

MIDI Implementation

Model VS-1680 V-XPANDED Version 2.00 Mar. 14 1999

1. Transmitted Data and Recognized Receive Data

■ Channel Voice Message

● Note On/Off

When "Metronome Out Mode (*1)" in the SYSTEM parameters is "MIDI," MIDI note number/velocity of MIDI channel number which is assigned to the Metronome is transmitted. Received when the effect patch Voice Transformer effect (algorithm 27) is selected and MIDI Control SW is On.

Status	Second	Third
9nH	mmH	llH

n = MIDI Channel No. : 0H - FH (ch.1-ch.16) (*2)
 0H - 3H (ch.1-ch.4) (*3)
 mm = Note No. : 00H - 7FH (0 - 127) (*3)
 ll = Velocity : 01H - 7FH (1 - 127) / 00H = NOTE OFF

(*1) See "2. Address Map for Data Transfer" section.
 (*2) Only when transmitting Metronome.
 (*3) Only when receiving with MIDI Control SW of Voice Transformer is On.

n = 0, 2 (ch.1, 3) : Voice Transformer : Chromatic Pitch
 mm = 24H - 54H (C2 - C6)
 ll = ignored

n = 1, 3 (ch.2, 4) : Voice Transformer : Chromatic Formant
 mm = 24H - 3CH (C2 - C4)
 ll = ignored

● Polyphonic Key Pressure

Transmits the level meter value of VS-1680 according to the value of "Level Meter Tx. via MIDI" (see "2. Data Transfer Address Map"). (MIDI ch. is fixed to 16.)
 Ignored when received.

When VS-1680 is booted up, "Level Meter Tx. via MIDI" is set to Off. Level meter value is not transmitted until is it set to On with Data Set (DT1).

Status	Second	Third
AFH	mmH	llH

mm = Note No. : 00H - 27H (0 - 39) (*1)
 ll = Level Meter Value : 00H - 36H (0 - 54) (*2)

Level Meter and Note No. (*1)

Level Meter Ch.	Note No.	Level Meter Ch.	Note No.
TRACK MIX CH. 1	0	EFX1 BUS Lch	26
TRACK MIX CH. 2	1	EFX1 BUS Rch	27
TRACK MIX CH. 3	2		
TRACK MIX CH. 4	3	EFX2 BUS Lch	28
TRACK MIX CH. 5	4	EFX2 BUS Rch	29
TRACK MIX CH. 6	5		
TRACK MIX CH. 7	6	EFX3 (AUX1) BUS Lch	30
TRACK MIX CH. 8	7	EFX3 (AUX1) BUS Rch	31
TRACK MIX CH. 9	8		
TRACK MIX CH.10	9	EFX4 (AUX2) BUS Lch	32
TRACK MIX CH.11	10	EFX4 (AUX2) BUS Rch	33
TRACK MIX CH.12	11		
TRACK MIX CH.13	12	AUX (AUX3) BUS Lch	34
TRACK MIX CH.14	13	AUX (AUX3) BUS Rch	35
TRACK MIX CH.15	14		
TRACK MIX CH.16	15	MONITOR Lch	36
		MONITOR Rch	37
INPUT MIX CH. 1	16		
INPUT MIX CH. 2	17	MASTER Lch	38
INPUT MIX CH. 3	18	MASTER Rch	39
INPUT MIX CH. 4	19		
INPUT MIX CH. 5	20		
INPUT MIX CH. 6	21		
INPUT MIX CH. 7	22		
INPUT MIX CH. 8	23		
INPUT MIX CH. 9	24		
INPUT MIX CH.10	25		

Level Meter Value and Level (*2)

Val	Level	Val	Level	Val	Level	Val	Level	Val	Level
0	-∞ dB	11	-30.0dB	22	-17.0dB	33	-8.00dB	44	-2.50dB
1	-51.0dB	12	-28.0dB	23	-16.0dB	34	-7.50dB	45	-2.25dB
2	-48.0dB	13	-26.0dB	24	-15.0dB	35	-7.00dB	46	-2.00dB
3	-46.0dB	14	-25.0dB	25	-14.0dB	36	-6.50dB	47	-1.75dB
4	-44.0dB	15	-24.0dB	26	-13.0dB	37	-6.00dB	48	-1.50dB
5	-42.0dB	16	-23.0dB	27	-12.5dB	38	-5.50dB	49	-1.25dB
6	-40.0dB	17	-22.0dB	28	-12.0dB	39	-5.00dB	50	-1.00dB
7	-38.0dB	18	-21.0dB	29	-11.0dB	40	-4.50dB	51	-0.75dB
8	-36.0dB	19	-20.0dB	30	-10.0dB	41	-4.00dB	52	-0.50dB
9	-34.0dB	20	-19.0dB	31	-9.00dB	42	-3.50dB	53	-0.25dB
10	-32.0dB	21	-18.0dB	32	-8.50dB	43	-3.00dB	54	-0.00dB

● Control Change

Parameters on the Mixer section can be received and transmitted by the control change messages when "MIDI Mixer Control Type (*1)" in the SYSTEM parameter is set to "C.C."

Status	Second	Third
nH	mmH	llH

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

Mixer Parameter and MIDI Channel/Control Change No.

<Channel Strip>

TRACK MIX CH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIDI ch. ->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TRACK STATUS (*3)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MIX Send Level	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MIX Send 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-1 SND Level	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-1 SND Pan/Bal	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-2 SND Level	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-2 SND Pan/Bal	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-3 SND Level	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-3 SND Pan/Bal	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-4 SND Level	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EFX-4 SND Pan/Bal	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUX Send Level	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUX Send Pan/Bal	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MIX Offset Level	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MIX Offset Bal	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

INPUT MIX CH.	1	2	3	4	5	6	7	8	9	10
MIDI ch. ->	1	2	3	4	5	6	7	8	9	10
MIX Send Level	68	-	-	-	-	-	-	-	-	-
MIX Send Pan/Bal	70	-	-	-	-	-	-	-	-	-
EQ L Freq.	71	-	-	-	-	-	-	-	-	-
EQ L Gain	72	-	-	-	-	-	-	-	-	-
EQ M Freq.	73	-	-	-	-	-	-	-	-	-
EQ M Gain	74	-	-	-	-	-	-	-	-	-
EQ M Q	75	-	-	-	-	-	-	-	-	-
EQ H Freq.	76	-	-	-	-	-	-	-	-	-
EQ H Gain	77	-	-	-	-	-	-	-	-	-
EFX-1 SND Level	78	-	-	-	-	-	-	-	-	-
EFX-1 SND Pan/Bal	79	-	-	-	-	-	-	-	-	-
EFX-2 SND Level	80	-	-	-	-	-	-	-	-	-
EFX-2 SND Pan/Bal	81	-	-	-	-	-	-	-	-	-
EFX-3 SND Level	82	-	-	-	-	-	-	-	-	-
EFX-3 SND Pan/Bal	83	-	-	-	-	-	-	-	-	-
EFX-4 SND Level	84	-	-	-	-	-	-	-	-	-
EFX-4 SND Pan/Bal	85	-	-	-	-	-	-	-	-	-
AUX Send Level	86	-	-	-	-	-	-	-	-	-
AUX Send Pan/Bal	87	-	-	-	-	-	-	-	-	-
MIX Offset Level	88	-	-	-	-	-	-	-	-	-
MIX Offset Bal	89	-	-	-	-	-	-	-	-	-

stereo in & effect return

	ST IN	EFX1	EFX2	EFX3	EFX4
MIDI ch. ->	11	12	13	14	15
		->	->	->	->
MIX Send Level	68	->	->	->	->
MIX Send Balance	70	->	->	->	->

<MASTER Block> MIDI ch.=16

Master Level	68
Master Balance	70
EFX-1 SND Level	78
EFX-1 SND Balance	79
EFX-2 SND Level	80
EFX-2 SND Balance	81
EFX-3 SND Level	82
EFX-3 SND Pan/Bal	83
EFX-4 SND Level	84
EFX-4 SND Pan/Bal	85
AUX Level	86
AUX Balance	87
Monitor Level	102
Monitor Balance	103

- (*1) See "2. Address Map for Data Transfer" section.
- (*2) Control Change of the odd number of channel is transmitted and received when Channel Link is On.
- (*3) Value and switching Track status corresponds as follows.

(1) While VS-1680 stops

Value :	0-31	32-63	64-95	96-127
Status:	MUTE ->MUTE	MUTE ->PLAY	MUTE ->REC	MUTE ->SOURCE
	PLAY ->MUTE	PLAY ->PLAY	PLAY ->REC	PLAY ->SOURCE
	REC ->MUTE	REC ->PLAY	REC ->REC	REC ->SOURCE
	SOURCE->MUTE	SOURCE->PLAY	SOURCE->REC	SOURCE->SOURCE

(2) While playback/recording

Value :	0-31	32-63	64-95	96-127
Status:	MUTE -> X	MUTE ->PLAY	MUTE -> X	MUTE -> X
	PLAY ->MUTE	PLAY ->PLAY	PLAY -> X	PLAY -> X
	REC -> X	REC -> X	REC ->REC	REC ->SOURCE (*)
	SOURCE->MUTE	SOURCE-> X	SOURCE->REC(*)	SOURCE->SOURCE

- (*) Impossible to switch while recording.
- (*) X = ignored

Bank select (MSB/LSB)

Switches the effect bank of Preset/User. VS-1680 never transmits this message.

Status	Second	Third
BnH	00H	mmH
BnH	20H	llH

n = MIDI Channel No. : 0H - 3H (ch.1 = EFX1, ch.2 = EFX2, ch.3 = EFX3, ch.4 = EFX4)
 mm = upper byte of bank number : 00H
 ll = lower byte of bank number : 00H - 04H (0 - 4)

Bank Select	Program Change	Patch Number
MSB LSB		
00H 00H	00H - 63H (0 - 99)	Preset #000 - #099
00H 01H	00H - 63H (0 - 99)	Preset #100 - #199
00H 02H	00H - 27H (0 - 39)	Preset #200 - #239
00H 03H	00H - 63H (0 - 99)	User #000 - #099
00H 04H	00H - 63H (0 - 99)	User #100 - #199

NRPN (MSB/LSB)

Selects a parameter of the effect to be controlled. VS-1680 never transmits this message.

Status	Second	Third
BnH	62H	llH
BnH	63H	mmH

n = MIDI Channel No. : 0H - 3H (ch.1 = EFX1, ch.2 = EFX2, ch.3 = EFX3, ch.4 = EFX4)
 mm = upper byte of the parameter number to be assigned with NRPN : 00H
 ll = lower byte of the parameter number to be assigned with NRPN : 00H - 2EH (0 - 46)

Data Entry (MSB/LSB)

Controls effect parameter assigned with NRPN. VS-1680 never transmits this message.

Status	Second	Third
BnH	06H	mmH
BnH	26H	llH

n = MIDI Channel No. : 0H - 3H (ch.1 = EFX1, ch.2 = EFX2, ch.3 = EFX3, ch.4 = EFX4)
 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

Data Increment

Increments the effect parameter selected with NRPN. VS-1680 never transmits this message.

Status	Second	Third
BnH	60H	00H

n = MIDI Channel No. : 0H - 3H (ch.1 = EFX1, ch.2 = EFX2, ch.3 = EFX3, ch.4 = EFX4)

Increment the effect parameter selected with NRPN.

Data Decrement

Decrement the effect parameter selected with NRPN. VS-1680 never transmits this message.

Status	Second	Third
BnH	61H	00H

n = MIDI Channel No. : 0H - 3H (ch.1 = EFX1, ch.2 = EFX2, ch.3 = EFX3, ch.4 = EFX4)

Decrement the effect parameter selected with NRPN.

NRPN and Effect parameters

Algorithm 0 Reverb (EFX1 or EFX3)

NRPN	Data	Entry
00H 00H	mmH llH	EQ SW 0,1 = Off, On
00H 01H	mmH llH	EQ: Low EQ Type 0,1 = Shelving, Peaking
00H 02H	mmH llH	EQ: Low EQ Gain -12,,12dB
00H 03H	mmH llH	EQ: Low EQ Frequency 2,,200 = 20,,2000Hz
00H 04H	mmH llH	EQ: Low EQ Q 3,,100 = 0.3,,10.0
00H 05H	mmH llH	EQ: Mid EQ Gain -12,,12dB
00H 06H	mmH llH	EQ: Mid EQ Frequency 20,,800 = 200,,8000Hz
00H 07H	mmH llH	EQ: Mid EQ Q 3,,100 = 0.3,,10.0
00H 08H	mmH llH	EQ: High EQ Type 0,1 = Shelving, Peaking

00H 09H	mmH 11H	EQ: High EQ Gain	-12,,,12dB
00H 0AH	mmH 11H	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 0BH	mmH 11H	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 0CH	mmH 11H	EQ: Out Level	0,,,100
00H 0DH	mmH 11H	Reverb: Room Size	5,,,40m
00H 0EH	mmH 11H	Reverb: Reverb Time	1,,,320 = 0.1,,,32.0s
00H 0FH	mmH 11H	Reverb: Pre Delay	0,,,200 = 0,,,200ms
00H 10H	mmH 11H	Reverb: Diffusion	0,,,100
00H 11H	mmH 11H	Reverb: Density	0,,,100
00H 12H	mmH 11H	Reverb: Early Reflection Level	0,,,100
00H 13H	mmH 11H	Reverb: LF Damp Frequency	5,,,400 = 50,,,4000Hz
00H 14H	mmH 11H	Reverb: LF Damp Gain	-36,,,0dB
00H 15H	mmH 11H	Reverb: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
00H 16H	mmH 11H	Reverb: HF Damp Gain	-36,,,0dB
00H 17H	mmH 11H	Reverb: HI Cut Frequency	2,,,200 = 0.2,,,20.0kHz
00H 18H	mmH 11H	Reverb: Effect Level	-100,,,100
00H 19H	mmH 11H	Reverb: Direct Level	-100,,,100
00H 1AH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 1 Delay

NRPN	Data Entry	
00H 00H	mmH 11H	Delay SW 0,1 = Off,On
00H 01H	mmH 11H	EQ SW 0,1 = Off,On
00H 02H	mmH 11H	Delay: Delay Time 0,,,1200ms
00H 03H	mmH 11H	Delay: Shift -1200,,,1200 = L1200,,,R1200ms
00H 04H	mmH 11H	Delay: Lch Feedback Level -100,,,100

00H 05H	mmH 11H	Delay: Rch Feedback Level	-100,,,100
00H 06H	mmH 11H	Delay: Lch Level	-100,,,100
00H 07H	mmH 11H	Delay: Rch Level	-100,,,100
00H 08H	mmH 11H	Delay: LF Damp Frequency	5,,,400 = 50,,,4000Hz
00H 09H	mmH 11H	Delay: LF Damp Gain	-36,,,0dB
00H 0AH	mmH 11H	Delay: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
00H 0BH	mmH 11H	Delay: HF Damp Gain	-36,,,0dB
00H 0CH	mmH 11H	Delay: Direct Level	-100,,,100
00H 0DH	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 0EH	mmH 11H	EQ: Low EQ Gain	-12,,,12dB
00H 0FH	mmH 11H	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 10H	mmH 11H	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 11H	mmH 11H	EQ: Mid EQ Gain	-12,,,12dB
00H 12H	mmH 11H	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 13H	mmH 11H	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 14H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 15H	mmH 11H	EQ: High EQ Gain	-12,,,12dB
00H 16H	mmH 11H	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 17H	mmH 11H	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 18H	mmH 11H	EQ: Out Level	0,,,100
00H 19H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

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

Algorithm 2 Stereo Delay Chorus

NRPN	Data Entry	
00H 00H	mmH 11H	Delay SW 0,1 = Off,On
00H 01H	mmH 11H	Chorus SW 0,1 = Off,On

00H 02H	mmH 11H	EQ SW	0,1 = Off,On
00H 03H	mmH 11H	Delay: Delay Time	0,,500ms
00H 04H	mmH 11H	Delay: Shift	-500,,500 = L500,,R500ms
00H 05H	mmH 11H	Delay: Lch Feedback Level	-100,,100
00H 06H	mmH 11H	Delay: Rch Feedback Level	-100,,100
00H 07H	mmH 11H	Delay: Lch Cross Feedback Level	-100,,100
00H 08H	mmH 11H	Delay: Rch Cross Feedback Level	-100,,100
00H 09H	mmH 11H	Delay: Effect Level	-100,,100
00H 0AH	mmH 11H	Delay: Direct Level	-100,,100
00H 0BH	mmH 11H	Chorus: Rate	1,,100 = 0.1,,10.0Hz
00H 0CH	mmH 11H	Chorus: Depth	0,,100
00H 0DH	mmH 11H	Chorus: Pre Delay	0,,50ms
00H 0EH	mmH 11H	Chorus: Effect Level	-100,,100
00H 0FH	mmH 11H	Chorus: Direct Level	-100,,100
00H 10H	mmH 11H	Chorus: Lch Feedback Level	-100,,100
00H 11H	mmH 11H	Chorus: Rch Feedback Level	-100,,100
00H 12H	mmH 11H	Chorus: Lch Cross Feedback Level	-100,,100
00H 13H	mmH 11H	Chorus: Rch Cross Feedback Level	-100,,100
00H 14H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 15H	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 16H	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 17H	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 18H	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 19H	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 1AH	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0
00H 1BH	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking

00H 1CH	mmH 11H	EQ: High EQ Gain	-12,,12dB
00H 1DH	mmH 11H	EQ: High EQ Frequency	14,,200 = 1.4,,20.0kHz
00H 1EH	mmH 11H	EQ: High EQ Q	3,,100 = 0.3,,10.0
00H 1FH	mmH 11H	EQ: Out Level	0,,100
00H 20H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

* (Delay Time) + (Absolute value of Shift) should be 500 or less.

Algorithm 3 Stereo Pitch Shifter Delay

NRPN	Data Entry		
00H 00H	mmH 11H	P.ShifterDelay SW	0,1 = Off,On
00H 01H	mmH 11H	EQ SW	0,1 = Off,On
00H 02H	mmH 11H	P.ShifterDelay: Lch Chromatic Pitch	-12,,12
00H 03H	mmH 11H	P.ShifterDelay: Lch Fine Pitch	-100,,100
00H 04H	mmH 11H	P.ShifterDelay: Lch Pre Delay	0,,50ms
00H 05H	mmH 11H	P.ShifterDelay: Lch Feedback Delay Time	0,,500ms
00H 06H	mmH 11H	P.ShifterDelay: Lch Feedback Level	-100,,100
00H 07H	mmH 11H	P.ShifterDelay: Lch Cross Feedback Level	-100,,100
00H 08H	mmH 11H	P.ShifterDelay: Rch Chromatic Pitch	-12,,12
00H 09H	mmH 11H	P.ShifterDelay: Rch Fine Pitch	-100,,100
00H 0AH	mmH 11H	P.ShifterDelay: Rch Pre Delay	0,,50ms
00H 0BH	mmH 11H	P.ShifterDelay: Rch Feedback Delay Time	0,,500ms
00H 0CH	mmH 11H	P.ShifterDelay: Rch Feedback Level	-100,,100
00H 0DH	mmH 11H	P.ShifterDelay: Rch Cross Feedback Level	-100,,100
00H 0EH	mmH 11H	P.ShifterDelay: Effect Level	-100,,100
00H 0FH	mmH 11H	P.ShifterDelay: Direct Level	-100,,100
00H 10H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 11H	mmH 11H	EQ: Low EQ Gain	-12,,12dB

00H 12H	mmH 11H	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 13H	mmH 11H	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 14H	mmH 11H	EQ: Mid EQ Gain	-12,,,12dB
00H 15H	mmH 11H	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 16H	mmH 11H	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 17H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 18H	mmH 11H	EQ: High EQ Gain	-12,,,12dB
00H 19H	mmH 11H	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 1AH	mmH 11H	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 1BH	mmH 11H	EQ: Out Level	0,,,100
00H 1CH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 4 Vocoder

NRPN	Data Entry		
00H 00H	mmH 11H	Chorus SW	0,1 = Off,On
00H 01H	mmH 11H	Vocoder: Voice Character 1	0,,,100
00H 02H	mmH 11H	Vocoder: Voice Character 2	0,,,100
00H 03H	mmH 11H	Vocoder: Voice Character 3	0,,,100
00H 04H	mmH 11H	Vocoder: Voice Character 4	0,,,100
00H 05H	mmH 11H	Vocoder: Voice Character 5	0,,,100
00H 06H	mmH 11H	Vocoder: Voice Character 6	0,,,100
00H 07H	mmH 11H	Vocoder: Voice Character 7	0,,,100
00H 08H	mmH 11H	Vocoder: Voice Character 8	0,,,100
00H 09H	mmH 11H	Vocoder: Voice Character 9	0,,,100
00H 0AH	mmH 11H	Vocoder: Voice Character 10	0,,,100
00H 0BH	mmH 11H	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz

00H 0CH	mmH 11H	Chorus: Depth	0,,,100
00H 0DH	mmH 11H	Chorus: Pre Delay	0,,,50ms
00H 0EH	mmH 11H	Chorus: Feedback Level	-100,,,100
00H 0FH	mmH 11H	Chorus: Effect Level	-100,,,100
00H 10H	mmH 11H	Chorus: Direct Level	-100,,,100
00H 11H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 5 2CH RSS

NRPN	Data Entry		
00H 00H	mmH 11H	2CH RSS: Ach Azimuth	-30,,,30 = -180,,,180
00H 01H	mmH 11H	2CH RSS: Ach Elevation	-15,,,15 = -90,,,90
00H 02H	mmH 11H	2CH RSS: Bch Azimuth	-30,,,30 = -180,,,180
00H 03H	mmH 11H	2CH RSS: Bch Elevation	-15,,,15 = -90,,,90
00H 04H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 6 Delay RSS

NRPN	Data Entry		
00H 00H	mmH 11H	Delay RSS: Delay Time	0,,,1200ms
00H 01H	mmH 11H	Delay RSS: Shift	-1200,,,1200 = L1200,,,R1200ms
00H 02H	mmH 11H	Delay RSS: Center Delay Time	0,,,1200ms
00H 03H	mmH 11H	Delay RSS: RSS Level	0,,,100
00H 04H	mmH 11H	Delay RSS: Center Level	0,,,100
00H 05H	mmH 11H	Delay RSS: Feedback Level	-100,,,100
00H 06H	mmH 11H	Delay RSS: LF Damp Frequency	5,,,400 = 50,,,4000Hz
00H 07H	mmH 11H	Delay RSS: LF Damp Gain	-36,,,0dB
00H 08H	mmH 11H	Delay RSS: HF Damp Frequency	10,,,200 = 1.0,,,20.0kHz
00H 09H	mmH 11H	Delay RSS: HF Damp Gain	-36,,,0dB

00H 0AH	mmH 11H	Delay RSS: Effect Level	-100,,,100
00H 0BH	mmH 11H	Delay RSS: Direct Level	-100,,,100
00H 0CH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 7 Chorus RSS

NRPN	Data Entry		
00H 00H	mmH 11H	Chorus RSS: Chorus Rate	1,,,100 = 0.1,,,10.0Hz
00H 01H	mmH 11H	Chorus RSS: Chorus Depth	0,,,100
00H 02H	mmH 11H	Chorus RSS: Effect Level	-100,,,100
00H 03H	mmH 11H	Chorus RSS: Direct Level	-100,,,100
00H 04H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Common for Algorithm 8, 9, 10 Guitar Multi 1, 2, 3

NRPN	Data Entry		
00H 00H	mmH 11H	Compressor SW	0,1 = Off,On
00H 01H	mmH 11H	Metal/Distortion/Over Drive SW	0,1 = Off,On
00H 02H	mmH 11H	Noise Suppressor SW	0,1 = Off,On
00H 03H	mmH 11H	Auto Wah SW	0,1 = Off,On
00H 04H	mmH 11H	Guitar Amp Simulator SW	0,1 = Off,On
00H 05H	mmH 11H	Flanger SW	0,1 = Off,On
00H 06H	mmH 11H	Delay SW	0,1 = Off,On
00H 07H	mmH 11H	Compressor: Attack	0,,,100
00H 08H	mmH 11H	Compressor: Level	0,,,100
00H 09H	mmH 11H	Compressor: Sustain	0,,,100
00H 0AH	mmH 11H	Compressor: Tone	-50,,,50
00H 0BH	mmH 11H	Noise Suppressor: Threshold	0,,,100

00H 0CH	mmH 11H	Noise Suppressor: Release	0,,,100
00H 0DH	mmH 11H	Auto Wah: Mode	0,1 = LPF,BPF
00H 0EH	mmH 11H	Auto Wah: Polarity	0,1 = Down,Up
00H 0FH	mmH 11H	Auto Wah: Frequency	0,,,100
00H 10H	mmH 11H	Auto Wah: Level	0,,,100
00H 11H	mmH 11H	Auto Wah: Peak	0,,,100
00H 12H	mmH 11H	Auto Wah: Sens	0,,,100
00H 13H	mmH 11H	Auto Wah: Rate	1,,,100 = 0.1,,,10.0Hz
00H 14H	mmH 11H	Auto Wah: Depth	0,,,100
00H 15H	mmH 11H	Guitar Amp Simulator: Mode	0,,,3 = Small,BultIn,2Stack,3Stack
00H 16H	mmH 11H	Flanger: Rate	1,,,100 = 0.1,,,10.0Hz
00H 17H	mmH 11H	Flanger: Depth	0,,,100
00H 18H	mmH 11H	Flanger: Manual	0,,,100
00H 19H	mmH 11H	Flanger: Resonance	0,,,100
00H 1AH	mmH 11H	Delay: Delay Time	0,,,1000ms
00H 1BH	mmH 11H	Delay: Shift	-1000,,,1000 = L1000,,,R1000ms
00H 1CH	mmH 11H	Delay: Feedback Time	0,,,1000ms
00H 1DH	mmH 11H	Delay: Feedback Level	-100,,,100
00H 1EH	mmH 11H	Delay: Effect Level	-100,,,100
00H 1FH	mmH 11H	Delay: Direct Level	-100,,,100

* (Delay Time) + (Absolute value of Shift) should be 1000 or less.

Individual for Algorithm 8 Guitar Multi1

00H 20H	mmH 11H	Metal: Gain	0,,,100
00H 21H	mmH 11H	Metal: Level	0,,,100
00H 22H	mmH 11H	Metal: Hi Gain	-100,,,100
00H 23H	mmH 11H	Metal: Mid Gain	-100,,,100

00H 24H	mmH 11H	Metal: Low Gain	-100,,100
00H 25H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Individual for Algorithm 9 Guitar Multi 2

00H 20H	mmH 11H	Distortion: Gain	0,,100
00H 21H	mmH 11H	Distortion: Level	0,,100
00H 22H	mmH 11H	Distortion: Tone	0,,100
00H 23H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Individual for Algorithm 10 Guitar Multi 3

00H 20H	mmH 11H	Over Drive: Gain	0,,100
00H 21H	mmH 11H	Over Drive: Level	0,,100
00H 22H	mmH 11H	Over Drive: Tone	0,,100
00H 23H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 11 Vocal Multi

NRPN	Data Entry		
00H 00H	mmH 11H	Noise Suppressor SW	0,1 = Off,On
00H 01H	mmH 11H	Limiter/De-esser SW	0,1 = Off,On
00H 02H	mmH 11H	Enhancer SW	0,1 = Off,On
00H 03H	mmH 11H	EQ SW	0,1 = Off,On
00H 04H	mmH 11H	P.Shifter SW	0,1 = Off,On
00H 05H	mmH 11H	Delay SW	0,1 = Off,On
00H 06H	mmH 11H	Chorus SW	0,1 = Off,On
00H 07H	mmH 11H	Limiter/De-esser Mode	0,1 = Limiter,De-esser
00H 08H	mmH 11H	Noise Suppressor: Threshold	0,,100
00H 09H	mmH 11H	Noise Suppressor: Release	0,,100

00H 0AH	mmH 11H	Limiter: Threshold	0,,100
00H 0BH	mmH 11H	Limiter: Release	0,,100
00H 0CH	mmH 11H	Limiter: Level	0,,100
00H 0DH	mmH 11H	De-esser: Sens	0,,100
00H 0EH	mmH 11H	De-esser: Frequency	10,,100 = 1.0,,10.0kHz
00H 0FH	mmH 11H	Enhancer: Sens	0,,100
00H 10H	mmH 11H	Enhancer: Frequency	10,,100 = 1.0,,10.0kHz
00H 11H	mmH 11H	Enhancer: MIX Level	0,,100
00H 12H	mmH 11H	Enhancer: Level	0,,100
00H 13H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 14H	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 15H	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 16H	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 17H	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 18H	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 19H	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0
00H 1AH	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 1BH	mmH 11H	EQ: High EQ Gain	-12,,12dB
00H 1CH	mmH 11H	EQ: High EQ Frequency	14,,200 = 1.4,,20.0kHz
00H 1DH	mmH 11H	EQ: High EQ Q	3,,100 = 0.3,,10.0
00H 1EH	mmH 11H	EQ: Out Level	0,,100
00H 1FH	mmH 11H	P.Shifter: Chromatic Pitch	-12,,12
00H 20H	mmH 11H	P.Shifter: Fine Pitch	-100,,100
00H 21H	mmH 11H	P.Shifter: Effect Level	-100,,100
00H 22H	mmH 11H	P.Shifter: Direct Level	-100,,100
00H 23H	mmH 11H	Delay: Delay Time	0,,1000

00H 24H	mmH 11H	Delay: Feedback Level	-100,,,100
00H 25H	mmH 11H	Delay: Effect Level	-100,,,100
00H 26H	mmH 11H	Delay: Direct Level	-100,,,100
00H 27H	mmH 11H	Chorus: Rate	1,,,100 = 0.1,,,10.0Hz
00H 28H	mmH 11H	Chorus: Depth	0,,,100
00H 29H	mmH 11H	Chorus: Pre Delay	0,,,50ms
00H 2AH	mmH 11H	Chorus: Effect Level	-100,,,100
00H 2BH	mmH 11H	Chorus: Direct Level	-100,,,100
00H 2CH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 12 Rotary

NRPN	Data Entry		
00H 00H	mmH 11H	Noise Suppressor SW	0,1 = Off,On
00H 01H	mmH 11H	Over Drive SW	0,1 = Off,On
00H 02H	mmH 11H	Noise Suppressor: Threshold	0,,,100
00H 03H	mmH 11H	Noise Suppressor: Release	0,,,100
00H 04H	mmH 11H	Over Drive: Gain	0,,,100
00H 05H	mmH 11H	Over Drive: Level	0,,,100
00H 06H	mmH 11H	Rotary: Low Rate	1,,,100 = 0.1,,,10.0Hz
00H 07H	mmH 11H	Rotary: Hi Rate	1,,,100 = 0.1,,,10.0Hz
00H 08H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 13 Guitar AMP Simulator

NRPN	Data Entry		
00H 00H	mmH 11H	Noise Suppressor SW	0,1 = Off,On
00H 01H	mmH 11H	Pre Amp SW	0,1 = Off,On
00H 02H	mmH 11H	Speaker SW	0,1 = Off,On

00H 03H	mmH 11H	Noise Suppressor: Threshold	0,,,100
00H 04H	mmH 11H	Noise Suppressor: Release	0,,,100
00H 05H	mmH 11H	Pre Amp: Mode	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
00H 06H	mmH 11H	Pre Amp: Volume	0,,,100
00H 07H	mmH 11H	Pre Amp: Bass	0,,,100
00H 08H	mmH 11H	Pre Amp: Middle	0,,,100
00H 09H	mmH 11H	Pre Amp: Treble	0,,,100
00H 0AH	mmH 11H	Pre Amp: Presence	0,,,100
00H 0BH	mmH 11H	Pre Amp: Master	0,,,100
00H 0CH	mmH 11H	Pre Amp: Bright	0,1 = Off,On
00H 0DH	mmH 11H	Pre Amp: Gain	0,1,2 = Low,Middle,High
00H 0EH	mmH 11H	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
00H 0FH	mmH 11H	Speaker: MIC Setting	0,1,2 = 1,2,3
00H 10H	mmH 11H	Speaker: MIC Level	0,,,100
00H 11H	mmH 11H	Speaker: Direct Level	0,,,100
00H 12H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

- * 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 14 Stereo Phaser

NRPN	Data Entry		
00H 00H	mmH 11H	Phaser SW	0,1 = Off,On
00H 01H	mmH 11H	EQ SW	0,1 = Off,On
00H 02H	mmH 11H	Phaser: Mode	0,,,3 = 4.8.12.16stage
00H 03H	mmH 11H	Phaser: Rate	1,,,100 = 0.1,,,10.0Hz

00H 04H	mmH 11H	Phaser: Depth	0,,100
00H 05H	mmH 11H	Phaser: Polarity	0,1 = Inverse,Synchro
00H 06H	mmH 11H	Phaser: Manual	0,,100
00H 07H	mmH 11H	Phaser: Resonance	0,,100
00H 08H	mmH 11H	Phaser: Cross Feedback	0,,100
00H 09H	mmH 11H	Phaser: Effect Level	-100,,100
00H 0AH	mmH 11H	Phaser: Direct Level	-100,,100
00H 0BH	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 0CH	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 0DH	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 0EH	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 0FH	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 10H	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 11H	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0
00H 12H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 13H	mmH 11H	EQ: High EQ Gain	-12,,12dB
00H 14H	mmH 11H	EQ: High EQ Frequency	14,,200 = 1.4,,20.0kHz
00H 15H	mmH 11H	EQ: High EQ Q	3,,100 = 0.3,,10.0
00H 16H	mmH 11H	EQ: Out Level	0,,100
00H 17H	00H 00H	(Reserved)	:
00H 7FH	00H 00H		

Algorithm 15 Stereo Flanger

NRPN	Data	Entry
00H 00H	mmH 11H	Flanger SW 0,1 = Off,On
00H 01H	mmH 11H	EQ SW 0,1 = Off,On
00H 02H	mmH 11H	Flanger: Rate 1,,100 = 0.1,,10.0Hz

00H 03H	mmH 11H	Flanger: Depth	0,,100
00H 04H	mmH 11H	Flanger: Polarity	0,1 = Inverse,Synchro
00H 05H	mmH 11H	Flanger: Manual	0,,100
00H 06H	mmH 11H	Flanger: Resonance	0,,100
00H 07H	mmH 11H	Flanger: Cross Feedback Level	0,,100
00H 08H	mmH 11H	Flanger: Effect Level	-100,,100
00H 09H	mmH 11H	Flanger: Direct Level	-100,,100
00H 0AH	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 0BH	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 0CH	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 0DH	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 0EH	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 0FH	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 10H	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0
00H 11H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 12H	mmH 11H	EQ: High EQ Gain	-12,,12dB
00H 13H	mmH 11H	EQ: High EQ Frequency	14,,200 = 1.4,,20.0kHz
00H 14H	mmH 11H	EQ: High EQ Q	3,,100 = 0.3,,10.0
00H 15H	mmH 11H	EQ: Out Level	0,,100
00H 16H	00H 00H	(Reserved)	:
00H 7FH	00H 00H		

Algorithm 16 Dual Compressor/Limiter

NRPN	Data	Entry
00H 00H	mmH 11H	Comp/Limit A SW 0,1 = Off,On
00H 01H	mmH 11H	Noise Suppressor A SW 0,1 = Off,On
00H 02H	mmH 11H	Comp/Limit B SW 0,1 = Off,On

00H 03H	mmH 11H	Noise Suppressor B SW	0,1 = Off,On
00H 04H	mmH 11H	Comp/Limit A: Detect	0,1,2 = A,B,Link
00H 05H	mmH 11H	Comp/Limit A: Level	-60,,,12dB
00H 06H	mmH 11H	Comp/Limit A: Thresh	-60,,,0dB
00H 07H	mmH 11H	Comp/Limit A: Attack	0,,,100
00H 08H	mmH 11H	Comp/Limit A: Release	0,,,100
00H 09H	mmH 11H	Comp/Limit A: Ratio	0,,,3 = 1.5:1,2:1,4:1,100:1
00H 0AH	mmH 11H	Noise Suppressor A: Detect	0,1,2 = A,B,Link
00H 0BH	mmH 11H	Noise Suppressor A: Threshold	0,,,100
00H 0CH	mmH 11H	Noise Suppressor A: Release	0,,,100
00H 0DH	mmH 11H	Comp/Limit B: Detect	0,1,2 = A,B,Link
00H 0EH	mmH 11H	Comp/Limit B: Level	-60,,,12dB
00H 0FH	mmH 11H	Comp/Limit B: Thresh	-60,,,0dB
00H 10H	mmH 11H	Comp/Limit B: Attack	0,,,100
00H 11H	mmH 11H	Comp/Limit B: Release	0,,,100
00H 12H	mmH 11H	Comp/Limit B: Ratio	0,,,3 = 1.5:1,2:1,4:1,100:1
00H 13H	mmH 11H	Noise Suppressor B: Detect	0,1,2 = A,B,Link
00H 14H	mmH 11H	Noise Suppressor B: Threshold	0,,,100
00H 15H	mmH 11H	Noise Suppressor B: Release	0,,,100
00H 16H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 17 Gate Reverb (EFX1 or EFX3)

NRPN	Data	Entry
00H 00H	mmH 11H	G.Reverb SW
		0,1 = Off,On
00H 01H	mmH 11H	EQ SW
		0,1 = Off,On
00H 02H	mmH 11H	G.Reverb: Gate Time
		10,,,400ms

00H 03H	mmH 11H	G.Reverb: Pre Delay	0,,,300ms
00H 04H	mmH 11H	G.Reverb: Effect Level	-100,,,100
00H 05H	mmH 11H	G.Reverb: Mode	0,,,4 = Normal,L->R,R->L,Reverse1,Reverse2
00H 06H	mmH 11H	G.Reverb: Thickness	0,,,100
00H 07H	mmH 11H	G.Reverb: Density	0,,,100
00H 08H	mmH 11H	G.Reverb: Accent Delay	0,,,200ms
00H 09H	mmH 11H	G.Reverb: Accent Level	0,,,100
00H 0AH	mmH 11H	G.Reverb: Accent Pan	1,,,127 = L63,,,R63
00H 0BH	mmH 11H	G.Reverb: Direct Level	-100,,,100
00H 0CH	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 0DH	mmH 11H	EQ: Low EQ Gain	-12,,,12dB
00H 0EH	mmH 11H	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 0FH	mmH 11H	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 10H	mmH 11H	EQ: Mid EQ Gain	-12,,,12dB
00H 11H	mmH 11H	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 12H	mmH 11H	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 13H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 14H	mmH 11H	EQ: High EQ Gain	-12,,,12dB
00H 15H	mmH 11H	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 16H	mmH 11H	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 17H	mmH 11H	EQ: Out Level	0,,,100
00H 18H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 18 Multi Tap Delay

NRPN	Data	Entry
00H 00H	mmH 11H	EQ SW
		0,1 = Off,On

00H 01H	mmH 11H	M.Tap Delay: Time 1	0,,,1200ms
00H 02H	mmH 11H	M.Tap Delay: Level 1	0,,,100
00H 03H	mmH 11H	M.Tap Delay: Pan 1	1,,,127 = L63,,,R63
00H 04H	mmH 11H	M.Tap Delay: Time 2	0,,,1200ms
00H 05H	mmH 11H	M.Tap Delay: Level 2	0,,,100
00H 06H	mmH 11H	M.Tap Delay: Pan 2	1,,,127 = L63,,,R63
00H 07H	mmH 11H	M.Tap Delay: Time 3	0,,,1200ms
00H 08H	mmH 11H	M.Tap Delay: Level 3	0,,,100
00H 09H	mmH 11H	M.Tap Delay: Pan 3	1,,,127 = L63,,,R63
00H 0AH	mmH 11H	M.Tap Delay: Time 4	0,,,1200ms
00H 0BH	mmH 11H	M.Tap Delay: Level 4	0,,,100
00H 0CH	mmH 11H	M.Tap Delay: Pan 4	1,,,127 = L63,,,R63
00H 0DH	mmH 11H	M.Tap Delay: Time 5	0,,,1200ms
00H 0EH	mmH 11H	M.Tap Delay: Level 5	0,,,100
00H 0FH	mmH 11H	M.Tap Delay: Pan 5	1,,,127 = L63,,,R63
00H 10H	mmH 11H	M.Tap Delay: Time 6	0,,,1200ms
00H 11H	mmH 11H	M.Tap Delay: Level 6	0,,,100
00H 12H	mmH 11H	M.Tap Delay: Pan 6	1,,,127 = L63,,,R63
00H 13H	mmH 11H	M.Tap Delay: Time 7	0,,,1200ms
00H 14H	mmH 11H	M.Tap Delay: Level 7	0,,,100
00H 15H	mmH 11H	M.Tap Delay: Pan 7	1,,,127 = L63,,,R63
00H 16H	mmH 11H	M.Tap Delay: Time 8	0,,,1200ms
00H 17H	mmH 11H	M.Tap Delay: Level 8	0,,,100
00H 18H	mmH 11H	M.Tap Delay: Pan 8	1,,,127 = L63,,,R63
00H 19H	mmH 11H	M.Tap Delay: Time 9	0,,,1200ms
00H 1AH	mmH 11H	M.Tap Delay: Level 9	0,,,100

00H 1BH	mmH 11H	M.Tap Delay: Pan 9	1,,,127 = L63,,,R63
00H 1CH	mmH 11H	M.Tap Delay: Time 10	0,,,1200ms
00H 1DH	mmH 11H	M.Tap Delay: Level 10	0,,,100
00H 1EH	mmH 11H	M.Tap Delay: Pan 10	1,,,127 = L63,,,R63
00H 1FH	mmH 11H	M.Tap Delay: Feedback Delay Time	0,,,1200ms
00H 20H	mmH 11H	M.Tap Delay: Feedback Level	-100,,,100
00H 21H	mmH 11H	M.Tap Delay: Effect Level	-100,,,100
00H 22H	mmH 11H	M.Tap Delay: Direct Level	-100,,,100
00H 23H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 24H	mmH 11H	EQ: Low EQ Gain	-12,,,12dB
00H 25H	mmH 11H	EQ: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 26H	mmH 11H	EQ: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 27H	mmH 11H	EQ: Mid EQ Gain	-12,,,12dB
00H 28H	mmH 11H	EQ: Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 29H	mmH 11H	EQ: Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 2AH	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 2BH	mmH 11H	EQ: High EQ Gain	-12,,,12dB
00H 2CH	mmH 11H	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 2DH	mmH 11H	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 2EH	mmH 11H	EQ: Out Level	0,,,100
00H 2FH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 19 Stereo Multi

NRPN	Data	Entry
00H 00H	mmH 11H	Noise Suppressor SW
		0,1 = Off,On
00H 01H	mmH 11H	Comp/Limit SW
		0,1 = Off,On

00H 02H	mmH 11H	Enhancer SW	0,1 = Off,On
00H 03H	mmH 11H	EQ SW	0,1 = Off,On
00H 04H	mmH 11H	Noise Suppressor: Threshold	0,,100
00H 05H	mmH 11H	Noise Suppressor: Release	0,,100
00H 06H	mmH 11H	Comp/Limit: Level	-60,,12dB
00H 07H	mmH 11H	Comp/Limit: Thresh	-60,,0dB
00H 08H	mmH 11H	Comp/Limit: Attack	0,,100
00H 09H	mmH 11H	Comp/Limit: Release	0,,100
00H 0AH	mmH 11H	Comp/Limit: Ratio	0,,3 = 1.5:1,2:1,4:1,100:1
00H 0BH	mmH 11H	Enhancer: Sens	0,,100
00H 0CH	mmH 11H	Enhancer: Frequency	10,,100 = 1.0,,10.0kHz
00H 0DH	mmH 11H	Enhancer: MIX Level	0,,100
00H 0EH	mmH 11H	Enhancer: Level	0,,100
00H 0FH	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 10H	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 11H	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 12H	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 13H	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 14H	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 15H	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0
00H 16H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 17H	mmH 11H	EQ: High EQ Gain	-12,,12dB
00H 18H	mmH 11H	EQ: High EQ Frequency	14,,200 = 1.4,,20.0kHz
00H 19H	mmH 11H	EQ: High EQ Q	3,,100 = 0.3,,10.0
00H 1AH	mmH 11H	EQ: Out Level	0,,100
00H 1BH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 20 Reverb 2

NRPN	Data Entry		
00H 00H	mmH 11H	Reverb SW	0,1 = Off,On
00H 01H	mmH 11H	EQ SW	0,1 = Off,On
00H 02H	mmH 11H	Reverb 2: Reverb Type	0,,4 = Room1,Room2,Hall1,Hall2,Plate
00H 03H	mmH 11H	Reverb 2: Reverb Time	1,,100 = 0.1,,10.0sec
00H 04H	mmH 11H	Reverb 2: Pre Delay	0,,200msec
00H 05H	mmH 11H	Reverb 2: Density	0,,100
00H 06H	mmH 11H	Reverb 2: High Pass Filter	1,,200 = Thru,20,,2000Hz
00H 07H	mmH 11H	Reverb 2: Low Pass Filter	10,,201 = 1.0,,20,0kHz,Thru
00H 08H	mmH 11H	Reverb 2: Effect Level	0,,100
00H 09H	mmH 11H	Reverb 2: Direct Level	0,,100
00H 0AH	mmH 11H	Reverb 2: Gate SW	0,1 = Off,On
00H 0BH	mmH 11H	Reverb 2: Gate Mode	0,1 = Gate,Ducking
00H 0CH	mmH 11H	Reverb 2: Gate Threshold	0,,100
00H 0DH	mmH 11H	Reverb 2: Gate Attack Time	1,,100
00H 0EH	mmH 11H	Reverb 2: Gate Release Time	1,,100
00H 0FH	mmH 11H	Reverb 2: Gate Hold Time	1,,100
00H 10H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 11H	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 12H	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 13H	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 14H	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 15H	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 16H	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0
00H 17H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking

00H 18H	mmH 11H	EQ: High EQ Gain	-12,,,12dB
00H 19H	mmH 11H	EQ: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 1AH	mmH 11H	EQ: High EQ Q	3,,,100 = 0.3,,,10.0
00H 1BH	mmH 11H	EQ: Out Level	0,,,100
00H 1CH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 21 Space Chorus

NRPN	Data Entry		
00H 00H	mmH 11H	Chorus SW	0,1 = Off,On
00H 01H	mmH 11H	Chorus: Input Mode	0,1 = Mono,Stereo
00H 02H	mmH 11H	Chorus: Mode	0,,,6 = 1,2,3,4,1+4,2+4,3+4
00H 03H	mmH 11H	Chorus: Mix Balance	0,,,100
00H 04H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 22 Lo-Fi Processor

NRPN	Data Entry		
00H 00H	mmH 11H	Lo-Fi Processor SW	0,1 = Off,On
00H 01H	mmH 11H	Realtime Modify Filter SW	0,1 = Off,On
00H 02H	mmH 11H	Lo-Fi Processor: Pre Filter SW	0,1 = Off,On
00H 03H	mmH 11H	Lo-Fi Processor: Rate	0,,,31 = Off,1/2,,,1/32
00H 04H	mmH 11H	Lo-Fi Processor: Number of Bit	0,,,15 = Off,15,,,1bit
00H 05H	mmH 11H	Lo-Fi Processor: Post Filter SW	0,1 = Off,On
00H 06H	mmH 11H	Lo-Fi Processor: Effect Level	0,,,100
00H 07H	mmH 11H	Lo-Fi Processor: Direct Level	0,,,100
00H 08H	mmH 11H	Realtime Modify Filter: Filter Type	0,,,2 = LPF,BPF,HPF
00H 09H	mmH 11H	Realtime Modify Filter: Cut Off	0,,,100
00H 0AH	mmH 11H	Realtime Modify Filter: Resonance	0,,,100

00H 0BH	mmH 11H	Realtime Modify Filter: Gain	0,,,24dB
00H 0CH	mmH 11H	Noise Suppressor: Threshold	0,,,100
00H 0DH	mmH 11H	Noise Suppressor: Release	0,,,100
00H 0EH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 23 4 Band Parametric EQ

NRPN	Data Entry		
00H 00H	mmH 11H	Parametric EQ Link SW	0,1 = Off,On
00H 01H	mmH 11H	Parametric EQ Ach SW	0,1 = Off,On
00H 02H	mmH 11H	Parametric EQ Bch SW	0,1 = Off,On
00H 03H	mmH 11H	EQ Ach: Input Gain	-60,,,12dB
00H 04H	mmH 11H	EQ Ach: Low EQ Type	0,1 = Shelving, Peaking
00H 05H	mmH 11H	EQ Ach: Low EQ Gain	-12,,,12dB
00H 06H	mmH 11H	EQ Ach: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 07H	mmH 11H	EQ Ach: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 08H	mmH 11H	EQ Ach: Low Mid EQ Gain	-12,,,12dB
00H 09H	mmH 11H	EQ Ach: Low Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 0AH	mmH 11H	EQ Ach: Low Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 0BH	mmH 11H	EQ Ach: High Mid EQ Gain	-12,,,12dB
00H 0CH	mmH 11H	EQ Ach: High Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 0DH	mmH 11H	EQ Ach: High Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 0EH	mmH 11H	EQ Ach: High EQ Type	0,1 = Shelving, Peaking
00H 0FH	mmH 11H	EQ Ach: High EQ Gain	-12,,,12dB
00H 10H	mmH 11H	EQ Ach: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 11H	mmH 11H	EQ Ach: High EQ Q	3,,,100 = 0.3,,,10.0
00H 12H	mmH 11H	EQ Ach: Output Level	-60,,,12dB

00H 13H	mmH 11H	EQ Bch: Input Gain	-60,,,12dB
00H 14H	mmH 11H	EQ Bch: Low EQ Type	0,1 = Shelving, Peaking
00H 15H	mmH 11H	EQ Bch: Low EQ Gain	-12,,,12dB
00H 16H	mmH 11H	EQ Bch: Low EQ Frequency	2,,,200 = 20,,,2000Hz
00H 17H	mmH 11H	EQ Bch: Low EQ Q	3,,,100 = 0.3,,,10.0
00H 18H	mmH 11H	EQ Bch: Low Mid EQ Gain	-12,,,12dB
00H 19H	mmH 11H	EQ Bch: Low Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 1AH	mmH 11H	EQ Bch: Low Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 1BH	mmH 11H	EQ Bch: High Mid EQ Gain	-12,,,12dB
00H 1CH	mmH 11H	EQ Bch: High Mid EQ Frequency	20,,,800 = 200,,,8000Hz
00H 1DH	mmH 11H	EQ Bch: High Mid EQ Q	3,,,100 = 0.3,,,10.0
00H 1EH	mmH 11H	EQ Bch: High EQ Type	0,1 = Shelving, Peaking
00H 1FH	mmH 11H	EQ Bch: High EQ Gain	-12,,,12dB
00H 20H	mmH 11H	EQ Bch: High EQ Frequency	14,,,200 = 1.4,,,20.0kHz
00H 21H	mmH 11H	EQ Bch: High EQ Q	3,,,100 = 0.3,,,10.0
00H 22H	mmH 11H	EQ Bch: Output Level	-60,,,12dB
00H 23H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

* When Link SW = On, Bch corresponds to Ach.

Algorithm 24 10 Band Graphic EQ

NRPN	Data Entry		
00H 00H	mmH 11H	Graphic EQ Link SW	0,1 = Off,On
00H 01H	mmH 11H	Graphic EQ Ach SW	0,1 = Off,On
00H 02H	mmH 11H	Graphic EQ Bch SW	0,1 = Off,On
00H 03H	mmH 11H	EQ Ach: Input Gain	-60,,,12dB
00H 04H	mmH 11H	EQ Ach: 31.25Hz Gain	-12,,,12dB
00H 05H	mmH 11H	EQ Ach: 62.5Hz Gain	-12,,,12dB

00H 06H	mmH 11H	EQ Ach: 125Hz Gain	-12,,,12dB
00H 07H	mmH 11H	EQ Ach: 250Hz Gain	-12,,,12dB
00H 08H	mmH 11H	EQ Ach: 500Hz Gain	-12,,,12dB
00H 09H	mmH 11H	EQ Ach: 1.0kHz Gain	-12,,,12dB
00H 0AH	mmH 11H	EQ Ach: 2.0kHz Gain	-12,,,12dB
00H 0BH	mmH 11H	EQ Ach: 4.0kHz Gain	-12,,,12dB
00H 0CH	mmH 11H	EQ Ach: 8.0kHz Gain	-12,,,12dB
00H 0DH	mmH 11H	EQ Ach: 16.0kHz Gain	-12,,,12dB
00H 0EH	mmH 11H	EQ Ach: Output Level	-60,,,12dB
00H 0FH	mmH 11H	EQ Bch: Input Gain	-60,,,12dB
00H 10H	mmH 11H	EQ Bch: 31.25Hz Gain	-12,,,12dB
00H 11H	mmH 11H	EQ Bch: 62.5Hz Gain	-12,,,12dB
00H 12H	mmH 11H	EQ Bch: 125Hz Gain	-12,,,12dB
00H 13H	mmH 11H	EQ Bch: 250Hz Gain	-12,,,12dB
00H 14H	mmH 11H	EQ Bch: 500Hz Gain	-12,,,12dB
00H 15H	mmH 11H	EQ Bch: 1.0kHz Gain	-12,,,12dB
00H 16H	mmH 11H	EQ Bch: 2.0kHz Gain	-12,,,12dB
00H 17H	mmH 11H	EQ Bch: 4.0kHz Gain	-12,,,12dB
00H 18H	mmH 11H	EQ Bch: 8.0kHz Gain	-12,,,12dB
00H 19H	mmH 11H	EQ Bch: 16.0kHz Gain	-12,,,12dB
00H 1AH	mmH 11H	EQ Bch: Output Level	-60,,,12dB
00H 1BH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

* When Link SW = On, Bch corresponds to Ach.

Algorithm 25 Hum Canceler

NRPN	Data Entry		
=====			

00H 00H	mmH 11H	Hum Canceler SW	0,1 = Off,On
00H 01H	mmH 11H	Noise Suppressor SW	0,1 = Off,On
00H 02H	mmH 11H	Hum Canceler: Freq	200,,8000 = 20.0,,800.0Hz
00H 03H	mmH 11H	Hum Canceler: Width	10,,40%
00H 04H	mmH 11H	Hum Canceler: Depth	0,,100
00H 05H	mmH 11H	Hum Canceler: Threshold	0,,100
00H 06H	mmH 11H	Hum Canceler: Range Low	1,,200 = Unlimit,20,,2000Hz
00H 07H	mmH 11H	Hum Canceler: Range High	10,,201 = 1.0,,20,0kHz,Unlimit
00H 08H	mmH 11H	Noise Suppressor: Threshold	0,,100
00H 09H	mmH 11H	Noise Suppressor: Release	0,,100
00H 0AH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 26 Vocal Canceler

NRPN	Data	Entry	
00H 00H	mmH 11H	Vocal Canceler SW	0,1 = Off,On
00H 01H	mmH 11H	EQ SW	0,1 = Off,On
00H 02H	mmH 11H	Vocal Canceler: Balance	0,,100
00H 03H	mmH 11H	Vocal Canceler: Range Low	1,,200 = Unlimit,20,,2000Hz
00H 04H	mmH 11H	Vocal Canceler: Range High	10,,201 = 1.0,,20,0kHz,Unlimit
00H 05H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking
00H 06H	mmH 11H	EQ: Low EQ Gain	-12,,12dB
00H 07H	mmH 11H	EQ: Low EQ Frequency	2,,200 = 20,,2000Hz
00H 08H	mmH 11H	EQ: Low EQ Q	3,,100 = 0.3,,10.0
00H 09H	mmH 11H	EQ: Mid EQ Gain	-12,,12dB
00H 0AH	mmH 11H	EQ: Mid EQ Frequency	20,,800 = 200,,8000Hz
00H 0BH	mmH 11H	EQ: Mid EQ Q	3,,100 = 0.3,,10.0

00H 0CH	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking
00H 0DH	mmH 11H	EQ: High EQ Gain	-12,,12dB
00H 0EH	mmH 11H	EQ: High EQ Frequency	14,,200 = 1.4,,20.0kHz
00H 0FH	mmH 11H	EQ: High EQ Q	3,,100 = 0.3,,10.0
00H 10H	mmH 11H	EQ: Out Level	0,,100
00H 11H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 27 Voice Transformer (EFX1 or EFX3)

NRPN	Data	Entry	
00H 00H	mmH 11H	Voice Transformer SW	0,1 = Off,On
00H 01H	mmH 11H	Reverb SW	0,1 = Off,On
00H 02H	mmH 11H	Fader Edit SW	0,1 = Off,On
00H 03H	mmH 11H	MIDI Control SW	0,1 = Off,On
00H 04H	mmH 11H	Voice Transformer: Robot SW	0,1 = Off,On
00H 05H	mmH 11H	Voice Transformer: Chromatic Pitch	-12,,36
00H 06H	mmH 11H	Voice Transformer: Fine Pitch	-100,,100
00H 07H	mmH 11H	Voice Transformer: Chromatic Formant	-12,,12
00H 08H	mmH 11H	Voice Transformer: Fine Formant	-100,,100
00H 09H	mmH 11H	Voice Transformer: Mix Balance	0,,100
00H 0AH	mmH 11H	Reverb: Reverb Time	1,,100 = 0.1,,10.0sec
00H 0BH	mmH 11H	Reverb: Pre Delay	0,,200msec
00H 0CH	mmH 11H	Reverb: Density	0,,100
00H 0DH	mmH 11H	Reverb: Effect Level	0,,100
00H 0EH	mmH 11H	MIDI Control: Bend Range	0,,12 = Off,1,,12
00H 0FH	mmH 11H	MIDI Control: Portamento	0...100 = Off,1,,100
00H 10H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 28 Vocoder 2 (EFX1 or EFX3)

NRPN	Data Entry	
00H 00H	mmH 11H	Chorus SW 0,1 = Off,On
00H 01H	mmH 11H	Vocoder: Envelope Mode 0,,,2 = Sharp,Soft,Long
00H 02H	mmH 11H	Vocoder: Pan Mode 0,,,3 = Mono,Stereo,L->R,R->L
00H 03H	mmH 11H	Vocoder: Hold 0,1 = Off,MIDI
00H 04H	mmH 11H	Vocoder: Mic Sens 0,,,100
00H 05H	mmH 11H	Vocoder: Synth Input Level 0,,,100
00H 06H	mmH 11H	Vocoder: Voice Char Level 1 0,,,100
00H 07H	mmH 11H	Vocoder: Voice Char Level 2 0,,,100
00H 08H	mmH 11H	Vocoder: Voice Char Level 3 0,,,100
00H 09H	mmH 11H	Vocoder: Voice Char Level 4 0,,,100
00H 0AH	mmH 11H	Vocoder: Voice Char Level 5 0,,,100
00H 0BH	mmH 11H	Vocoder: Voice Char Level 6 0,,,100
00H 0CH	mmH 11H	Vocoder: Voice Char Level 7 0,,,100
00H 0DH	mmH 11H	Vocoder: Voice Char Level 8 0,,,100
00H 0EH	mmH 11H	Vocoder: Voice Char Level 9 0,,,100
00H 0FH	mmH 11H	Vocoder: Voice Char Level 10 0,,,100
00H 10H	mmH 11H	Vocoder: Voice Char Level 11 0,,,100
00H 11H	mmH 11H	Vocoder: Voice Char Level 12 0,,,100
00H 12H	mmH 11H	Vocoder: Voice Char Level 13 0,,,100
00H 13H	mmH 11H	Vocoder: Voice Char Level 14 0,,,100
00H 14H	mmH 11H	Vocoder: Voice Char Level 15 0,,,100
00H 15H	mmH 11H	Vocoder: Voice Char Level 16 0,,,100
00H 16H	mmH 11H	Vocoder: Voice Char Level 17 0,,,100
00H 17H	mmH 11H	Vocoder: Voice Char Level 18 0,,,100

00H 18H	mmH 11H	Vocoder: Voice Char Level 19 0,,,100
00H 19H	mmH 11H	Vocoder: Mic High Pass Filter 9,,,200 = Thru,1.0,,,20.0kHz
00H 1AH	mmH 11H	Vocoder: Mic High Pass Filter Pan 1,,,127 = L63,,,R63
00H 1BH	mmH 11H	Vocoder: Mic Mix 0,,,100
00H 1CH	mmH 11H	Vocoder: Noise Suppressor Threshold 0,,,100
00H 1DH	mmH 11H	Chorus: Rate 1,,,100 = 0.1,,,10.0Hz
00H 1EH	mmH 11H	Chorus: Depth 0,,,100
00H 1FH	mmH 11H	Chorus: Pre Delay 0,,,50ms
00H 20H	mmH 11H	Chorus: Mix Balance 0,,,100
00H 21H	00H 00H	(Reserved)
:	:	
00H 7FH	00H 00H	

Algorithm 29 Mic Simulator

NRPN	Data Entry	
00H 00H	mmH 11H	Link SW 0,1 = Off,On
00H 01H	mmH 11H	Mic Converter Ach SW 0,1 = Off,On
00H 02H	mmH 11H	Bass Cut Ach SW 0,1 = Off,On
00H 03H	mmH 11H	Distance Ach SW 0,1 = Off,On
00H 04H	mmH 11H	Limiter Ach SW 0,1 = Off,On
00H 05H	mmH 11H	Mic Converter Bch SW 0,1 = Off,On
00H 06H	mmH 11H	Bass Cut Bch SW 0,1 = Off,On
00H 07H	mmH 11H	Distance Bch SW 0,1 = Off,On
00H 08H	mmH 11H	Limiter Bch SW 0,1 = Off,On
00H 09H	mmH 11H	Mic Converter Ach: Input 0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
00H 0AH	mmH 11H	Mic Converter Ach: Output 0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
00H 0BH	mmH 11H	Mic Converter Ach: Phase 0,1 = Normal,Inverse
00H 0CH	mmH 11H	Bass Cut Ach: Bass Cut Frequency 1,,,200 = Thru,20,,,2000Hz

00H 0DH	mmH 11H	Distance Ach: Proximity Effect	-12,,,+12
00H 0EH	mmH 11H	Distance Ach: Timelag	0,,,1000 = 0,,,3000cm
00H 0FH	mmH 11H	Limiter Ach: Detect HPF Frequency	1,,,200 = Thru,20,,,2000Hz
00H 10H	mmH 11H	Limiter Ach: Level	-60,,,24dB
00H 11H	mmH 11H	Limiter Ach: Threshold	-60,,,0dB
00H 12H	mmH 11H	Limiter Ach: Attack	0,,,100
00H 13H	mmH 11H	Limiter Ach: Release	0,,,100
00H 14H	mmH 11H	Mic Converter Bch: Input	0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
00H 15H	mmH 11H	Mic Converter Bch: Output	0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
00H 16H	mmH 11H	Mic Converter Bch: Phase	0,1 = Normal,Inverse
00H 17H	mmH 11H	Bass Cut Bch: Bass Cut Frequency	1,,,200 = Thru,20,,,2000Hz
00H 18H	mmH 11H	Distance Bch: Proximity Effect	-12,,,+12
00H 19H	mmH 11H	Distance Bch: Timelag	0,,,1000 = 0,,,3000cm
00H 1AH	mmH 11H	Limiter Bch: Detect HPF Frequency	1,,,200 = Thru,20,,,2000Hz
00H 1BH	mmH 11H	Limiter Bch: Level	-60,,,24dB
00H 1CH	mmH 11H	Limiter Bch: Threshold	-60,,,0dB
00H 1DH	mmH 11H	Limiter Bch: Attack	0,,,100
00H 1EH	mmH 11H	Limiter Bch: Release	0,,,100
00H 1FH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

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

Algorithm 30 3 Band Isolator

NRPN	Data	Entry	
00H 00H	mmH 11H	Isolator SW	0,1 = Off,On
00H 01H	mmH 11H	Isolator High Volume	-60,,,+4dB
00H 02H	mmH 11H	Isolator Middle Volume	-60,,,+4dB

00H 03H	mmH 11H	Isolator Low Volume	-60,,,+4dB
00H 04H	mmH 11H	Isolator Anti Phase Middle Switch	0,1 = Off,On
00H 05H	mmH 11H	Isolator Anti Phase Middle Level	0,,,100
00H 06H	mmH 11H	Isolator Anti Phase Low Switch	0,1 = Off,On
00H 07H	mmH 11H	Isolator Anti Phase Low Level	0,,,100
00H 08H	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 31 Tape Echo 201

NRPN	Data	Entry	
00H 00H	mmH 11H	Tape Echo SW	0,1 = Off,On
00H 01H	mmH 11H	Tape Echo Mode Select	0,,,6 = 1,,,7
00H 02H	mmH 11H	Tape Echo Repeat Rate	0,,,100
00H 03H	mmH 11H	Tape Echo Intensity	0,,,100
00H 04H	mmH 11H	Tape Echo Effect Level	0,,,100
00H 05H	mmH 11H	Tape Echo Direct Level	0,,,100
00H 06H	mmH 11H	Tape Echo Tone Bass	-100,,,100
00H 07H	mmH 11H	Tape Echo Tone Treble	-100,,,100
00H 08H	mmH 11H	Tape Echo Tape Head S Pan	1,,,127 = L63,,,R63
00H 09H	mmH 11H	Tape Echo Tape Head M Pan	1,,,127 = L63,,,R63
00H 0AH	mmH 11H	Tape Echo Tape Head L Pan	1,,,127 = L63,,,R63
00H 0BH	mmH 11H	Tape Echo Tape Distortion	0,,,100
00H 0CH	mmH 11H	Tape Echo Wah Flutter Rate	0,,,100
00H 0DH	mmH 11H	Tape Echo Wah Flutter Depth	0,,,100
00H 0EH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

Algorithm 32 Analog Flanger

NRPN	Data Entry	
00H 00H	mmH 11H	Analog Flanger SW 0,1 = Off,On
00H 01H	mmH 11H	Analog Flanger Mode 0,,,3 = FL1,FL2,FL3,CHO
00H 02H	mmH 11H	Analog Flanger Feedback 0,,,100
00H 03H	mmH 11H	Analog Flanger Modulation Rate 0,,,100
00H 04H	mmH 11H	Analog Flanger Modulation Depth 0,,,100
00H 05H	mmH 11H	Analog Flanger Modulation Frequency 0,,,100
00H 06H	mmH 11H	Analog Flanger Channel B Modulation 0,1 = Nor,Inv
00H 07H	mmH 11H	Analog Flanger Channel A Phase 0,1 = Nor,Inv
00H 08H	mmH 11H	Analog Flanger Channel B Phase 0,1 = Nor,Inv
00H 09H	00H 00H	(Reserved)
:	:	
00H 7FH	00H 00H	

Algorithm 33 Analog Phaser

NRPN	Data Entry	
00H 00H	mmH 11H	Analog Phaser SW 0,1 = Off,On
00H 01H	mmH 11H	Analog Phaser Mode 0,1 = 4STAGE,8STAGE
00H 02H	mmH 11H	Analog Phaser Frequency 0,,,100
00H 03H	mmH 11H	Analog Phaser Resonance 0,,,100
00H 04H	mmH 11H	Analog Phaser LFO 1 Rate 0,,,100
00H 05H	mmH 11H	Analog Phaser LFO 1 Depth 0,,,100
00H 06H	mmH 11H	Analog Phaser LFO 1 Channel B Mod 0,1 = Nor,Inv
00H 07H	mmH 11H	Analog Phaser LFO 2 Rate 0,,,100
00H 08H	mmH 11H	Analog Phaser LFO 2 Depth 0,,,100
00H 09H	mmH 11H	Analog Phaser LFO 2 Channel B Mod 0,1 = Nor,Inv
00H 0AH	00H 00H	(Reserved)
:	:	
00H 7FH	00H 00H	

Algorithm 34 Speaker Modeling

NRPN	Data Entry	
00H 00H	mmH 11H	Speaker Modeling SW 0,1 = Off,On
00H 01H	mmH 11H	Bass Cut SW 0,1 = Off,On
00H 02H	mmH 11H	Low Frequency Trimmer SW 0,1 = Off,On
00H 03H	mmH 11H	High Frequency Trimmer SW 0,1 = Off,On
00H 04H	mmH 11H	Limiter SW 0,1 = Off,On
00H 05H	mmH 11H	(Reserved)
00H 06H	mmH 11H	Speaker Modeling Model 0,,,11 = THRU,Super Flat,Powered GenBlk, Powered E-Bas,Powered Mack,Small Cube,White Cone, White C +tissue,Small Radio,Small TV,Boom Box, BoomBox LoBoost
00H 07H	mmH 11H	Speaker Modeling Phase 0,1 = NRM,INV
00H 08H	mmH 11H	Bass Cut Frequency 1,,,200 = Thru,20,,,2000Hz
00H 09H	mmH 11H	Low Frequency Trimmer Gain -12,,,12dB
00H 0AH	mmH 11H	Low Frequency Trimmer Frequency 2,,,200 = 20,,,2000Hz
00H 0BH	mmH 11H	High Frequency Trimmer Gain -12,,,12dB
00H 0CH	mmH 11H	High Frequency Trimmer Frequency 10,,,200 = 1.0,,,20.0kHz
00H 0DH	mmH 11H	Limiter Threshold -60,,,0dB
00H 0EH	mmH 11H	Limiter Release 0,,,100
00H 0FH	mmH 11H	Limiter Level -60,,,24dB
00H 10H	00H 00H	(Reserved)
:	:	
00H 7FH	00H 00H	

Algorithm 35 Mastering Tool Kit

NRPN	Data Entry	
00H 00H	mmH 11H	EQ SW 0,1 = Off,On
00H 01H	mmH 11H	Bass Cut SW 0,1 = Off,On
00H 02H	mmH 11H	Enhancer SW 0,1 = Off,On
00H 03H	mmH 11H	Expander SW 0,1 = Off,On

00H 04H	mmH 11H	Compressor SW	0,1 = Off,On	00H 1EH	mmH 11H	Expander Low Threshold	0,,,80 = -80,,,0dB
00H 05H	mmH 11H	Limiter SW	0,1 = Off,On	00H 1FH	mmH 11H	Expander Mid Threshold	0,,,80 = -80,,,0dB
00H 06H	mmH 11H	EQ: Input Gain	-24,,,12dB	00H 20H	mmH 11H	Expander High Threshold	0,,,80 = -80,,,0dB
00H 07H	mmH 11H	EQ: Low EQ Type	0,1 = Shelving, Peaking	00H 21H	mmH 11H	Expander Low Ratio	0,,,13 = 1:1.0,,,1:INF (*3 Ratio Table)
00H 08H	mmH 11H	EQ: Low EQ Gain	-12,,,12dB	00H 22H	mmH 11H	Expander Mid Ratio	0,,,13 = 1:1.0,,,1:INF (*3 Ratio Table)
00H 09H	mmH 11H	EQ: Low EQ Frequency	2,,,42 = 20,,,2000Hz (*1 Frequency Table)	00H 23H	mmH 11H	Expander High Ratio	0,,,13 = 1:1.0,,,1:INF (*3 Ratio Table)
00H 0AH	mmH 11H	EQ: Low EQ Q	0,,,31 = 0.3,,,16.0 (*2 Q Table)	00H 24H	mmH 11H	Expander Low Attack	0,,,100ms
00H 0BH	mmH 11H	EQ: Low Mid EQ Gain	-12,,,12dB	00H 25H	mmH 11H	Expander Mid Attack	0,,,100ms
00H 0CH	mmH 11H	EQ: Low Mid EQ Frequency	2,,,54 = 20,,,8000Hz (*1 Frequency Table)	00H 26H	mmH 11H	Expander High Attack	0,,,100ms
00H 0DH	mmH 11H	EQ: Low Mid EQ Q	0,,,31 = 0.3,,,16.0 (*2 Q Table)	00H 27H	mmH 11H	Expander Low Release	0,,,100 = 50,,,5000ms
00H 0EH	mmH 11H	EQ: High Mid EQ Gain	-12,,,12dB	00H 28H	mmH 11H	Expander Mid Release	0,,,100 = 50,,,5000ms
00H 0FH	mmH 11H	EQ: High Mid EQ Frequency	2,,,54 = 20,,,8000Hz (*1 Frequency Table)	00H 29H	mmH 11H	Expander High Release	0,,,100 = 50,,,5000ms
00H 10H	mmH 11H	EQ: High Mid EQ Q	0,,,31 = 0.3,,,16.0 (*2 Q Table)	00H 2AH	mmH 11H	Compressor Low Threshold	-24,,,0dB
00H 11H	mmH 11H	EQ: High EQ Type	0,1 = Shelving, Peaking	00H 2BH	mmH 11H	Compressor Mid Threshold	-24,,,0dB
00H 12H	mmH 11H	EQ: High EQ Gain	-12,,,12dB	00H 2CH	mmH 11H	Compressor High Threshold	-24,,,0dB
00H 13H	mmH 11H	EQ: High EQ Frequency	39,,,62 = 1.4,,,20.0kHz (*1 Frequency Table)	00H 2DH	mmH 11H	Compressor Low Ratio	0,,,13 = 1:1.0,,,1:INF (*3 Ratio Table)
00H 14H	mmH 11H	EQ: High EQ Q	0,,,31 = 0.3,,,16.0 (*2 Q Table)	00H 2EH	mmH 11H	Compressor Mid Ratio	0,,,13 = 1:1.0,,,1:INF (*3 Ratio Table)
00H 15H	mmH 11H	EQ: Level	-24,,,12dB	00H 2FH	mmH 11H	Compressor High Ratio	0,,,13 = 1:1.0,,,1:INF (*3 Ratio Table)
00H 16H	mmH 11H	Bass Cut Frequency	1,,,42 = Off,20,,,2000Hz (*1 Frequency Table)	00H 30H	mmH 11H	Compressor Low Attack	0,,,100ms
00H 17H	mmH 11H	Enhancer Sens	0,,,100	00H 31H	mmH 11H	Compressor Mid Attack	0,,,100ms
00H 18H	mmH 11H	Enhancer Frequency	36,,,56 = 1.0,,,10.0kHz (*1 Frequency Table)	00H 32H	mmH 11H	Compressor High Attack	0,,,100ms
00H 19H	mmH 11H	Enhancer Mix Level	-24,,,12dB	00H 33H	mmH 11H	Compressor Low Release	0,,,100 = 50,,,5000ms
00H 1AH	mmH 11H	Input Gain	-24,,,12dB	00H 34H	mmH 11H	Compressor Mid Release	0,,,100 = 50,,,5000ms
00H 1BH	mmH 11H	Input Detect Time	0,,,10ms	00H 35H	mmH 11H	Compressor High Release	0,,,100 = 50,,,5000ms
00H 1CH	mmH 11H	Input Low Split Point	2,,,34 = 20,,,800Hz (*1 Frequency Table)	00H 36H	mmH 11H	Mixer Low Level	0,,,86 = -80,,,6dB
00H 1DH	mmH 11H	Input High Split Point	40,,,60 = 1.6,,,16.0kHz (*1 Frequency Table)	00H 37H	mmH 11H	Mixer Mid Level	0,,,86 = -80,,,6dB

00H 38H	mmH 11H	Mixer High Level	0,,,86 = -80,,,6dB
00H 39H	mmH 11H	Limiters Threshold	-24,,,0dB
00H 3AH	mmH 11H	Limiters Attack	0,,,100ms
00H 3BH	mmH 11H	Limiters Release	0,,,100 = 50,,,5000ms
00H 3CH	mmH 11H	Output Level	0,,,86 = -80,,,6dB
00H 3DH	mmH 11H	Output Soft Clip	0,1 = Off,On
00H 3EH	mmH 11H	Output Dither	0,,,17 = Off,24,,,8Bit
00H 3FH	00H 00H	(Reserved)	
:	:		
00H 7FH	00H 00H		

* 1 Frequency Table

Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)	Data	Freq(Hz)
0	THRU	16	100	32	630	48	4.00k
1	THRU	17	112	33	710	49	4.50k
2	20.0	18	125	34	800	50	5.00k
3	22.4	19	140	35	900	51	5.60k
4	25.0	20	160	36	1.00k	52	6.30k
5	28.0	21	180	37	1.12k	53	7.10k
6	31.5	22	200	38	1.25k	54	8.00k
7	35.5	23	224	39	1.40k	55	9.00k
8	40.0	24	250	40	1.60k	56	10.0k
9	45.0	25	280	41	1.80k	57	11.2k
10	50.0	26	315	42	2.00k	58	12.5k
11	56.0	27	355	43	2.24k	59	14.0k
12	63.0	28	400	44	2.50k	60	16.0k
13	71.0	29	450	45	2.80k	61	18.0k
14	80.0	30	500	46	3.15k	62	20.0k
15	90.0	31	560	47	3.55k	63	22.4k

* 2 Q Table

Data	Q	Data	Q
0	0.3	16	2.8
1	0.4	17	3.1
2	0.5	18	3.5
3	0.6	19	4.0
4	0.7	20	4.5
5	0.8	21	5.0
6	0.9	22	5.6
7	1.0	23	6.3
8	1.1	24	7.1
9	1.2	25	8.0
10	1.4	26	9.0
11	1.6	27	10.0
12	1.8	28	11.2
13	2.0	29	12.5
14	2.2	30	14.0
15	2.5	31	16.0

* 3 Ratio Table

Data	RATIO
0	1:1.0 (OFF)
1	1:1.1
2	1:1.2
3	1:1.4
4	1:1.6

5	1:1.8
6	1:2.0
7	1:2.5
8	1:3.1
9	1:4.0
10	1:5.6
11	1:8.0
12	1:16
13	1:INF

● Program Change

Works as program change for the effects when MIDI channel number is set to 0H, 1H, 2H or 3H. Works as scene switch when channel number is set to FH. VS-1680 never transmits this message.

Status	Second
CnH	ppH

n = MIDI Channel No. : 0H - 3H (ch.1 = EFX1, ch.2 = EFX2, ch.3 = EFX3, ch.4 = EFX4)
 FH (ch.16 = Scene Memory (*1))
 pp = Program No. : 00H - 63H (0 - 99) n = 0H, 1H
 pp = Program No. : 00H - 07H (0 - 7) n = EH

(*1) If received while VS-1680 is playing, playback stops, and then restarts after the scene switched. Never receives while recording.

● Pitch Bend Range

Receives when effect algorithm 27 (Voice Transformer) is selected and MIDI Control SW is On.

Status	Second	Third
EnH	llH	mmH

n = MIDI Channel No. : 0H - 1H (ch.1-ch.2)
 n = 0, 2 (ch.1, 3) : Voice Transformer : Chromatic Pitch
 n = 1, 3 (ch.2, 4) : Voice Transformer : Chromatic Formant
 mm, ll = value : 00H, 00H - 40H, 00H - 7FH, 7FH (-8192 - 0 - +8191)

■ System Common Messages

● MIDI Time Code Quarter Frame Messages

MIDI Time Code Quarter Frame Messages can be transmitted while the VS-1680 is running (Playing or Recording) if the SYSTEM parameter "Syn:Source" is "INT" and "Syn:Gen." is "MTC" in the SYSTEM parameter. The transmitted time counts are summed to "SMPTE (MTC) Offset Time" as the song top is "00:00:00:00." The VS-1680 synchronizes with the time counts which are summed to "SMPTE (MTC) Offset Time" as the song top is "00:00:00:00" if the SYSTEM parameter "Syn:Source" is "EXT."

Status	Second
F1H	mmH (= 0nnndddd)

nnn = Message type : 0 = Frame count LS nibble
 1 = Frame count MS nibble
 2 = Seconds count LS nibble
 3 = Seconds count MS nibble
 4 = Minutes count LS nibble
 5 = Minutes count MS nibble
 6 = Hours count LS nibble
 7 = Hours count MS nibble

dddd = 4 bit nibble data : 0H - FH (0 - 15)

If the upper and lower 4 bits of the count are combined, these bit fields are assigned as follows.

Frame Count xxxxyyyy
 xxx Reserved (000)
 yyyy Frame No. (0-29)

Seconds Count xxxyyyyy
 xx Reserved (00)
 yyyyyy Seconds Count (0-59)

Minutes Count xxxyyyyy
 xx Reserved (00)
 yyyyyy Minutes Count (0-59)

Hours Count xyzyzzzzz
 x Reserved (0)
 yy Time Code type
 0 = 24 Frames / Sec
 1 = 25 Frames / Sec
 2 = 30 Frames / Sec (Drop Frame)
 3 = 30 Frames / Sec (Non Drop Frame)
 zzzzz Hours

●Song Position Pointer

The current position is transmitted with the Song Position Pointer Message before the VS-1680 starts to run or after the locate operation, when "Syn:Source" is "INT" and "Syn:Gen." is "MIDIclk" or "SyncTr."

<u>Status</u>	<u>Second</u>	<u>Third</u>
F2H	mmH	nnH

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

■System Realtime Message

Transmitted when "Syn:Source" is "INT" and "Syn:Gen." is "MIDIclk" or "SyncTr."

●Timing Clock

Status
F8H

●Start

Status
FAH

●Continue

Status
FBH

●Stop

Status
FCH

■System Exclusive Message

<u>Status</u>	<u>Data Bytes</u>	<u>Status</u>
F0H	iiH, ddH, ..., eeH	F7H

<u>Byte</u>	<u>Description</u>
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 VS-1680 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 VS-1680 can transmit and receive Universal System Exclusive messages, Data Request (RQ1) and Data set (DS1) as the System Exclusive message.

○About Model ID

For Data Request (RQ1) and Data Set (DT1), VS-1680 uses 00H 0EH 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 VS-1680 units. The VS-1680 sends system

exclusive messages using 00H - 1FH, and receives the system exclusive messages whose device ID is same as its device ID and 7FH. The value of the device ID is the value set on the SYSTEM parameter "MID:DeviceID" minus one.

●Universal System Exclusive Message

○INQUIRY MESSAGE

Identity Request

<u>Status</u>	<u>Data Byte</u>	<u>Status</u>
F0H	7EH, Dev, 06H, 01H	F7H

<u>Byte</u>	<u>Description</u>
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 VS-1680. The VS-1680 does not transmit the message. If the VS-1680 received the message and the device ID of the message is same as its device ID or 7FH, the VS-1680 transmits the following Identity Reply message.

Identity Reply

<u>Status</u>	<u>Data Bytes</u>	<u>Status</u>
F0H	7EH, Dev, 06H, 02H, 41H, 7CH, 00H, 00H, 00H, 00H, 00H, ssH, ssH	F7H

<u>Byte</u>	<u>Description</u>
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)
0EH 01H	Device Family Code (VS-1680)
00H 00H	Device Family No.
00H	
00H	
ssH ssH	Software Revision Level
F7H	EOX (End of System Exclusive Message)

MIDI Machine Control Commands

<u>Status</u>	<u>Data Bytes</u>	<u>Status</u>
F0H	7FH, Dev, 06H, aaH, ..., bbHF7H	

<u>Byte</u>	<u>Description</u>
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

<u>Status</u>	<u>Data Bytes</u>	<u>Status</u>
F0H	7FH, Dev, 07H, aaH, ..., bbHF7H	

<u>Byte</u>	<u>Description</u>
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)

<u>Status</u>	<u>Data Bytes</u>	<u>Status</u>
F0H	41H, Dev, 00H, 0EH, 11H, aaH, bbH, ccH, ssH, ssH, Sum	F7H

<u>Byte</u>	<u>Description</u>
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 0EH	Model ID (VS-1680)
11H	Command ID (RQ1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
ssH	Size MSB
ssH	Size
ssH	Size LSB
Sum	Check Sum
F7H	EOX (End of System Exclusive Message)

The message is used to request data to the VS-1680. The VS-1680 does not transmit this message. The VS-1680 transmits the requested data using Data Set (DT1) under following condition when it received the message.

1. The requested address correspond to the specified parameter base address of the VS-1680.
2. The requested size is over 1 byte.

○Data Set (DT1)

<u>Status</u>	<u>Data Bytes</u>	<u>Status</u>
F0H	41H, Dev, 00H, 0EH, 12H, aaH, bbH, ccH, ddH, ..., eeH, Sum	F7H

<u>Byte</u>	<u>Description</u>
F0H	Status of System Exclusive Message
41H	Manufacturer ID (Roland)
Dev	Device ID
00H 0EH	Model ID (VS-1680)
12H	Command ID (DT1)
aaH	Address MSB
bbH	Address
ccH	Address LSB
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 25 msec, the VS-1680 can not work the receive message procedure correctly.

The message is transmitted under the following condition.

When the VS-1680 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.

The message is transmitted under the following condition.

When the VS-1680 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

Address	MSB		LSB
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7 Bit Hex	AA	BB	CC

■Parameter Address Block

<Model ID = 00H 0EH>

Start address	Contents and remarks
00 00 00	System Parameter
01 00 00	Song Parameter
02 00 00	Mixer Parameter
03 00 00	Locate Parameter
04 00 00	Effect Parameter
05 00 00	Remote Operation
06 00 00	(Reserved)
07 00 00	
08 00 00	Sync Track Data
09 00 00	
0A 00 00	
0B 00 00	
0C 00 00	
0D 00 00	
0E 00 00	
0F 00 00	
10 00 00	(Reserved)
:	:
7F 7F 7F	

●System Parameter

Start address	Data	Contents and remarks
00 00 00	0aaaaaaa	SMPTE (MTC) Offset Time
00 00 01#	0bbbbbbb	aaaaaaabbbbbccccccddddd =
00 00 02#	0ccccccc	0,,,268435455block (1block=16sample)
00 00 03#	0ddddd	
00 00 04	0aaaaaaa	Vari Pitch
00 00 05#	0bbbbbbb	48kHz -241,,,23 (22.00,,,50.48kHz)
00 00 06#	0ccccccc	44.1kHz -202,,,58 (22.05,,,50.43kHz)
00 00 07#	0ddddd	32kHz -93,,,172 (22.05,,,50.41kHz)
00 00 08	0aaaaaaa	(Reserved)
00 00 09#	0bbbbbbb	
00 00 0A	00 - 01	Vari Pitch Switch Off,On
00 00 0B	00 - 01	Marker Stop Switch Off,On
00 00 0C	00 - 05	Fade Length 2,10,20,30,40,50mS
00 00 0D	0A - 64	Preview From Length 1.0,,,10.0S
00 00 0E	0A - 64	Preview To Length 1.0,,,10.0S

00 00 0F	00 - 05	Foot Switch Assign	Play/Stop,Record, TapMarker,Next,Previous
00 00 10	00 - 02	Metronome Out Mode	Off,INT,MIDI
00 00 11	00 - 01	Metronome Out Type	REOnly,AnyTime
00 00 12	00 - 01	Master Clock	DIGITAL1,INT,DIGITAL2
00 00 13	00 - 1F	MIDI System Exclusive Device ID (*1)	1,,32
00 00 14	00 - 01	MIDI OUT/THRU Switch (*1)	Out,Thru
00 00 15	00 - 01	MIDI System Exclusive RX Switch (*1)	Off,On
00 00 16	00 - 01	MIDI System Exclusive TX Switch (*1)	Off,On
00 00 17	00 - 0F	MIDI Metronome Channel	1,,16
00 00 18	0C - 7F	MIDI Metronome Accent Note	12,,127
00 00 19	01 - 7F	MIDI Metronome Accent Velocity	1,,127
00 00 1A	0C - 7F	MIDI Metronome Normal Note	12,,127
00 00 1B	01 - 7F	MIDI Metronome Normal Velocity	1,,127
00 00 1C	00 - 01	MIDI Mixer Control Local Switch	Off,On
00 00 1D	00 - 02	MIDI Mixer Control Type	Off,C.C.,Excl
00 00 1E	00 - 0A	Sync. Error Level	0,,10
00 00 1F	00 - 01	Sync. Source	INT,EXT
00 00 20	00 - 03	Sync. Generate	Off,MTC,MIDIclk,SyncTr
00 00 21	00 - 03	Sync. SMPTE Format	24,25,29D,29N,30
00 00 22	01 - 1F	(Reserved)	
00 00 23	01 - 1F	(Reserved)	
00 00 24	00 - 01	Recording Monitor	Auto,Source
00 00 25	00 - 01	Time Display	ABS,REL
00 00 26	00 - 7f	Internal Metronome Level	0-127
00 00 27	00 - 01	Undo Message	Off,On
00 00 28	0aaaaaaa	Tempo Map-1	Tempo Map Time
00 00 29#	0bbbbbbb		
00 00 2A#	0ccccccc		
00 00 2B#	0ddddddd		
00 00 2C	0aaaaaaa	Tempo Map-1	Sync Track Time
00 00 2D#	0bbbbbbb		
00 00 2E#	0ccccccc		
00 00 2F#	0ddddddd		
00 00 30	0aaaaaaa	Tempo Map-1	Tempo
00 00 31#	0bbbbbbb		250 - 2500 = 25.0 - 250.0
00 00 32	0aaaaaaa	Tempo Map-1	Meas
00 00 33#	0bbbbbbb		1 - 999
00 00 34	00	Tempo Map-1	Beat 0 - 31 =
00 00 35#	00 - 1F		1/1, 1/2, ..., 7/8, 8/8
00 00 36	00	Tempo Map-1	(Reserved)
00 00 37#	00		
00 00 38		Tempo Map-2 (See Tempo Map-1, 16bytes each)	
:	:		
00 06 47#		Tempo Map-50	
00 06 48	01 - 32	Total Tempo Map Number (*2)	1 - 50

00 06 49	00 - 4B	Scrub Loop Length	25 - 100 mS
00 06 4A	00 - 02	MMC Mode	Off, Master, Slave
00 06 4B	00 - 01	(Reserved)	
00 06 4C	00 - 01	Digital Output Copy Protect	Off,On
00 06 4D	00 - 01	Auto Mix Mode	Off,On
00 06 4E	00 - 01	Auto Mix Snap Shot Mode	ALL,MaskF
00 06 4F	00 - 03	Display Type of Remaining Time,CapaMB,Capa%,Event	
00 06 50	00 - 01	Fader Match Mode	Null,Jump
00 06 51	00 - 01	Peak Hold	Off,On
00 06 52	00 - 01	Scene Change by PG#	Off,On
00 06 53	00 - 01	Effect Change by PG#	Off,On
00 06 54	00 - 01	Effect Ctrl by Control Change	Off,On
00 06 55	00 - 01	Level Meter Tx. via MIDI	Off,On,Interval
00 06 56	00 - 01	Effector Board Available (*3)	Off,On (=01 or 03)
00 06 57	00 - 02	Mastering Track Status	Off,Rec,Play
00 06 58	0000000a	Mastering Track L (*4)	abbbbbbb = 0,,255
00 06 59#	0bbbbbbb		(0,,255 = Trk1-VTrk1,,Trk16-VTrk16)
00 06 5A	0000000a	Mastering Track R (*4)	abbbbbbb = 0,,255
00 06 5B#	0bbbbbbb		(0,,255 = Trk1-VTrk1,,Trk16-VTrk16)
00 06 5C	00 - 04	Mastering Track After Rec	0,,4 = to ZERO, to Last Phrs: 0s,to Last Phrs: 2s, to Last Phrs: 4s,stay HERE
00 06 5D	00 - 01	Mastering Track Marker Add	Off,On

(*) The address marked by "#" are invalid. Transmit the Data Set (DT1) or Data Request (RQ1) message with the specified size to the address without "#" mark.

(*1) These parameters are read only. The setting is a panel operation only.

(*2) You must write to the parameter whenever you rewrite the Tempo Map Data. The calculation will be begun when to write the parameter.

(*3) The flag shows that the Effect Board exists or not. It is a read only.

●Song Parameter

Start address	Data	Contents and remarks
01 00 00	20 - 7E	Current Song Name -1 (ASCII)
:	:	:
01 00 0B	20 - 7E	Current Song Name -12
01 00 0C	00 - 02	Current Song Sampling Frequency 48K,44.1K,32KHz
01 00 0D	00 - 03	Current Song R-DAC Mode
	05 - 06	MTP(5), MAS(3), MT1(0), MT2(1), LIV1(2), LIV2(6)
01 00 0E	00 - 3B	Current Song Created (second)
01 00 0F	00 - 3B	(minute)
01 00 10	00 - 17	(hour)
01 00 11	01 - 07	(a day of week)
01 00 12	01 - 1F	(day)
01 00 13	01 - 0C	(month)
01 00 14	0aaaaaaa	
01 00 15#	0bbbbbbb	(year)
01 00 16	00 - 3B	Current Song Saved (second)
01 00 17	00 - 3B	(minute)
01 00 18	00 - 17	(hour)
01 00 19	01 - 07	(a day of week)

01 00 1A	01 - 1F	(day)
01 00 1B	01 - 0C	(month)
01 00 1C	0aaaaaaa	
01 00 1D#	0bbbbbbb	(year)
01 00 1E	00	(Reserved)
01 00 1F	00	(Reserved)
01 00 20	00 - xx	Current Song Protect Off,On (=01 or 81)
01 00 21	00	(Reserved)
01 00 22	0000000a	Song List Length abbbbbbb = 1,,200
01 00 23#	0bbbbbbb	
01 00 24	00	(Reserved)
:	:	:
01 00 7F	00	(Reserved)
01 01 00	20 - 7E	Current Song Comment - 1 (ASCII)
:	:	:
01 01 63	20 - 7E	Current Song Comment -100 (ASCII)
01 01 64	00	(Reserved)
:	:	:
01 01 7D	00	(Reserved)
01 02 00	00 -	Song- 1 (similar to 01 00 00 - 01 00 1F)
:	:	:
01 02 1F	00 -	
:	:	:
01 33 60	00 -	Song-200 (similar to 01 00 00 - 01 00 1F)
:	:	:
01 33 7F	00 -	

- (*) The address marked by “#” are invalid. Request to Data Request (RQ1) message with the specified size to the address without “#” mark.
- (*) Only the Data Set (DT1) message to the song name and song comment is acceptable.

●Mixer Parameter

Start address	Data	Contents and remarks
02 00 00	00 -	Track Status -1 00=SOURCE,01=PLAY,02=REC 40=SOURCE_MUTE,41=PLAY_MUTE,22=REC_SOURCE
02 00 0F	00 -	Track Status -16
02 00 10	00 - 0f	V.Track -1 1,,16
02 00 1F	00 - 0f	V.Track -16
02 00 20	00 -	(Reserved) 0
02 00 3F	00 -	(Reserved)
02 00 40	00 - 08	Track Channel ATT -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
02 00 4F	00 - 08	Track Channel ATT -16
02 00 50	00 - 08	Input Channel ATT -1 -42,-36,-30,-24,-18,-12,-6,0,+6dB
02 00 59	00 - 08	Input Channel ATT -10
02 00 5A	00 -	(dummy)
02 00 5F	00 -	

02 00 60	00 - 01	Track Channel Phase -1 Nor,Inv
:	:	:
02 00 6F	00 - 01	Track Channel Phase -16
02 00 70	00 - 01	Input Channel Phase -1 Nor,Inv
:	:	:
02 00 79	00 - 01	Input Channel Phase -10
02 00 7A	00 -	(dummy)
:	:	:
02 00 7F	00 -	
02 01 00	00 -	(Reserved) 0
:	:	:
02 01 1F	00 -	(Reserved)
02 01 20	00 - 01	Track Channel EQ Switch -1 Off,On
:	:	:
02 01 2F	00 - 01	Track Channel EQ Switch -16
02 01 30	00 - 01	Input Channel EQ Switch -1 Off,On
:	:	:
02 01 39	00 - 01	Input Channel EQ Switch -10
02 01 3A	00 -	(dummy)
:	:	:
02 01 3F	00 -	
02 01 40	00 - 7F	Track Channel EQ L Freq.-1 40,50,60, 70,80,90,100,120,140,160,180,200,300,400,500, 600,700,800,900,1K,1.1K,1.2K,1.3K,1.4K,1.5KHz
:	:	:
02 01 4F	00 - 7F	Track Channel EQ L Freq.-16
02 01 50	00 - 7F	Input Channel EQ L Freq.-1 40,50,60, 70,80,90,100,120,140,160,180,200,300,400,500, 600,700,800,900,1K,1.1K,1.2K,1.3K,1.4K,1.5KHz
:	:	:
02 01 59	00 - 7F	Input Channel EQ L Freq.-10
02 01 5A	00 -	(dummy)
:	:	:
02 01 5F	00 -	
02 01 60	00 - 7F	Track Channel EQ L Gain -1 -12,,,+12dB
:	:	:
02 01 6F	00 - 7F	Track Channel EQ L Gain -16
02 01 70	00 - 7F	Input Channel EQ L Gain -1 -12,,,+12dB
:	:	:
02 01 79	00 - 7F	Input Channel EQ L Gain -10
02 01 7A	00 -	(dummy)
:	:	:
02 01 7F	00 -	
02 02 00	00 - 7F	Track Channel EQ M Freq.-1 200,300, 400,500,600,700,800,900,1K,1.1K,1.2K,1.3K,1.4K, 1.5K,1.6K,1.7K,1.8K,1.9K,2K,3K,4K,5K,6K,7K,8KHz
:	:	:
02 02 0F	00 - 7F	Track Channel EQ M Freq.-16
02 02 10	00 - 7F	Input Channel EQ M Freq.-1 200,300, 400,500,600,700,800,900,1K,1.1K,1.2K,1.3K,1.4K, 1.5K,1.6K,1.7K,1.8K,1.9K,2K,3K,4K,5K,6K,7K,8KHz
:	:	:
02 02 19	00 - 7F	Input Channel EQ M Freq.-16
02 02 1A	00 -	(dummy)
:	:	:
02 02 1F	00 -	
02 02 20	00 - 7F	Track Channel EQ M Gain -1 -12,,,+12dB
:	:	:
02 02 2F	00 - 7F	Track Channel EQ M Gain -16
02 02 30	00 - 7F	Input Channel EQ M Gain -1 -12,,,+12dB
:	:	:
02 02 39	00 - 7F	Input Channel EQ M Gain -10

02 02 3A	00 -	(dummy)	
:	:	:	
02 02 3F	00 -		
02 02 40	00 - 7F	Track Channel EQ M Q -1	0.5,1,2,4,8,16
:	:	:	
02 02 4F	00 - 7F	Track Channel EQ M Q -16	
02 02 50	00 - 7F	Input Channel EQ M Q -1	0.5,1,2,4,8,16
:	:	:	
02 02 59	00 - 7F	Input Channel EQ M Q -10	
02 02 5A	00 -	(dummy)	
:	:	:	
02 02 5F	00 -		
02 02 60	00 - 7F	Track Channel EQ H Freq.-1	500, 600,700,800,900,1K,1.2K,1.4K,1.6K,1.8K,2K,3K, 4K,5K,6K,7K,8K,9K,10K,11K,12K,13K,14K,16K,18KHz
:	:	:	
02 02 6F	00 - 7F	Track Channel EQ H Freq.-16	
02 02 70	00 - 7F	Input Channel EQ H Freq.-1	500, 600,700,800,900,1K,1.2K,1.4K,1.6K,1.8K,2K,3K, 4K,5K,6K,7K,8K,9K,10K,11K,12K,13K,14K,16K,18KHz
:	:	:	
02 02 79	00 - 7F	Input Channel EQ H Freq.-10	
02 02 7A	00 -	(dummy)	
:	:	:	
02 02 7F	00 -		
02 03 00	00 - 7F	Track Channel EQ H Gain -1	-12,,,+12dB
:	:	:	
02 03 0F	00 - 7F	Track Channel EQ H Gain -16	
02 03 10	00 - 7F	Input Channel EQ H Gain -1	-12,,,+12dB
:	:	:	
02 03 19	00 - 7F	Input Channel EQ H Gain -10	
02 03 1A	00 -	(dummy)	
:	:	:	
02 03 1F	00 -		
02 03 20	00 - 04	Track Channel EFX1 Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 03 2F	00 - 04	Track Channel EFX1 Insert Switch -16	
02 03 30	00 - 04	Input Channel EFX1 Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 03 39	00 - 04	Input Channel EFX1 Insert Switch -10	
02 03 3A	00 -	(dummy)	
:	:	:	
02 03 3F	00 -		
02 03 40	00 - 08	Track Channel EFX1 Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 4F	00 - 08	Track Channel EFX1 Insert Send Level -16	
02 03 50	00 - 08	Input Channel EFX1 Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 59	00 - 08	Input Channel EFX1 Insert Send Level -10	
02 03 5A	00 -	(dummy)	
:	:	:	
02 03 5F	00 -		
02 03 60	00 - 08	Track Channel EFX1 Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 6F	00 - 08	Track Channel EFX1 Insert Return Level -16	
02 03 70	00 - 08	Input Channel EFX1 Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 79	00 - 08	Input Channel EFX1 Insert Return Level -10	
02 03 7A	00 -	(dummy)	
:	:	:	
02 03 7F	00 -		
02 03 80	00 - 08	Track Channel EFX2 Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 03 8F	00 - 04	Track Channel EFX2 Insert Switch -16	
02 03 90	00 - 04	Input Channel EFX2 Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 03 99	00 - 04	Input Channel EFX2 Insert Switch -10	
02 03 9A	00 -	(dummy)	
:	:	:	
02 03 9F	00 -		
02 03 A0	00 - 08	Track Channel EFX2 Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 AF	00 - 08	Track Channel EFX2 Insert Send Level -16	
02 03 B0	00 - 08	Input Channel EFX2 Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 BF	00 - 08	Input Channel EFX2 Insert Send Level -10	
02 03 C0	00 - 08	Track Channel EFX2 Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 CF	00 - 08	Track Channel EFX2 Insert Return Level -16	
02 03 D0	00 - 08	Input Channel EFX2 Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 DF	00 - 08	Input Channel EFX2 Insert Return Level -10	
02 03 E0	00 -	(dummy)	
:	:	:	
02 03 EF	00 -		
02 03 F0	00 - 08	Track Channel EFX3 (AUX1) Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 03 F9	00 - 04	Track Channel EFX3 (AUX1) Insert Switch -16	
02 03 FA	00 - 04	Input Channel EFX3 (AUX1) Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 03 FB	00 - 04	Input Channel EFX3 (AUX1) Insert Switch -10	
02 03 FC	00 -	(dummy)	
:	:	:	
02 03 FD	00 -		
02 03 FE	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 03 FF	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -16	
02 04 00	00 - 08	Input Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 0F	00 - 08	Input Channel EFX3 (AUX1) Insert Send Level -10	
02 04 10	00 -	(dummy)	
:	:	:	
02 04 1F	00 -		
02 04 20	00 - 08	Track Channel EFX3 (AUX1) Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 2F	00 - 08	Track Channel EFX3 (AUX1) Insert Return Level -16	
02 04 30	00 - 08	Input Channel EFX3 (AUX1) Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 39	00 - 08	Input Channel EFX3 (AUX1) Insert Return Level -10	
02 04 3A	00 -	(dummy)	
:	:	:	
02 04 3F	00 -		
02 04 40	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 4F	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -16	
02 04 50	00 - 08	Input Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 59	00 - 08	Input Channel EFX3 (AUX1) Insert Send Level -10	
02 04 5A	00 -	(dummy)	
:	:	:	
02 04 5F	00 -		
02 04 60	00 - 04	Track Channel EFX3 (AUX1) Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 04 6F	00 - 04	Track Channel EFX3 (AUX1) Insert Switch -16	
02 04 70	00 - 04	Input Channel EFX3 (AUX1) Insert Switch -1	Off,Ins,InsL,InsR,InsS
:	:	:	
02 04 79	00 - 04	Input Channel EFX3 (AUX1) Insert Switch -10	
02 04 7A	00 -	(dummy)	
:	:	:	
02 04 7F	00 -		
02 04 80	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 8F	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -16	
02 04 90	00 - 08	Input Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 99	00 - 08	Input Channel EFX3 (AUX1) Insert Send Level -10	
02 04 9A	00 -	(dummy)	
:	:	:	
02 04 9F	00 -		
02 04 A0	00 - 08	Input Channel EFX3 (AUX1) Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 AF	00 - 08	Input Channel EFX3 (AUX1) Insert Return Level -10	
02 04 B0	00 -	(dummy)	
:	:	:	
02 04 BF	00 -		
02 04 C0	00 - 08	Track Channel EFX3 (AUX1) Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 CF	00 - 08	Track Channel EFX3 (AUX1) Insert Return Level -16	
02 04 D0	00 - 08	Input Channel EFX3 (AUX1) Insert Return Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 DF	00 - 08	Input Channel EFX3 (AUX1) Insert Return Level -10	
02 04 E0	00 -	(dummy)	
:	:	:	
02 04 EF	00 -		
02 04 F0	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -1	-42,-36,-30,-24,-18,-12,-6,0,+6dB
:	:	:	
02 04 FF	00 - 08	Track Channel EFX3 (AUX1) Insert Send Level -16	

02 05 20 00 - 08 Track Channel EFX3 (AUX1) Insert Return Level -1	
-42,-36,-30,-24,-18,-12,-6,0,+6dB	
: : :	
02 05 2F 00 - 08 Track Channel EFX3 (AUX1) Insert Return Level -16	
: : :	
02 05 30 00 - 08 Input Channel EFX3 (AUX1) Insert Return Level -1	
-42,-36,-30,-24,-18,-12,-6,0,+6dB	
: : :	
02 05 39 00 - 08 Input Channel EFX3 (AUX1) Insert Return Level -10	
: : :	
02 05 3A 00 - (dummy)	
: : :	
02 05 3F 00 -	
: : :	
02 05 40 00 - 04 Track Channel EFX4 (AUX2) Insert Switch -1	
Off,Ins,InsL,InsR,InsS	
: : :	
02 05 4F 00 - 04 Track Channel EFX4 (AUX2) Insert Switch -16	
: : :	
02 05 50 00 - 04 Input Channel EFX4 (AUX2) Insert Switch -1	
Off,Ins,InsL,InsR,InsS	
: : :	
02 05 59 00 - 04 Input Channel EFX4 (AUX2) Insert Switch -10	
: : :	
02 05 5A 00 - (dummy)	
: : :	
02 05 5F 00 -	
: : :	
02 05 60 00 - 08 Track Channel EFX4 (AUX2) Insert Send Level -1	
-42,-36,-30,-24,-18,-12,-6,0,+6dB	
: : :	
02 05 6F 00 - 08 Track Channel EFX4 (AUX2) Insert Send Level -16	
: : :	
02 05 70 00 - 08 Input Channel EFX4 (AUX2) Insert Send Level -1	
-42,-36,-30,-24,-18,-12,-6,0,+6dB	
: : :	
02 05 79 00 - 08 Input Channel EFX4 (AUX2) Insert Send Level -10	
: : :	
02 05 7A 00 - (dummy)	
: : :	
02 05 7F 00 -	
: : :	
02 06 00 00 - 08 Track Channel EFX4 (AUX2) Insert Return Level -1	
-42,-36,-30,-24,-18,-12,-6,0,+6dB	
: : :	
02 06 0F 00 - 08 Track Channel EFX4 (AUX2) Insert Return Level -16	
: : :	
02 06 10 00 - 08 Input Channel EFX4 (AUX2) Insert Return Level -1	
-42,-36,-30,-24,-18,-12,-6,0,+6dB	
: : :	
02 06 19 00 - 08 Input Channel EFX4 (AUX2) Insert Return Level -10	
: : :	
02 06 1A 00 - (dummy)	
: : :	
02 06 1F 00 -	
: : :	
02 06 20 00 - 7F Track Channel Level -1	0,,127
: : :	
02 06 2F 00 - 7F Track Channel Level -16	
: : :	
02 06 30 00 - 7F Input Channel Level -1	0,,127
: : :	
02 06 39 00 - 7F Input Channel Level -10	
: : :	
02 06 3A 00 - (dummy)	
: : :	
02 06 3F 00 -	
: : :	
02 06 40 00 - (Reserved)	2
: : :	
02 06 5F 00 - (Reserved)	
: : :	
02 06 60 01 - 7F Track Channel MIX & BUS Pan -1	L63,,,R63
: : :	
02 06 6F 01 - 7F Track Channel MIX & BUS Pan -16	
: : :	
02 06 70 01 - 7F Input Channel MIX & BUS Pan -1	L63,,,R63
: : :	
02 06 79 01 - 7F Input Channel MIX & BUS Pan -10	
: : :	
02 06 7A 00 - (dummy)	
: : :	
02 06 7F 00 -	
: : :	
02 07 00 00 - 02 Track Channel MIX Switch -1	Off,On
: : :	
02 07 0F 00 - 02 Track Channel MIX Switch -16	
: : :	
02 07 10 00 - 02 Input Channel MIX Switch -1	Off,On
: : :	
02 07 19 00 - 02 Input Channel MIX Switch -10	
: : :	
02 07 1A 00 - (dummy)	
: : :	
02 07 1F 00 -	
: : :	
02 07 20 00 - 01 Track Channel BUS Send Switch -1 -1	Off,On
: : :	
02 07 2F 00 - 01 Track Channel BUS Send Switch -1 -16	
: : :	
02 07 30 00 - 01 Track Channel BUS Send Switch -2 -1	Off,On
: : :	
02 07 3F 00 - 01 Track Channel BUS Send Switch -2 -16	
: : :	
02 07 40 00 - 01 Track Channel BUS Send Switch -3 -1	Off,On
: : :	
02 07 4F 00 - 01 Track Channel BUS Send Switch -3 -16	
: : :	
02 07 50 00 - 01 Track Channel BUS Send Switch -4 -1	Off,On
: : :	
02 07 5F 00 - 01 Track Channel BUS Send Switch -4 -16	
: : :	
02 07 60 00 - 01 Track Channel BUS Send Switch -5 -1	Off,On
: : :	
02 07 6F 00 - 01 Track Channel BUS Send Switch -5 -16	
: : :	
02 07 70 00 - 01 Track Channel BUS Send Switch -6 -1	Off,On
: : :	
02 07 7F 00 - 01 Track Channel BUS Send Switch -6 -16	
: : :	
02 08 00 00 - 01 Track Channel BUS Send Switch -7 -1	Off,On
: : :	
02 08 0F 00 - 01 Track Channel BUS Send Switch -7 -16	
: : :	
02 08 10 00 - 01 Track Channel BUS Send Switch -8 -1	Off,On
: : :	
02 08 1F 00 - 01 Track Channel BUS Send Switch -8 -16	
: : :	
02 08 20 00 - 01 Track Channel BUS Send Switch -9 -1	Off,On
: : :	
02 08 2F 00 - 01 Track Channel BUS Send Switch -9 -16	
: : :	
02 08 30 00 - 01 Track Channel BUS Send Switch -10 -1	Off,On
: : :	
02 08 3F 00 - 01 Track Channel BUS Send Switch -10 -16	
: : :	
02 08 40 00 - 01 Track Channel BUS Send Switch -11 -1	Off,On
: : :	
02 08 4F 00 - 01 Track Channel BUS Send Switch -11 -16	
: : :	
02 08 50 00 - 01 Track Channel BUS Send Switch -12 -1	Off,On
: : :	
02 08 5F 00 - 01 Track Channel BUS Send Switch -12 -16	
: : :	
02 08 60 00 - 01 Track Channel BUS Send Switch -13 -1	Off,On
: : :	
02 08 6F 00 - 01 Track Channel BUS Send Switch -13 -16	
: : :	
02 08 70 00 - 01 Track Channel BUS Send Switch -14 -1	Off,On
: : :	
02 08 7F 00 - 01 Track Channel BUS Send Switch -14 -16	
: : :	
02 09 00 00 - 01 Track Channel BUS Send Switch -15 -1	Off,On
: : :	
02 09 0F 00 - 01 Track Channel BUS Send Switch -15 -16	

02 09 10 00 - 01 Track Channel BUS Send Switch -16 -1	Off,On
: : :	
02 09 1F 00 - 01 Track Channel BUS Send Switch -16 -16	

02 09 20 00 - 01 Input Channel BUS Send Switch -1 -1	Off,On
: : :	
02 09 2F 00 - 01 Input Channel BUS Send Switch -1 -16	

02 09 30 00 - 01 Input Channel BUS Send Switch -2 -1	Off,On
: : :	
02 09 3F 00 - 01 Input Channel BUS Send Switch -2 -16	

02 09 40 00 - 01 Input Channel BUS Send Switch -3 -1	Off,On
: : :	
02 09 4F 00 - 01 Input Channel BUS Send Switch -3 -16	

02 09 50 00 - 01 Input Channel BUS Send Switch -4 -1	Off,On
: : :	
02 09 5F 00 - 01 Input Channel BUS Send Switch -4 -16	

02 09 60 00 - 01 Input Channel BUS Send Switch -5 -1	Off,On
: : :	
02 09 6F 00 - 01 Input Channel BUS Send Switch -5 -16	

02 09 70 00 - 01 Input Channel BUS Send Switch -6 -1	Off,On
: : :	
02 09 7F 00 - 01 Input Channel BUS Send Switch -6 -16	

02 0A 00 00 - 01 Input Channel BUS Send Switch -7 -1	Off,On
: : :	
02 0A 0F 00 - 01 Input Channel BUS Send Switch -7 -16	

02 0A 10 00 - 01 Input Channel BUS Send Switch -8 -1	Off,On
: : :	
02 0A 1F 00 - 01 Input Channel BUS Send Switch -8 -16	

02 0A 20 00 - 01 Input Channel BUS Send Switch -9 -1	Off,On
: : :	
02 0A 2F 00 - 01 Input Channel BUS Send Switch -9 -16	

02 0A 30 00 - 01 Input Channel BUS Send Switch -10 -1	Off,On
: : :	
02 0A 3F 00 - 01 Input Channel BUS Send Switch -10 -16	

02 0A 40 00 -	(dummy)
: : :	
02 0B 1F 00 -	

02 0B 20 00 - 02 Track Channel EFX1 Switch -1	Off,Pre,Post
: : :	
02 0B 2F 00 - 02 Track Channel EFX1 Switch -16	

02 0B 30 00 - 02 Input Channel EFX1 Switch -1	Off,Pre,Post
: : :	
02 0B 39 00 - 02 Input Channel EFX1 Switch -10	

02 0B 3A 00 -	(dummy)
: : :	
02 0B 3F 00 -	

02 0B 40 00 - 7F Track Channel EFX1 Level -1	0,,,127
: : :	
02 0B 4F 00 - 7F Track Channel EFX1 Level -16	

02 0B 50 00 - 7F Input Channel EFX1 Level -1	0,,,127
: : :	
02 0B 59 00 - 7F Input Channel EFX1 Level -10	

02 0B 5A 00 -	(dummy)
: : :	
02 0B 5F 00 -	

02 0B 60 01 - 7F Track Channel EFX1 Pan -1	L63,,,R63
: : :	
02 0B 6F 01 - 7F Track Channel EFX1 Pan -16	

02 0B 70 01 - 7F Input Channel EFX1 Pan -1	L63,,,R63
: : :	
02 0B 79 01 - 7F Input Channel EFX1 Pan -10	

02 0B 7A 00 -	(dummy)
: : :	
02 0B 7F 00 -	

02 0C 00 00 - 02 Track Channel EFX2 Switch -1	Off,Pre,Post
: : :	
02 0C 0F 00 - 02 Track Channel EFX2 Switch -16	

02 0C 10 00 - 02 Input Channel EFX2 Switch -1	Off,Pre,Post
: : :	
02 0C 19 00 - 02 Input Channel EFX2 Switch -10	

02 0C 1A 00 -	(dummy)
: : :	
02 0C 1F 00 -	

02 0C 20 00 - 7F Track Channel EFX2 Level -1	0,,,127
: : :	
02 0C 2F 00 - 7F Track Channel EFX2 Level -16	

02 0C 30 00 - 7F Input Channel EFX2 Level -1	0,,,127
: : :	
02 0C 39 00 - 7F Input Channel EFX2 Level -10	

02 0C 3A 00 -	(dummy)
: : :	
02 0C 3F 00 -	

02 0C 40 01 - 7F Track Channel EFX2 Pan -1	L63,,,R63
: : :	
02 0C 4F 01 - 7F Track Channel EFX2 Pan -16	

02 0C 50 01 - 7F Input Channel EFX2 Pan -1	L63,,,R63
: : :	
02 0C 59 01 - 7F Input Channel EFX2 Pan -10	

02 0C 5A 00 -	(dummy)
: : :	
02 0C 5F 00 -	

02 0C 60 00 - 02 Track Channel EFX3 (AUX1) Switch -1	Off,Pre,Post
: : :	
02 0C 6F 00 - 02 Track Channel EFX3 (AUX1) Switch -16	

02 0C 70 00 - 02 Input Channel EFX3 (AUX1) Switch -1	Off,Pre,Post
: : :	
02 0C 79 00 - 02 Input Channel EFX3 (AUX1) Switch -10	

02 0C 7A 00 -	(dummy)
: : :	
02 0C 7F 00 -	

02 0D 00 00 - 7F Track Channel EFX3 (AUX1) Level -1	0,,,127
: : :	
02 0D 0F 00 - 7F Track Channel EFX3 (AUX1) Level -16	

02 0D 10 00 - 7F Input Channel EFX3 (AUX1) Level -1	0,,,127
: : :	
02 0D 19 00 - 7F Input Channel EFX3 (AUX1) Level -10	

02 0D 1A 00 -	(dummy)
: : :	
02 0D 1F 00 -	

02 0D 20 01 - 7F Track Channel EFX3 (AUX1) Pan -1	L63,,,R63
: : :	
02 0D 2F 01 - 7F Track Channel EFX3 (AUX1) Pan -16	

02 0D 30 01 - 7F Input Channel EFX3 (AUX1) Pan -1	L63,,,R63
: : :	
02 0D 39 01 - 7F Input Channel EFX3 (AUX1) Pan -10	

02 0D 3A 00 -	(dummy)
: : :	
02 0D 3F 00 -	

02 0D 40 00 - 02 Track Channel EFX4 (AUX2) Switch -1 Off,Pre,Post	02 0F 30 00 - 01 Input Channel Solo Switch -1 Off,On
: : :	: : :
02 0D 4F 00 - 02 Track Channel EFX4 (AUX2) Switch -16	02 0F 39 00 - 01 Input Channel Solo Switch -10
: : :	: : :
02 0D 50 00 - 02 Input Channel EFX4 (AUX2) Switch -1 Off,Pre,Post	02 0F 3A 00 - (dummy)
: : :	: : :
02 0D 59 00 - 02 Input Channel EFX4 (AUX2) Switch -10	02 0F 3F 00 -
: : :	: : :
02 0D 5A 00 - (dummy)	02 0F 40 00 - 01 Track Channel Mute Switch -1 Off,On
: : :	: : :
02 0D 5F 00 -	02 0F 4F 00 - 01 Track Channel Mute Switch -16
: : :	: : :
02 0D 60 00 - 7F Track Channel EFX4 (AUX2) Level -1 0,,,127	02 0F 50 00 - 01 Input Channel Mute Switch -1 Off,On
: : :	: : :
02 0D 6F 00 - 7F Track Channel EFX4 (AUX2) Level -16	02 0F 59 00 - 01 Input Channel Mute Switch -10
: : :	: : :
02 0D 70 00 - 7F Input Channel EFX4 (AUX2) Level -1 0,,,127	02 0F 5A 00 - (dummy)
: : :	: : :
02 0D 79 00 - 7F Input Channel EFX4 (AUX2) Level -10	02 0F 5F 00 -
: : :	: : :
02 0D 7A 00 - (dummy)	02 0F 60 00 - 01 Track Channel Link Switch -1 Off,On
: : :	: : :
02 0D 7F 00 -	02 0F 6F 00 - 01 Track Channel Link Switch -16
: : :	: : :
02 0E 00 01 - 7F Track Channel EFX4 (AUX2) Pan -1 L63,,,R63	02 0F 70 00 - 01 Input Channel Link Switch -1 Off,On
: : :	: : :
02 0E 0F 01 - 7F Track Channel EFX4 (AUX2) Pan -16	02 0F 79 00 - 01 Input Channel Link Switch -10
: : :	: : :
02 0E 10 01 - 7F Input Channel EFX4 (AUX2) Pan -1 L63,,,R63	02 0F 7A 00 - (dummy)
: : :	: : :
02 0E 19 01 - 7F Input Channel EFX4 (AUX2) Pan -10	02 0F 7F 00 -
: : :	: : :
02 0E 1A 00 - (dummy)	02 10 00 00 - 7F Track Channel Offset Level -a 0,,,127
: : :	: : :
02 0E 1F 00 -	02 10 07 00 - 7F Track Channel Offset Level -h
: : :	: : :
02 0E 20 00 - 02 Track Channel AUX (AUX3) Switch -1 Off,Pre,Post	02 10 08 00 - 7F Input Channel Offset Level -a 0,,,127
: : :	: : :
02 0E 2F 00 - 02 Track Channel AUX (AUX3) Switch -16	02 10 0C 00 - 7F Input Channel Offset Level -e
: : :	: : :
02 0E 30 00 - 02 Input Channel AUX (AUX3) Switch -1 Off,Pre,Post	02 10 0D 00 - (dummy)
: : :	: : :
02 0E 39 00 - 02 Input Channel AUX (AUX3) Switch -10	02 10 0F 00 -
: : :	: : :
02 0E 3A 00 - (dummy)	02 10 10 00 - 7F Track Channel Offset Pan -a L63,,,R63
: : :	: : :
02 0E 3F 00 -	02 10 17 00 - 7F Track Channel Offset Pan -h
: : :	: : :
02 0E 40 00 - 7F Track Channel AUX (AUX3) Level -1 0,,,127	02 10 18 00 - 7F Input Channel Offset Pan -a L63,,,R63
: : :	: : :
02 0E 4F 00 - 7F Track Channel AUX (AUX3) Level -16	02 10 1C 00 - 7F Input Channel Offset Pan -e
: : :	: : :
02 0E 50 00 - 7F Input Channel AUX (AUX3) Level -1 0,,,127	02 10 1D 00 - (dummy)
: : :	: : :
02 0E 59 00 - 7F Input Channel AUX (AUX3) Level -10	02 10 1F 00 -
: : :	: : :
02 0E 5A 00 - (dummy)	02 10 20 00 - (Reserved)
: : :	: : :
02 0E 5F 00 -	02 10 27 00 - (Reserved)
: : :	: : :
02 0E 60 01 - 7F Track Channel AUX (AUX3) Pan -1 L63,,,R63	02 10 28 00 - 05 Stereo In Select Off,Input12,Input34,
: : :	Input56,Input78,DigitalIn
02 0E 6F 01 - 7F Track Channel AUX (AUX3) Pan -16	02 10 29 00 - 7F Stereo In Level 0,,,127
: : :	: : :
02 0E 70 01 - 7F Input Channel AUX (AUX3) Pan -1 L63,,,R63	02 10 2A 01 - 7F Stereo In Balance L63,,,R63
: : :	: : :
02 0E 79 01 - 7F Input Channel AUX (AUX3) Pan -10	02 10 2B 00 - (Reserved)
: : :	: : :
02 0E 7A 00 - (dummy)	02 10 2C 00 - 01 Stereo In Bus Send Switch -1 Off,On
: : :	: : :
02 0E 7F 00 -	02 10 3B 00 - 01 Stereo In Bus Send Switch -16
: : :	: : :
02 0F 00 00 - (Reserved) 0	02 10 3C 00 - 01 Stereo In Solo Switch Off,On
: : :	: : :
02 0F 1F 00 - (Reserved)	02 10 3D 00 - 01 Stereo In Mute Switch Off,On
: : :	: : :
02 0F 20 00 - 01 Track Channel Solo Switch -1 Off,On	02 10 3E 00 (Reserved)
: : :	: : :
02 0F 2F 00 - 01 Track Channel Solo Switch -16	

02 10 3F	00 - 7F	EFX1 Return Level	0,,127
02 10 40	01 - 7F	EFX1 Return Balance	L63,,R63
02 10 41	00 -	(Reserved)	
02 10 42	00 - 01	EFX1 Return Bus Send Switch -1	Off,On
:	:	:	
02 10 51	00 - 01	EFX1 Return Bus Send Switch -16	
02 10 52	00 - 01	EFX1 Return Solo Switch	Off,On
02 10 53	00 - 01	EFX1 Return Mute Switch	Off,On
02 10 54	00	(Reserved)	
02 10 55	00 - 7F	EFX2 Return Level	0,,127
02 10 56	01 - 7F	EFX2 Return Balance	L63,,R63
02 10 57	00 -	(Reserved)	
02 10 58	00 - 01	EFX2 Return Bus Send Switch -1	Off,On
:	:	:	
02 10 67	00 - 01	EFX2 Return Bus Send Switch -16	
02 10 68	00 - 01	EFX2 Return Solo Switch	Off,On
02 10 69	00 - 01	EFX2 Return Mute Switch	Off,On
02 10 6A	00	(Reserved)	
02 10 6B	00 - 7F	EFX3 Return Level	0,,127
02 10 6C	01 - 7F	EFX3 Return Balance	L63,,R63
02 10 6D	00 -	(Reserved)	
02 10 6E	00 - 01	EFX3 Return Bus Send Switch -1	Off,On
:	:	:	
02 10 7D	00 - 01	EFX3 Return Bus Send Switch -16	
02 10 7E	00 - 01	EFX3 Return Solo Switch	Off,On
02 10 7F	00 - 01	EFX3 Return Mute Switch	Off,On
02 11 00	00	(Reserved)	
02 11 01	00 - 7F	EFX4 Return Level	0,,127
02 11 02	01 - 7F	EFX4 Return Balance	L63,,R63
02 11 03	00 -	(Reserved)	
02 11 04	00 - 01	EFX4 Return Bus Send Switch -1	Off,On
:	:	:	
02 11 13	00 - 01	EFX4 Return Bus Send Switch -16	
02 11 14	00 - 01	EFX4 Return Solo Switch	Off,On
02 11 15	00 - 01	EFX4 Return Mute Switch	Off,On
02 11 16	00 - 01	EFX1 Master Insert Sw	Off,Ins
02 11 17	00 - 08	EFX1 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 18	00 - 08	EFX1 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 19	00 - 01	EFX2 Master Insert Sw	Off,Ins
02 11 1A	00 - 08	EFX2 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1B	00 - 08	EFX2 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1C	00 - 01	EFX3 Master Insert Sw	Off,Ins
02 11 1D	00 - 08	EFX3 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1E	00 - 08	EFX3 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 1F	00 - 01	EFX4 Master Insert Sw	Off,Ins
02 11 20	00 - 08	EFX4 Master Send Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 21	00 - 08	EFX4 Master Return Level	-42,-36,-30,-24,-18,-12,-6,0,+6dB
02 11 22	00 - 7F	Master Out Level	0,,127
02 11 23	01 - 7F	Master Out Balance	L63,,R63
02 11 24	00 - 7F	Master EFX1 Send Level	0,,127
02 11 25	01 - 7F	Master EFX1 Send Balance	L63,,R63
02 11 26	00 - 7F	Master EFX2 Send Level	0,,127
02 11 27	01 - 7F	Master EFX2 Send Balance	L63,,R63
02 11 28	00 - 7F	Master EFX3 (AUX1) Send Level	0,,127
02 11 29	01 - 7F	Master EFX3 (AUX1) Send Balance	L63,,R63
02 11 2A	00 - 7F	Master EFX4 (AUX2) Send Level	0,,127
02 11 2B	01 - 7F	Master EFX4 (AUX2) Send Balance	L63,,R63
02 11 2C	00 - 7F	Master AUX (AUX3) Send Level	0,,127
02 11 2D	01 - 7F	Master AUX (AUX3) Send Balance	L63,,R63
02 11 2E	00 - 07	Monitor Mode	Master,RecBus,EFX1,EFX2,EFX3(AUX1),EFX4(AUX2),AUX(AUX3),StereoIn
02 11 2F	00 - 7F	Monitor Out Level	0,,127
02 11 30	01 - 7F	Monitor Out Balance	L63,,R63
02 11 31	00 -	(Reserved)	
02 11 32	00 - 04	AUX A Output Select	EFX1,EFX2,EFX3(AUX1),EFX4(AUX2),AUX(AUX3)
02 11 33	00 - 04	AUX B Output Select	EFX1,EFX2,EFX3(AUX1),EFX4(AUX2),AUX(AUX3)
02 11 34	00 - 06	Digital 1 Output Select	Master,EFX1,EFX2,EFX3(AUX1),EFX4(AUX2),AUX(AUX3),Monitor
02 11 35	00 - 06	Digital 2 Output Select	Master,EFX1,EFX2,EFX3(AUX1),EFX4(AUX2),AUX(AUX3),Monitor
02 11 36	00 - 01	EQ Mode	2Band,3Band
02 11 37	00 -	(Reserved)	
02 11 38	00 -	(Reserved)	
02 11 39	00 - 01	Digital Input Select	0,1
02 11 3A	00 - 02	Direct Output Switch	Off,1-8,9-16
02 11 3B	00 -	(dummy)	
:	:	:	
02 11 3F	00 -		
02 11 40	00 - 7F	Track Channel Fader Group -1	0,,8 = Off,1,,8
:	:	:	
02 11 4F	00 - 7F	Track Channel Fader Group -16	

02 11 50	00 - 7F	Input Channel Fader Group -1	0,,,8 = Off,1,,,8
:	:	:	:
02 11 59	00 - 7F	Input Channel Fader Group -10	

		00=Marker Read (*3)	
		01=Marker Write (*3)	
		02=Marker Clear (*3)	
		03 = Get Locate Bank (*4)	
		04 = Set Locate Bank (*4)	

●Locate Parameter

Start address	Data	Contents and remarks
03 00 00	0aaaaaaa	LOCATE-1 (*1)
03 00 01#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 02#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 03#	0ddddddd	
03 00 04	0aaaaaaa	LOCATE-2 (*1)
03 00 05#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 06#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 07#	0ddddddd	
03 00 08	0aaaaaaa	LOCATE-3 (*1)
03 00 09#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 0A#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 0B#	0ddddddd	
03 00 0C	0aaaaaaa	LOCATE-4 (*1)
03 00 0D#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 0E#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 0F#	0ddddddd	
03 00 10	0aaaaaaa	LOCATE-5 (*1)
03 00 11#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 12#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 13#	0ddddddd	
03 00 14	0aaaaaaa	LOCATE-6 (*1)
03 00 15#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 16#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 17#	0ddddddd	
03 00 18	0aaaaaaa	LOCATE-7 (*1)
03 00 19#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 1A#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 1B#	0ddddddd	
03 00 1C	0aaaaaaa	LOCATE-8 (*1)
03 00 1D#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 1E#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 1F#	0ddddddd	
03 00 20	0aaaaaaa	Loop Start Point (*1,2)
03 00 21#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 22#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 23#	0ddddddd	
03 00 24	0aaaaaaa	Loop End Point (*1,2)
03 00 25#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 26#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 27#	0ddddddd	
03 00 28	0aaaaaaa	Punch In Point (*1,2)
03 00 29#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 2A#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 2B#	0ddddddd	
03 00 2C	0aaaaaaa	Punch Out Point (*1,2)
03 00 2D#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 00 2E#	0ccccccc	0,,,268435455block (1block=16sample)
03 00 2F#	0ddddddd	
03 01 00	0aaaaaaa	Marker Time or Marker Number (*1,3)
03 01 01#	0bbbbbbb	aaaaaaaaabbbbbccccccccdddddd =
03 01 02#	0ccccccc	0,,,268435455block (1block=16sample)
03 01 03#	0ddddddd	or 0,,,999 Marker Number, >=1000 All
03 01 04	00 - 04	Marker/Locator Command

- (*1) The address marked by “#” are invalid. Transmit the Data Set (DT1) or Data Request (RQ1) message with the specified size to the address without “#” mark.
- (*2) Time parameters are set to the relocated time (REL) that the time of song top is “00:00:00:00”
- (*3) The VS-1680 treats the 16 samples as 1 block for managing internal time. Pay attention to the expression of the internal time changes respond to the sampling frequency of each song. And time parameter can not be set to over 24 hours.

Example 1) Set the time 00:01:00:00 (30 Non-Drop)

Sampling Frequency is 48 kHz :
 2880000 sample = 180000 block = 00 0A 7E 20 (7bit Hex)

Sampling Frequency is 44.1 kHz :
 2646000 sample = 165375 block = 00 0A 0B 7F (7bit Hex)

Sampling Frequency is 32 kHz :
 1920000 sample = 120000 block = 00 07 29 40 (7bit Hex)

Example 2) Set the time 23:59:59:29 (30 Non-Drop)

Sampling Frequency is 48 kHz :
 4147198400 sample = 259199900 block = 7B 4C 27 1C (7bit Hex)

Sampling Frequency is 44.1 kHz :
 3810238530 sample = 238139908 block = 71 46 74 04 (7bit Hex)

Sampling Frequency is 32 kHz :
 2764798933 sample = 172799933 block = 52 32 6F 3D (7bit Hex)

- (*2) The Loop Start point must be before the Loop Stop point. The Auto Punch In point must be before the Auto Punch Out point. If the interval of each point is shorter than 1 sec, the VS-1680 does not work correctly.
- (*3) Read/Write/Erase of the Mark points are done by writing operation mode to the Marker command. Set the value of the Marker Time and Marker Number, before setting the value of the Marker command.

Example 1) Delete all mark points (Device ID = 10)

```
(HOST) => F0 41 10 00 0E 12 03 01 00 7F 7F 7F 7F 7A F7 => (VS-1680)
(HOST) => F0 41 10 00 0E 12 03 01 04 02 74 F7 => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 00 00 00 00 00 ss F7 <= (VS-1680)
```

The return value “00000000” is a sum of mark points.

Example 2) Write the mark point (Device ID = 10)

```
(HOST) => F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7 => (VS-1680)
          aaaaaaaa = time of Marker
(HOST) => F0 41 10 00 0E 12 03 01 04 01 75 F7 => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7 <= (VS-1680)
          nnnn = total marker number, ss = check sum
```

If the total of mark point is over 1000, the VS-1680 ignores the writing and returns the total numbers of the mark points. If the mark point already exists 0.1 msec near the new mark point, the VS-1680 ignores the writing and returns the total numbers of the mark points.

Example 3) Read the mark point #3 (Device ID = 10)

```
(HOST) => F0 41 10 00 0E 12 03 01 00 00 00 00 03 75 F7 => (VS-1680)
(HOST) => F0 41 10 00 0E 12 03 01 04 00 76 F7 => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7 <= (VS-1680)
          nnnnnnnn = total marker number, ss = check sum
(HOST) <= F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7 <= (VS-1680)
          aaaaaaaa = time of Marker #3
```

If the mark point is less than 3, the VS-1680 does not return the block of “aaaaaaa”.

Example 4) Read all mark points (Device ID = 10)

```
(HOST) => F0 41 10 00 0E 12 03 01 00 7F 7F 7F 7F 7A F7 => (VS-1680)
          7F7F7F7F (>= 1000) means All marker
```

```
(HOST) => F0 41 10 00 0E 12 03 01 04 00 76 F7 => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7 <= (VS-1680)
          nnnnnnnn = total marker number, ss = check sum
(HOST) <= F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7 <= (VS-1680)
          aaaaaaaa = time of Marker #1
(HOST) <= F0 41 10 00 0E 12 03 01 00 bb bb bb bb ss F7 <= (VS-1680)
          bbbbbbbb = time of Marker #2
          :
(HOST) <= F0 41 10 00 0E 12 03 01 00 xx xx xx xx ss F7 <= (VS-1680)
          xxxxxxxx = time of the last Marker#
```

If the mark point does not exist, the VS-1680 does not return blocks under "aaaaaaa".

Example 5) Delete the mark point (Device ID = 10)

```
(HOST) => F0 41 10 00 0E 12 03 01 00 aa aa aa aa ss F7 => (VS-1680)
          aaaaaaaa = time of Marker
(HOST) => F0 41 10 00 0E 12 03 01 04 02 74 F7 => (VS-1680)
(HOST) <= F0 41 10 00 0E 12 03 01 00 nn nn nn nn ss F7 <= (VS-1680)
          nnnn = total marker number, ss = check sum
```

The VS-1680 deletes the mark point which includes specified time, and returns the total numbers of the mark points.

(*4) Write Locate data into a bank memory (Set Locate Bank), and read from a bank memory (Get Locate Bank), according to the Locate Bank number (0 - 3) set in Marker Number.

●Effect parameters

Basic Address

Start address	Contents and remarks
04 00 00	0aaaaaaa Effector - 1 Algorithm aaaaaaabbabbbb =
04 00 01#	0bbbbbbb (0:Reverb *1)
	1:Delay
	2:Stereo Delay Chorus
	3:Stereo Pitch Shifter Delay
	4:Vocoder
	5:2ch RSS
	6:Delay RSS
	7:Chorus RSS
	8:Guitar Multi 1
	9:Guitar Multi 2
	10:Guitar Multi 3
	11:Vocal Multi
	12:Rotary
	13:Guitar Amp Simulator
	14:Stereo Phaser
	15:Stereo Flanger
	16:Dual Comp/Limiter
	(17:Gate Reverb *1)
	18:Multi Tap Delay
	19:Stereo Multi
	20:Reverb 2
	21:Space Chorus
	22:Lo-Fi Processor
	23:4Band Parametric Equalizer
	24:10Band Graphic Equalizer
	25:Hum Canceler
	26:Vocal Canceler
	(27:Voice Transformer *1,*2)
	(28:Vocoder 2 *1,*2)
	29:Micro Simulator
	30:3Band Isolator
	31:Tape Echo 201
	32:Analog Flanger
	33:Analog Phaser
	34:Speaker Modeling
	(35:Mastering Tool Kit *1,*2)
04 00 02	20 - 7E Effector - 1 Name -1 (ASCII)
:	:
04 00 0D	20 - 7E Effector - 1 Name -12

04 00 0E	00 - 7F	Effector - 1 Parameter Area (See Below)
:	:	:
04 00 7F	00 - 7F	
04 01 00	0aaaaaaa	Effector - 2 Algorithm aaaaaaabbabbbb =
04 01 01#	0bbbbbbb	(0:Reverb *1)
		1:Delay
		2:Stereo Delay Chorus
		3:Stereo Pitch Shifter Delay
		4:Vocoder
		5:2ch RSS
		6:Delay RSS
		7:Chorus RSS
		8:Guitar Multi 1
		9:Guitar Multi 2
		10:Guitar Multi 3
		11:Vocal Multi
		12:Rotary
		13:Guitar Amp Simulator
		14:Stereo Phaser
		15:Stereo Flanger
		16:Dual Comp/Limiter
		(17:Gate Reverb *1)
		18:Multi Tap Delay
		19:Stereo Multi
		20:Reverb 2
		21:Space Chorus
		22:Lo-Fi Processor
		23:4Band Parametric Equalizer
		24:10Band Graphic Equalizer
		25:Hum Canceler
		26:Vocal Canceler
		(27:Voice Transformer *1,*2)
		(28:Vocoder 2 *1,*2)
		29:Micro Simulator
		30:3Band Isolator
		31:Tape Echo 201
		32:Analog Flanger
		33:Analog Phaser
		34:Speaker Modeling
		(35:Mastering Tool Kit *1,*2)
04 01 02	20 - 7E	Effector - 2 Name -1 (ASCII)
:	:	:
04 01 0D	20 - 7E	Effector - 2 Name -12
04 01 0E	20 - 7E	Effector - 2 Parameter Area (See Below)
:	:	:
04 01 7F	20 - 7E	
04 02 00	0aaaaaaa	Effector - 3 Algorithm aaaaaaabbabbbb =
04 02 01#	0bbbbbbb	(0:Reverb *1)
		1:Delay
		2:Stereo Delay Chorus
		3:Stereo Pitch Shifter Delay
		4:Vocoder
		5:2ch RSS
		6:Delay RSS
		7:Chorus RSS
		8:Guitar Multi 1
		9:Guitar Multi 2
		10:Guitar Multi 3
		11:Vocal Multi
		12:Rotary
		13:Guitar Amp Simulator
		14:Stereo Phaser
		15:Stereo Flanger
		16:Dual Comp/Limiter
		(17:Gate Reverb *1)
		18:Multi Tap Delay
		19:Stereo Multi
		20:Reverb 2
		21:Space Chorus
		22:Lo-Fi Processor
		23:4Band Parametric Equalizer
		24:10Band Graphic Equalizer
		25:Hum Canceler
		26:Vocal Canceler
		(27:Voice Transformer *1,*2)

		(28:Vocoder 2 *1,*2)	
		29: Mic Simulator	
		30: 3Band Isolator	
		31: Tape Echo 201	
		32: Analog Flanger	
		33: Analog Phaser	
		34: Speaker Modeling	
		(35: Mastering Tool Kit *1,*2)	
04 02 02	20 - 7E	Effector - 3 Name -1	(ASCII)
:	:	:	
04 02 0D	20 - 7E	Effector - 3 Name -12	
04 02 0E	20 - 7E	Effector - 3 Parameter Area (See Below)	
:	:	:	
04 02 7F	20 - 7E		
04 03 00	0aaaaaaa	Effector - 4 Algorithm	aaaaaaabbbbbbb =
04 03 01#	0bbbbbbb	(0:Reverb *1)	
		1: Delay	
		2: Stereo Delay Chorus	
		3: Stereo Pitch Shifter Delay	
		4: Vocoder	
		5: 2ch RSS	
		6: Delay RSS	
		7: Chorus RSS	
		8: Guitar Multi 1	
		9: Guitar Multi 2	
		10: Guitar Multi 3	
		11: Vocal Multi	
		12: Rotary	
		13: Guitar Amp Simulator	
		14: Stereo Phaser	
		15: Stereo Flanger	
		16: Dual Comp/Limiter	
		(17: Gate Reverb *1)	
		18: Multi Tap Delay	
		19: Stereo Multi	
		20: Reverb 2	
		21: Space Chorus	
		22: Lo-Fi Processor	
		23: 4Band Parametric Equalizer	
		24: 10Band Graphic Equalizer	
		25: Hum Canceler	
		26: Vocal Canceler	
		(27: Voice Transformer *1,*2)	
		(28: Vocoder 2 *1,*2)	
		29: Mic Simulator	
		30: 3Band Isolator	
		31: Tape Echo 201	
		32: Analog Flanger	
		33: Analog Phaser	
		34: Speaker Modeling	
		(35: Mastering Tool Kit *1,*2)	
04 03 02	20 - 7E	Effector - 4 Name -1	(ASCII)
:	:	:	
04 03 0D	20 - 7E	Effector - 4 Name -12	
04 03 0E	20 - 7E	Effector - 4 Parameter Area (See Below)	
:	:	:	
04 03 7F	20 - 7E		

- (*1) can not select "0:Reverb," "17:Gate Reverb," "27:Voice Transformer" and "28:Vocoder2" on EFX2, 4.
- (*2) If 27:Voice Transformer or 28:Vocoder2 is selected at EFX1, EFX2 is invalid.
- (*) Two same parameters exist with two system Effects.
- (*) A meaning of the parameter area changes correspond with the top of parameter of Effect Algorithm. See the following tables. The address shows at EFX1.
- (*) If select the different Algorithm type from current one, all parameters will be copied from the preset patch data which selected Algorithm.

Algorithm 0 Reverb (EFX1 or EFX3)

04 00 0E	0aaaaaaa	EQ SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ: Low EQ Type	
04 00 11#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 12	0aaaaaaa	EQ: Low EQ Gain	
04 00 13#	0bbbbbbb		-12,,,12dB
04 00 14	0aaaaaaa	EQ: Low EQ Frequency	
04 00 15#	0bbbbbbb		2,,,200 = 20,,,2000Hz
04 00 16	0aaaaaaa	EQ: Low EQ Q	
04 00 17#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 18	0aaaaaaa	EQ: Mid EQ Gain	
04 00 19#	0bbbbbbb		-12,,,12dB
04 00 1A	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 1B#	0bbbbbbb		20,,,800 = 200,,,8000Hz
04 00 1C	0aaaaaaa	EQ: Mid EQ Q	
04 00 1D#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 1E	0aaaaaaa	EQ: High EQ Type	
04 00 1F#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 20	0aaaaaaa	EQ: High EQ Gain	
04 00 21#	0bbbbbbb		-12,,,12dB
04 00 22	0aaaaaaa	EQ: High EQ Frequency	
04 00 23#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
04 00 24	0aaaaaaa	EQ: High EQ Q	
04 00 25#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 26	0aaaaaaa	EQ: Out Level	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Reverb: Room Size	
04 00 29#	0bbbbbbb		5,,,40m
04 00 2A	0aaaaaaa	Reverb: Reverb Time	
04 00 2B#	0bbbbbbb		1,,,320 = 0.1,,,32.0s
04 00 2C	0aaaaaaa	Reverb: Pre Delay	
04 00 2D#	0bbbbbbb		0,,,200 = 0,,,200ms
04 00 2E	0aaaaaaa	Reverb: Diffusion	
04 00 2F#	0bbbbbbb		0,,,100
04 00 30	0aaaaaaa	Reverb: Density	
04 00 31#	0bbbbbbb		0,,,100
04 00 32	0aaaaaaa	Reverb: Early Reflection Level	
04 00 33#	0bbbbbbb		0,,,100
04 00 34	0aaaaaaa	Reverb: LF Damp Frequency	
04 00 35#	0bbbbbbb		5,,,400 = 50,,,4000Hz
04 00 36	0aaaaaaa	Reverb: LF Damp Gain	
04 00 37#	0bbbbbbb		-36,,,0dB
04 00 38	0aaaaaaa	Reverb: HF Damp Frequency	
04 00 39#	0bbbbbbb		10,,,200 = 1.0,,,20.0kHz
04 00 3A	0aaaaaaa	Reverb: HF Damp Gain	
04 00 3B#	0bbbbbbb		-36,,,0dB
04 00 3C	0aaaaaaa	Reverb: HI Cut Frequency	
04 00 3D#	0bbbbbbb		2,,,200 = 0.2,,,20.0kHz
04 00 3E	0aaaaaaa	Reverb: Effect Level	
04 00 3F#	0bbbbbbb		-100,,,100

04 00 40	0aaaaaaa	Reverb: Direct Level	
04 00 41#	0bbbbbbb		-100,,,100
04 00 42	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 1 Delay

04 00 0E	0aaaaaaa	Delay SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Delay: Delay Time	
04 00 13#	0bbbbbbb		0,,,1200ms
04 00 14	0aaaaaaa	Delay: Shift	
04 00 15#	0bbbbbbb		-1200,,,1200 = L1200,,,R1200ms
04 00 16	0aaaaaaa	Delay: Lch Feedback Level	
04 00 17#	0bbbbbbb		-100,,,100
04 00 18	0aaaaaaa	Delay: Rch Feedback Level	
04 00 19#	0bbbbbbb		-100,,,100
04 00 1A	0aaaaaaa	Delay: Lch Level	
04 00 1B#	0bbbbbbb		-100,,,100
04 00 1C	0aaaaaaa	Delay: Rch Level	
04 00 1D#	0bbbbbbb		-100,,,100
04 00 1E	0aaaaaaa	Delay: LF Damp Frequency	
04 00 1F#	0bbbbbbb		5,,,400 = 50,,,4000Hz
04 00 20	0aaaaaaa	Delay: LF Damp Gain	
04 00 21#	0bbbbbbb		-36,,,0dB
04 00 22	0aaaaaaa	Delay: HF Damp Frequency	
04 00 23#	0bbbbbbb		10,,,200 = 1.0,,,20.0kHz
04 00 24	0aaaaaaa	Delay: HF Damp Gain	
04 00 25#	0bbbbbbb		-36,,,0dB
04 00 26	0aaaaaaa	Delay: Direct Level	
04 00 27#	0bbbbbbb		-100,,,100
04 00 28	0aaaaaaa	EQ: Low EQ Type	
04 00 29#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 2A	0aaaaaaa	EQ: Low EQ Gain	
04 00 2B#	0bbbbbbb		-12,,,12dB
04 00 2C	0aaaaaaa	EQ: Low EQ Frequency	
04 00 2D#	0bbbbbbb		2,,,200 = 20,,,2000Hz
04 00 2E	0aaaaaaa	EQ: Low EQ Q	
04 00 2F#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 30	0aaaaaaa	EQ: Mid EQ Gain	
04 00 31#	0bbbbbbb		-12,,,12dB
04 00 32	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 33#	0bbbbbbb		20,,,800 = 200,,,8000Hz
04 00 34	0aaaaaaa	EQ: Mid EQ Q	
04 00 35#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 36	0aaaaaaa	EQ: High EQ Type	
04 00 37#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 38	0aaaaaaa	EQ: High EQ Gain	
04 00 39#	0bbbbbbb		-12,,,12dB

04 00 3A	0aaaaaaa	EQ: High EQ Frequency	
04 00 3B#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
04 00 3C	0aaaaaaa	EQ: High EQ Q	
04 00 3D#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 3E	0aaaaaaa	EQ: Out Level	
04 00 3F#	0bbbbbbb		0,,,100
04 00 40	00	(Reserved)	
:	:		
04 00 7F	00		

* (Delay Time) + (Absolute Shift) should be 1200 or less.

Algorithm 2 Stereo Delay Chorus

04 00 0E	0aaaaaaa	Delay SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Chorus SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	EQ SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	Delay: Delay Time	
04 00 15#	0bbbbbbb		0,,,500ms
04 00 16	0aaaaaaa	Delay: Shift	
04 00 17#	0bbbbbbb		-500,,,500 = L500,,,R500ms
04 00 18	0aaaaaaa	Delay: Lch Feedback Level	
04 00 19#	0bbbbbbb		-100,,,100
04 00 1A	0aaaaaaa	Delay: Rch Feedback Level	
04 00 1B#	0bbbbbbb		-100,,,100
04 00 1C	0aaaaaaa	Delay: Lch Cross Feedback Level	
04 00 1D#	0bbbbbbb		-100,,,100
04 00 1E	0aaaaaaa	Delay: Rch Cross Feedback Level	
04 00 1F#	0bbbbbbb		-100,,,100
04 00 20	0aaaaaaa	Delay: Effect Level	
04 00 21#	0bbbbbbb		-100,,,100
04 00 22	0aaaaaaa	Delay: Direct Level	
04 00 23#	0bbbbbbb		-100,,,100
04 00 24	0aaaaaaa	Chorus: Rate	
04 00 25#	0bbbbbbb		1,,,100 = 0.1,,,10.0Hz
04 00 26	0aaaaaaa	Chorus: Depth	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Chorus: Pre Delay	
04 00 29#	0bbbbbbb		0,,,50ms
04 00 2A	0aaaaaaa	Chorus: Effect Level	
04 00 2B#	0bbbbbbb		-100,,,100
04 00 2C	0aaaaaaa	Chorus: Direct Level	
04 00 2D#	0bbbbbbb		-100,,,100
04 00 2E	0aaaaaaa	Chorus: Lch Feedback Level	
04 00 2F#	0bbbbbbb		-100,,,100
04 00 30	0aaaaaaa	Chorus: Rch Feedback Level	
04 00 31#	0bbbbbbb		-100,,,100
04 00 32	0aaaaaaa	Chorus: Lch Cross Feedback Level	
04 00 33#	0bbbbbbb		-100,,,100
04 00 34	0aaaaaaa	Chorus: Rch Cross Feedback Level	
04 00 35#	0bbbbbbb		-100,,,100

04 00 36	0aaaaaaa	EQ: Low EQ Type	
04 00 37#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 38	0aaaaaaa	EQ: Low EQ Gain	
04 00 39#	0bbbbbbb		-12,,12dB
04 00 3A	0aaaaaaa	EQ: Low EQ Frequency	
04 00 3B#	0bbbbbbb		2,,200 = 20,,2000Hz
04 00 3C	0aaaaaaa	EQ: Low EQ Q	
04 00 3D#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 3E	0aaaaaaa	EQ: Mid EQ Gain	
04 00 3F#	0bbbbbbb		-12,,12dB
04 00 40	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 41#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 42	0aaaaaaa	EQ: Mid EQ Q	
04 00 43#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 44	0aaaaaaa	EQ: High EQ Type	
04 00 45#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 46	0aaaaaaa	EQ: High EQ Gain	
04 00 47#	0bbbbbbb		-12,,12dB
04 00 48	0aaaaaaa	EQ: High EQ Frequency	
04 00 49#	0bbbbbbb		14,,200 = 1.4,,20.0kHz
04 00 4A	0aaaaaaa	EQ: High EQ Q	
04 00 4B#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 4C	0aaaaaaa	EQ: Out Level	
04 00 4D#	0bbbbbbb		0,,100
04 00 4E	00	(Reserved)	
:	:		
04 00 7F	00		

* (Delay Time) + (Absolute Shift) should be 500 or less.

Algorithm 3 Stereo Pitch Shifter Delay

04 00 0E	0aaaaaaa	P.ShifterDelay SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	P.ShifterDelay: Lch Chromatic Pitch	
04 00 13#	0bbbbbbb		-12,,12
04 00 14	0aaaaaaa	P.ShifterDelay: Lch Fine Pitch	
04 00 15#	0bbbbbbb		-100,,100
04 00 16	0aaaaaaa	P.ShifterDelay: Lch Pre Delay	
04 00 17#	0bbbbbbb		0,,50ms
04 00 18	0aaaaaaa	P.ShifterDelay: Lch Feedback Delay Time	
04 00 19#	0bbbbbbb		0,,500ms
04 00 1A	0aaaaaaa	P.ShifterDelay: Lch Feedback Level	
04 00 1B#	0bbbbbbb		-100,,100
04 00 1C	0aaaaaaa	P.ShifterDelay: Lch Cross Feedback Level	
04 00 1D#	0bbbbbbb		-100,,100
04 00 1E	0aaaaaaa	P.ShifterDelay: Rch Chromatic Pitch	
04 00 1F#	0bbbbbbb		-12,,12
04 00 20	0aaaaaaa	P.ShifterDelay: Rch Fine Pitch	
04 00 21#	0bbbbbbb		-100,,100

04 00 22	0aaaaaaa	P.ShifterDelay: Rch Pre Delay	
04 00 23#	0bbbbbbb		0,,50ms
04 00 24	0aaaaaaa	P.ShifterDelay: Rch Feedback Delay Time	
04 00 25#	0bbbbbbb		0,,500ms
04 00 26	0aaaaaaa	P.ShifterDelay: Rch Feedback Level	
04 00 27#	0bbbbbbb		-100,,100
04 00 28	0aaaaaaa	P.ShifterDelay: Rch Cross Feedback Level	
04 00 29#	0bbbbbbb		-100,,100
04 00 2A	0aaaaaaa	P.ShifterDelay: Effect Level	
04 00 2B#	0bbbbbbb		-100,,100
04 00 2C	0aaaaaaa	P.ShifterDelay: Direct Level	
04 00 2D#	0bbbbbbb		-100,,100
04 00 2E	0aaaaaaa	EQ: Low EQ Type	
04 00 2F#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 30	0aaaaaaa	EQ: Low EQ Gain	
04 00 31#	0bbbbbbb		-12,,12dB
04 00 32	0aaaaaaa	EQ: Low EQ Frequency	
04 00 33#	0bbbbbbb		2,,200 = 20,,2000Hz
04 00 34	0aaaaaaa	EQ: Low EQ Q	
04 00 35#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 36	0aaaaaaa	EQ: Mid EQ Gain	
04 00 37#	0bbbbbbb		-12,,12dB
04 00 38	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 39#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 3A	0aaaaaaa	EQ: Mid EQ Q	
04 00 3B#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 3C	0aaaaaaa	EQ: High EQ Type	
04 00 3D#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 3E	0aaaaaaa	EQ: High EQ Gain	
04 00 3F#	0bbbbbbb		-12,,12dB
04 00 40	0aaaaaaa	EQ: High EQ Frequency	
04 00 41#	0bbbbbbb		14,,200 = 1.4,,20.0kHz
04 00 42	0aaaaaaa	EQ: High EQ Q	
04 00 43#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 44	0aaaaaaa	EQ: Out Level	
04 00 45#	0bbbbbbb		0,,100
04 00 46	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 4 Vocoder

04 00 0E	0aaaaaaa	Chorus SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Vocoder: Voice Character 1	
04 00 11#	0bbbbbbb		0,,100
04 00 12	0aaaaaaa	Vocoder: Voice Character 2	
04 00 13#	0bbbbbbb		0,,100
04 00 14	0aaaaaaa	Vocoder: Voice Character 3	
04 00 15#	0bbbbbbb		0,,100
04 00 16	0aaaaaaa	Vocoder: Voice Character 4	
04 00 17#	0bbbbbbb		0,,100

04 00 18	0aaaaaaa	Vocoder: Voice Character 5	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Vocoder: Voice Character 6	
04 00 1B#	0bbbbbbb		0,,,100
04 00 1C	0aaaaaaa	Vocoder: Voice Character 7	
04 00 1D#	0bbbbbbb		0,,,100
04 00 1E	0aaaaaaa	Vocoder: Voice Character 8	
04 00 1F#	0bbbbbbb		0,,,100
04 00 20	0aaaaaaa	Vocoder: Voice Character 9	
04 00 21#	0bbbbbbb		0,,,100
04 00 22	0aaaaaaa	Vocoder: Voice Character 10	
04 00 23#	0bbbbbbb		0,,,100
04 00 24	0aaaaaaa	Chorus: Rate	
04 00 25#	0bbbbbbb		1,,,100 = 0.1,,,10.0Hz
04 00 26	0aaaaaaa	Chorus: Depth	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Chorus: Pre Delay	
04 00 29#	0bbbbbbb		0,,,50ms
04 00 2A	0aaaaaaa	Chorus: Feedback Level	
04 00 2B#	0bbbbbbb		-100,,,100
04 00 2C	0aaaaaaa	Chorus: Effect Level	
04 00 2D#	0bbbbbbb		-100,,,100
04 00 2E	0aaaaaaa	Chorus: Direct Level	
04 00 2F#	0bbbbbbb		-100,,,100
04 00 30	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 5 2CH RSS

04 00 0E	0aaaaaaa	2CH RSS: Ach Azimuth	
04 00 0F#	0bbbbbbb		-30,,,30 = -180,,,180
04 00 10	0aaaaaaa	2CH RSS: Ach Elevation	
04 00 11#	0bbbbbbb		-15,,,15 = -90,,,90
04 00 12	0aaaaaaa	2CH RSS: Bch Azimuth	
04 00 13#	0bbbbbbb		-30,,,30 = -180,,,180
04 00 14	0aaaaaaa	2CH RSS: Bch Elevation	
04 00 15#	0bbbbbbb		-15,,,15 = -90,,,90
04 00 16	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 6 Delay RSS

04 00 0E	0aaaaaaa	Delay RSS: Delay Time	
04 00 0F#	0bbbbbbb		0,,,1200ms
04 00 10	0aaaaaaa	Delay RSS: Shift	
04 00 11#	0bbbbbbb		-1200,,,1200 = L1200,,,R1200ms
04 00 12	0aaaaaaa	Delay RSS: Center Delay Time	
04 00 13#	0bbbbbbb		0,,,1200ms
04 00 14	0aaaaaaa	Delay RSS: RSS Level	
04 00 15#	0bbbbbbb		0,,,100
04 00 16	0aaaaaaa	Delay RSS: Center Level	
04 00 17#	0bbbbbbb		0,,,100

04 00 18	0aaaaaaa	Delay RSS: Feedback Level	
04 00 19#	0bbbbbbb		-100,,,100
04 00 1A	0aaaaaaa	Delay RSS: LF Damp Frequency	
04 00 1B#	0bbbbbbb		5,,,400 = 50,,,4000Hz
04 00 1C	0aaaaaaa	Delay RSS: LF Damp Gain	
04 00 1D#	0bbbbbbb		-36,,,0dB
04 00 1E	0aaaaaaa	Delay RSS: HF Damp Frequency	
04 00 1F#	0bbbbbbb		10,,,200 = 1.0,,,20.0kHz
04 00 20	0aaaaaaa	Delay RSS: HF Damp Gain	
04 00 21#	0bbbbbbb		-36,,,0dB
04 00 22	0aaaaaaa	Delay RSS: Effect Level	
04 00 23#	0bbbbbbb		-100,,,100
04 00 24	0aaaaaaa	Delay RSS: Direct Level	
04 00 25#	0bbbbbbb		-100,,,100
04 00 26	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 7 Chorus RSS

04 00 0E	0aaaaaaa	Chorus RSS: Chorus Rate	
04 00 0F#	0bbbbbbb		1,,,100 = 0.1,,,10.0Hz
04 00 10	0aaaaaaa	Chorus RSS: Chorus Depth	
04 00 11#	0bbbbbbb		0,,,100
04 00 12	0aaaaaaa	Chorus RSS: Effect Level	
04 00 13#	0bbbbbbb		-100,,,100
04 00 14	0aaaaaaa	Chorus RSS: Direct Level	
04 00 15#	0bbbbbbb		-100,,,100
04 00 16	00	(Reserved)	
:	:		
04 00 7F	00		

Common for Algorithm 8, 9, 10 Guitar Multi 1, 2, 3

04 00 0E	0aaaaaaa	Compressor SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Metal/Distortion/Over Drive SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Noise Suppressor SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	Auto Wah SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	Guitar Amp Simulator SW	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	Flanger SW	
04 00 19#	0bbbbbbb		0,1 = Off,On
04 00 1A	0aaaaaaa	Delay SW	
04 00 1B#	0bbbbbbb		0,1 = Off,On
04 00 1C	0aaaaaaa	Compressor: Attack	
04 00 1D#	0bbbbbbb		0,,,100
04 00 1E	0aaaaaaa	Compressor: Level	
04 00 1F#	0bbbbbbb		0,,,100

04 00 20	0aaaaaaa	Compressor: Sustain	
04 00 21#	0bbbbbbb		0,,,100
04 00 22	0aaaaaaa	Compressor: Tone	
04 00 23#	0bbbbbbb		-50,,, -50
04 00 24	0aaaaaaa	Noise Suppressor: Threshold	
04 00 25#	0bbbbbbb		0,,,100
04 00 26	0aaaaaaa	Noise Suppressor: Release	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Auto Wah: Mode	
04 00 29#	0bbbbbbb		0,1 = LPF,BPF
04 00 2A	0aaaaaaa	Auto Wah: Polarity	
04 00 2B#	0bbbbbbb		0,1 = Down,Up
04 00 2C	0aaaaaaa	Auto Wah: Frequency	
04 00 2D#	0bbbbbbb		0,,,100
04 00 2E	0aaaaaaa	Auto Wah: Level	
04 00 2F#	0bbbbbbb		0,,,100
04 00 30	0aaaaaaa	Auto Wah: Peak	
04 00 31#	0bbbbbbb		0,,,100
04 00 32	0aaaaaaa	Auto Wah: Sens	
04 00 33#	0bbbbbbb		0,,,100
04 00 34	0aaaaaaa	Auto Wah: Rate	
04 00 35#	0bbbbbbb		1,,,100 = 0.1,,,10.0Hz
04 00 36	0aaaaaaa	Auto Wah: Depth	
04 00 37#	0bbbbbbb		0,,,100
04 00 38	0aaaaaaa	Guitar Amp Simulator: Mode	
04 00 39#	0bbbbbbb		0,,,3 = Small,BultIn,2Stack,3Stack
04 00 3A	0aaaaaaa	Flanger: Rate	
04 00 3B#	0bbbbbbb		1,,,100 = 0.1,,,10.0Hz
04 00 3C	0aaaaaaa	Flanger: Depth	
04 00 3D#	0bbbbbbb		0,,,100
04 00 3E	0aaaaaaa	Flanger: Manual	
04 00 3F#	0bbbbbbb		0,,,100
04 00 40	0aaaaaaa	Flanger: Resonance	
04 00 41#	0bbbbbbb		0,,,100
04 00 42	0aaaaaaa	Delay: Delay Time	
04 00 43#	0bbbbbbb		0,,,1000ms
04 00 44	0aaaaaaa	Delay: Shift	
04 00 45#	0bbbbbbb		-1000,,,1000 = L1000,,,R1000ms
04 00 46	0aaaaaaa	Delay: Feedback Time	
04 00 47#	0bbbbbbb		0,,,1000ms
04 00 48	0aaaaaaa	Delay: Feedback Level	
04 00 49#	0bbbbbbb		-100,,,100
04 00 4A	0aaaaaaa	Delay: Effect Level	
04 00 4B#	0bbbbbbb		-100,,,100
04 00 4C	0aaaaaaa	Delay: Direct Level	
04 00 4D#	0bbbbbbb		-100,,,100

* (Delay Time) + (Absolute Shift) should be 1000 or less.

Individual : Algorithm 8 Guitar Multi 1

04 00 4E	0aaaaaaa	Metal: Gain	
04 00 4F#	0bbbbbbb		0,,,100

04 00 50	0aaaaaaa	Metal: Level	
04 00 51#	0bbbbbbb		0,,,100
04 00 52	0aaaaaaa	Metal: Hi Gain	
04 00 53#	0bbbbbbb		-100,,,100
04 00 54	0aaaaaaa	Metal: Mid Gain	
04 00 55#	0bbbbbbb		-100,,,100
04 00 56	0aaaaaaa	Metal: Low Gain	
04 00 57#	0bbbbbbb		-100,,,100
04 00 58	00	(Reserved)	
:	:		
04 00 7F	00		

Individual : Algorithm 9 Guitar Multi 2

04 00 4E	0aaaaaaa	Distortion: Gain	
04 00 4F#	0bbbbbbb		0,,,100
04 00 50	0aaaaaaa	Distortion: Level	
04 00 51#	0bbbbbbb		0,,,100
04 00 52	0aaaaaaa	Distortion: Tone	
04 00 53#	0bbbbbbb		0,,,100
04 00 54	00	(Reserved)	
:	:		
04 00 7F	00		

Individual : Algorithm 10 Guitar Multi 3

04 00 4E	0aaaaaaa	Over Drive: Gain	
04 00 4F#	0bbbbbbb		0,,,100
04 00 50	0aaaaaaa	Over Drive: Level	
04 00 51#	0bbbbbbb		0,,,100
04 00 52	0aaaaaaa	Over Drive: Tone	
04 00 53#	0bbbbbbb		0,,,100
04 00 54	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 11 Vocal Multi

04 00 0E	0aaaaaaa	Noise Suppressor SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Limiter/De-esser SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Enhancer SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	EQ SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	P.Shifter SW	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	Delay SW	
04 00 19#	0bbbbbbb		0,1 = Off,On
04 00 1A	0aaaaaaa	Chorus SW	
04 00 1B#	0bbbbbbb		0,1 = Off,On
04 00 1C	0aaaaaaa	Limiter/De-esser Mode	
04 00 1D#	0bbbbbbb		0,1 = Limiter,De-esser

```

| 04 00 1E | 0aaaaaaa | Noise Suppressor: Threshold
| 04 00 1F# | 0bbbbbbb | 0,,100
+-----+
| 04 00 20 | 0aaaaaaa | Noise Suppressor: Release
| 04 00 21# | 0bbbbbbb | 0,,100
+-----+
| 04 00 22 | 0aaaaaaa | Limiter: Threshold
| 04 00 23# | 0bbbbbbb | 0,,100
+-----+
| 04 00 24 | 0aaaaaaa | Limiter: Release
| 04 00 25# | 0bbbbbbb | 0,,100
+-----+
| 04 00 26 | 0aaaaaaa | Limiter: Level
| 04 00 27# | 0bbbbbbb | 0,,100
+-----+
| 04 00 28 | 0aaaaaaa | De-esser: Sens
| 04 00 29# | 0bbbbbbb | 0,,100
+-----+
| 04 00 2A | 0aaaaaaa | De-esser: Frequency
| 04 00 2B# | 0bbbbbbb | 10,,100 = 1.0,,10.0kHz
+-----+
| 04 00 2C | 0aaaaaaa | Enhancer: Sens
| 04 00 2D# | 0bbbbbbb | 0,,100
+-----+
| 04 00 2E | 0aaaaaaa | Enhancer: Frequency
| 04 00 2F# | 0bbbbbbb | 10,,100 = 1.0,,10.0kHz
+-----+
| 04 00 30 | 0aaaaaaa | Enhancer: MIX Level
| 04 00 31# | 0bbbbbbb | 0,,100
+-----+
| 04 00 32 | 0aaaaaaa | Enhancer: Level
| 04 00 33# | 0bbbbbbb | 0,,100
+-----+
| 04 00 34 | 0aaaaaaa | EQ: Low EQ Type
| 04 00 35# | 0bbbbbbb | 0,1 = Shelving, Peaking
+-----+
| 04 00 36 | 0aaaaaaa | EQ: Low EQ Gain
| 04 00 37# | 0bbbbbbb | -12,,12dB
+-----+
| 04 00 38 | 0aaaaaaa | EQ: Low EQ Frequency
| 04 00 39# | 0bbbbbbb | 2,,200 = 20,,2000Hz
+-----+
| 04 00 3A | 0aaaaaaa | EQ: Low EQ Q
| 04 00 3B# | 0bbbbbbb | 3,,100 = 0.3,,10.0
+-----+
| 04 00 3C | 0aaaaaaa | EQ: Mid EQ Gain
| 04 00 3D# | 0bbbbbbb | -12,,12dB
+-----+
| 04 00 3E | 0aaaaaaa | EQ: Mid EQ Frequency
| 04 00 3F# | 0bbbbbbb | 20,,800 = 200,,8000Hz
+-----+
| 04 00 40 | 0aaaaaaa | EQ: Mid EQ Q
| 04 00 41# | 0bbbbbbb | 3,,100 = 0.3,,10.0
+-----+
| 04 00 42 | 0aaaaaaa | EQ: High EQ Type
| 04 00 43# | 0bbbbbbb | 0,1 = Shelving, Peaking
+-----+
| 04 00 44 | 0aaaaaaa | EQ: High EQ Gain
| 04 00 45# | 0bbbbbbb | -12,,12dB
+-----+
| 04 00 46 | 0aaaaaaa | EQ: High EQ Frequency
| 04 00 47# | 0bbbbbbb | 14,,200 = 1.4,,20.0kHz
+-----+
| 04 00 48 | 0aaaaaaa | EQ: High EQ Q
| 04 00 49# | 0bbbbbbb | 3,,100 = 0.3,,10.0
+-----+
| 04 00 4A | 0aaaaaaa | EQ: Out Level
| 04 00 4B# | 0bbbbbbb | 0,,100
+-----+
| 04 00 4C | 0aaaaaaa | P.Shifter: Chromatic Pitch
| 04 00 4D# | 0bbbbbbb | -12,,12
+-----+
| 04 00 4E | 0aaaaaaa | P.Shifter: Fine Pitch
| 04 00 4F# | 0bbbbbbb | -100,,100
+-----+
| 04 00 50 | 0aaaaaaa | P.Shifter: Effect Level
| 04 00 51# | 0bbbbbbb | -100,,100
+-----+

```

```

| 04 00 52 | 0aaaaaaa | P.Shifter: Direct Level
| 04 00 53# | 0bbbbbbb | -100,,100
+-----+
| 04 00 54 | 0aaaaaaa | Delay: Delay Time
| 04 00 55# | 0bbbbbbb | 0,,1000
+-----+
| 04 00 56 | 0aaaaaaa | Delay: Feedback Level
| 04 00 57# | 0bbbbbbb | -100,,100
+-----+
| 04 00 58 | 0aaaaaaa | Delay: Effect Level
| 04 00 59# | 0bbbbbbb | -100,,100
+-----+
| 04 00 5A | 0aaaaaaa | Delay: Direct Level
| 04 00 5B# | 0bbbbbbb | -100,,100
+-----+
| 04 00 5C | 0aaaaaaa | Chorus: Rate
| 04 00 5D# | 0bbbbbbb | 1,,100 = 0.1,,10.0Hz
+-----+
| 04 00 5E | 0aaaaaaa | Chorus: Depth
| 04 00 5F# | 0bbbbbbb | 0,,100
+-----+
| 04 00 60 | 0aaaaaaa | Chorus: Pre Delay
| 04 00 61# | 0bbbbbbb | 0,,50ms
+-----+
| 04 00 62 | 0aaaaaaa | Chorus: Effect Level
| 04 00 63# | 0bbbbbbb | -100,,100
+-----+
| 04 00 64 | 0aaaaaaa | Chorus: Direct Level
| 04 00 65# | 0bbbbbbb | -100,,100
+-----+
| 04 00 66 | 00 | (Reserved)
: :
| 04 00 7F | 00 |
+-----+

```

Algorithm 12 Rotary

```

+-----+
| 04 00 0E | 0aaaaaaa | Noise Suppressor SW
| 04 00 0F# | 0bbbbbbb | 0,1 = Off,On
+-----+
| 04 00 10 | 0aaaaaaa | Over Drive SW
| 04 00 11# | 0bbbbbbb | 0,1 = Off,On
+-----+
| 04 00 12 | 0aaaaaaa | Noise Suppressor: Threshold
| 04 00 13# | 0bbbbbbb | 0,,100
+-----+
| 04 00 14 | 0aaaaaaa | Noise Suppressor: Release
| 04 00 15# | 0bbbbbbb | 0,,100
+-----+
| 04 00 16 | 0aaaaaaa | Over Drive: Gain
| 04 00 17# | 0bbbbbbb | 0,,100
+-----+
| 04 00 18 | 0aaaaaaa | Over Drive: Level
| 04 00 19# | 0bbbbbbb | 0,,100
+-----+
| 04 00 1A | 0aaaaaaa | Rotary: Low Rate
| 04 00 1B# | 0bbbbbbb | 1,,100 = 0.1,,10.0Hz
+-----+
| 04 00 1C | 0aaaaaaa | Rotary: Hi Rate
| 04 00 1D# | 0bbbbbbb | 1,,100 = 0.1,,10.0Hz
+-----+
| 04 00 1E | 00 | (Reserved)
: :
| 04 00 7F | 00 |
+-----+

```

Algorithm 13 Guitar AMP Simulator

```

+-----+
| 04 00 0E | 0aaaaaaa | Noise Suppressor SW
| 04 00 0F# | 0bbbbbbb | 0,1 = Off,On
+-----+
| 04 00 10 | 0aaaaaaa | Pre Amp SW
| 04 00 11# | 0bbbbbbb | 0,1 = Off,On
+-----+
| 04 00 12 | 0aaaaaaa | Speaker SW
| 04 00 13# | 0bbbbbbb | 0,1 = Off,On
+-----+

```

04 00 14	0aaaaaaa	Noise Suppressor: Threshold	
04 00 15#	0bbbbbbb		0,,100
04 00 16	0aaaaaaa	Noise Suppressor: Release	
04 00 17#	0bbbbbbb		0,,100
04 00 18	0aaaaaaa	Pre Amp: Mode	
04 00 19#	0bbbbbbb	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	
04 00 1A	0aaaaaaa	Pre Amp: Volume	
04 00 1B#	0bbbbbbb		0,,100
04 00 1C	0aaaaaaa	Pre Amp: Bass	
04 00 1D#	0bbbbbbb		0,,100
04 00 1E	0aaaaaaa	Pre Amp: Middle	
04 00 1F#	0bbbbbbb		0,,100
04 00 20	0aaaaaaa	Pre Amp: Treble	
04 00 21#	0bbbbbbb		0,,100
04 00 22	0aaaaaaa	Pre Amp: Presence	
04 00 23#	0bbbbbbb		0,,100
04 00 24	0aaaaaaa	Pre Amp: Master	
04 00 25#	0bbbbbbb		0,,100
04 00 26	0aaaaaaa	Pre Amp: Bright	
04 00 27#	0bbbbbbb		0,1 = Off,On
04 00 28	0aaaaaaa	Pre Amp: Gain	
04 00 29#	0bbbbbbb		0,1,2 = Low,Middle,High
04 00 2A	0aaaaaaa	Speaker: Type	
04 00 2B#	0bbbbbbb	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	
04 00 2C	0aaaaaaa	Speaker: MIC Setting	
04 00 2D#	0bbbbbbb		0,1,2 = 1,2,3
04 00 2E	0aaaaaaa	Speaker: MIC Level	
04 00 2F#	0bbbbbbb		0,,100
04 00 30	0aaaaaaa	Speaker: Direct Level	
04 00 31#	0bbbbbbb		0,,100
04 00 32	00	(Reserved)	
:	:		
04 00 7F	00		

- (*) The "Pre Amp Middle" is invalid when "Mode" is "Match Drive."
- (*) The "Pre Amp Presence" works counter to the Value (-100...0) when "Mode" is "Match Drive."
- (*) The "Pre Amp Bright" is valid when "Mode" is "JC-120," "Clean Twin" and "BG Lead."

Algorithm 14 Stereo Phaser

04 00 0E	0aaaaaaa	Phaser SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Phaser: Mode	
04 00 13#	0bbbbbbb		0,,3 = 4.8.12.16stage
04 00 14	0aaaaaaa	Phaser: Rate	
04 00 15#	0bbbbbbb		1,,100 = 0.1,,10.0Hz
04 00 16	0aaaaaaa	Phaser: Depth	

04 00 17#	0bbbbbbb		0,,100
04 00 18	0aaaaaaa	Phaser: Polarity	
04 00 19#	0bbbbbbb		0,1 = Inverse,Synchro
04 00 1A	0aaaaaaa	Phaser: Manual	
04 00 1B#	0bbbbbbb		0,,100
04 00 1C	0aaaaaaa	Phaser: Resonance	
04 00 1D#	0bbbbbbb		0,,100
04 00 1E	0aaaaaaa	Phaser: Cross Feedback	
04 00 1F#	0bbbbbbb		0,,100
04 00 20	0aaaaaaa	Phaser: Effect Level	
04 00 21#	0bbbbbbb		-100,,100
04 00 22	0aaaaaaa	Phaser: Direct Level	
04 00 23#	0bbbbbbb		-100,,100
04 00 24	0aaaaaaa	EQ: Low EQ Type	
04 00 25#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 26	0aaaaaaa	EQ: Low EQ Gain	
04 00 27#	0bbbbbbb		-12,,12dB
04 00 28	0aaaaaaa	EQ: Low EQ Frequency	
04 00 29#	0bbbbbbb		2,,200 = 20,,2000Hz
04 00 2A	0aaaaaaa	EQ: Low EQ Q	
04 00 2B#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 2C	0aaaaaaa	EQ: Mid EQ Gain	
04 00 2D#	0bbbbbbb		-12,,12dB
04 00 2E	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 2F#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 30	0aaaaaaa	EQ: Mid EQ Q	
04 00 31#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 32	0aaaaaaa	EQ: High EQ Type	
04 00 33#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 34	0aaaaaaa	EQ: High EQ Gain	
04 00 35#	0bbbbbbb		-12,,12dB
04 00 36	0aaaaaaa	EQ: High EQ Frequency	
04 00 37#	0bbbbbbb		14,,200 = 1.4,,20.0kHz
04 00 38	0aaaaaaa	EQ: High EQ Q	
04 00 39#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 3A	0aaaaaaa	EQ: Out Level	
04 00 3B#	0bbbbbbb		0,,100
04 00 3C	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 15 Stereo Flanger

04 00 0E	0aaaaaaa	Flanger SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Flanger: Rate	
04 00 13#	0bbbbbbb		1,,100 = 0.1,,10.0Hz
04 00 14	0aaaaaaa	Flanger: Depth	
04 00 15#	0bbbbbbb		0,,100
04 00 16	0aaaaaaa	Flanger: Polarity	
04 00 17#	0bbbbbbb		0,1 = Inverse,Synchro

04 00 18	0aaaaaaa	Flanger: Manual	
04 00 19#	0bbbbbbb		0,,100
04 00 1A	0aaaaaaa	Flanger: Resonance	
04 00 1B#	0bbbbbbb		0,,100
04 00 1C	0aaaaaaa	Flanger: Cross Feedback Level	
04 00 1D#	0bbbbbbb		0,,100
04 00 1E	0aaaaaaa	Flanger: Effect Level	
04 00 1F#	0bbbbbbb		-100,,100
04 00 20	0aaaaaaa	Flanger: Direct Level	
04 00 21#	0bbbbbbb		-100,,100
04 00 22	0aaaaaaa	EQ: Low EQ Type	
04 00 23#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 24	0aaaaaaa	EQ: Low EQ Gain	
04 00 25#	0bbbbbbb		-12,,12dB
04 00 26	0aaaaaaa	EQ: Low EQ Frequency	
04 00 27#	0bbbbbbb		2,,200 = 20,,2000Hz
04 00 28	0aaaaaaa	EQ: Low EQ Q	
04 00 29#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 2A	0aaaaaaa	EQ: Mid EQ Gain	
04 00 2B#	0bbbbbbb		-12,,12dB
04 00 2C	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 2D#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 2E	0aaaaaaa	EQ: Mid EQ Q	
04 00 2F#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 30	0aaaaaaa	EQ: High EQ Type	
04 00 31#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 32	0aaaaaaa	EQ: High EQ Gain	
04 00 33#	0bbbbbbb		-12,,12dB
04 00 34	0aaaaaaa	EQ: High EQ Frequency	
04 00 35#	0bbbbbbb		14,,200 = 1.4,,20.0kHz
04 00 36	0aaaaaaa	EQ: High EQ Q	
04 00 37#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 38	0aaaaaaa	EQ: Out Level	
04 00 39#	0bbbbbbb		0,,100
04 00 3A	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 16 Dual Compressor/Limiter

04 00 0E	0aaaaaaa	Comp/Limit A SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Noise Suppressor A SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Comp/Limit B SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	Noise Suppressor B SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	Comp/Limit A: Detect	
04 00 17#	0bbbbbbb		0,1,2 = A,B,Link
04 00 18	0aaaaaaa	Comp/Limit A: Level	
04 00 19#	0bbbbbbb		-60,,12dB

04 00 1A	0aaaaaaa	Comp/Limit A: Thresh	
04 00 1B#	0bbbbbbb		-60,,0dB
04 00 1C	0aaaaaaa	Comp/Limit A: Attack	
04 00 1D#	0bbbbbbb		0,,100
04 00 1E	0aaaaaaa	Comp/Limit A: Release	
04 00 1F#	0bbbbbbb		0,,100
04 00 20	0aaaaaaa	Comp/Limit A: Ratio	
04 00 21#	0bbbbbbb		0,,3 = 1.5:1,2:1,4:1,100:1
04 00 22	0aaaaaaa	Noise Suppressor A: Detect	
04 00 23#	0bbbbbbb		0,1,2 = A,B,Link
04 00 24	0aaaaaaa	Noise Suppressor A: Threshold	
04 00 25#	0bbbbbbb		0,,100
04 00 26	0aaaaaaa	Noise Suppressor A: Release	
04 00 27#	0bbbbbbb		0,,100
04 00 28	0aaaaaaa	Comp/Limit B: Detect	
04 00 29#	0bbbbbbb		0,1,2 = A,B,Link
04 00 2A	0aaaaaaa	Comp/Limit B: Level	
04 00 2B#	0bbbbbbb		-60,,12dB
04 00 2C	0aaaaaaa	Comp/Limit B: Thresh	
04 00 2D#	0bbbbbbb		-60,,0dB
04 00 2E	0aaaaaaa	Comp/Limit B: Attack	
04 00 2F#	0bbbbbbb		0,,100
04 00 30	0aaaaaaa	Comp/Limit B: Release	
04 00 31#	0bbbbbbb		0,,100
04 00 32	0aaaaaaa	Comp/Limit B: Ratio	
04 00 33#	0bbbbbbb		0,,3 = 1.5:1,2:1,4:1,100:1
04 00 34	0aaaaaaa	Noise Suppressor B: Detect	
04 00 35#	0bbbbbbb		0,1,2 = A,B,Link
04 00 36	0aaaaaaa	Noise Suppressor B: Threshold	
04 00 37#	0bbbbbbb		0,,100
04 00 38	0aaaaaaa	Noise Suppressor B: Release	
04 00 39#	0bbbbbbb		0,,100
04 00 3A	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 17 Gate Reverb (EFX1 or EFX3)

04 00 0E	0aaaaaaa	G.Reverb SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	G.Reverb: Gate Time	
04 00 13#	0bbbbbbb		10,,400ms
04 00 14	0aaaaaaa	G.Reverb: Pre Delay	
04 00 15#	0bbbbbbb		0,,300ms
04 00 16	0aaaaaaa	G.Reverb: Effect Level	
04 00 17#	0bbbbbbb		-100,,100
04 00 18	0aaaaaaa	G.Reverb: Mode	
04 00 19#	0bbbbbbb		0,,4 = Normal,L->R,R->L,Reverse1,Reverse2
04 00 1A	0aaaaaaa	G.Reverb: Thickness	
04 00 1B#	0bbbbbbb		0,,100

```

| 04 00 1C | 0aaaaaaa | G.Reverb: Density |
| 04 00 1D# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 1E | 0aaaaaaa | G.Reverb: Accent Delay |
| 04 00 1F# | 0bbbbbbb | 0,,,200ms |
+-----+-----+
| 04 00 20 | 0aaaaaaa | G.Reverb: Accent Level |
| 04 00 21# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 22 | 0aaaaaaa | G.Reverb: Accent Pan |
| 04 00 23# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 24 | 0aaaaaaa | G.Reverb: Direct Level |
| 04 00 25# | 0bbbbbbb | -100,,,100 |
+-----+-----+
| 04 00 26 | 0aaaaaaa | EQ: Low EQ Type |
| 04 00 27# | 0bbbbbbb | 0,1 = Shelving, Peaking |
+-----+-----+
| 04 00 28 | 0aaaaaaa | EQ: Low EQ Gain |
| 04 00 29# | 0bbbbbbb | -12,,,12dB |
+-----+-----+
| 04 00 2A | 0aaaaaaa | EQ: Low EQ Frequency |
| 04 00 2B# | 0bbbbbbb | 2,,,200 = 20,,,2000Hz |
+-----+-----+
| 04 00 2C | 0aaaaaaa | EQ: Low EQ Q |
| 04 00 2D# | 0bbbbbbb | 3,,,100 = 0.3,,,10.0 |
+-----+-----+
| 04 00 2E | 0aaaaaaa | EQ: Mid EQ Gain |
| 04 00 2F# | 0bbbbbbb | -12,,,12dB |
+-----+-----+
| 04 00 30 | 0aaaaaaa | EQ: Mid EQ Frequency |
| 04 00 31# | 0bbbbbbb | 20,,,800 = 200,,,8000Hz |
+-----+-----+
| 04 00 32 | 0aaaaaaa | EQ: Mid EQ Q |
| 04 00 33# | 0bbbbbbb | 3,,,100 = 0.3,,,10.0 |
+-----+-----+
| 04 00 34 | 0aaaaaaa | EQ: High EQ Type |
| 04 00 35# | 0bbbbbbb | 0,1 = Shelving, Peaking |
+-----+-----+
| 04 00 36 | 0aaaaaaa | EQ: High EQ Gain |
| 04 00 37# | 0bbbbbbb | -12,,,12dB |
+-----+-----+
| 04 00 38 | 0aaaaaaa | EQ: High EQ Frequency |
| 04 00 39# | 0bbbbbbb | 14,,,200 = 1.4,,,20.0kHz |
+-----+-----+
| 04 00 3A | 0aaaaaaa | EQ: High EQ Q |
| 04 00 3B# | 0bbbbbbb | 3,,,100 = 0.3,,,10.0 |
+-----+-----+
| 04 00 3C | 0aaaaaaa | EQ: Out Level |
| 04 00 3D# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 3E | 00 | (Reserved) |
: |
| 04 00 7F | 00 |
+-----+-----+

```

Algorithm 18 Multi Tap Delay

```

+-----+-----+
| 04 00 0E | 0aaaaaaa | EQ SW |
| 04 00 0F# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 10 | 0aaaaaaa | M.Tap Delay: Time 1 |
| 04 00 11# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 12 | 0aaaaaaa | M.Tap Delay: Level 1 |
| 04 00 13# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 14 | 0aaaaaaa | M.Tap Delay: Pan 1 |
| 04 00 15# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 16 | 0aaaaaaa | M.Tap Delay: Time 2 |
| 04 00 17# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 18 | 0aaaaaaa | M.Tap Delay: Level 2 |
| 04 00 19# | 0bbbbbbb | 0,,,100 |
+-----+-----+

```

```

| 04 00 1A | 0aaaaaaa | M.Tap Delay: Pan 2 |
| 04 00 1B# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 1C | 0aaaaaaa | M.Tap Delay: Time 3 |
| 04 00 1D# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 1E | 0aaaaaaa | M.Tap Delay: Level 3 |
| 04 00 1F# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 20 | 0aaaaaaa | M.Tap Delay: Pan 3 |
| 04 00 21# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 22 | 0aaaaaaa | M.Tap Delay: Time 4 |
| 04 00 23# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 24 | 0aaaaaaa | M.Tap Delay: Level 4 |
| 04 00 25# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 26 | 0aaaaaaa | M.Tap Delay: Pan 4 |
| 04 00 27# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 28 | 0aaaaaaa | M.Tap Delay: Time 5 |
| 04 00 29# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 2A | 0aaaaaaa | M.Tap Delay: Level 5 |
| 04 00 2B# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 2C | 0aaaaaaa | M.Tap Delay: Pan 5 |
| 04 00 2D# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 2E | 0aaaaaaa | M.Tap Delay: Time 6 |
| 04 00 2F# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 30 | 0aaaaaaa | M.Tap Delay: Level 6 |
| 04 00 31# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 32 | 0aaaaaaa | M.Tap Delay: Pan 6 |
| 04 00 33# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 34 | 0aaaaaaa | M.Tap Delay: Time 7 |
| 04 00 35# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 36 | 0aaaaaaa | M.Tap Delay: Level 7 |
| 04 00 37# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 38 | 0aaaaaaa | M.Tap Delay: Pan 7 |
| 04 00 39# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 3A | 0aaaaaaa | M.Tap Delay: Time 8 |
| 04 00 3B# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 3C | 0aaaaaaa | M.Tap Delay: Level 8 |
| 04 00 3D# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 3E | 0aaaaaaa | M.Tap Delay: Pan 8 |
| 04 00 3F# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 40 | 0aaaaaaa | M.Tap Delay: Time 9 |
| 04 00 41# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 42 | 0aaaaaaa | M.Tap Delay: Level 9 |
| 04 00 43# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 44 | 0aaaaaaa | M.Tap Delay: Pan 9 |
| 04 00 45# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 46 | 0aaaaaaa | M.Tap Delay: Time 10 |
| 04 00 47# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+
| 04 00 48 | 0aaaaaaa | M.Tap Delay: Level 10 |
| 04 00 49# | 0bbbbbbb | 0,,,100 |
+-----+-----+
| 04 00 4A | 0aaaaaaa | M.Tap Delay: Pan 10 |
| 04 00 4B# | 0bbbbbbb | 1,,,127 = L63,,,R63 |
+-----+-----+
| 04 00 4C | 0aaaaaaa | M.Tap Delay: Feedback Delay Time |
| 04 00 4D# | 0bbbbbbb | 0,,,1200ms |
+-----+-----+

```



```

| 04 00 4E | 0aaaaaaa | M.Tap Delay: Feedback Level |
| 04 00 4F# | 0bbbbbbb | -100,,100 |
+-----+-----+
| 04 00 50 | 0aaaaaaa | M.Tap Delay: Effect Level |
| 04 00 51# | 0bbbbbbb | -100,,100 |
+-----+-----+
| 04 00 52 | 0aaaaaaa | M.Tap Delay: Direct Level |
| 04 00 53# | 0bbbbbbb | -100,,100 |
+-----+-----+
| 04 00 54 | 0aaaaaaa | EQ: Low EQ Type |
| 04 00 55# | 0bbbbbbb | 0,1 = Shelving, Peaking |
+-----+-----+
| 04 00 56 | 0aaaaaaa | EQ: Low EQ Gain |
| 04 00 57# | 0bbbbbbb | -12,,12dB |
+-----+-----+
| 04 00 58 | 0aaaaaaa | EQ: Low EQ Frequency |
| 04 00 59# | 0bbbbbbb | 2,,200 = 20,,2000Hz |
+-----+-----+
| 04 00 5A | 0aaaaaaa | EQ: Low EQ Q |
| 04 00 5B# | 0bbbbbbb | 3,,100 = 0.3,,10.0 |
+-----+-----+
| 04 00 5C | 0aaaaaaa | EQ: Mid EQ Gain |
| 04 00 5D# | 0bbbbbbb | -12,,12dB |
+-----+-----+
| 04 00 5E | 0aaaaaaa | EQ: Mid EQ Frequency |
| 04 00 5F# | 0bbbbbbb | 20,,800 = 200,,8000Hz |
+-----+-----+
| 04 00 60 | 0aaaaaaa | EQ: Mid EQ Q |
| 04 00 61# | 0bbbbbbb | 3,,100 = 0.3,,10.0 |
+-----+-----+
| 04 00 62 | 0aaaaaaa | EQ: High EQ Type |
| 04 00 63# | 0bbbbbbb | 0,1 = Shelving, Peaking |
+-----+-----+
| 04 00 64 | 0aaaaaaa | EQ: High EQ Gain |
| 04 00 65# | 0bbbbbbb | -12,,12dB |
+-----+-----+
| 04 00 66 | 0aaaaaaa | EQ: High EQ Frequency |
| 04 00 67# | 0bbbbbbb | 14,,200 = 1.4,,20.0kHz |
+-----+-----+
| 04 00 68 | 0aaaaaaa | EQ: High EQ Q |
| 04 00 69# | 0bbbbbbb | 3,,100 = 0.3,,10.0 |
+-----+-----+
| 04 00 6A | 0aaaaaaa | EQ: Out Level |
| 04 00 6B# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 6C | 00 | (Reserved) |
: | : |
| 04 00 7F | 00 |
+-----+-----+

```

Algorithm 19 Stereo Multi

```

+-----+-----+
| 04 00 0E | 0aaaaaaa | Noise Suppressor SW |
| 04 00 0F# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 10 | 0aaaaaaa | Comp/Limit SW |
| 04 00 11# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 12 | 0aaaaaaa | Enhancer SW |
| 04 00 13# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 14 | 0aaaaaaa | EQ SW |
| 04 00 15# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 16 | 0aaaaaaa | Noise Suppressor: Threshold |
| 04 00 17# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 18 | 0aaaaaaa | Noise Suppressor: Release |
| 04 00 19# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 1A | 0aaaaaaa | Comp/Limit: Level |
| 04 00 1B# | 0bbbbbbb | -60,,12dB |
+-----+-----+
| 04 00 1C | 0aaaaaaa | Comp/Limit: Thresh |
| 04 00 1D# | 0bbbbbbb | -60,,0dB |
+-----+-----+

```

```

| 04 00 1E | 0aaaaaaa | Comp/Limit: Attack |
| 04 00 1F# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 20 | 0aaaaaaa | Comp/Limit: Release |
| 04 00 21# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 22 | 0aaaaaaa | Comp/Limit: Ratio |
| 04 00 23# | 0bbbbbbb | 0,,3 = 1.5:1,2:1,4:1,100:1 |
+-----+-----+
| 04 00 24 | 0aaaaaaa | Enhancer: Sens |
| 04 00 25# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 26 | 0aaaaaaa | Enhancer: Frequency |
| 04 00 27# | 0bbbbbbb | 10,,100 = 1.0,,10.0kHz |
+-----+-----+
| 04 00 28 | 0aaaaaaa | Enhancer: MIX Level |
| 04 00 29# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 2A | 0aaaaaaa | Enhancer: Level |
| 04 00 2B# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 2C | 0aaaaaaa | EQ: Low EQ Type |
| 04 00 2D# | 0bbbbbbb | 0,1 = Shelving, Peaking |
+-----+-----+
| 04 00 2E | 0aaaaaaa | EQ: Low EQ Gain |
| 04 00 2F# | 0bbbbbbb | -12,,12dB |
+-----+-----+
| 04 00 30 | 0aaaaaaa | EQ: Low EQ Frequency |
| 04 00 31# | 0bbbbbbb | 2,,200 = 20,,2000Hz |
+-----+-----+
| 04 00 32 | 0aaaaaaa | EQ: Low EQ Q |
| 04 00 33# | 0bbbbbbb | 3,,100 = 0.3,,10.0 |
+-----+-----+
| 04 00 34 | 0aaaaaaa | EQ: Mid EQ Gain |
| 04 00 35# | 0bbbbbbb | -12,,12dB |
+-----+-----+
| 04 00 36 | 0aaaaaaa | EQ: Mid EQ Frequency |
| 04 00 37# | 0bbbbbbb | 20,,800 = 200,,8000Hz |
+-----+-----+
| 04 00 38 | 0aaaaaaa | EQ: Mid EQ Q |
| 04 00 39# | 0bbbbbbb | 3,,100 = 0.3,,10.0 |
+-----+-----+
| 04 00 3A | 0aaaaaaa | EQ: High EQ Type |
| 04 00 3B# | 0bbbbbbb | 0,1 = Shelving, Peaking |
+-----+-----+
| 04 00 3C | 0aaaaaaa | EQ: High EQ Gain |
| 04 00 3D# | 0bbbbbbb | -12,,12dB |
+-----+-----+
| 04 00 3E | 0aaaaaaa | EQ: High EQ Frequency |
| 04 00 3F# | 0bbbbbbb | 14,,200 = 1.4,,20.0kHz |
+-----+-----+
| 04 00 40 | 0aaaaaaa | EQ: High EQ Q |
| 04 00 41# | 0bbbbbbb | 3,,100 = 0.3,,10.0 |
+-----+-----+
| 04 00 42 | 0aaaaaaa | EQ: Out Level |
| 04 00 43# | 0bbbbbbb | 0,,100 |
+-----+-----+
| 04 00 44 | 00 | (Reserved) |
: | : |
| 04 00 7F | 00 |
+-----+-----+

```

Algorithm 20 Reverb 2

```

+-----+-----+
| 04 00 0E | 0aaaaaaa | Reverb SW |
| 04 00 0F# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 10 | 0aaaaaaa | EQ SW |
| 04 00 11# | 0bbbbbbb | 0,1 = Off,On |
+-----+-----+
| 04 00 12 | 0aaaaaaa | Reverb 2: Reverb Type |
| 04 00 13# | 0bbbbbbb | 0,,4 = Room1,Room2,Hall1,Hall2,Plate |
+-----+-----+
| 04 00 14 | 0aaaaaaa | Reverb 2: Reverb Time |
| 04 00 15# | 0bbbbbbb | 1,,100 = 0.1,,10.0sec |
+-----+-----+

```

04 00 16	0aaaaaaa	Reverb 2: Pre Delay	
04 00 17#	0bbbbbbb		0,,,200msec
04 00 18	0aaaaaaa	Reverb 2: Density	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Reverb 2: High Pass Filter	
04 00 1B#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
04 00 1C	0aaaaaaa	Reverb 2: Low Pass Filter	
04 00 1D#	0bbbbbbb		10,,,201 = 1.0,,,20,kHz,Thru
04 00 1E	0aaaaaaa	Reverb 2: Effect Level	
04 00 1F#	0bbbbbbb		0,,,100
04 00 20	0aaaaaaa	Reverb 2: Direct Level	
04 00 21#	0bbbbbbb		0,,,100
04 00 22	0aaaaaaa	Reverb 2: Gate SW	
04 00 23#	0bbbbbbb		0,1 = Off,On
04 00 24	0aaaaaaa	Reverb 2: Gate Mode	
04 00 25#	0bbbbbbb		0,1 = Gate,Ducking
04 00 26	0aaaaaaa	Reverb 2: Gate Threshold	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Reverb 2: Gate Attack Time	
04 00 29#	0bbbbbbb		1,,,100
04 00 2A	0aaaaaaa	Reverb 2: Gate Release Time	
04 00 2B#	0bbbbbbb		1,,,100
04 00 2C	0aaaaaaa	Reverb 2: Gate Hold Time	
04 00 2D#	0bbbbbbb		1,,,100
04 00 2E	0aaaaaaa	EQ: Low EQ Type	
04 00 2F#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 30	0aaaaaaa	EQ: Low EQ Gain	
04 00 31#	0bbbbbbb		-12,,,12dB
04 00 32	0aaaaaaa	EQ: Low EQ Frequency	
04 00 33#	0bbbbbbb		2,,,200 = 20,,,2000Hz
04 00 34	0aaaaaaa	EQ: Low EQ Q	
04 00 35#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 36	0aaaaaaa	EQ: Mid EQ Gain	
04 00 37#	0bbbbbbb		-12,,,12dB
04 00 38	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 39#	0bbbbbbb		20,,,800 = 200,,,8000Hz
04 00 3A	0aaaaaaa	EQ: Mid EQ Q	
04 00 3B#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 3C	0aaaaaaa	EQ: High EQ Type	
04 00 3D#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 3E	0aaaaaaa	EQ: High EQ Gain	
04 00 3F#	0bbbbbbb		-12,,,12dB
04 00 40	0aaaaaaa	EQ: High EQ Frequency	
04 00 41#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
04 00 42	0aaaaaaa	EQ: High EQ Q	
04 00 43#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 44	0aaaaaaa	EQ: Out Level	
04 00 45#	0bbbbbbb		0,,,100
04 00 46	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 21 Space Chorus

04 00 0E	0aaaaaaa	Chorus SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Chorus: Input Mode	
04 00 11#	0bbbbbbb		0,1 = Mono,Stereo
04 00 12	0aaaaaaa	Chorus: Mode	
04 00 13#	0bbbbbbb		0,,,6 = 1,2,3,4,1+4,2+4,3+4
04 00 14	0aaaaaaa	Chorus: Mix Balance	
04 00 15#	0bbbbbbb		0,,,100
04 00 16	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 22 Lo-Fi Processor

04 00 0E	0aaaaaaa	Lo-Fi Processor SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Realtime Modify Filter SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Lo-Fi Processor: Pre Filter SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	Lo-Fi Processor: Rate	
04 00 15#	0bbbbbbb		0,,,31 = Off,1/2,,,1/32
04 00 16	0aaaaaaa	Lo-Fi Processor: Number of Bit	
04 00 17#	0bbbbbbb		0,,,15 = Off,15,,,1bit
04 00 18	0aaaaaaa	Lo-Fi Processor: Post Filter SW	
04 00 19#	0bbbbbbb		0,1 = Off,On
04 00 1A	0aaaaaaa	Lo-Fi Processor: Effect Level	
04 00 1B#	0bbbbbbb		0,,,100
04 00 1C	0aaaaaaa	Lo-Fi Processor: Direct Level	
04 00 1D#	0bbbbbbb		0,,,100
04 00 1E	0aaaaaaa	Realtime Modify Filter: Filter Type	
04 00 1F#	0bbbbbbb		0,,,2 = LPF,BPF,HPF
04 00 20	0aaaaaaa	Realtime Modify Filter: Cut Off	
04 00 21#	0bbbbbbb		0,,,100
04 00 22	0aaaaaaa	Realtime Modify Filter: Resonance	
04 00 23#	0bbbbbbb		0,,,100
04 00 24	0aaaaaaa	Realtime Modify Filter: Gain	
04 00 25#	0bbbbbbb		0,,,24dB
04 00 26	0aaaaaaa	Noise Suppressor: Threshold	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Noise Suppressor: Release	
04 00 29#	0bbbbbbb		0,,,100
04 00 2A	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 23 4 Band Parametric EQ

04 00 0E	0aaaaaaa	Parametric EQ Link SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Parametric EQ Ach SW	
04 00 11#	0bbbbbbb		0,1 = Off,On

04 00 12	0aaaaaaa	Parametric EQ Bch SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	EQ Ach: Input Gain	
04 00 15#	0bbbbbbb		-60,,12dB
04 00 16	0aaaaaaa	EQ Ach: Low EQ Type	
04 00 17#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 18	0aaaaaaa	EQ Ach: Low EQ Gain	
04 00 19#	0bbbbbbb		-12,,12dB
04 00 1A	0aaaaaaa	EQ Ach: Low EQ Frequency	
04 00 1B#	0bbbbbbb		2,,200 = 20,,2000Hz
04 00 1C	0aaaaaaa	EQ Ach: Low EQ Q	
04 00 1D#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 1E	0aaaaaaa	EQ Ach: Low Mid EQ Gain	
04 00 1F#	0bbbbbbb		-12,,12dB
04 00 20	0aaaaaaa	EQ Ach: Low Mid EQ Frequency	
04 00 21#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 22	0aaaaaaa	EQ Ach: Low Mid EQ Q	
04 00 23#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 24	0aaaaaaa	EQ Ach: High Mid EQ Gain	
04 00 25#	0bbbbbbb		-12,,12dB
04 00 26	0aaaaaaa	EQ Ach: High Mid EQ Frequency	
04 00 27#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 28	0aaaaaaa	EQ Ach: High Mid EQ Q	
04 00 29#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 2A	0aaaaaaa	EQ Ach: High EQ Type	
04 00 2B#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 2C	0aaaaaaa	EQ Ach: High EQ Gain	
04 00 2D#	0bbbbbbb		-12,,12dB
04 00 2E	0aaaaaaa	EQ Ach: High EQ Frequency	
04 00 2F#	0bbbbbbb		14,,200 = 1.4,,20.0kHz
04 00 30	0aaaaaaa	EQ Ach: High EQ Q	
04 00 31#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 32	0aaaaaaa	EQ Ach: Output Level	
04 00 33#	0bbbbbbb		-60,,12dB
04 00 34	0aaaaaaa	EQ Bch: Input Gain	
04 00 35#	0bbbbbbb		-60,,12dB
04 00 36	0aaaaaaa	EQ Bch: Low EQ Type	
04 00 37#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 38	0aaaaaaa	EQ Bch: Low EQ Gain	
04 00 39#	0bbbbbbb		-12,,12dB
04 00 3A	0aaaaaaa	EQ Bch: Low EQ Frequency	
04 00 3B#	0bbbbbbb		2,,200 = 20,,2000Hz
04 00 3C	0aaaaaaa	EQ Bch: Low EQ Q	
04 00 3D#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 3E	0aaaaaaa	EQ Bch: Low Mid EQ Gain	
04 00 3F#	0bbbbbbb		-12,,12dB
04 00 40	0aaaaaaa	EQ Bch: Low Mid EQ Frequency	
04 00 41#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 42	0aaaaaaa	EQ Bch: Low Mid EQ Q	
04 00 43#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 44	0aaaaaaa	EQ Bch: High Mid EQ Gain	
04 00 45#	0bbbbbbb		-12,,12dB

04 00 46	0aaaaaaa	EQ Bch: High Mid EQ Frequency	
04 00 47#	0bbbbbbb		20,,800 = 200,,8000Hz
04 00 48	0aaaaaaa	EQ Bch: High Mid EQ Q	
04 00 49#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 4A	0aaaaaaa	EQ Bch: High EQ Type	
04 00 4B#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 4C	0aaaaaaa	EQ Bch: High EQ Gain	
04 00 4D#	0bbbbbbb		-12,,12dB
04 00 4E	0aaaaaaa	EQ Bch: High EQ Frequency	
04 00 4F#	0bbbbbbb		14,,200 = 1.4,,20.0kHz
04 00 50	0aaaaaaa	EQ Bch: High EQ Q	
04 00 51#	0bbbbbbb		3,,100 = 0.3,,10.0
04 00 52	0aaaaaaa	EQ Bch: Output Level	
04 00 53#	0bbbbbbb		-60,,12dB
04 00 54	00	(Reserved)	
:	:		
04 00 7F	00		

* When Link SW = On, Bch corresponds to Ach.

Algorithm 24 10 Band Graphic EQ

04 00 0E	0aaaaaaa	Graphic EQ Link SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Graphic EQ Ach SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Graphic EQ Bch SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	EQ Ach: Input Gain	
04 00 15#	0bbbbbbb		-60,,12dB
04 00 16	0aaaaaaa	EQ Ach: 31.25Hz Gain	
04 00 17#	0bbbbbbb		-12,,12dB
04 00 18	0aaaaaaa	EQ Ach: 62.5Hz Gain	
04 00 19#	0bbbbbbb		-12,,12dB
04 00 1A	0aaaaaaa	EQ Ach: 125Hz Gain	
04 00 1B#	0bbbbbbb		-12,,12dB
04 00 1C	0aaaaaaa	EQ Ach: 250Hz Gain	
04 00 1D#	0bbbbbbb		-12,,12dB
04 00 1E	0aaaaaaa	EQ Ach: 500Hz Gain	
04 00 1F#	0bbbbbbb		-12,,12dB
04 00 20	0aaaaaaa	EQ Ach: 1.0kHz Gain	
04 00 21#	0bbbbbbb		-12,,12dB
04 00 22	0aaaaaaa	EQ Ach: 2.0kHz Gain	
04 00 23#	0bbbbbbb		-12,,12dB
04 00 24	0aaaaaaa	EQ Ach: 4.0kHz Gain	
04 00 25#	0bbbbbbb		-12,,12dB
04 00 26	0aaaaaaa	EQ Ach: 8.0kHz Gain	
04 00 27#	0bbbbbbb		-12,,12dB
04 00 28	0aaaaaaa	EQ Ach: 16.0kHz Gain	
04 00 29#	0bbbbbbb		-12,,12dB
04 00 2A	0aaaaaaa	EQ Ach: Output Level	
04 00 2B#	0bbbbbbb		-60,,12dB
04 00 2C	0aaaaaaa	EQ Bch: Input Gain	
04 00 2D#	0bbbbbbb		-60,,12dB

04 00 2E	0aaaaaaa	EQ Bch: 31.25Hz Gain	
04 00 2F#	0bbbbbbb		-12,,,12dB
04 00 30	0aaaaaaa	EQ Bch: 62.5Hz Gain	
04 00 31#	0bbbbbbb		-12,,,12dB
04 00 32	0aaaaaaa	EQ Bch: 125Hz Gain	
04 00 33#	0bbbbbbb		-12,,,12dB
04 00 34	0aaaaaaa	EQ Bch: 250Hz Gain	
04 00 35#	0bbbbbbb		-12,,,12dB
04 00 36	0aaaaaaa	EQ Bch: 500Hz Gain	
04 00 37#	0bbbbbbb		-12,,,12dB
04 00 38	0aaaaaaa	EQ Bch: 1.0kHz Gain	
04 00 39#	0bbbbbbb		-12,,,12dB
04 00 3A	0aaaaaaa	EQ Bch: 2.0kHz Gain	
04 00 3B#	0bbbbbbb		-12,,,12dB
04 00 3C	0aaaaaaa	EQ Bch: 4.0kHz Gain	
04 00 3D#	0bbbbbbb		-12,,,12dB
04 00 3E	0aaaaaaa	EQ Bch: 8.0kHz Gain	
04 00 3F#	0bbbbbbb		-12,,,12dB
04 00 40	0aaaaaaa	EQ Bch: 16.0kHz Gain	
04 00 41#	0bbbbbbb		-12,,,12dB
04 00 42	0aaaaaaa	EQ Bch: Output Level	
04 00 43#	0bbbbbbb		-60,,,12dB
04 00 44	00	(Reserved)	
:	:		
04 00 7F	00		

* When Link SW = On, Bch corresponds to Ach.

Algorithm 25 Hum Canceled

04 00 0E	0aaaaaaa	Hum Canceled SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Noise Suppressor SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Hum Canceled: Freq	
04 00 13#	0bbbbbbb		200,,,8000 = 20.0,,,800.0Hz
04 00 14	0aaaaaaa	Hum Canceled: Width	
04 00 15#	0bbbbbbb		10,,,40%
04 00 16	0aaaaaaa	Hum Canceled: Depth	
04 00 17#	0bbbbbbb		0,,,100
04 00 18	0aaaaaaa	Hum Canceled: Threshold	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Hum Canceled: Range Low	
04 00 1B#	0bbbbbbb		1,,,200 = Unlimit,20,,,2000Hz
04 00 1C	0aaaaaaa	Hum Canceled: Range High	
04 00 1D#	0bbbbbbb		10,,,201 = 1.0,,,20,0kHz,Unlimit
04 00 1E	0aaaaaaa	Noise Suppressor: Threshold	
04 00 1F#	0bbbbbbb		0,,,100
04 00 20	0aaaaaaa	Noise Suppressor: Release	
04 00 21#	0bbbbbbb		0,,,100
04 00 22	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 26 Vocal Canceled

04 00 0E	0aaaaaaa	Vocal Canceled SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	EQ SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Vocal Canceled: Balance	
04 00 13#	0bbbbbbb		0,,,100
04 00 14	0aaaaaaa	Vocal Canceled: Range Low	
04 00 15#	0bbbbbbb		1,,,200 = Unlimit,20,,,2000Hz
04 00 16	0aaaaaaa	Vocal Canceled: Range High	
04 00 17#	0bbbbbbb		10,,,201 = 1.0,,,20,0kHz,Unlimit
04 00 18	0aaaaaaa	EQ: Low EQ Type	
04 00 19#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 1A	0aaaaaaa	EQ: Low EQ Gain	
04 00 1B#	0bbbbbbb		-12,,,12dB
04 00 1C	0aaaaaaa	EQ: Low EQ Frequency	
04 00 1D#	0bbbbbbb		2,,,200 = 20,,,2000Hz
04 00 1E	0aaaaaaa	EQ: Low EQ Q	
04 00 1F#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 20	0aaaaaaa	EQ: Mid EQ Gain	
04 00 21#	0bbbbbbb		-12,,,12dB
04 00 22	0aaaaaaa	EQ: Mid EQ Frequency	
04 00 23#	0bbbbbbb		20,,,800 = 200,,,8000Hz
04 00 24	0aaaaaaa	EQ: Mid EQ Q	
04 00 25#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 26	0aaaaaaa	EQ: High EQ Type	
04 00 27#	0bbbbbbb		0,1 = Shelving, Peaking
04 00 28	0aaaaaaa	EQ: High EQ Gain	
04 00 29#	0bbbbbbb		-12,,,12dB
04 00 2A	0aaaaaaa	EQ: High EQ Frequency	
04 00 2B#	0bbbbbbb		14,,,200 = 1.4,,,20.0kHz
04 00 2C	0aaaaaaa	EQ: High EQ Q	
04 00 2D#	0bbbbbbb		3,,,100 = 0.3,,,10.0
04 00 2E	0aaaaaaa	EQ: Out Level	
04 00 2F#	0bbbbbbb		0,,,100
04 00 30	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 27 Voice Transformer (EFX1 or EFX3)

04 00 0E	0aaaaaaa	Voice Transformer SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Reverb SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Fader Edit SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	MIDI Control SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	Voice Transformer: Robot SW	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	Voice Transformer: Chromatic Pitch	
04 00 19#	0bbbbbbb		-12,,,36

04 00 1A	0aaaaaaa	Voice Transformer: Fine Pitch	
04 00 1B#	0bbbbbbb		-100,,100
04 00 1C	0aaaaaaa	Voice Transformer: Chromatic Formant	
04 00 1D#	0bbbbbbb		-12,,12
04 00 1E	0aaaaaaa	Voice Transformer: Fine Formant	
04 00 1F#	0bbbbbbb		-100,,100
04 00 20	0aaaaaaa	Voice Transformer: Mix Balance	
04 00 21#	0bbbbbbb		0,,100
04 00 22	0aaaaaaa	Reverb: Reverb Time	
04 00 23#	0bbbbbbb		1,,100 = 0.1,,10.0sec
04 00 24	0aaaaaaa	Reverb: Pre Delay	
04 00 25#	0bbbbbbb		0,,200msec
04 00 26	0aaaaaaa	Reverb: Density	
04 00 27#	0bbbbbbb		0,,100
04 00 28	0aaaaaaa	Reverb: Effect Level	
04 00 29#	0bbbbbbb		0,,100
04 00 2A	0aaaaaaa	MIDI Control: Bend Range	
04 00 2B#	0bbbbbbb		0,,12 = Off,1,,12
04 00 2C	0aaaaaaa	MIDI Control: Portamento	
04 00 2D#	0bbbbbbb		0...100 = Off,1,,100
04 00 2E	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 28 Vocoder 2 (EFX1 or EFX3)

04 00 0E	0aaaaaaa	Chorus SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Vocoder: Envelope Mode	
04 00 11#	0bbbbbbb		0,,2 = Sharp,Soft,Long
04 00 12	0aaaaaaa	Vocoder: Pan Mode	
04 00 13#	0bbbbbbb		0,,3 = Mono,Stereo,L->R,R->L
04 00 14	0aaaaaaa	Vocoder: Hold	
04 00 15#	0bbbbbbb		0,1 = Off,MIDI
04 00 16	0aaaaaaa	Vocoder: Mic Sens	
04 00 17#	0bbbbbbb		0,,100
04 00 18	0aaaaaaa	Vocoder: Synth Input Level	
04 00 19#	0bbbbbbb		0,,100
04 00 1A	0aaaaaaa	Vocoder: Voice Char Level 1	
04 00 1B#	0bbbbbbb		0,,100
04 00 1C	0aaaaaaa	Vocoder: Voice Char Level 2	
04 00 1D#	0bbbbbbb		0,,100
04 00 1E	0aaaaaaa	Vocoder: Voice Char Level 3	
04 00 1F#	0bbbbbbb		0,,100
04 00 20	0aaaaaaa	Vocoder: Voice Char Level 4	
04 00 21#	0bbbbbbb		0,,100
04 00 22	0aaaaaaa	Vocoder: Voice Char Level 5	
04 00 23#	0bbbbbbb		0,,100
04 00 24	0aaaaaaa	Vocoder: Voice Char Level 6	
04 00 25#	0bbbbbbb		0,,100
04 00 26	0aaaaaaa	Vocoder: Voice Char Level 7	
04 00 27#	0bbbbbbb		0,,100

04 00 28	0aaaaaaa	Vocoder: Voice Char Level 8	
04 00 29#	0bbbbbbb		0,,100
04 00 2A	0aaaaaaa	Vocoder: Voice Char Level 9	
04 00 2B#	0bbbbbbb		0,,100
04 00 2C	0aaaaaaa	Vocoder: Voice Char Level 10	
04 00 2D#	0bbbbbbb		0,,100
04 00 2E	0aaaaaaa	Vocoder: Voice Char Level 11	
04 00 2F#	0bbbbbbb		0,,100
04 00 30	0aaaaaaa	Vocoder: Voice Char Level 12	
04 00 31#	0bbbbbbb		0,,100
04 00 32	0aaaaaaa	Vocoder: Voice Char Level 13	
04 00 33#	0bbbbbbb		0,,100
04 00 34	0aaaaaaa	Vocoder: Voice Char Level 14	
04 00 35#	0bbbbbbb		0,,100
04 00 36	0aaaaaaa	Vocoder: Voice Char Level 15	
04 00 37#	0bbbbbbb		0,,100
04 00 38	0aaaaaaa	Vocoder: Voice Char Level 16	
04 00 39#	0bbbbbbb		0,,100
04 00 3A	0aaaaaaa	Vocoder: Voice Char Level 17	
04 00 3B#	0bbbbbbb		0,,100
04 00 3C	0aaaaaaa	Vocoder: Voice Char Level 18	
04 00 3D#	0bbbbbbb		0,,100
04 00 3E	0aaaaaaa	Vocoder: Voice Char Level 19	
04 00 3F#	0bbbbbbb		0,,100
04 00 40	0aaaaaaa	Vocoder: Mic High Pass Filter	
04 00 41#	0bbbbbbb		9,,200 = Thru,1.0,,20.0kHz
04 00 42	0aaaaaaa	Vocoder: Mic High Pass Filter Pan	
04 00 43#	0bbbbbbb		1,,127 = L63,,R63
04 00 44	0aaaaaaa	Vocoder: Mic Mix	
04 00 45#	0bbbbbbb		0,,100
04 00 46	0aaaaaaa	Vocoder: Noise Suppressor Threshold	
04 00 47#	0bbbbbbb		0,,100
04 00 48	0aaaaaaa	Chorus: Rate	
04 00 49#	0bbbbbbb		1,,100 = 0.1,,10.0Hz
04 00 4A	0aaaaaaa	Chorus: Depth	
04 00 4B#	0bbbbbbb		0,,100
04 00 4C	0aaaaaaa	Chorus: Pre Delay	
04 00 4D#	0bbbbbbb		0,,50ms
04 00 4E	0aaaaaaa	Chorus: Mix Balance	
04 00 4F#	0bbbbbbb		0,,100
04 00 50	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 29 Mic Simulator

04 00 0E	0aaaaaaa	Link SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Mic Converter Ach SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Bass Cut Ach SW	
04 00 13#	0bbbbbbb		0,1 = Off,On

04 00 14	0aaaaaaa	Distance Ach SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	Limiters Ach SW	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	Mic Converter Bch SW	
04 00 19#	0bbbbbbb		0,1 = Off,On
04 00 1A	0aaaaaaa	Bass Cut Bch SW	
04 00 1B#	0bbbbbbb		0,1 = Off,On
04 00 1C	0aaaaaaa	Distance Bch SW	
04 00 1D#	0bbbbbbb		0,1 = Off,On
04 00 1E	0aaaaaaa	Limiters Bch SW	
04 00 1F#	0bbbbbbb		0,1 = Off,On
04 00 20	0aaaaaaa	Mic Converter Ach: Input	
04 00 21#	0bbbbbbb		0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
04 00 22	0aaaaaaa	Mic Converter Ach: Output	
04 00 23#	0bbbbbbb		0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
04 00 24	0aaaaaaa	Mic Converter Ach: Phase	
04 00 25#	0bbbbbbb		0,1 = Normal,Inverse
04 00 26	0aaaaaaa	Bass Cut Ach: Bass Cut Frequency	
04 00 27#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
04 00 28	0aaaaaaa	Distance Ach: Proximity Effect	
04 00 29#	0bbbbbbb		-12,,,+12
04 00 2A	0aaaaaaa	Distance Ach: Timelag	
04 00 2B#	0bbbbbbb		0,,,1000 = 0,,,3000cm
04 00 2C	0aaaaaaa	Limiters Ach: Detect HPF Frequency	
04 00 2D#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
04 00 2E	0aaaaaaa	Limiters Ach: Level	
04 00 2F#	0bbbbbbb		-60,,,24dB
04 00 30	0aaaaaaa	Limiters Ach: Threshold	
04 00 31#	0bbbbbbb		-60,,,0dB
04 00 32	0aaaaaaa	Limiters Ach: Attack	
04 00 33#	0bbbbbbb		0,,,100
04 00 34	0aaaaaaa	Limiters Ach: Release	
04 00 35#	0bbbbbbb		0,,,100
04 00 36	0aaaaaaa	Mic Converter Bch: Input	
04 00 37#	0bbbbbbb		0,,,4 = DR-20,SmlDy,HedDy,MinCn,Flat
04 00 38	0aaaaaaa	Mic Converter Bch: Output	
04 00 39#	0bbbbbbb		0,,,6 = SmlDy,VocDy,LrgDy,SmlCn,LrgCn,VntCn,Flat
04 00 3A	0aaaaaaa	Mic Converter Bch: Phase	
04 00 3B#	0bbbbbbb		0,1 = Normal,Inverse
04 00 3C	0aaaaaaa	Bass Cut Bch: Bass Cut Frequency	
04 00 3D#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
04 00 3E	0aaaaaaa	Distance Bch: Proximity Effect	
04 00 3F#	0bbbbbbb		-12,,,+12
04 00 40	0aaaaaaa	Distance Bch: Timelag	
04 00 41#	0bbbbbbb		0,,,1000 = 0,,,3000cm
04 00 42	0aaaaaaa	Limiters Bch: Detect HPF Frequency	
04 00 43#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
04 00 44	0aaaaaaa	Limiters Bch: Level	
04 00 45#	0bbbbbbb		-60,,,24dB
04 00 46	0aaaaaaa	Limiters Bch: Threshold	
04 00 47#	0bbbbbbb		-60,,,0dB

04 00 48	0aaaaaaa	Limiters Bch: Attack	
04 00 49#	0bbbbbbb		0,,,100
04 00 4A	0aaaaaaa	Limiters Bch: Release	
04 00 4B#	0bbbbbbb		0,,,100
04 00 4C	00	(Reserved)	
:	:		
04 00 7F	00		

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

Algorithm 30 3 Band Isolator

04 00 0E	0aaaaaaa	Isolator SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Isolator High Volume	
04 00 11#	0bbbbbbb		-60,,,+4dB
04 00 12	0aaaaaaa	Isolator Middle Volume	
04 00 13#	0bbbbbbb		-60,,,+4dB
04 00 14	0aaaaaaa	Isolator Low Volume	
04 00 15#	0bbbbbbb		-60,,,+4dB
04 00 16	0aaaaaaa	Isolator Anti Phase Middle Switch	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	Isolator Anti Phase Middle Level	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Isolator Anti Phase Low Switch	
04 00 1B#	0bbbbbbb		0,1 = Off,On
04 00 1C	0aaaaaaa	Isolator Anti Phase Low Level	
04 00 1D#	0bbbbbbb		0,,,100
04 00 1E	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 31 Tape Echo 201

04 00 0E	0aaaaaaa	Tape Echo SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Tape Echo Mode Select	
04 00 11#	0bbbbbbb		0,,,6 = 1,,,7
04 00 12	0aaaaaaa	Tape Echo Repeat Rate	
04 00 13#	0bbbbbbb		0,,,100
04 00 14	0aaaaaaa	Tape Echo Intensity	
04 00 15#	0bbbbbbb		0,,,100
04 00 16	0aaaaaaa	Tape Echo Effect Level	
04 00 17#	0bbbbbbb		0,,,100
04 00 18	0aaaaaaa	Tape Echo Direct Level	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Tape Echo Tone Bass	
04 00 1B#	0bbbbbbb		-100,,,100
04 00 1C	0aaaaaaa	Tape Echo Tone Treble	
04 00 1D#	0bbbbbbb		-100,,,100
04 00 1E	0aaaaaaa	Tape Echo Tape Head S Pan	
04 00 1F#	0bbbbbbb		1,,,127 = L63,,,R63
04 00 20	0aaaaaaa	Tape Echo Tape Head M Pan	
04 00 21#	0bbbbbbb		1,,,127 = L63,,,R63

04 00 22	0aaaaaaa	Tape Echo Tape Head L Pan	
04 00 23#	0bbbbbbb		1,,,127 = L63,,,R63
04 00 24	0aaaaaaa	Tape Echo Tape Distortion	
04 00 25#	0bbbbbbb		0,,,100
04 00 26	0aaaaaaa	Tape Echo Wah Flutter Rate	
04 00 27#	0bbbbbbb		0,,,100
04 00 28	0aaaaaaa	Tape Echo Wah Flutter Depth	
04 00 29#	0bbbbbbb		0,,,100
04 00 2A	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 32 Analog Flanger

04 00 0E	0aaaaaaa	Analog Flanger SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Analog Flanger Mode	
04 00 11#	0bbbbbbb		0,,,3 = FL1,FL2,FL3,CHO
04 00 12	0aaaaaaa	Analog Flanger Feedback	
04 00 13#	0bbbbbbb		0,,,100
04 00 14	0aaaaaaa	Analog Flanger Modulation Rate	
04 00 15#	0bbbbbbb		0,,,100
04 00 16	0aaaaaaa	Analog Flanger Modulation Depth	
04 00 17#	0bbbbbbb		0,,,100
04 00 18	0aaaaaaa	Analog Flanger Modulation Frequency	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Analog Flanger Channel B Modulation	
04 00 1B#	0bbbbbbb		0,1 = Nor,Inv
04 00 1C	0aaaaaaa	Analog Flanger Channel A Phase	
04 00 1D#	0bbbbbbb		0,1 = Nor,Inv
04 00 1E	0aaaaaaa	Analog Flanger Channel B Phase	
04 00 1F#	0bbbbbbb		0,1 = Nor,Inv
04 00 20	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 33 Analog Phaser

04 00 0E	0aaaaaaa	Analog Phaser SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Analog Phaser Mode	
04 00 11#	0bbbbbbb		0,1 = 4STAGE,8STAGE
04 00 12	0aaaaaaa	Analog Phaser Frequency	
04 00 13#	0bbbbbbb		0,,,100
04 00 14	0aaaaaaa	Analog Phaser Resonance	
04 00 15#	0bbbbbbb		0,,,100
04 00 16	0aaaaaaa	Analog Phaser LFO 1 Rate	
04 00 17#	0bbbbbbb		0,,,100
04 00 18	0aaaaaaa	Analog Phaser LFO 1 Depth	
04 00 19#	0bbbbbbb		0,,,100
04 00 1A	0aaaaaaa	Analog Phaser LFO 1 Channel B Mod	
04 00 1B#	0bbbbbbb		0,1 = Nor,Inv

04 00 1C	0aaaaaaa	Analog Phaser LFO 2 Rate	
04 00 1D#	0bbbbbbb		0,,,100
04 00 1E	0aaaaaaa	Analog Phaser LFO 2 Depth	
04 00 1F#	0bbbbbbb		0,,,100
04 00 20	0aaaaaaa	Analog Phaser LFO 2 Channel B Mod	
04 00 21#	0bbbbbbb		0,1 = Nor,Inv
04 00 22	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 34 Speaker Modeling

04 00 0E	0aaaaaaa	Speaker Modeling SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On
04 00 10	0aaaaaaa	Bass Cut SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Low Frequency Trimmer SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	High Frequency Trimmer SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	Limiter SW	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	(Reserved)	
04 00 19#	0bbbbbbb		
04 00 1A	0aaaaaaa	Speaker Modeling Model	
04 00 1B#	0bbbbbbb		0,,,11 = THRU,Super Flat,Powered GenBlk, Powered E-Bas,Powered Mack,Small Cube,White Cone, White C +tissue,Small Radio,Small TV,Boom Box, BoomBox LoBoost
04 00 1C	0aaaaaaa	Speaker Modeling Phase	
04 00 1D#	0bbbbbbb		0,1 = NRM,INV
04 00 1E	0aaaaaaa	Bass Cut Frequency	
04 00 1F#	0bbbbbbb		1,,,200 = Thru,20,,,2000Hz
04 00 20	0aaaaaaa	Low Frequency Trimmer Gain	
04 00 21#	0bbbbbbb		-12,,,12dB
04 00 22	0aaaaaaa	Low Frequency Trimmer Frequency	
04 00 23#	0bbbbbbb		2,,,200 = 20,,,2000Hz
04 00 24	0aaaaaaa	High Frequency Trimmer Gain	
04 00 25#	0bbbbbbb		-12,,,12dB
04 00 26	0aaaaaaa	High Frequency Trimmer Frequency	
04 00 27#	0bbbbbbb		10,,,200 = 1.0,,,20.0kHz
04 00 28	0aaaaaaa	Limiter Threshold	
04 00 29#	0bbbbbbb		-60,,,0dB
04 00 2A	0aaaaaaa	Limiter Release	
04 00 2B#	0bbbbbbb		0,,,100
04 00 2C	0aaaaaaa	Limiter Level	
04 00 2D#	0bbbbbbb		-60,,,24dB
04 00 2E	00	(Reserved)	
:	:		
04 00 7F	00		

Algorithm 35 Mastering Tool Kit

04 00 0E	0aaaaaaa	EQ SW	
04 00 0F#	0bbbbbbb		0,1 = Off,On

04 00 10	0aaaaaaa	Bass Cut SW	
04 00 11#	0bbbbbbb		0,1 = Off,On
04 00 12	0aaaaaaa	Enhancer SW	
04 00 13#	0bbbbbbb		0,1 = Off,On
04 00 14	0aaaaaaa	Expander SW	
04 00 15#	0bbbbbbb		0,1 = Off,On
04 00 16	0aaaaaaa	Compressor SW	
04 00 17#	0bbbbbbb		0,1 = Off,On
04 00 18	0aaaaaaa	Limiter SW	
04 00 19#	0bbbbbbb		0,1 = Off,On
04 00 1A	0aaaaaaa	EQ: Input Gain	-24,,12dB
04 00 1B#	0aaaaaaa	EQ: Low EQ Type	0,1 = Shelving, Peaking
04 00 1C	0aaaaaaa	EQ: Low EQ Gain	-12,,12dB
04 00 1D#	0aaaaaaa	EQ: Low EQ Frequency	2,,42 = 20,,2000Hz(*1)
04 00 1E	0aaaaaaa	EQ: Low EQ Q	0,,31 = 0.3,,16.0(*2)
04 00 1F#	0aaaaaaa	EQ: Low Mid EQ Gain	-12,,12dB
04 00 20	0aaaaaaa	EQ: Low Mid EQ Frequency	2,,54 = 20,,8000Hz(*1)
04 00 21#	0aaaaaaa	EQ: Low Mid EQ Q	0,,31 = 0.3,,16.0(*2)
04 00 22	0aaaaaaa	EQ: High Mid EQ Gain	-12,,12dB
04 00 23#	0aaaaaaa	EQ: High Mid EQ Frequency	2,,54 = 20,,8000Hz(*1)
04 00 24	0aaaaaaa	EQ: High Mid EQ Q	0,,31 = 0.3,,16.0(*2)
04 00 25#	0aaaaaaa	EQ: High EQ Type	0,1 = Shelving, Peaking
04 00 26	0aaaaaaa	EQ: High EQ Gain	-12,,12dB
04 00 27#	0aaaaaaa	EQ: High EQ Frequency	39,,62 = 1.4,,20.0kHz(*1)
04 00 28	0aaaaaaa	EQ: High EQ Q	0,,31 = 0.3,,16.0(*2)
04 00 29#	0aaaaaaa	EQ: Level	-24,,12dB
04 00 2A	0aaaaaaa	Bass Cut Frequency	1,,42 = Off,20,,2000Hz(*1)
04 00 2B#	0aaaaaaa	Enhancer Sens	0,,100
04 00 2C	0aaaaaaa	Enhancer Frequency	36,,56 = 1.0,,10.0kHz(*1)
04 00 2D#	0aaaaaaa	Enhancer Mix Level	-24,,12dB
04 00 2E	0aaaaaaa	Input Gain	-24,,12dB
04 00 2F#	0aaaaaaa	Input Detect Time	0,,10ms
04 00 30	0aaaaaaa	Input Low Split Point	2,,34 = 20,,800Hz(*1)
04 00 31#	0aaaaaaa	Input High Split Point	40,,60 = 1.6,,16.0kHz(*1)
04 00 32	0aaaaaaa	Expander Low Threshold	0,,80 = -80,,0dB
04 00 33#	0aaaaaaa	Expander Mid Threshold	0,,80 = -80,,0dB
04 00 34	0aaaaaaa	Expander High Threshold	0,,80 = -80,,0dB
04 00 35#	0aaaaaaa	Expander Low Ratio	0,,13 = 1:1.0,,1:INF(*3)
04 00 36	0aaaaaaa	Expander Mid Ratio	0,,13 = 1:1.0,,1:INF(*3)
04 00 37#	0aaaaaaa	Expander High Ratio	0,,13 = 1:1.0,,1:INF(*3)
04 00 38	0aaaaaaa	Expander Low Attack	0,,100ms
04 00 39#	0aaaaaaa	Expander Mid Attack	0,,100ms

04 00 3A	0aaaaaaa	Expander High Attack	0,,100ms
04 00 3B#	0aaaaaaa	Expander Low Release	0,,100 = 50,,5000ms
04 00 3C	0aaaaaaa	Expander Mid Release	0,,100 = 50,,5000ms
04 00 3D#	0aaaaaaa	Expander High Release	0,,100 = 50,,5000ms
04 00 3E	0aaaaaaa	Compressor Low Threshold	-24,,0dB
04 00 3F#	0aaaaaaa	Compressor Mid Threshold	-24,,0dB
04 00 40	0aaaaaaa	Compressor High Threshold	-24,,0dB
04 00 41#	0aaaaaaa	Compressor Low Ratio	0,,13 = 1:1.0,,1:INF(*3)
04 00 42	0aaaaaaa	Compressor Mid Ratio	0,,13 = 1:1.0,,1:INF(*3)
04 00 43#	0aaaaaaa	Compressor High Ratio	0,,13 = 1:1.0,,1:INF(*3)
04 00 44	0aaaaaaa	Compressor Low Attack	0,,100ms
04 00 45#	0aaaaaaa	Compressor Mid Attack	0,,100ms
04 00 46	0aaaaaaa	Compressor High Attack	0,,100ms
04 00 47#	0aaaaaaa	Compressor Low Release	0,,100 = 50,,5000ms
04 00 48	0aaaaaaa	Compressor Mid Release	0,,100 = 50,,5000ms
04 00 49#	0aaaaaaa	Compressor High Release	0,,100 = 50,,5000ms
04 00 4A	0aaaaaaa	Mixer Low Level	0,,86 = -80,,6dB
04 00 4B#	0aaaaaaa	Mixer Mid Level	0,,86 = -80,,6dB
04 00 4C	0aaaaaaa	Mixer High Level	0,,86 = -80,,6dB
04 00 4D#	0aaaaaaa	Limiter Threshold	-24,,0dB
04 00 4E	0aaaaaaa	Limiter Attack	0,,100ms
04 00 4F#	0aaaaaaa	Limiter Release	0,,100 = 50,,5000ms
04 00 50	0aaaaaaa	Output Level	0,,86 = -80,,6dB
04 00 51#	0aaaaaaa	Output Soft Clip	0,1 = Off,On
04 00 52	0aaaaaaa	Output Dither	0,,17 = Off,24,,8Bit
04 00 53#	00	(Reserved)	
04 00 54	00	(Reserved)	
:	:		
04 00 7F	00		

●Remote Operation

Start address	Data	Contents and remarks
05 00 00	00 -	Remote Command / Response
05 00 01#	00 -	Parameter
:	:	:
05 nn mm#	00 -	Parameter

(*) The address marked by “#” are invalid. Transmit the Data Set (DT1) message with the specified size to the address without “#” mark. Data Request (RQ1) message is ignored.

(*) The commands require to set simultaneously the parameter which specified size.

Remote Operation Command List

Command	Remarks
00	NOP (No Operation)
01	Abort Command
02	Undo
03	Redo
04	Get Now Time
05	Preview From
06	Preview To
07	Preview Thru
08	Preview Scrub On
09	Preview Scrub Off
0A	Get Amplitude Profile
0B	Get Wave Data
0C	Get Track Name
0D	Set Track Name
0E	Get Event List (1) - Full Parameter Sequence
0F	Get Event List (2) - Event Number Sequence
10	Get Event List (3) - Event List Pointer : Top, Bottom, Count
11	Get Event Parameter
12	Set Event Name
13	Create New Event
14	Track Copy
15	Track Move
16	Track Exchange
17	Track Insert
18	Track Cut
19	Track Erase
1A	Track Time Comp/Exp.
1B	Track Exchange with Track Name

Remote Operation Response List

Response	Remarks
40	Complete (No Error)
41	Error
42	Now Time
43	Amplitude Profile
44	Wave Data
45	Track Name
46	Event List (1) - Full Parameter Sequence
47	Event List (2) - Event Number Sequence
48	Event List (3) - Event List Pointer: Top,Bottom,Count
49	Event Parameter

Command 00 NOP (No Operation)

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 00 | NOP (No Operation) |
+-----+
    
```

Command 01 Abort Command

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 01 | Abort Command |
+-----+
    
```

Command 02 Undo

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 02 | Undo |
+-----+
| 05 00 01# | 000000aa | Undo Level |
| 05 00 02# | 0bbbbbbb | aabbbbbbbcccccc = 1,,,999 |
| 05 00 03# | 0ccccccc |
+-----+
    
```

Command 03 Redo

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 03 | Redo |
+-----+
    
```

Command 04 Get Now Time

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 04 | Get Now Time |
+-----+
    
```

Command 05 Preview From

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 05 | Preview From |
+-----+
    
```

Command 06 Preview To

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 06 | Preview To |
+-----+
    
```

Command 07 Preview Thru

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 07 | Preview Thru |
+-----+
    
```

Command 08 Preview Scrub On

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 08 | Preview Scrub On |
+-----+
| 05 00 01# | 00 - 0F | Target Track | 1,,,16 |
+-----+
    
```

Command 09 Preview Scrub Off

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 09 | Preview Scrub Off |
+-----+
    
```

Command 0A Get Amplitude Profile

```

+-----+
| Start | | |
| address | Data | Contents and remarks |
|-----+-----+-----+
| 05 00 00 | 0A | Get Amplitude Profile |
+-----+
| 05 00 01# | 0000000a | Target V.Tr. |
| 05 00 02# | 0bbbbbbb | abbbbbbb = V.Tr.1-1,,,V.Tr.16-16 |
+-----+
| 05 00 03# | 0aaaaaaa | From Time |
| 05 00 04# | 0bbbbbbb | aaaaaabbbbbbbccccccddddd = |
| 05 00 05# | 0ccccccc | 0,,,268435455block (1block=16sample) |
| 05 00 06# | 0ddddddd |
+-----+
| 05 00 07# | 0aaaaaaa | Length Time |
| 05 00 08# | 0bbbbbbb | aaaaaabbbbbbbccccccddddd = |
| 05 00 09# | 0ccccccc | 0,,,268435455block (1block=16sample) |
+-----+
    
```

05 00 0A#	0ddddddd		
05 00 0B#	0aaaaaaaa	Resolution	
05 00 0C#	0bbbbbbb		aaaaaaaaabbbbbbb = 1,,, (blocks)
05 00 0D#	0aaaaaaaa	Packet Byte Length	
05 00 0E#	0bbbbbbb		aaaaaaaaabbbbbbb = 6,,,16384 (=00)

Command 0B Get Wave Data

Start	address	Data	Contents and remarks
05 00 00	0B		Get Wave Data
05 00 01#	0000000a		Target V.Tr.
05 00 02#	0bbbbbbb		abbbbbbb = V.Tr.1-1,,,V.Tr.16-16
05 00 03#	0aaaaaaaa	From Time	
05 00 04#	0bbbbbbb		aaaaaaaaabbbbbbbccccccddddddd =
05 00 05#	0ccccccc		0,,,268435455block (1block=16sample)
05 00 06#	0ddddddd		
05 00 07#	0aaaaaaaa	Length Time	
05 00 08#	0bbbbbbb		aaaaaaaaabbbbbbbccccccddddddd =
05 00 09#	0ccccccc		0,,,268435455block (1block=16sample)
05 00 0A#	0ddddddd		
05 00 0B#	0aaaaaaaa	Packet Byte Length	
05 00 0C#	0bbbbbbb		aaaaaaaaabbbbbbb = 6,,,16384 (=00)

Command 0C Get Track Name

Start	address	Data	Contents and remarks
05 00 00	0C		Get Track Name
05 00 01#	0000000a		Target V.Tr.
05 00 02#	0bbbbbbb		abbbbbbb = V.Tr.1-1,,,V.Tr.16-16

Command 0D Set Track Name

Start	address	Data	Contents and remarks
05 00 00	0D		Set Track Name
05 00 01#	0000000a		Target V.Tr.
05 00 02#	0bbbbbbb		abbbbbbb = V.Tr.1-1,,,V.Tr.16-16
05 00 03#	20 - 7E	Name - 1	(ASCII)
05 00 04#	20 - 7E	Name - 2	
:	:		
05 00 12#	20 - 7E	Name - 16	

Command 0E Get Event List (1) - Full Parameter Sequence

Start	address	Data	Contents and remarks
05 00 00	0E		Get Event List (1) - Full Parameter Sequence
05 00 01#	0aaaaaaaa	Target V.Tr.	
05 00 02#	0bbbbbbb		aaaaaaaaabbbbbbb = V.Tr.1-1,,,V.Tr.16-16, take (=3FFF)
05 00 03#	0aaaaaaaa	Packet Byte Length	
05 00 04#	0bbbbbbb		aaaaaaaaabbbbbbb = 6,,,16384 (=00)

Command 0F Get Event List (2) - Event Number Sequence

Start	address	Data	Contents and remarks
05 00 00	0F		Get Event List (2) - Event Number Sequence
05 00 01#	0aaaaaaaa	Target V.Tr.	
05 00 02#	0bbbbbbb		aaaaaaaaabbbbbbb = V.Tr.1-1,,,V.Tr.16-16, take (=3FFF)
05 00 03#	0aaaaaaaa	Packet Byte Length	
05 00 04#	0bbbbbbb		aaaaaaaaabbbbbbb = 6,,,16384 (=00)

Command 10 Get Event List (3) - Event List Pointer: Top,Bottom,Count

Start	address	Data	Contents and remarks
05 00 00	10		Get Event List (3) - Event List Pointer: Top, Bottom, Count
05 00 01#	0aaaaaaaa	Target V.Tr.	
05 00 02#	0bbbbbbb		aaaaaaaaabbbbbbb = V.Tr.1-1,,,V.Tr.16-16, take (=3FFF)

Command 11 Get Event Parameter

Start	address	Data	Contents and remarks
05 00 00	11		Get Event Parameter
05 00 01#	000000aa	Event Number	
05 00 02#	0bbbbbbb		aabbbbbbbccccccc = 0000,,,FFFE
05 00 03#	0bbbbbbb		

Command 12 Set Event Name

Start	address	Data	Contents and remarks
05 00 00	12		Set Event Name
05 00 01#	000000aa	Event Number	
05 00 02#	0bbbbbbb		aabbbbbbbccccccc = 0000,,,FFFE
05 00 03#	0bbbbbbb		
05 00 04#	20 - 7E	Name - 1	(ASCII)
05 00 05#	20 - 7E	Name - 2	
:	:		
05 00 13#	20 - 7E	Name - 16	

Command 13 Create New Event

Start	address	Data	Contents and remarks
05 00 00	13		Create New Event
05 00 01#	0aaaaaaaa	Target V.Tr.	
05 00 02#	0bbbbbbb		aaaaaaaaabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
05 00 03#	000000aa	Original Take Event Number	
05 00 04#	0bbbbbbb		aabbbbbbbccccccc = 0000,,,FFFE
05 00 05#	0ccccccc		(silent event=FFFF)
00 00 06#	0aaaaaaaa	Start Time	
05 00 07#	0bbbbbbb		aaaaaaaaabbbbbbbccccccddddddd =
05 00 08#	0ccccccc		0,,,268435455block (1block=16sample)
00 00 09#	0ddddddd		

```

| 00 00 0A#| 0aaaaaaa| End Time
| 05 00 0B#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 0C#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 00 00 0D#| 0ddddd
-----
| 00 00 0E#| 0aaaaaaa| Offset Time
| 05 00 0F#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 10#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 00 00 11#| 0ddddd
-----

```

Command 14 Track Copy

```

-----
| Start | |
| address | Data | Contents and remarks
-----
| 05 00 00 | 14 | Track Copy
-----
| 05 00 01#| 0aaaaaaa| Track Copy Start Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddd
-----
| 05 00 05#| 0aaaaaaa| Track Copy End Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddd
-----
| 05 00 09#| 0aaaaaaa| Track Copy From Time
| 05 00 0A#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 0B#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 0C#| 0ddddd
-----
| 05 00 0D#| 0aaaaaaa| Track Copy To Time
| 05 00 0E#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 0F#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 10#| 0ddddd
-----
| 05 00 11#| 01 - 63 | Track Copy Time | 1,,,99
-----
| 05 00 12#| 00 - 01 | Track Copy +Insert | Off,On
-----
| 05 00 13#| 000000aa| The Number Of Target | aabbbbbb = 1,,,256
| 05 00 14#| 0bbbbbbb
-----
| 05 00 15#| 0000000a| Source V.Tr.
| 05 00 16#| 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| 05 00 17#| 0000000c| Destination V.Tr.
| 05 00 18#| 0ddddd| cddddd = V.Tr.1-1,,,V.Tr.16-16
: : :
| : | 0000000a| Source V.Tr.
| : | 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| : | 0000000c| Destination V.Tr.
| 05 nn mm#| 0ddddd| cddddd = V.Tr.1-1,,,V.Tr.16-16
| : | | (nn mm = 00 14 + The Number Of Target * 4)
-----

```

Command 15 Track Move

```

-----
| Start | |
| address | Data | Contents and remarks
-----
| 05 00 00 | 15 | Track Move
-----
| 05 00 01#| 0aaaaaaa| Track Move Start Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddd
-----
| 05 00 05#| 0aaaaaaa| Track Move End Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddd
-----
| 05 00 09#| 0aaaaaaa| Track Move From Time
| 05 00 0A#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 0B#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 0C#| 0ddddd
-----

```

```

-----
| 05 00 0D#| 0aaaaaaa| Track Move To Time
| 05 00 0E#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 0F#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 10#| 0ddddd
-----
| 05 00 11#| 00 - 01 | Track Move +Insert | Off,On
-----
| 05 00 12#| 000000aa| The Number Of Target | aabbbbbb = 1,,,256
| 05 00 13#| 0bbbbbbb
-----
| 05 00 14#| 0000000a| Source V.Tr.
| 05 00 15#| 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| 05 00 16#| 0000000c| Destination V.Tr.
| 05 00 17#| 0ddddd| cddddd = V.Tr.1-1,,,V.Tr.16-16
: : :
| : | 0000000a| Source V.Tr.
| : | 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| : | 0000000c| Destination V.Tr.
| 05 nn mm#| 0ddddd| cddddd = V.Tr.1-1,,,V.Tr.16-16
| : | | (nn mm = 00 13 + The Number Of Target * 4)
-----

```

Command 16 Track Exchange

```

-----
| Start | |
| address | Data | Contents and remarks
-----
| 05 00 00 | 16 | Track Exchange
-----
| 05 00 01#| 000000aa| The Number Of Target | aabbbbbb = 1,,,256
| 05 00 02#| 0bbbbbbb
-----
| 05 00 03#| 0000000a| Source V.Tr.
| 05 00 04#| 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| 05 00 05#| 0000000c| Destination V.Tr.
| 05 00 06#| 0ddddd| cddddd = V.Tr.1-1,,,V.Tr.16-16
: : :
| : | 0000000a| Source V.Tr.
| : | 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| : | 0000000c| Destination V.Tr.
| 05 nn mm#| 0ddddd| cddddd = V.Tr.1-1,,,V.Tr.16-16
| : | | (nn mm = 00 02 + The Number Of Target * 4)
-----

```

Command 17 Track Insert

```

-----
| Start | |
| address | Data | Contents and remarks
-----
| 05 00 00 | 17 | Track Insert
-----
| 05 00 01#| 0aaaaaaa| Track Insert Start Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddd
-----
| 05 00 05#| 0aaaaaaa| Track Insert To Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbabbbbbbcccccccdxxxx =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddd
-----
| 05 00 09#| 000000aa| The Number Of Target | aabbbbbb = 1,,,256
| 05 00 0A#| 0bbbbbbb
-----
| 05 00 0B#| 0000000a| Insert V.Tr.
| 05 00 0C#| 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
: : :
| : | 0000000a| Insert V.Tr.
| 05 nn mm#| 0bbbbbbb| abbbbbb = V.Tr.1-1,,,V.Tr.16-16
| : | | (nn mm = 00 0A + The Number Of Target * 2)
-----

```

Command 18 Track Cut

```

-----
| Start | |
| address | Data | Contents and remarks
-----

```

```

| 05 00 00 | 18      | Track Cut
+-----+
| 05 00 01#| 0aaaaaaa| Track Cut Start Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddddd|
+-----+
| 05 00 05#| 0aaaaaaa| Track Cut End Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddddd|
+-----+
| 05 00 09#| 000000aa| The Number Of Target      aabbbbbbb = 1,,,256
| 05 00 0A#| 0bbbbbbb|
+-----+
| 05 00 0B#| 0000000a| Cut V.Tr.
| 05 00 0C#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
:   :   :
|   :   :
| 0000000a| Cut V.Tr.
| 05 nn mm#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
|           |           | (nn mm = 00 0A + The Number Of Target * 2)
+-----+

```

Command 19 Track Erase

```

+-----+
| Start | | |
| address | Data | Contents and remarks
+-----+
| 05 00 00 | 19 | Track Erase
+-----+
| 05 00 01#| 0aaaaaaa| Track Erase Start Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddddd|
+-----+
| 05 00 05#| 0aaaaaaa| Track Erase End Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddddd|
+-----+
| 05 00 09#| 000000aa| The Number Of Target      aabbbbbbb = 1,,,256
| 05 00 0A#| 0bbbbbbb|
+-----+
| 05 00 0B#| 0000000a| Erase V.Tr.
| 05 00 0C#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
:   :   :
|   :   :
| 0000000a| Erase V.Tr.
| 05 nn mm#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
|           |           | (nn mm = 00 0A + The Number Of Target * 2)
+-----+

```

Command 1A Track Time Comp/Exp.

```

+-----+
| Start | | |
| address | Data | Contents and remarks
+-----+
| 05 00 00 | 1A | Track Time Comp/Exp.
+-----+
| 05 00 01#| 0aaaaaaa| Track Time Comp/Exp. Start Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddddd|
+-----+
| 05 00 05#| 0aaaaaaa| Track Time Comp/Exp. End Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddddd|
+-----+
| 05 00 09#| 0aaaaaaa| Track Time Comp/Exp. To Time
| 05 00 0A#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 0B#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 0C#| 0ddddddd|
+-----+
| 05 00 0D#| 00 - 01 | Track Time Comp/Exp. Pitch Mode      Fix,Vari
+-----+
| 05 00 0E#| 00 - 02 | Track Time Comp/Exp. Type              A,B,C
+-----+
| 05 00 0F#| 01 - 64 | Track Time Comp/Exp. Amplitude        1,,,100%
+-----+

```

```

+-----+
| 05 00 10#| 000000aa| The Number Of Target      aabbbbbbb = 1,,,256
| 05 00 11#| 0bbbbbbb|
+-----+
| 05 00 0B#| 0000000a| Comp/Exp V.Tr.
| 05 00 0C#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
:   :   :
|   :   :
| 0000000a| Comp/Exp V.Tr.
| 05 nn mm#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
|           |           | (nn mm = 00 11 + The Number Of Target * 2)
+-----+

```

Command 1B Track Exchange with Track Name

```

+-----+
| Start | | |
| address | Data | Contents and remarks
+-----+
| 05 00 00 | 1B | Track Exchange With Track Name
+-----+
| 05 00 01#| 000000aa| The Number Of Target      aabbbbbbb = 1,,,256
| 05 00 02#| 0bbbbbbb|
+-----+
| 05 00 03#| 0000000a| Source V.Tr.
| 05 00 04#| 0bbbbbbb| aabbbbbbb = V.Tr.1-1,,,V.Tr.16-16
| 05 00 05#| 0000000c| Destination V.Tr.
| 05 00 06#| 0ddddddd| cddddddd = V.Tr.1-1,,,V.Tr.16-16
:   :   :
|   :   :
| 0000000a| Source V.Tr.
|   :   :
| 0000000c| Destination V.Tr.
| 05 nn mm#| 0ddddddd| cddddddd = V.Tr.1-1,,,V.Tr.16-16
|           |           | (nn mm = 00 02 + The Number Of Target * 4)
+-----+

```

Response 40 Complete (No Error)

```

+-----+
| Start | | |
| address | Data | Contents and remarks
+-----+
| 05 00 00 | 40 | Complete (No Error)
+-----+

```

Response 41 Error

```

+-----+
| Start | | |
| address | Data | Contents and remarks
+-----+
| 05 00 00 | 41 | Error
+-----+
| 05 00 01#| 00 - 7F | Error Code (00=No Error (complete, end of data))
|           |           | 01=Busy
|           |           | 02=Command Aborted
|           |           | 03=Illegal Command
|           |           | 04=Command Error
|           |           | 05=Command Rejected (song protected)
+-----+

```

Response 42 Now Time

```

+-----+
| Start | | |
| address | Data | Contents and remarks
+-----+
| 05 00 00 | 42 | Now Time
+-----+
| 05 00 01#| 0aaaaaaa| Now Relative Time
| 05 00 02#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 03#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 04#| 0ddddddd|
+-----+
| 05 00 05#| 0aaaaaaa| Now Absolute Time
| 05 00 06#| 0bbbbbbb| aaaaaaabbbbbbbccccccddddd =
| 05 00 07#| 0ccccccc| 0,,,268435455block (1block=16sample)
| 05 00 08#| 0ddddddd|
+-----+

```

Response 43 Amplitude Profile

Start	address	Data	Contents and remarks
05 00 00	43		Amplitude Profile
05 00 01#	0000000a		Target V.Tr.
05 00 02#	0bbbbbbb		abbbbbbb = V.Tr.1-1,,V.Tr.16-16
05 00 03#	0aaaaaaa		Packet Number
05 00 04#	0bbbbbbb		aaaaaaabbbbbbb = 0 - 16383
05 00 05#	00 - 7F		Packet Data Buffer
:	:	:	
05 nn mm#			(nn mm = Packet Byte Length - 1)
Data Sequence			
05 00 00	00 - 7F		Amplitude Data
			0=-127dB, 1=-126dB,...,126=-1dB,127=0dB

Response 44 Wave Data

Start	address	Data	Contents and remarks
05 00 00	44		Wave Data
05 00 01#	0000000a		Target V.Tr.
05 00 02#	0bbbbbbb		abbbbbbb = V.Tr.1-1,,V.Tr.16-16
05 00 03#	0aaaaaaa		Packet Number
05 00 04#	0bbbbbbb		aaaaaaabbbbbbb = 0 - 16383
05 00 05#	00 - 7F		Packet Data Buffer
:	:	:	
05 nn mm#			(nn mm = Packet Byte Length - 1)
Data Sequence			
05 00 00	000000aa		Wave Data
05 00 01	0bbbbbbb		aabbbbbbbccccccc = 16bit 2"s Complement data
05 00 02	0ccccccc		

Response 45 Track Name

Start	address	Data	Contents and remarks
05 00 00	45		Track Name
05 00 01#	0000000a		Target V.Tr.
05 00 02#	0bbbbbbb		abbbbbbb = V.Tr.1-1,,V.Tr.16-16
05 00 03#	20 - 7E		Name - 1 (ASCII)
05 00 04#	20 - 7E		Name - 2
:	:	:	
05 00 12#	20 - 7E		Name - 16

Response 46 Event List (1) - Full Parameter Sequence

Start	address	Data	Contents and remarks
05 00 00	46		Event List (1) - Full Parameter Sequence
05 00 01#	0aaaaaaa		Target V.Tr.
05 00 02#	0bbbbbbb		aaaaaaabbbbbbb = V.Tr.1-1,,V.Tr.16-16, take (=3FFF)

05 00 03#	0aaaaaaa		Packet Number
05 00 04#	0bbbbbbb		aaaaaaabbbbbbb = 0 - 16383
05 00 05#	00 - 7F		Packet Data Buffer
:	:	:	
05 nn mm#			(nn mm = Packet Byte Length - 1)
Data Sequence (Event Parameter)			
00 00 00	000000aa		Event Number
00 00 01	0bbbbbbb		aabbbbbbbccccccc = 0000,,FFFE
00 00 02	0ccccccc		
00 00 03	0aaaaaaa		Start Time
00 00 04	0bbbbbbb		aaaaaaabbbbbbbcccccccdddddd =
00 00 05	0ccccccc		0,,268435455block (1block=16sample)
00 00 06	0ddddddd		
00 00 07	0aaaaaaa		End Time
00 00 08	0bbbbbbb		aaaaaaabbbbbbbcccccccdddddd =
00 00 09	0ccccccc		0,,268435455block (1block=16sample)
00 00 0A	0ddddddd		
00 00 0B	0aaaaaaa		Offset Time
00 00 0C	0bbbbbbb		aaaaaaabbbbbbbcccccccdddddd =
00 00 0D	0ccccccc		0,,268435455block (1block=16sample)
00 00 0E	0ddddddd		
00 00 0F	000000aa		Previous Event
00 00 10	0bbbbbbb		aabbbbbbbccccccc = 0000,,FFFE,
00 00 11	0ccccccc		Termination (=FFFF)
00 00 12	000000aa		Next Event
00 00 13	0bbbbbbb		aabbbbbbbccccccc = 0000,,FFFE,
00 00 14	0ccccccc		Termination (=FFFF)
00 00 15	000000aa		Archive Flag
00 00 16	0bbbbbbb		aabbbbbbbccccccc = 0000,,FFFF
00 00 17	0ccccccc		
00 00 18	000000aa		UNDO Level
00 00 19	0bbbbbbb		aabbbbbbbccccccc = 0000,,FFFF
00 00 1A	0ccccccc		
00 00 1B	0000000a		Target V.Tr.
00 00 1C	0bbbbbbb		abbbbbbb = V.Tr.1-1,,V.Tr.16-16,
00 00 1D	00 - 01		Sub Take ORG, SUB
00 00 1E	000000aa		From Original Event Number of Take List
00 00 1F	0bbbbbbb		aabbbbbbbccccccc = 0000,,FFFE
00 00 20	0ccccccc		
00 00 21	00 - 3B		Time&Date (second) 0,,59
00 00 22	00 - 3B		(minute) 0,,59
00 00 23	00 - 17		(hour) 0,,23
00 00 24	00 - 06		(day) 1,,7
00 00 25	00 - 1E		(date) 1,,31
00 00 26	00 - 0B		(month) 1,,12
00 00 27	000000aa		(year) aabbbbbbbccccccc = 1980,,2079
00 00 28	0bbbbbbb		
00 00 29	0ccccccc		
00 00 2A	20 - 7e		Name - 1 ASCII
00 00 2B	20 - 7e		Name - 2
:	:	:	
00 00 39	20 - 7e		Name - 16

Response 47 Event List (2) - Event Number Sequence

Start	address	Data	Contents and remarks
05 00 00	47		Event List (2) - Event Number Sequence

05 00 01#	0aaaaaaa	Target V.Tr.
05 00 02#	0bbbbbbb	aaaaaaabbbbbbb = V.Tr.1-1,,V.Tr.16-16, take (=3FFF)
05 00 03#	0aaaaaaa	Packet Number
05 00 04#	0bbbbbbb	aaaaaaabbbbbbb = 0 - 16383
05 00 05#	00 - 7F	Packet Data Buffer
:	:	:
05 nn mm#		(nn mm = Packet Byte Length - 1)

Data Sequence		
00 00 00	000000aa	Event Number
00 00 01	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE
00 00 02	0ccccccc	

Response 48 Event List (3) - Event List Pointer: Top,Bottom,Count

Start	address	Data	Contents and remarks
05 00 00	48		Event List (3) - Event List Pointer: Top,Bottom,Count
05 00 01#	0aaaaaaa	Target V.Tr.	
05 00 02#	0bbbbbbb	aaaaaaabbbbbbb = V.Tr.1-1,,V.Tr.16-16, take (=3FFF)	
00 00 03#	000000aa	Event List Top	
00 00 04#	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE,	
00 00 05#	0ccccccc	Termination (=FFFF)	
00 00 06#	000000aa	Event List Bottom	
00 00 07#	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE,	
00 00 08#	0ccccccc	Termination (=FFFF)	
00 00 09#	000000aa	Event List Count	
00 00 0A#	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFF	
00 00 0B#	0ccccccc		

Response 49 Event Parameter

Start	address	Data	Contents and remarks
05 00 00	49		Event Parameter
05 00 01	000000aa	Event Number	
05 00 02	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE	
05 00 03	0ccccccc		
05 00 04	0aaaaaaa	Start Time	
05 00 05	0bbbbbbb	aaaaaaabbbbbbbcccccccddddddd =	
05 00 06	0ccccccc	0,,268435455block (1block=16sample)	
05 00 07	0ddddddd		
05 00 08	0aaaaaaa	End Time	
05 00 09	0bbbbbbb	aaaaaaabbbbbbbcccccccddddddd =	
05 00 0A	0ccccccc	0,,268435455block (1block=16sample)	
05 00 0B	0ddddddd		
05 00 0C	0aaaaaaa	Offset Time	
05 00 0D	0bbbbbbb	aaaaaaabbbbbbbcccccccddddddd =	
05 00 0E	0ccccccc	0,,268435455block (1block=16sample)	
05 00 0F	0ddddddd		
05 00 10	000000aa	Previous Event	
05 00 11	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE,	
05 00 12	0ccccccc	Termination (=FFFF)	
05 00 13	000000aa	Next Event	
05 00 14	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE,	

05 00 15	0ccccccc	Termination (=FFFF)
05 00 16	000000aa	Archive Flag
05 00 17	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFF
05 00 18	0ccccccc	
05 00 19	000000aa	UNDO Level
05 00 1A	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFF
05 00 1B	0ccccccc	
05 00 1C	000000aa	Target V.Tr.
05 00 1D	0bbbbbbb	abbbbbbb = V.Tr.1-1,,V.Tr.16-16,
05 00 1E	00 - 01	Sub Take ORG, SUB
05 00 1F	000000aa	From Original Event Number of Take List
05 00 20	0bbbbbbb	aabbbbbbbccccccc = 0000,,FFFE
05 00 21	0ccccccc	
05 00 22	00 - 3B	Time&Date (second) 0,,59
05 00 23	00 - 3B	(minute) 0,,59
05 00 24	00 - 17	(hour) 0,,23
05 00 25	00 - 06	(day) 1,,7
05 00 26	00 - 1E	(date) 1,,31
05 00 27	00 - 0B	(month) 1,,12
05 00 28	000000aa	(year) aabbbbbbbccccccc = 1980,,2079
05 00 29	0bbbbbbb	
05 00 2A	0ccccccc	
05 00 2B	20 - 7e	Name - 1 ASCII
05 00 2C	20 - 7e	Name - 2
:	:	:
05 00 3A	20 - 7e	Name - 16

●Sync Track Data

Start	address	Data	Contents and remarks
08 00 00	0000aaaa	Sync Track Data 1	
08 00 01	0000bbbb	aaaabbbbccccdddd	
08 00 02	0000cccc		
08 00 03	0000dddd		
08 00 04	0000aaaa	Sync Track Data 2	
08 00 05	0000bbbb	aaaabbbbccccdddd	
08 00 06	0000cccc		
08 00 07	0000dddd		
08 00 08	0000aaaa	Sync Track Data 3	
:	:	:	
0F 7f 7B	0000dddd	Sync Track Data 32767	
0F 7F 7C	0000aaaa	Sync Track Data 32768	
0F 7F 7D	0000bbbb	aaaabbbbccccdddd	
0F 7F 7E	0000cccc		
0F 7F 7F	0000dddd		

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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 stops immediately. If the transport switch [STOP] was pressed, the VS-1680 transmits as the device ID 7FH.

●PLAY (MCS)

Status	Data Byte	Status
F0H	7FH, Dev, 06H, 02H	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
02H	PLAY (MCS)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the playback condition. The VS-1680 does not transmit this message.

●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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the playback condition after the locate operation. If the transport switch [PLAY] was pressed, the VS-1680 transmits as the device ID 7FH.

●FAST FORWARD (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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the fast forward condition. The VS-1680 does not transmit the message.

●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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the rewind condition. The VS-1680 does not transmit the message.

●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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 goes into the following condition.

1. The VS-1680 is in the playback condition. Start Recording the tracks that status are the record standby mode.
2. The VS-1680 is in the stop condition. Start Playing back, and Start Recording the track that status are the record standby mode.

If the transport switch [REC] was pressed out of the recording condition, the VS-1680 transmits as the device ID 7FH.

●RECORD EXIT

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 07H	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
07H	RECORD EXIT
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 exits from the record condition. If the transport switch [REC] was pressed while recording, the VS-1680 transmits as the device ID 7FH.

●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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 resets all communication channels related with MMC. When powered on the VS-1680 transmits as the device ID 7FH.

●WRITE

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 40H, ccH, ddH, eeH, ..., 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
40H	WRITE
ccH	Information Bytes follows the command
ddH	The name of the writable Information Field
eeH	Information Field Format
:	:
ffH	Field names and data
:	:
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 writes the data to the specified information field. The VS-1680 does not transmit the message.

●MASKED WRITE

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 41H, 04H, ddH, eeH, ffH, ggH	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
41H	MASKED WRITE
04H	Number of Bytes follows the command
ddH	The name of the masked type writable Information Field
eeH	Byte number to write in the Bit Map
ffH	Bit location of the bit map byte to change
ggH	New data to write to the specified bit map byte
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 writes the data to the specified bit map byte. The VS-1680 does not transmit the message.

●LOCATE (MCP)

○Format 1 - LOCATE[I/F]

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 44H, 02H, 00H, nnH	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)
02H	Number of Bytes
00H	"I/F" sub command
nnH	Information Field (08H, 09H, 0AH, 0BH, 0CH, 0DH, 0EH, 0FH)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 locates the selected time location stored to the specified information field. The VS-1680 does not transmit the message.

○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)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 locates the specified time location received from the command. If the efficient locate switch [LOC?] or Marker switch [PREVIOUS][NEXT] is pressed, the VS-1680 transmits as the device ID 7FH.

●MOVE

Status	Data Bytes	Status
F0H	7FH, Dev, 06H, 4CH, 02H, ddH, ssH	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
4CH	MOVE
02H	Number of Bytes
ddH	Name of the Efficient Destination Information Field (08H,09H,0AH,0BH,0CH,0DH,0EH,0FH)
ssH	Name of the Efficient Source Information Field (01H)
F7H	EOX (End of System Exclusive Message)

If the device ID on the message was as same as that of the receiving device or 7FH, the VS-1680 transfers the data on the selected source information field to the destination Information Field, if the name of both information fields is efficient. The VS-1680 does not transmit the message.

●The efficient Information Field

The followings are the efficient Information Field on the VS-1680.

The name of the efficient destination Information Field :

01H	SELECTED TIME CODE
08H	GP0 / LOCATE POINT
09H	GP1
0AH	GP2
0BH	GP3
0CH	GP4
0DH	GP5
0EH	GP6
0FH	GP7
4FH	TRACK RECORD READY

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 $aa \times 128 + bb$.
- * 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 $a \times 16 + b$.

<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 $18 \times 128 + 52 = 2356$.

<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 $(10 \times 16 + 3) \times 16 + 9 \times 16 + 13 = 41885$.

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

```

16)1258
  78 ... 10
  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,

$aa + bb + cc + dd + ee + ff = \text{sum}$

$\text{sum} / 128 = \text{quotient and odd}$

When odd is 0, 0 = checksum

When odd is other than 0, $128 - \text{odd} = \text{checksum}$

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

●Commands Recognized

Command	Action
01H STOP	STOP
02H PLAY	PLAY
03H DEFERRED PLAY	PLAY
04H FAST FORWARD	FF
05H REWIND	REW
06H RECORD STROBE	REC / PUNCH IN
07H RECORD EXIT	PUNCH OUT
0DH MMC RESET	RESET
40H WRITE	Write to Information Fields
41H MASKED WRITE	Set Track Status Information Fields
44H 00H LOCATE I/F	LOCATE (Read Locator)
44H 01H LOCATE TARGET	LOCATE (Designated Time)
4CH MOVE	Move between Information fields

●Commands Transmitted

Command	Action
01H STOP	STOP
03H DEFERRED PLAY	PLAY
06H RECORD STROBE	REC / PUNCH IN
07H RECORD EXIT	PUNCH OUT
0DH MMC RESET	RESET
44H 01H LOCATE TARGET	LOCATE

●Valid Information Fields / Response

Information Field	Interpret	Valid Commands
01H SELECTED TIME CODE	Current Time	MOVE (FROM)
08H GP0 / LOCATE POINT	Locator 1	MOVE (FROM), MOVE (TO), WRITE
09H GP1	Locator 2	MOVE (FROM), MOVE (TO), WRITE
0AH GP2	Locator 3	MOVE (FROM), MOVE (TO), WRITE
0BH GP3	Locator 4	MOVE (FROM), MOVE (TO), WRITE
0CH GP4	Locator 5	MOVE (FROM), MOVE (TO), WRITE
0DH GP5	Locator 6	MOVE (FROM), MOVE (TO), WRITE
0EH GP6	Locator 7	MOVE (FROM), MOVE (TO), WRITE
0FH GP7	Locator 8	MOVE (FROM), MOVE (TO), WRITE
4FH TRACK RECORD READY	Track Status	MASKED WRITE, WRITE

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