Roland®

GENERAL MIDI2

Fantom-S
Fantom-S88

Parameter List

Thank you, and congratulations on your choice of the Roland *Fantom-S* / *Fantom-S88* .

Parameter List

Patch Parameter

General Group (Owner's Manual; p. 43)

Parameter		Value
Patch Name	** Specify when writing.*	space, A–Z, a–z, 0–9, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
Patch Category		
Patch Level		0–127
Patch Pan		L64–0–63R
Patch Priority		LAST, LOUDEST
Octave Shift		-3– +3
Patch Coarse Tune		-48– +48
Patch Fine Tune		-50– +50
Stretch Tune Depth		OFF, 1–3
Analog Feel	Analog Feel Depth	0–127
Cutoff Offset		-63– +63
Resonance Offset		-63– +63
Attack Time Offset		-63– +63
Release Time Offset		-63– +63
Velocity Sens Offset		-63– +63

Wave Group (Owner's Manual; p. 45)

Parameter		Value
Wave Group		INT, EXP, SAMP, MSAM
Wave Bank		When the wave group is EXP: A–D, When the wave group is SAMP: PRST, USER, CARD, When the wave group is MSAM: USER, CARD
Wave No. L (Mono)	Wave Number L (Mono)	----, 1–1228 (The upper limit will depend on the wave group.)
Wave No. R	Wave Number R	----, 1–1228 (The upper limit will depend on the wave group.)
Wave Gain		-6, 0, +6, +12
Wave Tempo Sync		OFF, ON
FXM Switch		OFF, ON
FXM Color		1–4
FXM Depth		0–16

TMT Group (Owner's Manual; p. 46)

Parameter		Value
Structure Type 1 & 2, 3 & 4		1–10
Booster 1 & 2, 3 & 4	Booster Gain 1 & 2, 3 & 4	0, +6, +12, +18
Key Fade Lower	Keyboard Fade Width Lower	0–127
Key Range Lower	Keyboard Range Lower	C-1–UPPER
Key Range Upper	Keyboard Range Upper	LOWER–G9
Key Fade Upper	Keyboard Fade Width Upper	0–127
TMT Velocity Control	TMT Velocity Control Switch	OFF, ON, RANDOM, CYCLE
Velo Fade Lower	Velocity Fade Width Lower	0–127
Velo Range Lower	Velocity Range Lower	1–UPPER
Velo Range Upper	Velocity Range Upper	LOWER–127
Velo Fade Upper	Velocity Fade Width Upper	0–127
TMT Control Sw	TMT Control Switch	OFF, ON

Pitch Group (Owner's Manual; p. 49)

Parameter		Value
Tone Coarse Tune		-48– +48
Tone Fine Tune		-50– +50
Random Pitch Depth		0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200
Pitch Key Follow		-200, -190, -180, -170, -160, -150, -140, -130, -120, -110, -100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100, +110, +120, +130, +140, +150, +160, +170, +180, +190, +200
Bend Range Up	Pitch Bend Range Up	0– +48
Bend Range Down	Pitch Bend Range Down	-48–0
P-Env V-Sens	Pitch Envelope Velocity Sensitivity	-63– +63
P-Env T1 V-Sens	Pitch Envelope Time 1 Velocity Sensitivity	-63– +63
P-Env T4 V-Sens	Pitch Envelope Time 4 Velocity Sensitivity	-63– +63
P-Env Time KF	Pitch Envelope Time Key Follow	-100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100

Pitch Env Group (Owner's Manual; p. 50)

Parameter		Value
P-Env Depth	Pitch Envelope Depth	-12– +12
P-Env Time1–4	Pitch Envelope Time 1–4	0–127
P-Env Level0–4	Pitch Envelope Level 0–4	-63– +63

TVF Group (Owner's Manual; p. 50)

Parameter		Value
Filter Type		OFF, LPF BPF, HPF, PKG, LPF2, LPF3
Cutoff Frequency		0–127
Resonance		0–127
Cutoff Key Follow	Cutoff Frequency Key follow	-200, -190, -180, -170, -160, -150, -140, -130, -120, -110, -100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100, +110, +120, +130, +140, +150, +160, +170, +180, +190, +200
Cutoff V-Curve	Cutoff Frequency Velocity Curve	FIXED, 1–7
Cutoff V-Sens	Cutoff Velocity Sensitivity	-63– +63
Resonance V-Sens	Resonance Velocity Sensitivity	-63– +63
F-Env V-Curve	TVF Envelope Velocity Curve	FIXED, 1–7
F-Env V-Sens	TVF Envelope Velocity Sensitivity	-63– +63
F-Env T1 V-Sens	TVF Envelope Time 1 Velocity Sensitivity	-63– +63
F-Env T4 V-Sens	TVF Envelope Time 4 Velocity Sensitivity	-63– +63

TVF Env Group (Owner's Manual; p. 52)

Parameter		Value
F-Env Depth	TVF Envelope Depth	-63– +63
F-Env Time KF	TVF Envelope Time Key Follow	-100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100
F-Env Time1–4	TVF Envelope Time 1–4	0–127
F-Env Level 0–4	TVF Envelope Level 0–4	0–127

Parameter List

TVA Group (Owner's Manual; p. 53)

Parameter		Value
Tone Level		0–127
Level V-Curve	TVA Level Velocity Curve	FIXED, 1–7
Level V-Sens	TVA Level Velocity Sensitivity	-63– +63
Bias Level		-100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100
Bias Position		C-1–G9
Bias Direction		LOWER, UPPER, LO&UP, ALL
Tone Pan		L64–0–63R
Pan Key follow		-100– +100
Random Pan Depth		0–63
Alter Pan Depth	Alternate Pan Depth	L63–0–63R

TVA Env Group (Owner's Manual; p. 54)

Parameter		Value
A-Env T1 V-Sens	TVA Envelope Time 1 Velocity Sensitivity	-63– +63
A-Env T4 V-Sens	TVA Envelope Time 4 Velocity Sensitivity	-63– +63
A-Env Time KF	TVA Envelope Time Key Follow	-100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100
A-Env Time1–4	TVA Envelope Time 1–4	0–127
A-Env Level1–3	TVA Envelope Level 1–3	0–127

Output Group (Owner's Manual; p. 55)

Parameter		Value
Patch Out Assign	Patch Output Assign	MFX, A, B, 1–4, TONE
Tone Out Assign	Tone Output Assign	MFX, A, B, 1–4
Tone Out Level	Tone Output Level	0–127
Tone Chorus Send (Send Level (Output=MFX))	Tone Chorus Send Level	0–127
Tone Reverb Send (Send Level (Output=MFX))	Tone Reverb Send Level	0–127
Tone Chorus Send (Send Level (Output=non MFX))	Tone Chorus Send Level	0–127
Tone Reverb Send (Send Level (Output=non MFX))	Tone Reverb Send Level	0–127

LFO1/2 Group (Owner's Manual; p. 56)

Parameter		Value
Waveform	LFO1/LFO2 Waveform	SIN, TRI, SAW-U, SAW-D, SQR, RND, BND-U, BND-D, TRP S&H, CHAOS, VSIN, STEP
Rate	LFO1/LFO2 Rate	0–127, Note
Rate Detune	LFO1/LFO2 Rate Detune	0–127
Offset	LFO1/LFO2 Offset	-100, -50, 0, +50, +100
Delay Time	LFO1/LFO2 Delay Time	0–127
Delay Time KF	LFO1/LFO2 Delay Time Key Follow	-100, -90, -80, -70, -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, +100
Fade Mode	LFO1/LFO2 Fade Mode	ON <, ON >, OFF <, OFF >
Fade Time	LFO1/LFO2 Fade Time	0–127
Key Trigger	LFO1/LFO2 Key Trigger	OFF, ON
Pitch Depth	LFO1/LFO2 Pitch Depth	-63– +63
TVF Depth	LFO1/LFO2 TVF Depth	-63– +63
TVA Depth	LFO1/LFO2 TVA Depth	-63– +63
Pan Depth	LFO1/LFO2 Pan Depth	-63– +63

Step LFO Group (Owner's Manual; p. 57)

Parameter		Value
Step Type	LFO Step Type	TYPE 1, TYPE 2
Step 1–16	LFO Step1–16	-36– +36

Solo/Porta Group (Owner's Manual; p. 58)

Parameter		Value
Mono/Poly		MONO, POLY
Legato Switch		OFF, ON
Legato Retrigger	Legato Retrigger Switch	OFF, ON
Portamento Switch		OFF, ON
Portamento Mode		NORMAL, LEGATO
Portamento Type		RATE, TIME
Portamento Start		PITCH, NOTE
Portamento Time		0–127

Misc Group (Owner's Manual; p. 60)

Parameter		Value
Tone Delay Mode		NORM, HOLD, OFF-N, OFF-D
Tone Delay Time		0–127, Note
Tone Env Mode		NO SUS, SUST
Tone Rx Bender	Tone Receive Pitch Bend Switch	OFF, ON
Tone Rx Expression	Tone Receive Expression Switch	OFF, ON
Tone Rx Hold-1	Tone Receive Hold Switch	OFF, ON
Tone Rx Pan Mode	Tone Receive Pan Mode	CONT, K-ON
Tone Redamper Sw	Tone Redamper Switch	OFF, ON

CTRL 1–4 Group (Owner's Manual; p. 61)

Parameter		Value
Matrix Control 1–4 Source		OFF, CC01–31, 33–95, PITCH BEND, AFTERTOUCH, SYS CTRL1–SYS CTRL4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PITCH ENV, TVF ENV, TVA ENV
CTRL Destination 1–4	Matrix Control Destination 1–4	OFF, PITCH, CUTOFF, RESONANCE, LEVEL, PAN, OUTPUT LEVEL, CHORUS SEND, REVERB SEND, LFO1 PITCH DEPTH, LFO2 PITCH DEPTH, LFO1 TVF DEPTH, LFO2 TVF DEPTH, LFO1 TVA DEPTH, LFO2 TVA DEPTH, LFO1 PAN DEPTH, LFO2 PAN DEPTH, LFO1 RATE, LFO2 RATE, PIT ENV A-TIME, PIT ENV D-TIME, PIT ENV R-TIME, TVF ENV A-TIME, TVF ENV D-TIME, TVF ENV R-TIME, TVA ENV A-TIME, TVA ENV D-TIME, TVA ENV R-TIME, TMT, FXM DEPTH, MFX CTRL1, MFX CTRL2, MFX CTRL3, MFX CTRL4, TIME
CTRL Sens 1–4	Matrix Control Sens 1–4	-63– +63
CTRL Switch 1–4	Tone Control Switch 1–4	OFF, ON, REVERSE

Effect Group (Owner's Manual; p. 175)

Parameter		Value
MFX		
Type	Multi-Effects Type	00 THROUGH–77 CHORUS->FLANGER (Fantom-S), 78 SYMPATHETIC RESONANCE (Fantom-S88)
MFX Output Level	Multi-Effects Output Level	0–127
MFX Chorus Send Level	Multi-Effects Chorus Send Level	0–127
MFX Reverb Send Level	Multi-Effects Reverb Send Level	0–127
MFX Output Assign	Multi-Effects Output Assign	A, B
Source 1–4	Multi-Effects Control Source 1–4	OFF, CC01–31, 33–95, PITCH BEND, AFTERTOUCH, SYS CTRL1–SYS CTRL4
Destination 1–4	Multi-Effects Control Destination 1–4	
Sens 1–4	Multi-Effects Control Sens 1–4	-63– +63
Chorus		
Chorus Type		0 (Off), 1 (Chorus), 2 (Delay), 3 (GM2 Chorus)
Chorus Output Select		MAIN, REV, M+R
Chorus Level		0–127
Chorus Output Assign		A, B
Reverb		
Reverb Type		0 (Off), 1 (Reverb), 2 (SRV Room), 3 (SRV Hall), 4 (SRV Plate), 5 (GM2 Reverb)
Reverb Level		0–127
Reverb Output Assign		A, B

Rhythm Set Parameter

General Group (Owner's Manual; p. 67)

Parameter		Value
Rhythm Set Name	** Specify when writing.*	space, A–Z, a–z, 0–9, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
Rhythm Tone Name		space, A–Z, a–z, 0–9, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
Rhythm Level	Rhythm Set Level	0–127
Assign Type		MULTI, SINGLE
Mute Group		OFF, 1–31
Tone Env Mode	Rhythm Tone Envelope Mode	NO-SUS, SUSTAIN
Tone Pitch Bend Range	Rhythm Tone Pitch Bend Range	0–48
Tone Receive Expression	Rhythm Tone Receive Expression Switch	OFF, ON
Tone Receive Hold-1	Rhythm Tone Receive Hold-1 Switch	OFF, ON
Tone Receive Pan Mode	Rhythm Tone Receive Pan Mode	CONTINUOUS, KEY-ON
One Shot Mode		OFF, ON
Aftertouch Time Ctrl Sens	Aftertouch Time Control Sensitivity	-63– +63

Wave Group (Owner's Manual; p. 68)

Parameter		Value
Wave Group		INT, EXP, SAMP, MSAM
Wave Bank		When the wave group is EXP: A–D, When the wave group is SAMP: PRST, USER, CARD, When the wave group is MSAM: USER, CARD
Wave No. L (Mono)	Wave Number L (Mono)	----, 1–1228 (The upper limit will depend on the wave group.)
Wave No. R	Wave Number R	----, 1–1228 (The upper limit will depend on the wave group.)
Wave Gain		-6, 0, +6, +12
Wave Tempo Sync		OFF, ON
FXM Switch		OFF, ON
FXM Color		1–4
FXM Depth		0–16

WMT Group (Owner's Manual; p. 70)

Parameter		Value
Wave Coarse Tune		-48– +48
Wave Fine Tune		-50– +50
Wave Level		0–127
Wave Pan		L64–0–63R
Wave Rnd Pan Sw	Wave Random Pan Switch	OFF, ON
Wave Alter Pan Sw	Wave Alternate Pan Switch	OFF, ON, REVS
WMT Velocity Control	Velocity Control Switch	OFF, ON, RANDOM
Velo Fade Lower	Velocity Fade Width Lower	0–127
Velo Range Lower	Velocity Range Lower	1–UPPER
Velo Range Upper	Velocity Range Upper	LOWER–127
Velo Fade Upper	Velocity Fade Width Upper	0–127

Pitch Group (Owner's Manual; p. 71)

Parameter		Value
Tone Coarse Tune	Rhythm Tone Coarse Tune	C-1–G9
Tone Fine Tune	Rhythm Tone Fine Tune	-50– +50
Tone Random Pitch Depth		0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200

Parameter List

Pitch Env Group (Owner's Manual; p. 71)

Parameter		Value
P-Env Depth	Pitch Envelope Depth	-12– +12
P-Env V-Sens	Pitch Envelope Velocity Sensitivity	-63– +63
P-Env T1 V-Sens	Pitch Envelope Time 1 Velocity Sensitivity	-63– +63
P-Env T4 V-Sens	Pitch Envelope Time 4 Velocity Sensitivity	-63– +63
P-Env Time1–4	Pitch Envelope Time 1–4	0–127
P-Env Level 0–4	Pitch Envelope Level 0–4	-63– +63

TVF Group (Owner's Manual; p. 72)

Parameter		Value
Filter Type		OFF, LPF BPF, HPF, PKG, LPF2, LPF3
Cutoff Frequency		0–127
Resonance		0–127
Cutoff V-Curve	Cutoff Frequency Velocity Curve	FIXED, 1–7
Cutoff V-Sens	Cutoff Velocity Sensitivity	-63– +63
Resonance V-Sens	Resonance Velocity Sensitivity	-63– +63

TVF Env Group (Owner's Manual; p. 73)

Parameter		Value
F-Env Depth	TVF Envelope Depth	-63– +63
F-Env V-Curve	TVF Envelope Velocity Curve	FIX, 1–7
F-Env V-Sens	TVF Envelope Velocity Sensitivity	-63– +63
F-Env T1 V-Sens	TVF Envelope Time 1 Velocity Sensitivity	-63– +63
F-Env T4 V-Sens	TVF Envelope Time 4 Velocity Sensitivity	-63– +63
F-Env Time1–4	TVF Envelope Time 1–4	0–127
F-Env Level0–4	TVF Envelope Level 0–4	0–127

TVA Group (Owner's Manual; p. 74)

Parameter		Value
Tone Level	Rhythm Tone level	0–127
Level V-Curve	Level Velocity Curve	FIXED, 1–7
Level V-Sens	Level Velocity Sensitivity	-63– +63
Tone Pan	Rhythm Tone Pan	L64–0–63R
Random Pan Depth		0–63
Alternate Pan Depth		L63–0–63R

TVA Env Group (Owner's Manual; p. 74)

Parameter		Value
A-Env T1 V-Sens	TVA Envelope Time 1 Velocity Sensitivity	-63– +63
A-Env T4 V-Sens	TVA Envelope Time 4 Velocity Sensitivity	-63– +63
A-Env Time1–4	TVA Envelope Time 1–4	0–127
A-Env Level1–3	TVA Envelope Level 1–3	0–127

Output Group (Owner's Manual; p. 75)

Parameter		Value
Rhythm Out Assign	Rhythm Output Assign	MFX, A, B, 1–4, TONE
Tone Out Assign	Tone Output Assign	MFX, A, B, 1–4
Tone Out Level	Tone Output Level	0–127
Tone Chorus Send (Send Level (Output=MFX))	Tone Chorus Send Level	0–127
Tone Reverb Send (Send Level (Output=MFX))	Tone Reverb Send Level	0–127
Tone Chorus Send (Send Level (Output=non MFX))	Tone Chorus Send Level	0–127
Tone Reverb Send (Send Level (Output=non MFX))	Tone Reverb Send Level	0–127

Effect Group (Owner's Manual; p. 175)

Parameter		Value
MFX		
Type	Multi-Effects Type	00 THROUGH–77 CHORUS->FLANGER (Fantom-S), 78 SYMPATHETIC RESONANCE (Fantom-S88)
MFX Output Level	Multi-Effects Output Level	0–127
MFX Chorus Send Level	Multi-Effects Chorus Send Level	0–127
MFX Reverb Send Level	Multi-Effects Reverb Send Level	0–127
MFX Output Assign	Multi-Effects Output Assign	A, B
Source 1–4	Multi-Effects Control Source 1–4	OFF, CC01–31, 33–95, PITCH BEND, AFTERTOUCH, SYS CTRL1–SYS CTRL4
Destination 1–4	Multi-Effects Control Destination 1–4	
Sens 1–4	Multi-Effects Control Sens 1–4	-63– +63
Chorus		
Chorus Type		0 (Off), 1 (Chorus), 2 (Delay), 3 (GM2 Chorus)
Chorus Output Select		MAIN, REV, M+R
Chorus Level		0–127
Chorus Output Assign		A, B
Reverb		
Reverb Type		0 (Off), 1 (Reverb), 2 (SRV Room), 3 (SRV Hall), 4 (SRV Plate), 5 (GM2 Reverb)
Reverb Level		0–127
Reverb Output Assign		A, B

Performance Parameter

General Group (Owner's Manual; p. 96)

Parameter		Value
Performance Name	** Specify when writing.*	space, A–Z, a–z, 0–9, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }

Part View Group (Owner's Manual; p. 84)

Parameter		Value
[1 (Level/Pan)]		
Patch Type		Patch, Rhythm
Patch Bank		USER, PR-A–E (F;Fantom-S88), GM, CARD, XP-A–D
Patch Number		001–
Keyboard Switch		OFF, ON
Solo Switch		OFF, ON
Mute Switch		OFF, ON
Part Level		0–127
Part Pan		L64–0–63R
[2 (Output Effect)]		
Part Output Assign		MFX, A, B, 1–4, PATCH
Part Output MFX Select		1–3 (MFX-1–MFX-3)
Part Output Level		0–127
Part Chorus Send Level		0–127
Part Reverb Send Level		0–127
MFX1–3 Source		OFF, ON
Chorus Source		OFF, ON
Reverb Source		OFF, ON
[3 (Pitch)]		
Part Octave Shift		-3– +3
Part Coarse Tune		-48– +48
Part Fine Tune		-50– +50
Part Mono/Poly		MONO, POLY, PATCH
Part Legato Switch		OFF, ON, PATCH
Part Pitch Bend Range		0–24, PATCH
Part Portamento Switch		OFF, ON, PATCH
Part Portamento Time		0–127, PATCH
[4 (Offset)]		
Part Cutoff Offset		-64– +63
Part Resonance Offset		-64– +63
Part Attack Time Offset		-64– +63
Part Release Time Offset		-64– +63
Part Decay Time Offset		-64– +63
[5 (Key Range)]		
Keyboard Range Lower		C-1–UPPER
Keyboard Range Upper		LOWER–G9
Part Velocity Sens Offset		-63– +63
Part Vibrato Rate		-64– +63
Part Vibrato Depth		-64– +63
Part Vibrato Delay		-64– +63
Voice Reserve		0–63, FULL
[6 (Scale Tune)]		
C–B	Part Scale Tune C–B	-64– +63
[7 (External)]		
Receive Switch		OFF, ON
Receive Channel		1–16
External Bank Select MSB		0–127, OFF
External Bank Select LSB		0–127
External Program Number	External Program Change Number	1–128, OFF
External Level		0–127, OFF
External Pan		L64–0–63R, OFF

Parameter		Value
[8 (MIDI Filter)]		
Program Change	Receive Program Change Switch	OFF, ON
Bank Select	Receive Bank Select Switch	OFF, ON
Pitch Bend	Receive Pitch Bend Switch	OFF, ON
Polyphonic Key Pressure	Receive Polyphonic Key Pressure Switch	OFF, ON
Channel Pressure	Receive Channel Pressure Switch	OFF, ON
Modulation	Receive Modulation Switch	OFF, ON
Volume	Receive Volume Switch	OFF, ON
Pan	Receive Pan Switch	OFF, ON
Expression	Receive Expression Switch	OFF, ON
Hold-1	Receive Hold 1 Switch	OFF, ON
Phase Lock	Phase Lock Switch	OFF, ON
Velocity Curve		OFF, 1–4

Control Setting Group (Owner's Manual; p. 91)

Parameter		Value
Ctrl Switch		
Control Bender	Control Pitch Bend Switch	OFF, ON
Control Aftertouch	Control Aftertouch Switch	OFF, ON
Control Modulation	Control Modulation Switch	OFF, ON
Control Hold Pedal	Control Hold Pedal Switch	OFF, ON
Control Pedal	Control Pedal Switch	OFF, ON
Control D Beam	Control D Beam Switch	OFF, ON
Control Knob 1–4	Control Knob Switch	OFF, ON
D Beam (Pad Trigger)		
Pad Number		1–16
Pad Velocity		1–127
Pad Control Mode		MOMENTARY, LATCH
D Beam (Assignable)		
Type	Assignable Type	CC01–31, 33–95, Bend Up, Bend Down, Start/Stop, Tap Tempo, Arp Grid, Arp Duration, Arp Motif, Arp Octave Up, Arp Octave Down
Range Min		0–127
Range Max		0–127
Knob		
Knob 1–4 Assign	Realtime Control Knob Assign 1–4	CC01–31, 33–95, Pitch Bend, Aftertouch, Arp Style, Arp Grid, Arp Duration, Arp Motif, Chord Form, Master Level
Switch		
Switch 1/2 Assign	Assignable Switch 1/2	Transpose Down, Transpose Up, Tap Tempo, Mono/Poly, Portamento, Hold, MFX1–3 Sw, Chorus Sw, Reverb Sw, Mastering Sw, Loop, Rhythm Start/Stop
Tempo		
Recommended Tempo		20–250
MFX Ctrl Ch		
MFX1–3 Control Channel		1–16, OFF

Pad Setting Group (Owner's Manual; p. 136)

Parameter		Value
Pad Set		User, Note, Rhythm
Base	Pad Base Note	C-1–G9
Pad Part		1–16
Note	Pad Note	C-1–G9
Velocity	Pad Velocity	REAL, 1–127

Parameter List

Arpeggio Group (Owner's Manual; p. 104)

Parameter		Value
Arp/Rhy Switch	Arpeggio/Rhythm Switch	OFF, ON
Arp Grid	Arpeggio Grid	1/4 (♩), 1/8 (♪), 1/8 (♪) L, 1/8 (♪) H, 1/12 (♪3), 1/16 (♬), 1/16 (♬) L, 1/16 (♬) H, 1/24 (♬3)
Arp Duration	Arpeggio Duration	30, 40, 50, 60, 70, 80, 90,100, 120, FULL
Arpeggio Switch		OFF, ON
Arpeggio Hold		OFF, ON
Arpeggio Style		U001–U128, P001–P128
Arpeggio Motif		Up (L), Up (L&H), Up (_), Down (L), Down (L&H), Down (_), Up&Down, Up&Down (L&H), Up&Down (_), Random (L), Random (_), Phrase
Arpeggio Velocity		REAL, 1–127
Arpeggio Part		1–16
Arpeggio Octave Range		-3– +3
Arpeggio Accent Rate		0–100

Rhythm Group (Owner's Manual; p. 112)

Parameter		Value
Arp/Rhy Switch	Arpeggio/Rhythm Switch	OFF, ON
Rhythm Pattern Grid		1/4 (♩), 1/8 (♪), 1/8 (♪) L, 1/8 (♪) H, 1/12 (♪3), 1/16 (♬), 1/16 (♬) L, 1/16 (♬) H, 1/24 (♬3)
Rhythm Pattern Duration		30, 40, 50, 60, 70, 80, 90, 100, 120, FULL
Rhythm Pattern Switch		OFF, ON
Rhythm Pattern Velocity		REAL, 1–127
Rhythm Pattern Accent Rate		0–100
Rhythm Group Number		U01–U32, P01–P32

Chord Memory Group (Owner's Manual; p. 110)

Parameter		Value
Chord Switch		OFF, ON
Chord Form		U01–U64, P01–P64

Effect Group (Owner's Manual; p. 178)

Parameter		Value
MFX		
Structure Type		1–16
MFX Type	Multi-Effects Type	0–77 (Fantom-S88;78)
MFX Output Level	Multi-Effects Output Level	0–127
MFX Chorus Send Level	Multi-Effects Chorus Send Level	0–127
MFX Reverb Send Level	Multi-Effects Reverb Send Level	0–127
MFX Output Assign	Multi-Effects Output Assign	A, B
Source 1–4	Multi-Effects Control Source 1–4	OFF, CC01–31, 33–95, PITCH BEND, AFTERTOUCH, SYS CTRL1–SYS CTRL4
Destination 1–4	Multi-Effects Control Destination 1–4	
Sens 1–4	Multi-Effects Control Sens 1–4	-63– +63
MFX Control Channel	Multi-Effects Control Channel	1–16, OFF
MFX-1–3 Source	Multi-Effects 1–3 Source	PRF, P1–P16
Chorus		
Chorus Type		0 (Off), 1 (Chorus), 2 (Delay), 3 (GM2 Chorus)
Chorus Output Select		MAIN, REV, MAIN+REV
Chorus Level		0–127
Chorus Output Assign		A, B
Chorus Source		PRF, P1–P16
Reverb		
Reverb Type		0 (Off), 1 (Reverb) 2 (SRV Room), 3 (SRV Hall) 4 (SRV Plate), 5 (GM2 Reverb)
Reverb Level		0–127
Reverb Output Assign		A, B
Reverb Source		PRF, P1–P16

Rhythm Group Parameter

Rhythm Group Group (Owner's Manual; p. 116)

Parameter		Value
Recommended Rhy	Recommended Rhythm Set	USER, PR-A–E (F;Fantom-S88), GM, CARD, XP-A–D
Pad Mode		OFF, NOTE, PATTERN
Rhy Ptn Number	Rhythm Pattern Number	U001–U256, P001–P256
Rhy Ptn Velocity	Rhythm Pattern Velocity	REAL, 1–127
Pad Note		C-1–G9
Pad Velocity		REAL, 1–127

Sample Parameters

Sample Group (Owner's Manual; p. 125)

Parameter		Value
Sample Name		space, A–Z, a–z, 0–9, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
Loop Mode		FWD, ONE-SHOT, REV, REV-ONE
Loop Tune		-50– +50
Original Key		0 (C-1) –127 (G9)
BPM	tempo	5.00–300.00
Time Stretch Type		TYPE01–TYPE10
Start Fine		0–255
Loop Start Fine		0–255
Loop End Fine		0–255

System Parameters

Pedal/D Beam Group (Owner's Manual; p. 189)

Parameter		Value
D Beam Sens	D Beam Sensitivity	0–127
Control Pedal Assign		CC01–31, 33–95, BEND-UP, BEND-DOWN, AFT, OCT-UP, OCT-DOWN, START/STOP, PUNCH-I/O, TAP-TEMPO, PROG-UP, PROG-DOWN, FAV-UP, FAV-DOWN, ARP-RHY-SW, RHY-START-STOP, CHD-SW
Control Pedal Polarity		STANDARD, REVERSE
Hold Pedal Polarity		STANDARD, REVERSE
Continuous Hold Pedal		OFF, ON

Keyboard Group (Owner's Manual; p. 189)

Parameter		Value
Keyboard Velocity		REAL, 1–127
Keyboard Sens	Keyboard Sensitivity	LIGHT, MEDIUM, HEAVY
Aftertouch Sens	Aftertouch Sensitivity	0–100

System Ctrl Group (Owner's Manual; p. 190)

Parameter		Value
Sys Ctrl 1–4 Source	System Control1–4 Source	OFF, CC01–31, 33–95, BEND, AFT

Screen Saver Group (Owner's Manual; p. 190)

Parameter		Value
Screen Saver Type		1–10
Screen Saver Time		OFF, 5–60 min

Background Group (Owner's Manual; p. 190)

Parameter		Value
Background Picture		1–10

Sync/Tempo Group (Owner's Manual; p. 190)

Parameter		Value
Sync Mode		MASTER, SLAVE-MIDI, SLAVE-MTC, REMOTE
Sync Output	Sync Output switch	OFF, ON
Tempo Override		OFF, ON
Arp/Rhythm Sync Switch	Arpeggio/Rhythm Sync Switch	OFF, ON
MMC Mode		MASTER, SLAVE
MMC Output	MMC Output switch	OFF, ON
MTC Sync Output	MTC Sync Output switch	OFF, ON
MTC Frame Rate		24, 25, 29N, 29D, 30
MTC Offset Time Hour		0–23 hours
MTC Offset Time Minute		0–59 minutes
MTC Offset Time Second		0–59 seconds
MTC Offset Time Frame		0–29 frames
MTC Error Level		0 –10

Metronome Group (Owner's Manual; p. 192)

Parameter		Value
Metronome Mode		OFF, PLAY-ONLY, REC-ONLY, PLAY&REC, ALWAYS
Metronome Level		0–10
Metronome Sound		TYPE 1, TYPE 2, TYPE 3, TYPE 4

MIDI Group (Owner's Manual; p. 192)

Parameter		Value
Device ID	Device ID Number	17–32
Performance Control Channel		1–16, OFF
Kbd Patch Rx/Tx Ch	Keyboard Patch Receive/Transmit Channel	1–16
Pad Patch Rx/Tx Ch	Pad Patch Receive/Transmit Channel	1–16
Transmit Program Change	Transmit Program Change Switch	OFF, ON
Transmit Bank Select	Transmit Bank Select Switch	OFF, ON
Transmit Active Sensing	Transmit Active Sensing Switch	OFF, ON
Transmit Edit Data	Transmit Edit Data Switch	OFF, ON
Soft Through	Soft Through Switch	OFF, ON
Remote Keyboard Sw	Remote Keyboard Switch	OFF, ON
Receive Program Change	Receive Program Change Switch	OFF, ON
Receive Bank Select	Receive Bank Select Switch	OFF, ON
Receive Exclusive	Receive System Exclusive Switch	OFF, ON
Receive GM System On	Receive GM System On Switch	OFF, ON
Receive GM2 System On	Receive GM2 System On Switch	OFF, ON
Receive GS Reset	Receive GS Reset Switch	OFF, ON

Sound (Owner's Manual; p. 193)

Parameter		Value
Local Switch		OFF, ON
Master Tune		415.3–466.2 Hz
Master Level		0–127
Output Gain		-12– +12 dB
Mix/Parallel		MIX, PARALLEL
Master Key Shift		-24– +24
Patch Remain	Patch Remain Switch	OFF, ON

Preview Group (Owner's Manual; p. 194)

Parameter		Value
Preview Mode		SINGLE, CHORD, PHRASE
Preview 1–4 Note Number		C-1–G9
Preview 1–4 Velocity		OFF, 1–127

Scale Tune Group (Owner's Manual; p. 194)

Parameter		Value
Scale Tune Switch		OFF, ON
Patch Scale Tune for C–B		-64– +63

Parameter List

Sampling Group (Owner's Manual; p. 195)

Parameter		Value
Default File Type		WAV, AIFF
Pre Sample Time		0–1000 ms
Trigger Level		0–7
Gap Time		500, 1000, 1500, 2000 ms
External Source Select		LINE-L-R, LINE-L, MIC
Trimming Switch		OFF, ON
Skip Back Time		5s–40s

Startup Group (Owner's Manual; p. 195)

Parameter		Value
Preset Default Load		OFF, ON
Sample Default Load		OFF, ON
Power Up Mode		PATCH, PERFORMANCE
SRX/RAM Mode		4 SRX/192MB Max, 2 SRX/288MB Max

System Information Group (Owner's Manual; p. 195)

Parameter	
Features	Displays the main features of the Fantom-S.
Memory Info	Memory Information
SRX Info	SRX Information
Version Info	Version Information

D Beam (Solo Synth) Group (Owner's Manual; p. 100)

Parameter		Value
OSC1/2 Waveform		SAW, SQR
OSC1/2 Pulse Width		0–127
OSC1/2 Coarse Tune		-48– +48
OSC1/2 Fine Tune		-50– +50
OSC2 Level		0–127
OSC Sync Switch		OFF, ON
Filter Type		OFF, LPF, BPF, HPF, PKG
Cutoff		0–127
Resonance		0–127
Level		0–127
Chorus Send Level		0–127
Reverb Send Level		0–127
LFO Rate		0–127
LFO Osc 1 Pitch Depth		-63– +63
LFO Osc 2 Pitch Depth		-63– +63
LFO Osc 1 Pulse Width Depth		-63– +63
LFO Osc 2 Pulse Width Depth		-63– +63
Range	Solo Synth Range	2 OCTAVE, 4 OCTAVE, 8 OCTAVE

Mastering Effect Group (Owner's Manual; p. 183)

Parameter		Value
HIGH/MID/LOW ATTACK		0–100 ms
HIGH/MID/LOW RELEASE		50–5000 ms
HIGH/MID/LOW THRESHOLD		-36–0 dB
HIGH/MID/LOW RATIO		1.00:1–INF:1 (INF: Infinity)
HIGH/MID/LOW LEVEL		0–24 dB
Split Frequency High		2000–8000 Hz
Split Frequency Low		200–800 Hz

Input Setting Group (Owner's Manual; p. 118)

Parameter		Value
Input Select		LINE IN L/R, LINE IN L, MICROPHONE
Mix-In		ON, OFF
Ext Output Assign		DRY, MFX
Ext Output Level		0–127
Ext Chorus Send Level		0–127
Ext Reverb Send Level		0–127
Input Effect Switch		ON, OFF
Input Effect Type		EQ, ENHANCER, COMP, LIMITER, NOISE SUP, C CANCELER

V-LINK Group (Owner's Manual; p. 201)

Parameter		Value
Note Tx Ch	Note Transmit Channel	1–16
Clip 1 Note No.	Clip 1 Note Number	0 (C-1)–127 (G9)
Play Speed Ctrl	Play Speed Control	0.0-1.0-2.0, 0.5-1.0-2.0, 0.0-1.0-4.0, 0.5-1.0-4.0, 0.0-1.0-8.0, 0.5-1.0-8.0, 0.0-1.0-16.0, 0.5-1.0-16.0, 0.0-1.0-32.0, 0.5-1.0-32.0, 0.0-2.0-4.0, 0.0-4.0-8.0, 0.0 8.0-16.0, 0.0-16.0-32.0, -2.0-1.0-4.0, -6.0-1.0-8.0
Dissolve Time		OFF, CC1, CC5, CC7, CC10, CC11, CC71–74, CC91–93, Channel Aftertouch
Ctrl Tx Ch	Control Transmit Channel	1–16
Color Cb Ctrl	Color Cb Control	OFF, CC1, CC5, CC7, CC10, CC11, CC71–74, CC91–93, Channel Aftertouch
Color Cr Ctrl	Color Cr Control	OFF, CC1, CC5, CC7, CC10, CC11, CC71–74, CC91–93, Channel Aftertouch
Brightness Ctrl	Brightness Control	OFF, CC1, CC5, CC7, CC10, CC11, CC71–74, CC91–93, Channel Aftertouch
VFX Ctrl	VFX Control	OFF, CC1, CC5, CC7, CC10, CC11, CC71–74, CC91–93, Channel Aftertouch
PAD MODE		CLIP, PALETT
Local Sw	Local Switch	OFF, ON
CLIP FILTER 1–32		OFF, ON

D Beam (Assignable) Group (Owner's Manual; p. 98)

* *If Patch mode is selected, this is saved as part of the system settings.*

Parameter		Value
Type	Assignable Type	CC01–31, 33–95, Bend Up, Bend Down, Start/Stop, Tap Tempo, Arp Grid, Arp Duration, Arp Motif, Arp Octave Up, Arp Octave Down
Range Min		0–127
Range Max		0–127

Knob Group (Owner's Manual; p. 101)

* *If Patch mode is selected, this is saved as part of the system settings.*

Parameter		Value
Knob 1–4 Assign	Realtime Control Knob Assign 1–4	CC01–31, 33–95, Pitch Bend, Aftertouch, Arp Style, Arp Grid, Arp Duration, Arp Motif, Chord Form, Master Level

Switch Group (Owner's Manual; p. 102)

* *If Patch mode is selected, this is saved as part of the system settings.*

Parameter		Value
Switch 1/2 Assign	Assignable Switch 1/2	Transpose Down, Transpose¬ Up, Tap Tempo, Mono/Poly, Portamento, Hold, MFX1–3 Sw, Chorus Sw, Reverb Sw, Mastering Sw, Loop, Rhythm Start/Stop

Pad Setting Group (Owner's Manual; p. 136)

Parameter		Value
Pad Common Velo	Pad Common Velocity	REAL, 1–127
Pad Sens	Pad Sensitivity	LIGHT, MEDIUM, HEAVY
Aftertouch Sens	Aftertouch Sensitivity	0–100
Roll Resolution		1/4 (♩), 1/6 (♩3), 1/8 (♪), 1/12 (♪3), 1/16 (𝅘𝅥𝅯), 1/24 (𝅘𝅥𝅯3), 1/32 (𝅘𝅥𝅰), 1/48 (𝅘𝅥𝅰3)

* *If Patch mode is selected, this is saved as part of the system settings.*

Parameter		Value
Pad Set		User, Note, Rhythm
Base	Pad Base Note	C-1–G9
Note	Pad Note	C-1–G9
Velocity	Pad Velocity	REAL, 1–127

Effects List

Multi-Effects Parameters

The multi-effects feature 78 (Fantom-S; 77) different kinds of effects. Some of the effects consist of two or more different effects connected in series.

Parameters marked with a sharp "#" can be controlled using a specified controller (Two setting items will change simultaneously for "#1" and "#2").

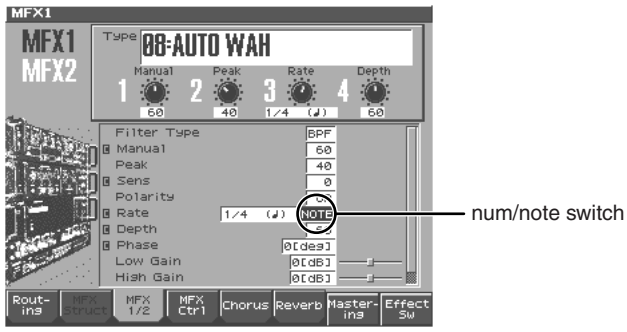
FILTER (10 types)		
01	EQUALIZER	P.20
02	SPECTRUM	P.20
03	ISOLATOR	P.20
04	LOW BOOST	P.20
05	SUPER FILTER	P.20
06	STEP FILTER	P.21
07	ENHANCER	P.21
08	AUTO WAH	P.21
09	HUMANIZER	P.22
10	SPEAKER SIMULATOR	P.22
MODULATION (12 types)		
11	PHASER	P.22
12	STEP PHASER	P.22
13	MULTI STAGE PHASER	P.23
14	INFINITE PHASER	P.23
15	RING MODULATOR	P.23
16	STEP RING MODULATOR	P.23
17	TREMOLO	P.24
18	AUTO PAN	P.24
19	STEP PAN	P.24
20	SLICER	P.24
21	ROTARY	P.25
22	VK ROTARY	P.25
CHORUS (12 types)		
23	CHORUS	P.25
24	FLANGER	P.26
25	STEP FLANGER	P.26
26	HEXA-CHORUS	P.26
27	TREMOLO CHORUS	P.26
28	SPACE-D	P.27
29	3D CHORUS	P.27
30	3D FLANGER	P.27
31	3D STEP FLANGER	P.28
32	2BAND CHORUS	P.28
33	2BAND FLANGER	P.28
34	2BAND STEP FLANGER	P.29
DYNAMICS (8 types)		
35	OVERDRIVE	P.29
36	DISTORTION	P.29
37	VS OVERDRIVE	P.29
38	VS DISTORTION	P.30
39	GUITAR AMP SIMULATOR	P.30
40	COMPRESSOR	P.30
41	LIMITER	P.30
42	GATE	P.31
DELAY (13 types)		
43	DELAY	P.31
44	LONG DELAY	P.31
45	SERIAL DELAY	P.31
46	MODULATION DELAY	P.32
47	3TAP PAN DELAY	P.32
48	4TAP PAN DELAY	P.32
49	MULTI TAP DELAY	P.33
50	REVERSE DELAY	P.33
51	SHUFFLE DELAY	P.33
52	3D DELAY	P.34
53	TIME CTRL DELAY	P.34
54	LONG TIME CTRL DELAY	P.34
55	TAPE ECHO	P.34
LO-FI (5 types)		
56	LOFI NOISE	P.35
57	LOFI COMPRESS	P.35
58	LOFI RADIO	P.35
59	TELEPHONE	P.36
60	PHONOGRAPH	P.36
PITCH (3 types)		
61	PITCH SHIFTER	P.36
62	2VOICE PITCH SHIFTER	P.36
63	STEP PITCH SHIFTER	P.37
REVERB (2 types)		
64	REVERB	P.37
65	GATED REVERB	P.37
COMBINATION (12 types)		
66	OVERDRIVE → CHORUS	P.38
67	OVERDRIVE → FLANGER	P.38
68	OVERDRIVE → DELAY	P.38
69	DISTORTION → CHORUS	P.38
70	DISTORTION → FLANGER	P.38
71	DISTORTION → DELAY	P.38
72	ENHANCER → CHORUS	P.39
73	ENHANCER → FLANGER	P.39
74	ENHANCER → DELAY	P.39
75	CHORUS → DELAY	P.39
76	FLANGER → DELAY	P.40
77	CHORUS → FLANGER	P.40
5 PIANO (1 type)		
78	SYMPATHETIC RESONANCE (Fantom-S88 only)	P.40

About Note

Some effect parameters (such as Rate or Delay Time) can be set in terms of a note value.

Such parameters have a num/note switch that lets you specify whether you will set the value as a note value or as a numerical value.

If you want to set Rate (Delay Time) as a numerical value, set the num/note switch to "Hz" ("msec"). If you want to set it as a note value, set the num/note switch to "NOTE."

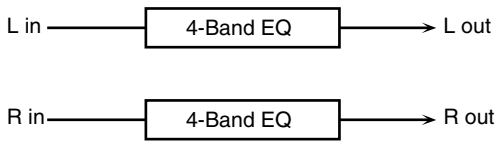


NOTE

If a parameter whose num/note switch is set to "NOTE" is specified as a destination for multi-effect control, you will not be able to use multi-effect control to control that parameter.

01: EQUALIZER

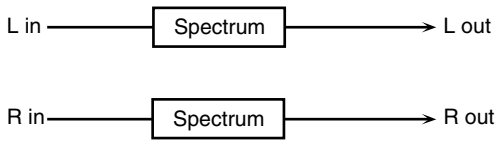
This is a four-band stereo equalizer (low, mid x 2, high).



Parameter	Value	Description
Low Freq	200, 400 Hz	Frequency of the low range
Low Gain #	-15– +15 dB	Gain of the low range
Mid1 Freq	200–8000 Hz	Frequency of the middle range 1
Mid1 Gain	-15– +15 dB	Gain of the middle range 1
Mid1 Q	0.5, 1.0, 2.0, 4.0, 8.0	Width of the middle range 1 Set a higher value for Q to narrow the range to be affected.
Mid2 Freq	200–8000 Hz	Frequency of the middle range 2
Mid2 Gain	-15– +15 dB	Gain of the middle range 2
Mid2 Q	0.5, 1.0, 2.0, 4.0, 8.0	Width of the middle range 2 Set a higher value for Q to narrow the range to be affected.
High Freq	2000, 4000, 8000 Hz	Frequency of the high range
High Gain #	-15– +15 dB	Gain of the high range
Level #	0–127	Output Level

02: SPECTRUM

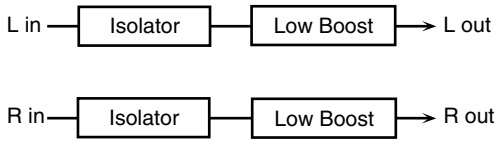
This is a stereo spectrum. Spectrum is a type of filter which modifies the timbre by boosting or cutting the level at specific frequencies.



Parameter	Value	Description
Band1 (250Hz)	-15– +15 dB	Gain of each frequency band
Band2 (500Hz)		
Band3 (1000Hz)		
Band4 (1250Hz)		
Band5 (2000Hz)		
Band6 (3150Hz)		
Band7 (4000Hz)		
Band8 (8000Hz)		
Q	0.5, 1.0, 2.0, 4.0, 8.0	Simultaneously adjusts the width of the adjusted ranges for all the frequency bands.
Level #	0–127	Output Level

03: ISOLATOR

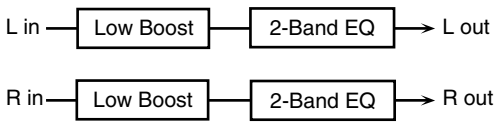
This is an equalizer which cuts the volume greatly, allowing you to add a special effect to the sound by cutting the volume in varying ranges.



Parameter	Value	Description
Boost/ Cut Low #	-60– +4 dB	These boost and cut each of the High, Middle, and Low frequency ranges. At -60 dB, the sound becomes inaudible. 0 dB is equivalent to the input level of the sound.
Boost/ Cut Mid #		
Boost/ Cut High #		
Anti Phase Low Sw	OFF, ON	Turns the Anti-Phase function on and off for the Low frequency ranges. When turned on, the counter-channel of stereo sound is inverted and added to the signal.
Anti Phase Low Level	0–127	Adjusts the level settings for the Low frequency ranges. Adjusting this level for certain frequencies allows you to lend emphasis to specific parts. (This is effective only for stereo source.)
Anti Phase Mid Sw	OFF, ON	Settings of the Anti-Phase function for the Middle frequency ranges The parameters are the same as for the Low frequency ranges.
Anti Phase Mid Level	0–127	
Low Boost Sw	OFF, ON	Turns Low Booster on/off. This emphasizes the bottom to create a heavy bass sound.
Low Boost Level	0–127	Increasing this value gives you a heavier low end. * Depending on the Isolator and filter settings this effect may be hard to distinguish.
Level	0–127	Output Level

04: LOW BOOST

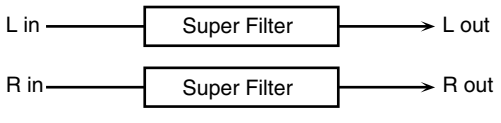
Boosts the volume of the lower range, creating powerful lows.



Parameter	Value	Description
Boost Frequency #	50–125 Hz	Center frequency at which the lower range will be boosted
Boost Gain #	0– +12 dB	Amount by which the lower range will be boosted
Boost Width	WIDE, MID, NARROW	Width of the lower range that will be boosted
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Level	0–127	Output level

05: SUPER FILTER

This is a filter with an extremely sharp slope. The cutoff frequency can be varied cyclically.

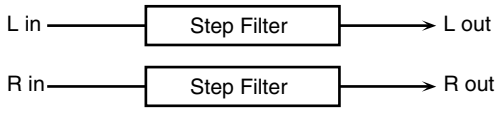


Parameter	Value	Description
Filter Type	LPF, BPF, HPF, NOTCH	Filter type Frequency range that will pass through each filter **LPF**: frequencies below the cutoff **BPF:** frequencies in the region of the cutoff **HPF:** frequencies above the cutoff **NOTCH:** frequencies other than the region of the cutoff

Parameter	Value	Description
Filter Slope	-12, -24, -36 dB	Amount of attenuation per octave **-36 dB:** extremely steep **-24 dB:** steep **-12 dB:** gentle
Filter Cutoff #	0–127	Cutoff frequency of the filter Increasing this value will raise the cutoff frequency.
Filter Resonance #	0–127	Filter resonance level Increasing this value will emphasize the region near the cutoff frequency.
Filter Gain	0– +12 dB	Amount of boost for the filter output
Modulation Sw	OFF,ON	On/off switch for cyclic change
Modulation Wave	TRI, SQR, SIN, SAW1, SAW2	How the cutoff frequency will be modulated **TRI:** triangle wave **SQR:** square wave **SIN:** sine wave **SAW1:** sawtooth wave (upward) **SAW2:** sawtooth wave (downward)
		
Rate #	0.05–10.00 Hz, note	Rate of modulation
Depth	0–127	Depth of modulation
Attack #	0–127	Speed at which the cutoff frequency will change This is effective if Modulation Wave is SQR, SAW1, or SAW2.
Level	0–127	Output level

06: STEP FILTER

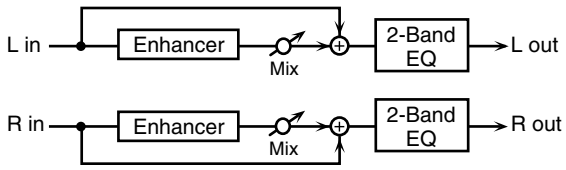
This is a filter whose cutoff frequency can be modulated in steps. You can specify the pattern by which the cutoff frequency will change.



Parameter	Value	Description
Step 01–16	0–127	Cutoff frequency at each step
Rate #	0.05–10.00 Hz, note	Rate of modulation
Attack #	0–127	Speed at which the cutoff frequency changes between steps
Filter Type	LPF, BPF, HPF, NOTCH	Filter type Frequency range that will pass through each filter **LPF:** frequencies below the cutoff **BPF:** frequencies in the region of the cutoff **HPF:** frequencies above the cutoff **NOTCH:** frequencies other than the region of the cutoff
Filter Slope	-12, -24, -36 dB	Amount of attenuation per octave **-12 dB:** gentle **-24 dB:** steep **-36 dB:** extremely steep
Filter Resonance #	0–127	Filter resonance level Increasing this value will emphasize the region near the cutoff frequency.
Filter Gain	0– +12 dB	Amount of boost for the filter output
Level	0–127	Output level

07: ENHANCER

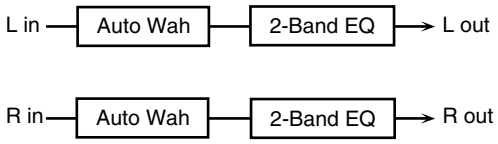
Controls the overtone structure of the high frequencies, adding sparkle and tightness to the sound.



Parameter	Value	Description
Sens #	0–127	Sensitivity of the enhancer
Mix #	0–127	Level of the overtones generated by the enhancer
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

08: AUTO WAH

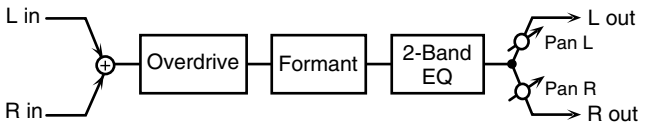
Cyclically controls a filter to create cyclic change in timbre.



Parameter	Value	Description
Filter Type	LPF, BPF	Type of filter **LPF:** The wah effect will be applied over a wide frequency range. **BPF:** The wah effect will be applied over a narrow frequency range.
Manual #	0–127	Adjusts the center frequency at which the effect is applied.
Peak	0–127	Adjusts the amount of the wah effect that will occur in the range of the center frequency. Set a higher value for Q to narrow the range to be affected.
Sens #	0–127	Adjusts the sensitivity with which the filter is controlled.
Polarity	UP, DOWN	Sets the direction in which the frequency will change when the auto-wah filter is modulated. **UP:** The filter will change toward a higher frequency. **DOWN:** The filter will change toward a lower frequency.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth #	0–127	Depth of modulation
Phase #	0–180 deg	Adjusts the degree of phase shift of the left and right sounds when the wah effect is applied.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

09: HUMANIZER

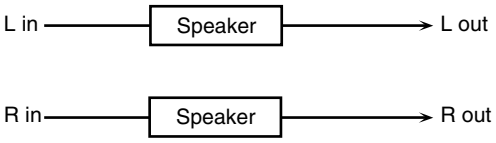
Adds a vowel character to the sound, making it similar to a human voice.



Parameter	Value	Description
Drive Sw	OFF, ON	Turns Drive on/off.
Drive #	0–127	Degree of distortion Also changes the volume.
Vowel1	a, e, i, o, u	Selects the vowel.
Vowel2	a, e, i, o, u	
Rate #	0.05–10.00 Hz, note	Frequency at which the two vowels switch
Depth #	0–127	Effect depth
Input Sync Sw	OFF, ON	Determines whether the LFO for switching the vowels is reset by the input signal (ON) or not (OFF).
Input Sync Threshold	0–127	Volume level at which reset is applied
Manual #	0–100	Point at which Vowel 1/2 switch **49 or less:** Vowel 1 will have a longer duration. **50:** Vowel 1 and 2 will be of equal duration. **51 or more:** Vowel 2 will have a longer duration.
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Pan #	L64–63R	Stereo location of the output
Level	0–127	Output level

10: SPEAKER SIMULATOR

Simulates the speaker type and mic settings used to record the speaker sound.



Parameter	Value	Description
Speaker Type	(See the table right.)	Type of speaker
Mic Setting	1, 2, 3	Adjusts the location of the mic that is recording the sound of the speaker. This can be adjusted in three steps, with the mic becoming more distant in the order of 1, 2, and 3.
Mic Level #	0–127	Volume of the microphone
Direct Level #	0–127	Volume of the direct sound
Level #	0–127	Output Level

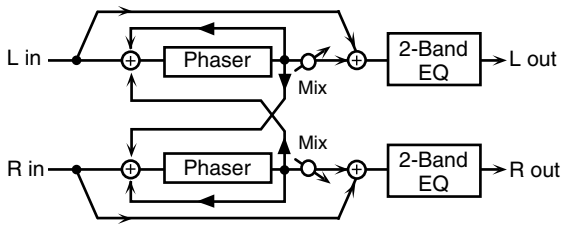
Specifications of each Speaker Type

The speaker column indicates the diameter of each speaker unit (in inches) and the number of units.

Type	Cabinet	Speaker	Micro-phone
SMALL 1	small open-back enclosure	10	dynamic
SMALL 2	small open-back enclosure	10	dynamic
MIDDLE	open back enclosure	12 x 1	dynamic
JC-120	open back enclosure	12 x 2	dynamic
BUILT-IN 1	open back enclosure	12 x 2	dynamic
BUILT-IN 2	open back enclosure	12 x 2	condenser
BUILT-IN 3	open back enclosure	12 x 2	condenser
BUILT-IN 4	open back enclosure	12 x 2	condenser
BUILT-IN 5	open back enclosure	12 x 2	condenser
BG STACK 1	sealed enclosure	12 x 2	condenser
BG STACK 2	large sealed enclosure	12 x 2	condenser
MS STACK 1	large sealed enclosure	12 x 4	condenser
MS STACK 2	large sealed enclosure	12 x 4	condenser
METAL STACK	large double stack	12 x 4	condenser
2-STACK	large double stack	12 x 4	condenser
3-STACK	large triple stack	12 x 4	condenser

11: PHASER

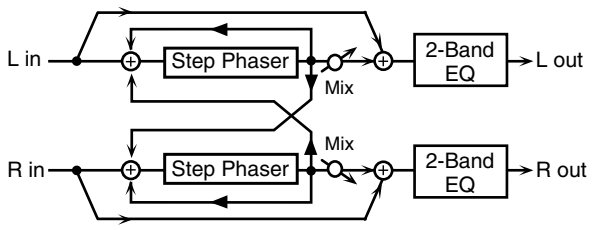
A phase-shifted sound is added to the original sound and modulated.



Parameter	Value	Description
Mode	4-STAGE, 8-STAGE, 12-STAGE	Number of stages in the phaser
Manual #	0–127	Adjusts the basic frequency from which the sound will be modulated.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Polarity	INVERSE, SYNCHRO	Selects whether the left and right phase of the modulation will be the same or the opposite. **INVERSE:** The left and right phase will be opposite. When using a mono source, this spreads the sound. **SYNCHRO:** The left and right phase will be the same. Select this when inputting a stereo source.
Resonance #	0–127	Amount of feedback
Cross Feedback	-98– +98 %	Adjusts the proportion of the phaser sound that is fed back into the effect. Negative (-) settings will invert the phase.
Mix #	0–127	Level of the phase-shifted sound
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

12: STEP PHASER

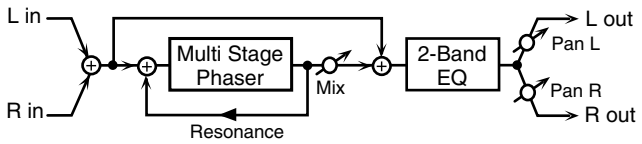
The phaser effect will be varied gradually.



Parameter	Value	Description
Mode	4-STAGE, 8-STAGE, 12-STAGE	Number of stages in the phaser
Manual #	0–127	Adjusts the basic frequency from which the sound will be modulated.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Polarity	INVERSE, SYNCHRO	Selects whether the left and right phase of the modulation will be the same or the opposite. **INVERSE:** The left and right phase will be opposite. When using a mono source, this spreads the sound. **SYNCHRO:** The left and right phase will be the same. Select this when inputting a stereo source.
Resonance #	0–127	Amount of feedback
Cross Feedback	-98– +98 %	Adjusts the proportion of the phaser sound that is fed back into the effect. Negative (-) settings will invert the phase.
Step Rate #	0.10–20.00 Hz, note	Rate of the step-wise change in the phaser effect
Mix #	0–127	Level of the phase-shifted sound
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

13: MULTI STAGE PHASER

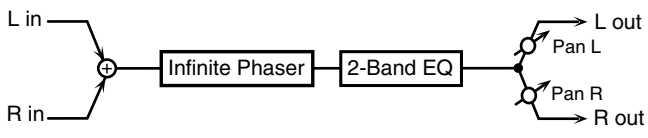
Extremely high settings of the phase difference produce a deep phaser effect.



Parameter	Value	Description
Mode	4-STAGE, 8-STAGE, 12-STAGE, 16-STAGE, 20-STAGE, 24-STAGE	Number of phaser stages
Manual #	0–127	Adjusts the basic frequency from which the sound will be modulated.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Resonance #	0–127	Amount of feedback
Mix #	0–127	Level of the phase-shifted sound
Pan #	L64–63R	Stereo location of the output sound
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

14: INFINITE PHASER

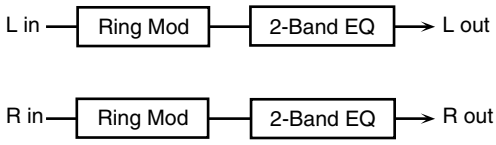
A phaser that continues raising/lowering the frequency at which the sound is modulated.



Parameter	Range	Explanation
Mode	1, 2, 3, 4	Higher values will produce a deeper phaser effect.
Speed #	-100– +100	Speed at which to raise or lower the frequency at which the sound is modulated (+: upward / -: downward)
Resonance #	0–127	Amount of feedback
Mix #	0–127	Volume of the phase-shifted sound
Pan #	L64–63R	Panning of the output sound
Low Gain	-15– +15 dB	Amount of boost/cut for the low-frequency range
High Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
Level	0–127	Output volume

15: RING MODULATOR

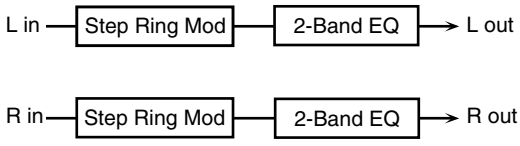
This is an effect that applies amplitude modulation (AM) to the input signal, producing bell-like sounds. You can also change the modulation frequency in response to changes in the volume of the sound sent into the effect.



Parameter	Value	Description
Frequency #	0–127	Adjusts the frequency at which modulation is applied.
Sens #	0–127	Adjusts the amount of frequency modulation applied.
Polarity	UP, DOWN	Determines whether the frequency modulation moves towards higher frequencies (**UP**) or lower frequencies (**DOWN**).
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

16: STEP RING MODULATOR

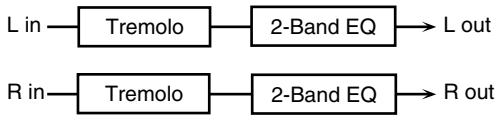
This is a ring modulator that uses a 16-step sequence to vary the frequency at which modulation is applied.



Parameter	Range	Explanation
Step 01–16	0–127	Frequency of ring modulation at each step
Rate #	0.05–10.00 Hz, note	Rate at which the 16-step sequence will cycle
Attack #	0–127	Speed at which the modulation frequency changes between steps
Low Gain	-15– +15 dB	Amount of boost/cut for the low-frequency range
High Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and effect sound (W)
Level	0–127	Output volume

17: TREMOLO

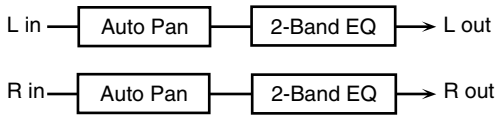
Cyclically modulates the volume to add tremolo effect to the sound.

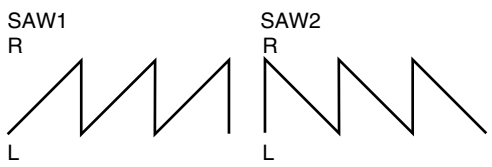


Parameter	Value	Description
Mod Wave	TRI, SQR, SIN, SAW1, SAW2	Modulation Wave **TRI:** triangle wave **SQR:** square wave **SIN:** sine wave **SAW1/2:** sawtooth wave
		
Rate #	0.05–10.00 Hz, note	Frequency of the change
Depth #	0–127	Depth to which the effect is applied
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

18: AUTO PAN

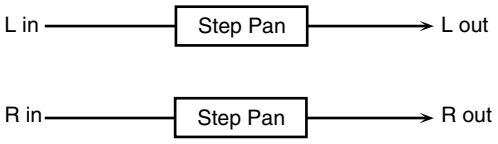
Cyclically modulates the stereo location of the sound.



Parameter	Value	Description
Mod Wave	TRI, SQR, SIN, SAW1, SAW2	Modulation Wave **TRI:** triangle wave **SQR:** square wave **SIN:** sine wave **SAW1/2:** sawtooth wave
		
Rate #	0.05–10.00 Hz, note	Frequency of the change
Depth #	0–127	Depth to which the effect is applied
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level	0–127	Output Level

19: STEP PAN

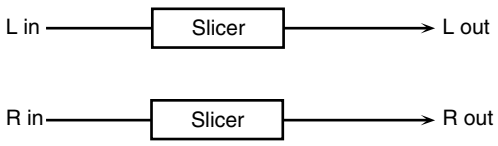
This uses a 16-step sequence to vary the panning of the sound.



Parameter	Range	Explanation
Step 01–16	L64–63R	Pan at each step
Rate #	0.05–10.00 Hz, note	Rate at which the 16-step sequence will cycle
Attack #	0–127	Speed at which the pan changes between steps
Input Sync Sw	OFF, ON	Specifies whether an input note will cause the sequence to resume from the first step of the sequence (ON) or not (OFF)
Input Sync Threshold	0–127	Volume at which an input note will be detected
Level	0–127	Output volume

20: SLICER

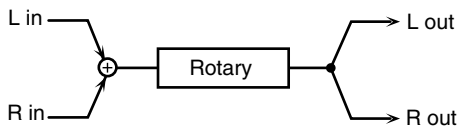
By applying successive cuts to the sound, this effect turns a conventional sound into a sound that appears to be played as a backing phrase. This is especially effective when applied to sustain-type sounds.



Parameter	Value	Description
Step 01–16	L64–63R	Level at each step
Rate #	0.05–10.00 Hz, note	Rate at which the 16-step sequence will cycle
Attack #	0–127	Speed at which the level changes between steps
Input Sync Sw	OFF, ON	Specifies whether an input note will cause the sequence to resume from the first step of the sequence (ON) or not (OFF)
Input Sync Threshold	0–127	Volume at which an input note will be detected
Mode	LEGATO, SLASH	Sets the manner in which the volume changes as one step progresses to the next. **LEGATO:** The change in volume from one step's level to the next remains unaltered. If the level of a following step is the same as the one preceding it, there is no change in volume. **SLASH:** The level is momentarily set to 0 before progressing to the level of the next step. This change in volume occurs even if the level of the following step is the same as the preceding step.
Shuffle #	0–127	Timing of volume changes in levels for even-numbered steps (step 2, step 4, step 6...). The higher the value, the later the beat progresses.
Level	0–127	Output level

21: ROTARY

The Rotary effect simulates the sound of the rotary speakers often used with the electric organs of the past. Since the movement of the high range and low range rotors can be set independently, the unique type of modulation characteristic of these speakers can be simulated quite closely. This effect is most suitable for electric organ Patches.

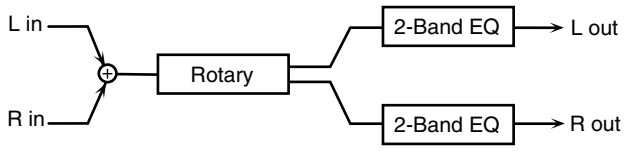


Parameter	Value	Description
Speed #	SLOW, FAST	Simultaneously switch the rotational speed of the low frequency rotor and high frequency rotor. **SLOW:** Slows down the rotation to the Slow Rate. **FAST:** Speeds up the rotation to the Fast Rate.
Woofer Slow Speed	0.05–10.00 Hz	Slow speed (SLOW) of the low frequency rotor
Woofer Fast Speed	0.05–10.00 Hz	Fast speed (FAST) of the low frequency rotor
Woofer Acceleration	0–15	Adjusts the time it takes the low frequency rotor to reach the newly selected speed when switching from fast to slow (or slow to fast) speed. Lower values will require longer times.
Woofer Level	0–127	Volume of the low frequency rotor
Tweeter Slow Speed	0.05–10.00 Hz	Settings of the high frequency rotor The parameters are the same as for the low frequency rotor
Tweeter Fast Speed	0.05–10.00 Hz	
Tweeter Acceleration	0–15	
Tweeter Level	0–127	
Separation	0–127	Spatial dispersion of the sound
Level #	0–127	Output Level

22: VK ROTARY

This type provides modified response for the rotary speaker, with the low end boosted further.

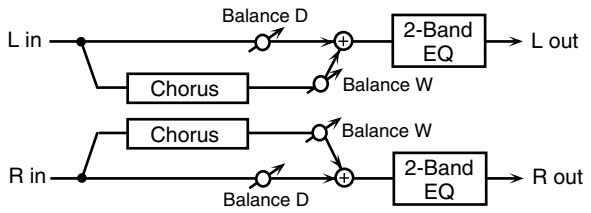
This effect features the same specifications as the VK-7's built-in rotary speaker.



Parameter	Value	Description
Speed #	SLOW, FAST	Rotational speed of the rotating speaker
Brake #	OFF, ON	Switches the rotation of the rotary speaker. When this is turned on, the rotation will gradually stop. When it is turned off, the rotation will gradually resume.
Woofer Slow Speed	0.05–10.00 Hz	Low-speed rotation speed of the woofer
Woofer Fast Speed	0.05–10.00 Hz	High-speed rotation speed of the woofer
Woofer Trans Up	0–127	Adjusts the rate at which the woofer rotation speeds up when the rotation is switched from Slow to Fast.
Woofer Trans Down	0–127	Adjusts the rate at which the woofer rotation speeds up when the rotation is switched from Fast to Slow.
Woofer Level	0–127	Volume of the woofer
Tweeter Slow Speed	0.05–10.00 Hz	Settings of the tweeter The parameters are the same as for the woofer.
Tweeter Fast Speed	0.05–10.00 Hz	
Tweeter Trans Up	0–127	
Tweeter Trans Down	0–127	
Tweeter Level	0–127	
Spread	0–10	Sets the rotary speaker stereo image. The higher the value set, the wider the sound is spread out.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level #	0–127	Output Level

23: CHORUS

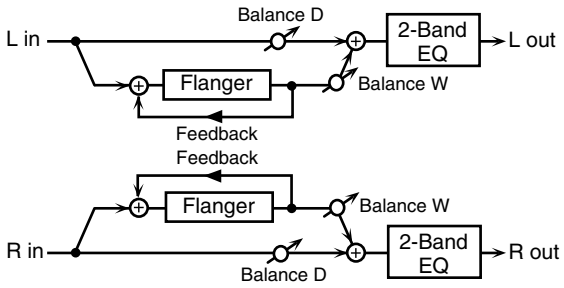
This is a stereo chorus. A filter is provided so that you can adjust the timbre of the chorus sound.



Parameter	Value	Description
Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff Freq **HPF:** cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0–180 deg	Spatial spread of the sound
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the chorus sound (W)
Level	0–127	Output Level

24: FLANGER

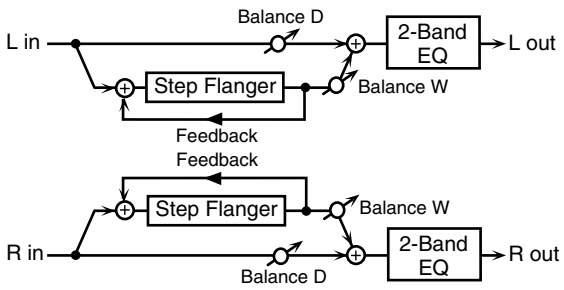
This is a stereo flanger. (The LFO has the same phase for left and right.) It produces a metallic resonance that rises and falls like a jet airplane taking off or landing. A filter is provided so that you can adjust the timbre of the flanged sound.



Parameter	Value	Description
Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff Freq **HPF:** cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0–180 deg	Spatial spread of the sound
Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the flanger sound (W)
Level	0–127	Output Level

25: STEP FLANGER

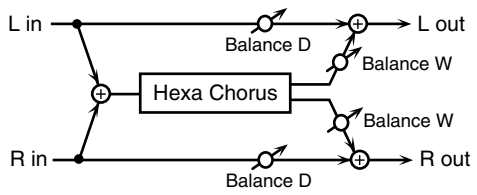
This is a flanger in which the flanger pitch changes in steps. The speed at which the pitch changes can also be specified in terms of a note-value of a specified tempo.



Parameter	Value	Description
Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff Freq **HPF:** cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0–180 deg	Spatial spread of the sound
Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Step Rate #	0.10–20.00 Hz, note	Rate (period) of pitch change
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the flanger sound (W)
Level	0–127	Output Level

26: HEXA-CHORUS

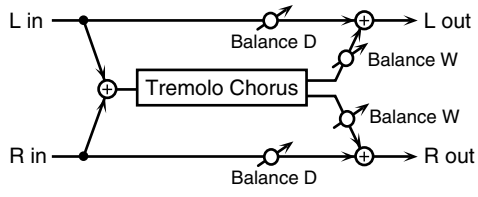
Uses a six-phase chorus (six layers of chorused sound) to give richness and spatial spread to the sound.



Parameter	Value	Description
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Pre Delay Deviation	0–20	Adjusts the differences in Pre Delay between each chorus sound.
Depth Deviation	-20– +20	Adjusts the difference in modulation depth between each chorus sound.
Pan Deviation	0–20	Adjusts the difference in stereo location between each chorus sound. **0:** All chorus sounds will be in the center. **20:** Each chorus sound will be spaced at 60 degree intervals relative to the center.
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the chorus sound (W)
Level	0–127	Output Level

27: TREMOLO CHORUS

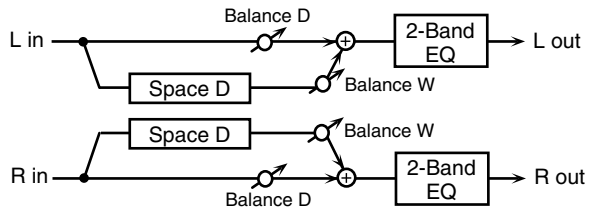
This is a chorus effect with added Tremolo (cyclic modulation of volume).



Parameter	Value	Description
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Chorus Rate #	0.05–10.00 Hz, note	Modulation frequency of the chorus effect
Chorus Depth	0–127	Modulation depth of the chorus effect
Tremolo Rate #	0.05–10.00 Hz, note	Modulation frequency of the tremolo effect
Tremolo Separation	0–127	Spread of the tremolo effect
Tremolo Phase	0–180 deg	Spread of the tremolo effect
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the tremolo chorus sound (W)
Level	0–127	Output Level

28: SPACE-D

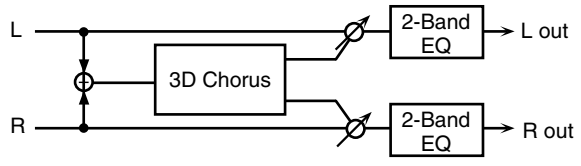
This is a multiple chorus that applies two-phase modulation in stereo. It gives no impression of modulation, but produces a transparent chorus effect.



Parameter	Value	Description
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0–180 deg	Spatial spread of the sound
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the chorus sound (W)
Level	0–127	Output Level

29: 3D CHORUS

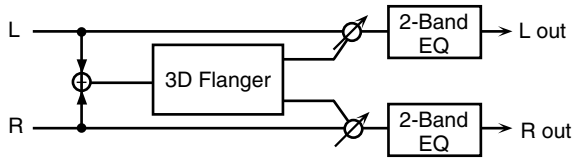
This applies a 3D effect to the chorus sound. The chorus sound will be positioned 90 degrees left and 90 degrees right.



Parameter	Value	Description
Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff Freq **HPF:** cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Modulation depth of the chorus effect
Phase	0–180 deg	Spatial spread of the sound
Output Mode	SPEAKER, PHONES	Adjusts the method that will be used to hear the sound that is output to the OUTPUT jacks. The optimal 3D effect will be achieved if you select **SPEAKER** when using speakers, or **PHONES** when using headphones.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the chorus sound (W)
Level	0–127	Output Level

30: 3D FLANGER

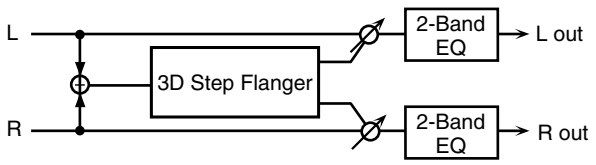
This applies a 3D effect to the flanger sound. The flanger sound will be positioned 90 degrees left and 90 degrees right.



Parameter	Value	Description
Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff Freq **HPF:** cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0–180 deg	Spatial spread of the sound
Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Output Mode	SPEAKER, PHONES	Adjusts the method that will be used to hear the sound that is output to the OUTPUT jacks. The optimal 3D effect will be achieved if you select **SPEAKER** when using speakers, or **PHONES** when using headphones.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the flanger sound (W)
Level	0–127	Output Level

31: 3D STEP FLANGER

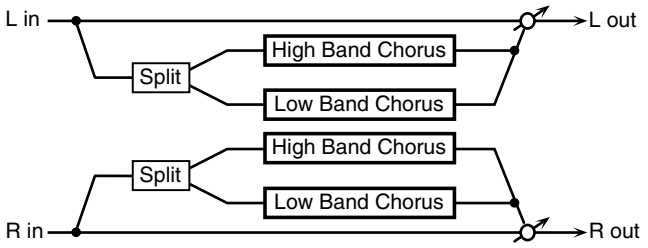
This applies a 3D effect to the step flanger sound. The flanger sound will be positioned 90 degrees left and 90 degrees right.



Parameter	Value	Description
Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff Freq **HPF:** cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0–180 deg	Spatial spread of the sound
Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Step Rate #	0.10–20.00 Hz, note	Rate (period) of pitch change
Output Mode	SPEAKER, PHONES	Adjusts the method that will be used to hear the sound that is output to the OUTPUT jacks. The optimal 3D effect will be achieved if you select **SPEAKER** when using speakers, or **PHONES** when using headphones.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the flanger sound (W)
Level	0–127	Output Level

32: 2BAND CHORUS

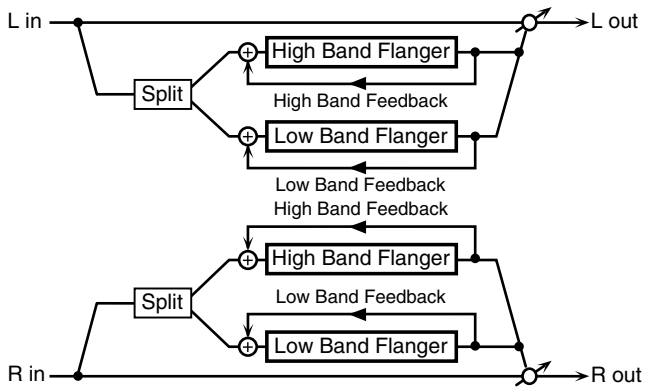
A chorus effect that lets you apply an effect independently to the low-frequency and high-frequency ranges.



Parameter	Range	Explanation
Split Freq	200–8000 Hz	Frequency at which the low and high ranges will be divided
Low Pre Delay	0.0–100.0 ms	Delay time from when the original sound is heard to when the low-range chorus sound is heard
Low Rate #	0.05–10.00 Hz, note	Rate at which the low-range chorus sound is modulated
Low Depth	0–127	Modulation depth for the low-range chorus sound
Low Phase	0–180 deg	Spaciousness of the low-range chorus sound
High Pre Delay	0.0–100.0 ms	Delay time from when the original sound is heard to when the high-range chorus sound is heard
High Rate #	0.05–10.00 Hz, note	Rate at which the low-range chorus sound is modulated
High Depth	0–127	Modulation depth for the high-range chorus sound
High Phase	0–180 deg	Spaciousness of the high-range chorus sound
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and chorus sound (W)
Level	0–127	Output volume

33: 2BAND FLANGER

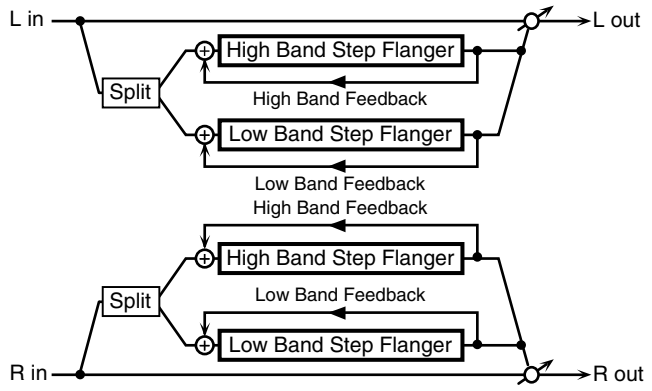
A flanger that lets you apply an effect independently to the low-frequency and high-frequency ranges.



Parameter	Range	Explanation
Split Freq	200–8000 Hz	Frequency at which the low and high ranges will be divided
Low Pre Delay	0.0–100.0 ms	Delay time from when the original sound is heard to when the low-range flanger sound is heard
Low Rate #	0.05–10.00 Hz, note	Rate at which the low-range flanger sound is modulated
Low Depth	0–127	Modulation depth for the low-range flanger sound
Low Phase	0–180 deg	Spaciousness of the low-range flanger sound
Low Feedback #	-98– +98%	Proportion of the low-range flanger sound that is to be returned to the input (negative values invert the phase)
High Pre Delay	0.0–100.0 ms	Delay time from when the original sound is heard to when the high-range flanger sound is heard
High Rate #	0.05–10.00 Hz, note	Rate at which the high-range flanger sound is modulated
High Depth	0–127	Modulation depth for the high-range flanger sound
High Phase	0–180 deg	Spaciousness of the high-range flanger sound
High Feedback #	-98– +98%	Proportion of the high-range flanger sound that is to be returned to the input (negative values invert the phase)
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and flanger sound (W)
Level	0–127	Output volume

34: 2BAND STEP FLANGER

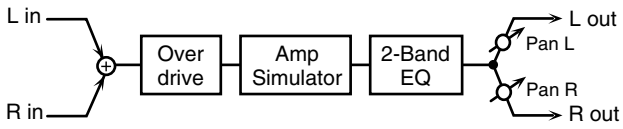
A step flanger that lets you apply an effect independently to the low-frequency and high-frequency ranges.



Parameter	Range	Explanation
Split Freq	200–8000 Hz	Frequency at which the low and high ranges will be divided
Low Pre Delay	0.0–100.0 ms	Delay time from when the original sound is heard to when the low-range flanger sound is heard
Low Rate #	0.05–10.00 Hz, note	Rate at which the low-range flanger sound is modulated
Low Depth	0–127	Modulation depth for the low-range flanger sound
Low Phase	0–180 deg	Spaciousness of the low-range flanger sound
Low Feedback #	-98– +98%	Proportion of the low-range flanger sound that is to be returned to the input (negative values invert the phase)
Low Step Rate #	0.10–20.00 Hz, note	Rate at which the steps will cycle for the low-range flanger sound
High Pre Delay	0.0–100.0 ms	Delay time from when the original sound is heard to when the high-range flanger sound is heard
High Rate #	0.05–10.00 Hz, note	Rate at which the high-range flanger sound is modulated
High Depth	0–127	Modulation depth for the high-range flanger sound
High Phase	0–180 deg	Spaciousness of the high-range flanger sound
High Feedback #	-98– +98%	Proportion of the high-range flanger sound that is to be returned to the input (negative values invert the phase)
High Step Rate #	0.10–20.00 Hz, note	Rate at which the steps will cycle for the high-range flanger sound
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and flanger sound (W)
Level	0–127	Output volume

35: OVERDRIVE

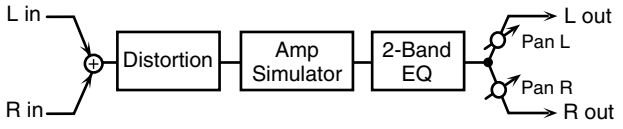
Creates a soft distortion similar to that produced by vacuum tube amplifiers.



Parameter	Value	Description
Drive #	0–127	Degree of distortion Also changes the volume.
Amp Type	SMALL, BUILT-IN, 2-STACK, 3-STACK	Type of guitar amp **SMALL:** small amp **BUILT-IN:** single-unit type amp **2-STACK:** large double stack amp **3-STACK:** large triple stack amp
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Pan #	L64–63R	Stereo location of the output sound
Level	0–127	Output Level

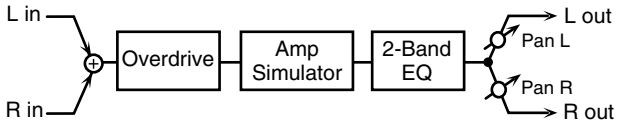
36: DISTORTION

Produces a more intense distortion than Overdrive. The parameters are the same as for "35: OVERDRIVE."



37: VS OVERDRIVE

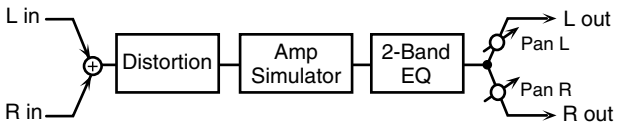
This is an overdrive that provides heavy distortion.



Parameter	Value	Description
Drive #	0–127	Degree of distortion Also changes the volume.
Tone #	0–127	Sound quality of the Overdrive effect
Amp Sw	OFF, ON	Turns the Amp Simulator on/off.
Amp Type	SMALL, BUILT-IN, 2-STACK, 3-STACK	Type of guitar amp **SMALL:** small amp **BUILT-IN:** single-unit type amp **2-STACK:** large double stack amp **3-STACK:** large triple stack amp
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Pan #	L64–63R	Stereo location of the output sound
Level	0–127	Output Level

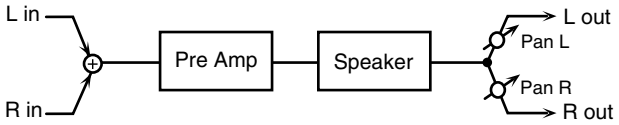
38: VS DISTORTION

This is a distortion effect that provides heavy distortion. The parameters are the same as for "37: VS OVERDRIVE."



39: GUITAR AMP SIMULATOR

This is an effect that simulates the sound of a guitar amplifier.



Parameter	Value	Description
Pre Amp Sw	OFF, ON	Turns the amp switch on/off.
Pre Amp Type	JC-120, CLEAN TWIN, MATCH DRIVE, BG LEAD, MS1959I, MS1959II, MS1959I+II, SLDN LEAD, METAL5150, METAL LEAD, OD-1, OD-2 TURBO, DISTORTION, FUZZ	Type of guitar amp
Pre Amp Volume #	0–127	Volume and amount of distortion of the amp
Pre Amp Master #	0–127	Volume of the entire pre-amp
Pre Amp Gain	LOW, MIDDLE, HIGH	Amount of pre-amp distortion
Pre Amp Bass	0–127	Tone of the bass/mid/treble frequency range * Middle cannot be set if "Match Drive" is selected as the Pre Amp Type.
Pre Amp Middle		
Pre Amp Treble		
Pre Amp Presence	0–127 (MATCH DRIVE: -127 - 0)	Tone for the ultra-high frequency range
Pre Amp Bright	OFF, ON	Turning this "On" produces a sharper and brighter sound. * This parameter applies to the "JC-120," "Clean Twin," and "BG Lead" Pre Amp Types.
Speaker Sw	OFF, ON	Determines whether the signal passes through the speaker (ON), or not (OFF).
Speaker Type	(See the table below.)	Type of speaker
Mic Setting	1, 2, 3	Adjusts the location of the mic that's capturing the sound of the speaker. This can be adjusted in three steps, from 1 to 3, with the mic becoming more distant as the value increases.
Mic Level	0–127	Volume of the microphone
Direct Level	0–127	Volume of the direct sound
Pan #	L64–63R	Stereo location of the output
Level #	0–127	Output level

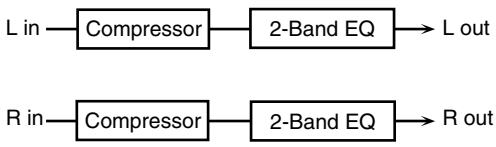
Specifications for each Speaker Type

The speaker column indicates the diameter of each speaker unit (in inches) and the number of units.

Type	Cabinet	Speaker	Microphone
SMALL 1	small open-back enclosure	10	dynamic
SMALL 2	small open-back enclosure	10	dynamic
MIDDLE	open back enclosure	12 x 1	dynamic
JC-120	open back enclosure	12 x 2	dynamic
BUILT-IN 1	open back enclosure	12 x 2	dynamic
BUILT-IN 2	open back enclosure	12 x 2	condenser
BUILT-IN 3	open back enclosure	12 x 2	condenser
BUILT-IN 4	open back enclosure	12 x 2	condenser
BUILT-IN 5	open back enclosure	12 x 2	condenser
BG STACK 1	sealed enclosure	12 x 2	condenser
BG STACK 2	large sealed enclosure	12 x 2	condenser
MS STACK 1	large sealed enclosure	12 x 4	condenser
MS STACK 2	large sealed enclosure	12 x 4	condenser
METAL STACK	large double stack	12 x 4	condenser
2-STACK	large double stack	12 x 4	condenser
3-STACK	large triple stack	12 x 4	condenser

40: COMPRESSOR

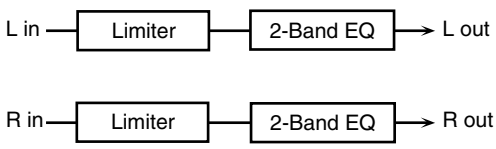
Flattens out high levels and boosts low levels, smoothing out fluctuations in volume.



Parameter	Value	Description
Attack #	0–127	Sets the speed at which compression starts
Threshold #	0–127	Adjusts the volume at which compression begins
Post Gain	0– +18 dB	Adjusts the output gain.
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Level #	0–127	Output level

41: LIMITER

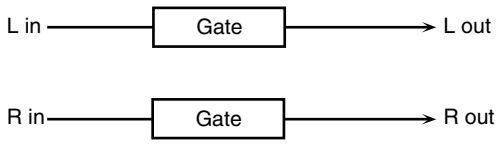
Compresses signals that exceed a specified volume level, preventing distortion from occurring.



Parameter	Value	Description
Release #	0–127	Adjusts the time after the signal volume falls below the Threshold Level until compression is no longer applied.
Threshold #	0–127	Adjusts the volume at which compression begins
Ratio	1.5:1, 2:1, 4:1, 100:1	Compression ratio
Post Gain	0– +18 dB	Adjusts the output gain.
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Level #	0–127	Output level

42: GATE

Cuts the reverb's delay according to the volume of the sound sent into the effect. Use this when you want to create an artificial-sounding decrease in the reverb's decay.

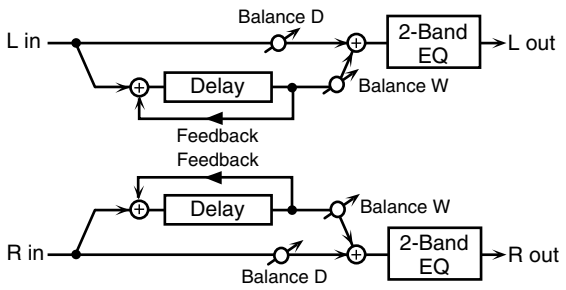


Parameter	Value	Description
Threshold #	0–127	Volume level at which the gate begins to close
Mode	GATE, DUCK	Type of gate **GATE:** The gate will close when the volume of the original sound decreases, cutting the original sound. **DUCK (Ducking):** The gate will close when the volume of the original sound increases, cutting the original sound.
Attack	0–127	Adjusts the time it takes for the gate to fully open after being triggered.
Hold	0–127	Adjusts the time it takes for the gate to start closing after the source sound falls beneath the Threshold.
Release	0–127	Adjusts the time it takes the gate to fully close after the hold time.
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

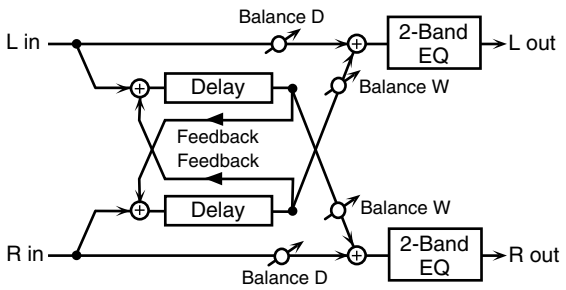
43: DELAY

This is a stereo delay.

When Feedback Mode is NORMAL:



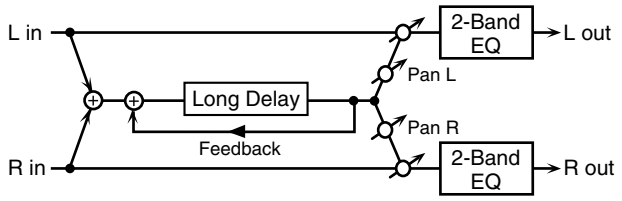
When Feedback Mode is CROSS:



Parameter	Value	Description
Delay Left	0–1300 ms, note	Adjusts the time until the delay sound is heard.
Delay Right		
Phase Left	NORMAL, INVERSE	Phase of the delay sound
Phase Right		
Feedback Mode	NORMAL, CROSS	Selects the way in which delay sound is fed back into the effect. (See the figures above.)
Feedback #	-98– +98 %	Adjusts the amount of the delay sound that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you don't want to filter out any high frequencies, set this parameter to BYPASS.
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the delay sound (W)
Level	0–127	Output level

44: LONG DELAY

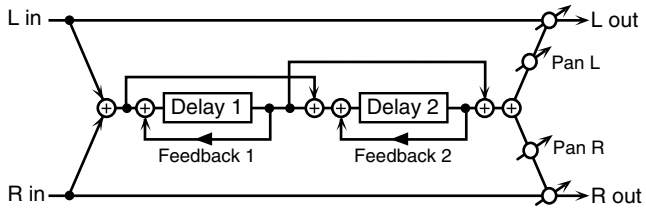
A delay that provides a long delay time.



Parameter	Range	Explanation
Delay Time	0–2600 ms, note	Delay time from when the original sound is heard to when the delay sound is heard
Phase	NORMAL, INVERSE	Phase of the delay (NORMAL: non-inverted, INVERT: inverted)
Feedback #	-98– +98%	Proportion of the delay sound that is to be returned to the input (negative values invert the phase)
HF Damp	200–8000 Hz, BYPASS	Frequency at which the high-frequency content of the delayed sound will be cut (BYPASS: no cut)
Pan #	L64–63R	Panning of the delay sound
Low Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
High Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and delay sound (W)
Level	0–127	Output volume

45: SERIAL DELAY

This delay connects two delay units in series. Feedback can be applied independently to each delay unit, allowing you to produce complex delay sounds.

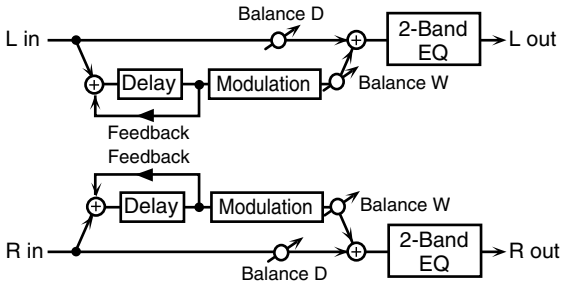


Parameter	Range	Explanation
Delay1 Time	0–1300 ms, note	Delay time from when sound is input to delay 1 until the delay sound is heard
Delay1 Feedback #	-98– +98%	Proportion of the delay sound that is to be returned to the input of delay 1 (negative values invert the phase)
Delay1 HF Damp	200–8000 Hz, BYPASS	Frequency at which the high-frequency content of the delayed sound of delay 1 will be cut (BYPASS: no cut)
Delay2 Time	0–1300 ms, note	Delay time from when sound is input to delay 2 until the delay sound is heard
Delay2 Feedback #	-98– +98%	Proportion of the delay sound that is to be returned to the input of delay 2 (negative values invert the phase)
Delay2 HF Damp	200–8000 Hz, BYPASS	Frequency at which the high-frequency content of the delayed sound of delay 2 will be cut (BYPASS: no cut)
Pan #	L64–63R	Panning of the delay sound
Low Gain	-15– +15 dB	Amount of boost/cut for the low-frequency range
High Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and delay sound (W)
Level	0–127	Output volume

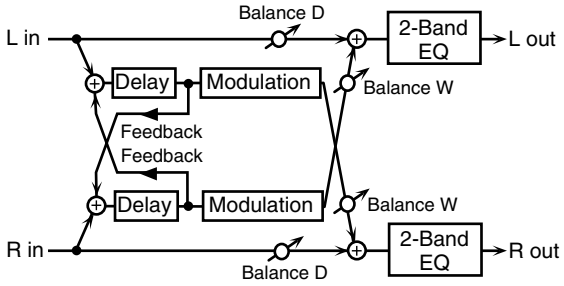
46: MODULATION DELAY

Adds modulation to the delayed sound.

When Feedback Mode is NORMAL:



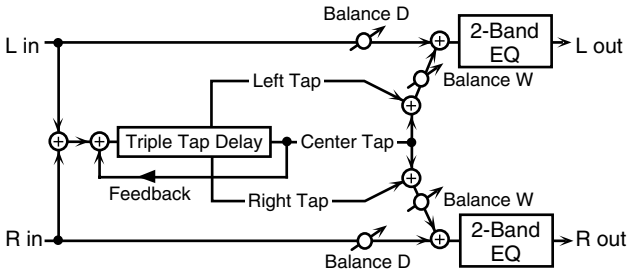
When Feedback Mode is CROSS:



Parameter	Value	Description
Delay Left Delay Right	0–1300 ms, note	Adjusts the time until the delay sound is heard.
Feedback Mode	NORMAL, CROSS	Selects the way in which delay sound is fed back into the effect (See the figures above.)
Feedback #	-98– +98 %	Adjusts the amount of the delay sound that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you don't want to filter out any high frequencies, set this parameter to BYPASS.
Rate #	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Phase	0-180 deg	Spatial spread of the sound
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the delay sound (W)
Level	0–127	Output level

47: 3TAP PAN DELAY

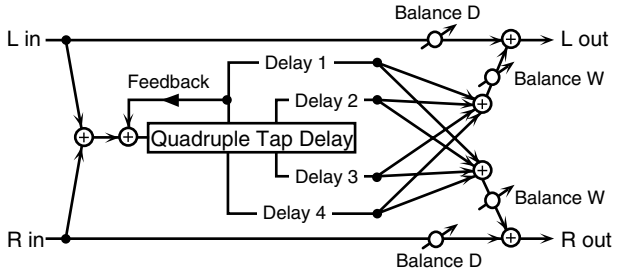
Produces three delay sounds; center, left and right.

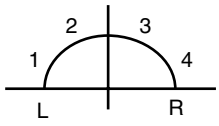


Parameter	Value	Description
Delay Left/ Right/Center	0–2600 ms, note	Adjusts the time until the delay sound is heard.
Center Feedback #	-98– +98 %	Adjusts the amount of the delay sound that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you do not want to filter out any high frequencies, set this parameter to BYPASS.
Left/Right/ Center Level	0–127	Volume of each delay
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the delay sound (W)
Level	0–127	Output level

48: 4TAP PAN DELAY

This effect has four delays.



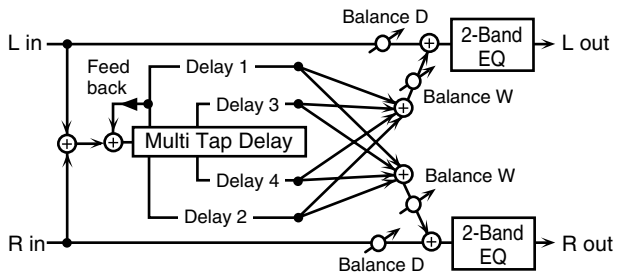


Stereo location of each delay

Parameter	Value	Description
Delay 1–4 Time	0–2600 ms, note	Adjusts the time until the delay sound is heard.
Delay 1 Feedback #	-98– +98 %	Adjusts the amount of the delay sound that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you do not want to filter out any high frequencies, set this parameter to BYPASS.
Delay 1–4 Level	0–127	Volume of each delay
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the delay sound (W)
Level	0–127	Output level

49: MULTI TAP DELAY

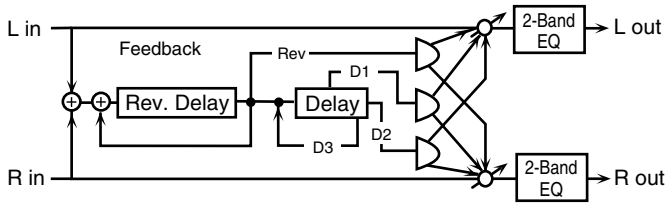
This effect provides four delays. Each of the Delay Time parameters can be set to a note length based on the selected tempo. You can also set the panning and level of each delay sound.



Parameter	Value	Description
Delay 1–4 Time	0–2600 ms, note	Adjusts the time until Delays 1–4 are heard.
Delay 1 Feedback #	-98– +98 %	Adjusts the amount of the delay sound that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you don't want to filter out any the high frequencies, set this parameter to BYPASS.
Delay 1–4 Pan	L64–63R	Stereo location of Delays 1–4
Delay 1–4 Level	0–127	Output level of Delays 1–4
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

50: REVERSE DELAY

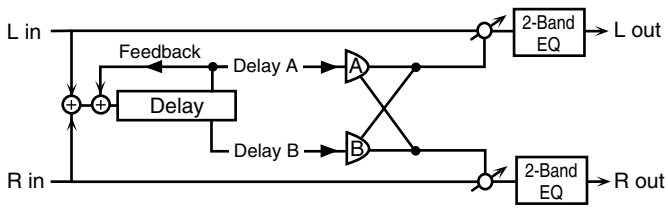
This is a reverse delay that adds a reversed and delayed sound to the input sound. A tap delay is connected immediately after the reverse delay.



Parameter	Range	Explanation
Threshold	0–127	Volume at which the reverse delay will begin to be applied
Rev Delay Time	0–1300 ms, note	Delay time from when sound is input into the reverse delay until the delay sound is heard
Rev Delay Feedback #	-98– +98%	Proportion of the delay sound that is to be returned to the input of the reverse delay (negative values invert the phase)
Rev Delay HF Damp	200–8000 Hz, BYPASS	Frequency at which the high-frequency content of the reverse-delayed sound will be cut (BYPASS: no cut)
Rev Delay Pan	L64–63R	Panning of the reverse delay sound
Rev Delay Level	0–127	Volume of the reverse delay sound
Delay 1 – 3 Time	0–1300 ms, note	Delay time from when sound is input into the tap delay until the delay sound is heard
Delay 3 Feedback #	-98– +98%	Proportion of the delay sound that is to be returned to the input of the tap delay (negative values invert the phase)
Delay HF Damp	200–8000 Hz, BYPASS	Frequency at which the low-frequency content of the tap delay sound will be cut (BYPASS: no cut)
Delay 1 Pan', 'Delay 2 Pan	L64–63R	Panning of the tap delay sounds
Delay 1 Level', 'Delay 2 Level	0–127	Volume of the tap delay sounds
Low Gain	-15– +15 dB	Amount of boost/cut for the low-frequency range
High Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and delay sound (W)
Level	0–127	Output volume

51: SHUFFLE DELAY

Adds a shuffle to the delay sound, giving the sound a bouncy delay effect with a swing feel.

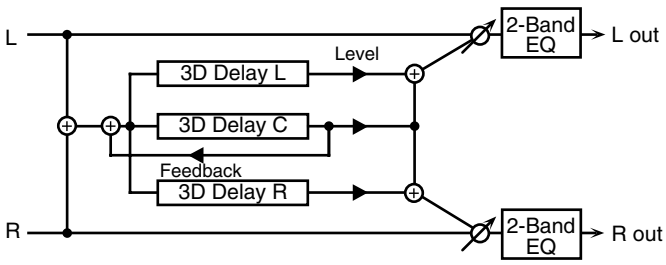


Parameter	Value	Description
Delay Time #	0–2600 ms, note	Adjusts the time until the delay sound is heard.
Shuffle Rate #	0–100 %	Adjusts the ratio (as a percentage) of the time that elapses before Delay B sounds relative to the time that elapses before the Delay A sounds. When set to 100%, the delay times are the same.
Acceleration	0–15	Adjusts the time over which the Delay Time changes from the current setting to its specified new setting.
Feedback #	-98– +98 %	Adjusts the amount of the delay that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you don't want to filter out any high frequencies, set this parameter to BYPASS.
Pan A/B	0–127	Stereo location of Delay A/B

Parameter	Value	Description
Level A/B	0–127	Volume of delay A/B
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

52: 3D DELAY

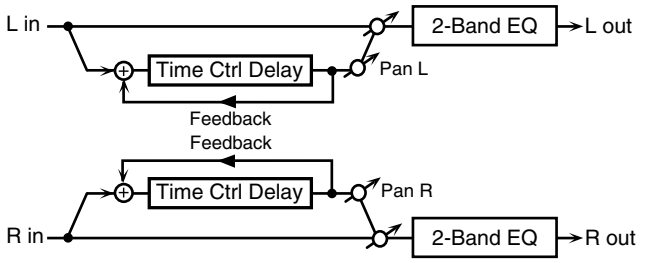
This applies a 3D effect to the delay sound. The delay sound will be positioned 90 degrees left and 90 degrees right.



Parameter	Value	Description
Delay Left	0–2600 ms, note	Adjusts the delay time from the direct sound until the delay sound is heard.
Delay Right		
Delay Center		
Center Feedback #	-98– +98 %	Adjusts the proportion of the delay sound that is fed back into the effect. Negative (-) settings will invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect will be cut. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Left Level	0–127	Output level of the delay sound
Right Level		
Center Level		
Output Mode	SPEAKER, PHONES	Adjusts the method that will be used to hear the sound that is output to the OUTPUT jacks. The optimal 3D effect will be achieved if you select **SPEAKER** when using speakers, or **PHONES** when using headphones.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output Level

53: TIME CTRL DELAY

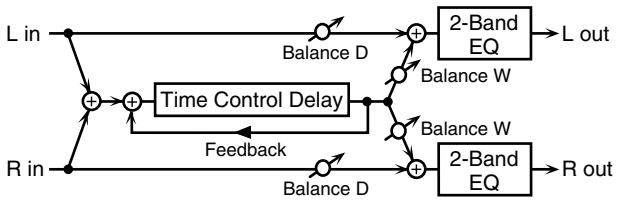
A stereo delay in which the delay time can be varied smoothly.



Parameter	Value	Description
Delay Time #	0–1300 ms, note	Adjusts the time until the delay is heard.
Acceleration	0–15	Adjusts the time over which the Delay Time changes from the current setting to a specified new setting. The rate of change for the Delay Time directly affects the rate of pitch change.
Feedback #2	-98– +98 %	Adjusts the amount of the delay that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you do not want to filter out any high frequencies, set this parameter to BYPASS.
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the delay sound (W)
Level	0–127	Output level

54: LONG TIME CTRL DELAY

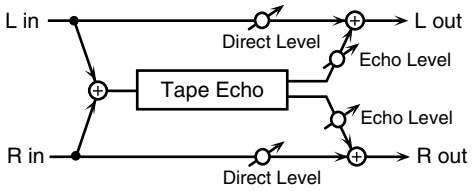
A delay in which the delay time can be varied smoothly, and allowing an extended delay to be produced.



Parameter	Value	Description
Delay Time #	0–2600 ms, note	Adjusts the time until the delay is heard.
Acceleration	0–15	Adjusts the time over which the Delay Time changes from the current setting to a specified new setting. The rate of change for the Delay Time directly affects the rate of pitch change.
Feedback #	-98– +98 %	Adjusts the amount of the delay that's fed back into the effect. Negative (-) settings invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect is filtered out. If you do not want to filter out any high frequencies, set this parameter to BYPASS.
Pan #	L64–63R	Stereo location of the delay
Low Gain	-15– +15 dB	Gain of the low frequency range
High Gain	-15– +15 dB	Gain of the high frequency range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the delay sound (W)
Level	0–127	Output level

55: TAPE ECHO

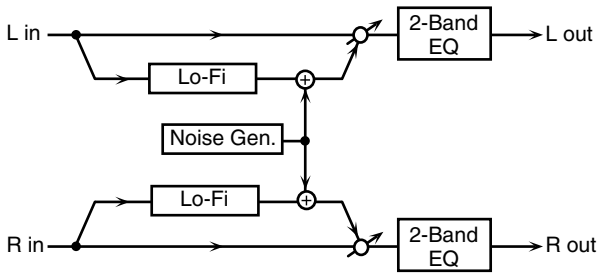
A virtual tape echo that produces a realistic tape delay sound. This simulates the tape echo section of a Roland RE-201 Space Echo.



Parameter	Value	Description
Mode	S, M, L, S+M, S+L, M+L, S+M+L	Combination of playback heads to use Select from three different heads with different delay times. **S:** short **M:** middle **L:** long
Repeat Rate #	0–127	Tape speed Increasing this value will shorten the spacing of the delayed sounds.
Intensity #	0–127	Amount of delay repeats
Bass	-15– +15 dB	Boost/cut for the lower range of the echo sound
Treble	-15– +15 dB	Boost/cut for the upper range of the echo sound
Head S Pan	L64–63R	Independent panning for the short, middle, and long playback heads
Head M Pan		
Head L Pan		
Tape Distortion	0–5	Amount of tape-dependent distortion to be added This simulates the slight tonal changes that can be detected by signal-analysis equipment. Increasing this value will increase the distortion.
Wow/Flutter Rate	0–127	Speed of wow/flutter (complex variation in pitch caused by tape wear and rotational irregularity)
Wow/Flutter Depth	0–127	Depth of wow/flutter
Echo Level #	0–127	Volume of the echo sound
Direct Level #	0–127	Volume of the original sound
Level	0–127	Output level

56: LOFI NOISE

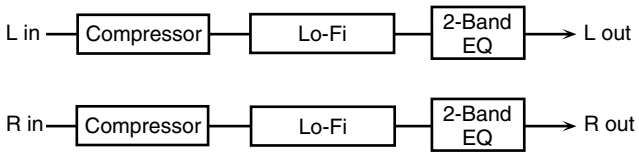
In addition to a lo-fi effect, this adds various types of noise such as white noise and disc noise.



Parameter	Value	Description
LoFi Type	1–9	Degrades the sound quality. The sound quality grows poorer as this value is increased.
Post Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff **HPF:** cuts the frequency range below the Cutoff
Post Filter Cutoff	200–8000 Hz	Center frequency of the filter
W/P Noise Type	WHITE, PINK	Switch between white noise and pink noise.
W/P Noise LPF	200–8000 Hz, BYPASS	Center frequency of the low pass filter applied to the white/pink noise (BYPASS: no cut)
W/P Noise Level #	0–127	Volume of the white/pink noise
Disc Noise Type	LP, EP, SP, RND	Type of record noise The frequency at which the noise is heard depends on the selected type.
Disc Noise LPF	200–8000 Hz, BYPASS	Adjusts the cutoff frequency of the low pass filter applied to the record noise. If you don't want to filter out any high frequencies, set this parameter to BYPASS.
Disc Noise Level #	0–127	Volume of the record noise
Hum Noise Type	50 Hz, 60 Hz	Frequency of the hum noise
Hum Noise LPF	200–8000 Hz, BYPASS	Center frequency of the low pass filter applied to the hum noise (BYPASS: no cut)
Hum Noise Level #	0–127	Volume of the hum noise
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

57: LOFI COMPRESS

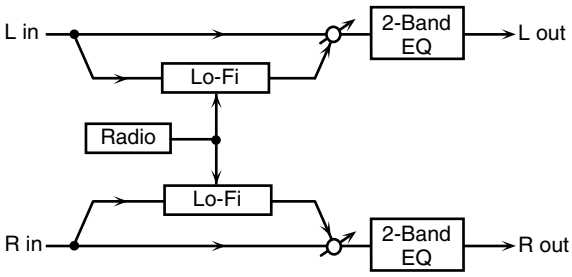
This is an effect that intentionally degrades the sound quality for creative purposes.



Parameter	Value	Description
Pre Filter Type	1–6	Selects the type of filter applied to the sound before it passes through the Lo-Fi effect.
LoFi Type	1–9	Degrades the sound quality. The sound quality grows poorer as this value is increased.
Post Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff **HPF:** cuts the frequency range below the Cutoff
Post Filter Cutoff	200–8000 Hz	Basic frequency of the Post Filter
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level #	0–127	Output level

58: LOFI RADIO

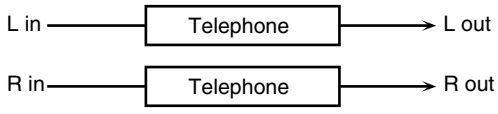
In addition to a Lo-Fi effect, this effect also generates radio noise.



Parameter	Value	Description
LoFi Type	1–9	Degrades the sound quality. The sound quality grows poorer as this value is increased.
Post Filter Type	OFF, LPF, HPF	Type of filter **OFF:** no filter is used **LPF:** cuts the frequency range above the Cutoff **HPF:** cuts the frequency range below the Cutoff
Post Filter Cutoff	200–8000 Hz	Basic frequency of the Post Filter

Parameter	Value	Description
Radio Detune #	0–127	Simulates the tuning noise of a radio. As this value is raised, the tuning drifts further.
Radio Noise Level #	0–127	Volume of the radio noise
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

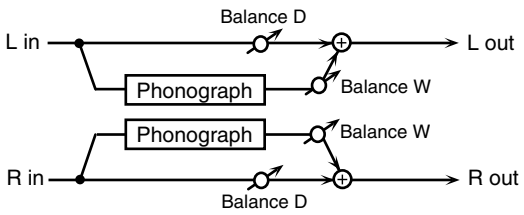
59: TELEPHONE



Parameter	Value	Description
Voice Quality #	0–15	Audio quality of the telephone voice
Treble	-15– +15 dB	Bandwidth of the telephone voice
Balance #	D100:0–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

60: PHONOGRAPH

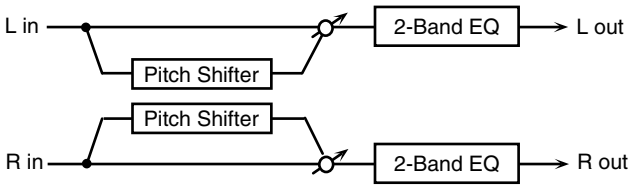
Simulates a sound recorded on an analog record and played back on a record player. This effect also simulates the various types of noise that are typical of a record, and even the rotational irregularities of an old turntable.



Parameter	Value	Description
Signal Distortion	0–127	Depth of distortion
Frequency Range	0–127	Frequency response of the playback system Decreasing this value will produce the impression of an old system with a poor frequency response.
Disc Type	LP, EP, SP	Rotational speed of the turntable This will affect the frequency of the scratch noise.
Scratch Noise Level	0–127	Amount of noise due to scratches on the record
Dust Noise Level	0–127	Volume of noise due to dust on the record
Hiss Noise Level	0–127	Volume of continuous "hiss"
Total Noise Level #	0–127	Volume of overall noise
Wow	0–127	Depth of long-cycle rotational irregularity
Flutter	0–127	Depth of short-cycle rotational irregularity
Random	0–127	Depth of indefinite-cycle rotational irregularity
Total Wow/Flutter #	0–127	Depth of overall rotational irregularity
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the effect sound (W)
Level	0–127	Output level

61: PITCH SHIFTER (Feedback Pitch Shifter)

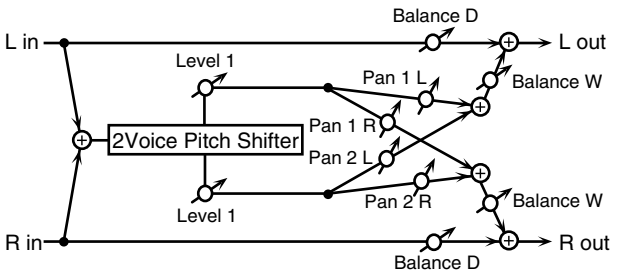
A stereo pitch shifter.



Parameter	Value	Description
Coarse #1	-24– +12 semi	Adjusts the pitch of the pitch shifted sound in semitone steps.
Fine #1	-100– +100 cent	Adjusts the pitch of the pitch shifted sound in 2-cent steps.
Delay Time	0–1300 ms, note	Adjusts the delay time from the direct sound until the pitch shifted sound is heard.
Feedback #	-98– +98 %	Adjusts the proportion of the pitch shifted sound that is fed back into the effect. Negative (-) settings will invert the phase.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the pitch shifted sound (W)
Level	0–127	Output Level

62: 2VOICE PITCH SHIFTER

Shifts the pitch of the original sound. This 2-voice pitch shifter has two pitch shifters, and can add two pitch shifted sounds to the original sound.

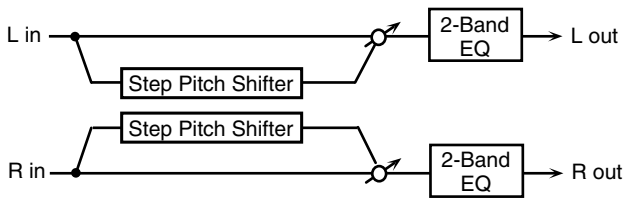


Parameter	Value	Description
Pitch 1: Coarse #1	-24-+12 semi	Adjusts the pitch of Pitch Shift 1 in semitone steps.
Pitch 1:Fine #1	-100-+100 cent	Adjusts the pitch of Pitch Shift Pitch 1 in 2-cent steps.
Pitch 1:Delay	0–1300 ms, note	Adjusts the delay time from the direct sound until the Pitch Shift 1 sound is heard.
Pitch 1:Feedback #	-98– +98 %	Adjusts the proportion of the pitch shifted sound that is fed back into the effect. Negative (-) settings will invert the phase.
Pitch 1:Pan #	L64-63R	Stereo location of the Pitch Shift 1 sound
Pitch 1:Level	0–127	Volume of the Pitch Shift1 sound

Parameter	Value	Description
Pitch 2: Coarse #2	-24-+12 semi	Settings of the Pitch Shift 2 sound. The parameters are the same as for the Pitch Shift 1 sound.
Pitch 2:Fine #2	-100-+100 cent	
Pitch 2:Delay	0–1300 ms, note	
Pitch 2:Feedback #	-98– +98 %	
Pitch 2:Pan #	L64-63R	
Pitch 2:Level	0–127	
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Level Balance	A100:0B-A0:100B	Volume balance between the Pitch Shift 1 and Pitch Shift 2 sounds
Balance	D100:0W-D0:100W	Volume balance between the direct sound (D) and the pitch shifted sound (W)
Level	0-127	Output Level

63: STEP PITCH SHIFTER

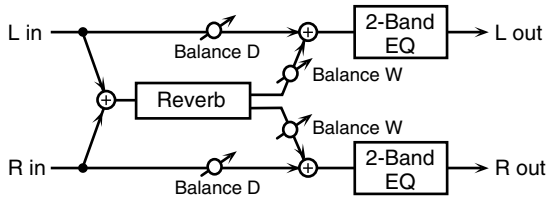
A pitch shifter in which the amount of pitch shift is varied by a 16-step sequence.



Parameter	Range	Explanation
Step 01–16	-24–+12 semi	Amount of pitch shift at each step (semitone units)
Rate #	0.05–10.00 Hz, note	Rate at which the 16-step sequence will cycle
Attack #	0–127	Speed at which the amount of pitch shift changes between steps
Gate Time #	0–127	Duration of the pitch shifted sound at each step
Fine	-100– +100 cent	Pitch shift adjustment for all steps (2-cent units)
Delay Time	0–1300 ms, note	Delay time from the original sound until the pitch-shifted sound is heard
Feedback #	-98– +98%	Proportion of the pitch-shifted sound that is to be returned to the input (negative values invert the phase)
Low Gain	-15– +15 dB	Amount of boost/cut for the low-frequency range
High Gain	-15– +15 dB	Amount of boost/cut for the high-frequency range
Balance #	D100:0W–D0:100W	Volume balance of the original sound (D) and pitch-shifted sound (W)
Level	0–127	Output volume

64: REVERB

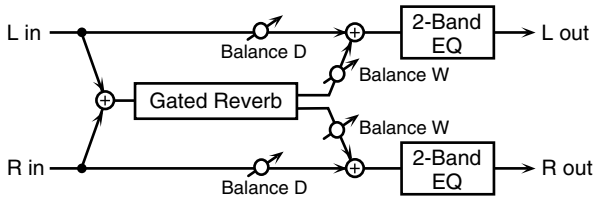
Adds reverberation to the sound, simulating an acoustic space.



Parameter	Value	Description
Type	ROOM1, ROOM2, STAGE1, STAGE2, HALL1, HALL2	Type of reverb **ROOM1:** dense reverb with short decay **ROOM2:** sparse reverb with short decay **STAGE1:** reverb with greater late reverberation **STAGE2:** reverb with strong early reflections **HALL1:** reverb with clear reverberance **HALL2:** reverb with rich reverberance
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the reverb sound is heard.
Time #	0–127	Time length of reverberation
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which the reverberant sound will be cut. As the frequency is set lower, more of the high frequencies will be cut, resulting in a softer and more muted reverberance. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the reverb sound (W)
Level	0–127	Output Level

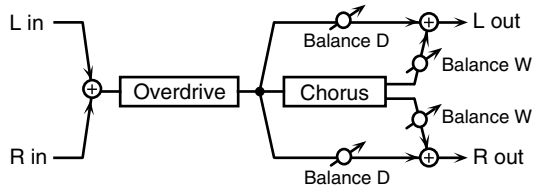
65: GATED REVERB

This is a special type of reverb in which the reverberant sound is cut off before its natural length.



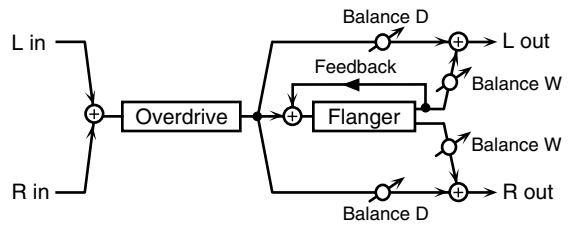
Parameter	Value	Description
Type	NORMAL, REVERSE, SWEEP1, SWEEP2	Type of reverb **NORMAL:** conventional gated reverb **REVERSE:** backwards reverb **SWEEP1:** the reverberant sound moves from right to left **SWEEP2:** the reverberant sound moves from left to right
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the reverb sound is heard.
Gate Time	5–500 ms	Adjusts the time from when the reverb is heard until it disappears.
Low Gain	-15– +15 dB	Gain of the low range
High Gain	-15– +15 dB	Gain of the high range
Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the reverb sound (W)
Level #	0–127	Output Level

66: OVERDRIVE → CHORUS



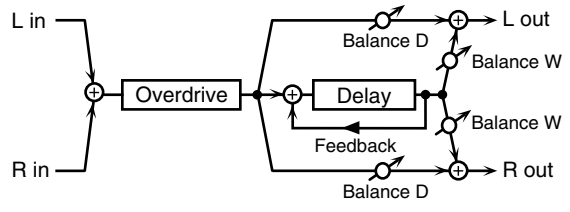
Parameter	Value	Description
Overdrive Drive #	0–127	Degree of distortion Also changes the volume.
Overdrive Pan #	L64–63R	Stereo location of the overdrive sound
Chorus Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Chorus Rate #	0.05–10.00 Hz, note	Frequency of modulation
Chorus Depth	0–127	Depth of modulation
Chorus Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the chorus (W) and the sound that is not sent through the chorus (D).
Level	0–127	Output Level

67: OVERDRIVE → FLANGER



Parameter	Value	Description
Overdrive Drive #	0–127	Degree of distortion Also changes the volume.
Overdrive Pan #	L64–63R	Stereo location of the overdrive sound
Flanger Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Flanger Rate #	0.05–10.00 Hz, note	Frequency of modulation
Flanger Depth	0–127	Depth of modulation
Flanger Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Flanger Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the flanger (W) and the sound that is not sent through the flanger (D).
Level	0–127	Output Level

68: OVERDRIVE → DELAY

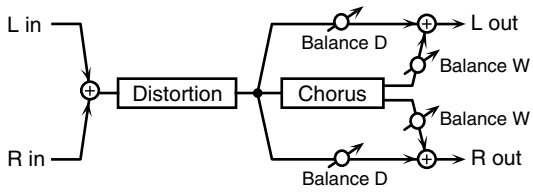


Parameter	Value	Description
Overdrive Drive #	0–127	Degree of distortion Also changes the volume.
Overdrive Pan #	L64–63R	Stereo location of the overdrive sound
Delay Time	0–2600 ms, note	Adjusts the delay time from the direct sound until the delay sound is heard.
Delay Feedback #	-98– +98 %	Adjusts the proportion of the delay sound that is fed back into the effect. Negative (-) settings will invert the phase.
Delay HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect will be cut. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Delay Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the delay (W) and the sound that is not sent through the delay (D).
Level	0–127	Output Level

69: DISTORTION → CHORUS

The parameters are essentially the same as in "66: OVERDRIVE → CHORUS," with the exception of the following two.

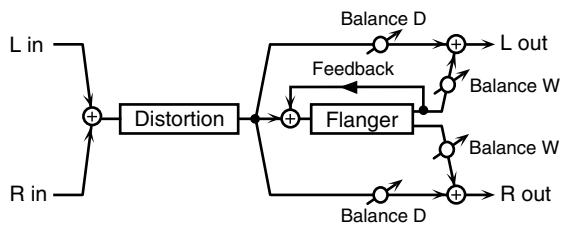
OD Drive → Dist Drive, OD Pan → Dist Pan



70: DISTORTION → FLANGER

The parameters are essentially the same as in "67: OVERDRIVE → FLANGER," with the exception of the following two.

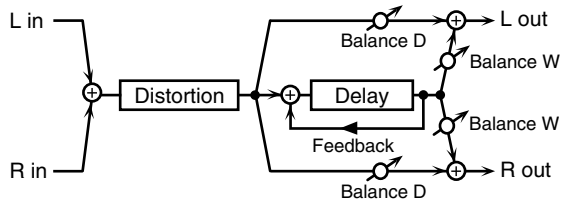
OD Drive → Dist Drive, OD Pan → Dist Pan



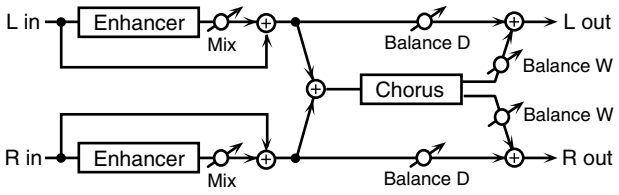
71: DISTORTION → DELAY

The parameters are essentially the same as in "68: OVERDRIVE → DELAY," with the exception of the following two.

OD Drive → Dist Drive, OD Pan → Dist Pan

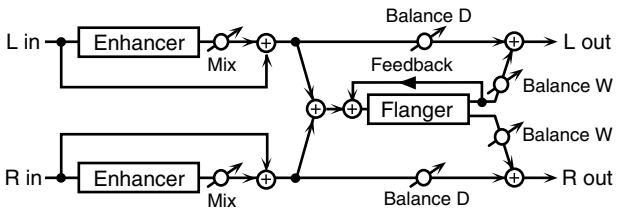


72: ENHANCER → CHORUS



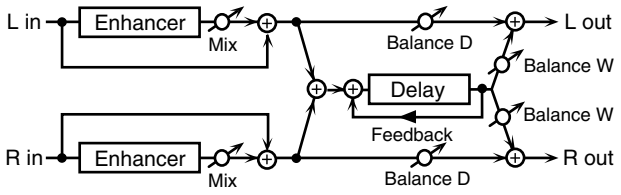
Parameter	Value	Description
Enhancer Sens #	0–127	Sensitivity of the enhancer
Enhancer Mix #	0–127	Level of the overtones generated by the enhancer
Chorus Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Chorus Rate #	0.05–10.00 Hz, note	Frequency of modulation
Chorus Depth	0–127	Depth of modulation
Chorus Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the chorus (W) and the sound that is not sent through the chorus (D).
Level	0–127	Output Level

73: ENHANCER → FLANGER



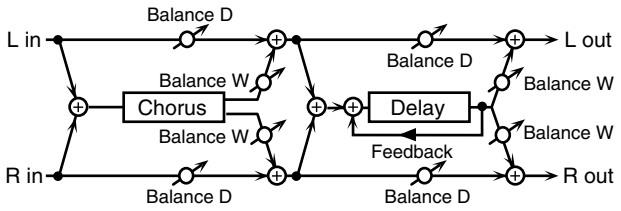
Parameter	Value	Description
Enhancer Sens #	0–127	Sensitivity of the enhancer
Enhancer Mix #	0–127	Level of the overtones generated by the enhancer
Flanger Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Flanger Rate #	0.05–10.00 Hz, note	Frequency of modulation
Flanger Depth	0–127	Depth of modulation
Flanger Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Flanger Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the flanger (W) and the sound that is not sent through the flanger (D).
Level	0–127	Output Level

74: ENHANCER → DELAY



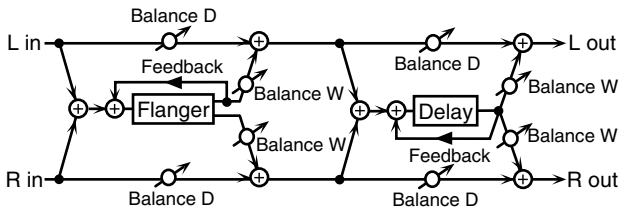
Parameter	Value	Description
Enhancer Sens #	0–127	Sensitivity of the enhancer
Enhancer Mix #	0–127	Level of the overtones generated by the enhancer
Delay Time	0–2600 ms, note	Adjusts the delay time from the direct sound until the delay sound is heard.
Delay Feedback #	-98– +98 %	Adjusts the proportion of the delay sound that is fed back into the effect. Negative (-) settings will invert the phase.
Delay HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect will be cut. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Delay Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the delay (W) and the sound that is not sent through the delay (D).
Level	0–127	Output Level

75: CHORUS → DELAY



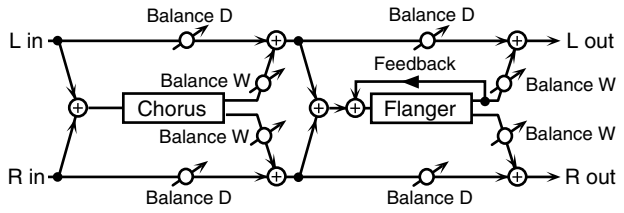
Parameter	Value	Description
Chorus Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Chorus Rate #	0.05–10.00 Hz, note	Frequency of modulation
Chorus Depth	0–127	Depth of modulation
Chorus Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the chorus sound (W)
Delay Time	0–2600 ms, note	Adjusts the delay time from the direct sound until the delay sound is heard.
Delay Feedback #	-98– +98 %	Adjusts the proportion of the delay sound that is fed back into the effect. Negative (-) settings will invert the phase.
Delay HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect will be cut. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Delay Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the delay (W) and the sound that is not sent through the delay (D).
Level	0–127	Output Level

76: FLANGER → DELAY



Parameter	Value	Description
Flanger Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Flanger Rate #	0.05–10.00 Hz, note	Frequency of modulation
Flanger Depth	0–127	Depth of modulation
Flanger Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Flanger Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the flanger sound (W)
Delay Time	0–2600 ms, note	Adjusts the delay time from the direct sound until the delay sound is heard.
Delay Feedback #	-98– +98 %	Adjusts the proportion of the delay sound that is fed back into the effect. Negative (-) settings will invert the phase.
Delay HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect will be cut. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Delay Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the delay (W) and the sound that is not sent through the delay (D).
Level	0–127	Output Level

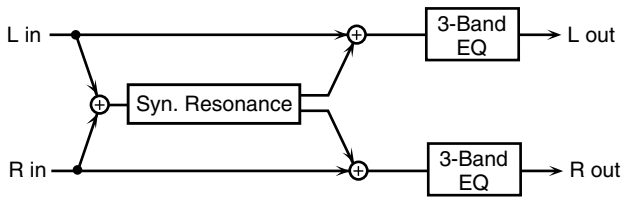
77: CHORUS → FLANGER



Parameter	Value	Description
Chorus Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Chorus Rate #	0.05–10.00 Hz, note	Modulation frequency of the chorus effect
Chorus Depth	0–127	Modulation depth of the chorus effect
Chorus Balance #	D100:0W–D0:100W	Volume balance between the direct sound (D) and the chorus sound (W)
Flanger Pre Delay	0.0–100.0 ms	Adjusts the delay time from when the direct sound begins until the flanger sound is heard.
Flanger Rate #	0.05–10.00 Hz, note	Modulation frequency of the flanger effect
Flanger Depth	0–127	Modulation depth of the flanger effect
Flanger Feedback #	-98– +98 %	Adjusts the proportion of the flanger sound that is fed back into the effect. Negative (-) settings will invert the phase.
Flanger Balance #	D100:0W–D0:100W	Adjusts the volume balance between the sound that is sent through the flanger (W) and the sound that is not sent through the flanger (D).
Level	0–127	Output Level

78: SYMPATHETIC RESONANCE (Fantom-S88 only)

On an acoustic piano, holding down the damper pedal allows other strings to resonate in sympathy with the notes you play, creating rich and spacious resonances. This effect simulates these sympathetic resonances.



Parameter	Range	Explanation
Depth #	0–127	Depth of the effect
Damper #	0–127	Depth to which the damper pedal is pressed (controls the resonant sound)
Pre LPF	16–15000 Hz, BYPASS	Frequency of the filter that cuts the high-frequency content of the input sound (BYPASS: no cut)
Pre HPF	BYPASS, 16–15000 Hz	Frequency of the filter that cuts the low-frequency content of the input sound (BYPASS: no cut)
Peaking Freq	200–8000 Hz	Frequency of the filter that boosts/cuts a specific frequency region of the input sound
Peaking Gain	-15– +15 dB	Amount of boost/cut produced by the filter at the specified frequency region of the input sound
Peaking Q	0.5, 1.0, 2.0, 4.0, 8.0	Width of the frequency region boosted/cut by the 'Peaking Gain' parameter (larger values make the region narrower)
HF Damp	16–15000 Hz, BYPASS	Frequency at which the high-frequency content of the resonant sound will be cut (BYPASS: no cut)
LF Damp	BYPASS, 16–15000 Hz	Frequency at which the low-frequency content of the resonant sound will be cut (BYPASS: no cut)
Lid	1–6	This simulates the actual changes in sound that occur when the lid of a grand piano is set at different heights.
EQ Low Freq	200, 400 Hz	Frequency of the low-range EQ
EQ Low Gain	-15– +15 dB	Amount of low-range boost/cut
EQ Mid Freq	200–8000 Hz	Frequency of the midrange EQ
EQ Mid Gain	-15– +15 dB	Amount of midrange boost/cut
EQ Mid Q	0.5, 1.0, 2.0, 4.0, 8.0	Width of midrange (larger values make the region narrower)
EQ High Freq	2000, 4000, 8000 Hz	Frequency of the high-range EQ
EQ High Gain	-15–+15 dB	Amount of high-range boost/cut
Level	0–127	Output Level

When Using 3D Effects

The following 3D effects utilize RSS (Roland Sound Space) technology to create a spaciousness that cannot be produced by delay, reverb, chorus, etc.

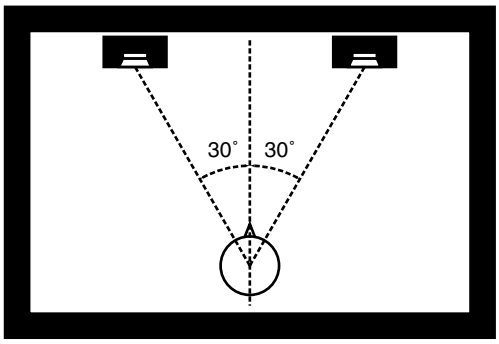
52: 3D DELAY

29: 3D CHORUS

30: 3D FLANGER

31: 3D STEP FLANGER

When using these effects, we recommend that you place your speakers as follows. Also, make sure that the speakers are at a sufficient distance from the walls on either side.



If the left and right speakers are too far apart, or if there is too much reverberation, the full 3D effect may not appear.

Each of these effects has an "Output Mode" parameter. If the sound from the OUTPUT jacks is to be heard through speakers, set this parameter to "SPEAKER." If the sound is to be heard through headphones, set it to "PHONES." This will ensure that the optimal 3D effect will be heard. If this parameter is not set correctly, the full 3D effect may not appear.

About the STEP RESET function

06: STEP FILTER

16: STEP RING MODULATOR

19: STEP PAN

20: SLICER

63: STEP PITCH SHIFTER

The above five types contain a sixteen-step sequencer.

For these types, you can use a multi-effect control to reset the sequence to play from the first step.

To do this, set the multi-effect control Destination to "Step Reset."

For example if you are using the modulation lever to control the effect, you would make the following settings.

Source: CC01: MODULATION

Destination: Step Reset

Sens: +63

With these settings, the sequence will play back from the first step whenever you operate the modulation lever.

note:

(Sixty-fourth-note triplet), (Sixty-fourth note), (Thirty-second-note triplet),

(Thirty-second note), (Sixteenth-note triplet), (Dotted thirty-second note),

(Sixteenth note), (Eighth-note triplet), (Dotted sixteenth note),

(Eighth note), (Quarter-note triplet), (Dotted eighth note),

(Quarter note), (Half-note triplet), (Dotted quarter note), (Half note),

(Whole-note triplet), (Dotted half note), (Whole note),

(Double-note triplet), (Dotted whole note), (Double note)

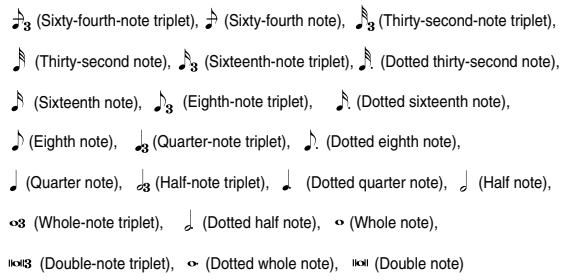
Chorus Parameters

The Fantom-S's Chorus effect unit can also be used as a stereo delay unit.

These settings allow you to select chorus or delay, and the characteristics of the selected effect type.

Parameter	Value	Description
Chorus Type	0 (OFF), 1 (CHORUS), 2 (DELAY), 3 (GM2 CHORUS)	Selects either Chorus or Delay. 0 (OFF): Neither Chorus or Delay is used. 1 (CHORUS): Chorus is used. 2 (DELAY): Delay is used. 3 (GM2 CHORUS): GM2 Chorus is used.
Type: 1 (CHORUS)		
Rate	0.05–10.00 Hz, note	Frequency of modulation
Depth	0–127	Depth of modulation
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the chorus sound is heard.
Feedback	0–127	Adjusts the amount of the chorus sound that is fed back into the effect.
Filter Type	OFF, LPF, HPF	Type of filter OFF: no filter is used LPF: cuts the frequency range above the Cutoff Freq HPF: cuts the frequency range below the Cutoff Freq
Cutoff Freq	200–8000 Hz	Basic frequency of the filter
Phase	0–180°	Spatial spread of the sound
Type: 2 (DELAY)		
Delay Left Delay Right Delay Center	0–1000 ms, note	Adjusts the delay time from the direct sound until the delay sound is heard.
Center Feedback	-98–+98 %	Adjusts the proportion of the delay sound that is fed back into the effect. Negative (-) settings will invert the phase.
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which sound fed back to the effect will be cut. If you do not want to cut the high frequencies, set this parameter to BYPASS.
Left Level Right Level Center Level	0–127	Volume of each delay sound
Type: 3 (GM2 CHORUS)		
Pre-LPF	0–7	Cuts the high frequency range of the sound coming into the chorus. Higher values will cut more of the high frequencies.
Level	0–127	Volume of the chorus sound
Feedback	0–127	Adjusts the amount of the chorus sound that is fed back into the effect.
Delay	0–127	Adjusts the delay time from the direct sound until the chorus sound is heard.
Rate	0–127	Frequency of modulation
Depth	0–127	Depth of modulation
Send Level To Reverb	0–127	Adjusts the amount of chorus sound that will be sent to the reverb.

note:



Reverb Parameters

These settings allow you to select the desired type of reverb, and its characteristics.

Parameter	Value	Description
Reverb Type	0 (OFF), 1 (REVERB), 2 (SRV ROOM), 3 (SRV HALL), 4 (SRV PLATE), 5 (GM2 REVERB)	Type of reverb 0 (OFF): Reverb is not used. 1 (REVERB): Normal reverb 2 (SRV ROOM): This simulates typical room acoustic reflections. 3 (SRV HALL): This simulates typical concert hall acoustic reflections. 4 (SRV PLATE): This simulates a reverb plate, a popular type of artificial reverb unit that derives its sound from the vibration of a metallic plate. 5 (GM2 REVERB): GM2 Reverb
Type: 1 (REVERB)		
Type	ROOM1, ROOM2, STAGE1, STAGE2, HALL1, HALL2, DELAY, PAN-DELAY	Type of reverb/delay ROOM1: short reverb with high density ROOM2: short reverb with low density STAGE1: reverb with greater late reverberation STAGE2: reverb with strong early reflections HALL1: very clear-sounding reverb HALL2: rich reverb DELAY: conventional delay effect PAN-DELAY: delay effect with echoes that pan left and right
Time	0–127	Time length of reverberation (Type: ROOM1–HALL2) Delay time (Type: DELAY, PAN-DELAY)
HF Damp	200–8000 Hz, BYPASS	Adjusts the frequency above which the high-frequency content of the reverb sound will be cut, or "damped." If you do not want to cut the high frequencies, set this parameter to BYPASS.
Delay Feedback	0–127	Adjusts the amount of delay feedback when the Type setting is DELAY or PAN-DELAY.
Type: 2 (SRV ROOM)/3 (SRV HALL)/4 (SRV PLATE)		
Pre Delay	0.0–100.0 ms	Adjusts the delay time from the direct sound until the reverb sound is heard.
Time	0–127	Time length of reverberation
Size	1–8	Size of the simulated room or hall
High Cut	160 Hz–12.5 kHz, BYPASS	Adjusts the frequency above which the high-frequency content of the reverb will be reduced. If you do not want to reduce the high frequencies, set this parameter to BYPASS.
Density	0–127	Density of reverb
Diffusion	0–127	Adjusts the change in the density of the reverb over time. The higher the value, the more the density increases with time. (The effect of this setting is most pronounced with long reverb times.)
LF Damp Freq	50–4000 Hz	Adjusts the frequency below which the low-frequency content of the reverb sound will be reduced, or "damped."
LF Damp Gain	-36–0 dB	Adjusts the amount of damping applied to the frequency range selected with LF Damp. With a setting of "0," there will be no reduction of the reverb's low-frequency content.
HF Damp Freq	4000 Hz–12.5 kHz	Adjusts the frequency above which the high-frequency content of the reverb sound will be reduced, or "damped."
HF Damp Gain	-36–0 dB	Adjusts the amount of damping applied to the frequency range selected with HF Damp. With a setting of "0," there will be no reduction of the reverb's high-frequency content.
Type: 5 (GM2 REVERB)		
Character	0–7	Type of reverb 0–5: reverb 6, 7: delay
Pre-LPF	0–7	Cuts the high frequency range of the sound coming into the reverb. Higher values will cut more of the high frequencies.
Level	0–127	Output level of reverbration
Time	0–127	Time length of reverberation
Delay Feedback	0–127	Adjusts the amount of the delay sound that is fed back into the effect when the Reverb Character setting is 6 or 7.

Input Effect Parameter

Selects the type of effect that will be applied to the external input source.

01: EQUALIZER

Adjusts the tone of the low-frequency and high-frequency ranges.

Parameter	Range	Explanation
Low Freq	200, 400 Hz	Center frequency of the low-frequency range
Low Gain	-15–+15 dB	Amount of low-frequency boost/cut
High Freq	2000, 4000, 8000 Hz	Center frequency of the high-frequency range
High Gain	-15–+15 dB	Amount of high-frequency boost/cut

02: ENHANCER

Modifies the harmonic content of the high-frequency range to add sparkle to the sound.

Parameter	Range	Explanation
Sens	0–127	Depth of the enhancer effect
Mix	0–127	Volume of the harmonics that are generated

03: COMPRESSOR

Restrains high levels and boosts low levels to make the overall volume more consistent.

Parameter	Range	Explanation
Attack	0–127	Time from when the input exceeds the Threshold until the volume begins to be compressed
Threshold	0–127	Volume level at which compression will begin
Post Gain	0–+18 dB	Level of the output sound

04: LIMITER

Compresses the sound when it exceeds a specified volume, to keep distortion from occurring.

Parameter	Range	Explanation
Release	0–127	Time from when the input falls below the Threshold until compression ceases
Threshold	0–127	Volume level at which compression will begin
Post Gain	0–+18 dB	Level of the output sound

05: NOISE SUPPRESSOR

Suppresses noise during periods of silence.

Parameter	Range	Explanation
Threshold	0–127	Volume at which noise suppression will begin
Release	0–127	Time from when noise suppression begins until the volume reaches zero.

06: CENTER CANCELER

Removes the sounds that are localized at the center of the stereo input. This is a convenient way to eliminate a vocal.

Parameter	Range	Explanation
Ch Balance	-50– +50	Volume balance of the L (left) and R (right) channels for removing the sound
Range Low	16–15000 Hz	Lower frequency limit of the band to be removed
Range High	16–15000 Hz1	Upper frequency limit of the band to be removed

Error Messages

If an incorrect operation is performed, or if processing could not be performed as you specified, an error message will appear. Refer to the explanation for the error message that appears, and take the appropriate action.

Message	Meaning	Action
Cannot Edit Preset Sample!	This is a preset sample, and therefore cannot be edited.	—
Card Not Ready!	A memory card is not inserted in the slot.	Insert a memory card into the slot.
Card Protected!	The write-protect sticker is affixed to the card.	—
Data not found	The data for placement is not specified.	—
Empty Pattern	The Pattern has no data in it, so the Pattern Call message cannot be recorded in Step Recording.	—
Empty Sample!	The sample contains no data.	Select a sample that contains data.
Empty Song!	The song has not been recorded, and therefore cannot be played.	Select a song that contains data.
File Name Duplicate	A file with the same name already exists.	Delete the file bearing the same name from the disk, and if overwriting and saving the data, merely save the file. If you do not want to delete the file with the same name from the disk, either save the file with a different name.
Illegal File!	The Fantom-S cannot use this file.	—
Memory Damaged!	The contents of memory may have been damaged.	Please perform the Factory Reset operation. If this does not resolve the problem, please contact your dealer or the nearest Roland Service Center.
Memory Full!	Saving is not possible because there is insufficient space in the user area or memory card.	Delete unneeded data.
MIDI Offline!	There is a problem with the MIDI cable connection.	Check that the MIDI cable has not been disconnected or broken.
No More Note Numbers!	A maximum of 16 different note numbers can be used in one style of the arpeggio/rhythm function.	Please delete unneeded notes.
No More Sample Numbers!	The sample cannot be divided any further.	Erase unneeded samples in order to allocate 256 or more consecutive sample numbers.
	Since fewer than 256 consecutive sample numbers are vacant, no further sampling is possible.	
No More Song Numbers!	No more songs can be saved. A maximum of 256 songs can be handled simultaneously for both the user bank and card bank.	Please delete unneeded songs.
Now Playing!	Since the Fantom-S is playing, this operation cannot be executed.	Stop playback before you execute the operation.
Permission Denied!	The file is protected.	—
Playback Tempo Range Over	Tempo values exceed the allowable limit, and data is created in which the closest time available within the allowable range is specified.	—
Recording Parameter Error	You are attempting to begin recording after a looped segment.	You are attempting to begin recording within or before a looped segment.
Rec Over Flow	Since a large amount of recorded data was input all at once, it could not be processed correctly.	Reduce the amount of recorded data.
Sample Length Too Short!	The sample is too short, and cannot be edited correctly.	If the sample is extremely short, editing may not produce the desired result.
Sample Memory Full!	Since there is insufficient sample memory, no further sampling or sample editing is possible.	Erase unneeded samples.
Song Full	Since the maximum number of notes that can be recorded in a song or pattern has been exceeded, no further recording/editing is possible.	Use the track edit Delete or Erase commands to remove unneeded data from the song/pattern that you are recording/editing.
Song Format Error	This song is damaged.	This song cannot be used.
Song Not Found	The selected song cannot be found.	—
Too Many Sample Selected!	The operation cannot be executed, since marks are assigned to more than one sample.	Either clear the marks, or mark only one sample.
Unformatted!	The memory card is in an unsupported format.	Format the memory card.
You Cannot Assign	The sample cannot be assigned to a pad.	Assign To Pad requires that all pads be playing a rhythm set. Assign a rhythm set to the Pad part. Turn off the RPS function. Turn off the rhythm switch. Turn off the ARPEGGIO/RHYTHM function.
	Since the Pad Set is not of the User type, you cannot use the clipboard to copy pad settings.	Change Pad Set to User.
You Cannot Copy This Message	This message cannot be copied.	—
You Cannot Erase This Message	This message cannot be erased.	—
You Cannot Move This Message	This message cannot be moved.	—
You Cannot Quick Play S-MRC Song	This is a SuperMRC song; it cannot be played back in Quick Play.	Save the data as an MRC Pro song.
Rhythm Note Range Over!	The pad selected for Assign To Pad is outside the range of the rhythm set.	Select a pad that is within the range of the rhythm set.

About MIDI

MIDI (Musical Instruments Digital Interface) is a standard specification that allows musical data to be exchanged between electronic musical instruments and computers. MIDI With a MIDI cable connecting MIDI devices that are equipped with MIDI connectors, you can play multiple instruments with a single keyboard, have multiple MIDI instruments perform in ensemble, program the settings to change automatically to match the performance as the song progresses, and more.

If you mainly use the Fantom-S as a standalone keyboard instrument, you may really not need to know much at all about MIDI.

However, the following MIDI-related information is provided so you can play the Fantom-S using an external MIDI device, or master other advanced techniques.

About MIDI Connectors

The Fantom-S is equipped with the three types of MIDI connectors, each which works differently.

MIDI IN Connector

This connector receives MIDI messages that are transmitted from external MIDI devices. The Fantom-S can receive these messages to play notes or select sounds, etc.

MIDI OUT Connector

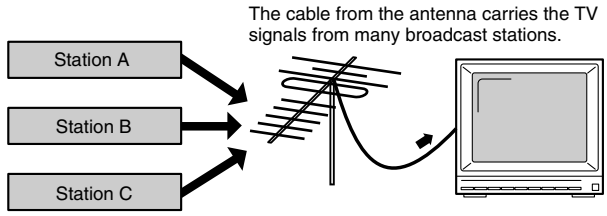
This connector transmits MIDI messages to external MIDI devices. The Fantom-S's MIDI OUT connector is used for sending the performance data of the keyboard controller section as well as data used for saving various settings and patterns.

MIDI THRU Connector

MIDI messages received at MIDI IN are re-transmitted without change from this connector to an external MIDI device. Use this in situations such as when you use multiple MIDI devices simultaneously.

MIDI Channels and Multi-timbral Sound Generators

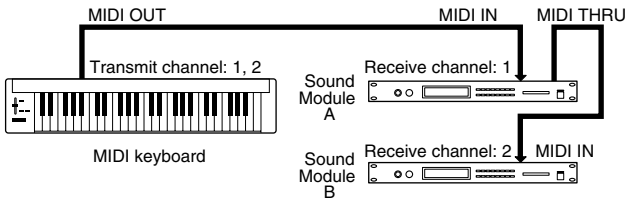
MIDI transmits many types of data over a single MIDI cable. This is made possible by the concept of **MIDI channels**. MIDI channels allow messages intended for a given instrument to be distinguished from messages intended for another instrument. In some ways, MIDI channels are similar to television channels. By changing the channel on a television set, you can view the programs that are being broadcast by different stations. In the same way, MIDI also allows a device to select the information intended for that device out of the variety of information that is being transmitted to it.



MIDI uses sixteen channels; 1 through 16. Set the receiving device so that it will receive only the channel that it needs to receive.

Example:

Set the Fantom-S to send Channel 1 and Channel 2, then set sound module A to receive only Channel 1 and sound module B only Channel 2. With this setup, you can get an ensemble performance, with, for example, a guitar sound from sound module A and bass from sound module B.



When used as a sound module, the Fantom-S can receive on up to sixteen MIDI channels. Sound modules like the Fantom-S which can receive multiple MIDI channels simultaneously to play different sounds on each channel are called **multi-timbral sound modules**.

MIDI Implementation

1. Receive Data (Sound Source Section)

■Channel Voice Messages

* Not received in Performance mode when the Receive Switch parameter (PERFORM/MIDI) is OFF.

●Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH
9nH	kkH	00H
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = note off velocity:	00H - 7FH (0 - 127)	

* Not received when the Envelope Mode parameter (PATCH/GENERAL and RHYTHM/GENERAL) is NO-SUS.

●Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = note on velocity:	01H - 7FH (1 - 127)	

●Polyphonic Key Pressure

Status	2nd byte	3rd byte
AnH	kkH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = Polyphonic Key Pressure:	00H - 7FH (0 - 127)	

* Not received in Performance mode when the Receive Poly Key Pressure parameter (PERFORM/MIDI) is OFF.

●Control Change

* If the corresponding Controller number is selected for the Patch Control Source 1, 2, 3 or 4 parameter (PATCH/CTRL1-4), the corresponding effect will occur.
* If a Controller number that corresponds to the System Control Source 1, 2, 3 or 4 parameter (SYSTEM/SYSTEM CONTROL) is selected, the specified effect will apply if Patch Control Source 1, 2, 3 or 4 parameter (PATCH/CTRL1–4) is set to SYS-CTRL1, SYS-CTRL2, SYS-CTRL3 or SYS-CTRL4.

❍Bank Select (Controller number 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm, ll = Bank number:	00 00H - 7F 7FH (bank.1 - bank.16384)	

* Not received in Performance mode when the Receive Bank Select (PERFORM/MIDI) is OFF.
* The Performances, Patches, and Rhythms corresponding to each Bank Select are as follows.
* The SRX series corresponding to each Bank Select are to see the SRX series owner's manual.

BANK SELECT MSB	LSB	PROGRAM NUMBER	GROUP	NUMBER
000		001 - 128	GM Patch	001 - 256
:				
063		001 - 128	GM Patch	001 - 256
085	000	001 - 064	User Performance	001 - 064
	032	001 - 064	Card Performance	001 - 064
	064	001 - 064	Preset Performance	001 - 064
086	000	001 - 032	User Rhythm	001 - 032
	032	001 - 032	Card Rhythm	001 - 032
	064	001 - 032	Preset Rhythm	001 - 032
087	000	001 - 128	User Patch	001 - 128
	001	001 - 128	User Patch	129 - 256
	032	001 - 128	Card Patch	001 - 128
	033	001 - 128	Card Patch	129 - 256
	064	001 - 128	Preset Patch A	001 - 128
	065	001 - 128	Preset Patch B	001 - 128
	:		:	
092	000 -	001 -	SRX Rhythm	001 -
	:		:	
093	000 -	001 -	SRX Patch	001 -
	:		:	
120		001 - 057	GM Rhythm	001 - 009
121	000 -	001 - 128	GM Patch	001 - 256

❍Modulation (Controller number 1)

Status	2nd byte	3rd byte
BnH	01H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Modulation depth:	00H - 7FH (0 - 127)	

* Not received in Performance mode when the Receive Modulation parameter (PERFORM/MIDI) is OFF.

❍Breath type (Controller number 2)

Status	2nd byte	3rd byte
BnH	02H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127)	

❍Foot type (Controller number 4)

Status	2nd byte	3rd byte
BnH	04H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127)	

❍Portamento Time (Controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Portamento Time:	00H - 7FH (0 - 127)	

* In Performance mode the Part Portament Time parameter (PERFORM/PART) will change.

❍Data Entry (Controller number 6, 38)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)
mm, ll = the value of the parameter specified by RPN/NRPN
mm = MSB, ll = LSB

❍Volume (Controller number 7)

Status	2nd byte	3rd byte
BnH	07H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Volume:	00H - 7FH (0 - 127)	

* Not received in Performance mode when the Receive Volume parameter (PERFORM/MIDI) is OFF.
* In Performance mode the Part Level parameter (PERFORM/PART) will change.

❍Balance (Controller number 8)

Status	2nd byte	3rd byte
BnH	08H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Balance:	00H - 7FH (0 - 127)	

❍Panpot (Controller number 10)

Status	2nd byte	3rd byte
BnH	0AH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Panpot:	00H - 40H - 7FH (Left - Center - Right),	

* Not received in Performance mode when the Receive Pan parameter (PERFORM/MIDI) is OFF.
* In Performance mode the Part Pan parameter (PERFORM/PART) will change.

❍Expression (Controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Expression:	00H - 7FH (0 - 127)	

* Not received when Tone Receive Expression parameter (PATCH/GENERAL or RHYTHM/GENERAL) is OFF.
* Not received in Performance mode when Receive Expression parameter (PERFORM/MIDI) is OFF.

❍Hold 1 (Controller number 64)

Status	2nd byte	3rd byte
BnH	40H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0-63 = OFF, 64-127 = ON

* Not received when Tone Receive Hold-1 parameter (PATCH/GENERAL or RHYTHM/GENERAL) is OFF.
* Not received in Performance mode when Receive Hold-1 parameter (PERFORM/MIDI) is OFF.

❍Portamento (Controller number 65)

Status	2nd byte	3rd byte
BnH	41H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON

* In Performance mode the Part Portamento Switch parameter (PERFORM/PART) will change.

❍Sostenuto (Controller number 66)

Status	2nd byte	3rd byte
BnH	42H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON

❍Soft (Controller number 67)

Status	2nd byte	3rd byte
BnH	43H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON

❍Legato Foot Switch (Controller number 68)

Status	2nd byte	3rd byte
BnH	44H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON

* In Performance mode the Part Legato Switch parameter (PERFORM/PART) will change.

❍Hold-2 (Controller number 69)

Status	2nd byte	3rd byte
BnH	45H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

* A hold movement isn't done.

❍Resonance (Controller number 71)

Status	2nd byte	3rd byte
BnH	47H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv= Resonance value (relative change): 00H - 40H - 7FH (-64 - 0 - +63),

* In Performance mode the Part Resonance Offset parameter (PERFORM/PART) will change.

❍Release Time (Controller number 72)

Status	2nd byte	3rd byte
BnH	48H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Release Time value (relative change): 00H - 40H - 7FH (-64 - 0 - +63),

* In Performance mode the Part Release Time Offset parameter (PERFORM/PART) will change.

❍Attack time (Controller number 73)

Status	2nd byte	3rd byte
BnH	49H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Attack time value (relative change): 00H - 40H - 7FH (-64 - 0 - +63),

* In Performance mode the Part Attack Time Offset parameter (PERFORM/PART) will change.

❍Cutoff (Controller number 74)

Status	2nd byte	3rd byte
BnH	4AH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Cutoff value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

* In Performance mode the Part Cutoff Offset parameter (PERFORM/PART) will change.

❍Decay Time (Controller number 75)

Status	2nd byte	3rd byte
BnH	4BH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Decay Time value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

* In Performance mode the Part Decay Time Offset parameter (PERFORM/PART) will change.

❍Vibrato Rate (Controller number 76)

Status	2nd byte	3rd byte
BnH	4CH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Vibrato Rate value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

* In Performance mode the Part Vibrato Rate parameter (PERFORM/PART) will change.

❍Vibrato Depth (Controller number 77)

Status	2nd byte	3rd byte
BnH	4DH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Vibrato Depth Value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

* In Performance mode the Part Vibrato Depth parameter (PERFORM/PART) will change.

❍Vibrato Delay (Controller number 78)

Status	2nd byte	3rd byte
BnH	4EH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Vibrato Delay value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

* In Performance mode the Part Vibrato Delay parameter (PERFORM/PART) will change.

❍General Purpose Controller 5 (Controller number 80)

Status	2nd byte	3rd byte
BnH	50H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

* The Tone Level parameter (PATCH/TVA) of Tone 1 will change.

❍General Purpose Controller 6 (Controller number 81)

Status	2nd byte	3rd byte
BnH	51H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

* The Tone Level parameter (PATCH/TVA) of Tone 2 will change.

❍General Purpose Controller 7 (Controller number 82)

Status	2nd byte	3rd byte
BnH	52H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

* The Tone Level parameter (PATCH/TVA) of Tone 3 will change.

❍General Purpose Controller 8 (Controller number 83)

Status	2nd byte	3rd byte
BnH	53H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

* The Tone Level parameter (PATCH/TVA) of Tone 4 will change.

❍Portamento control (Controller number 84)

Status	2nd byte	3rd byte
BnH	54H	kkH

n = MIDI channel number: 0H - FH (ch.1 - 16)
kk = source note number: 00H - 7FH (0 - 127)

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

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

Status	2nd byte	3rd byte
BnH	5BH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Reverb Send Level: 00H - 7FH (0 - 127)

* In Performance mode the Part Reverb Send Level parameter (PERFORM/PART) will change.

❍Effect 3 (Chorus Send Level) (Controller number 93)

Status	2nd byte	3rd byte
BnH	5DH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Chorus Send Level: 00H - 7FH (0 - 127)

* In Performance mode the Part Chorus Send Level parameter (PERFORM/PART) will change.

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

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

n = MIDI channel number: 0H - FH (ch.1 - 16)
mm = upper byte (MSB) of parameter number specified by RPN
ll = lower byte (LSB) of parameter number specified by RPN

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

This device receives the following RPNs.

RPN MSB, LSB	Data entry MSB, LSB	Notes
00H, 00H	mmH, llH	Pitch Bend Sensitivity mm: 00H - 18H (0 - 24 semitones) ll: ignored (processed as 00H) Up to 2 octave can be specified in semitone steps.

* In Performance mode, the Part Bend Range parameter (PERFORM/PART) will change.

00H, 01H	mmH, llH	Channel Fine Tuning mm, ll: 20 00H - 40 00H - 60 00H (-4096 x 100 / 8192 - 0 - +4096 x 100 / 8192 cent)

* In Performance mode, the Part Fine Tune parameter (PERFORM/PART) will change.

00H, 02H	mmH, llH	Channel Coarse Tuning mm: 10H - 40H - 70H (-48 - 0 - +48 semitones) ll: ignored (processed as 00H)

* In Performance mode, the Part Coarse Tune parameter (PERFORM/PART) will change.

7FH, 7FH	---, ---	RPN null RPN and NRPN will be set as "unspecified." Once this setting has been made, subsequent Parameter values that were previously set will not change. mm, ll: ignored

●Program Change

Status	2nd byte
CnH	ppH

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

* Not received in Performance mode when the Receive Program Change parameter (PERFORM/MIDI) is OFF.

●Channel Pressure

Status	2nd byte
DnH	vvH

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

* Not received in Performance mode when the Receive Channel Pressure parameter (PERFORM/MIDI) is OFF.

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH

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

* Not received when the Tone Receive Bender parameter (PATCH/GENERAL) is OFF.
* Not received in Performance mode when the Receive Pitch Bend parameter (PERFORM/MIDI) is OFF.

■Channel Mode Messages

* Not received in Performance mode when the Receive Switch parameter (PERFORM/MIDI) is OFF.

●All Sounds Off (Controller number 120)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

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

●Reset All Controllers (Controller number 121)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

* When this message is received, the following controllers will be set to their reset values.

Controller	Reset value
Pitch Bend Change	+/-0 (center)
Polyphonic Key Pressure	0 (off)
Channel Pressure	0 (off)
Modulation	0 (off)
Breath Type	0 (min)
Expression	127 (max) However the controller will be at minimum.
Hold 1	0 (off)
Sostenuto	0 (off)
Soft	0 (off)
Hold 2	0 (off)
RPN	unset; previously set data will not change
NRPN	unset; previously set data will not change

●All Notes Off (Controller number 123)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

* When All Notes Off is received, all notes on the corresponding channel will be turned off. However, if Hold 1 or Sostenuto is ON, the sound will be continued until these are turned off.

●OMNI OFF (Controller number 124)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

* The same processing will be carried out as when All Notes Off is received.

●OMNI ON (Controller number 125)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

* The same processing will be carried out as when All Notes Off is received. OMNI ON will not be turned on.

●MONO (Controller number 126)

Status	2nd byte	3rd byte
BnH	7EH	mmH

n = MIDI channel number: 0H - FH (ch.1 - 16)
mm = mono number: 00H - 10H (0 - 16)

* The same processing will be carried out as when All Notes Off is received.
* In Performance mode, the Part Mono/Poly parameter (PERFORM/PART) will change.

●POLY (Controller number 127)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

* The same processing will be carried out as when All Notes Off is received.
* In Performance mode, the Part Mono/Poly parameter (PERFORM/PART) will change.

■System Realtime Message

●Active Sensing

Status
FEH

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

■System Exclusive Message

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

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

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

●Universal Non-realtime System Exclusive Messages

❍Identity Request Message

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

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

* When this message is received, Identity Reply message (p. 54) will be transmitted.

❍GM1 System On

Status	Data byte	Status
F0H	7EH, 7FH, 09H, 01H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
01H	Sub ID#2 (General MIDI 1 On)
F7H	EOX (End Of Exclusive)

* When this messages is received, this instrument will turn to the Performance mode.
* Not received when the Receive GM1 System On parameter (SYSTEM/MIDI) is OFF.

❍GM2 System On

Status	Data byte	Status
F0H	7EH 7FH 09H 03H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
03H	Sub ID#2 (General MIDI 2 On)
F7H	EOX (End Of Exclusive)

* When this messages is received, this instrument will turn to the Performance mode.
* Not received when the Receive GM2 System On parameter (SYSTEM/MIDI) is OFF.

❍GM System Off

Status	Data byte	Status
F0H	7EH, 7F, 09H, 02H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (General MIDI Message)
02H	Sub ID#2 (General MIDI Off)
F7H	EOX (End Of Exclusive)

* When this messages is received, this instrument will return to the Performance mode.

●Universal Realtime System Exclusive Messages

❍Master Volume

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

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
01H	Sub ID#2 (Master Volume)
llH	Master Volume lower byte
mmH	Master Volume upper byte
F7H	EOX (End Of Exclusive)

* The lower byte (llH) of Master Volume will be handled as 00H.
* The Master Level parameter (SYSTEM/SOUND) will change.

❍Master Fine Tuning

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

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

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

* The Master Tune parameter (SYSTEM/SOUND) will change.

❍Master Coarse Tuning

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

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

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

* The Master Key Shift parameter (SYSTEM/SOUND) will change.

●Global Parameter Control

* Not received in Patch mode.

❍Reverb Parameters

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 05H, 01H, 01H, 01H, 01H, 01H, ppH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
05H	Sub ID#2 (Global Parameter Control)
01H	Slot path length
01H	Parameter ID width
01H	Value width
01H	Slot path MSB
01H	Slot path LSB (Effect 0101: Reverb)
ppH	Parameter to be controlled.
vvH	Value for the parameter.
	pp=0 Reverb Type
	vv = 00H Small Room
	vv = 01H Medium Room
	vv = 02H Large Room
	vv = 03H Medium Hall
	vv = 04H Large Hall
	vv = 08H Plate
	pp=1 Reverb Time
	vv = 00H - 7FH 0 - 127
F7H	EOX (End Of Exclusive)

❍Chorus Parameters

Status	Data byte	Status
F0H	7FH, 7FH, 04H, 05H, 01H, 01H, 01H, 01H, 02H, ppH, vvH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
04H	Sub ID#1 (Device Control)
05H	Sub ID#2 (Global Parameter Control)
01H	Slot path length
01H	Parameter ID width
01H	Value width
01H	Slot path MSB
02H	Slot path LSB (Effect 0102: Chorus)
ppH	Parameter to be controlled.
vvH	Value for the parameter.
	pp=0 Chorus Type
	vv=0 Chorus1
	vv=1 Chorus2
	vv=2 Chorus3
	vv=3 Chorus4
	vv=4 FB Chorus
	vv=5 Flanger
	pp=1 Mod Rate
	vv= 00H - 7FH 0 - 127
	pp=2 Mod Depth
	vv = 00H - 7FH 0 - 127
	pp=3 Feedback
	vv = 00H - 7FH 0 - 127
	pp=4 Send To Reverb
	vv = 00H - 7FH 0 - 127
F7H	EOX (End Of Exclusive)

❍Channel Pressure

Status	Data byte	Status
F0H	7FH, 7FH, 09H, 01H, 0nH, ppH, rrH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (Controller Destination Setting)
01H	Sub ID#2 (Channel Pressure)
0nH	MIDI Channel (00 - 0F)
ppH	Controlled parameter
rrH	Controlled range
	pp=0 Pitch Control
	rr = 28H - 58H -24 - +24 [semitones]
	pp=1 Filter Cutoff Control
	rr = 00H - 7FH -9600 - +9450 [cents]
	pp=2 Amplitude Control
	rr = 00H - 7FH 0 - 200%
	pp=3 LFO Pitch Depth
	rr = 00H - 7FH 0 - 600 [cents]
	pp=4 LFO Filter Depth
	rr = 00H - 7FH 0 - 2400 [cents]
	pp=5 LFO Amplitude Depth
	rr = 00H - 7FH 0 - 100%
F7H	EOX (End Of Exclusive)

❍Controller

Status	Data byte	Status
F0H	7FH, 7FH, 09H, 03H, 0nH, ccH, ppH, rrH	F7H

Byte	Explanation
F0H	Exclusive status
7FH	ID number (universal realtime message)
7FH	Device ID (Broadcast)
09H	Sub ID#1 (Controller Destination Setting)
03H	Sub ID#2 (Control Change)
0nH	MIDI Channel (00 - 0F)
ccH	Controller number (01 - 1F, 40 - 5F)
ppH	Controlled parameter
rrH	Controlled range pp=0 Pitch Control rr = 28H - 58H -24 - +24 [semitones] pp=1 Filter Cutoff Control rr = 00H - 7FH -9600 - +9450 [cents] pp=2 Amplitude Control rr = 00H - 7FH 0 - 200% pp=3 LFO Pitch Depth rr = 00H - 7FH 0 - 600 [cents] pp=4 LFO Filter Depth rr = 00H - 7FH 0 - 2400 [cents] pp=5 LFO Amplitude Depth rr = 00H - 7FH 0 - 100%
F7H	EOX (End Of Exclusive)

❍Scale/Octave Tuning Adjust

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

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
7FH	Device ID (Broadcast)
08H	Sub ID#1 (MIDI Tuning Standard)
08H	Sub ID#2 (scale/octave tuning 1-byte form)
ffH	Channel/Option byte 1 bits 0 to 1 = channel 15 to 16 bit 2 to 6 = Undefined
ggH	Channel byte 2 bits 0 to 6 = channel 8 to 14
hhH	Channel byte 3 bits 0 to 6 = channel 1 to 7
ssH	12 byte tuning offset of 12 semitones from C to B 00H = -64 [cents] 40H = 0 [cents] (equal temperament) 7FH = +63 [cents]
F7H	EOX (End Of Exclusive)

❍Key-based Instrument Controllers

Status	Data byte	Status
F0H	7FH, 7FH, 0AH, 01H, 0nH, kkH, nnH, vvH	F7H

Byte	Explanation	
F0H	Exclusive status	
7FH	ID number (universal realtime message)	
7FH	Device ID (Broadcast)	
0AH	Sub ID#1 (Key-Based Instrument Control)	
01H	Sub ID#2 (Controller)	
0nH	MIDI Channel (00 - 0FH)	
kkH	Key Number	
nnH	Control Number	
vvH	Value	
	nn=07H Level	
	vv = 00H - 7FH	0 - 200% (Relative)
	nn=0AH	Pan
	vv = 00H - 7FH	Left - Right (Absolute)
	nn=5BH	Reverb Send
	vv = 00H - 7FH	0 - 127 (Absolute)
	nn=5D	Chorus Send
	vv = 00H - 7FH	0 - 127 (Absolute)
:	:	
F7	EOX (End Of Exclusive)	

* This parameter affects drum instruments only.

●Data Transmission

This instrument can use exclusive messages to exchange many varieties of internal settings with other devices.
The model ID of the exclusive messages used by this instrument is 00H 6BH.

❍Data Request 1 RQ1 (11H)

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

Status	data byte	status
F0H	41H, dev, 00H, 6BH, 11H, aaH, bbH, ccH, ddH, ssH, ttH, uuH, vvH, sum	F7H

Byte	Remarks
F0H	Exclusive status
41H	ID number (Roland)
dev	device ID (dev: 10H - 1FH, 7FH)
00H	model ID #1 (Fantom-S/Fantom-S88)
6BH	model ID #2 (Fantom-S/Fantom-S88)
11H	command ID (RQ1)
aaH	address MSB
bbH	address
ccH	address
ddH	address LSB
ssH	size MSB
ttH	size
uuH	size
vvH	size LSB
sum	checksum
F7H	EOX (End Of Exclusive)

* The size of data that can be transmitted at one time is fixed for each type of data. And data requests must be made with a fixed starting address and size. Refer to the address and size given in **Parameter Address Map** (p. 58).
* For the checksum, refer to (p. 76).
* Not received when the Receive Exclusive parameter (SYSTEM/MIDI) is OFF.

❍Data set 1 DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 00H, 6BH, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H - 1FH, 7FH)
00H	Model ID #1 (Fantom-S/Fantom-S88)
6BH	Model ID #2 (Fantom-S/Fantom-S88)
12H	Command ID (DT1)
aaH	Address MSB: upper byte of the starting address of the data to be sent
bbH	Address: upper middle byte of the starting address of the data to be sent
ccH	Address: lower middle byte of the starting address of the data to be sent
ddH	Address LSB: lower byte of the starting address of the data to be sent.
eeH	Data: the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:
ffH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in **Parameter Address Map** (p. 58).
* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.
* Regarding the checksum, please refer to (p. 76).
* Not received when the Receive Exclusive parameter (SYSTEM/MIDI) is OFF.

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

Byte	Explanation	
F0H	Exclusive status	
41H	ID number (Roland)	
dev	Device ID (dev: 10H - 1FH, 7FH)	
42H	Model ID (GS)	
12H	Command ID (DT1)	
aaH	Address MSB:	upper byte of the starting address of the transmitted data
bbH	Address:	middle byte of the starting address of the transmitted data
ccH	Address LSB:	lower byte of the starting address of the transmitted data
ddH	Data:	the actual data to be transmitted. Multiple bytes of data are transmitted starting from the address.
:	:	
eeH	Data	
sum	Checksum	
F7H	EOX (End Of Exclusive)	

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in **Parameter Address Map** (p. 58).
* Data larger than 256 bytes will be divided into packets of 256 bytes or less, and each packet will be sent at an interval of about 20 ms.
* Regarding the checksum, please refer to (p. 76)
* Not received when the Receive Exclusive parameter (SYSTEM/MIDI) is OFF.

2. Data Transmission

■Channel Voice Messages

●Note off

Status	2nd byte	3rd byte
8nH	kkH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = note off velocity:	00H - 7FH (0 - 127)	

●Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = note on velocity:	01H - 7FH (1 - 127)	

●Polyphonic Key Pressure

Status	2nd byte	3rd byte
AnH	kkH	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
kk = note number:	00H - 7FH (0 - 127)	
vv = Polyphonic Key Pressure:	00H - 7FH (0 - 127)	

●Control Change

* By selecting a controller number that corresponds to the setting of parameters of controllers (REALTIME CONTROL knob, and so on), the Fantom-S/Fantom-S88 can transmit any control change message.

❍Bank Select (Controller number 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
mm, ll = Bank number:	00 00H - 7F 7FH (bank.1 - bank.16384)	

* These messages are transmitted when Patch, Rhythm Set or Performance is selected. But not transmitted when Transmit Program Change or Transmit Bank Select parameter (SYSTEM/MIDI) is OFF.
* In Performance mode, these messages are not transmitted when External Bank Select MSB or External PC Number parameter (PERFORMANCE/PART) is OFF.
* Although with the Fantom-S/Fantom-S88 you can select the Bank Select messages to be transmitted, be sure to refer to the Program Change Map on (p. 78) for the Bank Select messages transmitted when the Fantom-S/Fantom-S88 is select a Patch, Rhythm Set or Performance.
* The Bank Select Numbers corresponding to SRX series should be referred to the SRX series owner's manual.

❍Modulation (Controller number 1)

Status	2nd byte	3rd byte
BnH	01H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Modulation depth:	00H - 7FH (0 - 127)	

❍Breath type (Controller number 2)

Status	2nd byte	3rd byte
BnH	02H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Control value:	00H - 7FH (0 - 127)	

❍Portamento Time (Controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH
n = MIDI channel number:	0H - FH (ch.1 - 16)	
vv = Portamento Time:	00H - 7FH (0 - 127)	

❍Data Entry (Controller number 6, 38)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)
mm, ll = the value of the parameter specified by RPN/NRPN
mm = MSB, ll = LSB

❍**Volume (Controller number 7)**

Status	2nd byte	3rd byte
BnH	07H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Volume: 00H - 7FH (0 - 127)

* In Performance mode, these messages are not transmitted when External Level parameter (PERFORMANCE/PART) is OFF.

❍**Panpot (Controller number 10)**

Status	2nd byte	3rd byte
BnH	0AH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Panpot: 00H - 40H - 7FH (Left - Center - Right),

* In Performance mode, these messages are not transmitted when External Pan parameter (PERFORMANCE/PART) is OFF.

❍**Expression (Controller number 11)**

Status	2nd byte	3rd byte
BnH	0BH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Expression: 00H - 7FH (0 - 127)

❍**Hold 1 (Controller number 64)**

Status	2nd byte	3rd byte
BnH	40H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0-63 = OFF, 64-127 = ON

* When Continuous Hold Pedal parameter (SYSTEM/PEDAL) is OFF, just only 00H (0FF) and 7FH (0N) can be send as the control value.

❍**Portamento (Controller number 65)**

Status	2nd byte	3rd byte
BnH	41H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127) 0 - 63 = OFF, 64 - 127 = ON

❍**Resonance (Controller number 71)**

Status	2nd byte	3rd byte
BnH	47H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv= Resonance value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

❍**Release Time (Controller number 72)**

Status	2nd byte	3rd byte
BnH	48H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Release Time value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

❍**Attack time (Controller number 73)**

Status	2nd byte	3rd byte
BnH	49H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Attack time value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

❍**Cutoff (Controller number 74)**

Status	2nd byte	3rd byte
BnH	4AH	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Cutoff value (relative change): 00H - 40H - 7FH (-64 - 0 - +63)

❍**General Purpose Controller 5 (Controller number 80)**

Status	2nd byte	3rd byte
BnH	50H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

❍**General Purpose Controller 6 (Controller number 81)**

Status	2nd byte	3rd byte
BnH	51H	vvH

n = MIDI channel number: 0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

❍**General Purpose Controller 7 (Controller number 82)**

Status	2nd byte	3rd byte
BnH	52H	vvH

n = MIDI channel number:0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

❍**General Purpose Controller 8 (Controller number 83)**

Status	2nd byte	3rd byte
BnH	53H	vvH

n = MIDI channel number:0H - FH (ch.1 - 16)
vv = Control value: 00H - 7FH (0 - 127)

❍**Portamento control (Controller number 84)**

Status	2nd byte	3rd byte
BnH	54H	kkH

n = MIDI channel number: 0H - FH (ch.1 - 16)
kk = source note number: 00H - 7FH (0 - 127)

●Program Change

Status	2nd byte
CnH	ppH

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

* These messages are transmitted when Patch, Rhythm Set or Performance is selected. But not transmitted when Transmit Program Change parameter (SYSTEM/MIDI) is OFF.
* In Performance mode, these messages are not transmitted when External PC Num parameter (PERFORMANCE/PART) is OFF.

●Channel Pressure

Status	2nd byte
DnH	vvH

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

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH

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

■Channel Mode Messages

●MONO (Controller number 126)

Status	2nd byte	3rd byte
BnH	7EH	mmH

n = MIDI channel number: 0H - FH (ch.1 - 16)
mm = mono number: 00H - 10H (0 - 16)

●POLY (Controller number 127)

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

n = MIDI channel number: 0H - FH (ch.1 - 16)

■System Realtime Messages

●Active Sensing

Status
FEH

* This message is transmitted at intervals of approximately 250 msec.
* This message is not sent when Transmit Active Sensing parameter (SYSTEM/MIDI) is OFF.

■System Exclusive Messages

Universal Non-realtime System Exclusive Message" and Data Set 1 (DT1) are the only System Exclusive messages transmitted by the Fantom-S/Fantom-S88.

●Universal Non-realtime System Exclusive Message

❍Identity Reply Message (Fantom-S)

Receiving Identity Request Message, the Fantom-S send this message.

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 6BH, 01H, 00H, 00H, 00H, 03H, 00H, 00H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (dev: 10H - 1FH)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Reply)
41H	ID number (Roland)
6BH 01H	Device family code
00H 00H	Device family number code
00H 03H 00H 00H	Software revision level
F7H	EOX (End of Exclusive)

❍Identity Reply Message (Fantom-S88)

Receiving Identity Request Message, the Fantom-S88 send this message.

Status	Data byte	Status
F0H	7EH, dev, 06H, 02H, 41H, 6BH, 01H, 01H, 00H, 00H, 03H, 00H, 00H	F7H

Byte	Explanation
F0H	Exclusive status
7EH	ID number (Universal Non-realtime Message)
dev	Device ID (dev: 10H - 1FH)
06H	Sub ID#1 (General Information)
02H	Sub ID#2 (Identity Reply)
41H	ID number (Roland)
6BH 01H	Device family code
01H 00H	Device family number code
00H 03H 00H 00H	Software revision level
F7H	EOX (End of Exclusive)

●Data Transmission

❍Data set 1DT1 (12H)

Status	Data byte	Status
F0H	41H, dev, 00H, 6BH, 12H, aaH, bbH, ccH, ddH, eeH, ... ffH, sum	F7H

Byte	Explanation	
F0H	Exclusive status	
41H	ID number (Roland)	
dev	Device ID (dev: 00H - 1FH, 7FH)	
00H	Model ID #1 (Fantom-S/Fantom-S88)	
6BH	Model ID #2 (Fantom-S/Fantom-S88)	
12H	Command ID (DT1)	
aaH	Address MSB:	upper byte of the starting address of the data to be sent
bbH	Address:	upper middle byte of the starting address of the data to be sent
ccH	Address:	lower middle byte of the starting address of the data to be sent
ddH	Address LSB:	lower byte of the starting address of the data to be sent.
eeH	Data:	the actual data to be sent. Multiple bytes of data are transmitted in order starting from the address.
:	:	
ffH	Data	
sum	Checksum	
F7H	EOX (End Of Exclusive)	

* The amount of data that can be transmitted at one time depends on the type of data, and data will be transmitted from the specified starting address and size. Refer to the address and size given in **Parameter Address Map** (p. 58).

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

3. Data reception (Sequencer Section)

3.1 Messages recorded during recording

■Channel Voice Messages

●Note Off

Status	2nd byte	3rd byte
8nH	kkH	vvH
9nH	kkH	00H
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
kk=note number:		00H - 7FH (0 - 127)
vv=note off velocity:		00H - 7FH (0 - 127)

* Not received when the Note parameter(Recording Select window) is OFF.

●Note on

Status	2nd byte	3rd byte
9nH	kkH	vvH
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
kk=note number:		00H - 7FH (0 - 127)
vv=note on velocity:		01H - 7FH (1 - 127)

* Not received when the Note parameter(Recording Select window) is OFF.

●Polyphonic Aftertouch

Status	2nd byte	3rd byte
AnH	kkH	vvH
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
kk=note number:		00H - 7FH (0 - 127)
vv=Polyphonic Aftertouch:		00H - 7FH (0 - 127)

* Not received when the Poly Afertouch parameter(Recording Select window) is OFF.

●Control Change

Status	2nd byte	3rd byte
BnH	kkH	vvH
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
kk=Control number:		00H - 78H (0 - 120)
vv=value:		00H - 7FH (0 - 127)

* Not received when the Control Change parameter(Recording Select window) is OFF.

●Program Change

Status	2nd byte	
CnH	ppH	
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
pp=Program number:		00H - 7FH (prog.1 - prog.128)

* Not received when the Program Change parameter(Recording Select window) is OFF.

●Channel Aftertouch

Status	2nd byte	
DnH	vvH	
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
vv=Channel Aftertouch:		00H - 7FH (0 - 127)

* Not received when the Channel Aftertouch parameter(Recording Select window) is OFF.

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH
n=MIDI channel number:		0H - FH (ch.1 - ch.16)
mm, ll=Pitch Bend value:		00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

* Not received when the Pitch Bend parameter (Recording Select window) is OFF.

■Channel Mode messages

●All Sound Off (Controller number 120)

Status	2nd byte	3rd byte
BnH	78H	00H
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	

●Reset All Controller (Controller number 121)

Status	2nd byte	3rd byte
BnH	79H	00H
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	

●Omni Off (Controller number 124)

Status	2nd byte	3rd byte
BnH	7CH	00H
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	

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

●Omni On (Controller number 125)

Status	2nd byte	3rd byte
BnH	7DH	00H
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	

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

●Mono (Controller number 126)

Status	2nd byte	3rd byte
BnH	7EH	mmH
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	
mm=mono number:	00H - 10H (0 - 16)	

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

●Poly (Controller number 127)

Status	2nd byte	3rd byte
BnH	7FH	00H
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	

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

■System Exclusive Messages

Status	Data byte	Status
F0H	iiH, ddH, ..., eeH	F7H
F0H:	System Exclusive message status	
ii=ID number:	This is the ID number (manufacturer ID) that specifies the manufacturer whose exclusive message this is. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are defined in an expansion of the MIDI standard as Universal Non-real-time messages (7EH) and Universal Realtime Messages (7FH).	
dd,..., ee = data:	00H - 7FH (0 - 127)	
F7H:	EOX (End of System Exclusive)	

* Not received when the System Exclusive parameter (Recording Select window) is OFF.
* MIDI Machine Control and MIDI Time code is not recorded.(Refer to "1.3 Messages acknowledged for synchronization")

3.2 Messages not recorded during recording

■Channel mode messages

●Local On/Off (Controller number 122)

Status	2nd byte	3rd byte
BnH	7AH	vvH
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	
vv=Value:	00H, 7FH (Local Off, Local On)	

●All notes off (Controller number 123)

Status	2nd byte	3rd byte
BnH	7BH	00H
n=MIDI channel number:	0H - FH (ch.1 - ch.16)	

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

3.3 Messages acknowledged for synchronization

■System Common messages

●Tune Request

Status
F6H

●MIDI Time Code Quarter Frame Messages

MIDI Time Code Quarter Frame Messages can be transmitted while the sequencer is running (Playing or Recording) if the Sync Mode parameter (System/Sync/Tempo) is MASTER and MTC Sync Output parameter (System/Sync/Tempo) is ON. The transmitted time counts are summed to MTC Offset Time parameter (System/Sync/Tempo) as the song top is "00:00:00:00."
The sequencer synchronizes with the time counts which are summed to MTC Offset Time parameter (System/Sync/Tempo) as the song top is "00:00:00:00" if the Sync Mode parameter (System/Sync/Tempo) is SLAVE(MTC).

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 : h - FH (0 - 15)
Bit Field is assigned as follows.

Frame Count	xxxyyyyy	
xxx	Reserved (000)	
yyyyy	Frame No.(0-29)	
Seconds Count	xxyyyyyy	
	xx	Reserved (00)
	yyyyyy	Seconds (0-59)
Minutes Count	xxyyyyyy	
	xx	Reserved (00)
	yyyyyy	Minutes (0-59)
Hours Count	xyyzzzzz	
	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 (0-23)

●Song Position Pointer

Status	2nd byte	3rd byte
F2H	mmH	llH
mm, ll=value:	00 00H - 7F 7FH (0 - 16383)	

■System Realtime Messages

●Timing Clock

Status
F8H

* Received when Sync Mode parameter (System/Sync/Tempo) is set to SLAVE-MIDI.

●Start

Status
FAH

* Received when Sync Mode parameter (System/Sync/Tempo) is set to SLAVE-MIDI or REMOTE.

●Continue

Status
FBH

* Received when Sync Mode parameter (System/Sync/Tempo) is set to SLAVE-MIDI or REMOTE.

●Stop

Status
FCH

* Received when Sync Mode parameter (System/Sync/Tempo) is set to SLAVE-MIDI or REMOTE.

■System Exclusive Message

●MIDI Machine Control (MMC)

* Received when the MMC Mode parameter (System/Sync/Tempo) is SLAVE.

❍STOP (MCS)

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

Byte	Remarks
F0H	Exclusive status
7FH	Universal System Exclusive Realtime Header
7FH	Device ID
06H	MMC command message
01H	STOP (MCS)
F7H	EOX (End of Exclusive)

❍DEFERRED PLAY (MCS)

Status	Data byte	Status
F0H	7FH, dev, 06H, 03H	F7H

Byte	Remarks
F0H	Exclusive status
7FH	Universal System Exclusive Realtime Header
7FH	Device ID
06H	MMC command message
03H	DEFERRED PLAY (MCS)
F7H	EOX (End of Exclusive)

❍LOCATE (MCP)

❍Format2---LOCATE [TARGET]

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

Byte	Remarks
F0H	Exclusive status
7FH	Universal System Exclusive Realtime Header
7FH	Device ID
06H	MMC command message
44H	LOCATE (MCP)
06H	Byte count
01H	"TARGET" sub-Command
hrH	Standard Time Specification with subframes (type**ff**)
mnH	
scH	
frH	
ffH	
F7H	EOX (End of Exclusive)

4. Data transmission (Sequencer Section)

4.1 Messages transmitted during playing

Recorded messages are transmitted during playback.

4.2 Soft Thru setting

Messages (except System Common and System Realtime Messages) that are received are then sent out when Soft Thru parameter (System/Sync/Tempo) is switched to ON.

4.3 Messages that are generated and transmitted

4.3.1 Messages Appearing When Synchronizing with Other Devices

■System Common Messages

* Sent when Sync Output parameter (System/Sync/Tempo) is set to ON.

●Song Position Pointer

Status	2nd byte	3rd byte
F2H	mmH	llH
mm, ll=value:	00 00H - 7F 7FH (0 - 16383)	

■System Realtime Messages

* Sent when Sync Output parameter (System/Sync/Tempo) is set to ON.

●Timing Clock

Status
F8H

●Start

Status
FAH

●Continue

Status
FBH

●Stop

Status
FCH

●Quarter Frame Messages

Status	2nd byte
F1H	mmH (= 0nnndddd)

* Sent when Sync Mode parameter (System/Sync/Tempo) is set to MASTER and MTC Sync Output parameter (System/Sync/Tempo) is set to ON. Furthermore, sending a Quarter Frame Message with "00h00m00s00f00" at the beginning of the song adds the MTC Offset Time parameter (System/Sync/Tempo).

■System Exclusive Message

●MIDI Time code

❍Full Message

Full Messages are used, which encode the complete time into a single message.
This message transmitted when the song position moves.

Status	Data Byte	Status
F0H, 7FH	xxH, 01H, 01H, hrH, mnH, scH, frH	F7H

F0H, 7FH : Realtime Universal System Exclusive Header
xxH : 7F (Device ID)
01H : sub-ID #1 (MIDI Time code)
01H : sub-ID #2 (Full Message)
hrH : hours and type: 0 yy zzzzz
yy type:
00 = 24 Flame/sec
01 = 25 Flame/sec
10 = 30 Flame/sec
11 = 30 Flame/sec
zzzzz : Hours (00 - 23)
mnH : Minutes (00 - 59)
scH : Seconds (00 - 59)
frH : Frames (00 - 29)
F7H : EOX (End of Exclusive)

●MIDI Machine Control (MMC)

* Not received when the MMC Mode parameter (System/Sync/Tempo) is Master.

❍STOP (MCS)

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

Byte	Remarks
F0H	Exclusive status
7FH	Universal System Exclusive Realtime Header
7FH	Device ID
06H	MMC command message
01H	STOP (MCS)
F7H	EOX (End of Exclusive)

❍DEFFERRED PLAY (MCS)

Status	Data byte	Status
F0H	7FH, dev, 06H, 03H	F7H

Byte	Remarks
F0H	Exclusive status
7FH	Universal System Exclusive Realtime Header
7FH	Device ID
06H	MMC command message
03H	DEFERRED PLAY (MCS)
F7H	EOX (End of Exclusive)

❍LOCATE (MCP)

❍Format2---LOCATE [TARGET]

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

Byte	Remarks
F0H	Exclusive status
7FH	Universal System Exclusive Realtime Header
7FH	Device ID
06H	MMC command message
44H	LOCATE (MCP)
06H	Byte count
01H	"TARGET" sub-Command
hrH	Standard Time Specification with subframes (type**ff**)
mnH	
scH	
frH	
ffH	
F7H	EOX (End of Exclusive)

5. Parameter Address Map

* Transmission of "#" marked address is diviedd to some packets. For example, ABH in hexadecimal notation will be divied to 0AH and 0BH, and is sent/received in this order.
* "<*>" marked adddress or parameters are ignored when the Fantom-S/Fantom-S88 received them.

1. Fantom-S/Fantom-S88 (ModelID = 00H 6BH)

Start Address	Description
01 00 00 00	Setup
02 00 00 00	System
10 00 00 00	Temporary Performance
11 00 00 00	Temporary Patch/Rhythm (Performance Mode Part 1)
11 20 00 00	Temporary Patch/Rhythm (Performance Mode Part 2)
:	
14 60 00 00	Temporary Patch/Rhythm (Performance Mode Part 16)
1E 00 00 00	Temporary Rhythm Pattern
1E 01 00 00	Temporary Arpeggio (Performance Mode)
1E 02 00 00	Temporary Chord (Performance Mode)
1E 03 00 00	Temporary Rhythm Group (Performance Mode)
1E 11 00 00	Temporary Arpeggio (Patch Mode)
1E 12 00 00	Temporary Chord (Patch Mode)
1E 13 00 00	Temporary Rhythm Group (Patch Mode)
1F 00 00 00	Temporary Patch/Rhythm (Patch Mode Part 1)
1F 20 00 00	Temporary Patch/Rhythm (Patch Mode Part 2)

❍System

Offset Address	Description
00 00 00	System Common
00 02 00	System Mastering
00 03 00	System External Input
00 40 00	System Controller

❍Temporary Patch/Rhythm

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

❍Performance

Offset Address	Description
00 00 00	Performance Common
00 02 00	Performance Common MFX1
00 04 00	Performance Common Chorus
00 06 00	Performance Common Reverb
00 08 00	Performance Common MFX2
00 0A 00	Performance Common MFX3
00 10 00	Performance MIDI (Channel 1)
00 11 00	Performance MIDI (Channel 2)
:	
00 1F 00	Performance MIDI (Channel 16)
00 20 00	Performance Part (Part 1)
00 21 00	Performance Part (Part 2)
:	
00 2F 00	Performance Part (Part 16)
00 50 00	Performance Zone (Channel 1)
00 51 00	Performance Zone (Channel 2)
:	
00 5F 00	Performance Zone (Channel 16)
00 60 00	Performance Controller

❍Patch

Offset Address	Description
00 00 00	Patch Common
00 02 00	Patch Common MFX
00 04 00	Patch Common Chorus
00 06 00	Patch Common Reverb
00 10 00	Patch TMT (Tone Mix Table)
00 20 00	Patch Tone (Tone 1)
00 22 00	Patch Tone (Tone 2)
00 24 00	Patch Tone (Tone 3)
00 26 00	Patch Tone (Tone 4)

❍Rhythm

Offset Address	Description
00 00 00	Rhythm Common
00 02 00	Rhythm Common MFX
00 04 00	Rhythm Common Chorus
00 06 00	Rhythm Common Reverb
00 10 00	Rhythm Tone (Key # 21)
00 12 00	Rhythm Tone (Key # 22)
:	
01 3E 00	Rhythm Tone (Key # 108)

❍Arpeggio

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

❍Chord

Offset Address	Description
00 00 00	Chord Pattern

❍Rhythm Group

Offset Address	Description
00 00 00	Rhythm Group

❍Setup

Offset Address		Description	
00 00	0000 0aaa	Sound Mode PATCH, PERFORM, GM1, GM2, GS, PIANO<S88>	(0 – 5)
00 01	0aaa aaaa	Performance Bank Select MSB (CC# 0)	(0 – 127)
00 02	0aaa aaaa	Performance Bank Select LSB (CC# 32)	(0 – 127)
00 03	0aaa aaaa	Performance Program Number (PC)	(0 – 127)
00 04	0aaa aaaa	Kbd Patch Bank Select MSB (CC# 0)	(0 – 127)
00 05	0aaa aaaa	Kbd Patch Bank Select LSB (CC# 32)	(0 – 127)
00 06	0aaa aaaa	Kbd Patch Program Number (PC)	(0 – 127)
00 07	0aaa aaaa	Pad Patch Bank Select MSB (CC# 0)	(0 – 127)
00 08	0aaa aaaa	Pad Patch Bank Select LSB (CC# 32)	(0 – 127)
00 09	0aaa aaaa	Pad Patch Program Number (PC)	(0 – 127)
00 0A	0000 000a	MFX1 Switch	(0 – 1) BYPASS, ON
00 0B	0000 000a	MFX2 Switch	(0 – 1) BYPASS, ON
00 0C	0000 000a	MFX3 Switch	(0 – 1) BYPASS, ON
00 0D	0000 000a	Chorus Switch	(0 – 1) OFF, ON
00 0E	0000 000a	Reverb Switch	(0 – 1) OFF, ON
00 0F	0000 000a	Input Effect Switch	(0 – 1) OFF, ON
00 10	0000 000a	Patch Mode Chorus Source	(0 – 1) KBD, PAD
00 11	0000 000a	Patch Mode Reverb Source	(0 – 1) KBD, PAD
00 12	0000 aaaa	Transpose Value	(59 – 70) –5 – +6
00 13	0000 0aaa	Octave Shift	(61 – 67) –3 – +3
00 14	0000 0aaa	D Beam Select OFF, PAD–TRIG, SOLO–SYN, ASGN	(0 – 5)
00 15	0000 00aa	Knob Select OFF, FLT–ENV, ARP–RHY, ASGN	(0 – 3)
00 16	0000 000a	Arp/Ptn Switch	(0 – 1) OFF, ON
00 17	0aaa aaaa	Arp/Ptn Grid 04_, 08_, 08L, 08H, 08t, 16_, 16L, 16H, 16t	(0 – 8)
00 18	0aaa aaaa	Arp/Ptn Duration 30, 40, 50, 60, 70, 80, 90, 100, 120, FUL	(0 – 9)
00 19	0000 000a	Arpeggio Switch	(0 – 1) OFF, ON
00 1A	0aaa aaaa	Arpeggio Bank	(0 – 1) USER, PRESET
00 1B	0aaa aaaa	Arpeggio Style	(0 – 127) 1 – 128
00 1C	0aaa aaaa	Arpeggio Motif UP/L, UP/H, UP/_, dn/L, dn/H, dn/_, Ud/L, Ud/H, Ud/_, rn/L, rn/_, PHRASE	(0 – 11)
00 1D	0000 0aaa	Arpeggio Octave Range	(61 – 67) –3 – +3
00 1E	0000 000a	Arpeggio Hold	(0 – 1) OFF, ON
00 1F	0aaa aaaa	Arpeggio Accent Rate	(0 – 100)
00 20	0aaa aaaa	Arpeggio Velocity	(0 – 127) REAL, 1 – 127
00 21	0000 000a	Rhythm Pattern Switch	(0 – 1) OFF, ON
00 22	0aaa aaaa	Rhythm Pattern Bank	(0 – 1) USER, PRESET
# 00 23	0000 aaaa		
	0000 bbbb	Rhythm Pattern Style	(0 – 255) 1 – 256
00 25	0000 000a	Rhythm Pattern Group Bank	(0 – 1) USER, PRESET
00 26	0aaa aaaa	Rhythm Pattern Group Number	(0 – 31) 1 – 32
00 27	0aaa aaaa	Rhythm Pattern Accent Rate	(0 – 100)
00 28	0aaa aaaa	Rhythm Pattern Velocity	(0 – 127) REAL, 1 – 127
00 29	0000 000a	Chord Switch	(0 – 1) OFF, ON
00 2A	0aaa aaaa	Chord Bank	(0 – 1) USER, PRESET
00 2B	00aa aaaa	Chord Form	(0 – 63)
00 2C	0000 000a	Bender and Modulation Part Select	(0 – 1) KBD, PAD
00 2D	0000 000a	Beam Part Select	(0 – 1) KBD, PAD
00 2E	0000 000a	Knob Part Select	(0 – 1) KBD, PAD
00 00 00 2F		Total Size	

❍System Common

#	Offset Address		Description	
#	00 00	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Master Tune	(24 – 2024) –100.0 – 100.0 [cent]
	00 04	00aa aaaa	Master Key Shift	(40 – 88) –24 – +24
	00 05	0aaa aaaa	Master Level	(0 – 127)
	00 06	0000 000a	Scale Tune Switch	(0 – 1) OFF, ON
	00 07	0000 000a	Patch Remain	(0 – 1) OFF, ON
	00 08	0000 000a	Mix/Parallel	(0 – 1) MIX, PARALLEL
	00 09	000a aaaa	Performance Control Channel	(0 – 16) 1 – 16, OFF
	00 0A	0000 aaaa	Kbd Patch Rx/Tx Channel	(0 – 15) 1 – 16
	00 0B	0000 aaaa	Pad Patch Rx/Tx Channel	(0 – 15) 1 – 16
	00 0C	0aaa aaaa	Patch Scale Tune for C	(0 – 127) –64 – +63
	00 0D	0aaa aaaa	Patch Scale Tune for C#	(0 – 127) –64 – +63
	00 0E	0aaa aaaa	Patch Scale Tune for D	(0 – 127) –64 – +63
	00 0F	0aaa aaaa	Patch Scale Tune for D#	(0 – 127) –64 – +63
	00 10	0aaa aaaa	Patch Scale Tune for E	(0 – 127) –64 – +63
	00 11	0aaa aaaa	Patch Scale Tune for F	(0 – 127) –64 – +63
	00 12	0aaa aaaa	Patch Scale Tune for F#	(0 – 127) –64 – +63
	00 13	0aaa aaaa	Patch Scale Tune for G	(0 – 127) –64 – +63
	00 14	0aaa aaaa	Patch Scale Tune for G#	(0 – 127) –64 – +63
	00 15	0aaa aaaa	Patch Scale Tune for A	(0 – 127) –64 – +63
	00 16	0aaa aaaa	Patch Scale Tune for A#	(0 – 127) –64 – +63
	00 17	0aaa aaaa	Patch Scale Tune for B	(0 – 127) –64 – +63
	00 18	0aaa aaaa	System Control 1 Source	(0 – 97) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT
	00 19	0aaa aaaa	System Control 2 Source	(0 – 97) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT
	00 1A	0aaa aaaa	System Control 3 Source	(0 – 97) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT
	00 1B	0aaa aaaa	System Control 4 Source	(0 – 97) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT
	00 1C	0000 000a	Receive Program Change	(0 – 1) OFF, ON
	00 1D	0000 000a	Receive Bank Select	(0 – 1) OFF, ON
	00 00 00 1E	Total Size		

❍System Mastering

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

❍System External Input

#	Offset Address		Description	
	00 00	0aaa aaaa	External Dry Send Level	(0 – 127)
	00 01	0aaa aaaa	External Chorus Send Level	(0 – 127)
	00 02	0aaa aaaa	External Reverb Send Level	(0 – 127)
	00 03	0000 aaaa	External Output Assign	(0 – 1) MFX, DRY
	00 04	0000 00aa	External Output MFX Select	(0 – 2) MFX1, MFX2, MFX3
	00 05	0000 aaaa	Input Effect Type	(1 – 6)
#	00 06	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 1	(12768 – 52768) –20000 – +20000
#	00 0A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 2	(12768 – 52768) –20000 – +20000
#	00 0E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 3	(12768 – 52768) –20000 – +20000
#	00 12	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 4	(12768 – 52768) –20000 – +20000
#	00 16	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 5	(12768 – 52768) –20000 – +20000
#	00 1A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 6	(12768 – 52768) –20000 – +20000
#	00 1E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 7	(12768 – 52768) –20000 – +20000
#	00 22	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 8	(12768 – 52768) –20000 – +20000
#	00 26	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 9	(12768 – 52768) –20000 – +20000
#	00 2A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 10	(12768 – 52768) –20000 – +20000
#	00 2E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 11	(12768 – 52768) –20000 – +20000
#	00 32	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 12	(12768 – 52768) –20000 – +20000
#	00 36	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 13	(12768 – 52768) –20000 – +20000
#	00 3A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 14	(12768 – 52768) –20000 – +20000
#	00 3E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 15	(12768 – 52768) –20000 – +20000
#	00 42	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 16	(12768 – 52768) –20000 – +20000
#	00 46	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 17	(12768 – 52768) –20000 – +20000
#	00 4A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 18	(12768 – 52768) –20000 – +20000
#	00 4E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 19	(12768 – 52768) –20000 – +20000
#	00 52	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Input Effect Parameter 20	(12768 – 52768) –20000 – +20000
	00 00 00 56	Total Size		

❍System Controller

Offset Address		Description	
00 00	0000 000a	Transmit Program Change	(0 – 1) OFF, ON
00 01	0000 000a	Transmit Bank Select	(0 – 1) OFF, ON
00 02	0aaa aaaa	Keyboard Velocity	(0 – 127) REAL, 1 – 127
00 03	0000 00aa	Keyboard Sens	(0 – 2) LIGHT, MEDIUM, HEAVY
00 04	0aaa aaaa	Aftertouch Sens	(0 – 100)
00 05	0000 0aaa	Hold Pedal Polarity	(0 – 1) STANDARD, REVERSE
00 06	0000 000a	Continuous Hold Pedal	(0 – 1) OFF, ON
00 07	0aaa aaaa	Pedal Assign	(0 – 108) CC01 – CC31, CC33 – CC95, BEND–UP, BEND–DOWN, AFT, OCT–UP, OCT–DOWN, START/STOP, PUNCH–I/O, TAP–TEMPO, PROG–UP, PROG–DOWN, FAV–UP, FAV–DOWN, ARP–RHY–SW, RHY–START/STOP, CHD–SW
00 08	0000 0aaa	Pedal Polarity	(0 – 1) STANDARD, REVERSE
00 09	0000 aaaa	Beam Sens	(1 – 10)
00 0A	0aaa aaaa	Beam Assign	(0 – 102) CC01 – CC31, CC33 – CC95, BEND–UP, BEND–DOWN, START/STOP, TAP–TEMPO, ARP–GRID, ARP–DUR, ARP–MOTIF, ARP–OCT–UP, ARP–OCT–DW
00 0B	0aaa aaaa	Beam Range Lower	(0 – 127)
00 0C	0aaa aaaa	Beam Range Upper	(0 – 127)
00 0D	0000 aaaa	Beam Trigger Pad	(0 – 15) 1 – 16
00 0E	0aaa aaaa	Beam Trigger Velo	(1 – 127)
00 0F	0aaa aaaa	Beam Trigger Mode	(0 – 1) MOMENTARY, LATCH
00 10	0aaa aaaa	Knob 1 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER-LEVEL
00 11	0aaa aaaa	Knob 2 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER-LEVEL
00 12	0aaa aaaa	Knob 3 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER-LEVEL
00 13	0aaa aaaa	Knob 4 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER-LEVEL
00 14	0aaa aaaa	Switch 1 Assign	(0 – 13) TRNS–DW, TRNS–UP, TAP–TEMPO, MONO/POLY, PORTAMENTO, HOLD1, MFX1–SW, MFX2–SW, MFX3–SW, CHO–SW, REV–SW, MAS–SW, SEQ–LOOP, RHY–START/STOP
00 15	0aaa aaaa	Switch 2 Assign	(0 – 13) TRNS–DW, TRNS–UP, TAP–TEMPO, MONO/POLY, PORTAMENTO, HOLD1, MFX1–SW, MFX2–SW, MFX3–SW, CHO–SW, REV–SW, MAS–SW, SEQ–LOOP, RHY–START/STOP
00 16	0aaa aaaa	Pad Velocity	(0 – 127) REAL, 1 – 127
00 17	0000 00aa	Pad Sens	(0 – 2) LIGHT, MEDIUM, HEAVY
00 18	0aaa aaaa	Pad Aftertouch Sens	(0 – 100)
00 19	0000 aaaa	Pad Roll Resolution	(0 – 7)
00 1A	0aaa aaaa	Pad Set	(0 – 2) USER, NOTE, RHY
00 1B	0aaa aaaa	Pad Base Note	(0 – 127) C–1 – G9
00 1C	0aaa aaaa	(reserve) <*>	(0 – 1)
00 1D	0aaa aaaa	Pad 1 Note Number	(0 – 127) C–1 – G9
00 1E	0aaa aaaa	Pad 1 Velocity	(0 – 127) REAL, 1 – 127
00 1F	0aaa aaaa	(reserve) <*>	(0 – 1)
00 20	0aaa aaaa	Pad 2 Note Number	(0 – 127) C–1 – G9
00 21	0aaa aaaa	Pad 2 Velocity	(0 – 127) REAL, 1 – 127
00 22	0aaa aaaa	(reserve) <*>	(0 – 1)
00 23	0aaa aaaa	Pad 3 Note Number	(0 – 127) C–1 – G9
00 24	0aaa aaaa	Pad 3 Velocity	(0 – 127) REAL, 1 – 127
00 25	0aaa aaaa	(reserve) <*>	(0 – 1)
00 26	0aaa aaaa	Pad 4 Note Number	(0 – 127) C–1 – G9
00 27	0aaa aaaa	Pad 4 Velocity	(0 – 127) REAL, 1 – 127
00 28	0aaa aaaa	(reserve) <*>	(0 – 1)
00 29	0aaa aaaa	Pad 5 Note Number	(0 – 127) C–1 – G9
00 2A	0aaa aaaa	Pad 5 Velocity	(0 – 127) REAL, 1 – 127
00 2B	0aaa aaaa	(reserve) <*>	(0 – 1)
00 2C	0aaa aaaa	Pad 6 Note Number	(0 – 127) C–1 – G9
00 2D	0aaa aaaa	Pad 6 Velocity	(0 – 127) REAL, 1 – 127
00 2E	0aaa aaaa	(reserve) <*>	(0 – 1)
00 2F	0aaa aaaa	Pad 7 Note Number	(0 – 127) C–1 – G9
00 30	0aaa aaaa	Pad 7 Velocity	(0 – 127) REAL, 1 – 127
00 31	0aaa aaaa	(reserve) <*>	(0 – 1)
00 32	0aaa aaaa	Pad 8 Note Number	(0 – 127) C–1 – G9
00 33	0aaa aaaa	Pad 8 Velocity	(0 – 127) REAL, 1 – 127
00 34	0aaa aaaa	(reserve) <*>	(0 – 1)
00 35	0aaa aaaa	Pad 9 Note Number	(0 – 127) C–1 – G9
00 36	0aaa aaaa	Pad 9 Velocity	(0 – 127) REAL, 1 – 127
00 37	0aaa aaaa	(reserve) <*>	(0 – 1)
00 38	0aaa aaaa	Pad 10 Note Number	(0 – 127) C–1 – G9
00 39	0aaa aaaa	Pad 10 Velocity	(0 – 127) REAL, 1 – 127
00 3A	0aaa aaaa	(reserve) <*>	(0 – 1)
00 3B	0aaa aaaa	Pad 11 Note Number	(0 – 127) C–1 – G9
00 3C	0aaa aaaa	Pad 11 Velocity	(0 – 127) REAL, 1 – 127
00 3D	0aaa aaaa	(reserve) <*>	(0 – 1)
00 3E	0aaa aaaa	Pad 12 Note Number	(0 – 127) C–1 – G9
00 3F	0aaa aaaa	Pad 12 Velocity	(0 – 127) REAL, 1 – 127
00 40	0aaa aaaa	(reserve) <*>	(0 – 1)
00 41	0aaa aaaa	Pad 13 Note Number	(0 – 127) C–1 – G9
00 42	0aaa aaaa	Pad 13 Velocity	(0 – 127) REAL, 1 – 127
00 43	0aaa aaaa	(reserve) <*>	(0 – 1)
00 44	0aaa aaaa	Pad 14 Note Number	(0 – 127) C–1 – G9
00 45	0aaa aaaa	Pad 14 Velocity	(0 – 127) REAL, 1 – 127
00 46	0aaa aaaa	(reserve) <*>	(0 – 1)
00 47	0aaa aaaa	Pad 15 Note Number	(0 – 127) C–1 – G9
00 48	0aaa aaaa	Pad 15 Velocity	(0 – 127) REAL, 1 – 127
00 49	0aaa aaaa	(reserve) <*>	(0 – 1)
00 4A	0aaa aaaa	Pad 16 Note Number	(0 – 127) C–1 – G9
00 4B	0aaa aaaa	Pad 16 Velocity	(0 – 127) REAL, 1 – 127
00 00 00 4C		Total Size	

❍Performance Common

Offset Address		Description	
00 00	0aaa aaaa	Performance Name 1	(32 – 127) 32 – 127 [ASCII]
00 01	0aaa aaaa	Performance Name 2	(32 – 127) 32 – 127 [ASCII]
00 02	0aaa aaaa	Performance Name 3	(32 – 127) 32 – 127 [ASCII]
00 03	0aaa aaaa	Performance Name 4	(32 – 127) 32 – 127 [ASCII]
00 04	0aaa aaaa	Performance Name 5	(32 – 127) 32 – 127 [ASCII]
00 05	0aaa aaaa	Performance Name 6	(32 – 127) 32 – 127 [ASCII]
00 06	0aaa aaaa	Performance Name 7	(32 – 127) 32 – 127 [ASCII]
00 07	0aaa aaaa	Performance Name 8	(32 – 127) 32 – 127 [ASCII]
00 08	0aaa aaaa	Performance Name 9	(32 – 127) 32 – 127 [ASCII]
00 09	0aaa aaaa	Performance Name 10	(32 – 127) 32 – 127 [ASCII]
00 0A	0aaa aaaa	Performance Name 11	(32 – 127) 32 – 127 [ASCII]
00 0B	0aaa aaaa	Performance Name 12	(32 – 127) 32 – 127 [ASCII]
00 0C	00aa aaaa	Solo Part Select	(0 – 16) OFF, 1 – 16
00 0D	000a aaaa	MFX1 Control Channel	(0 – 16) 1 – 16, OFF
00 0E	0000 000a	(reserve) <*>	(1 – 0)
00 0F	0000 000a	(reserve) <*>	(1 – 0)
00 10	0aaa aaaa	Voice Reserve 1	(0 – 64) 0 – 63, FULL
00 11	0aaa aaaa	Voice Reserve 2	(0 – 64) 0 – 63, FULL
00 12	0aaa aaaa	Voice Reserve 3	(0 – 64) 0 – 63, FULL
00 13	0aaa aaaa	Voice Reserve 4	(0 – 64) 0 – 63, FULL
00 14	0aaa aaaa	Voice Reserve 5	(0 – 64) 0 – 63, FULL
00 15	0aaa aaaa	Voice Reserve 6	(0 – 64) 0 – 63, FULL
00 16	0aaa aaaa	Voice Reserve 7	(0 – 64) 0 – 63, FULL
00 17	0aaa aaaa	Voice Reserve 8	(0 – 64) 0 – 63, FULL
00 18	0aaa aaaa	Voice Reserve 9	(0 – 64) 0 – 63, FULL
00 19	0aaa aaaa	Voice Reserve 10	(0 – 64) 0 – 63, FULL
00 1A	0aaa aaaa	Voice Reserve 11	(0 – 64) 0 – 63, FULL
00 1B	0aaa aaaa	Voice Reserve 12	(0 – 64) 0 – 63, FULL
00 1C	0aaa aaaa	Voice Reserve 13	(0 – 64) 0 – 63, FULL
00 1D	0aaa aaaa	Voice Reserve 14	(0 – 64) 0 – 63, FULL
00 1E	0aaa aaaa	Voice Reserve 15	(0 – 64) 0 – 63, FULL
00 1F	0aaa aaaa	Voice Reserve 16	(0 – 64) 0 – 63, FULL
00 20	0aaa aaaa	(reserve) <*>	(0 – 64)
00 21	0aaa aaaa	(reserve) <*>	(0 – 64)
00 22	0aaa aaaa	(reserve) <*>	(0 – 64)
00 23	0aaa aaaa	(reserve) <*>	(0 – 64)
00 24	0aaa aaaa	(reserve) <*>	(0 – 64)
00 25	0aaa aaaa	(reserve) <*>	(0 – 64)
00 26	0aaa aaaa	(reserve) <*>	(0 – 64)
00 27	0aaa aaaa	(reserve) <*>	(0 – 64)

00 28	0aaa aaaa	(reserve) <*>	(0 – 64)
00 29	0aaa aaaa	(reserve) <*>	(0 – 64)
00 2A	0aaa aaaa	(reserve) <*>	(0 – 64)
00 2B	0aaa aaaa	(reserve) <*>	(0 – 64)
00 2C	0aaa aaaa	(reserve) <*>	(0 – 64)
00 2D	0aaa aaaa	(reserve) <*>	(0 – 64)
00 2E	0aaa aaaa	(reserve) <*>	(0 – 64)
00 2F	0aaa aaaa	(reserve) <*>	(0 – 64)
00 30	00aa aaaa	MFX1 Source	(0 – 16) PERFORM, 1 – 16
00 31	00aa aaaa	MFX2 Source	(0 – 16) PERFORM, 1 – 16
00 32	00aa aaaa	MFX3 Source	(0 – 16) PERFORM, 1 – 16
00 33	00aa aaaa	Chorus Source	(0 – 16) PERFORM, 1 – 16
00 34	00aa aaaa	Reverb Source	(0 – 16) PERFORM, 1 – 16
00 35	00aa aaaa	MFX2 Control Channel	(0 – 16) 1 – 16, OFF
00 36	00aa aaaa	MFX3 Control Channel	(0 – 16) 1 – 16, OFF
00 37	0000 aaaa	MFX Structure	(0 – 15) 1 – 16
00 00 00 38	Total Size		

❍Performance Common MFX

Offset Address		Description	
00 00	0aaa aaaa	MFX Type	(0 – 127)
00 01	0aaa aaaa	MFX Dry Send Level	(0 – 127)
00 02	0aaa aaaa	MFX Chorus Send Level	(0 – 127)
00 03	0aaa aaaa	MFX Reverb Send Level	(0 – 127)
00 04	0000 00aa	MFX Output Assign	(0 – 3) A, B, ——, ——
00 05	0aaa aaaa	MFX Control 1 Source	(0 – 101) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4
00 06	0aaa aaaa	MFX Control 1 Sens	(1 – 127) –63 – +63
00 07	0aaa aaaa	MFX Control 2 Source	(0 – 101) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4
00 08	0aaa aaaa	MFX Control 2 Sens	(1 – 127) –63 – +63
00 09	0aaa aaaa	MFX Control 3 Source	(0 – 101) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4
00 0A	0aaa aaaa	MFX Control 3 Sens	(1 – 127) –63 – +63
00 0B	0aaa aaaa	MFX Control 4 Source	(0 – 101) OFF, CC01 – CC31, CC33 – CC95, BEND, AFT, SYS1 – SYS4
00 0C	0aaa aaaa	MFX Control 4 Sens	(1 – 127) –63 – +63
00 0D	000a aaaa	MFX Control Assign 1	(0 – 16) OFF, 1 – 16
00 0E	000a aaaa	MFX Control Assign 2	(0 – 16) OFF, 1 – 16
00 0F	000a aaaa	MFX Control Assign 3	(0 – 16) OFF, 1 – 16
00 10	000a aaaa	MFX Control Assign 4	(0 – 16) OFF, 1 – 16
# 00 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 1	(12768 – 52768) –20000 – +20000
# 00 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 2	(12768 – 52768) –20000 – +20000
# 00 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 3	(12768 – 52768) –20000 – +20000
# 00 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 4	(12768 – 52768) –20000 – +20000
# 00 21	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 5	(12768 – 52768) –20000 – +20000
# 00 25	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 6	(12768 – 52768) –20000 – +20000
# 00 29	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 7	(12768 – 52768) –20000 – +20000
# 00 2D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 8	(12768 – 52768) –20000 – +20000
# 00 31	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 9	(12768 – 52768) –20000 – +20000
# 00 35	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 10	(12768 – 52768) –20000 – +20000
# 00 39	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 11	(12768 – 52768) –20000 – +20000
# 00 3D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 12	(12768 – 52768) –20000 – +20000
# 00 41	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 13	(12768 – 52768) –20000 – +20000
# 00 45	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 14	(12768 – 52768) –20000 – +20000
# 00 49	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 15	(12768 – 52768) –20000 – +20000
# 00 4D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 16	(12768 – 52768) –20000 – +20000
# 00 51	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 17	(12768 – 52768) –20000 – +20000
# 00 55	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 18	(12768 – 52768) –20000 – +20000
# 00 59	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 19	(12768 – 52768) –20000 – +20000
# 00 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 20	(12768 – 52768) –20000 – +20000
# 00 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 21	(12768 – 52768) –20000 – +20000
# 00 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 22	(12768 – 52768) –20000 – +20000
# 00 69	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 23	(12768 – 52768) –20000 – +20000
# 00 6D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 24	(12768 – 52768) –20000 – +20000
# 00 71	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 25	(12768 – 52768) –20000 – +20000
# 00 75	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 26	(12768 – 52768) –20000 – +20000
# 00 79	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 27	(12768 – 52768) –20000 – +20000
# 00 7D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 28	(12768 – 52768) –20000 – +20000
# 01 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 29	(12768 – 52768) –20000 – +20000
# 01 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 30	(12768 – 52768) –20000 – +20000
# 01 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 31	(12768 – 52768) –20000 – +20000
# 01 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 32	(12768 – 52768) –20000 – +20000
00 00 01 11	Total Size		

❍Performance Common Chorus

Offset Address		Description	
00 00	0000 aaaa	Chorus Type	(0 – 3)
00 01	0aaa aaaa	Chorus Level	(0 – 127)
00 02	0000 00aa	Chorus Output Assign	(0 – 3) A, B, ——, ——
00 03	0000 00aa	Chorus Output Select	(0 – 2) MAIN, REV, MAIN+REV
# 00 04	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 1	(12768 – 52768) –20000 – +20000
# 00 08	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 2	(12768 – 52768) –20000 – +20000
# 00 0C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 3	(12768 – 52768) –20000 – +20000
# 00 10	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 4	(12768 – 52768) –20000 – +20000
# 00 14	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 5	(12768 – 52768) –20000 – +20000
# 00 18	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 6	(12768 – 52768) –20000 – +20000
# 00 1C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 7	(12768 – 52768) –20000 – +20000
# 00 20	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 8	(12768 – 52768) –20000 – +20000
# 00 24	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 9	(12768 – 52768) –20000 – +20000
# 00 28	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 10	(12768 – 52768) –20000 – +20000
# 00 2C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 11	(12768 – 52768) –20000 – +20000
# 00 30	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 12	(12768 – 52768) –20000 – +20000
# 00 34	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 13	(12768 – 52768) –20000 – +20000
# 00 38	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 14	(12768 – 52768) –20000 – +20000
# 00 3C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 15	(12768 – 52768) –20000 – +20000
# 00 40	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 16	(12768 – 52768) –20000 – +20000
# 00 44	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 17	(12768 – 52768) –20000 – +20000
# 00 48	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 18	(12768 – 52768) –20000 – +20000
# 00 4C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 19	(12768 – 52768) –20000 – +20000
# 00 50	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 20	(12768 – 52768) –20000 – +20000
00 00 00 54	Total Size		

❍Performance Common Reverb

Offset Address		Description	
00 00	0000 aaaa	Reverb Type	(0 – 5)
00 01	0aaa aaaa	Reverb Level	(0 – 127)
00 02	0000 00aa	Reverb Output Assign	(0 – 3) A, B, ——, ——
# 00 03	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 1	(12768 – 52768) –20000 – +20000
# 00 07	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 2	(12768 – 52768) –20000 – +20000
# 00 0B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 3	(12768 – 52768) –20000 – +20000
# 00 0F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 4	(12768 – 52768) –20000 – +20000
# 00 13	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 5	(12768 – 52768) –20000 – +20000
# 00 17	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 6	(12768 – 52768) –20000 – +20000
# 00 1B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 7	(12768 – 52768) –20000 – +20000
# 00 1F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 8	(12768 – 52768) –20000 – +20000
# 00 23	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 9	(12768 – 52768) –20000 – +20000
# 00 27	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 10	(12768 – 52768) –20000 – +20000
# 00 2B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 11	(12768 – 52768) –20000 – +20000
# 00 2F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 12	(12768 – 52768) –20000 – +20000
# 00 33	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 13	(12768 – 52768) –20000 – +20000
# 00 37	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 14	(12768 – 52768) –20000 – +20000
# 00 3B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 15	(12768 – 52768) –20000 – +20000
# 00 3F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 16	(12768 – 52768) –20000 – +20000
# 00 43	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 17	(12768 – 52768) –20000 – +20000
# 00 47	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 18	(12768 – 52768) –20000 – +20000
# 00 4B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 19	(12768 – 52768) –20000 – +20000
# 00 4F	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Reverb Parameter 20	(12768 – 52768) –20000 – +20000
00 00 00 53	Total Size		

❍Performance MIDI

Offset Address		Description	
00 00	0000 000a	Receive Program Change	(0 – 1) OFF, ON
00 01	0000 000a	Receive Bank Select	(0 – 1) OFF, ON
00 02	0000 000a	Receive Bender	(0 – 1) OFF, ON
00 03	0000 000a	Receive Polyphonic Key Pressure	(0 – 1) OFF, ON
00 04	0000 000a	Receive Channel Pressure	(0 – 1) OFF, ON
00 05	0000 000a	Receive Modulation	(0 – 1) OFF, ON
00 06	0000 000a	Receive Volume	(0 – 1) OFF, ON
00 07	0000 000a	Receive Pan	(0 – 1) OFF, ON
00 08	0000 000a	Receive Expression	(0 – 1) OFF, ON
00 09	0000 000a	Receive Hold–1	(0 – 1) OFF, ON
00 0A	0000 000a	Phase Lock	(0 – 1) OFF, ON
00 0B	0000 0aaa	Velocity Curve Type	(0 – 4) OFF, 1 – 4
00 00 00 0C	Total Size		

❍Performance Part

Offset Address		Description	
00 00	0000 aaaa	Receive Channel	(0 – 15) 1 – 16
00 01	0000 000a	Receive Switch	(0 – 1) OFF, ON
00 02	0000 0000	(reserve) <*>	(1 – 0)
00 03	0000 0000	(reserve) <*>	(1 – 0)
00 04	0aaa aaaa	Patch Bank Select MSB (CC# 0)	(0 – 127)
00 05	0aaa aaaa	Patch Bank Select LSB (CC# 32)	(0 – 127)
00 06	0aaa aaaa	Patch Program Number (PC)	(0 – 127)
00 07	0aaa aaaa	Part Level (CC# 7)	(0 – 127)
00 08	0aaa aaaa	Part Pan (CC# 10)	(0 – 127) L64 – 63R
00 09	0aaa aaaa	Part Coarse Tune (RPN# 2)	(16 – 112) –48 – +48
00 0A	0aaa aaaa	Part Fine Tune (RPN# 1)	(14 – 114) –50 – +50
00 0B	0000 00aa	Part Mono/Poly (MONO ON/POLY ON)	(0 – 2) MONO, POLY, PATCH
00 0C	0000 00aa	Part Legato Switch (CC# 68)	(0 – 2) OFF, ON, PATCH
00 0D	000a aaaa	Part Pitch Bend Range (RPN# 0)	(0 – 25) 0 – 24, PATCH
00 0E	0000 00aa	Part Portamento Switch (CC# 65)	(0 – 2) OFF, ON, PATCH
# 00 0F	0000 aaaa 0000 bbbb	Part Portamento Time (CC# 5)	(0 – 128) 0 – 127, PATCH
00 11	0aaa aaaa	Part Cutoff Offset (CC# 74)	(0 – 127) –64 – +63
00 12	0aaa aaaa	Part Resonance Offset (CC# 71)	(0 – 127) –64 – +63
00 13	0aaa aaaa	Part Attack Time Offset (CC# 73)	(0 – 127) –64 – +63
00 14	0aaa aaaa	Part Release Time Offset (CC# 72)	(0 – 127) –64 – +63
00 15	0000 0aaa	Part Octave Shift	(61 – 67) –3 – +3
00 16	0aaa aaaa	Part Velocity Sens Offset	(1 – 127) –63 – +63
00 17	0aaa aaaa	(reserve) <*>	(0 – 127)
00 18	0aaa aaaa	(reserve) <*>	(0 – 127)
00 19	0aaa aaaa	(reserve) <*>	(0 – 127)
00 1A	0aaa aaaa	(reserve) <*>	(0 – 127)
00 1B	0000 000a	Mute Switch	(0 – 1) OFF, MUTE
00 1C	0aaa aaaa	Part Dry Send Level	(0 – 127)
00 1D	0aaa aaaa	Part Chorus Send Level (CC# 93)	(0 – 127)
00 1E	0aaa aaaa	Part Reverb Send Level (CC# 91)	(0 – 127)
00 1F	0000 aaaa	Part Output Assign	(0 – 13) MFX, A, B, ———, ———, 1, 2, 3, 4, ———, ———, ———, ———, PATCH
00 20	0000 00aa	Part Output MFX Select	(0 – 2) MFX1, MFX2, MFX3
00 21	0aaa aaaa	Part Decay Time Offset (CC# 75)	(0 – 127) –64 – +63
00 22	0aaa aaaa	Part Vibrato Rate (CC# 76)	(0 – 127) –64 – +63
00 23	0aaa aaaa	Part Vibrato Depth (CC# 77)	(0 – 127) –64 – +63
00 24	0aaa aaaa	Part Vibrato Delay (CC# 78)	(0 – 127) –64 – +63
00 25	0aaa aaaa	Part Scale Tune for C	(0 – 127) –64 – +63
00 26	0aaa aaaa	Part Scale Tune for C#	(0 – 127) –64 – +63
00 27	0aaa aaaa	Part Scale Tune for D	(0 – 127) –64 – +63
00 28	0aaa aaaa	Part Scale Tune for D#	(0 – 127) –64 – +63
00 29	0aaa aaaa	Part Scale Tune for E	(0 – 127) –64 – +63
00 2A	0aaa aaaa	Part Scale Tune for F	(0 – 127) –64 – +63
00 2B	0aaa aaaa	Part Scale Tune for F#	(0 – 127) –64 – +63
00 2C	0aaa aaaa	Part Scale Tune for G	(0 – 127) –64 – +63
00 2D	0aaa aaaa	Part Scale Tune for G#	(0 – 127) –64 – +63
00 2E	0aaa aaaa	Part Scale Tune for A	(0 – 127) –64 – +63
00 2F	0aaa aaaa	Part Scale Tune for A#	(0 – 127) –64 – +63
00 30	0aaa aaaa	Part Scale Tune for B	(0 – 127) –64 – +63
00 00 00 31	Total Size		

❍Performance Zone

Offset Address		Description	
00 00	000a aaaa	(reserve) <*>	(0 – 16)
00 01	0000 000a	Zone Switch	(0 – 1) OFF, ON
00 02	0000 000a	(reserve) <*>	(0 – 1)
# 00 03	0000 aaaa 0000 bbbb	External Bank Select MSB (CC# 0)	(0 – 128) 0 – 127, NO–SEND
00 05	0aaa aaaa	External Bank Select LSB (CC# 32)	(0 – 127)
# 00 06	0000 aaaa 0000 bbbb	External Program Number (PC)	(0 – 128) 0 – 127, NO–SEND
# 00 08	0000 aaaa 0000 bbbb	External Level (CC# 7)	(0 – 128) 0 – 127, NO–SEND
# 00 0A	0000 aaaa 0000 bbbb	External Pan (CC# 10)	(0 – 128) L64 – 63R, NO–SEND
00 0C	0aaa aaaa	Keyboard Range Lower	(0 – 127) C–1 – UPPER
00 0D	0aaa aaaa	Keyboard Range Upper	(0 – 127) LOWER – G9
00 0E	0000 000a	Control Bender	(0 – 1) OFF, ON
00 0F	0000 000a	Control Aftertouch	(0 – 1) OFF, ON
00 10	0000 000a	Control Modulation	(0 – 1) OFF, ON
00 11	0000 000a	Control Hold Pedal	(0 – 1) OFF, ON
00 12	0000 000a	Control Pedal	(0 – 1) OFF, ON
00 13	0000 000a	(reserve) <*>	(0 – 1)
00 14	0000 000a	Control D Beam	(0 – 1) OFF, ON
00 15	0000 000a	Control Knob 1	(0 – 1) OFF, ON
00 16	0000 000a	Control Knob 2	(0 – 1) OFF, ON
00 17	0000 000a	Control Knob 3	(0 – 1) OFF, ON
00 18	0000 000a	Control Knob 4	(0 – 1) OFF, ON
00 19	0000 000a	(reserve) <*>	(0 – 1)
00 1A	0000 000a	(reserve) <*>	(0 – 1)
00 00 00 1B	Total Size		

❍Performance Controller

Offset Address		Description	
00 00	0000 000a	(reserve) <*>	(0 – 1)
00 01	0aaa aaaa	Beam Assign	(0 – 102) CC01 – CC31, CC33 – CC95, BEND–UP, BEND–DOWN, START/STOP, TAP–TEMPO, ARP–GRID, ARP–DUR, ARP–MOTIF, ARP–OCT–UP, ARP–OCT–DW
00 02	0aaa aaaa	Beam Range Lower	(0 – 127)
00 03	0aaa aaaa	Beam Range Upper	(0 – 127)
00 04	0000 aaaa	Beam Trigger Pad	(0 – 15) 1 – 16
00 05	0aaa aaaa	Beam Trigger Velo	(1 – 127)
00 06	0aaa aaaa	Beam Trigger Mode	(0 – 1) MOMENTARY, LATCH
00 07	0aaa aaaa	Knob 1 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER–LEVEL
00 08	0aaa aaaa	Knob 2 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER–LEVEL
00 09	0aaa aaaa	Knob 3 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER–LEVEL
00 0A	0aaa aaaa	Knob 4 Assign	(0 – 101) CC01 – CC31, CC33 – CC95, BEND, AFT, ARP–STYLE, ARP–GRID, ARP–DUR, ARP–MOTIF, CHORD–FORM, MASTER–LEVEL
00 0B	0aaa aaaa	Switch 1 Assign	(0 – 13) TRNS–DW, TRNS–UP, TAP–TEMPO, MONO/POLY, PORTAMENTO, HOLD1, MFX1–SW, MFX2–SW, MFX3–SW, CHO–SW, REV–SW, MAS–SW, SEQ–LOOP, RHY–START/STOP
00 0C	0aaa aaaa	Switch 2 Assign	(0 – 13) TRNS–DW, TRNS–UP, TAP–TEMPO, MONO/POLY, PORTAMENTO, HOLD1, MFX1–SW, MFX2–SW, MFX3–SW, CHO–SW, REV–SW, MAS–SW, SEQ–LOOP, RHY–START/STOP
00 0D	0000 000a	Arp/Ptn Switch	(0 – 1) OFF, ON
00 0E	0aaa aaaa	Arp/Ptn Grid	(0 – 8) 04_, 08_, 08L, 08H, 08t, 16_, 16L, 16H, 16t
00 0F	0aaa aaaa	Arp/Ptn Duration	(0 – 9) 30, 40, 50, 60, 70, 80, 90, 100, 120, FUL
00 10	0000 000a	Arpeggio Switch	(0 – 1) OFF, ON
00 11	0aaa aaaa	Arpeggio Bank	(0 – 1) USER, PRESET
00 12	0aaa aaaa	Arpeggio Style	(0 – 127) 1 – 128
00 13	0aaa aaaa	Arpeggio Motif	(0 – 11) UP/L, UP/H, UP/_, dn/L, dn/H, dn/_, Ud/L, Ud/H, Ud/_, rn/L, rn/_, PHRASE
00 14	0000 0aaa	Arpeggio Octave Range	(61 – 67) –3 – +3
00 15	0000 000a	Arpeggio Hold	(0 – 1) OFF, ON
00 16	0aaa aaaa	Arpeggio Accent Rate	(0 – 100)
00 17	0aaa aaaa	Arpeggio Velocity	(0 – 127)

			REAL, 1 – 127
	00 18	0000 aaaa	Arpeggio Zone Number (0 – 15) ZONE1 – ZONE16
	00 19	0000 000a	Rhythm Pattern Switch (0 – 1) OFF, ON
	00 1A	0aaa aaaa	Rhythm Pattern Group Bank (0 – 1) USER, PRESET
	00 1B	0aaa aaaa	Rhythm Pattern Group Number (0 – 31) 1 – 32
	00 1C	0aaa aaaa	Rhythm Pattern Accent Rate (0 – 100)
	00 1D	0aaa aaaa	Rhythm Pattern Velocity (0 – 127) REAL, 1 – 127
	00 1E	0000 000a	Chord Switch (0 – 1) OFF, ON
	00 1F	0aaa aaaa	Chord Group (0 – 1) USER, PRESET
	00 20	00aa aaaa	Chord Form (0 – 63)
	00 21	0aaa aaaa	Pad Set (0 – 2) USER, NOTE, RHY
	00 22	0aaa aaaa	Pad Base Note (0 – 127) C–1 – G9
	00 23	000a aaaa	Pad Transmit Channel (0 – 15) 1 – 16
	00 24	0aaa aaaa	(reserve) <*> (0 – 1)
	00 25	0aaa aaaa	Pad 1 Note Number (0 – 127) C–1 – G9
	00 26	0aaa aaaa	Pad 1 Velocity (0 – 127) REAL, 1 – 127
	00 27	0aaa aaaa	(reserve) <*> (0 – 1)
	00 28	0aaa aaaa	Pad 2 Note Number (0 – 127) C–1 – G9
	00 29	0aaa aaaa	Pad 2 Velocity (0 – 127) REAL, 1 – 127
	00 2A	0aaa aaaa	(reserve) <*> (0 – 1)
	00 2B	0aaa aaaa	Pad 3 Note Number (0 – 127) C–1 – G9
	00 2C	0aaa aaaa	Pad 3 Velocity (0 – 127) REAL, 1 – 127
	00 2D	0aaa aaaa	(reserve) <*> (0 – 1)
	00 2E	0aaa aaaa	Pad 4 Note Number (0 – 127) C–1 – G9
	00 2F	0aaa aaaa	Pad 4 Velocity (0 – 127) REAL, 1 – 127
	00 30	0aaa aaaa	(reserve) <*> (0 – 1)
	00 31	0aaa aaaa	Pad 5 Note Number (0 – 127) C–1 – G9
	00 32	0aaa aaaa	Pad 5 Velocity (0 – 127) REAL, 1 – 127
	00 33	0aaa aaaa	(reserve) <*> (0 – 1)
	00 34	0aaa aaaa	Pad 6 Note Number (0 – 127) C–1 – G9
	00 35	0aaa aaaa	Pad 6 Velocity (0 – 127) REAL, 1 – 127
	00 36	0aaa aaaa	(reserve) <*> (0 – 1)
	00 37	0aaa aaaa	Pad 7 Note Number (0 – 127) C–1 – G9
	00 38	0aaa aaaa	Pad 7 Velocity (0 – 127) REAL, 1 – 127
	00 39	0aaa aaaa	(reserve) <*> (0 – 1)
	00 3A	0aaa aaaa	Pad 8 Note Number (0 – 127) C–1 – G9
	00 3B	0aaa aaaa	Pad 8 Velocity (0 – 127) REAL, 1 – 127
	00 3C	0aaa aaaa	(reserve) <*> (0 – 1)
	00 3D	0aaa aaaa	Pad 9 Note Number (0 – 127) C–1 – G9
	00 3E	0aaa aaaa	Pad 9 Velocity (0 – 127) REAL, 1 – 127
	00 3F	0aaa aaaa	(reserve) <*> (0 – 1)
	00 40	0aaa aaaa	Pad 10 Note Number (0 – 127) C–1 – G9
	00 41	0aaa aaaa	Pad 10 Velocity (0 – 127) REAL, 1 – 127
	00 42	0aaa aaaa	(reserve) <*> (0 – 1)
	00 43	0aaa aaaa	Pad 11 Note Number (0 – 127) C–1 – G9
	00 44	0aaa aaaa	Pad 11 Velocity (0 – 127) REAL, 1 – 127
	00 45	0aaa aaaa	(reserve) <*> (0 – 1)
	00 46	0aaa aaaa	Pad 12 Note Number (0 – 127) C–1 – G9
	00 47	0aaa aaaa	Pad 12 Velocity (0 – 127) REAL, 1 – 127
	00 48	0aaa aaaa	(reserve) <*> (0 – 1)
	00 49	0aaa aaaa	Pad 13 Note Number (0 – 127) C–1 – G9
	00 4A	0aaa aaaa	Pad 13 Velocity (0 – 127) REAL, 1 – 127
	00 4B	0aaa aaaa	(reserve) <*> (0 – 1)
	00 4C	0aaa aaaa	Pad 14 Note Number (0 – 127) C–1 – G9
	00 4D	0aaa aaaa	Pad 14 Velocity (0 – 127) REAL, 1 – 127
	00 4E	0aaa aaaa	(reserve) <*> (0 – 1)
	00 4F	0aaa aaaa	Pad 15 Note Number (0 – 127) C–1 – G9
	00 50	0aaa aaaa	Pad 15 Velocity (0 – 127) REAL, 1 – 127
	00 51	0aaa aaaa	(reserve) <*> (0 – 1)
	00 52	0aaa aaaa	Pad 16 Note Number (0 – 127) C–1 – G9
	00 53	0aaa aaaa	Pad 16 Velocity (0 – 127) REAL, 1 – 127
#	00 54	0000 aaaa 0000 bbbb	Recommended Tempo (20 – 250)
00 00 00 56		Total Size	

❍Arpeggio Common

Offset Address		Description	
#	00 00	0000 aaaa 0000 bbbb	End Step (1 – 32)
	00 02	0aaa aaaa	Arpeggio Name 1 (32 – 127)
	00 03	0aaa aaaa	Arpeggio Name 2 (32 – 127)
	00 04	0aaa aaaa	Arpeggio Name 3 (32 – 127)
	00 05	0aaa aaaa	Arpeggio Name 4 (32 – 127)
	00 06	0aaa aaaa	Arpeggio Name 5 (32 – 127)
	00 07	0aaa aaaa	Arpeggio Name 6 (32 – 127)
	00 08	0aaa aaaa	Arpeggio Name 7 (32 – 127)
	00 09	0aaa aaaa	Arpeggio Name 8 (32 – 127)
	00 0A	0aaa aaaa	Arpeggio Name 9 (32 – 127)
	00 0B	0aaa aaaa	Arpeggio Name 10 (32 – 127)
	00 0C	0aaa aaaa	Arpeggio Name 11 (32 – 127)
	00 0D	0aaa aaaa	Arpeggio Name 12 (32 – 127)
	00 0E	0aaa aaaa	Arpeggio Name 13 (32 – 127)
	00 0F	0aaa aaaa	Arpeggio Name 14 (32 – 127)
	00 10	0aaa aaaa	Arpeggio Name 15 (32 – 127)
	00 11	0aaa aaaa	Arpeggio Name 16 (32 – 127)
00 00 00 12		Total Size	

❍Arpeggio Pattern

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

❍Chord Pattern

Offset Address		Description	
00 00	0000 000a	Chord Note1	(0 – 1) OFF, ON
00 01	0000 000a	Chord Note2	(0 – 1) OFF, ON
00 02	0000 000a	Chord Note3	(0 – 1) OFF, ON
00 03	0000 000a	Chord Note4	(0 – 1) OFF, ON
00 04	0000 000a	Chord Note5	(0 – 1) OFF, ON
00 05	0000 000a	Chord Note6	(0 – 1) OFF, ON
00 06	0000 000a	Chord Note7	(0 – 1) OFF, ON
00 07	0000 000a	Chord Note8	(0 – 1) OFF, ON
00 08	0000 000a	Chord Note9	(0 – 1) OFF, ON
00 09	0000 000a	Chord Note10	(0 – 1) OFF, ON
00 0A	0000 000a	Chord Note11	(0 – 1) OFF, ON
00 0B	0000 000a	Chord Note12	(0 – 1) OFF, ON
00 0C	0000 000a	Chord Note13	(0 – 1) OFF, ON
00 0D	0000 000a	Chord Note14	(0 – 1) OFF, ON
00 0E	0000 000a	Chord Note15	(0 – 1) OFF, ON
00 0F	0000 000a	Chord Note16	(0 – 1) OFF, ON
00 10	0000 000a	Chord Note17	(0 – 1) OFF, ON
00 11	0000 000a	Chord Note18	(0 – 1) OFF, ON
00 12	0000 000a	Chord Note19	(0 – 1) OFF, ON
00 13	0000 000a	Chord Note20	(0 – 1) OFF, ON
00 14	0000 000a	Chord Note21	(0 – 1) OFF, ON
00 15	0000 000a	Chord Note22	(0 – 1) OFF, ON
00 16	0000 000a	Chord Note23	(0 – 1) OFF, ON
00 17	0000 000a	Chord Note24	(0 – 1) OFF, ON
00 18	0000 000a	Chord Note25	(0 – 1) OFF, ON
00 19	0000 000a	Chord Note26	(0 – 1) OFF, ON
00 1A	0000 000a	Chord Note27	(0 – 1) OFF, ON
00 1B	0000 000a	Chord Note28	(0 – 1) OFF, ON
00 1C	0000 000a	Chord Note29	(0 – 1) OFF, ON
00 1D	0000 000a	Chord Note30	(0 – 1) OFF, ON
00 1E	0000 000a	Chord Note31	(0 – 1) OFF, ON
00 1F	0000 000a	Chord Note32	(0 – 1) OFF, ON
00 20	0000 000a	Chord Note33	(0 – 1) OFF, ON
00 21	0000 000a	Chord Note34	(0 – 1) OFF, ON
00 22	0000 000a	Chord Note35	(0 – 1) OFF, ON
00 23	0000 000a	Chord Note36	(0 – 1) OFF, ON
00 24	0000 000a	Chord Note37	(0 – 1) OFF, ON
00 25	0000 000a	Chord Note38	(0 – 1) OFF, ON
00 26	0000 000a	Chord Note39	(0 – 1) OFF, ON
00 27	0000 000a	Chord Note40	(0 – 1) OFF, ON
00 28	0000 000a	Chord Note41	(0 – 1) OFF, ON
00 29	0000 000a	Chord Note42	(0 – 1) OFF, ON
00 2A	0000 000a	Chord Note43	(0 – 1) OFF, ON
00 2B	0000 000a	Chord Note44	(0 – 1) OFF, ON
00 2C	0000 000a	Chord Note45	(0 – 1) OFF, ON
00 2D	0000 000a	Chord Note46	(0 – 1) OFF, ON
00 2E	0000 000a	Chord Note47	(0 – 1) OFF, ON
00 2F	0000 000a	Chord Note48	(0 – 1) OFF, ON
00 30	0000 000a	Chord Note49	(0 – 1) OFF, ON
00 31	0000 000a	Chord Note50	(0 – 1) OFF, ON
00 32	0000 000a	Chord Note51	(0 – 1) OFF, ON
00 33	0000 000a	Chord Note52	(0 – 1) OFF, ON
00 34	0000 000a	Chord Note53	(0 – 1) OFF, ON
00 35	0000 000a	Chord Note54	(0 – 1) OFF, ON
00 36	0000 000a	Chord Note55	(0 – 1) OFF, ON
00 37	0000 000a	Chord Note56	(0 – 1) OFF, ON
00 38	0000 000a	Chord Note57	(0 – 1) OFF, ON
00 39	0000 000a	Chord Note58	(0 – 1) OFF, ON
00 3A	0000 000a	Chord Note59	(0 – 1) OFF, ON
00 3B	0000 000a	Chord Note60	(0 – 1) OFF, ON
00 3C	0000 000a	Chord Note61	(0 – 1) OFF, ON
00 3D	0000 000a	Chord Note62	(0 – 1) OFF, ON
00 3E	0000 000a	Chord Note63	(0 – 1) OFF, ON
00 3F	0000 000a	Chord Note64	(0 – 1) OFF, ON
00 40	0000 000a	Chord Note65	(0 – 1) OFF, ON
00 41	0000 000a	Chord Note66	(0 – 1) OFF, ON
00 42	0000 000a	Chord Note67	(0 – 1) OFF, ON
00 43	0000 000a	Chord Note68	(0 – 1) OFF, ON
00 44	0000 000a	Chord Note69	(0 – 1) OFF, ON
00 45	0000 000a	Chord Note70	(0 – 1) OFF, ON
00 46	0000 000a	Chord Note71	(0 – 1) OFF, ON
00 47	0000 000a	Chord Note72	(0 – 1) OFF, ON
00 48	0000 000a	Chord Note73	(0 – 1) OFF, ON
00 49	0000 000a	Chord Note74	(0 – 1) OFF, ON
00 4A	0000 000a	Chord Note75	(0 – 1) OFF, ON
00 4B	0000 000a	Chord Note76	(0 – 1) OFF, ON
00 4C	0000 000a	Chord Note77	(0 – 1) OFF, ON
00 4D	0000 000a	Chord Note78	(0 – 1) OFF, ON
00 4E	0000 000a	Chord Note79	(0 – 1) OFF, ON
00 4F	0000 000a	Chord Note80	(0 – 1) OFF, ON
00 50	0000 000a	Chord Note81	(0 – 1) OFF, ON
00 51	0000 000a	Chord Note82	(0 – 1) OFF, ON
00 52	0000 000a	Chord Note83	(0 – 1) OFF, ON
00 53	0000 000a	Chord Note84	(0 – 1) OFF, ON
00 54	0000 000a	Chord Note85	(0 – 1) OFF, ON
00 55	0000 000a	Chord Note86	(0 – 1) OFF, ON
00 56	0000 000a	Chord Note87	(0 – 1) OFF, ON
00 57	0000 000a	Chord Note88	(0 – 1) OFF, ON
00 58	0000 000a	Chord Note89	(0 – 1) OFF, ON
00 59	0000 000a	Chord Note90	(0 – 1) OFF, ON
00 5A	0000 000a	Chord Note91	(0 – 1) OFF, ON
00 5B	0000 000a	Chord Note92	(0 – 1) OFF, ON
00 5C	0000 000a	Chord Note93	(0 – 1) OFF, ON
00 5D	0000 000a	Chord Note94	(0 – 1) OFF, ON
00 5E	0000 000a	Chord Note95	(0 – 1) OFF, ON
00 5F	0000 000a	Chord Note96	(0 – 1) OFF, ON
00 60	0000 000a	Chord Note97	(0 – 1) OFF, ON
00 61	0000 000a	Chord Note98	(0 – 1) OFF, ON
00 62	0000 000a	Chord Note99	(0 – 1) OFF, ON
00 63	0000 000a	Chord Note100	(0 – 1) OFF, ON
00 64	0000 000a	Chord Note101	(0 – 1) OFF, ON
00 65	0000 000a	Chord Note102	(0 – 1) OFF, ON
00 66	0000 000a	Chord Note103	(0 – 1) OFF, ON
00 67	0000 000a	Chord Note104	(0 – 1) OFF, ON
00 68	0000 000a	Chord Note105	(0 – 1) OFF, ON
00 69	0000 000a	Chord Note106	(0 – 1) OFF, ON
00 6A	0000 000a	Chord Note107	(0 – 1) OFF, ON
00 6B	0000 000a	Chord Note108	(0 – 1) OFF, ON
00 6C	0000 000a	Chord Note109	(0 – 1) OFF, ON
00 6D	0000 000a	Chord Note110	(0 – 1) OFF, ON
00 6E	0000 000a	Chord Note111	(0 – 1) OFF, ON
00 6F	0000 000a	Chord Note112	(0 – 1) OFF, ON
00 70	0000 000a	Chord Note113	(0 – 1) OFF, ON
00 71	0000 000a	Chord Note114	(0 – 1) OFF, ON
00 72	0000 000a	Chord Note115	(0 – 1) OFF, ON
00 73	0000 000a	Chord Note116	(0 – 1) OFF, ON
00 74	0000 000a	Chord Note117	(0 – 1) OFF, ON
00 75	0000 000a	Chord Note118	(0 – 1) OFF, ON
00 76	0000 000a	Chord Note119	(0 – 1) OFF, ON
00 77	0000 000a	Chord Note120	(0 – 1) OFF, ON
00 78	0000 000a	Chord Note121	(0 – 1) OFF, ON
00 79	0000 000a	Chord Note122	(0 – 1) OFF, ON
00 7A	0000 000a	Chord Note123	(0 – 1) OFF, ON
00 7B	0000 000a	Chord Note124	(0 – 1) OFF, ON
00 7C	0000 000a	Chord Note125	(0 – 1) OFF, ON
00 7D	0000 000a	Chord Note126	(0 – 1) OFF, ON
00 7E	0000 000a	Chord Note127	(0 – 1) OFF, ON
00 7F	0000 000a	Chord Note128	(0 – 1) OFF, ON
01 00	0aaa aaaa	Chord Pattern Name 1	(32 – 127)
01 01	0aaa aaaa	Chord Pattern Name 2	(32 – 127)
01 02	0aaa aaaa	Chord Pattern Name 3	(32 – 127)
01 03	0aaa aaaa	Chord Pattern Name 4	(32 – 127)
01 04	0aaa aaaa	Chord Pattern Name 5	(32 – 127)
01 05	0aaa aaaa	Chord Pattern Name 6	(32 – 127)
01 06	0aaa aaaa	Chord Pattern Name 7	(32 – 127)

	01 07	0aaa aaaa	Chord Pattern Name 8 (32 – 127)
	01 08	0aaa aaaa	Chord Pattern Name 9 (32 – 127)
	01 09	0aaa aaaa	Chord Pattern Name 10 (32 – 127)
	01 0A	0aaa aaaa	Chord Pattern Name 11 (32 – 127)
	01 0B	0aaa aaaa	Chord Pattern Name 12 (32 – 127)
	01 0C	0aaa aaaa	Chord Pattern Name 13 (32 – 127)
	01 0D	0aaa aaaa	Chord Pattern Name 14 (32 – 127)
	01 0E	0aaa aaaa	Chord Pattern Name 15 (32 – 127)
	01 0F	0aaa aaaa	Chord Pattern Name 16 (32 – 127)
	00 00 01 10	Total Size	

❍Rhythm Group

	Offset Address		Description	
	00 00	0aaa aaaa	Rhythm Group Name 1	(32 – 127)
	00 01	0aaa aaaa	Rhythm Group Name 2	(32 – 127)
	00 02	0aaa aaaa	Rhythm Group Name 3	(32 – 127)
	00 03	0aaa aaaa	Rhythm Group Name 4	(32 – 127)
	00 04	0aaa aaaa	Rhythm Group Name 5	(32 – 127)
	00 05	0aaa aaaa	Rhythm Group Name 6	(32 – 127)
	00 06	0aaa aaaa	Rhythm Group Name 7	(32 – 127)
	00 07	0aaa aaaa	Rhythm Group Name 8	(32 – 127)
	00 08	0aaa aaaa	Rhythm Group Name 9	(32 – 127)
	00 09	0aaa aaaa	Rhythm Group Name 10	(32 – 127)
	00 0A	0aaa aaaa	Rhythm Group Name 11	(32 – 127)
	00 0B	0aaa aaaa	Rhythm Group Name 12	(32 – 127)
	00 0C	0aaa aaaa	Rhythm Group Name 13	(32 – 127)
	00 0D	0aaa aaaa	Rhythm Group Name 14	(32 – 127)
	00 0E	0aaa aaaa	Rhythm Group Name 15	(32 – 127)
	00 0F	0aaa aaaa	Rhythm Group Name 16	(32 – 127)
	00 10	0aaa aaaa	Recommended Rhythm Bank Select MSB	(0 – 127)
	00 11	0aaa aaaa	Recommended Rhythm Bank Select LSB	(0 – 127)
	00 12	0aaa aaaa	Recommended Rhythm Program Number	(0 – 127)
	00 13	0aaa aaaa	Pad 1 Mode	(0 – 2) OFF, NOTE, PTN
	00 14	0aaa aaaa	Pad 1 Note Number	(0 – 127) C–1 – G9
	00 15	0aaa aaaa	Pad 1 Velocity	(0 – 127) REAL, 1 – 127
	00 16	0000 000a	Pad 1 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 17	0000 aaaa 0000 bbbb	Pad 1 Rhythm Pattern Number	(0 – 255)
	00 19	0aaa aaaa	Pad 2 Mode	(0 – 2) OFF, NOTE, PTN
	00 1A	0aaa aaaa	Pad 2 Note Number	(0 – 127) C–1 – G9
	00 1B	0aaa aaaa	Pad 2 Velocity	(0 – 127) REAL, 1 – 127
	00 1C	0000 000a	Pad 2 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 1D	0000 aaaa 0000 bbbb	Pad 2 Rhythm Pattern Number	(0 – 255)
	00 1F	0aaa aaaa	Pad 3 Mode	(0 – 2) OFF, NOTE, PTN
	00 20	0aaa aaaa	Pad 3 Note Number	(0 – 127) C–1 – G9
	00 21	0aaa aaaa	Pad 3 Velocity	(0 – 127) REAL, 1 – 127
	00 22	0000 000a	Pad 3 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 23	0000 aaaa 0000 bbbb	Pad 3 Rhythm Pattern Number	(0 – 255)
	00 25	0aaa aaaa	Pad 4 Mode	(0 – 2) OFF, NOTE, PTN
	00 26	0aaa aaaa	Pad 4 Note Number	(0 – 127) C–1 – G9
	00 27	0aaa aaaa	Pad 4 Velocity	(0 – 127) REAL, 1 – 127
	00 28	0000 000a	Pad 4 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 29	0000 aaaa 0000 bbbb	Pad 4 Rhythm Pattern Number	(0 – 255)
	00 2B	0aaa aaaa	Pad 5 Mode	(0 – 2) OFF, NOTE, PTN
	00 2C	0aaa aaaa	Pad 5 Note Number	(0 – 127) C–1 – G9
	00 2D	0aaa aaaa	Pad 5 Velocity	(0 – 127) REAL, 1 – 127
	00 2E	0000 000a	Pad 5 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 2F	0000 aaaa 0000 bbbb	Pad 5 Rhythm Pattern Number	(0 – 255)
	00 31	0aaa aaaa	Pad 6 Mode	(0 – 2) OFF, NOTE, PTN
	00 32	0aaa aaaa	Pad 6 Note Number	(0 – 127) C–1 – G9
	00 33	0aaa aaaa	Pad 6 Velocity	(0 – 127) REAL, 1 – 127
	00 34	0000 000a	Pad 6 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 35	0000 aaaa 0000 bbbb	Pad 6 Rhythm Pattern Number	(0 – 255)
	00 37	0aaa aaaa	Pad 7 Mode	(0 – 2) OFF, NOTE, PTN
	00 38	0aaa aaaa	Pad 7 Note Number	(0 – 127) C–1 – G9
	00 39	0aaa aaaa	Pad 7 Velocity	(0 – 127) REAL, 1 – 127
	00 3A	0000 000a	Pad 7 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 3B	0000 aaaa 0000 bbbb	Pad 7 Rhythm Pattern Number	(0 – 255)
	00 3D	0aaa aaaa	Pad 8 Mode	(0 – 2) OFF, NOTE, PTN
	00 3E	0aaa aaaa	Pad 8 Note Number	(0 – 127) C–1 – G9
	00 3F	0aaa aaaa	Pad 8 Velocity	(0 – 127) REAL, 1 – 127
	00 40	0000 000a	Pad 8 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 41	0000 aaaa 0000 bbbb	Pad 8 Rhythm Pattern Number	(0 – 255)
	00 43	0aaa aaaa	Pad 9 Mode	(0 – 2) OFF, NOTE, PTN
	00 44	0aaa aaaa	Pad 9 Note Number	(0 – 127) C–1 – G9
	00 45	0aaa aaaa	Pad 9 Velocity	(0 – 127) REAL, 1 – 127
	00 46	0000 000a	Pad 9 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 47	0000 aaaa 0000 bbbb	Pad 9 Rhythm Pattern Number	(0 – 255)
	00 49	0aaa aaaa	Pad 10 Mode	(0 – 2) OFF, NOTE, PTN
	00 4A	0aaa aaaa	Pad 10 Note Number	(0 – 127) C–1 – G9
	00 4B	0aaa aaaa	Pad 10 Velocity	(0 – 127) REAL, 1 – 127
	00 4C	0000 000a	Pad 10 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 4D	0000 aaaa 0000 bbbb	Pad 10 Rhythm Pattern Number	(0 – 255)
	00 4F	0aaa aaaa	Pad 11 Mode	(0 – 2) OFF, NOTE, PTN
	00 50	0aaa aaaa	Pad 11 Note Number	(0 – 127) C–1 – G9
	00 51	0aaa aaaa	Pad 11 Velocity	(0 – 127) REAL, 1 – 127
	00 52	0000 000a	Pad 11 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 53	0000 aaaa 0000 bbbb	Pad 11 Rhythm Pattern Number	(0 – 255)
	00 55	0aaa aaaa	Pad 12 Mode	(0 – 2) OFF, NOTE, PTN
	00 56	0aaa aaaa	Pad 12 Note Number	(0 – 127) C–1 – G9
	00 57	0aaa aaaa	Pad 12 Velocity	(0 – 127) REAL, 1 – 127
	00 58	0000 000a	Pad 12 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 59	0000 aaaa 0000 bbbb	Pad 12 Rhythm Pattern Number	(0 – 255)
	00 5B	0aaa aaaa	Pad 13 Mode	(0 – 2) OFF, NOTE, PTN
	00 5C	0aaa aaaa	Pad 13 Note Number	(0 – 127) C–1 – G9
	00 5D	0aaa aaaa	Pad 13 Velocity	(0 – 127) REAL, 1 – 127
	00 5E	0000 000a	Pad 13 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 5F	0000 aaaa 0000 bbbb	Pad 13 Rhythm Pattern Number	(0 – 255)
	00 61	0aaa aaaa	Pad 14 Mode	(0 – 2) OFF, NOTE, PTN
	00 62	0aaa aaaa	Pad 14 Note Number	(0 – 127) C–1 – G9
	00 63	0aaa aaaa	Pad 14 Velocity	(0 – 127) REAL, 1 – 127
	00 64	0000 000a	Pad 14 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 65	0000 aaaa 0000 bbbb	Pad 14 Rhythm Pattern Number	(0 – 255)
	00 67	0aaa aaaa	Pad 15 Mode	(0 – 2) OFF, NOTE, PTN
	00 68	0aaa aaaa	Pad 15 Note Number	(0 – 127) C–1 – G9
	00 69	0aaa aaaa	Pad 15 Velocity	(0 – 127) REAL, 1 – 127
	00 6A	0000 000a	Pad 15 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 6B	0000 aaaa 0000 bbbb	Pad 15 Rhythm Pattern Number	(0 – 255)
	00 6D	0aaa aaaa	Pad 16 Mode	(0 – 2) OFF, NOTE, PTN
	00 6E	0aaa aaaa	Pad 16 Note Number	(0 – 127) C–1 – G9
	00 6F	0aaa aaaa	Pad 16 Velocity	(0 – 127) REAL, 1 – 127
	00 70	0000 000a	Pad 16 Rhythm Pattern Group	(0 – 1) USER, PRESET
#	00 71	0000 aaaa 0000 bbbb	Pad 16 Rhythm Pattern Number	(0 – 255)
	00 00 00 73	Total Size		

❍Patch Common

Offset Address		Description	
00 00	0aaa aaaa	Patch Name 1	(32 - 127) 32 - 127 [ASCII]
00 01	0aaa aaaa	Patch Name 2	(32 - 127) 32 - 127 [ASCII]
00 02	0aaa aaaa	Patch Name 3	(32 - 127) 32 - 127 [ASCII]
00 03	0aaa aaaa	Patch Name 4	(32 - 127) 32 - 127 [ASCII]
00 04	0aaa aaaa	Patch Name 5	(32 - 127) 32 - 127 [ASCII]
00 05	0aaa aaaa	Patch Name 6	(32 - 127) 32 - 127 [ASCII]
00 06	0aaa aaaa	Patch Name 7	(32 - 127) 32 - 127 [ASCII]
00 07	0aaa aaaa	Patch Name 8	(32 - 127) 32 - 127 [ASCII]
00 08	0aaa aaaa	Patch Name 9	(32 - 127) 32 - 127 [ASCII]
00 09	0aaa aaaa	Patch Name 10	(32 - 127) 32 - 127 [ASCII]
00 0A	0aaa aaaa	Patch Name 11	(32 - 127) 32 - 127 [ASCII]
00 0B	0aaa aaaa	Patch Name 12	(32 - 127) 32 - 127 [ASCII]
00 0C	0aaa aaaa	Patch Category	(0 - 127)
00 0D	0000 000a	(reserve)<*>	
00 0E	0aaa aaaa	Patch Level	(0 - 127)
00 0F	0aaa aaaa	Patch Pan	(0 - 127) L64 - 63R
00 10	0000 000a	Patch Priority	(0 - 1) LAST, LOUDEST
00 11	0aaa aaaa	Patch Coarse Tune	(16 - 112) -48 - +48
00 12	0aaa aaaa	Patch Fine Tune	(14 - 114) -50 - +50
00 13	0000 0aaa	Octave Shift	(61 - 67) -3 - +3
00 14	0000 00aa	Stretch Tune Depth	(0 - 3) OFF, 1 - 3

	00 15	0aaa aaaa	Analog Feel (0 - 127)
	00 16	0000 000a	Mono/Poly (0 - 1) MONO, POLY
	00 17	0000 000a	Legato Switch (0 - 1) OFF, ON
	00 18	0000 000a	Legato Retrigger (0 - 1) OFF, ON
	00 19	0000 000a	Portamento Switch (0 - 1) OFF, ON
	00 1A	0000 000a	Portamento Mode (0 - 1) NORMAL, LEGATO
	00 1B	0000 000a	Portamento Type (0 - 1) RATE, TIME
	00 1C	0000 000a	Portamento Start (0 - 1) PITCH, NOTE
	00 1D	0aaa aaaa	Portamento Time (0 - 127)
	00 1E	0000 000a	(reserve)<*>
#	00 1F	0000 aaaa	
		0000 bbbb	(reserve)<*>
	00 21	0000 000a	(reserve)<*>
	00 22	0aaa aaaa	Cutoff Offset (1 - 127) -63 - +63
	00 23	0aaa aaaa	Resonance Offset (1 - 127) -63 - +63
	00 24	0aaa aaaa	Attack Time Offset (1 - 127) -63 - +63
	00 25	0aaa aaaa	Release Time Offset (1 - 127) -63 - +63
	00 26	0aaa aaaa	Velocity Sens Offset (1 - 127) -63 - +63
	00 27	0000 aaaa	Patch Output Assign (0 - 13) MFX, A, B, ---, ---, 1, 2, 3, 4, ---, ---, ---, ---, TONE
	00 28	0000 000a	TMT Control Switch (0 - 1) OFF, ON
	00 29	00aa aaaa	Pitch Bend Range Up (0 - 48)
	00 2A	00aa aaaa	Pitch Bend Range Down (0 - 48)
	00 2B	0aaa aaaa	Matrix Control 1 Source (0 - 109) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT-ENV, TVF-ENV, TVA-ENV
	00 2C	00aa aaaa	Matrix Control 1 Destination 1 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 2D	0aaa aaaa	Matrix Control 1 Sens 1 (1 - 127) -63 - +63
	00 2E	00aa aaaa	Matrix Control 1 Destination 2 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 2F	0aaa aaaa	Matrix Control 1 Sens 2 (1 - 127) -63 - +63
	00 30	00aa aaaa	Matrix Control 1 Destination 3 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 31	0aaa aaaa	Matrix Control 1 Sens 3 (1 - 127) -63 - +63
	00 32	00aa aaaa	Matrix Control 1 Destination 4 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 33	0aaa aaaa	Matrix Control 1 Sens 4 (1 - 127) -63 - +63
	00 34	0aaa aaaa	Matrix Control 2 Source (0 - 109) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT-ENV, TVF-ENV, TVA-ENV
	00 35	00aa aaaa	Matrix Control 2 Destination 1 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 36	0aaa aaaa	Matrix Control 2 Sens 1 (1 - 127) -63 - +63
	00 37	00aa aaaa	Matrix Control 2 Destination 2 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 38	0aaa aaaa	Matrix Control 2 Sens 2 (1 - 127) -63 - +63
	00 39	00aa aaaa	Matrix Control 2 Destination 3 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 3A	0aaa aaaa	Matrix Control 2 Sens 3 (1 - 127) -63 - +63
	00 3B	00aa aaaa	Matrix Control 2 Destination 4 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 3C	0aaa aaaa	Matrix Control 2 Sens 4 (1 - 127) -63 - +63
	00 3D	0aaa aaaa	Matrix Control 3 Source (0 - 109) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT-ENV, TVF-ENV, TVA-ENV
	00 3E	00aa aaaa	Matrix Control 3 Destination 1 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 3F	0aaa aaaa	Matrix Control 3 Sens 1 (1 - 127) -63 - +63
	00 40	00aa aaaa	Matrix Control 3 Destination 2 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 41	0aaa aaaa	Matrix Control 3 Sens 2 (1 - 127) -63 - +63
	00 42	00aa aaaa	Matrix Control 3 Destination 3 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 43	0aaa aaaa	Matrix Control 3 Sens 3 (1 - 127) -63 - +63
	00 44	00aa aaaa	Matrix Control 3 Destination 4 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 45	0aaa aaaa	Matrix Control 3 Sens 4 (1 - 127) -63 - +63
	00 46	0aaa aaaa	Matrix Control 4 Source (0 - 109) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4, VELOCITY, KEYFOLLOW, TEMPO, LFO1, LFO2, PIT-ENV, TVF-ENV, TVA-ENV
	00 47	00aa aaaa	Matrix Control 4 Destination 1 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 48	0aaa aaaa	Matrix Control 4 Sens 1 (1 - 127) -63 - +63
	00 49	00aa aaaa	Matrix Control 4 Destination 2 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 4A	0aaa aaaa	Matrix Control 4 Sens 2 (1 - 127) -63 - +63
	00 4B	00aa aaaa	Matrix Control 4 Destination 3 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 4C	0aaa aaaa	Matrix Control 4 Sens 3 (1 - 127) -63 - +63
	00 4D	00aa aaaa	Matrix Control 4 Destination 4 (0 - 34) OFF, PCH, CUT, RES, LEV, PAN, DRY, CHO, REV, PIT-LFO1, PIT-LFO2, TVF-LFO1, TVF-LFO2, TVA-LFO1, TVA-LFO2, PAN-LFO1, PAN-LFO2, LFO1-RATE, LFO2-RATE, PIT-ATK, PIT-DCY, PIT-REL, TVF-ATK, TVF-DCY, TVF-REL, TVA-ATK, TVA-DCY, TVA-REL, TMT, FXM, MFX1, MFX2, MFX3, MFX4, TIME
	00 4E	0aaa aaaa	Matrix Control 4 Sens 4 (1 - 127) -63 - +63
	00 00 00 4F		Total Size

❍Patch Common MFX

Offset Address		Description	
00 00	0aaa aaaa	MFX Type	(0 - 127)
00 01	0aaa aaaa	MFX Dry Send Level	(0 - 127)
00 02	0aaa aaaa	MFX Chorus Send Level	(0 - 127)
00 03	0aaa aaaa	MFX Reverb Send Level	(0 - 127)
00 04	0000 00aa	MFX Output Assign	(0 - 3) A, B, ---, ---
00 05	0aaa aaaa	MFX Control 1 Source	(0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
00 06	0aaa aaaa	MFX Control 1 Sens	(1 - 127) -63 - +63
00 07	0aaa aaaa	MFX Control 2 Source	(0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
00 08	0aaa aaaa	MFX Control 2 Sens	(1 - 127) -63 - +63
00 09	0aaa aaaa	MFX Control 3 Source	(0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
00 0A	0aaa aaaa	MFX Control 3 Sens	(1 - 127) -63 - +63
00 0B	0aaa aaaa	MFX Control 4 Source	(0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
00 0C	0aaa aaaa	MFX Control 4 Sens	(1 - 127) -63 - +63
00 0D	000a aaaa	MFX Control Assign 1	(0 - 16) OFF, 1 - 16
00 0E	000a aaaa	MFX Control Assign 2	(0 - 16) OFF, 1 - 16
00 0F	000a aaaa	MFX Control Assign 3	(0 - 16) OFF, 1 - 16
00 10	000a aaaa	MFX Control Assign 4	(0 - 16) OFF, 1 - 16
# 00 11	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 1	(12768 - 52768) -20000 - +20000
# 00 15	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 2	(12768 - 52768) -20000 - +20000
# 00 19	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 3	(12768 - 52768) -20000 - +20000
# 00 1D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 4	(12768 - 52768) -20000 - +20000
# 00 21	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 5	(12768 - 52768) -20000 - +20000
# 00 25	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 6	(12768 - 52768) -20000 - +20000
# 00 29	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 7	(12768 - 52768) -20000 - +20000
# 00 2D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 8	(12768 - 52768) -20000 - +20000
# 00 31	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 9	(12768 - 52768) -20000 - +20000
# 00 35	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 10	(12768 - 52768) -20000 - +20000
# 00 39	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 11	(12768 - 52768) -20000 - +20000
# 00 3D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 12	(12768 - 52768) -20000 - +20000
# 00 41	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 13	(12768 - 52768) -20000 - +20000
# 00 45	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 14	(12768 - 52768) -20000 - +20000
# 00 49	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 15	(12768 - 52768) -20000 - +20000
# 00 4D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 16	(12768 - 52768) -20000 - +20000
# 00 51	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 17	(12768 - 52768) -20000 - +20000
# 00 55	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 18	(12768 - 52768) -20000 - +20000
# 00 59	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 19	(12768 - 52768) -20000 - +20000
# 00 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 20	(12768 - 52768) -20000 - +20000
# 00 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 21	(12768 - 52768) -20000 - +20000
# 00 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 22	(12768 - 52768) -20000 - +20000
# 00 69	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 23	(12768 - 52768) -20000 - +20000
# 00 6D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 24	(12768 - 52768) -20000 - +20000
# 00 71	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 25	(12768 - 52768) -20000 - +20000
# 00 75	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 26	(12768 - 52768) -20000 - +20000
# 00 79	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 27	(12768 - 52768) -20000 - +20000
# 00 7D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 28	(12768 - 52768) -20000 - +20000
# 01 01	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 29	(12768 - 52768) -20000 - +20000
# 01 05	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 30	(12768 - 52768) -20000 - +20000
# 01 09	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 31	(12768 - 52768) -20000 - +20000
# 01 0D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	MFX Parameter 32	(12768 - 52768) -20000 - +20000
00 00 01 11	Total Size		

❍Patch Common Chorus

Offset Address		Description	
00 00	0000 aaaa	Chorus Type	(0 - 3)
00 01	0aaa aaaa	Chorus Level	(0 - 127)
00 02	0000 00aa	Chorus Output Assign	(0 - 3) A, B, ---, ---
00 03	0000 00aa	Chorus Output Select	(0 - 2) MAIN, REV, MAIN+REV
# 00 04	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 1	(12768 - 52768) -20000 - +20000
# 00 08	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 2	(12768 - 52768) -20000 - +20000
# 00 0C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 3	(12768 - 52768) -20000 - +20000
# 00 10	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 4	(12768 - 52768) -20000 - +20000
# 00 14	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 5	(12768 - 52768) -20000 - +20000
# 00 18	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 6	(12768 - 52768) -20000 - +20000
# 00 1C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 7	(12768 - 52768) -20000 - +20000
# 00 20	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 8	(12768 - 52768) -20000 - +20000
# 00 24	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 9	(12768 - 52768) -20000 - +20000
# 00 28	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 10	(12768 - 52768) -20000 - +20000
# 00 2C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Chorus Parameter 11	(12768 - 52768) -20000 - +20000
# 00 30	0000 aaaa 0000 bbbb		

	0000 cccc		
	0000 dddd	Chorus Parameter 12	(12768 - 52768) -20000 - +20000
# 00 34	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 13	(12768 - 52768) -20000 - +20000
# 00 38	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 14	(12768 - 52768) -20000 - +20000
# 00 3C	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 15	(12768 - 52768) -20000 - +20000
# 00 40	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 16	(12768 - 52768) -20000 - +20000
# 00 44	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 17	(12768 - 52768) -20000 - +20000
# 00 48	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 18	(12768 - 52768) -20000 - +20000
# 00 4C	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 19	(12768 - 52768) -20000 - +20000
# 00 50	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 20	(12768 - 52768) -20000 - +20000
00 00 00 54	Total Size		

❍Patch Common Reverb

Offset Address		Description	
00 00	0000 aaaa	Reverb Type	(0 - 5)
00 01	0aaa aaaa	Reverb Level	(0 - 127)
00 02	0000 00aa	Reverb Output Assign	(0 - 3) A, B, ---, ---
# 00 03	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 1	(12768 - 52768) -20000 - +20000
# 00 07	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 2	(12768 - 52768) -20000 - +20000
# 00 0B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 3	(12768 - 52768) -20000 - +20000
# 00 0F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 4	(12768 - 52768) -20000 - +20000
# 00 13	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 5	(12768 - 52768) -20000 - +20000
# 00 17	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 6	(12768 - 52768) -20000 - +20000
# 00 1B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 7	(12768 - 52768) -20000 - +20000
# 00 1F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 8	(12768 - 52768) -20000 - +20000
# 00 23	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 9	(12768 - 52768) -20000 - +20000
# 00 27	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 10	(12768 - 52768) -20000 - +20000
# 00 2B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 11	(12768 - 52768) -20000 - +20000
# 00 2F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 12	(12768 - 52768) -20000 - +20000
# 00 33	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 13	(12768 - 52768) -20000 - +20000
# 00 37	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 14	(12768 - 52768) -20000 - +20000
# 00 3B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 15	(12768 - 52768) -20000 - +20000
# 00 3F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 16	(12768 - 52768) -20000 - +20000
# 00 43	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 17	(12768 - 52768) -20000 - +20000
# 00 47	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 18	(12768 - 52768) -20000 - +20000
# 00 4B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 19	(12768 - 52768) -20000 - +20000
# 00 4F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 20	(12768 - 52768) -20000 - +20000
00 00 00 53	Total Size		

❍Patch TMT (Tone Mix Table)

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

❍Patch Tone

Offset Address		Description	
00 00	0aaa aaaa	Tone Level	(0 - 127)
00 01	0aaa aaaa	Tone Coarse Tune	(16 - 112) -48 - +48
00 02	0aaa aaaa	Tone Fine Tune	(14 - 114) -50 - +50
00 03	000a aaaa	Tone Random Pitch Depth	(0 - 30) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200
00 04	0aaa aaaa	Tone Pan	(0 - 127) L64 - 63R
00 05	000a aaaa	Tone Pan Keyfollow	(54 - 74) -100 - +100
00 06	00aa aaaa	Tone Random Pan Depth	(0 - 63)
00 07	0aaa aaaa	Tone Alternate Pan Depth	(1 - 127) L63 - 63R
00 08	0000 000a	Tone Env Mode	(0 - 1) NO-SUS, SUSTAIN
00 09	0000 00aa	Tone Delay Mode	(0 - 3) NORMAL, HOLD, KEY-OFF-NORMAL, KEY-OFF-DECAY
# 00 0A	0000 aaaa		
	0000 bbbb	Tone Delay Time	(0 - 149) 0 - 127, MUSICAL-NOTES

	00 0C	0aaa aaaa	Tone Dry Send Level (0 - 127)
	00 0D	0aaa aaaa	Tone Chorus Send Level (MFX) (0 - 127)
	00 0E	0aaa aaaa	Tone Reverb Send Level (MFX) (0 - 127)
	00 0F	0aaa aaaa	Tone Chorus Send Level (non MFX) (0 - 127)
	00 10	0aaa aaaa	Tone Reverb Send Level (non MFX) (0 - 127)
	00 11	0000 aaaa	Tone Output Assign (0 - 12) MFX, A, B, ---, ---, 1, 2, 3, 4, ---, ---, ---, ---
	00 12	0000 000a	Tone Receive Bender (0 - 1) OFF, ON
	00 13	0000 000a	Tone Receive Expression (0 - 1) OFF, ON
	00 14	0000 000a	Tone Receive Hold-1 (0 - 1) OFF, ON
	00 15	0000 000a	Tone Receive Pan Mode (0 - 1) CONTINUOUS, KEY-ON
	00 16	0000 000a	Tone Redamper Switch (0 - 1) OFF, ON
	00 17	0000 00aa	Tone Control 1 Switch 1 (0 - 2) OFF, ON, REVERSE
	00 18	0000 00aa	Tone Control 1 Switch 2 (0 - 2) OFF, ON, REVERSE
	00 19	0000 00aa	Tone Control 1 Switch 3 (0 - 2) OFF, ON, REVERSE
	00 1A	0000 00aa	Tone Control 1 Switch 4 (0 - 2) OFF, ON, REVERSE
	00 1B	0000 00aa	Tone Control 2 Switch 1 (0 - 2) OFF, ON, REVERSE
	00 1C	0000 00aa	Tone Control 2 Switch 2 (0 - 2) OFF, ON, REVERSE
	00 1D	0000 00aa	Tone Control 2 Switch 3 (0 - 2) OFF, ON, REVERSE
	00 1E	0000 00aa	Tone Control 2 Switch 4 (0 - 2) OFF, ON, REVERSE
	00 1F	0000 00aa	Tone Control 3 Switch 1 (0 - 2) OFF, ON, REVERSE
	00 20	0000 00aa	Tone Control 3 Switch 2 (0 - 2) OFF, ON, REVERSE
	00 21	0000 00aa	Tone Control 3 Switch 3 (0 - 2) OFF, ON, REVERSE
	00 22	0000 00aa	Tone Control 3 Switch 4 (0 - 2) OFF, ON, REVERSE
	00 23	0000 00aa	Tone Control 4 Switch 1 (0 - 2) OFF, ON, REVERSE
	00 24	0000 00aa	Tone Control 4 Switch 2 (0 - 2) OFF, ON, REVERSE
	00 25	0000 00aa	Tone Control 4 Switch 3 (0 - 2) OFF, ON, REVERSE
	00 26	0000 00aa	Tone Control 4 Switch 4 (0 - 2) OFF, ON, REVERSE
	00 27	0000 00aa	Wave Group Type (0 - 3) INT, SRX, SAMPLE, MULTISAMPLE
#	00 28	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Wave Group ID (0 - 16384) OFF, 1 - 16384
#	00 2C	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Wave Number L (Mono) (0 - 16384) OFF, 1 - 16384
#	00 30	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Wave Number R (0 - 16384) OFF, 1 - 16384
	00 34	0000 00aa	Wave Gain (0 - 3) -6, 0, +6, +12 [dB]
	00 35	0000 000a	Wave FXM Switch (0 - 1) OFF, ON
	00 36	0000 00aa	Wave FXM Color (0 - 3) 1 - 4
	00 37	000a aaaa	Wave FXM Depth (0 - 16)
	00 38	0000 000a	Wave Tempo Sync (0 - 1) OFF, ON
	00 39	00aa aaaa	Wave Pitch Keyfollow (44 - 84) -200 - +200
	00 3A	000a aaaa	Pitch Env Depth (52 - 76) -12 - +12
	00 3B	0aaa aaaa	Pitch Env Velocity Sens (1 - 127) -63 - +63
	00 3C	0aaa aaaa	Pitch Env Time 1 Velocity Sens (1 - 127) -63 - +63
	00 3D	0aaa aaaa	Pitch Env Time 4 Velocity Sens (1 - 127) -63 - +63
	00 3E	000a aaaa	Pitch Env Time Keyfollow (54 - 74) -100 - +100
	00 3F	0aaa aaaa	Pitch Env Time 1 (0 - 127)
	00 40	0aaa aaaa	Pitch Env Time 2 (0 - 127)
	00 41	0aaa aaaa	Pitch Env Time 3 (0 - 127)
	00 42	0aaa aaaa	Pitch Env Time 4 (0 - 127)
	00 43	0aaa aaaa	Pitch Env Level 0 (1 - 127) -63 - +63
	00 44	0aaa aaaa	Pitch Env Level 1 (1 - 127) -63 - +63
	00 45	0aaa aaaa	Pitch Env Level 2 (1 - 127) -63 - +63
	00 46	0aaa aaaa	Pitch Env Level 3 (1 - 127) -63 - +63
	00 47	0aaa aaaa	Pitch Env Level 4 (1 - 127) -63 - +63
	00 48	0000 0aaa	TVF Filter Type (0 - 6) OFF, LPF, BPF, HPF, PKG, LPF2, LPF3
	00 49	0aaa aaaa	TVF Cutoff Frequency (0 - 127)
	00 4A	00aa aaaa	TVF Cutoff Keyfollow (44 - 84) -200 - +200
	00 4B	0000 0aaa	TVF Cutoff Velocity Curve (0 - 7) FIXED, 1 - 7
	00 4C	0aaa aaaa	TVF Cutoff Velocity Sens (1 - 127) -63 - +63
	00 4D	0aaa aaaa	TVF Resonance (0 - 127)
	00 4E	0aaa aaaa	TVF Resonance Velocity Sens (1 - 127) -63 - +63
	00 4F	0aaa aaaa	TVF Env Depth (1 - 127) -63 - +63
	00 50	0000 0aaa	TVF Env Velocity Curve (0 - 7) FIXED, 1 - 7
	00 51	0aaa aaaa	TVF Env Velocity Sens (1 - 127) -63 - +63
	00 52	0aaa aaaa	TVF Env Time 1 Velocity Sens (1 - 127) -63 - +63
	00 53	0aaa aaaa	TVF Env Time 4 Velocity Sens (1 - 127) -63 - +63
	00 54	000a aaaa	TVF Env Time Keyfollow (54 - 74) -100 - +100
	00 55	0aaa aaaa	TVF Env Time 1 (0 - 127)
	00 56	0aaa aaaa	TVF Env Time 2 (0 - 127)
	00 57	0aaa aaaa	TVF Env Time 3 (0 - 127)
	00 58	0aaa aaaa	TVF Env Time 4 (0 - 127)
	00 59	0aaa aaaa	TVF Env Level 0 (0 - 127)
	00 5A	0aaa aaaa	TVF Env Level 1 (0 - 127)
	00 5B	0aaa aaaa	TVF Env Level 2 (0 - 127)
	00 5C	0aaa aaaa	TVF Env Level 3 (0 - 127)
	00 5D	0aaa aaaa	TVF Env Level 4 (0 - 127)
	00 5E	000a aaaa	Bias Level (54 - 74) -100 - +100
	00 5F	0aaa aaaa	Bias Position (0 - 127) C-1 - G9
	00 60	0000 00aa	Bias Direction (0 - 3) LOWER, UPPER, LOWER&UPPER, ALL
	00 61	0000 0aaa	TVA Level Velocity Curve (0 - 7) FIXED, 1 - 7
	00 62	0aaa aaaa	TVA Level Velocity Sens (1 - 127) -63 - +63
	00 63	0aaa aaaa	TVA Env Time 1 Velocity Sens (1 - 127) -63 - +63
	00 64	0aaa aaaa	TVA Env Time 4 Velocity Sens (1 - 127) -63 - +63
	00 65	000a aaaa	TVA Env Time Keyfollow (54 - 74) -100 - +100
	00 66	0aaa aaaa	TVA Env Time 1 (0 - 127)
	00 67	0aaa aaaa	TVA Env Time 2 (0 - 127)
	00 68	0aaa aaaa	TVA Env Time 3 (0 - 127)
	00 69	0aaa aaaa	TVA Env Time 4 (0 - 127)
	00 6A	0aaa aaaa	TVA Env Level 1 (0 - 127)
	00 6B	0aaa aaaa	TVA Env Level 2 (0 - 127)
	00 6C	0aaa aaaa	TVA Env Level 3 (0 - 127)
	00 6D	0000 aaaa	LFO1 Waveform (0 - 12) SIN, TRI, SAW-UP, SAW-DW, SQR, RND, BEND-UP, BEND-DW, TRP, S&H, CHS, VSIN, STEP
#	00 6E	0000 aaaa 0000 bbbb	LFO1 Rate (0 - 149) 0 - 127, MUSICAL-NOTES
	00 70	0000 0aaa	LFO1 Offset (0 - 4) -100, -50, 0, +50, +100
	00 71	0aaa aaaa	LFO1 Rate Detune (0 - 127)
	00 72	0aaa aaaa	LFO1 Delay Time (0 - 127)
	00 73	000a aaaa	LFO1 Delay Time Keyfollow (54 - 74) -100 - +100
	00 74	0000 00aa	LFO1 Fade Mode (0 - 3) ON-IN, ON-OUT, OFF-IN, OFF-OUT
	00 75	0aaa aaaa	LFO1 Fade Time (0 - 127)
	00 76	0000 000a	LFO1 Key Trigger (0 - 1) OFF, ON
	00 77	0aaa aaaa	LFO1 Pitch Depth (1 - 127) -63 - +63
	00 78	0aaa aaaa	LFO1 TVF Depth (1 - 127) -63 - +63
	00 79	0aaa aaaa	LFO1 TVA Depth (1 - 127) -63 - +63
	00 7A	0aaa aaaa	LFO1 Pan Depth (1 - 127) -63 - +63
	00 7B	0000 aaaa	LFO2 Waveform (0 - 12) SIN, TRI, SAW-UP, SAW-DW, SQR, RND, BEND-UP, BEND-DW, TRP, S&H, CHS, VSIN, STEP
#	00 7C	0000 aaaa 0000 bbbb	LFO2 Rate (0 - 149) 0 - 127, MUSICAL-NOTES
	00 7E	0000 0aaa	LFO2 Offset (0 - 4) -100, -50, 0, +50, +100
	00 7F	0aaa aaaa	LFO2 Rate Detune (0 - 127)
	01 00	0aaa aaaa	LFO2 Delay Time (0 - 127)
	01 01	000a aaaa	LFO2 Delay Time Keyfollow (54 - 74) -100 - +100
	01 02	0000 00aa	LFO2 Fade Mode (0 - 3) ON-IN, ON-OUT, OFF-IN, OFF-OUT
	01 03	0aaa aaaa	LFO2 Fade Time (0 - 127)
	01 04	0000 000a	LFO2 Key Trigger (0 - 1) OFF, ON
	01 05	0aaa aaaa	LFO2 Pitch Depth (1 - 127) -63 - +63
	01 06	0aaa aaaa	LFO2 TVF Depth (1 - 127) -63 - +63
	01 07	0aaa aaaa	LFO2 TVA Depth (1 - 127) -63 - +63
	01 08	0aaa aaaa	LFO2 Pan Depth (1 - 127) -63 - +63
	01 09	0000 aaaa	LFO Step Type (0 - 1)
	01 0A	0aaa aaaa	LFO Step1 (28 - 100) -36 - +36
	01 0B	0aaa aaaa	LFO Step2 (28 - 100) -36 - +36
	01 0C	0aaa aaaa	LFO Step3 (28 - 100) -36 - +36
	01 0D	0aaa aaaa	LFO Step4 (28 - 100) -36 - +36
	01 0E	0aaa aaaa	LFO Step5 (28 - 100) -36 - +36
	01 0F	0aaa aaaa	LFO Step6 (28 - 100) -36 - +36
	01 10	0aaa aaaa	LFO Step7 (28 - 100) -36 - +36
	01 11	0aaa aaaa	LFO Step8 (28 - 100) -36 - +36
	01 12	0aaa aaaa	LFO Step9 (28 - 100) -36 - +36
	01 13	0aaa aaaa	LFO Step10 (28 - 100) -36 - +36
	01 14	0aaa aaaa	LFO Step11 (28 - 100) -36 - +36
	01 15	0aaa aaaa	LFO Step12 (28 - 100) -36 - +36
	01 16	0aaa aaaa	LFO Step13 (28 - 100) -36 - +36
	01 17	0aaa aaaa	LFO Step14 (28 - 100) -36 - +36
	01 18	0aaa aaaa	LFO Step15 (28 - 100) -36 - +36
	01 19	0aaa aaaa	LFO Step16 (28 - 100) -36 - +36
	00 00 01 1A	Total Size	

❍Rhythm Common

Offset Address		Description	
00 00	0aaa aaaa	Rhythm Name 1	(32 - 127) 32 - 127 [ASCII]
00 01	0aaa aaaa	Rhythm Name 2	(32 - 127) 32 - 127 [ASCII]
00 02	0aaa aaaa	Rhythm Name 3	(32 - 127) 32 - 127 [ASCII]
00 03	0aaa aaaa	Rhythm Name 4	(32 - 127) 32 - 127 [ASCII]
00 04	0aaa aaaa	Rhythm Name 5	(32 - 127) 32 - 127 [ASCII]
00 05	0aaa aaaa	Rhythm Name 6	(32 - 127) 32 - 127 [ASCII]
00 06	0aaa aaaa	Rhythm Name 7	(32 - 127) 32 - 127 [ASCII]

	00 07	0aaa aaaa	Rhythm Name 8 (32 - 127) 32 - 127 [ASCII]
	00 08	0aaa aaaa	Rhythm Name 9 (32 - 127) 32 - 127 [ASCII]
	00 09	0aaa aaaa	Rhythm Name 10 (32 - 127) 32 - 127 [ASCII]
	00 0A	0aaa aaaa	Rhythm Name 11 (32 - 127) 32 - 127 [ASCII]
	00 0B	0aaa aaaa	Rhythm Name 12 (32 - 127) 32 - 127 [ASCII]
	00 0C	0aaa aaaa	Rhythm Level (0 - 127)
	00 0D	0000 000a	(reserve)<*>
#	00 0E	0000 aaaa	
		0000 bbbb	(reserve)<*>
	00 10	0000 000a	(reserve)<*>
	00 11	0000 aaaa	Rhythm Output Assign (0 - 13) MFX, A, B, ---, ---, 1, 2, 3, 4, ---, ---, ---, ---, TONE
	00 00 00 12		Total Size

❍Rhythm Common MFX

	00 00	0aaa aaaa	MFX Type (0 - 127)
	00 01	0aaa aaaa	MFX Dry Send Level (0 - 127)
	00 02	0aaa aaaa	MFX Chorus Send Level (0 - 127)
	00 03	0aaa aaaa	MFX Reverb Send Level (0 - 127)
	00 04	0000 00aa	MFX Output Assign (0 - 3) A, B, ---, ---
	00 05	0aaa aaaa	MFX Control 1 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
	00 06	0aaa aaaa	MFX Control 1 Sens (1 - 127) -63 - +63
	00 07	0aaa aaaa	MFX Control 2 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
	00 08	0aaa aaaa	MFX Control 2 Sens (1 - 127) -63 - +63
	00 09	0aaa aaaa	MFX Control 3 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
	00 0A	0aaa aaaa	MFX Control 3 Sens (1 - 127) -63 - +63
	00 0B	0aaa aaaa	MFX Control 4 Source (0 - 101) OFF, CC01 - CC31, CC33 - CC95, BEND, AFT, SYS1 - SYS4
	00 0C	0aaa aaaa	MFX Control 4 Sens (1 - 127) -63 - +63
	00 0D	000a aaaa	MFX Control Assign 1 (0 - 16) OFF, 1 - 16
	00 0E	000a aaaa	MFX Control Assign 2 (0 - 16) OFF, 1 - 16
	00 0F	000a aaaa	MFX Control Assign 3 (0 - 16) OFF, 1 - 16
	00 10	000a aaaa	MFX Control Assign 4 (0 - 16) OFF, 1 - 16
#	00 11	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 1 (12768 - 52768) -20000 - +20000
#	00 15	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 2 (12768 - 52768) -20000 - +20000
#	00 19	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 3 (12768 - 52768) -20000 - +20000
#	00 1D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 4 (12768 - 52768) -20000 - +20000
#	00 21	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 5 (12768 - 52768) -20000 - +20000
#	00 25	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 6 (12768 - 52768) -20000 - +20000
#	00 29	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 7 (12768 - 52768) -20000 - +20000
#	00 2D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 8 (12768 - 52768) -20000 - +20000
#	00 31	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 9 (12768 - 52768) -20000 - +20000
#	00 35	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 10 (12768 - 52768) -20000 - +20000
#	00 39	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 11 (12768 - 52768) -20000 - +20000
#	00 3D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 12 (12768 - 52768) -20000 - +20000
#	00 41	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 13 (12768 - 52768) -20000 - +20000
#	00 45	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 14 (12768 - 52768) -20000 - +20000
#	00 49	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 15 (12768 - 52768) -20000 - +20000
#	00 4D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 16 (12768 - 52768) -20000 - +20000
#	00 51	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 17 (12768 - 52768) -20000 - +20000
#	00 55	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 18 (12768 - 52768) -20000 - +20000
#	00 59	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 19 (12768 - 52768) -20000 - +20000
#	00 5D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 20 (12768 - 52768) -20000 - +20000
#	00 61	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 21 (12768 - 52768) -20000 - +20000
#	00 65	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 22 (12768 - 52768) -20000 - +20000
#	00 69	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 23 (12768 - 52768) -20000 - +20000
#	00 6D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 24 (12768 - 52768) -20000 - +20000
#	00 71	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 25 (12768 - 52768) -20000 - +20000
#	00 75	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 26 (12768 - 52768) -20000 - +20000
#	00 79	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 27 (12768 - 52768) -20000 - +20000
#	00 7D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 28 (12768 - 52768) -20000 - +20000
#	01 01	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 29 (12768 - 52768) -20000 - +20000
#	01 05	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 30 (12768 - 52768) -20000 - +20000
#	01 09	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 31 (12768 - 52768) -20000 - +20000
#	01 0D	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	MFX Parameter 32 (12768 - 52768) -20000 - +20000
	00 00 01 11		Total Size

❍Rhythm Common Chorus

	00 00	0000 aaaa	Chorus Type (0 - 3)
	00 01	0aaa aaaa	Chorus Level (0 - 127)
	00 02	0000 00aa	Chorus Output Assign (0 - 3) A, B, ---, ---
	00 03	0000 00aa	Chorus Output Select (0 - 2) MAIN, REV, MAIN+REV
#	00 04	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	Chorus Parameter 1 (12768 - 52768) -20000 - +20000
#	00 08	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	Chorus Parameter 2 (12768 - 52768) -20000 - +20000
#	00 0C	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	Chorus Parameter 3 (12768 - 52768) -20000 - +20000
#	00 10	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	Chorus Parameter 4 (12768 - 52768) -20000 - +20000
#	00 14	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	Chorus Parameter 5 (12768 - 52768) -20000 - +20000
#	00 18	0000 aaaa	
		0000 bbbb	
		0000 cccc	
		0000 dddd	Chorus Parameter 6 (12768 - 52768) -20000 - +20000
#	00 1C	0000 aaaa	
		0000 bbbb	

	0000 cccc		
	0000 dddd	Chorus Parameter 7	(12768 - 52768) -20000 - +20000
# 00 20	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 8	(12768 - 52768) -20000 - +20000
# 00 24	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 9	(12768 - 52768) -20000 - +20000
# 00 28	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 10	(12768 - 52768) -20000 - +20000
# 00 2C	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 11	(12768 - 52768) -20000 - +20000
# 00 30	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 12	(12768 - 52768) -20000 - +20000
# 00 34	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 13	(12768 - 52768) -20000 - +20000
# 00 38	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 14	(12768 - 52768) -20000 - +20000
# 00 3C	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 15	(12768 - 52768) -20000 - +20000
# 00 40	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 16	(12768 - 52768) -20000 - +20000
# 00 44	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 17	(12768 - 52768) -20000 - +20000
# 00 48	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 18	(12768 - 52768) -20000 - +20000
# 00 4C	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 19	(12768 - 52768) -20000 - +20000
# 00 50	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Chorus Parameter 20	(12768 - 52768) -20000 - +20000
00 00 00 54	Total Size		

❍Rhythm Common Reverb

Offset Address		Description	
00 00	0000 aaaa	Reverb Type	(0 - 5)
00 01	0aaa aaaa	Reverb Level	(0 - 127)
00 02	0000 00aa	Reverb Output Assign	(0 - 3) A, B, ---, ---
# 00 03	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 1	(12768 - 52768) -20000 - +20000
# 00 07	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 2	(12768 - 52768) -20000 - +20000
# 00 0B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 3	(12768 - 52768) -20000 - +20000
# 00 0F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 4	(12768 - 52768) -20000 - +20000
# 00 13	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 5	(12768 - 52768) -20000 - +20000
# 00 17	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 6	(12768 - 52768) -20000 - +20000
# 00 1B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 7	(12768 - 52768) -20000 - +20000
# 00 1F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 8	(12768 - 52768) -20000 - +20000
# 00 23	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 9	(12768 - 52768) -20000 - +20000
# 00 27	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 10	(12768 - 52768) -20000 - +20000
# 00 2B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 11	(12768 - 52768) -20000 - +20000
# 00 2F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 12	(12768 - 52768) -20000 - +20000
# 00 33	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 13	(12768 - 52768) -20000 - +20000
# 00 37	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 14	(12768 - 52768) -20000 - +20000
# 00 3B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 15	(12768 - 52768) -20000 - +20000
# 00 3F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 16	(12768 - 52768) -20000 - +20000
# 00 43	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 17	(12768 - 52768) -20000 - +20000
# 00 47	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 18	(12768 - 52768) -20000 - +20000
# 00 4B	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 19	(12768 - 52768) -20000 - +20000
# 00 4F	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	Reverb Parameter 20	(12768 - 52768) -20000 - +20000
00 00 00 53	Total Size		

❍Rhythm Tone

Offset Address		Description	
00 00	0aaa aaaa	Tone Name 1	(32 - 127) 32 - 127 [ASCII]
00 01	0aaa aaaa	Tone Name 2	(32 - 127) 32 - 127 [ASCII]
00 02	0aaa aaaa	Tone Name 3	(32 - 127) 32 - 127 [ASCII]
00 03	0aaa aaaa	Tone Name 4	(32 - 127) 32 - 127 [ASCII]
00 04	0aaa aaaa	Tone Name 5	(32 - 127) 32 - 127 [ASCII]
00 05	0aaa aaaa	Tone Name 6	(32 - 127) 32 - 127 [ASCII]
00 06	0aaa aaaa	Tone Name 7	(32 - 127) 32 - 127 [ASCII]
00 07	0aaa aaaa	Tone Name 8	(32 - 127) 32 - 127 [ASCII]
00 08	0aaa aaaa	Tone Name 9	(32 - 127) 32 - 127 [ASCII]
00 09	0aaa aaaa	Tone Name 10	(32 - 127) 32 - 127 [ASCII]
00 0A	0aaa aaaa	Tone Name 11	(32 - 127) 32 - 127 [ASCII]
00 0B	0aaa aaaa	Tone Name 12	(32 - 127) 32 - 127 [ASCII]
00 0C	0000 000a	Assign Type	(0 - 1) MULTI, SINGLE
00 0D	000a aaaa	Mute Group	(0 - 31) OFF, 1 - 31
00 0E	0aaa aaaa	Tone Level	(0 - 127)
00 0F	0aaa aaaa	Tone Coarse Tune	(0 - 127) C-1 - G9
00 10	0aaa aaaa	Tone Fine Tune	(14 - 114) -50 - +50
00 11	000a aaaa	Tone Random Pitch Depth	(0 - 30) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200
00 12	0aaa aaaa	Tone Pan	(0 - 127) L64 - 63R
00 13	00aa aaaa	Tone Random Pan Depth	(0 - 63)
00 14	0aaa aaaa	Tone Alternate Pan Depth	(1 - 127) L63 - 63R
00 15	0000 000a	Tone Env Mode	(0 - 1) NO-SUS, SUSTAIN
00 16	0aaa aaaa	Tone Dry Send Level	(0 - 127)
00 17	0aaa aaaa	Tone Chorus Send Level	(0 - 127)
00 18	0aaa aaaa	Tone Reverb Send Level	(0 - 127)
00 19	0aaa aaaa	Tone Chorus Send Level (non MFX)	(0 - 127)
00 1A	0aaa aaaa	Tone Reverb Send Level (non MFX)	(0 - 127)
00 1B	0000 aaaa	Tone Output Assign	(0 - 12) MFX, A, B, ---, ---, 1, 2, 3, 4, ---, ---, ---, ---
00 1C	00aa aaaa	Tone Pitch Bend Range	(0 - 48)
00 1D	0000 000a	Tone Receive Expression	(0 - 1) OFF, ON
00 1E	0000 000a	Tone Receive Hold-1	(0 - 1) OFF, ON
00 1F	0000 000a	Tone Receive Pan Mode	(0 - 1) CONTINUOUS, KEY-ON
00 20	0000 00aa	WMT Velocity Control	(0 - 2) OFF, ON, RANDOM
00 21	0000 000a	WMT1 Wave Switch	(0 - 1) OFF, ON
00 22	0000 00aa	WMT1 Wave Group Type	(0 - 3) INT, SRX, SAMPLE, MULTISAMPLE
# 00 23	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	WMT1 Wave Group ID	(0 - 16384) OFF, 1 - 16384
# 00 27	0000 aaaa		
	0000 bbbb		
	0000 cccc		
	0000 dddd	WMT1 Wave Number L (Mono)	(0 - 16384) OFF, 1 - 16384

#	00 2B	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT1 Wave Number R	(0 - 16384) OFF, 1 - 16384
	00 2F	0000 00aa	WMT1 Wave Gain	(0 - 3) -6, 0, +6, +12 [dB]
	00 30	0000 000a	WMT1 Wave FXM Switch	(0 - 1) OFF, ON
	00 31	0000 00aa	WMT1 Wave FXM Color	(0 - 3) 1 - 4
	00 32	000a aaaa	WMT1 Wave FXM Depth	(0 - 16)
	00 33	0000 000a	WMT1 Wave Tempo Sync	(0 - 1) OFF, ON
	00 34	0aaa aaaa	WMT1 Wave Coarse Tune	(16 - 112) -48 - +48
	00 35	0aaa aaaa	WMT1 Wave Fine Tune	(14 - 114) -50 - +50
	00 36	0aaa aaaa	WMT1 Wave Pan	(0 - 127) L64 - 63R
	00 37	0000 000a	WMT1 Wave Random Pan Switch	(0 - 1) OFF, ON
	00 38	0000 00aa	WMT1 Wave Alternate Pan Switch	(0 - 2) OFF, ON, REVERSE
	00 39	0aaa aaaa	WMT1 Wave Level	(0 - 127)
	00 3A	0aaa aaaa	WMT1 Velocity Range Lower	(1 - 127) 1 - UPPER
	00 3B	0aaa aaaa	WMT1 Velocity Range Upper	(1 - 127) LOWER - 127
	00 3C	0aaa aaaa	WMT1 Velocity Fade Width Lower	(0 - 127)
	00 3D	0aaa aaaa	WMT1 Velocity Fade Width Upper	(0 - 127)
	00 3E	0000 000a	WMT2 Wave Switch	(0 - 1) OFF, ON
	00 3F	0000 00aa	WMT2 Wave Group Type	(0 - 3) INT, SRX, SAMPLE, MULTISAMPLE
#	00 40	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT2 Wave Group ID	(0 - 16384) OFF, 1 - 16384
#	00 44	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT2 Wave Number L (Mono)	(0 - 16384) OFF, 1 - 16384
#	00 48	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT2 Wave Number R	(0 - 16384) OFF, 1 - 16384
	00 4C	0000 00aa	WMT2 Wave Gain	(0 - 3) -6, 0, +6, +12 [dB]
	00 4D	0000 000a	WMT2 Wave FXM Switch	(0 - 1) OFF, ON
	00 4E	0000 00aa	WMT2 Wave FXM Color	(0 - 3) 1 - 4
	00 4F	000a aaaa	WMT2 Wave FXM Depth	(0 - 16)
	00 50	0000 000a	WMT2 Wave Tempo Sync	(0 - 1) OFF, ON
	00 51	0aaa aaaa	WMT2 Wave Coarse Tune	(16 - 112) -48 - +48
	00 52	0aaa aaaa	WMT2 Wave Fine Tune	(14 - 114) -50 - +50
	00 53	0aaa aaaa	WMT2 Wave Pan	(0 - 127) L64 - 63R
	00 54	0000 000a	WMT2 Wave Random Pan Switch	(0 - 1) OFF, ON
	00 55	0000 00aa	WMT2 Wave Alternate Pan Switch	(0 - 2) OFF, ON, REVERSE
	00 56	0aaa aaaa	WMT2 Wave Level	(0 - 127)
	00 57	0aaa aaaa	WMT2 Velocity Range Lower	(1 - 127) 1 - UPPER
	00 58	0aaa aaaa	WMT2 Velocity Range Upper	(1 - 127) LOWER - 127
	00 59	0aaa aaaa	WMT2 Velocity Fade Width Lower	(0 - 127)
	00 5A	0aaa aaaa	WMT2 Velocity Fade Width Upper	(0 - 127)
	00 5B	0000 000a	WMT3 Wave Switch	(0 - 1) OFF, ON
	00 5C	0000 00aa	WMT3 Wave Group Type	(0 - 3) INT, SRX, SAMPLE, MULTISAMPLE
#	00 5D	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT3 Wave Group ID	(0 - 16384) OFF, 1 - 16384
#	00 61	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT3 Wave Number L (Mono)	(0 - 16384) OFF, 1 - 16384
#	00 65	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT3 Wave Number R	(0 - 16384) OFF, 1 - 16384
	00 69	0000 00aa	WMT3 Wave Gain	(0 - 3) -6, 0, +6, +12 [dB]
	00 6A	0000 000a	WMT3 Wave FXM Switch	(0 - 1) OFF, ON
	00 6B	0000 00aa	WMT3 Wave FXM Color	(0 - 3) 1 - 4
	00 6C	000a aaaa	WMT3 Wave FXM Depth	(0 - 16)
	00 6D	0000 000a	WMT3 Wave Tempo Sync	(0 - 1) OFF, ON
	00 6E	0aaa aaaa	WMT3 Wave Coarse Tune	(16 - 112) -48 - +48
	00 6F	0aaa aaaa	WMT3 Wave Fine Tune	(14 - 114) -50 - +50
	00 70	0aaa aaaa	WMT3 Wave Pan	(0 - 127) L64 - 63R
	00 71	0000 000a	WMT3 Wave Random Pan Switch	(0 - 1) OFF, ON
	00 72	0000 00aa	WMT3 Wave Alternate Pan Switch	(0 - 2) OFF, ON, REVERSE
	00 73	0aaa aaaa	WMT3 Wave Level	(0 - 127)
	00 74	0aaa aaaa	WMT3 Velocity Range Lower	(1 - 127) 1 - UPPER
	00 75	0aaa aaaa	WMT3 Velocity Range Upper	(1 - 127) LOWER - 127
	00 76	0aaa aaaa	WMT3 Velocity Fade Width Lower	(0 - 127)
	00 77	0aaa aaaa	WMT3 Velocity Fade Width Upper	(0 - 127)
	00 78	0000 000a	WMT4 Wave Switch	(0 - 1) OFF, ON
	00 79	0000 00aa	WMT4 Wave Group Type	(0 - 3) INT, SRX, SAMPLE, MULTISAMPLE
#	00 7A	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT4 Wave Group ID	(0 - 16384) OFF, 1 - 16384
#	00 7E	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT4 Wave Number L (Mono)	(0 - 16384) OFF, 1 - 16384
#	01 02	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	WMT4 Wave Number R	(0 - 16384) OFF, 1 - 16384
	01 06	0000 00aa	WMT4 Wave Gain	(0 - 3) -6, 0, +6, +12 [dB]
	01 07	0000 000a	WMT4 Wave FXM Switch	(0 - 1) OFF, ON
	01 08	0000 00aa	WMT4 Wave FXM Color	(0 - 3) 1 - 4
	01 09	000a aaaa	WMT4 Wave FXM Depth	(0 - 16)
	01 0A	0000 000a	WMT4 Wave Tempo Sync	(0 - 1) OFF, ON
	01 0B	0aaa aaaa	WMT4 Wave Coarse Tune	(16 - 112) -48 - +48
	01 0C	0aaa aaaa	WMT4 Wave Fine Tune	(14 - 114) -50 - +50
	01 0D	0aaa aaaa	WMT4 Wave Pan	(0 - 127) L64 - 63R
	01 0E	0000 000a	WMT4 Wave Random Pan Switch	(0 - 1) OFF, ON
	01 0F	0000 00aa	WMT4 Wave Alternate Pan Switch	(0 - 2) OFF, ON, REVERSE
	01 10	0aaa aaaa	WMT4 Wave Level	(0 - 127)
	01 11	0aaa aaaa	WMT4 Velocity Range Lower	(1 - 127) 1 - UPPER
	01 12	0aaa aaaa	WMT4 Velocity Range Upper	(1 - 127) LOWER - 127
	01 13	0aaa aaaa	WMT4 Velocity Fade Width Lower	(0 - 127)
	01 14	0aaa aaaa	WMT4 Velocity Fade Width Upper	(0 - 127)
	01 15	000a aaaa	Pitch Env Depth	(52 - 76) -12 - +12
	01 16	0aaa aaaa	Pitch Env Velocity Sens	(1 - 127) -63 - +63
	01 17	0aaa aaaa	Pitch Env Time 1 Velocity Sens	(1 - 127) -63 - +63
	01 18	0aaa aaaa	Pitch Env Time 4 Velocity Sens	(1 - 127) -63 - +63
	01 19	0aaa aaaa	Pitch Env Time 1	(0 - 127)
	01 1A	0aaa aaaa	Pitch Env Time 2	(0 - 127)
	01 1B	0aaa aaaa	Pitch Env Time 3	(0 - 127)
	01 1C	0aaa aaaa	Pitch Env Time 4	(0 - 127)
	01 1D	0aaa aaaa	Pitch Env Level 0	(1 - 127) -63 - +63
	01 1E	0aaa aaaa	Pitch Env Level 1	(1 - 127) -63 - +63
	01 1F	0aaa aaaa	Pitch Env Level 2	(1 - 127) -63 - +63
	01 20	0aaa aaaa	Pitch Env Level 3	(1 - 127) -63 - +63
	01 21	0aaa aaaa	Pitch Env Level 4	(1 - 127) -63 - +63
	01 22	0000 0aaa	TVF Filter Type	(0 - 6) OFF, LPF, BPF, HPF, PKG, LPF2, LPF3
	01 23	0aaa aaaa	TVF Cutoff Frequency	(0 - 127)
	01 24	0000 0aaa	TVF Cutoff Velocity Curve	(0 - 7) FIXED, 1 - 7
	01 25	0aaa aaaa	TVF Cutoff Velocity Sens	(1 - 127) -63 - +63
	01 26	0aaa aaaa	TVF Resonance	(0 - 127)
	01 27	0aaa aaaa	TVF Resonance Velocity Sens	(1 - 127) -63 - +63
	01 28	0aaa aaaa	TVF Env Depth	(1 - 127) -63 - +63
	01 29	0000 0aaa	TVF Env Velocity Curve Type	(0 - 7) FIXED, 1 - 7
	01 2A	0aaa aaaa	TVF Env Velocity Sens	(1 - 127) -63 - +63
	01 2B	0aaa aaaa	TVF Env Time 1 Velocity Sens	(1 - 127) -63 - +63
	01 2C	0aaa aaaa	TVF Env Time 4 Velocity Sens	(1 - 127) -63 - +63
	01 2D	0aaa aaaa	TVF Env Time 1	(0 - 127)
	01 2E	0aaa aaaa	TVF Env Time 2	(0 - 127)
	01 2F	0aaa aaaa	TVF Env Time 3	(0 - 127)
	01 30	0aaa aaaa	TVF Env Time 4	(0 - 127)
	01 31	0aaa aaaa	TVF Env Level 0	(0 - 127)
	01 32	0aaa aaaa	TVF Env Level 1	(0 - 127)
	01 33	0aaa aaaa	TVF Env Level 2	(0 - 127)
	01 34	0aaa aaaa	TVF Env Level 3	(0 - 127)
	01 35	0aaa aaaa	TVF Env Level 4	(0 - 127)
	01 36	0000 0aaa	TVA Level Velocity Curve	(0 - 7) FIXED, 1 - 7
	01 37	0aaa aaaa	TVA Level Velocity Sens	(1 - 127) -63 - +63
	01 38	0aaa aaaa	TVA Env Time 1 Velocity Sens	(1 - 127) -63 - +63
	01 39	0aaa aaaa	TVA Env Time 4 Velocity Sens	(1 - 127) -63 - +63
	01 3A	0aaa aaaa	TVA Env Time 1	(0 - 127)
	01 3B	0aaa aaaa	TVA Env Time 2	(0 - 127)
	01 3C	0aaa aaaa	TVA Env Time 3	(0 - 127)
	01 3D	0aaa aaaa	TVA Env Time 4	(0 - 127)
	01 3E	0aaa aaaa	TVA Env Level 1	(0 - 127)
	01 3F	0aaa aaaa	TVA Env Level 2	(0 - 127)
	01 40	0aaa aaaa	TVA Env Level 3	(0 - 127)
	01 41	0000 000a	One Shot Mode	(0 - 1) OFF, ON
	01 42	0aaa aaaa	Aftertouch Time Ctrl Sens	(1 - 127) -63 - +63
	00 00 01 43	Total Size		

2. GS (Model ID = 42H)

❍System Parameter

Start Address		Description	
# 40 00 00	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd	Master Tune	(24 - 2024) -100.0 - 100.0 [cent]
40 00 04	0aaa aaaa	Master Volume	(0 - 127)
40 00 05	0aaa aaaa	Master Key Shift	(40 - 88) -24 - +24 [semitone]
40 00 06	0aaa aaaa	Master Pan	(1 - 127) L63 - 63R
40 00 7F	0aaa aaaa	Mode Set	(0, 127) GS-RESET, GS-EXIT

❍Common Parameter

Start Address		Description	
40 01 10	0aaa aaaa	Voice Reserve 1	(0 - 24)
40 01 11	0aaa aaaa	Voice Reserve 2	(0 - 24)
40 01 12	0aaa aaaa	Voice Reserve 3	(0 - 24)
40 01 13	0aaa aaaa	Voice Reserve 4	(0 - 24)
40 01 14	0aaa aaaa	Voice Reserve 5	(0 - 24)
40 01 15	0aaa aaaa	Voice Reserve 6	(0 - 24)
40 01 16	0aaa aaaa	Voice Reserve 7	(0 - 24)
40 01 17	0aaa aaaa	Voice Reserve 8	(0 - 24)
40 01 18	0aaa aaaa	Voice Reserve 9	(0 - 24)
40 01 19	0aaa aaaa	Voice Reserve 10	(0 - 24)
40 01 1A	0aaa aaaa	Voice Reserve 11	(0 - 24)
40 01 1B	0aaa aaaa	Voice Reserve 12	(0 - 24)
40 01 1C	0aaa aaaa	Voice Reserve 13	(0 - 24)
40 01 1D	0aaa aaaa	Voice Reserve 14	(0 - 24)
40 01 1E	0aaa aaaa	Voice Reserve 15	(0 - 24)
40 01 1F	0aaa aaaa	Voice Reserve 16	(0 - 24)
40 01 30	0aaa aaaa	Reverb Macro	(0 - 7)
40 01 31	0aaa aaaa	Reverb Character	(0 - 7)
40 01 32	0aaa aaaa	Reverb Pre-LPF	(0 - 7)
40 01 33	0aaa aaaa	Reverb Level	(0 - 127)
40 01 34	0aaa aaaa	Reverb Time	(0 - 127)
40 01 35	0aaa aaaa	Reverb Delay Feedback	(0 - 127)
40 01 36	0aaa aaaa	Reverb Send Level to Chorus<*>	(0 - 127)
40 01 38	0aaa aaaa	Chorus Macro	(0 - 7)
40 01 39	0aaa aaaa	Chorus Pre-LPF	(0 - 7)
40 01 3A	0aaa aaaa	Chorus Level	(0 - 127)
40 01 3B	0aaa aaaa	Chorus Feedback	(0 - 127)
40 01 3C	0aaa aaaa	Chorus Delay	(0 - 127)
40 01 3D	0aaa aaaa	Chorus Rate	(0 - 127)
40 01 3E	0aaa aaaa	Chorus Depth	(0 - 127)
40 01 3F	0aaa aaaa	Chorus Send Level to Reverb	(0 - 127)

❍Part Parameter

Start Address		Description	
# 40 1x 00	0aaa aaaa	Tone Number CC#00 Value	(0 - 127)
	0aaa aaaa	Tone Number PC Value	(0 - 127)
40 1x 02	0aaa aaaa	Rx. Channel	(0 - 16) 1 - 16, OFF
40 1x 03	0000 000a	Rx. Pitch Bend	(0 - 1) OFF, ON
40 1x 04	0000 000a	Rx. Channel Pressure	(0 - 1) OFF, ON
40 1x 05	0000 000a	Rx. Program Change	(0 - 1) OFF, ON
40 1x 06	0000 000a	Rx. Control Change	(0 - 1) OFF, ON
40 1x 07	0000 000a	Rx. Poly Pressure	(0 - 1) OFF, ON
40 1x 08	0000 000a	Rx. Note Message	(0 - 1) OFF, ON
40 1x 09	0000 000a	Rx. RPN	(0 - 1) OFF, ON
40 1x 0A	0000 000a	Rx. NRPN	(0 - 1) OFF, ON
40 1x 0B	0000 000a	Rx. Modulation	(0 - 1) OFF, ON
40 1x 0C	0000 000a	Rx. Volume	(0 - 1) OFF, ON
40 1x 0D	0000 000a	Rx. Panpot	(0 - 1) OFF, ON
40 1x 0E	0000 000a	Rx. Expression	(0 - 1) OFF, ON
40 1x 0F	0000 000a	Rx. Hold-1	(0 - 1) OFF, ON
40 1x 10	0000 000a	Rx. Portamento	(0 - 1) OFF, ON
40 1x 11	0000 000a	Rx. Sostenuto	(0 - 1) OFF, ON
40 1x 12	0000 000a	Rx. Soft	(0 - 1) OFF, ON
40 1x 13	0aaa aaaa	Mono / Poly Mode	(0 - 1) MODE, POLY
40 1x 14	0aaa aaaa	Assign Mode<*>	(0 - 2) SINGLE, LIMITED-MULTI, FULL-MULTI
40 1x 15	0aaa aaaa	Use for Rhythm Part	(0 - 2) OFF, MAP1, MAP2
40 1x 16	0aaa aaaa	Pitch Key Shift	(40 - 88) -24 - +24 [semitone]
# 40 1x 17	0000 aaaa 0000 bbbb	Pitch Offset Fine	(8 - 248) -12.0 - +12.0 [Hz]
40 1x 19	0aaa aaaa	Part Level (CC# 7)	(0 - 127)
40 1x 1A	0aaa aaaa	Velocity Sens Depth	(0 - 127) -64 - +63
40 1x 1B	0aaa aaaa	Velocity Sens Offset	(0 - 127) -64 - +63
40 1x 1C	0aaa aaaa	Part Panpot (CC# 10)	(0 - 127) RANDOM, L63 - 63R
40 1x 1D	0aaa aaaa	Keyboard Range Low	(0 - 127)
40 1x 1E	0aaa aaaa	Keyboard Range High	(0 - 127)
40 1x 1F	0aaa aaaa	CC1 Controller Number	(0 - 95)
40 1x 20	0aaa aaaa	CC2 Controller Number	(0 - 95)
40 1x 21	0aaa aaaa	Chorus Send Level (CC# 93)	(0 - 127)
40 1x 22	0aaa aaaa	Reverb Send Level (CC# 93)	(0 - 127)
40 1x 23	0000 000a	Rx. Bank Select<*>	(0 - 1) OFF, ON
40 1x 24	0000 000a	Rx. Bank Select LSB<*>	(0 - 1) OFF, ON
40 1x 30	0aaa aaaa	Tone Modify 1 (Vibrato Rate)	(0 - 127) -64 - +63
40 1x 31	0aaa aaaa	Tone Modify 2 (Vibrato Depth)	(0 - 127) -64 - +63
40 1x 32	0aaa aaaa	Tone Modify 3 (TVF Cutoff Freq.)	(0 - 127) -64 - +63
40 1x 33	0aaa aaaa	Tone Modify 4 (TVF Resonance)	(0 - 127) -64 - +63
40 1x 34	0aaa aaaa	Tone Modify 5 (TVF&TVA Env. Attack)	(0 - 127) -64 - +63
40 1x 35	0aaa aaaa	Tone Modify 6 (TVF&TVA Env. Decay)	(0 - 127) -64 - +63
40 1x 36	0aaa aaaa	Tone Modify 7 (TVF&TVA ENv. Release)	(0 - 127) -64 - +63
40 1x 37	0aaa aaaa	Tone Modify 8 (Vibrato Delay)	(0 - 127) -64 - +63
40 1x 40	0aaa aaaa	Scale Tuning C	(0 - 127) -64 - +63 [cent]
40 1x 41	0aaa aaaa	Scale Tuning C#	(0 - 127) -64 - +63 [cent]
40 1x 42	0aaa aaaa	Scale Tuning D	(0 - 127) -64 - +63 [cent]
40 1x 43	0aaa aaaa	Scale Tuning D#	(0 - 127) -64 - +63 [cent]
40 1x 44	0aaa aaaa	Scale Tuning E	(0 - 127) -64 - +63 [cent]
40 1x 45	0aaa aaaa	Scale Tuning F	(0 - 127) -64 - +63 [cent]
40 1x 46	0aaa aaaa	Scale Tuning F#	(0 - 127) -64 - +63 [cent]
40 1x 47	0aaa aaaa	Scale Tuning G	(0 - 127) -64 - +63 [cent]
40 1x 48	0aaa aaaa	Scale Tuning G#	(0 - 127) -64 - +63 [cent]
40 1x 49	0aaa aaaa	Scale Tuning A	(0 - 127) -64 - +63 [cent]
40 1x 4A	0aaa aaaa	Scale Tuning A#	(0 - 127) -64 - +63 [cent]
40 1x 4B	0aaa aaaa	Scale Tuning B	(0 - 127) -64 - +63 [cent]
40 2x 00	0aaa aaaa	Mod Pitch Control	(40 - 88) -24 - +24 [semitone]
40 2x 01	0aaa aaaa	Mod TVF Cutoff Control	(0 - 127) -9600 - +9600 [cent]
40 2x 02	0aaa aaaa	Mod Amplitude Control	(0 - 127) -100.0 - +100.0 [%]
40 2x 03	0aaa aaaa	Mod LFO1 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 04	0aaa aaaa	Mod LFO1 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 05	0aaa aaaa	Mod LFO1 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 06	0aaa aaaa	Mod LFO1 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 07	0aaa aaaa	Mod LFO2 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 08	0aaa aaaa	Mod LFO2 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 09	0aaa aaaa	Mod LFO2 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 0A	0aaa aaaa	Mod LFO2 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 10	0aaa aaaa	Bend Pitch Control	(64 - 88) 0 - 24 [semitone]
40 2x 11	0aaa aaaa	Bend TVF Cutoff Control	(0 - 127) -9600 - +9600 [cent]
40 2x 12	0aaa aaaa	Bend Amplitude Control	(0 - 127) -100.0 - +100.0 [%]
40 2x 13	0aaa aaaa	Bend LFO1 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 14	0aaa aaaa	Bend LFO1 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 15	0aaa aaaa	Bend LFO1 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 16	0aaa aaaa	Bend LFO1 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 17	0aaa aaaa	Bend LFO2 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 18	0aaa aaaa	Bend LFO2 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 19	0aaa aaaa	Bend LFO2 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 1A	0aaa aaaa	Bend LFO2 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 20	0aaa aaaa	CAf Pitch Control	(40 - 88) -24 - +24 [semitone]
40 2x 21	0aaa aaaa	CAf TVF Cutoff Control	(0 - 127) -9600 - +9600 [cent]
40 2x 22	0aaa aaaa	CAf Amplitude Control	(0 - 127) -100.0 - +100.0 [%]
40 2x 23	0aaa aaaa	CAf LFO1 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 24	0aaa aaaa	CAf LFO1 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 25	0aaa aaaa	CAf LFO1 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 26	0aaa aaaa	CAf LFO1 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 27	0aaa aaaa	CAf LFO2 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 28	0aaa aaaa	CAf LFO2 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 29	0aaa aaaa	CAf LFO2 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 2A	0aaa aaaa	CAf LFO2 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 30	0aaa aaaa	PAf Pitch Control	(40 - 88) -24 - +24 [semitone]
40 2x 31	0aaa aaaa	PAf TVF Cutoff Control	(0 - 127) -9600 - +9600 [cent]
40 2x 32	0aaa aaaa	PAf Amplitude Control	(0 - 127) -100.0 - +100.0 [%]
40 2x 33	0aaa aaaa	PAf LFO1 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 34	0aaa aaaa	PAf LFO1 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 35	0aaa aaaa	PAf LFO1 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 36	0aaa aaaa	PAf LFO1 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 37	0aaa aaaa	PAf LFO2 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 38	0aaa aaaa	PAf LFO2 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 39	0aaa aaaa	PAf LFO2 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 3A	0aaa aaaa	PAf LFO2 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 40	0aaa aaaa	CC1 Pitch Control	(40 - 88) -24 - +24 [semitone]

Start Address		Description	
40 2x 41	0aaa aaaa	CC1 TVF Cutoff Control	(0 - 127) -9600 - +9600 [cent]
40 2x 42	0aaa aaaa	CC1 Amplitude Control	(0 - 127) -100.0 - +100.0 [%]
40 2x 43	0aaa aaaa	CC1 LFO1 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 44	0aaa aaaa	CC1 LFO1 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 45	0aaa aaaa	CC1 LFO1 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 46	0aaa aaaa	CC1 LFO1 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 47	0aaa aaaa	CC1 LFO2 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 48	0aaa aaaa	CC1 LFO2 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 49	0aaa aaaa	CC1 LFO2 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 4A	0aaa aaaa	CC1 LFO2 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 50	0aaa aaaa	CC2 Pitch Control	(40 - 88) -24 - +24 [semitone]
40 2x 51	0aaa aaaa	CC2 TVF Cutoff Control	(0 - 127) -9600 - +9600 [cent]
40 2x 52	0aaa aaaa	CC2 Amplitude Control	(0 - 127) -100.0 - +100.0 [%]
40 2x 53	0aaa aaaa	CC2 LFO1 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 54	0aaa aaaa	CC2 LFO1 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 55	0aaa aaaa	CC2 LFO1 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 56	0aaa aaaa	CC2 LFO1 TVA Depth	(0 - 127) 0 - 100.0 [%]
40 2x 57	0aaa aaaa	CC2 LFO2 Rate Control	(0 - 127) -10.0 - +10.0 [Hz]
40 2x 58	0aaa aaaa	CC2 LFO2 Pitch Control	(0 - 127) 0 - 600 [cent]
40 2x 59	0aaa aaaa	CC2 LFO2 TVF Depth	(0 - 127) 0 - 2400 [cent]
40 2x 5A	0aaa aaaa	CC2 LFO2 TVA Depth	(0 - 127) 0 - 100.0 [%]

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

❍ Drum Setup Parameter

Start Address		Description	
41 m0 00	0aaa aaaa	Drum Map Name 1	(32 - 127) 32 - 127 [ASCII]
41 m0 01	0aaa aaaa	Drum Map Name 2	(32 - 127) 32 - 127 [ASCII]
41 m0 02	0aaa aaaa	Drum Map Name 3	(32 - 127) 32 - 127 [ASCII]
41 m0 03	0aaa aaaa	Drum Map Name 4	(32 - 127) 32 - 127 [ASCII]
41 m0 04	0aaa aaaa	Drum Map Name 5	(32 - 127) 32 - 127 [ASCII]
41 m0 05	0aaa aaaa	Drum Map Name 6	(32 - 127) 32 - 127 [ASCII]
41 m0 06	0aaa aaaa	Drum Map Name 7	(32 - 127) 32 - 127 [ASCII]
41 m0 07	0aaa aaaa	Drum Map Name 8	(32 - 127) 32 - 127 [ASCII]
41 m0 08	0aaa aaaa	Drum Map Name 9	(32 - 127) 32 - 127 [ASCII]
41 m0 09	0aaa aaaa	Drum Map Name 10	(32 - 127) 32 - 127 [ASCII]
41 m0 0A	0aaa aaaa	Drum Map Name 11	(32 - 127) 32 - 127 [ASCII]
41 m0 0B	0aaa aaaa	Drum Map Name 12	(32 - 127) 32 - 127 [ASCII]
41 m1 rr	0aaa aaaa	Play Note Number	(0 - 127)
41 m2 rr	0aaa aaaa	Level	(0 - 127)
41 m3 rr	0aaa aaaa	Assign Group Number	(0 - 127) NON, 1 - 127
41 m4 rr	0aaa aaaa	Panpot	(0 - 127) RAMDOM, L63 - 63R
41 m5 rr	0aaa aaaa	Reverb Send Level	(0 - 127) 0.0 - 1.0
41 m6 rr	0aaa aaaa	Chorus Send Level	(0 - 127) 0.0 - 1.0
41 m7 rr	0000 000a	Rx. Note Off	(0 - 1) OFF, ON
41 m8 rr	0000 000a	Rx. Note On	(0 - 1) OFF, ON

m: Map number (0 = MAP1, 1 = MAP2)
rr: drum part note number (00H-7FH)

■Decimal and Hexadecimal Table

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

D	H	D	H	D	H	D	H
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

D: decimal
H: hexadecimal

* Decimal values such as MIDI channel, bank select, and program change are listed as one greater than the values given in the above table.
* A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of aa x 128+bb.
* In the case of values which have a +/- sign, 00H = -64, 40H = +/-0, and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = +/-0, and 7F 7FH = +8191. For example, if aa bbH were expressed as decimal, this would be aa bbH - 40 00H = aa x 128+bb - 64 x 128.
* Data marked "Use nibbled data" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of a x 16+b.

<Example1> What is the decimal expression of 5AH?

From the preceding table, 5AH = 90

<Example2> What is the decimal expression of the value 12 34H given as hexadecimal for each 7 bits?

From the preceding table, since 12H = 18 and 34H = 52
18 x 128+52 = 2356

<Example3> What is the decimal expression of the nibbled value 0A 03 09 0D?

From the preceding table, since 0AH = 10, 03H = 3, 09H = 9, 0DH = 13
((10 x 16+3) x 16+9) x 16+13 = 41885

<Example4> What is the nibbled expression of the decimal value 1258?

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

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

■Examples of Actual MIDI Messages

<Example1> 92 3E 5F

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

<Example2> CE 49

CnH is the Program Change status, and n is the MIDI channel number. Since EH = 14 and 49H = 73, this is a Program Change message with MIDI CH = 15, program number 74.

<Example3> EA 00 28

EnH is the Pitch Bend Change status, and n is the MIDI channel number. The 2nd byte (00H = 0) is the LSB and the 3rd byte (28H = 40) is the MSB, but Pitch Bend Value is a signed number in which 40 00H (= 64 x 12+80 = 8192) is 0, so this Pitch Bend Value is
28 00H - 40 00H = 40 x 12+80 - (64 x 12+80) = 5120 - 8192 = -3072

If the Pitch Bend Sensitivity is set to 2 semitones, -8192 (00 00H) will cause the pitch to change -200 cents, so in this case -200 x (-3072) é÷ (-8192) = -75 cents of Pitch Bend is being applied to MIDI channel 11.

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

BnH is the Control Change status, and n is the MIDI channel number. For Control Changes, the 2nd byte is the control number, and the 3rd byte is the value. In a case in which two or more messages consecutive messages have the same status, MIDI has a provision called "running status" which allows the status byte of the second and following messages to be omitted. Thus, the above messages have the following meaning.

B3	64 00	MIDI ch.4, lower byte of RPN parameter number:	00H
(B3)	65 00	(MIDI ch.4) upper byte of RPN parameter number:	00H
(B3)	06 0C	(MIDI ch.4) upper byte of parameter value:	0CH
(B3)	26 00	(MIDI ch.4) lower byte of parameter value:	00H
(B3)	64 7F	(MIDI ch.4) lower byte of RPN parameter number:	7FH
(B3)	65 7F	(MIDI ch.4) upper byte of RPN parameter number:	7FH

In other words, the above messages specify a value of 0C 00H for RPN parameter number 00 00H on MIDI channel 4, and then set the RPN parameter number to 7F 7FH.

RPN parameter number 00 00H is Pitch Bend Sensitivity, and the MSB of the value indicates semitone units, so a value of 0CH = 12 sets the maximum pitch bend range to +/-12 semitones (1 octave). (On GS sound generators the LSB of Pitch Bend Sensitivity is ignored, but the LSB should be transmitted anyway (with a value of 0) so that operation will be correct on any device.)

Once the parameter number has been specified for RPN or NRPN, all Data Entry messages transmitted on that same channel will be valid, so after the desired value has been transmitted, it is a good idea to set the parameter number to 7F 7FH to prevent accidents. This is the reason for the (B3) 64 7F (B3) 65 7F at the end.

It is not desirable for performance data (such as Standard MIDI File data) to contain many events with running status as given in <Example 4>. This is because if playback is halted during the song and then rewound or fast-forwarded, the sequencer may not be able to transmit the correct status, and the sound generator will then misinterpret the data. Take care to give each event its own status.

It is also necessary that the RPN or NRPN parameter number setting and the value setting be done in the proper order. On some sequencers, events occurring in the same (or consecutive) clock may be transmitted in an order different than the order in which they were received. For this reason it is a good idea to slightly skew the time of each event (about 1 tick for TPQN = 96, and about 5 ticks for TPQN = 480).

* TPQN: Ticks Per Quarter Note

■Example of an Exclusive Message and Calculating a Checksum

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

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

The checksum is a value derived by adding the address, size, and checksum itself and inverting the lower 7 bits.
Heresanexampleofhowthechecksumiscalculated.WewillassumethatintheExclusivemessage wearetransmitting,theaddressisaabbccddHandthedataorsizeiseeffH.'

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

<Example> Setting CHORUS TYPE of PERFORMANCE COMMON to DELAY (DT1)

According to the **Parameter Address Map** (p. 58), the start address of Temporary Performance is 10 00 00 00H, the offset address of CHORUS at PERFORMANCE COMMON is 04 00H, and the address of CHORUS TYPE is 00 00H. Therefore the address of CHORUS TYPE of PERFORMANCE COMMON is;

```
   10 00 00 00H
         04 00H
+)       00 00H
   10 00 04 00H
```

DELAY has the value of 02H.
So the system exclusive message should be sent is;

F0	41	10	00 6B	12	10 00 04 00	02	??	F7
(1)	(2)	(3)	(4)	(5)	address	data	checksum	(6)

(1) Exclusive Status (2) ID (Roland) (3) Device ID (17)
(4) Model ID (Fantom-S/S88) (5) Command ID (DT1) (6) End of Exclusive

Then calculate the checksum.

10H + 00H + 04H + 00H + 02H = 16 + 0 + 4 + 0 + 2 = 22 (sum)
22 (sum) ÷ 128 = 0 (quotient) ... 22 (remainder)
checksum = 128 - 22 (remainder) = 106 = 6AH

This means that F0 41 10 00 6B 12 10 00 04 00 02 6A F7 is the message should be sent.

■The Scale Tune Feature (address: 40 1x 40)

The scale Tune feature allows you to finely adjust the individual pitch of the notes from C through B. Though the settings are made while working with one octave, the fine adjustments will affect all octaves. By making the appropriate Scale Tune settings, you can obtain a complete variety of tuning methods other than equal temperament. As examples, three possible types of scale setting are explained below.

❍Equal Temperament

This method of tuning divides the octave into 12 equal parts. It is currently the most widely used form of tuning, especially in occidental music. On the Fantom, the default settings for the Scale Tune feature produce equal temperament.

❍Just Temperament (Tonic of C)

The principal triads resound much more beautifully than with equal temperament, but this benefit can only be obtained in one key. If transposed, the chords tend to become ambiguous. The example given involves settings for a key in which C is the keynote.

❍Arabian Scale

By altering the setting for Scale Tune, you can obtain a variety of other tunings suited for ethnic music. For example, the settings introduced below will set the unit to use the Arabian Scale.

Example Settings

Note name	Equal Temperament	Just Temperament (Key-tone C)	Arabian Scale
C	0	0	-6
C#	0	-8	+45
D	0	+4	-2
Eb	0	+16	-12
E	0	-14	-51
F	0	-2	-8
F#	0	-10	+43
G	0	+2	-4
G#	0	+14	+47
A	0	-16	0
Bb	0	+14	-10
B	0	-12	-49

The values in the table are given in cents. Convert these values to hexadecimal, and transmit them as Exclusive data.
For example, to set the tune (C-B) of the Part 1 Arabian Scale, send the following data:

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

■ASCII Code Table

Patch Name and Performance Name, etc., of MIDI data are described the ASCII code in the table below.

D	H	Char	D	H	Char	D	H	Char
32	20H	SP	64	40H	@	96	60H	`
33	21H	!	65	41H	A	97	61H	a
34	22H	"	66	42H	B	98	62H	b
35	23H	#	67	43H	C	99	63H	c
36	24H	$	68	44H	D	100	64H	d
37	25H	%	69	45H	E	101	65H	e
38	26H	&	70	46H	F	102	66H	f
39	27H	`	71	47H	G	103	67H	g
40	28H	(	72	48H	H	104	68H	h
41	29H	)	73	49H	I	105	69H	i
42	2AH	*	74	4AH	J	106	6AH	j
43	2BH	+	75	4BH	K	107	6BH	k
44	2CH	,	76	4CH	L	108	6CH	l
45	2DH	−	77	4DH	M	109	6DH	m
46	2EH	.	78	4EH	N	110	6EH	n
47	2FH	/	79	4FH	O	111	6FH	o
48	30H	0	80	50H	P	112	70H	p
49	31H	1	81	51H	Q	113	71H	q
50	32H	2	82	52H	R	114	72H	r
51	33H	3	83	53H	S	115	73H	s
52	34H	4	84	54H	T	116	74H	t
53	35H	5	85	55H	U	117	75H	u
54	36H	6	86	56H	V	118	76H	v
55	37H	7	87	57H	W	119	77H	w
56	38H	8	88	58H	X	120	78H	x
57	39H	9	89	59H	Y	121	79H	y
58	3AH	:	90	5AH	Z	122	7AH	z
59	3BH	;	91	5BH	[	123	7BH	{
60	3CH	<	92	5CH	\	124	7CH	|
61	3DH	=	93	5DH	]	125	7DH	}
62	3EH	>	94	5EH	^			
63	3FH	?	95	5FH	_			

D: decimal
H: hexadecimal

* "SP" is space.

<Bank Select and Program Change Correspondence Chart>

Patch

Group	Number	Bank Select		Program Number
		MSB	LSB	
USER	001–128	87	0	1–128
	129–256	87	1	1–128
CARD	001–128	87	32	1–128
	129–256	87	33	1–128
PR-A	001–128	87	64	1–128
PR-B	001–128	87	65	1–128
PR-C	001–128	87	66	1–128
PR-D	001–128	87	67	1–128
PR-E	001–128	87	68	1–128
PR-F (* S88 only)	001–008	87	69	1–8
GM(2)	001–256	121	0–	1–128
XP-A (SRX-01)	001–	93	0	1–
(SRX-02)	001–	93	1	1–
:	:	:	:	:
XP-B (SRX-01)	001–	93	0	1–
(SRX-02)	001–	93	1	1–
:	:	:	:	:
XP-C (SRX-01)	001–	93	0	1–
(SRX-02)	001–	93	1	1–
:	:	:	:	:
XP-D (SRX-01)	001–	93	0	1–
(SRX-02)	001–	93	1	1–
:	:	:	:	:

* *The XP groups vary depending on the Wave Expansion Board(s) you've installed. For information about an SRX series board, refer to the Owner's Manual that came with it.*

Rhythm Set

Group	Number	Bank Select		Program Number
		MSB	LSB	
USER	001–032	86	0	1–32
CARD	001–032	86	32	1–32
PRST	001–032	86	64	1–32
GM(2)	001–009	120	---	1–57
XP-A (SRX-01)	001–	92	0	1–
(SRX-02)	001–	92	1	1–
:	:	:	:	:
XP-B (SRX-01)	001–	92	0	1–
(SRX-02)	001–	92	1	1–
:	:	:	:	:
XP-C (SRX-01)	001–	92	0	1–
(SRX-02)	001–	92	1	1–
:	:	:	:	:
XP-D (SRX-01)	001–	92	0	1–
(SRX-02)	001–	92	1	1–
:	:	:	:	:

* *The XP groups vary depending on the Wave Expansion Board(s) you've installed. For information about an SRX series board, refer to the Owner's Manual that came with it.*

Performance

Group	Number	Bank Select		Program Number
		MSB	LSB	
USER	01–64	85	0	1–64
CARD	01–64	85	32	1–64
PRST	01–64	85	64	1–64

* *To switch multitimbres, the external MIDI device's transmit channel needs to be matched up with the Control Channel of the Fantom-S. (Owner's Manual; p. 192)*

(Sound Generator Section)
Model Fantom-S/S88

MIDI Implementation Chart

Date : Feb. 6, 2003
Version : 1.00

Function...		Transmitted	Recognized	Remarks
Basic	Default	1–16	1–16	
Channel	Changed	1–16	1–16	Memorized
Mode	Default	Mode 3	Mode 3	
	Messages	Mono, Poly	Mode 3, 4 (M = 1)	* 2
	Altered	**********		
Note Number :	True Voice	0–127 **********	0–127 0–127	
Velocity	Note On	O	O	
	Note Off	O	O	
After Touch	Key's	O	O *1	
	Channel's	O	O *1	
Pitch Bend		O	O *1	
Control Change	0, 32	O *1	O *1	Bank select
	1	O	O *1	Modulation
	2	O	O	Breath type
	4	O	O	Foot type
	5	O	O	Portamento time
	6, 38	O	O	Data entry
	7	O	O *1	Volume
	8	O	X	Balance
	10	O	O *1	Panpot
	11	O	O *1	Expression
	16	O	X	General purpose controller 1
	17	O	X	General purpose controller 2
	18	O	X	General purpose controller 3
	19	O	X	General purpose controller 4
	64	O	O *1	Hold 1
	65	O	O	Portamento
	66	O	O	Sostenuto
	67	O	O	Soft
	68	O	O	Legato foot switch
	69	O	O	Hold 2
	70	O	X	Sound variation
	71	O	O	Resonance
	72	O	O	Release time
	73	O	O	Attack time
	74	O	O	Cutoff
	75	O	O	Decay time
	76	O	O	Vibrato rate
	77	O	O	Vibrato depth
	78	O	O	Vibrato delay
	80	O	O (Tone 1 Level)	General purpose controller 5
	81	O	O (Tone 2 Level)	General purpose controller 6
	82	O	O (Tone 3 Level)	General purpose controller 7
	83	O	O (Tone 4 Level)	General purpose controller 8
	84	O	O	Portamento control
	91	O	O (Reverb)	General purpose effects 1
	92	O	X	Tremolo
	93	O	O (Chorus)	General purpose effects 3
	94	O	X	Celeste
	95	O	X	Phaser
	1–31, 64–95	O	O	Pedal, Knob, D Beam
	98, 99	X	X	NRPN LSB, MSB
	100, 101	X	O	RPN LSB, MSB
Program Change	: True Number	O *1 **********	O *1 0–127	Program No. 1–128
System Exclusive		O *3	O *1	
System Common	: Song Position	X	X	
	: Song Select	X	X	
	: Tune Request	X	X	
System Real Time	: Clock	X	X	
	: Commands	X	X	
Aux Messages	: All Sound Off	X	O	
	: Reset All Controllers	X	O	
	: Local On/Off	X	X	
	: All Notes Off	X	O (123–127)	
	: Active Sensing	O *1	O	
	: System Reset	X	X	
Notes		* 1 O X is selectable. * 2 Recognized as M=1 even if M≠1.		

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

O : Yes
X : No

(Sequencer Section)

Model Fantom-S/S88

MIDI Implementation Chart

Date : Feb. 6, 2003

Version : 1.00

Function...		Transmitted	Recognized	Remarks
Basic	Default	All channel	All channel	There is no specific basic channel.
Channel	Changed	X	1–16	
Mode	Default	X	X	
	Messages	X	X	
	Altered	**********		
Note Number :	True Voice	0–127 **********	0–127 0–127	
Velocity	Note On	O	O	
	Note Off	O	O	
After Touch	Key's	O	O *1	
	Channel's	O	O *1	
Pitch Bend		O	O *1	
Control Change	0–119	O	O *1	
Program Change	: True Number	O **********	O *1 0–127	
System Exclusive		O	O *1	
System Common	: Quarter Frames	O *1	O *2	
	: Song Position	O *1	O *1	
	: Song Select	X	X	
	: Tune Request	O	O	
System Real Time	: Clock	O *1	O *1	
	: Commands	O *1	O *1	
Aux Messages	: All Sound Off	O	O	
	: Reset All Controllers	O	O	
	: Local On/Off	X *2	X	
	: All Notes Off	O *3	O (123–127) *3	
	: Active Sensing	O	O	
	: System Reset	X	X	
Notes		*1 O X is selectable. *2 Not stored/transmitted when received, but can be created and transmitted using Microscope. *3 Mode Messages (123–127) are recorded and transmitted, after all currently sounding notes are turned off. The All Note Message itself is not recorded or transmitted. However, it can be created in Microscope and transmitted.		

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

O : Yes
X : No