH
0000 00bb (0b)	BANK(0:A/1:B/2:C/3:D)	
1111 0111 (F7)	EOX	

Pattern BANK is 64patterns block.
0:A01~A64, 1:B01~B64, 2:C01~C64, 3:D01~D64

When this message is received, the PATTERN DATA DUMP(Function:4Ch) message will be transmitted.

(3) CURRENT SONG DATA DUMP REQUEST R

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0000 1010 (0A)	CURRENT SONG DATA DUMP REQUEST	0AH
1111 0111 (F7)	EOX	

When this message is received, the CURRENT SONG DATA DUMP (Function:58h) message will be transmitted.

(4) ALL SONG DATA DUMP REQUEST R

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0000 1011 (0B)	ALL SONG DATA DUMP REQUEST	0BH
1111 0111 (F7)	EOX	

When this message is received, the ALL SONG DATA DUMP(Function:57h) message will be transmitted.

(5) GLOBAL DATA DUMP REQUEST R

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0000 1111 (0E)	GLOBAL DATA DUMP REQUEST	0EH
1111 0111 (F7)	EOX	

When this message is received, the GLOBAL DATA DUMP(Function:51h) message will be transmitted.

(6) PATTERN WRITE REQUEST R

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0001 0001 (11)	PATTERN WRITE REQUEST	11H
0000 000b (0b)	Destination Pattern Number(0:A01~B64,1:C01~D64)	
0ppp pppp (pp)	Destination Pattern Number	
1111 0111 (F7)	EOX	

When this message is received, a WRITE COMPLETED(Function:21h) message or a WRITE ERROR(Function:22h) message will be transmitted.

(7) SONG WRITE REQUEST R

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0001 1010 (1A)	SONG WRITE REQUEST	1AH
00ss ssss (ss)	Destination Song No(0~63)	
1111 0111 (F7)	EOX	

When this message is received, a WRITE COMPLETED(Function:21h) message or a WRITE ERROR(Function:22h) message will be transmitted.

(8) CURRENT PATTERN DATA DUMP R/T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0100 0000 (40)	CURRENT PATTERN DATA DUMP	40H
0ddd dddd (dd)	Data	[NOTE2][TABLE4]
:	:	
1111 0111 (F7)	EOX	

When this message is received, a DATA LOAD COMPLETED(Function:23h) message or a DATA LOAD ERROR(Function:24h) message will be transmitted.

(9) PATTERN DATA DUMP R/T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0100 1100 (4C)	PATTERN DATA DUMP	4CH
0000 00bb (0b)	BANK(0:A/1:B/2:C/3:D)	
0ddd dddd (dd)	Data	[NOTE2][TABLE3]
:	:	
1111 0111 (F7)	EOX	

Pattern BANK is 64patterns block.
0:A01~A64, 1:B01~B64, 2:C01~C64, 3:D01~D64

When this message is received, a DATA LOAD COMPLETED(Function:23h) message or a DATA LOAD ERROR(Function:24h) message will be transmitted.

(10) GLOBAL DATA DUMP R/T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0101 0001 (51)	GLOBAL DATA DUMP	51H
0ddd dddd (dd)	Data	[NOTE2][TABLE11]
:	:	
1111 0111 (F7)	EOX	

When this message is received, a DATA LOAD COMPLETED(Function:23h) message or a DATA LOAD ERROR(Function:24h) message will be transmitted.

(11) CURRENT SONG DATA DUMP R/T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0101 1000 (58)	CURRENT SONG DATA DUMP	58H
0ddd dddd (dd)	Data	[NOTE2][TABLE12]
:	:	
1111 0111 (F7)	EOX	

When this message is received, a DATA LOAD COMPLETED(Function:23h) message or a DATA LOAD ERROR(Function:24h) message will be transmitted.

(12) ALL SONG DATA DUMP R/T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0101 0111 (57)	ALL SONG DATA DUMP	57H
0ddd dddd (dd)	Data	[NOTE2][TABLE13]
:	:	
1111 0111 (F7)	EOX	

When this message is received, a DATA LOAD COMPLETED(Function:23h) message or a DATA LOAD ERROR(Function:24h) message will be transmitted.

(13) DATA FORMAT ERROR T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0010 0110 (26)	DATA FORMAT ERROR	26H
1111 0111 (F7)	EOX	

(14) DATA LOAD COMPLETED T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0010 0011 (23)	DATA LOAD COMPLETED	23H
1111 0111 (F7)	EOX	

(15) DATA LOAD ERROR T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0010 0100 (24)	DATA LOAD ERROR	24H
1111 0111 (F7)	EOX	

(16) WRITE COMPLETED T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0010 0001 (21)	WRITE COMPLETED	21H
1111 0111 (F7)	EOX	

(17) WRITE ERROR T

Byte	Description	
F0,42,3g,69	EXCLUSIVE HEADER	
0010 0010 (22)	WRITE ERROR	22H
1111 0111 (F7)	EOX	

NOTE1 : Pattern number
mm,bb,pp = 00,00,00~3F : A01~64
00,00,40~7F : B01~64
00,01,00~3F : C01~64
00,01,40~7F : D01~64

NOTE2 : The dump data conversion

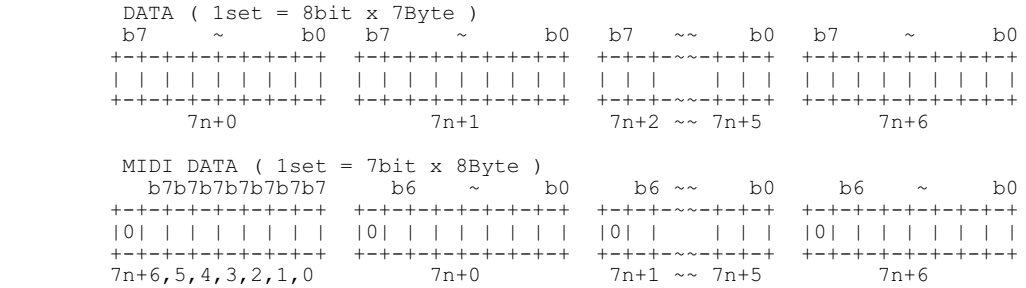

TABLE1 : NON REGISTERED PARAMETER NUMBER (NRPN)

nm [H]	nl [H]	Parameter	MIDI Ch	Data Entry	dd (Data Entry Value) [D]
08	01	Synth Wave	Synth	MSB	0~75
08	02	Synth Tune	Synth	MSB	*T1-1
09	20	Drum1 Wave	Drum	MSB,LSB	0~143 (*T1-2)
09	21	Drum1 Pitch	Drum	MSB	0~127 (64=equal pitch)
09	27	Drum1 Level	Drum	MSB	0~127
09	28	Drum1 Pan	Drum	MSB	0~127 (64=center)
09	29	Drum1 EG Time	Drum	MSB	0~127
09	2A	Drum1 Amp EG	Drum	MSB	0~63/64~127 : Off/On
09	2B	Drum1 Roll	Drum	MSB	0~63/64~127 : Off/On
09	2D	Drum1 Effect Send	Drum	MSB	0~63/64~127 : Off/On
09	2E	Drum1 Effect Select	Drum	MSB	*T1-3
09	2F	Drum1 Modulation Type	Drum	MSB	*T1-4
09	30	Drum1 Modulation Depth	Drum	MSB	0~64~127 : -63~0~63
09	31	Drum1 Modulation Speed	Drum	MSB	0~127
09	32	Drum1 Modulation Destination	Drum	MSB	*T1-5
09	33	Drum1 Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On
09	34	Drum1 Motion Seq Type	Drum	MSB	*T1-6
09	40	Drum2 Wave	Drum	MSB,LSB	0~143 (*T1-2)
09	41	Drum2 Pitch	Drum	MSB	0~127 (64=equal pitch)
09	47	Drum2 Level	Drum	MSB	0~127
09	48	Drum2 Pan	Drum	MSB	0~127 (64=center)

09	49	Drum2 EG Time	Drum	MSB	0~127	
09	4A	Drum2 Amp EG	Drum	MSB	0~63/64~127 : Off/On	
09	4B	Drum2 Roll	Drum	MSB	0~63/64~127 : Off/On	
09	4D	Drum2 Effect Send	Drum	MSB	0~63/64~127 : Off/On	
09	4E	Drum2 Effect Select	Drum	MSB	*T1-3	
09	4F	Drum2 Modulation Type	Drum	MSB	*T1-4	
09	50	Drum2 Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
09	51	Drum2 Modulation Speed	Drum	MSB	0~127	
09	52	Drum2 Modulation Destination	Drum	MSB	*T1-5	
09	53	Drum2 Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
09	54	Drum2 Motion Seq Type	Drum	MSB	*T1-6	
09	60	Drum3 Wave	Drum	MSB,LSB	0~143 (*T1-2)	
09	61	Drum3 Pitch	Drum	MSB	0~127 (64=equal pitch)	
09	67	Drum3 Level	Drum	MSB	0~127	
09	68	Drum3 Pan	Drum	MSB	0~127 (64=center)	
09	69	Drum3 EG Time	Drum	MSB	0~127	
09	6A	Drum3 Amp EG	Drum	MSB	0~63/64~127 : Off/On	
09	6B	Drum3 Roll	Drum	MSB	0~63/64~127 : Off/On	
09	6D	Drum3 Effect Send	Drum	MSB	0~63/64~127 : Off/On	
09	6E	Drum3 Effect Select	Drum	MSB	*T1-3	
09	6F	Drum3 Modulation Type	Drum	MSB	*T1-4	
09	70	Drum3 Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
09	71	Drum3 Modulation Speed	Drum	MSB	0~127	
09	72	Drum3 Modulation Destination	Drum	MSB	*T1-5	
09	73	Drum3 Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
09	74	Drum3 Motion Seq Type	Drum	MSB	*T1-6	
0A	00	Drum4 Wave	Drum	MSB,LSB	0~143 (*T1-2)	
0A	01	Drum4 Pitch	Drum	MSB	0~127 (64=equal pitch)	
0A	07	Drum4 Level	Drum	MSB	0~127	
0A	08	Drum4 Pan	Drum	MSB	0~127 (64=center)	
0A	09	Drum4 EG Time	Drum	MSB	0~127	
0A	0A	Drum4 Amp EG	Drum	MSB	0~63/64~127 : Off/On	
0A	0B	Drum4 Roll	Drum	MSB	0~63/64~127 : Off/On	
0A	0D	Drum4 Effect Send	Drum	MSB	0~63/64~127 : Off/On	
0A	0E	Drum4 Effect Select	Drum	MSB	*T1-3	
0A	0F	Drum4 Modulation Type	Drum	MSB	*T1-4	
0A	10	Drum4 Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
0A	11	Drum4 Modulation Speed	Drum	MSB	0~127	
0A	12	Drum4 Modulation Destination	Drum	MSB	*T1-5	
0A	13	Drum4 Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
0A	14	Drum4 Motion Seq Type	Drum	MSB	*T1-6	
0A	20	Drum5 Wave	Drum	MSB,LSB	0~143 (*T1-2)	
0A	21	Drum5 Pitch	Drum	MSB	0~127 (64=equal pitch)	
0A	27	Drum5 Level	Drum	MSB	0~127	
0A	28	Drum5 Pan	Drum	MSB	0~127 (64=center)	
0A	29	Drum5 EG Time	Drum	MSB	0~127	
0A	2A	Drum5 Amp EG	Drum	MSB	0~63/64~127 : Off/On	
0A	2B	Drum5 Roll	Drum	MSB	0~63/64~127 : Off/On	
0A	2D	Drum5 Effect Send	Drum	MSB	0~63/64~127 : Off/On	
0A	2E	Drum5 Effect Select	Drum	MSB	*T1-3	
0A	2F	Drum5 Modulation Type	Drum	MSB	*T1-4	
0A	30	Drum5 Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
0A	31	Drum5 Modulation Speed	Drum	MSB	0~127	
0A	32	Drum5 Modulation Destination	Drum	MSB	*T1-5	
0A	33	Drum4 Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
0A	34	Drum5 Motion Seq Type	Drum	MSB	*T1-6	
0A	40	Drum6A Wave	Drum	MSB,LSB	0~143 (*T1-2)	
0A	41	Drum6A Pitch	Drum	MSB	0~127 (64=equal pitch)	
0A	47	Drum6A Level	Drum	MSB	0~127	
0A	48	Drum6A Pan	Drum	MSB	0~127 (64=center)	
0A	49	Drum6A EG Time	Drum	MSB	0~127	
0A	4A	Drum6A Amp EG	Drum	MSB	0~63/64~127 : Off/On	
0A	4B	Drum6A Roll	Drum	MSB	0~63/64~127 : Off/On	
0A	4D	Drum6A Effect Send	Drum	MSB	0~63/64~127 : Off/On	
0A	4E	Drum6A Effect Select	Drum	MSB	*T1-3	
0A	4F	Drum6A Modulation Type	Drum	MSB	*T1-4	
0A	50	Drum6A Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
0A	51	Drum6A Modulation Speed	Drum	MSB	0~127	
0A	52	Drum6A Modulation Destination	Drum	MSB	*T1-5	
0A	53	Drum6A Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
0A	54	Drum6A Motion Seq Type	Drum	MSB	*T1-6	
0A	60	Drum6B Wave	Drum	MSB,LSB	0~143 (*T1-2)	
0A	61	Drum6B Pitch	Drum	MSB	0~127 (64=equal pitch)	
0A	67	Drum6B Level	Drum	MSB	0~127	
0A	68	Drum6B Pan	Drum	MSB	0~127 (64=center)	
0A	69	Drum6B EG Time	Drum	MSB	0~127	
0A	6A	Drum6B Amp EG	Drum	MSB	0~63/64~127 : Off/On	
0A	6B	Drum6B Roll	Drum	MSB	0~63/64~127 : Off/On	
0A	6D	Drum6B Effect Send	Drum	MSB	0~63/64~127 : Off/On	
0A	6E	Drum6B Effect Select	Drum	MSB	*T1-3	
0A	6F	Drum6B Modulation Type	Drum	MSB	*T1-4	
0A	70	Drum6B Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
0A	71	Drum6B Modulation Speed	Drum	MSB	0~127	
0A	72	Drum6B Modulation Destination	Drum	MSB	*T1-5	
0A	73	Drum6B Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
0A	74	Drum6B Motion Seq Type	Drum	MSB	*T1-6	

0B	00	Drum7A Wave	Drum	MSB,LSB	0~143 (*T1-2)	
0B	01	Drum7A Pitch	Drum	MSB	0~127 (64=equal pitch)	
0B	07	Drum7A Level	Drum	MSB	0~127	
0B	08	Drum7A Pan	Drum	MSB	0~127 (64=center)	
0B	09	Drum7A EG Time	Drum	MSB	0~127	
0B	0A	Drum7A Amp EG	Drum	MSB	0~63/64~127 : Off/On	
0B	0B	Drum7A Roll	Drum	MSB	0~63/64~127 : Off/On	
0B	0D	Drum7A Effect Send	Drum	MSB	0~63/64~127 : Off/On	
0B	0E	Drum7A Effect Select	Drum	MSB	*T1-3	
0B	0F	Drum7A Modulation Type	Drum	MSB	*T1-4	
0B	10	Drum7A Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
0B	11	Drum7A Modulation Speed	Drum	MSB	0~127	
0B	12	Drum7A Modulation Destination	Drum	MSB	*T1-5	
0B	13	Drum7A Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
0B	14	Drum7A Motion Seq Type	Drum	MSB	*T1-6	
0B	20	Drum7B Wave	Drum	MSB,LSB	0~143 (*T1-2)	
0B	21	Drum7B Pitch	Drum	MSB	0~127 (64=equal pitch)	
0B	27	Drum7B Level	Drum	MSB	0~127	
0B	28	Drum7B Pan	Drum	MSB	0~127 (64=center)	
0B	29	Drum7B EG Time	Drum	MSB	0~127	
0B	2A	Drum7B Amp EG	Drum	MSB	0~63/64~127 : Off/On	
0B	2B	Drum7B Roll	Drum	MSB	0~63/64~127 : Off/On	
0B	2D	Drum7B Effect Send	Drum	MSB	0~63/64~127 : Off/On	
0B	2E	Drum7B Effect Select	Drum	MSB	*T1-3	
0B	2F	Drum7B Modulation Type	Drum	MSB	*T1-4	
0B	30	Drum7B Modulation Depth	Drum	MSB	0~64~127 : -63~0~63	
0B	31	Drum7B Modulation Speed	Drum	MSB	0~127	
0B	32	Drum7B Modulation Destination	Drum	MSB	*T1-5	
0B	33	Drum7B Modulation BPM Sync	Drum	MSB	0~63/64~127 : Off/On	
0B	34	Drum7B Motion Seq Type	Drum	MSB	*T1-6	
0B	60	Synth Accent Level	Global	MSB	0~127	
0B	61	Synth Accent Motion Seq SW	Global	MSB	0~42/43~127 : Off/Trig Hold	
0B	62	Drum Accent Level	Global	MSB	0~127	
0B	63	Drum Accent Motion Seq SW	Global	MSB	0~42/43~127 : Off/Trig Hold	
0B	70	Swing	Global	MSB	*T1-7	
0B	71	RollType	Global	MSB	*T1-8	
0B	76	Mute 1	Global	MSB,LSB	*T1-9	
0B	77	Mute 2	Global	MSB,LSB	*T1-10	

*T1-1 : 00~07 : -50, -49, -48, -47, -46, -45, -44, -43
08~0F : -42, -41, -40, -39, -38, -37, -36, -35
10~17 : -34, -33, -32, -31, -30, -29, -28, -27
18~1F : -26, -25, -24, -23, -22, -21, -20, -19
20~27 : -18, -17, -16, -15, -14, -13, -13, -12
28~2F : -12, -11, -11, -10, -10, -9, -9, -8
30~37 : -8, -7, -7, -6, -6, -5, -5, -4
38~3F : -4, -3, -3, -2, -2, -1, -1, 0
40~47 : 0, 0, 1, 1, 2, 2, 3, 3
48~4F : 4, 4, 5, 5, 6, 6, 7, 7
50~57 : 8, 8, 9, 9, 10, 10, 11, 11
58~5F : 12, 12, 13, 14, 15, 16, 17, 18
60~67 : 19, 20, 21, 22, 23, 24, 25, 26
68~6F : 27, 28, 29, 30, 31, 32, 33, 34
70~77 : 35, 36, 37, 38, 39, 40, 41, 42
78~7F : 43, 44, 45, 46, 47, 48, 49, 50

*T1-2 : Data Entry Conversion
MIDI Data
MSB : 0MMMMMMM (0~7F), LSB : 0LLLLLLL (0~7F)
Data
00MMMMMMMLLLLLLL (0~3FFF)

*T1-3 : 00~2A : FX1
2B~55 : FX2
56~7F : FX3

*T1-4 : 00~0F : Saw
10~1F : Squ
20~2F : Tri
30~3F : S&H
40~7F : EG

*T1-5 : 00~0F : PITCH
10~4F : AMP
50~7F : PAN

*T1-6 : 00~2A : Off
2B~55 : Smooth
56~7F : Trig Hold

*T1-7 : 00~07 : 50, 50, 50, 50, 50, 51, 51, 51
08~0F : 51, 51, 52, 52, 52, 52, 52, 53
10~17 : 53, 53, 53, 53, 54, 54, 54, 54
18~1F : 54, 55, 55, 55, 55, 55, 56, 56
20~27 : 56, 56, 56, 57, 57, 57, 57, 57
28~2F : 58, 58, 58, 58, 58, 59, 59, 59

```
        30~37 :  59, 59, 60, 60, 60, 60, 60, 61
        38~3F :  61, 61, 61, 61, 62, 62, 62, 62
        40~47 :  62, 63, 63, 63, 63, 63, 64, 64
        48~4F :  64, 64, 64, 65, 65, 65, 65, 65
        50~57 :  66, 66, 66, 66, 66, 67, 67, 67
        58~5F :  67, 67, 68, 68, 68, 68, 68, 69
        60~67 :  69, 69, 69, 19, 70, 70, 70, 70
        68~6F :  70, 71, 71, 71, 71, 71, 72, 72
        70~77 :  72, 72, 72, 73, 73, 73, 73, 73
        78~7F :  74, 74, 74, 74, 74, 75, 75, 75

*T1-8 : 00~2A : 2
        2B~55 : 3
        56~7F : 4

*T1-9 : MSB   : Bit0=1 SoloSts
        LSB   : Bit4~0(S5~S1)=1   : Mute

*T1-10 : MSB   : Bit1~0(P7B~P7A)=1 : Mute
         LSB   : Bit6~0(P6B~P1)=1  : Mute
```

TABLE2 : Panel Knob & Switch Control (assignable)

	Parameter	Value [D]	Default CC No. [D]
Synth OSC	Type	*T2-1	70
	Edit1	0~127	14
	Edit2	0~127	15
Synth MOD	Speed	0~127	89
	Depth	0~64~127 : -63~0~63	90
	Type	*T1-4	87
	Dest	*T2-2	88
	BPM Sync	0~63/64~127 : Off/On	82
Synth FILTER	Cutoff	0~127	74
	Resonance	0~127	71
	EG Int	0~64~127 : -63~0~63	79
	Drive	0~127	84
	Type	*T2-3	83
Synth Part Common	Glide	0~127 : Off,1~127	5
	Pan	0~127 (64=center)	10
	EG Time	0~127	75
	Level	0~127	7
	Amp EG	0~63/64~127 : Off/On	86
	Roll	0~63/64~127 : Off/On	85
	Fx Send	0~63/64~127 : Off/On	91
	Fx Select	*T1-3	81
	Motion Seq Sw	*T1-6	80
FX1	Type	*T2-4	12
	Edit1	0~127	92
	Edit2	0~127	93
	Motion Seq Sw	0~63/64~127 : Off/On	20
FX2	Type	*T2-4	13
	Edit1	0~127	94
	Edit2	0~127	95
	Motion Seq Sw	0~63/64~127 : Off/On	21
FX3	Type	*T2-4	24
	Edit1	0~127	25
	Edit2	0~127	26
	Motion Seq Sw	0~63/64~127 : Off/On	22
FX	Chain	*T2-5	23

```
*T2-1 : 00~07 : WAVE FORM
        08~0F : DUAL OSC
        10~17 : CHORD OSC
        18~1F : UNISON OSC
        20~27 : RING MOD
        28~2F : OSC SYNC
        30~37 : CROSS MOD
        38~3F : VPM OSC
        40~47 : WS
        48~4F : ADDITIVE OSC
        50~57 : COMB OSC
        58~5F : FORMANT OSC
        60~67 : NOISE OSC
        68~6F : PCM OSC + COMB
        70~77 : PCM OSC + WS
        78~7F : AUDIO IN + COMB

*T2-2 : 00~0F : PITCH
        10~1F : OSC EDIT1
        20~2F : OSC EDIT2
        30~3F : CUTOFF
```

```
        40~4F : AMP
        50~7F : PAN

*T2-3 : 00~1F : LPF
        20~3F : HPF
        40~5F : BPF
        60~7F : BPF+

*T2-4 : 00~07 : REVERB
        08~0F : BPM SYNC DELAY
        10~17 : SHORT DELAY
        18~1F : MOD DELAY
        20~27 : GRAIN SHIFTER
        28~2F : CHO/FLG
        30~37 : PHASER
        38~3F : RING MOD
        40~47 : TALKING MOD
        48~4F : PITCH SHIFTER
        50~57 : COMPRESSOR
        58~5F : DISTORTION
        60~67 : DECIMATOR
        68~6F : EQ
        70~77 : LPF
        78~7F : HPF

*T2-5 : 00~1F : none
        20~3F : FX1-FX2
        40~5F : FX2-FX3
        60~7F : FX1-FX2-FX3
```

TABLE3 : PATTERN BANK PARAMETERS (307456 bytes)

0~4805	pattern parameter (1st)	(4806bytes)	[TABLE4]
4806~9611	pattern parameter (2nd)		
:			
302778~307583	pattern parameter (64th)		

TABLE4 : PATTERN PARAMETERS (4806 bytes)

0~23	Pattern Common Parameters	(24bytes)	[TABLE5]
24~49	Part d1 Parameters	(26bytes)	[TABLE6]
50~75	Part d2 Parameters	(26bytes)	[TABLE6]
76~101	Part d3 Parameters	(26bytes)	[TABLE6]
102~127	Part d4 Parameters	(26bytes)	[TABLE6]
128~153	Part d5 Parameters	(26bytes)	[TABLE6]
154~179	Part d6A Parameters	(26bytes)	[TABLE6]
180~205	Part d6B Parameters	(26bytes)	[TABLE6]
206~231	Part d7A Parameters	(26bytes)	[TABLE6]
232~257	Part d7B Parameters	(26bytes)	[TABLE6]
258~533	Part s1 Parameters	(276bytes)	[TABLE7]
534~809	Part s2 Parameters	(276bytes)	[TABLE7]
810~1085	Part s3 Parameters	(276bytes)	[TABLE7]
1086~1361	Part s4 Parameters	(276bytes)	[TABLE7]
1362~1637	Part s5 Parameters	(276bytes)	[TABLE7]
1638~1655	Drum Accent Parameters	(18bytes)	[TABLE8]
1656~1673	Synth Accent Parameters	(18bytes)	[TABLE8]
1674~1677	Fx1 Parameters	(4bytes)	[TABLE9]
1678~1681	Fx2 Parameters	(4bytes)	[TABLE9]
1682~1685	Fx3 Parameters	(4bytes)	[TABLE9]
1686~1815	Motion Parameters (1st)	(130bytes)	[TABLE10]
1816~1945	Motion Parameters (2nd)		
:			
4676~4805	Motion Parameters (24th)		

TABLE5 : PATTERN COMMON PARAMETERS (24 bytes)

0~7	Pattern Name		
8	Tempo (MSB)	20.0~300.0	iiiiiiiii 20~300
9	Tempo (LSB)	iiiiiiiii00ffff	ffff 0~9
10	Swing	0~25 : 50~75%	
b2~0	Pattern Length	0~7 : 1~8	
11 b5,4	Beat	0~3 : 16th,32nd,tri,tr2	
b7,6	RollType	0~2 : 2~4	
12	Fx Chain	0~3 : xx,ox,xo,oo (FX1-FX2,FX2-FX3)	
13	Last Step	0~15 : 1~16	
b4~0	Arpeggiator Scale	0~30 : 1~31	
14 b7~5	(reserve)		
15	Arpeggiator CenterNote	0~127 : C-1~G9	
16~17	Part Mute/Solo Status	b15 = 0 : Mute 0/1 : Mute Off/Mute On [TABLE20] b15 = 1 : Solo 0/1 : Solo On/Solo Off [TABLE20]	
18~19	Part Swing Status	0/1 : Off/On [TABLE20]	
20~21	Part OutputBus Status	0/1 : 3/4 / L/R [TABLE20]	
22~23	Part Accent Status	0/1 : Off/On [TABLE20]	

TABLE6 : DRUM PART PARAMETERS (26 bytes)

0	Wave	0~206 : 1~207	
1	Pitch	0~127 (64=equal pitch)	
2	Level	0~127	
3	Panpot	0~127 (64=center)	
4	EG Time	0~127	
b1,0	Fx Select	0~2 : FX1/FX2/FX3	
b2	Fx Send	0/1 : Off/On	
5 b3	Roll	0/1 : Off/On	
b4	Amp EG	0/1 : Gate/EG	
b2~0	Mod Dest	0,4,5 : Pitch/Amp/Pan	
6 b6~4	Mod Type	0~4 : Saw/Squ/Tri/S&H/EG	
b7	BPM Sync	0/1 : Off/On	
7	Mod Speed	0~127	
8	Mod Depth	0~64~127 : -63~0~+63	
9	Motion Sequence Status	0~2 : Off/Smooth/TrigHold	
10~25	Sequence Data		[TABLE21]

TABLE7 : SYNTH PART PARAMETERS (276 bytes)

0	Wave	0~75 : 1~76
1	Tune	0~50~101 : -50~0~+50
2	OSC Type	0~15 : 1~16
3	OSC Edit1	0~127
4	OSC Edit2	0~127
5	Glide	0~127 : Off,1~127
6	Filter Type	0~3 : LPF/HPF/BPF/BPF+
7	Cut Off	0~127

	8	Resonance	0~127
	9	EG Intensity	0~64~127 : -63~0~+63
	10	Drive	0~127
	11	Level	0~127
	12	Panpot	0~127 (64=center)
	13	EG Time	0~127
14	b1,0	Fx Select	0~2 : FX1/FX2/FX3
	b2	Fx Send	0/1 : Off/On
	b3	Roll	0/1 : Off/On
	b4	Amp EG	0/1 : Gate/EG
	15	(reserve)	
16	b2~0	Mod Dest	0~5 : Pitch/OSCEdit1/OSCEdit2/CutOff/Amp/Pan
	b6~4	Mde Type	0~4 : Saw/Squ/Tri/S&H/EG
	b7	BPM Sync	0/1 : Off/On
	17	Mod Speed	0~127
	18	Mod Depth	0~64~127 : -63~0~+63
	19	Motion Sequence Status	0~2 : Off/Smooth/TrigHold
	20	Sequence Data Note (Step1)	0~127 : C-1~G9 (MSB="1" : Off)
	:	:	
	147	Sequence Data Note (Step128)	
	148	Sequence Data Gate (Step1)	0~255 : 0.25~128.0 (*T7-1)
	:	:	
	275	Sequence Data Gate (Step128)	

*T7-1 :

00~07 :	0.25,	0.50,	0.75,	1.00,	1.25,	1.50,	1.75,	2.00
08~0F :	2.25,	2.50,	2.75,	3.00,	3.25,	3.50,	3.75,	4.00
10~17 :	4.25,	4.50,	4.75,	5.00,	5.25,	5.50,	5.75,	6.00
18~1F :	6.25,	6.50,	6.75,	7.00,	7.25,	7.50,	7.75,	8.00
20~27 :	8.25,	8.50,	8.75,	9.00,	9.25,	9.50,	9.75,	10.00
28~2F :	10.25,	10.50,	10.75,	11.00,	11.25,	11.50,	11.75,	12.00
30~37 :	12.25,	12.50,	12.75,	13.00,	13.25,	13.50,	13.75,	14.00
38~3F :	14.25,	14.50,	14.75,	15.00,	15.25,	15.50,	15.75,	16.00
40~47 :	16.25,	16.50,	16.75,	17.00,	17.25,	17.50,	17.75,	18.00
48~4F :	18.25,	18.50,	18.75,	19.00,	19.25,	19.50,	19.75,	20.00
50~57 :	20.25,	20.50,	20.75,	21.00,	21.25,	21.50,	21.75,	22.00
58~5F :	22.25,	22.50,	22.75,	23.00,	23.25,	23.50,	23.75,	24.00
60~67 :	24.25,	24.50,	24.75,	25.00,	25.25,	25.50,	25.75,	26.00
68~6F :	26.25,	26.50,	26.75,	27.00,	27.25,	27.50,	27.75,	28.00
70~77 :	28.25,	28.50,	28.75,	29.00,	29.25,	29.50,	29.75,	30.00
78~7F :	30.25,	30.50,	30.75,	31.00,	31.25,	31.50,	31.75,	32.00
80~87 :	32.50,	33.00,	33.50,	34.00,	34.50,	35.00,	35.50,	36.00
88~8F :	36.50,	37.00,	37.50,	38.00,	38.50,	39.00,	39.50,	40.00
90~97 :	40.50,	41.00,	41.50,	42.00,	42.50,	43.00,	43.50,	44.00
98~9F :	44.50,	45.00,	45.50,	46.00,	46.50,	47.00,	47.50,	48.00
A0~A7 :	48.50,	49.00,	49.50,	50.00,	50.50,	51.00,	51.50,	52.00
A8~AF :	52.50,	53.00,	53.50,	54.00,	54.50,	55.00,	55.50,	56.00
B0~B7 :	56.50,	57.00,	57.50,	58.00,	58.50,	59.00,	59.50,	60.00
B8~BF :	60.50,	61.00,	61.50,	62.00,	62.50,	63.00,	63.50,	64.00
C0~C7 :	65.00,	66.00,	67.00,	68.00,	69.00,	70.00,	71.00,	72.00
C8~CF :	73.00,	74.00,	75.00,	76.00,	77.00,	78.00,	79.00,	80.00
D0~D7 :	81.00,	82.00,	83.00,	84.00,	85.00,	86.00,	87.00,	88.00
D8~DF :	89.00,	90.00,	91.00,	92.00,	93.00,	94.00,	95.00,	96.00
E0~E7 :	97.00,	98.00,	99.00,	100.00,	101.00,	102.00,	103.00,	104.00
E8~EF :	105.00,	106.00,	107.00,	108.00,	109.00,	110.00,	111.00,	112.00
F0~F7 :	113.00,	114.00,	115.00,	116.00,	117.00,	118.00,	119.00,	120.00
F8~FF :	121.00,	122.00,	123.00,	124.00,	125.00,	126.00,	127.00,	128.00

TABLE8 : ACCENT PART PARAMTERS (18 bytes)

0	Level	0~127
1	Motion Sequence Status	0/2 : Off/TrigHold
2~17	Sequence Data	[TABLE21]

TABLE9 : FX PARAMETERS (4 bytes)

0	Effect Type	0~15 : 1~16	[TABLE22]
1	Edit1	0~127	[TABLE22]
2	Edit2	0~127	[TABLE22]
3	Motion Sequence Status	0/1 : Off/On	

TABLE10 : MOTION SEQUENCE PARAMETERS (130 bytes)

0~1	Operation No.		[TABLE23]
2~129	Value	(MSB="1" : Off)	[TABLE23]

TABLE11 : GLOBAL PARAMETERS (192 bytes)

0	Memory Protect	0/1 : Protect Off/On	
1	Master Tune	0~50~100 : -50~0~+50	
2~3	(reserve)		
4	MIDI Clock	0~2 : Int/Ext/Auto	
5 b0	Note Message Enable Flag	0/1 : Dis/Ena	
5 b1	System Ex. Enable Flag	0/1 : Dis/Ena	
5 b2	Control Change Enable Flag	0/1 : Dis/Ena	
5 b3	Program Change Enable Flag	0/1 : Dis/Ena	
6	Pitch Bend Range	0~12~24 : -12~0~12	
7~12	MIDI Channel	0~15 : 1ch~16ch	[TABLE24]
13~21	Drum Note Number	0~127 : C-1~G9	[TABLE25]
22~56	MIDI Control Change Assign	(35bytes) CC# = 01~05,07~31,33~37,39~95	[TABLE26]
57~63	(reserve)		
64~191	Pattern Set Parameters	0~255 : A01~D64	

TABLE12 : CURRENT SONG PARAMETER

0~527	Song Parameter	(528bytes)	[TABLE14]
Song Event Data			
528~535	event data (1st)	(8bytes)	[TABLE15] or [TABLE16]
536~543	event data (2nd)		or [TABLE17] or [TABLE18]
:			or [TABLE19]
160520~160527 (max)	event data (20000th(max))		

TABLE13 : ALL SONG DATA

0~527	Song Parameter (1st)	(528bytes)	[TABLE14]
528~1055	Song Parameter (2nd)		
:			
33264~33791	Song Parameter (64th)		
Song Event Data (Event Size is total number of event of All Songs.)			
33792~33799	event data (1st)	(8bytes)	[TABLE15] or [TABLE16]
33800~33807	event data (2nd)		or [TABLE17] or [TABLE18]
:			or [TABLE19]
193784~193791 (max)	event data (20000th(max))		

TABLE14 : SONG PARAMETER (528 bytes)

0~7	Song Name	
8	Tempo (MSB)	20.0~300.0 iiiiiiiii 20~300
9	Tempo (LSB)	iiiiiiiii00ffff ffff .0~.9
10	Tempo Lock	0/1 : Off/On
11	Length	0~255 : 1~256
12	Mute Hold	0/1 : Off/On
13	Next Song	0~64 : Off,song1~song64
14~15	Num of Events	0~19999
16	Pattern Number (1st)	
:	:	0~255 : A01~D64
271	Pattern Number (256th)	
272	Note Offset (1st)	
:	:	-24~+24
527	Note Offset (256th)	

TABLE15 : SONG EVENT DATA (Control Type) (8byte)

0	Position Number	0~255 : 1~256
b7~4	Measure	0~7 : 1~8
1		
b3~0	Step	0~15 : 1~16
2~3	Operation No.	[TABLE23]
4	(reserve)	
5	Value	[TABLE23]
6~7	(reserve)	AAAA [H] (fixed)

TABLE16 : SONG EVENT DATA (Drum Note Type) (8byte)

0	Position Number	0~255 : 1~256
b7~4	Measure	0~7 : 1~8
1		
b3~0	Step	0~15 : 1~16
2~3	(reserve)	4000 [H] (fixed)
4	Part	0~15 : drum1~7B,drum accent,synth1~5,synth accent
5~7	(reserve)	

TABLE17 : SONG EVENT DATA (Synth Note Type) (8byte)

0	Position Number	0~255 : 1~256
b7~4	Measure	0~7 : 1~8
1		
b3~0	Step	0~15 : 1~16
2~3	(reserve)	4000 [H] (fixed)
4	Part	0~15 : drum1~7B,drum accent,synth1~5,synth accent
5	Note No.	0~127 : C-1~G9
6~7	Length	0~32767 : 0.25~8192.00 (per 0.25)
		32768~49151 : 8192.50~12288.00 (per 0.5)
		49152~65535 : 12289.00~16384.00 (per 1.0)

TABLE18 : SONG EVENT DATA (Tempo Type) (8byte)

0	Position Number	0~255 : 1~256
b7~4	Measure	0~7 : 1~8
1		
b3~0	Step	0~15 : 1~16
2~3	Operation No.	515 (fixed)
4~5	(reserve)	
6~7	Tempo	20.0~300.0 iiiiiiiii = 20~300
		0iiiiiiiiiffffff ffffff = 0~63 : .0~.9

TABLE19 : SONG EVENT DATA (Mute/Solo Type) (8byte)

	0	Position Number	0~255 : 1~256
1	b7~4	Measure	0~7 : 1~8
	b3~0	Step	0~15 : 1~16
	2~3	Operation No.	503 (fixed)
	4~5	(reserve)	
	6~7	Part Mute/Solo Status	b15 = 0 : Mute 0/1 : Mute Off/Mute On [TABLE20] b15 = 1 : Solo 0/1 : Solo On/Solo Off [TABLE20]

TABLE20 : PART STATUS PARAMETERS (2 bytes)

	b5	Part s5 Status	0/1
	b4	Part s4 Status	0/1
	b3	Part s3 Status	0/1
0[MSB]	b2	Part s2 Status	0/1
	b1	Part s1 Status	0/1
	b0	Part d7B Status	0/1
	b7	Part d7A Status	0/1
	b6	Part d6B Status	0/1
	b5	Part d6A Status	0/1
	b4	Part d5 Status	0/1
1[LSB]	b3	Part d4 Status	0/1
	b2	Part d3 Status	0/1
	b1	Part d2 Status	0/1
	b0	Part d1 Status	0/1

TABLE21 : DRUM PART STEP SEQUECNCE DATA / ACCENT STEP DATA (16 bytes)

Offset	bit pattern	value (on Accent Part)
0	Bit0~7 (Step1 ~8)	0/1 : Off(Soft)/On(hard)
1	Bit0~7 (Step9 ~16)	0/1 : Off(Soft)/On(hard)
2	Bit0~7 (Step17~24)	0/1 : Off(Soft)/On(hard)
3	Bit0~7 (Step25~32)	0/1 : Off(Soft)/On(hard)
4	Bit0~7 (Step33~40)	0/1 : Off(Soft)/On(hard)
5	Bit0~7 (Step41~48)	0/1 : Off(Soft)/On(hard)
6	Bit0~7 (Step49~56)	0/1 : Off(Soft)/On(hard)
7	Bit0~7 (Step57~64)	0/1 : Off(Soft)/On(hard)
8	Bit0~7 (Step65~72)	0/1 : Off(Soft)/On(hard)
9	Bit0~7 (Step73~80)	0/1 : Off(Soft)/On(hard)
10	Bit0~7 (Step81~88)	0/1 : Off(Soft)/On(hard)
11	Bit0~7 (Step89~96)	0/1 : Off(Soft)/On(hard)
12	Bit0~7 (Step97~104)	0/1 : Off(Soft)/On(hard)
13	Bit0~7 (Step105~112)	0/1 : Off(Soft)/On(hard)
14	Bit0~7 (Step113~120)	0/1 : Off(Soft)/On(hard)
15	Bit0~7 (Step121~128)	0/1 : Off(Soft)/On(hard)

TABLE22 : Effect List

	NAME	EDIT1	PARAMETER [D]	EDIT2	PARAMETER [D]
1	Reverb	Time	0~127	Level	0~127
2	BPM Sync Delay	Time	*T22-1	Depth	0~127
3	Short Delay	Time	0~127	Depth	0~127
4	Mod Delay	Time	*T22-1	Depth	0~127
5	Grain Shifter	Speed	0~127	Depth	0~127
6	Cho/Flg	LFO Rate	0~127	Depth	0~127
7	Phaser	LFO Rate	0~127	Depth	0~127
8	Ring Mod	Frequency	0~127	Balance	0~127
9	Talking Mod	Formant	0~127	Offset	-63~+63
10	Pitch Shifter	Pitch	0~127	Balance	0~127
11	Compressor	Sensitivity	-2400~+2400	Attack	0~127
12	Distortion	Gain	0~127	Level	0~127
13	Decimator	Sampling Freq	0~127	Sampling Bit	0~127
14	EQ	Low Gain (80Hz)	-63~+63	High Gain (12kHz)	-63~+63
15	LPF	Cutoff Freq	0~127	Resonance	0~127
16	HPF	Cutoff Freq	0~127	Resonance	0~127

*T22-1 : 1/64,1/32,1/24,1/16,1/12,1/8,1/6,3/16,1/4,1/3,3/8,1/2,3/4,1/1

TABLE23 : Opration No. & Value

No. [H]	Parameter	Value [D]	Motion Seq	Song Event
003	Synth1 OSC Edit1	0~127	O	O
004	Synth1 OSC Edit2	0~127	O	O
005	Synth1 Glide	0~127 : Off,1~127	O	O
006	Synth1 Filter Type	*T2-3	O	O
007	Synth1 Filter Cutoff	0~127	O	O
008	Synth1 Filter Resonance	0~127	O	O
009	Synth1 Filter EG Int	0~64~127 : -63~0~63	O	O
00A	Synth1 Filter Drive	0~127	O	O
00B	Synth1 Level	0~127	O	O
00C	Synth1 Pan	0~127 (64=center)	O	O
00D	Synth1 EG Time	0~127	O	O
00E	Synth1 Amp EG	0~63/64~127 : Off/On	O	O
00F	Synth1 Roll	0~63/64~127 : Off/On	O	O
011	Synth1 Effect Send	0~63/64~127 : Off/On	O	O
012	Synth1 Effect Select	*T1-3	O	O
013	Synth1 Modulation Type	*T1-4	O	O
014	Synth1 Modulation Depth	0~64~127 : -63~0~63	O	O
015	Synth1 Modulation Speed	0~127	O	O
016	Synth1 Modulation Destination	*T2-2	O	O
017	Synth1 Modulation BPM Sync	0~63/64~127 : Off/On	O	O
018	Synth1 Motion Seq Type	*T1-6	X	O
023	Synth2 OSC Edit1	0~127	O	O
024	Synth2 OSC Edit2	0~127	O	O
025	Synth2 Glide	0~127 : Off,1~127	O	O
026	Synth2 Filter Type	*T2-3	O	O
027	Synth2 Filter Cutoff	0~127	O	O
028	Synth2 Filter Resonance	0~127	O	O
029	Synth2 Filter EG Int	0~64~127 : -63~0~63	O	O
02A	Synth2 Filter Drive	0~127	O	O
02B	Synth2 Level	0~127	O	O
02C	Synth2 Pan	0~127 (64=center)	O	O
02D	Synth2 EG Time	0~127	O	O
02E	Synth2 Amp EG	0~63/64~127 : Off/On	O	O
02F	Synth2 Roll	0~63/64~127 : Off/On	O	O
031	Synth2 Effect Send	0~63/64~127 : Off/On	O	O
032	Synth2 Effect Select	*T1-3	O	O
033	Synth2 Modulation Type	*T1-4	O	O
034	Synth2 Modulation Depth	0~64~127 : -63~0~63	O	O
035	Synth2 Modulation Speed	0~127	O	O
036	Synth2 Modulation Destination	*T2-2	O	O
037	Synth2 Modulation BPM Sync	0~63/64~127 : Off/On	O	O
038	Synth2 Motion Seq Type	*T1-6	X	O
043	Synth3 OSC Edit1	0~127	O	O
044	Synth3 OSC Edit2	0~127	O	O
045	Synth3 Glide	0~127 : Off,1~127	O	O

046	Synth3 Filter Type	*T2-3	O	O	
047	Synth3 Filter Cutoff	0~127	O	O	
048	Synth3 Filter Resonance	0~127	O	O	
049	Synth3 Filter EG Int	0~64~127 : -63~0~63	O	O	
04A	Synth3 Filter Drive	0~127	O	O	
04B	Synth3 Level	0~127	O	O	
04C	Synth3 Pan	0~127 (64=center)	O	O	
04D	Synth3 EG Time	0~127	O	O	
04E	Synth3 Amp EG	0~63/64~127 : Off/On	O	O	
04F	Synth3 Roll	0~63/64~127 : Off/On	O	O	
051	Synth3 Effect Send	0~63/64~127 : Off/On	O	O	
052	Synth3 Effect Select	*T1-3	O	O	
053	Synth3 Modulation Type	*T1-4	O	O	
054	Synth3 Modulation Depth	0~64~127 : -63~0~63	O	O	
055	Synth3 Modulation Speed	0~127	O	O	
056	Synth3 Modulation Destination	*T2-2	O	O	
057	Synth3 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
058	Synth3 Motion Seq Type	*T1-6	X	O	
063	Synth4 OSC Edit1	0~127	O	O	
064	Synth4 OSC Edit2	0~127	O	O	
065	Synth4 Glide	0~127 : Off,1~127	O	O	
066	Synth4 Filter Type	*T2-3	O	O	
067	Synth4 Filter Cutoff	0~127	O	O	
068	Synth4 Filter Resonance	0~127	O	O	
069	Synth4 Filter EG Int	0~64~127 : -63~0~63	O	O	
06A	Synth4 Filter Drive	0~127	O	O	
06B	Synth4 Level	0~127	O	O	
06C	Synth4 Pan	0~127 (64=center)	O	O	
06D	Synth4 EG Time	0~127	O	O	
06E	Synth4 Amp EG	0~63/64~127 : Off/On	O	O	
06F	Synth4 Roll	0~63/64~127 : Off/On	O	O	
071	Synth4 Effect Send	0~63/64~127 : Off/On	O	O	
072	Synth4 Effect Select	*T1-3	O	O	
073	Synth4 Modulation Type	*T1-4	O	O	
074	Synth4 Modulation Depth	0~64~127 : -63~0~63	O	O	
075	Synth4 Modulation Speed	0~127	O	O	
076	Synth4 Modulation Destination	*T2-2	O	O	
077	Synth4 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
078	Synth4 Motion Seq Type	*T1-6	X	O	
083	Synth5 OSC Edit1	0~127	O	O	
084	Synth5 OSC Edit2	0~127	O	O	
085	Synth5 Glide	0~127 : Off,1~127	O	O	
086	Synth5 Filter Type	*T2-3	O	O	
087	Synth5 Filter Cutoff	0~127	O	O	
088	Synth5 Filter Resonance	0~127	O	O	
089	Synth5 Filter EG Int	0~64~127 : -63~0~63	O	O	
08A	Synth5 Filter Drive	0~127	O	O	
08B	Synth5 Level	0~127	O	O	
08C	Synth5 Pan	0~127 (64=center)	O	O	
08D	Synth5 EG Time	0~127	O	O	
08E	Synth5 Amp EG	0~63/64~127 : Off/On	O	O	
08F	Synth5 Roll	0~63/64~127 : Off/On	O	O	
091	Synth5 Effect Send	0~63/64~127 : Off/On	O	O	
092	Synth5 Effect Select	*T1-3	O	O	
093	Synth5 Modulation Type	*T1-4	O	O	
094	Synth5 Modulation Depth	0~64~127 : -63~0~63	O	O	
095	Synth5 Modulation Speed	0~127	O	O	
096	Synth5 Modulation Destination	*T2-2	O	O	
097	Synth5 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
098	Synth5 Motion Seq Type	*T1-6	X	O	
0A1	Drum1 Pitch	0~127 (64=equal pitch)	O	O	
0A7	Drum1 Level	0~127	O	O	
0A8	Drum1 Pan	0~127 (64=center)	O	O	
0A9	Drum1 EG Time	0~127	O	O	
0AA	Drum1 Amp EG	0~63/64~127 : Off/On	O	O	
0AB	Drum1 Roll	0~63/64~127 : Off/On	O	O	
0AD	Drum1 Effect Send	0~63/64~127 : Off/On	O	O	
0AE	Drum1 Effect Select	*T1-3	O	O	
0AF	Drum1 Modulation Type	*T1-4	O	O	
0B0	Drum1 Modulation Depth	0~64~127 : -63~0~63	O	O	
0B1	Drum1 Modulation Speed	0~127	O	O	
0B2	Drum1 Modulation Destination	*T1-5	O	O	
0B3	Drum1 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
0B4	Drum1 Motion Seq Type	*T1-6	X	O	
0C1	Drum2 Pitch	0~127 (64=equal pitch)	O	O	
0C7	Drum2 Level	0~127	O	O	
0C8	Drum2 Pan	0~127 (64=center)	O	O	
0C9	Drum2 EG Time	0~127	O	O	
0CA	Drum2 Amp EG	0~63/64~127 : Off/On	O	O	
0CB	Drum2 Roll	0~63/64~127 : Off/On	O	O	
0CD	Drum2 Effect Send	0~63/64~127 : Off/On	O	O	
0CE	Drum2 Effect Select	*T1-3	O	O	
0CF	Drum2 Modulation Type	*T1-4	O	O	
0D0	Drum2 Modulation Depth	0~64~127 : -63~0~63	O	O	
0D1	Drum2 Modulation Speed	0~127	O	O	
0D2	Drum2 Modulation Destination	*T1-5	O	O	
0D3	Drum2 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
0D4	Drum2 Motion Seq Type	*T1-6	X	O	

0E1	Drum3 Pitch	0~127 (64=equal pitch)	O	O	
0E7	Drum3 Level	0~127	O	O	
0E8	Drum3 Pan	0~127 (64=center)	O	O	
0E9	Drum3 EG Time	0~127	O	O	
0EA	Drum3 Amp EG	0~63/64~127 : Off/On	O	O	
0EB	Drum3 Roll	0~63/64~127 : Off/On	O	O	
0ED	Drum3 Effect Send	0~63/64~127 : Off/On	O	O	
0EE	Drum3 Effect Select	*T1-3	O	O	
0EF	Drum3 Modulation Type	*T1-4	O	O	
0F0	Drum3 Modulation Depth	0~64~127 : -63~0~63	O	O	
0F1	Drum3 Modulation Speed	0~127	O	O	
0F2	Drum3 Modulation Destination	*T1-5	O	O	
0F3	Drum3 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
0F4	Drum3 Motion Seq Type	*T1-6	X	O	
101	Drum4 Pitch	0~127 (64=equal pitch)	O	O	
107	Drum4 Level	0~127	O	O	
108	Drum4 Pan	0~127 (64=center)	O	O	
109	Drum4 EG Time	0~127	O	O	
10A	Drum4 Amp EG	0~63/64~127 : Off/On	O	O	
10B	Drum4 Roll	0~63/64~127 : Off/On	O	O	
10D	Drum4 Effect Send	0~63/64~127 : Off/On	O	O	
10E	Drum4 Effect Select	*T1-3	O	O	
10F	Drum4 Modulation Type	*T1-4	O	O	
110	Drum4 Modulation Depth	0~64~127 : -63~0~63	O	O	
111	Drum4 Modulation Speed	0~127	O	O	
112	Drum4 Modulation Destination	*T1-5	O	O	
113	Drum4 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
114	Drum4 Motion Seq Type	*T1-6	X	O	
121	Drum5 Pitch	0~127 (64=equal pitch)	O	O	
127	Drum5 Level	0~127	O	O	
128	Drum5 Pan	0~127 (64=center)	O	O	
129	Drum5 EG Time	0~127	O	O	
12A	Drum5 Amp EG	0~63/64~127 : Off/On	O	O	
12B	Drum5 Roll	0~63/64~127 : Off/On	O	O	
12D	Drum5 Effect Send	0~63/64~127 : Off/On	O	O	
12E	Drum5 Effect Select	*T1-3	O	O	
12F	Drum5 Modulation Type	*T1-4	O	O	
130	Drum5 Modulation Depth	0~64~127 : -63~0~63	O	O	
131	Drum5 Modulation Speed	0~127	O	O	
132	Drum5 Modulation Destination	*T1-5	O	O	
133	Drum5 Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
134	Drum5 Motion Seq Type	*T1-6	X	O	
141	Drum6A Pitch	0~127 (64=equal pitch)	O	O	
147	Drum6A Level	0~127	O	O	
148	Drum6A Pan	0~127 (64=center)	O	O	
149	Drum6A EG Time	0~127	O	O	
14A	Drum6A Amp EG	0~63/64~127 : Off/On	O	O	
14B	Drum6A Roll	0~63/64~127 : Off/On	O	O	
14D	Drum6A Effect Send	0~63/64~127 : Off/On	O	O	
14E	Drum6A Effect Select	*T1-3	O	O	
14F	Drum6A Modulation Type	*T1-4	O	O	
150	Drum6A Modulation Depth	0~64~127 : -63~0~63	O	O	
151	Drum6A Modulation Speed	0~127	O	O	
152	Drum6A Modulation Destination	*T1-5	O	O	
153	Drum6A Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
154	Drum6A Motion Seq Type	*T1-6	X	O	
161	Drum6B Pitch	0~127 (64=equal pitch)	O	O	
167	Drum6B Level	0~127	O	O	
168	Drum6B Pan	0~127 (64=center)	O	O	
169	Drum6B EG Time	0~127	O	O	
16A	Drum6B Amp EG	0~63/64~127 : Off/On	O	O	
16B	Drum6B Roll	0~63/64~127 : Off/On	O	O	
16D	Drum6B Effect Send	0~63/64~127 : Off/On	O	O	
16E	Drum6B Effect Select	*T1-3	O	O	
16F	Drum6B Modulation Type	*T1-4	O	O	
170	Drum6B Modulation Depth	0~64~127 : -63~0~63	O	O	
171	Drum6B Modulation Speed	0~127	O	O	
172	Drum6B Modulation Destination	*T1-5	O	O	
173	Drum6B Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
174	Drum6B Motion Seq Type	*T1-6	X	O	
181	Drum7A Pitch	0~127 (64=equal pitch)	O	O	
187	Drum7A Level	0~127	O	O	
188	Drum7A Pan	0~127 (64=center)	O	O	
189	Drum7A EG Time	0~127	O	O	
18A	Drum7A Amp EG	0~63/64~127 : Off/On	O	O	
18B	Drum7A Roll	0~63/64~127 : Off/On	O	O	
18D	Drum7A Effect Send	0~63/64~127 : Off/On	O	O	
18E	Drum7A Effect Select	*T1-3	O	O	
18F	Drum7A Modulation Type	*T1-4	O	O	
190	Drum7A Modulation Depth	0~64~127 : -63~0~63	O	O	
191	Drum7A Modulation Speed	0~127	O	O	
192	Drum7A Modulation Destination	*T1-5	O	O	
193	Drum7A Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
194	Drum7A Motion Seq Type	*T1-6	X	O	
1A1	Drum7B Pitch	0~127 (64=equal pitch)	O	O	

1A7	Drum7B Level	0~127	O	O	
1A8	Drum7B Pan	0~127 (64=center)	O	O	
1A9	Drum7B EG Time	0~127	O	O	
1AA	Drum7B Amp EG	0~63/64~127 : Off/On	O	O	
1AB	Drum7B Roll	0~63/64~127 : Off/On	O	O	
1AD	Drum7B Effect Send	0~63/64~127 : Off/On	O	O	
1AE	Drum7B Effect Select	*T1-3	O	O	
1AF	Drum7B Modulation Type	*T1-4	O	O	
1B0	Drum7B Modulation Depth	0~64~127 : -63~0~63	O	O	
1B1	Drum7B Modulation Speed	0~127	O	O	
1B2	Drum7B Modulation Destination	*T1-5	O	O	
1B3	Drum7B Modulation BPM Sync	0~63/64~127 : Off/On	O	O	
1B4	Drum7B Motion Seq Type	*T1-6	X	O	
1E0	Synth Accent Level	0~127	O	O	
1E1	Synth Accent Motion Seq SW	0~42/43~127 : Off/Trig Hold	X	O	
1E2	Drum Accent Level	0~127	O	O	
1E3	Drum Accent Motion Seq SW	0~42/43~127 : Off/Trig Hold	X	O	
1E4	FX1 Type	*T2-4	X	O	
1E5	FX1 Edit1	0~127	O	O	
1E6	FX1 Edit2	0~127	O	O	
1E7	FX1 Motion Seq SW	0~63/64~127 : Off/On	X	O	
1E8	FX2 Type	*T2-4	X	O	
1E9	FX2 Edit1	0~127	O	O	
1EA	FX2 Edit2	0~127	O	O	
1EB	FX2 Motion Seq SW	0~63/64~127 : Off/On	X	O	
1EC	FX3 Type	*T2-4	X	O	
1ED	FX3 Edit1	0~127	O	O	
1EE	FX3 Edit2	0~127	O	O	
1EF	FX3 Motion Seq SW	0~63/64~127 : Off/On	X	O	
1F5	FX Chain	*T2-5	X	O	

TABLE24 : MIDI Channel (6byte)

Offset	Part	Default MIDI Ch
0	Synth1	01
1	Synth2	02
2	Synth3	03
3	Synth4	04
4	Synth5	05
5	Drum	10

TABLE25 : Drum Note Number (9byte)

Offset	Part	Default Note No.[H] (Note)
0	Drum1	24 (C2)
1	Drum2	26 (D2)
2	Drum3	28 (E2)
3	Drum4	29 (F2)
4	Drum5	2B (G2)
5	Drum6A	2A (F#2)
6	Drum6B	2E (A#2)
7	Drum7A	31 (C#3)
8	Drum7B	33 (D#3)

TABLE26 : Control Change Assign Map (35 bytes)

Offset	Control	(default)
0	OSC TYPE	CC #70
1	OSC EDIT1	CC #14
2	OSC EDIT2	CC #15
3	MOD SPEED	CC #89
4	MOD DEPTH	CC #90

5	MOD TYPE	CC #87
6	MOD DEST	CC #88
7	MOD BPMSYNC	CC #82
8	FILTER CUTOFF	CC #74
9	FILTER RESONANCE	CC #71
10	FILTER EGINT	CC #79
11	FILTER DRIVE	CC #84
12	FILTER TYPE	CC #83
13	GLIDE(PITCH)	CC #5
14	PAN	CC #10
15	EG TIME	CC #75
16	LEVEL	CC #7
17	AMP EG	CC #86
18	ROLL	CC #85
19	EFFECT SEND	CC #91
20	EFFECT SELECT	CC #81
21	PART MOTION SEQ	CC #80
22	FX1 TYPE	CC #12
23	FX1 EDIT1	CC #92
24	FX1 EDIT2	CC #93
25	FX1 MOTION SEQ	CC #20
26	FX2 TYPE	CC #13
27	FX2 EDIT1	CC #94
28	FX2 EDIT2	CC #95
29	FX2 MOTION SEQ	CC #21
30	FX3 TYPE	CC #24
31	FX3 EDIT1	CC #25
32	FX3 EDIT2	CC #26
33	FX3 MOTION SEQ	CC #22
34	FX CHAIN	CC #23

-Revision History-

Rev	Date	Description
1.0	May.08.'03	Initial Release.
1.1	Sep.09.'03	Fix some mistakes.