



Clavinova[®]

CLP-990

CLP-990M

Reference Booklet

This booklet is available in English only.

GENERAL
MIDI

XG



YAMAHA

Table of Contents

Normal (Default) Setting List	3
XG Voice List	6
XG Drum Kit List	10
XG Effect Type List	12
Effect Parameter List.....	13
Effect Data Assign Table	16
MIDI Data Format	18
Panel sound source.....	18
XG sound source.....	23
MIDI Implementation Chart	31
Specifications	33

Normal (Default) Setting List

Function		Value	Reference page in the Owner's Manual
Voice selection		GrandPiano1	30
Split mode		Off	37
Split point		F#2	38
Reverb On/Off		ON	33
Chorus On/Off		per voice	33
Brilliance mode		Normal	32
Metronome	Time signature	4/4	77
	Volume	100	
	Voice	BellOff	
Tempo		120	27, 41, 57
Transpose		0	34
Song select		Preset song [NewSong]	26, 41, 57
Song balance		127:127	48
Recording mode	Extra track channel: 3		46
	Start: Normal		44
	End: Replace		44
Character code		International	56

■ Song setting

Function	Value	Reference page in the Owner's Manual
Correcting note timing (Quantize) Swing rate (SwingRate)	Off	74
	50%	
Specifying whether playback starts immediately along with the first voicing (QuickPlay)	On	75
Specifying the range and playing back repeatedly (FromToRepeat)	RepeatOff	75
Playing back the phrase specified by the phrase mark (PhraseMark)	RepeatOff	76
Playing back a song repeatedly (SongRepeat)	Off	76

Normal (Default) Setting List

■ Voice setting

Function	Value	Reference page in the Owner's Manual
Octave (Octave)	per voice	78
Volume level (Volume)	per voice	78
Position of right and left channels (Pan)	per voice	79
Fine pitch adjustment (only in Dual mode) (Detune)	per voice	79
Reverb type (ReverbType)	per voice	79
Reverb depth (ReverbSend)	per voice	79
Chorus type (ChorusType)	per voice	80
Chorus depth (ChorusSend)	per voice	80
Chorus on/off (ChorusOnOff)	per voice	80
Variation effect type (VariationType)	per voice	80
Variation effect depth (VariationSend)	per voice	81
Touch sensitivity (TouchSense)	per voice	81
Right pedal function (RPedal)	SustainCont	81
Center pedal function (MPedal)	Sostenuto	82
Left pedal function (LPedal)	JazzOrgan:RotarySpeed	82
	Vibraphone:VibeRotor	
	Other voices: Soft	
Auxiliary pedal function (AuxPedal)	Expression	82

■ MIDI setting

Function	Value	Reference page in the Owner's Manual
MIDI transmit channel (MidiOutChannel)	Main:Ch1	84
	Left:Ch2	
	Layer:Ch3	
	LeftLayer:Ch4	
MIDI receive channel (Port A) (MidiInAChannel)	All channels: On	84
MIDI receive channel (Port B) (MidiInBChannel)	All channels: On	85
Local control on/off (LocalControl)	On	85
Selecting performance from the keyboard or song data for MIDI transmission (MidiOutSelect)	Keyboard	85
Type of data received via MIDI (ReceiveParameter)	All data: On	85
Type of data transmitted via MIDI (TransmitParameter)	All data: On	86

■ Other settings

Function	Value	Reference page in the Owner's Manual
Selecting a touch response (TouchResponse) Fixed volume	Medium	87
	64	
Fine tuning of the pitch (Tune)	A3=440.0Hz	87
Selecting a tuning curve for a piano voice (PianoTuningCurve)	Stretch	87
Selecting a scale (Scale) Root note	Equal	88
	C	
Depth of string resonance (StringResonanceDepth)	5	88
Depth of sustain sampling for the damper pedal (SustainSamplingDepth)	5	88
Setting the speed of vibraphone's vibrato effect (VibraphoneRotorSpeed)	6	89
Selecting a pedal function for vibraphone (VibraphonePedalMode)	PianoLike	89
Assigning the START/PAUSE function to a pedal (PedalStart/Pause)	All pedals: Off	89
Selecting a type of auxiliary pedal (AuxPedalType)	Make	89
Setting the point at which the damper pedal starts to affect the sound (HalfPedalPoint)	0	89
Pitch bend range (PitchBendRange)	-2	90
Replacing XG voices with the panel preset voices (XGAlternative)	GrandPiano1: Native (using the panel preset voices) Other voices: XG (using XG voices)	90
Selecting the items stored at shutdown (MemoryBackUp)	Transpose:Off	90
	Main/LeftVoice:Off	
	MetronomeSetting:Off	
	Others: On	

Bank Select MSB=64

Instrument Group	Pgm#	Bank 0		E	Bank 72	E	Bank 96	E	Bank 97	E	Bank 98	E	Bank 99	E	Bank 100	E	Bank 101	E	
		Bank Select LSB=00	Bank 0																
Piano	1	Acoustic Grand Piano	GrandPno	1															
	2	Bright Acoustic Piano	BritePno	1															
	3	Electric Grand Piano	ElGrand	2															
	4	Honky-tonk Piano	HnkyTonk	2															
	5	Electric Piano 1	E.Piano1	2															
	6	Electric Piano 2	E.Piano2	2															
	7	Harpichord	Harpsi.	1															
	8	Clavi	Clavi.	2															
Chromatic Percussion	9	Celesta	Celesta	1															
	10	Glockenspiel	Glocken	1															
	11	Music Box	MusicBox	2															
	12	Vibraphone	Vibres	1															
	13	Marimba	Marimba	1					Balimba	2	Log Drum	2							
	14	Xylophone	Xylophon	1															
	15	Tubular Bells	TubuBel	1				ChrchBel	2	Carillon	2								
	16	Dulcimer	Dulcimer	1				Cimbalom	2	Santur	2								
Organ	17	Drawbar Organ 1	DrawOrgn	1															
	18	Perussive Organ	PerccOrgn	1															
	19	Rock Organ	RockOrgn	2															
	20	Church Organ 1	ChrchOrg	2															
	21	Reed Organ	ReedOrgn	1															
	22	Accordion	Acordion	2															
	23	Harmonica	Harmonica	1															
	24	Tango Accordion	TangoAcid	2															
Guitar	25	Acoustic Guitar (nylon)	NylonGtr	1				Ukulele	1										
	26	Acoustic Guitar (steel)	SteelGtr	1				Mandolin	2										
	27	Electric Guitar (jazz)	JazzGtr	1															
	28	Electric Guitar (clean)	CleanGtr	1															
	29	Electric Guitar (muted)	Mute.Gtr	1															
	30	Overdriven Guitar	Ovrdrive	1															
	31	Distortion Guitar	Dist.Gtr	1															
	32	Guitar Harmonics	GtrHarmo	1															
Bass	33	Acoustic Bass	Acobass	1															
	34	Electric Bass (finger)	FingrBass	1															
	35	Electric Bass (pick)	PickBass	1															
	36	Fretless Bass	Fretless	1				SynFret1	2	SmthFrit	2								
	37	Slap Bass 1	SlapBas1	1															
	38	Slap Bass 2	SlapBas2	1															
	39	Synth Bass 1	SynBas1	1				Hammer	2										
	40	Synth Bass 2	SynBas2	2															
Strings	41	Violin	Violin	1															
	42	Viola	Viola	1															
	43	Cello	Cello	1															
	44	Contrabass	Contrabs	1															
	45	Tremolo Strings	Trem.Str	1															
	46	Pizzicato Strings	Pizz.Str	1															
	47	Orchestral Harp	Harp	1															
	48	Timpani	Timpani	1															
Ensemble	49	String Ensemble 1	StrngEnsb1	1															
	50	String Ensemble 2	StrngEnsb2	1															
	51	Synth Strings 1	Syn.Str1	2															
	52	Synth Strings 2	Syn.Str2	2															
	53	Choir Aahs	ChoirAah	1															
	54	Voice Oohs	VoiceOoh	1															
	55	Synth Voice	SynVoice	1															
	56	Orchestra Hit	OrchHit	2															
Brass	57	Trumpet	Trumpet	1															
	58	Trombone	Trombone	1															
	59	Tuba	Tuba	1															
	60	Muted Trumpet	Mute.Trp	1															
	61	French Horn	Fr. Horn	2															
	62	Brass Section 1	BrasSect	1															
	63	Synth Brass 1	SynBras1	2															
	64	Synth Brass 2	SynBras2	2															
Reed	65	Soprano Sax	SprnoSax	1															
	66	Alto Sax	Alto Sax	1															
	67	Tenor Sax	TenorSax	1															
	68	Baritone Sax	Bari.Sax	1															
	69	Oboe	Oboe	2															
	70	English Horn	Eng.Horn	1															
	71	Bassoon	Bassoon	1															
	72	Clarinet	Clarinet	1															
Pipe	73	Piccolo	Piccolo	1															
	74	Flute	Flute	1															
	75	Recorder	Recorder	1															
	76	Pan Flute	PanFlute	1															
	77	Blown Bottle	Bottle	2															
	78	Shakuhachi	Shakohchi	2															
	79	Whistle	Whistle	1															
	80	Ocarina	Ocarina	1															
Synth Lead	81	Lead 1 (square)	SquareLd	2															
	82	Lead 2 (sawtooth)	Saw Ld	2				Seq Ana.	2										
	83	Lead 3 (callopie)	CallopLd	2															
	84	Lead 4 (chiff)	Chiff Ld	2															
	85	Lead 5 (charang)	CharanLd	2															
	86	Lead 6 (voice)	Voice Ld	2															
	87	Lead 7 (fifths)	Fifth Ld	2															
	88	Lead 8 (bass+lead)	Bass&Ld	2															
Synth Pad	89	Pad 1 (new age)	NewAgePd	2															
	90	Pad 2 (warm)	Warm Pad	2															
	91	Pad 3 (polysynth)	PolySyPd	2															
	92	Pad 4 (choir)	ChoirPad	2															
	93	Pad 5 (bowed)	BowedPd	2															
	94	Pad 6 (metallic)	MetalPad	2															
	95	Pad 7 (halo)	Halo Pad	2															
	96	Pad 8 (sweep)	SweepPad	2															
Synth Effects	97	FX 1 (rain)	Rain	2															
	98	FX 2 (soundtrack)	SoundTrk	2															
	99	FX 3 (crystal)	Crystal	2				GameImba	2										
	100	FX 4 (atmosphere)	Atmosphr	2															
	101	FX 5 (brightness)	Bright	2						Smoky	2								
	102	FX 6 (goblins)	Goblins	2						BelChoir	2								
	103	FX 7 (echoes)	Echoes	2															
	104	FX 8 (sci-fi)	Sci-Fi	2															
Ethnic	105	Sitar	Sitar	1				Tambra	2	Tamboura	2								
	106	Banjo	Banjo	1				Rabab	2	Gopichnt	2	Oud	2						
	107	Shamisen	Shamisen	1															
	108	Koto	Koto	1				Taisho-k	2	Kanoon	2								
	109	Kalimba	Kalimba	1															
	110	Bagpipe	Bagpipe	2															
	111	Fiddle	Fiddle	1															
	112	Shanai	Shanai	1					Pungi	1	Hichnri	2							
Percussive	113	Tinkle Bell	TrnkBell	2				Bonang	2	Altair	2	Gamelan	2	S.Gamlan	2	Rama Cym	2	AsianBel	2
	114	Agogo	Agogo	2															
	115	Steel Drums	SteelDrm	2															
	116	Woodblock	Woodblok	1					Castanet	1	GlasPerc	2	ThaiBell	2					
	117	Taiko Drum	TaikoDrm	1					Gr.Cassa	1									
	118	Melodic Tom 1	MelodTom	2															
	119	Synth Drum	Syn Drum	1															
	120	Reverse Cymbal	RevCymb1	1															
Sound Effects	121	Guitar Fret Noise	FretNoiz	2															
	122	Breath Noise	BrethNoiz	2															
	123	Seashore	Seashore	2															
	124	Bird Tweet	Tweet	2				</											

XG Drum Kit List

These XG drum kit voices are used for GM/XG/DOC song playback. They are not used for your manual performance.

Bank MSB#				127	127	127	127	127	127
Program #				1	2	9	17	25	26
Note#	Note	Rcv Note off	Alternate Group	StandKit	StndKit2	Room Kit	Rock Kit	ElctrKit	AnalgKit
13	C#	-1		Surdo Mute					
14	D	-1		Surdo Open					
15	D#	-1		Hi Q					
16	E	-1		Whip Slap					
17	F	-1		Scratch H					
18	F#	-1		Scratch L					
19	G	-1		Finger Snap					
20	G#	-1		Click Noise					
21	A	-1		Mtrnm Click					
22	A#	-1		Mtrnm Bell					
23	B	-1		Seq Click L					
24	C	0		Seq Click H					
25	C#	0		Brush Tap					
26	D	0	O	Brush Swirl					
27	D#	0		Brush Slap					
28	E	0	O	BrushTapSwrl				ReversCymbal	ReversCymbal
29	F	0	O	Snare Roll	Snare Roll 2				
30	F#	0		Castanet				Hi Q 2	Hi Q 2
31	G	0		Snare Soft	Snare Soft 2		Snare Noisy	SnrSnpYElctr	SnareNoisy 4
32	G#	0		Sticks					
33	A	0		Kick Soft			Kick Tight 2	Kick 3	Kick Tight 2
34	A#	0		OpenRimShot	RimShotHSht				
35	B	0		Kick Tight	KickTghtShrt		Kick 2	Kick Gate	KickAnlgShrt
36	C	1		Kick	Kick Short		Kick Gate	KckGateHeavy	Kick Analog
37	C#	1		Side Stick					SideStickAn
38	D	1		Snare	Snare Short	Snare Snappy	Snare Rock	SnareNoisy 2	SnareAnalog
39	D#	1		Hand Clap					
40	E	1		Snare Tight	SnareTight H	SnrTightSnpY	Snare Rock Rim	SnareNoisy 3	SnareAnalog2
41	F	1		Floor Tom L		Tom Room 1	Tom Rock 1	TomElectro 1	Tom Analog 1
42	F#	1		Hi-HatClosed					HatCloseAnlg
43	G	1		Floor Tom H		Tom Room 2	Tom Rock 2	TomElectro 2	Tom Analog 2
44	G#	1		Hi-Hat Pedal					HatCloseAn 2
45	A	1		Low Tom		Tom Room 3	Tom Rock 3	TomElectro 3	Tom Analog 3
46	A#	1		Hi-Hat Open					HatOpen Anlg
47	B	1		Mid Tom L		Tom Room 4	Tom Rock 4	TomElectro 4	Tom Analog 4
48	C	2		Mid Tom H		Tom Room 5	Tom Rock 5	TomElectro 5	Tom Analog 5
49	C#	2		CrashCymbal1					Crash Analog
50	D	2		High Tom		Tom Room 6	Tom Rock 6	TomElectro 6	Tom Analog 6
51	D#	2		RideCymbal 1					
52	E	2		Chinese Cym					
53	F	2		Ride Cym Cup					
54	F#	2		Tambourine					
55	G	2		SplashCymbal					
56	G#	2		Cowbell					Cowbell Anlg
57	A	2		CrashCymbal2					
58	A#	2		Vibraslap					
59	B	2		RideCymbal 2					
60	C	3		Bongo H					
61	C#	3		Bongo L					
62	D	3		Conga H Mute					Conga Anlg H
63	D#	3		Conga H Open					Conga Anlg M
64	E	3		Conga L					Conga Anlg L
65	F	3		Timbale H					
66	F#	3		Timbale L					
67	G	3		Agogo H					
68	G#	3		Agogo L					
69	A	3		Cabasa					
70	A#	3		Maracas					Maracas 2
71	B	3	O	SambaWhistlH					
72	C	4	O	SambaWhistlL					
73	C#	4		Guiro Short					
74	D	4	O	Guiro Long					
75	D#	4		Claves					Claves 2
76	E	4		Wood Block H					
77	F	4		Wood Block L					
78	F#	4		Cuica Mute				Scratch H 2	Scratch H 2
79	G	4		Cuica Open				Scratch L 2	Scratch L 2
80	G#	4		TriangleMute					
81	A	4		TriangleOpen					
82	A#	4		Shaker					
83	B	4		Jingle Bells					
84	C	5		Bell Tree					
85	C#	5							
86	D	5							
87	D#	5							
88	E	5							
89	F	5							
90	F#	5							
91	G	5							

█ : Same as Standard Kit

█ : No sound

- Key Off: Keys marked "O" stop sounding the instant they are released.
- Alternate Assign: Playing any instrument within a numbered group will immediately stop the sound of any other instrument in the same group of the same number.

XG Drum Kit List

Bank MSB#				127	127	127	127	127	126	126
Program #				1	28	33	41	49	1	2
Note#	Note	Rcv Note off	Alter-nate Group	StandKit	DanceKit	Jazz Kit	BrushKit	SymphKit	SFXKit 1	SFXKit 2
13	C#	-1	3	Surdo Mute						
14	D	-1	3	Surdo Open						
15	D#	-1		Hi Q						
16	E	-1		Whip Slap						
17	F	-1	4	Scratch H						
18	F#	-1	4	Scratch L						
19	G	-1		Finger Snap						
20	G#	-1		Click Noise						
21	A	-1		Mtrnm Click						
22	A#	-1		Mtrnm Bell						
23	B	-1		Seq Click L						
24	C	0		Seq Click H						
25	C#	0		Brush Tap						
26	D	0	O	Brush Swirl						
27	D#	0		Brush Slap						
28	E	0	O	BrushTapSwrl	ReversCymbal					
29	F	0	O	Snare Roll						
30	F#	0		Castanet	Hi Q 2					
31	G	0		Snare Soft	Snare Tchno 3		Brush Slap 2			
32	G#	0		Sticks						
33	A	0		Kick Soft	Kick Techno Q			Kick Soft 2		
34	A#	0		OpenRimShot	Rim Gate					
35	B	0		Kick Tight	Kick Techno L			Gran Cassa		
36	C	1		Kick	Kick Techno 2	Kick Jazz	Kick Small	GranCassa Mu	CuttingNoiz	Phone Call
37	C#	1		Side Stick	Side Stick Analog				CuttingNoiz	Door Squeak
38	D	1		Snare	Snare Clap		Brush Slap 3	Band Snare		Door Slam
39	D#	1		Hand Clap					String Slap	Scratch Cut
40	E	1		Snare Tight	Snare Dry 2		Brush Tap 2	Band Snare 2		Scratch H 3
41	F	1		Floor Tom L	Tom Analog 1	Tom Jazz 1	Tom Brush 1	Tom Jazz 1		Wind Chime
42	F#	1	1	Hi-HatClosed	Hi-Hat Closed 3					Telephone 2
43	G	1		Floor Tom H	Tom Analog 2	Tom Jazz 2	Tom Brush 2	Tom Jazz 2		
44	G#	1	1	Hi-Hat Pedal	Hi-Hat CloseAn 2					
45	A	1		Low Tom	Tom Analog 3	Tom Jazz 3	Tom Brush 3	Tom Jazz 3		
46	A#	1	1	Hi-Hat Open	Hi-Hat Open 3					
47	B	1		Mid Tom L	Tom Analog 4	Tom Jazz 4	Tom Brush 4	Tom Jazz 4		
48	C	2		Mid Tom H	Tom Analog 5	Tom Jazz 5	Tom Brush 5	Tom Jazz 5		
49	C#	2		CrashCymbal1	Clash Analog			Hand Cymbal		
50	D	2		High Tom	Tom Analog 6	Tom Jazz 6	Tom Brush 6	Tom Jazz 6		
51	D#	2		RideCymbal 1				HandCymShort		
52	E	2		Chinese Cym					Fl.Key Click	CarEngnIgnit
53	F	2		Ride Cym Cup						CarTireSqeal
54	F#	2		Tambourine						Car Passing
55	G	2		SplashCymbal						Car Crash
56	G#	2		Cowbell	Cowbell Anlg					Siren
57	A	2		CrashCymbal2				HandCymbal 2		Train
58	A#	2		Vibraslap						Jet Plane
59	B	2		RideCymbal 2				HandCym2Shrt		Starship
60	C	3		Bongo H						Burst
61	C#	3		Bongo L						Coaster
62	D	3		Conga H Mute	Conga Anlg H					Submarine
63	D#	3		Conga H Open	Conga Anlg M					
64	E	3		Conga L	Conga Anlg L					
65	F	3		Timbale H						
66	F#	3		Timbale L						
67	G	3		Agogo H						
68	G#	3		Agogo L						
69	A	3		Cabasa					Shower	Laugh
70	A#	3		Maracas	Maracas 2				Thunder	Scream
71	B	3	O	SambaWhistlH					Wind	Punch
72	C	4	O	SambaWhistlL					Stream	Heartbeat
73	C#	4		Guiro Short					Bubble	Footsteps
74	D	4	O	Guiro Long					Feed	
75	D#	4		Claves	Claves 2					
76	E	4		Wood Block H						
77	F	4		Wood Block L						
78	F#	4		Cuica Mute	Scratch H 2					
79	G	4		Cuica Open	Scratch L 3					
80	G#	4	2	TriangleMute						
81	A	4	2	TriangleOpen						
82	A#	4		Shaker						
83	B	4		Jingle Bells						
84	C	5		Bell Tree					Dog	Machine Gun
85	C#	5							Horse	Laser Gun
86	D	5							Bird Tweet 2	Explosion
87	D#	5								FireWork
88	E	5								
89	F	5								
90	F#	5							Ghost	
91	G	5							Maou	

XG Effect Type List

REVERB

Exclusive		Effect Type	Description
MSB	LSB		
00	00	NoEffect	Effect turned off.
01	00	Hall1	Reverb simulating the resonance of a hall.
01	01	Hall2	Reverb simulating the resonance of a hall.
02	00	Room1	Reverb simulating the resonance of a room.
02	01	Room2	Reverb simulating the resonance of a room.
02	02	Room3	Reverb simulating the resonance of a room.
03	00	Stage1	Reverb appropriate for a solo instrument.
03	01	Stage2	Reverb appropriate for a solo instrument.
04	00	Plate	Reverb simulating a metal plate reverb unit.
10	00	W-Room	A unique short reverb with a bit of initial delay.
11	00	Tunnel	Simulation of a tunnel space expanding to left and right.
13	00	Basement	A bit of initial delay followed by reverb with a unique resonance.

CHORUS

Exclusive		Effect Type	Description
MSB	LSB		
00	00	NoEffect	Effect turned off.
41	00	Chorus1	Conventional chorus program that adds natural spaciousness.
41	01	Chorus2	Conventional chorus program that adds natural spaciousness.
41	02	Chorus3	Conventional chorus program that adds natural spaciousness.
41	08	Chorus4	Chorus with stereo input. The pan setting specified for the Part will also apply to the effect sound.
42	00	Celeste1	A 3-phase LFO adds modulation and spaciousness to the sound.
42	01	Celeste2	A 3-phase LFO adds modulation and spaciousness to the sound.
42	02	Celeste3	A 3-phase LFO adds modulation and spaciousness to the sound.
42	08	Celeste4	Celeste with stereo input. The pan setting specified for the Part will also apply to the effect sound.
43	00	Flanger1	Adds a jet-airplane effect to the sound.
43	01	Flanger2	Adds a jet-airplane effect to the sound.
43	08	Flanger3	Adds a jet-airplane effect to the sound.

VARIATION

Exclusive		Effect Type	Description
MSB	LSB		
00	00	NoEffect	Effect turned off.
01	00	Hall1	Reverb simulating the resonance of a hall.
01	01	Hall2	Reverb simulating the resonance of a hall.
02	00	Room1	Reverb simulating the resonance of a room.
02	01	Room2	Reverb simulating the resonance of a room.
02	02	Room3	Reverb simulating the resonance of a room.
03	00	Stage1	Reverb appropriate for a solo instrument.
03	01	Stage2	Reverb appropriate for a solo instrument.
04	00	Plate	Reverb simulating a metal plate reverb unit.
05	00	DelayLCR	A program that creates three delay sounds; L, R, and C (center).
06	00	DelayLR	A program that creates two delay sounds; L and R. Two feedback delays are provided.
07	00	Echo	Two delays (L and R) and independent feedback delays for L and R.
08	00	CrsDelay	A program that crosses the feedback of two delays.
09	00	E-Ref1	An effect that produces only the early reflection component of reverb.
09	01	E-Ref2	An effect that produces only the early reflection component of reverb.
0A	00	GateRev	A simulation of gated reverb.
0B	00	RvsGate	A program that simulates gated reverb played backwards.
14	00	Karaoke1	A delay with feedback of the same types as used for karaoke reverb.
14	01	Karaoke2	A delay with feedback of the same types as used for karaoke reverb.
14	02	Karaoke3	A delay with feedback of the same types as used for karaoke reverb.
41	00	Chorus1	Conventional chorus program that adds natural spaciousness.
41	01	Chorus2	Conventional chorus program that adds natural spaciousness.
41	02	Chorus3	Conventional chorus program that adds natural spaciousness.
41	08	Chorus4	Chorus with stereo input.
42	00	Celeste1	A 3-phase LFO adds modulation and spaciousness to the sound.
42	01	Celeste2	A 3-phase LFO adds modulation and spaciousness to the sound.
42	02	Celeste3	A 3-phase LFO adds modulation and spaciousness to the sound.
42	08	Celeste4	Celeste with stereo input.
43	00	Flanger1	Adds a jet-airplane effect to the sound.
43	01	Flanger2	Adds a jet-airplane effect to the sound.
43	08	Flanger3	Adds a jet-airplane effect to the sound.
44	00	Symphnic	A multi-phase version of Celeste.
45	00	RotarySp	A simulation of a rotary speaker.
46	00	Tremolo	An effect that cyclically modulates the volume.
47	00	AutoPan	A program that cyclically moves that sound image to left and right, front and back.
48	00	Phaser1	Cyclically changes the phase to add modulation to the sound.
48	08	Phaser2	Phaser with stereo input.
49	00	Dist	Adds a sharp-edged distortion to the sound.
4A	00	OverDrv	Adds mild distortion to the sound.
4B	00	AmpSim	A simulation of a guitar amp.
4C	00	3BandEQ	A mono EQ with adjustable LOW, MID, and HIGH equalizing.
4D	00	2BandEQ	A stereo EQ with adjustable LOW and HIGH. Ideal for drum Parts.
4E	00	AutoWah	Cyclically modulates the center frequency of a wah filter. With an AC1 etc. this can function as a pedal wah.
50	00	PitchCng	This program changes the pitch of the input signal.
40	00	Thru	Bypass without applying an effect.

* MSB, LSB is represented in hexadecimal.

* LSB=0 is the basic effect type.

Effect Parameter List

TIP

Parameters marked with a ● in the "Control" column can be controlled from an AC1 (assignable controller 1) etc. However, this is valid only for a Variation effect (when selected for Insertion).

HALL1,HALL2 ROOM1,ROOM2,ROOM3 STAGE1,STAGE2 PLATE (reverb, variation block)

No.	Parameter	Display	Value	See Table	Control
1	Reverb Time	0.3 - 30.0s	0 - 69	table#4	
2	Diffusion	0 - 10	0 - 10		
3	Initial Delay	0.1 - 99.3ms	0 - 63	table#5	
4	HPF Cutoff	Thru - 8.0kHz	0 - 52	table#3	
5	LPF Cutoff	1.0k - Thru	34 - 60	table#3	
6					
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11	Rev Delay	0 - 63	0 - 63	table#5	
12	Density	0 - 3	0 - 3		
13	Er/Rev Balance	E63>R - E=R - E<R63	1 - 127		
14					
15	Feedback Level	-63 - +63	1 - 127		
16					

WHITE ROOM TUNNEL BASEMENT (reverb block)

No.	Parameter	Display	Value	See Table	Control
1	Reverb Time	0.3 - 30.0s	0 - 69	table#4	
2	Diffusion	0 - 10	0 - 10		
3	Initial Delay	0.1 - 99.3ms	0 - 63	table#5	
4	HPF Cutoff	Thru - 8.0kHz	0 - 52	table#3	
5	LPF Cutoff	1.0k - Thru	34 - 60	table#3	
6	Width	0.5 - 10.2m	0 - 37	table#8	
7	Height	0.5 - 20.2m	0 - 73	table#8	
8	Depth	0.5 - 30.2m	0 - 104	table#8	
9	Wall Vary	0 - 30	0 - 30		
10					
11	Rev Delay	0 - 63	0 - 63	table#5	
12	Density	0 - 3	0 - 3		
13	Er/Rev Balance	E63>R - E=R - E<R63	1 - 127		
14					
15	Feedback Level	-63 - +63	1 - 127		
16					

DELAY L,C,R (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay	0.1 - 715.0ms (variation block)	1 - 7150		
2	Rch Delay	0.1 - 715.0ms (variation block)	1 - 7150		
3	Cch Delay	0.1 - 715.0ms (variation block)	1 - 7150		
4	Feedback Delay	0.1 - 715.0ms (variation block)	1 - 7150		
5	Feedback Level	-63 - +63	1 - 127		
6	Cch Level	0 - 127	0 - 127		
7	High Damp	0.1 - 1.0	1 - 10		
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
14	EQ Low Gain	-12 - +12dB	52 - 76		
15	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
16	EQ High Gain	-12 - +12dB	52 - 76		

DELAY L,R (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay	0.1 - 715.0ms (variation block)	1 - 7150		
2	Rch Delay	0.1 - 715.0ms (variation block)	1 - 7150		
3	Feedback Delay 1	0.1 - 715.0ms (variation block)	1 - 7150		
4	Feedback Delay 2	0.1 - 715.0ms (variation block)	1 - 7150		
5	Feedback Level	-63 - +63	1 - 127		
6	High Damp	0.1 - 1.0	1 - 10		
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
14	EQ Low Gain	-12 - +12dB	52 - 76		
15	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
16	EQ High Gain	-12 - +12dB	52 - 76		

ECHO (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay1	0.1 - 355.0ms (variation block)	1 - 3550		
2	Lch Feedback Level	-63 - +63	1 - 127		
3	Rch Delay1	0.1 - 355.0ms (variation block)	1 - 3550		
4	Rch Feedback Level	-63 - +63	1 - 127		
5	High Damp	0.1 - 1.0	1 - 10		
6	Lch Delay2	0.1 - 355.0ms (variation block)	1 - 3550		
7	Rch Delay2	0.1 - 355.0ms (variation block)	1 - 3550		
8	Delay2 Level	0 - 127	0 - 127		
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
14	EQ Low Gain	-12 - +12dB	52 - 76		
15	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
16	EQ High Gain	-12 - +12dB	52 - 76		

CROSS DELAY (variation block)

No.	Parameter	Display	Value	See Table	Control
1	L->R Delay	0.1 - 355.0ms (variation block)	1 - 3550		
2	R->L Delay	0.1 - 355.0ms (variation block)	1 - 3550		
3	Feedback Level	-63 - +63	1 - 127		
4	Input Select	L,R,L&R	0 - 2		
5	High Damp	0.1 - 1.0	1 - 10		
6					
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
14	EQ Low Gain	-12 - +12dB	52 - 76		
15	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
16	EQ High Gain	-12 - +12dB	52 - 76		

EARLY REF1,EARLY REF2(variation block)

No.	Parameter	Display	Value	See Table	Control
1	Type	S-H, L-H, Rdm, Rvs, Plt, Spr	0 - 5		
2	Room Size	0.1 - 7.0	0 - 44	table#6	
3	Diffusion	0 - 10	0 - 10		
4	Initial Delay	0.1 - 99.3ms	0 - 63	table#5	
5	Feedback Level	-63 - +63	1 - 127		
6	HPF Cutoff	Thru - 8.0kHz	0 - 52	table#3	
7	LPF Cutoff	1.0k - Thru	34 - 60	table#3	
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11	Liveness	0 - 10	0 - 10		
12	Density	0 - 3	0 - 3		
13	High Damp	0.1 - 1.0	1 - 10		
14					
15					
16					

GATE REVERB REVERSE GATE (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Type	TypeA, TypeB	0 - 1		
2	Room Size	0.1 - 7.0	0 - 44	table#6	
3	Diffusion	0 - 10	0 - 10		
4	Initial Delay	0.1 - 99.3ms	0 - 63	table#5	
5	Feedback Level	-63 - +63	1 - 127		
6	HPF Cutoff	Thru - 8.0kHz	0 - 52	table#3	
7	LPF Cutoff	1.0k - Thru	34 - 60	table#3	
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11	Liveness	0 - 10	0 - 10		
12	Density	0 - 3	0 - 3		
13	High Damp	0.1 - 1.0	1 - 10		
14					
15					
16					

Effect Parameter List

KARAOKE1,2,3 (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Delay Time	0.1 - 400ms	0 - 127	table#7	
2	Feedback Level	-63 - +63	1 - 127		
3	HPF Cutoff	Thru - 8.0kHz	0 - 52	table#3	
4	LPF Cutoff	1.0k - Thru	34 - 60	table#3	
5					
6					
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13					
14					
15					
16					

CHORUS1,2,3,4

CELESTE1,2,3,4 (chorus, variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	
2	LFO Depth	0 - 127	0 - 127		
3	Feedback Level	-63 - +63	1 - 127		
4	Delay Offset	0.0 - 50	0 - 127	table#2	
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13					
14					
15	Input Mode	mono/stereo	0 - 1		
16					

FLANGER1,2,3 (chorus, variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	
2	LFO Depth	0 - 127	0 - 127		
3	Feedback Level	-63 - +63	1 - 127		
4	Delay Offset	0 - 63	0 - 63	table#2	
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13					
14	LFO Phase Difference	-180 - +180deg	4 - 124	resolution=3deg.	
15					
16					

SYMPHONIC (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	
2	LFO Depth	0 - 127	0 - 127		
3	Delay Offset	0.0 - 50	0 - 127	table#2	
4					
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11					
12					
13					
14					
15					
16					

ROTARY SPEAKER (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	●
2	LFO Depth	0 - 127	0 - 127		
3					
4					
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		
11					
12					
13					
14					
15					
16					

TREMOLO (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	●
2	AM Depth	0 - 127	0 - 127		
3	PM Depth	0 - 127	0 - 127		
4					
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10					
11					
12					
13					
14	LFO Phase Difference	-180 - +180deg	4 - 124	resolution=3deg.	
15	Input Mode	mono/stereo	0 - 1		
16					

AUTO PAN (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	●
2	L/R Depth	0 - 127	0 - 127		
3	F/R Depth	0 - 127	0 - 127		
4	PAN Direction	L<->R,L->R,L<-R,Lturn,Rturn,L/R	0 - 5		
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10					
11					
12					
13					
14					
15					
16					

PHASER 1 (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	
2	LFO Depth	0 - 127	0 - 127		
3	Phase Shift Offset	0 - 127	0 - 127		
4	Feedback Level	-63 - +63	1 - 127		
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		●
11	Stage	6 - 10	6 - 10		
12					
13					
14					
15					
16					

PHASER 2 (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	
2	LFO Depth	0 - 127	0 - 127		
3	Phase Shift Offset	0 - 127	0 - 127		
4	Feedback Level	-63 - +63	1 - 127		
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58		
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		
11	Stage	3 - 5	3 - 5		●
12					
13	LFO Phase Difference	-180deg - +180deg	4 - 124	resolution=3deg.	
14					
15					
16					

DISTORTION OVERDRIVE (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Drive	0 - 127	0 - 127		●
2	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
3	EQ Low Gain	-12 - +12dB	52 - 76		
4	LPF Cutoff	1.0k - Thru	34 - 60		
5	Output Level	0 - 127	0 - 127	table#3	
6					
7	EQ Mid Frequency	500Hz - 10.0kHz	28 - 54	table#3	
8	EQ Mid Gain	-12 - +12dB	52 - 76		
9	EQ Mid Width	1.0 - 12.0	10 - 120		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		
11	Edge(Clip Curve)	0 - 127	0 - 127	mild - sharp	
12					
13					
14					
15					
16					

AMP SIMULATOR (variation block)

No.	Parameter	Display	Value	See Table	Control
1	Drive	0 - 127	0 - 127		●
2	AMP Type	Off,Stack,Combo,Tube	0 - 3	table#3	
3	LPF Cutoff	1.0k - Thru	34 - 60		
4	Output Level	0 - 127	0 - 127		
5					
6					
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		
11	Edge(Clip Curve)	0 - 127	0 - 127	mild - sharp	
12					
13					
14					
15					
16					

3BAND EQ(MONO) (variation block)

No.	Parameter	Display	Value	See Table	Control
1	EQ Low Gain	-12 - +12dB	52 - 76	table#3	
2	EQ Mid Frequency	500Hz - 10.0kHz	28 - 54		
3	EQ Mid Gain	-12 - +12dB	52 - 76		
4	EQ Mid Width	1.0 - 12.0	10 - 120	table#3	
5	EQ High Gain	-12 - +12dB	52 - 76		
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ High Frequency	500Hz - 16.0kHz	28 - 58		
8					
9					
10					
11					
12					
13					
14					
15					
16					

2BAND EQ(STEREO) (variation block)

No.	Parameter	Display	Value	See Table	Control
1	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
2	EQ Low Gain	-12 - +12dB	52 - 76		
3	EQ High Frequency	500Hz - 16.0kHz	28 - 58		
4	EQ High Gain	-12 - +12dB	52 - 76		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

AUTO WAH (variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0 - 127	table#1	
2	LFO Depth	0 - 127	0 - 127		
3	Cutoff Frequency Offset	0 - 127	0 - 127		
4	Resonance	1.0 - 12.0	10 - 120		
5					
6	EQ Low Frequency	50Hz - 2.0kHz	8 - 40	table#3	
7	EQ Low Gain	-12 - +12dB	52 - 76		
8	EQ High Frequency	500Hz - 16.0kHz	28 - 58	table#3	
9	EQ High Gain	-12 - +12dB	52 - 76		
10	Dry/Wet	D63>W - D=W - D<W63	1 - 127		
11					
12					
13					
14					
15					
16					

Effect Data Assign Table

table#1

LFO Frequency			
Data	Value	Data	Value
0	0.00	64	0.69
1	0.04	65	2.77
2	0.08	66	2.86
3	0.12	67	2.94
4	0.16	68	3.02
5	0.21	69	3.11
6	0.25	70	3.19
7	0.29	71	3.28
8	0.33	72	3.36
9	0.37	73	3.44
10	0.42	74	3.53
11	0.46	75	3.61
12	0.50	76	3.70
13	0.54	77	3.86
14	0.58	78	4.03
15	0.63	79	4.20
16	0.67	80	4.37
17	0.71	81	4.54
18	0.75	82	4.71
19	0.79	83	4.87
20	0.84	84	5.04
21	0.88	85	5.21
22	0.92	86	5.38
23	0.96	87	5.55
24	1.00	88	5.72
25	1.05	89	6.05
26	1.09	90	6.39
27	1.13	91	6.72
28	1.17	92	7.06
29	1.22	93	7.40
30	1.26	94	7.73
31	1.30	95	8.07
32	1.34	96	8.41
33	1.38	97	8.74
34	1.43	98	9.08
35	1.47	99	9.42
36	1.51	100	9.75
37	1.55	101	10.0
38	1.59	102	10.7
39	1.64	103	11.4
40	1.68	104	12.1
41	1.72	105	12.7
42	1.76	106	13.4
43	1.80	107	14.1
44	1.85	108	14.8
45	1.89	109	15.4
46	1.93	110	16.1
47	1.97	111	16.8
48	2.01	112	17.5
49	2.06	113	18.1
50	2.10	114	19.5
51	2.14	115	20.8
52	2.18	116	22.2
53	2.22	117	23.5
54	2.27	118	24.8
55	2.31	119	26.2
56	2.35	120	27.5
57	2.39	121	28.9
58	2.43	122	30.2
59	2.48	123	31.6
60	2.52	124	32.9
61	2.56	125	34.3
62	2.60	126	37.0
63	2.65	127	39.7

table#2

Modulation Delay Offset			
Data	Value	Data	Value
0	0.0	64	6.4
1	0.1	65	6.5
2	0.2	66	6.6
3	0.3	67	6.7
4	0.4	68	6.8
5	0.5	69	6.9
6	0.6	70	7.0
7	0.7	71	7.1
8	0.8	72	7.2
9	0.9	73	7.3
10	1.0	74	7.4
11	1.1	75	7.5
12	1.2	76	7.6
13	1.3	77	7.7
14	1.4	78	7.8
15	1.5	79	7.9
16	1.6	80	8.0
17	1.7	81	8.1
18	1.8	82	8.2
19	1.9	83	8.3
20	2.0	84	8.4
21	2.1	85	8.5
22	2.2	86	8.6
23	2.3	87	8.7
24	2.4	88	8.8
25	2.5	89	8.9
26	2.6	90	9.0
27	2.7	91	9.1
28	2.8	92	9.2
29	2.9	93	9.3
30	3.0	94	9.4
31	3.1	95	9.5
32	3.2	96	9.6
33	3.3	97	9.7
34	3.4	98	9.8
35	3.5	99	9.9
36	3.6	100	10.0
37	3.7	101	11.1
38	3.8	102	12.2
39	3.9	103	13.3
40	4.0	104	14.4
41	4.1	105	15.5
42	4.2	106	17.1
43	4.3	107	18.6
44	4.4	108	20.2
45	4.5	109	21.8
46	4.6	110	23.3
47	4.7	111	24.9
48	4.8	112	26.5
49	4.9	113	28.0
50	5.0	114	29.6
51	5.1	115	31.2
52	5.2	116	32.8
53	5.3	117	34.3
54	5.4	118	35.9
55	5.5	119	37.5
56	5.6	120	39.0
57	5.7	121	40.6
58	5.8	122	42.2
59	5.9	123	43.7
60	6.0	124	45.3
61	6.1	125	46.9
62	6.2	126	48.4
63	6.3	127	50.0

table#3

EQ Frequency	
Data	Value
0	THRU(20)
1	22
2	25
3	28
4	32
5	36
6	40
7	45
8	50
9	56
10	63
11	70
12	80
13	90
14	100
15	110
16	125
17	140
18	160
19	180
20	200
21	225
22	250
23	280
24	315
25	355
26	400
27	450
28	500
29	560
30	630
31	700
32	800
33	900
34	1.0k
35	1.1k
36	1.2k
37	1.4k
38	1.6k
39	1.8k
40	2.0k
41	2.2k
42	2.5k
43	2.8k
44	3.2k
45	3.6k
46	4.0k
47	4.5k
48	5.0k
49	5.6k
50	6.3k
51	7.0k
52	8.0k
53	9.0k
54	10.0k
55	11.0k
56	12.0k
57	14.0k
58	16.0k
59	18.0k
60	THRU(20.0k)

table#4

Reverb time			
Data	Value	Data	Value
0	0.3	64	17.0
1	0.4	65	18.0
2	0.5	66	19.0
3	0.6	67	20.0
4	0.7	68	25.0
5	0.8	69	30.0
6	0.9		
7	1.0		
8	1.1		
9	1.2		
10	1.3		
11	1.4		
12	1.5		
13	1.6		
14	1.7		
15	1.8		
16	1.9		
17	2.0		
18	2.1		
19	2.2		
20	2.3		
21	2.4		
22	2.5		
23	2.6		
24	2.7		
25	2.8		
26	2.9		
27	3.0		
28	3.1		
29	3.2		
30	3.3		
31	3.4		
32	3.5		
33	3.6		
34	3.7		
35	3.8		
36	3.9		
37	4.0		
38	4.1		
39	4.2		
40	4.3		
41	4.4		
42	4.5		
43	4.6		
44	4.7		
45	4.8		
46	4.9		
47	5.0		
48	5.5		
49	6.0		
50	6.5		
51	7.0		
52	7.5		
53	8.0		
54	8.5		
55	9.0		
56	9.5		
57	10.0		
58	11.0		
59	12.0		
60	13.0		
61	14.0		
62	15.0		
63	16.0		

table#5

Delay Time(200.0ms)			
Data	Value	Data	Value
0	0.1	64	100.8
1	1.7	65	102.4
2	3.2	66	104.0
3	4.8	67	105.6
4	6.4	68	107.1
5	8.0	69	108.7
6	9.5	70	110.3
7	11.1	71	111.9
8	12.7	72	113.4
9	14.3	73	115.0
10	15.8	74	116.6
11	17.4	75	118.2
12	19.0	76	119.7
13	20.6	77	121.3
14	22.1	78	122.9
15	23.7	79	124.4
16	25.3	80	126.0
17	26.9	81	127.6
18	28.4	82	129.2
19	30.0	83	130.7
20	31.6	84	132.3
21	33.2	85	133.9
22	34.7	86	135.5
23	36.3	87	137.0
24	37.9	88	138.6
25	39.5	89	140.2
26	41.0	90	141.8
27	42.6	91	143.3
28	44.2	92	144.9
29	45.7	93	146.5
30	47.3	94	148.1
31	48.9	95	149.6
32	50.5	96	151.2
33	52.0	97	152.8
34	53.6	98	154.4
35	55.2	99	155.9
36	56.8	100	157.5
37	58.3	101	159.1
38	59.9	102	160.6
39	61.5	103	162.2
40	63.1	104	163.8
41	64.6	105	165.4
42	66.2	106	166.9
43	67.8	107	168.5
44	69.4	108	170.1
45	70.9	109	171.7
46	72.5	110	173.2
47	74.1	111	174.8
48	75.7	112	176.4
49	77.2	113	178.0
50	78.8	114	179.5
51	80.4	115	181.1
52	81.9	116	182.7
53	83.5	117	184.3
54	85.1	118	185.8
55	86.7	119	187.4
56	88.2	120	189.0
57	89.8	121	190.6
58	91.4	122	192.1
59	93.0	123	193.7
60	94.5	124	195.3
61	96.1	125	196.9
62	97.7	126	198.4
63	99.3	127	200.0

table#6
Room Size

Data	Value
0	0.1
1	0.3
2	0.4
3	0.6
4	0.7
5	0.9
6	1.0
7	1.2
8	1.4
9	1.5
10	1.7
11	1.8
12	2.0
13	2.1
14	2.3
15	2.5
16	2.6
17	2.8
18	2.9
19	3.1
20	3.2
21	3.4
22	3.5
23	3.7
24	3.9
25	4.0
26	4.2
27	4.3
28	4.5
29	4.6
30	4.8
31	5.0
32	5.1
33	5.3
34	5.4
35	5.6
36	5.7
37	5.9
38	6.1
39	6.2
40	6.4
41	6.5
42	6.7
43	6.8
44	7.0

table#7
Delay Time(400.0ms)

Data	Value	Data	Value
0	0.1	64	201.6
1	3.2	65	204.8
2	6.4	66	207.9
3	9.5	67	211.1
4	12.7	68	214.2
5	15.8	69	217.4
6	19.0	70	220.5
7	22.1	71	223.7
8	25.3	72	226.8
9	28.4	73	230.0
10	31.6	74	233.1
11	34.7	75	236.3
12	37.9	76	239.4
13	41.0	77	242.6
14	44.2	78	245.7
15	47.3	79	248.9
16	50.5	80	252.0
17	53.6	81	255.2
18	56.8	82	258.3
19	59.9	83	261.5
20	63.1	84	264.6
21	66.2	85	267.7
22	69.4	86	270.9
23	72.5	87	274.0
24	75.7	88	277.2
25	78.8	89	280.3
26	82.0	90	283.5
27	85.1	91	286.6
28	88.3	92	289.8
29	91.4	93	292.9
30	94.6	94	296.1
31	97.7	95	299.2
32	100.9	96	302.4
33	104.0	97	305.5
34	107.2	98	308.7
35	110.3	99	311.8
36	113.5	100	315.0
37	116.6	101	318.1
38	119.8	102	321.3
39	122.9	103	324.4
40	126.1	104	327.6
41	129.2	105	330.7
42	132.4	106	333.9
43	135.5	107	337.0
44	138.6	108	340.2
45	141.8	109	343.3
46	144.9	110	346.5
47	148.1	111	349.6
48	151.2	112	352.8
49	154.4	113	355.9
50	157.5	114	359.1
51	160.7	115	362.2
52	163.8	116	365.4
53	167.0	117	368.5
54	170.1	118	371.7
55	173.3	119	374.8
56	176.4	120	378.0
57	179.6	121	381.1
58	182.7	122	384.3
59	185.9	123	387.4
60	189.0	124	390.6
61	192.2	125	393.7
62	195.3	126	396.9
63	198.5	127	400.0

table#8
Reverb Width;Depth;Height

Data	Value	Data	Value
0	0.5	64	17.6
1	0.8	65	17.9
2	1.0	66	18.2
3	1.3	67	18.5
4	1.5	68	18.8
5	1.8	69	19.1
6	2.0	70	19.4
7	2.3	71	19.7
8	2.6	72	20.0
9	2.8	73	20.2
10	3.1	74	20.5
11	3.3	75	20.8
12	3.6	76	21.1
13	3.9	77	21.4
14	4.1	78	21.7
15	4.4	79	22.0
16	4.6	80	22.4
17	4.9	81	22.7
18	5.2	82	23.0
19	5.4	83	23.3
20	5.7	84	23.6
21	5.9	85	23.9
22	6.2	86	24.2
23	6.5	87	24.5
24	6.7	88	24.9
25	7.0	89	25.2
26	7.2	90	25.5
27	7.5	91	25.8
28	7.8	92	26.1
29	8.0	93	26.5
30	8.3	94	26.8
31	8.6	95	27.1
32	8.8	96	27.5
33	9.1	97	27.8
34	9.4	98	28.1
35	9.6	99	28.5
36	9.9	100	28.8
37	10.2	101	29.2
38	10.4	102	29.5
39	10.7	103	29.9
40	11.0	104	30.2
41	11.2		
42	11.5		
43	11.8		
44	12.1		
45	12.3		
46	12.6		
47	12.9		
48	13.1		
49	13.4		
50	13.7		
51	14.0		
52	14.2		
53	14.5		
54	14.8		
55	15.1		
56	15.4		
57	15.6		
58	15.9		
59	16.2		
60	16.5		
61	16.8		
62	17.1		
63	17.3		

MIDI Data Format

“MIDI Data Format” lists data and values in decimal, binary, and hexadecimal. Hexadecimal values have “H (hexadecimal)” at the beginning of the data line or at the end of the values.

Refer to the following table when you enter data values.

decimal	hexadecimal	binary	decimal	hexadecimal	binary
0	00	0000 0000	64	40	0100 0000
1	01	0000 0001	65	41	0100 0001
2	02	0000 0010	66	42	0100 0010
3	03	0000 0011	67	43	0100 0011
4	04	0000 0100	68	44	0100 0100
5	05	0000 0101	69	45	0100 0101
6	06	0000 0110	70	46	0100 0110
7	07	0000 0111	71	47	0100 0111
8	08	0000 1000	72	48	0100 1000
9	09	0000 1001	73	49	0100 1001
10	0A	0000 1010	74	4A	0100 1010
11	0B	0000 1011	75	4B	0100 1011
12	0C	0000 1100	76	4C	0100 1100
13	0D	0000 1101	77	4D	0100 1101
14	0E	0000 1110	78	4E	0100 1110
15	0F	0000 1111	79	4F	0100 1111
16	10	0001 0000	80	50	0101 0000
17	11	0001 0001	81	51	0101 0001
18	12	0001 0010	82	52	0101 0010
19	13	0001 0011	83	53	0101 0011
20	14	0001 0100	84	54	0101 0100
21	15	0001 0101	85	55	0101 0101
22	16	0001 0110	86	56	0101 0110
23	17	0001 0111	87	57	0101 0111
24	18	0001 1000	88	58	0101 1000
25	19	0001 1001	89	59	0101 1001
26	1A	0001 1010	90	5A	0101 1010
27	1B	0001 1011	91	5B	0101 1011
28	1C	0001 1100	92	5C	0101 1100
29	1D	0001 1101	93	5D	0101 1101
30	1E	0001 1110	94	5E	0101 1110
31	1F	0001 1111	95	5F	0101 1111
32	20	0010 0000	96	60	0110 0000
33	21	0010 0001	97	61	0110 0001
34	22	0010 0010	98	62	0110 0010
35	23	0010 0011	99	63	0110 0011
36	24	0010 0100	100	64	0110 0100
37	25	0010 0101	101	65	0110 0101
38	26	0010 0110	102	66	0110 0110
39	27	0010 0111	103	67	0110 0111
40	28	0010 1000	104	68	0110 1000
41	29	0010 1001	105	69	0110 1001
42	2A	0010 1010	106	6A	0110 1010
43	2B	0010 1011	107	6B	0110 1011
44	2C	0010 1100	108	6C	0110 1100
45	2D	0010 1101	109	6D	0110 1101
46	2E	0010 1110	110	6E	0110 1110
47	2F	0010 1111	111	6F	0110 1111
48	30	0011 0000	112	70	0111 0000
49	31	0011 0001	113	71	0111 0001
50	32	0011 0010	114	72	0111 0010
51	33	0011 0011	115	73	0111 0011
52	34	0011 0100	116	74	0111 0100
53	35	0011 0101	117	75	0111 0101
54	36	0011 0110	118	76	0111 0110
55	37	0011 0111	119	77	0111 0111
56	38	0011 1000	120	78	0111 1000
57	39	0011 1001	121	79	0111 1001
58	3A	0011 1010	122	7A	0111 1010
59	3B	0011 1011	123	7B	0111 1011
60	3C	0011 1100	124	7C	0111 1100
61	3D	0011 1101	125	7D	0111 1101
62	3E	0011 1110	126	7E	0111 1110
63	3F	0011 1111	127	7F	0111 1111

Notes

- Besides the table listed above, for example, values 144 - 159 (decimal)/9nH/1001 0000 - 1001 1111 (binary) indicate Note On message for each channel (1-16). Values 175 - 191/BnH/1011 0000 - 1011 1111 indicate Control Change message for each channel (1-16). Values 192 - 207/CnH/1100 0000 - 1100 1111 indicate Program Change message for each channel (1-16). Values 240/F0H/1111 0000 indicate the beginning of System Exclusive message. Values 247/F7H/1111 0111 indicate the end of System Exclusive message.
- “aaH (hexadecimal)/0aaaaaaa (binary)” indicate data addresses that contain High, Mid, and Low.
- “bbH/0bbbbb” indicate byte count.
- “ccH/0cccccc” indicate checksum

Panel sound source

(1) Transmission

ID#	KEY ON/OFF	9nH
OUT		
	---CONTROL CHANGE	BnH
	BANK SELECT MSB	BnH,00H
	BANK SELECT LSB	BnH,20H
	VOLUME	BnH,07H
	PANPOT	BnH,0AH
	EXPRESSION	BnH,0BH
	SUSTAIN	BnH,40H
	SOSTENUTE	BnH,42H
	SOFT PEDAL	BnH,43H
	REVERB SEND LEVEL	BnH,5BH
	CHORUS SEND LEVEL	BnH,5DH
	VARIATION SEND LEVEL	BnH,5EH
	ALL SOUND OFF	BnH,78H
	RESET ALL CONTROLLERS	BnH,79H
	ALL NOTE OFF	BnH,7BH
	---PROGRAM CHANGE	CnH
	---PITCH BEND CHANGE	EnH
	-----SYSTEM EXCLUSIVE MESSAGE	
	<YAMAHA MIDI FORMAT>	
	<UNIVERSAL>	
	----- UNIVERSAL REALTIME	F0H 7FH.....F7H
	----- UNIVERSAL NON-REALTIMEF0H	7EH.....F7H
	<XG STANDARD>	
	----- XG PARAMETER CHANGE	F0H 43H 1nH 4CH aaH aaH aaH ddH.....ddH F7H
	<XG BULK DUMP>	F0H 43H 0nH 4CH bbH bbH aaH aaH aaH ddH.....ddH cch F7H
	<CLAVINOVA MIDI COMPLIANCE>	
	<SPECIAL OPERATORS>	
	-----SYSTEM REALTIME MESSAGE	
	MIDI CLOCK	F8H
	START	FAH
	STOP	FCH
	ACTIVE SENSING	FEH

(2) Reception

```

MIDI<-----KEY OFF      8nH
IN
|
| +---KEY ON/OFF          9nH
|
| +---CONTROL CHANGE
|   BANK SELECT MSB      BnH,00H
|   BANK SELECT LSB      BnH,20H
|   DATA ENTRY MSB      BnH,06H
|   DATA ENTRY LSB      BnH,26H
|   MAIN VOLUME          BnH,07H
|   PANPOT               BnH,0AH
|   EXPRESSION           BnH,0BH
|   SUSTAIN              BnH,40H
|   SOSTENUTO            BnH,42H
|   SOFT PEDAL          BnH,43H
|   REVERB SEND LEVEL    BnH,5BH
|   CHORUS SEND LEVEL    BnH,5DH
|   VARIATION SEND LEVEL BnH,5EH
|   DATA INCREMENT      BnH,60H
|   DATA DECREMENT      BnH,61H
|   RPN LSB              BnH,64H
|   RPN MSB              BnH,65H
|   PITCH BEND SENS.     BnH,65H,00H,64H,00H,06H,mmH
|   FINE TUNING          BnH,65H,00H,64H,01H,06H,mmH,
|                       26H,llH
|   COARSE TUNING       BnH,65H,00H,64H,02H,06H,mmH
|   NULL                 BnH,65H,7FH,64H,7FH
|   ALL SOUND OFF        BnH,78H,00H
|   RESET ALL CONTROLLERS BnH,79H,00H
|   LOCAL CONTROL        BnH,7AH,00H
|   ALL NOTES OFF        BnH,7BH,00H
|   OMNI OFF             BnH,7CH,00H
|   OMNI ON              BnH,7DH,00H
|   MONO                 BnH,7EH
|   POLY                 BnH,7FH
|
| +---PROGRAM CHANGE      CnH
|
| +---PITCH BEND CHANGE   EnH
|
| +---SYSTEM EXCLUSIVE MESSAGE
|   <YAMAHA MIDI FORMAT>
|   <UNIVERSAL>
|   ----- UNIVERSAL REALTIME
|   ----- UNIVERSAL NON-REALTIME
|   <XG STANDARD>
|   ----- XG PARAMETER CHANGE
|   F0H 43H 1nH 4CH aaH aaH aaH
|
| ddH.....ddH F7H
|   ----- XG BULK DUMP
|   F0H 43H 0nH 4CH bbH bbH aaH aaH
|
| aaH ddH.....ddH ccH F7H
|   ----- PARAMETER REQUEST
|   ----- DUMP REQUEST
|   <CLAVINOVA MIDI COMPLIANCE>
|   <SPECIAL OPERATORS>
|   <Others>
|
| +---SYSTEM REALTIME MESSAGE
|   MIDI CLOCK          F8H
|   START               FAH
|   STOP                FCH
|   ACTIVE SENSING      FEH
    
```

(3) Transmission/reception

(3-1) CHANNEL VOICE MESSAGES

(3-1-1) KEY OFF

```

STATUS      1000nnnn (8nH)   n = 0 - 15 VOICE CHANNEL NUMBER
NOTE NUMBER 0kkkkkkk        k = 0 (C-2) - 127 (G8)
VELOCITY    0vvvvvvvv       "v" is ignored.
    
```

(3-1-2) KEY ON/OFF

```

STATUS      1001nnnn (9nH)   n = 0 - 15 VOICE CHANNEL NUMBER
NOTE NUMBER 0kkkkkkk        k = 0 (C-2) - 127 (G8)
VELOCITY    0vvvvvvvv       (v≠0) NOTE ON
                                   (v=0) NOTE OFF
    
```

(3-1-3) PROGRAM CHANGE

```

STATUS      1100nnnn (CnH)   n = 0 - 15 VOICE CHANNEL NUMBER
PROGRAM NUMBER0ppppppp       p = 0 - 127
    
```

Voice name	Bank MSB	Bank LSB	PROGRAM CHANGE
GrandPiano1	0	112	0
GrandPiano2	0	112	1
E.Piano1	0	112	5
E.Piano2	0	112	4
SynthPiano	0	112	88
WoodBass	0	112	32
ElectricBass	0	112	33
Bass&Cymbal	0	114	32
Harpsichord 8'	0	112	6
Harpsichord 8'+4'	0	113	6
ElectricClavichord	0	112	7
Vibraphone	0	112	11
Marimba	0	112	12
Celesta	0	112	8
PipeOrganPrincipal	0	113	19
PipeOrganFlute1	0	114	19
PipeOrganFlute2	0	115	19
PipeOrganTutti	0	112	19
JazzOrgan	0	112	16
Strings	0	113	48
SynthStrings	0	112	48
SlowStrings	0	113	49
Choir	0	112	52
SlowChoir	0	113	52
Scat	0	112	53

(3-1-4) PITCH BEND CHANGE (Only reception)

```

STATUS      1110nnnn (EnH)   n = 0 - 15 VOICE CHANNEL NUMBER
LSB         0vvvvvvv         PITCH BEND CHANGE LSB
MSB         0vvvvvvv         PITCH BEND CHANGE MSB
    
```

(3-1-5) CONTROL CHANGE

```

STATUS      1011nnnn (BnH)   n = 0 - 15 VOICE CHANNEL NUMBER
CONTROL NUMBER 0cccceccc
CONTROL VALUE 0vvvvvvv
    
```

* Transmitted control numbers

c = 0	BANK SELECT MSB	; v = 0: PANEL VOICE
c = 32	BANK SELECT LSB	; v = 0 - 127
c = 11	EXPRESSION	; v = 0 - 127
c = 64	SUSTAIN	; v = 0 - 127
c = 66	SOSTENUTO	; v = 0: OFF, 127: ON
c = 67	SOFT PEDAL	; v = 0: OFF, 127: ON
c = 91	REVERB SEND LEVEL	; v = 0 - 127
c = 93	CHORUS SEND LEVEL	; v = 0 - 127
c = 94	VARIATION SEND LEVEL	; v = 0 - 127

MIDI Data Format

* Receiving control numbers

c = 0	BANK SELECT MSB	; v = 0: PANEL VOICE
c = 32	BANK SELECT LSB	; v = 0 - 127
c = 6	DATA ENTRY MSB	; v = 0 - 127*1
c = 38	DATA ENTRY LSB	; v = 0 - 127*1
c = 7	MAIN VOLUME	; v = 0 - 127
c = 10	PANPOT	; v = 0 - 127
c = 11	EXPRESSION	; v = 0 - 127
c = 64	SUSTAIN	; v = 0 - 127
c = 66	SOSTENUTO	; v = 0-63: OFF , 64-127: ON
c = 67	SOFT PEDAL	; v = 0-63: OFF , 64-127: ON
c = 91	REVERB SEND LEVEL	; v = 0 - 127
c = 93	CHORUS SEND LEVEL	; v = 0 - 127
c = 94	VARIATION SEND LEVEL	; v = 0 - 127
c = 96	DATA INCREMENT	; v = 127*1
c = 97	DATA DECREMENT	; v = 127*1

*1: Used only for setting the parameters with the specified RPN.

Processing the Bank Select message is deferred until the Program Change is received. To change the voices (including the voice banks), transmit Bank Select MSB, LSB, then Program Change in this order as a set.

(3-2) CHANNEL MODE MESSAGES

STATUS	1011nnnn (BnH)	n = 0 - 15 VOICE CHANNEL NUMBER
CONTROL NUMBER	0cccccc	c = CONTROL NUMBER
CONTROL VALUE	0vvvvvv	v = DATA VALUE

(3-2-1) ALL SOUND OFF (Only reception) (CONTROL NUMBER = 78H , DATA VALUE = 0)

All voicing sounds on the corresponding channel(s) are muted. Note On and Hold On Channel messages are also erased.

(3-2-2) RESET ALL CONTROLLERS (Only reception) (CONTROL NUMBER = 79H , DATA VALUE = 0)

The following controller values are reset.

PITCH BEND CHANGE	0 (mid point)
EXPRESSION	127 (max)
SUSTAIN	0 (off)
SOSTENUTO	0 (off)
SOFT PEDAL	0 (off)
RPN	The number is not specified. The internal data does not change.

(3-2-3) ALL NOTES OFF (Only reception) (CONTROL NUMBER = 7BH , DATA VALUE = 0)

All notes (that are on) are turned off. If sustain or sostenuto is on, the corresponding note does not stop voicing until sustain or sostenuto is turned off.

(3-2-4) OMNI OFF (Only reception) (CONTROL NUMBER = 7CH , DATA VALUE = 0)

Same process as when All Notes Off message is received.

(3-2-5) OMNI ON (Only reception) (CONTROL NUMBER = 7DH , DATA VALUE = 0)

Same process as when All Notes Off message is received. It does not set OMNI On.

(3-2-6) MONO (Only reception) (CONTROL NUMBER = 7EH , DATA VALUE = 0)

Same process as when All Sound Off message is received.

(3-2-7) POLY (Only reception) (CONTROL NUMBER = 7FH , DATA VALUE = 0)

Same process as when All Notes Off message is received.

(3-3) REGISTERED PARAMETER NUMBER (RPN) (Only reception)

STATUS	1011nnnn (BnH)	n = 0 - 15 VOICE CHANNEL NUMBER
RPN LSB	01100100 (64H)	
RPN LSB NUMBER	0ppppppp	p = RPN LSB (Refer to below)
RPN MSB	01100101 (65H)	
RPN MSB NUMBER	0qqqqqqq	q = RPN MSB (Refer to below)
DATA ENTRY MSB	00000110 (06H)	
DATA VALUE	0mmmmmmm	m = Data Value
DATA ENTRY LSB	00100110 (26H)	
DATA VALUE	0lllllll	l = Data Value

Specify the parameter with RPN MSB/LSB, then set the parameter value with data entry MSB/LSB.

RPN	D.ENTRY		
LSB MSB	MSB LSB	PARAMETER NAME	DATA RANGE
00H 00H	mmH ---	PITCH BEND SENSITIVITY	00H - 18H (0 - 24 semitone)
01H 00H	mmH llH	FINE TUNE {mmH, llH} = {00H, 00H} - {40H, 00H} - (7FH, 7FH)	(-8192*100/8192) - 0 - (+8192*100/8192)
02H 00H	mmH ---	COARSE TUNE	28H - 40H - 58H (-24 - 0 - +24 semitone)
7FH 7FH	--- ---	NULL	The RPN number is not specified. It does not affect the internal settings.

(3-4) SYSTEM REALTIME MESSAGES (Only transmission)

(3-4-1) MIDI CLOCK

STATUS 11111000 (F8H)

Transmission: Transmitted in a 1/24 beat timing.

(3-4-2) START

STATUS 11111010 (FAH)

Transmission: The message is output when song playback on the instrument starts.
Reception: Song playback or song recording starts, depending on the state of the instrument.

(3-4-3) STOP

STATUS 11111100 (FCH)

Transmission: The message is output when song playback on the instrument stops.
Reception: Song playback or song recording stops, depending on the state of the instrument.

(3-4-4) ACTIVE SENSING

STATUS 11111110 (FEH)

This message is transmitted about every 200 msec.

When the instrument receives this code, it starts "sensing." If it does not receive any status information or other data, the instrument clears the MIDI reception buffer and forces off all voicing notes and sustain. All Control values are reset to their default settings.

(3-5) SYSTEM EXCLUSIVE MESSAGE

(3-5-1) UNIVERSAL SYSTEM EXCLUSIVE

(3-5-1-1) UNIVERSAL REALTIME MESSAGE

(3-5-1-1-1) MIDI MASTER VOLUME (Only reception)

binary	hexadecimal	
11110000	F0	Exclusive status
01111111	7F	Universal Realtime
01111111	7F	ID of target Device
00000100	04	Sub-ID #1=Device Control Message
00000001	01	Sub-ID #2=Master Volume
0sssssss	SS	Volume LSB
0ttttttt	TT	Volume MSB
11110111	F7	End of Exclusive
or		
11110000	F0	Exclusive status
01111110	7F	Universal Realtime
0xxxxnmm	XN	When N is received N=0-F, whichever is received. When N is transmitted N always=0. X = don't care
00000100	04	Sub-ID #1=Device Control Message
00000001	01	Sub-ID #2=Master Volume
0sssssss	SS	Volume LSB
0ttttttt	TT	Volume MSB
11110111	F7	End of Exclusive

All channel volume level is changed simultaneously.
Value "TT" is used as the master volume level. (Value "SS" is ignored.)

(3-5-1-2) UNIVERSAL NON REALTIME MESSAGE

(3-5-1-2-1) GENERAL MIDI SYSTEM ON

binary	hexadecimal	
11110000	F0	Exclusive status
01111110	7E	Universal Non-Realtime
01111111	7F	ID of target Device
00001001	09	Sub-ID #1=General MIDI Message
00000001	01	Sub-ID #2=General MIDI On
11110111	F7	End of Exclusive
or		
11110000	F0	Exclusive status
01111110	7E	Universal Non-Realtime
0xxxxnnn	XN	When N is received N=0-F, whichever is received.
		When N is transmitted N always=0.
		X = don't care
00001001	09	Sub-ID #1=General MIDI Message
00000001	01	Sub-ID #2=General MIDI On
11110111	F7	End of Exclusive

Upon receiving an "On" message, System Mode is changed to "XG." All Control data values except for the master tuning setting are reset to the default values.

Executing this message takes about 50ms. There should be a sufficient interval between this and the next message.

(3-5-2) XG STANDARD

(3-5-2-1) XG PARAMETER CHANGE

(3-5-2-1-1) XG SYSTEM ON

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1N	Device Number
01001100	4C	Model ID
00000000	00	Address High
00000000	00	Address Mid
01111110	7E	Address Low
00000000	00	Data
11110111	F7	End of Exclusive

Upon receiving an "On" message, System Mode is changed to "XG." All Controllers are reset, and all MultiPart data is shown in the table, and all "All System" data with (XG) mark is reset to the default values.

Executing this message takes about 50ms. There should be a sufficient interval between this and the next message.

(3-5-2-1-2) XG PARAMETER CHANGE

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1N	Device Number
01001100	4C	Model ID
0aaaaaaa	AA	Address High
0aaaaaaa	AA	Address Mid
0aaaaaaa	AA	Address Low
0ddddd	DD	Data
11110111	F7	End of Exclusive

If the data size of the parameter is 2 or 4, the amount of data that corresponds to the size is transmitted.

Refer to the table on page 128 for more information on the address and parameters.

The following two types of data are transmitted and received. (The data is transmitted only when Parameter Change Request is received.)

- XG System Data
- Multi Part Data

(3-5-3) SPECIAL OPERATORS

(3-5-3-1) SPLIT POINT

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
00000001	01	Common
00010001	11	Sub ID
00000000	00	
00010100	14	Split Point
0ddddd	DD	Split Key No.
11110111	F7	End of Exclusive

(3-5-3-2) VOLUME, EXPRESSION AND PAN REALTIME CONTROL OFF

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
00000001	01	Common
00010001	11	Sub ID
0000nnnn	0N	N = MIDI Channel
01001001	45	Volume and Expression Realtime Control Off
0vvvvvvv	VV	Value VV: On=7FH, off=00H
11110111	F7	End of Exclusive

After this Exclusive On message is received, any change to Volume and Expression becomes effective only at the time of key on. When Exclusive Off message is received, the settings return to normal.

(3-5-3-3) Panel Reverb Type

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00000000	00	Panel Reverb Type
0ddddd	DD	DD: 0 (Room), 1 (Hall1), 2 (Hall2), 3 (Stage), 4 (Plate)
11110111	F7	End of Exclusive

(3-5-3-4) Panel Chorus Type

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00000001	01	Panel Chorus Type
0ddddd	DD	DD: 0 (Chorus), 1 (Celeste), 2 (Flanger)
11110111	F7	End of Exclusive

(3-5-3-5) Panel Variation Type

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00000010	02	Panel Variation Type
0ddddd	DD	DD: 0 (DelayLCR), 1 (DelayLR), 2 (Echo), 3 (CrossDelay), 4 (Symphonic), 5 (RotarySpeaker), 6 (Tremolo), 7 (VibeRotor), 8 (AutoPan), 9 (Phaser), 10 (AutoWah), 11 (SoundBoardRev), 12 (Off)
11110111	F7	End of Exclusive

(3-5-3-6) Vibe Rotor Control

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00001000	08	Vibe Rotor Control
0ddddd	DD	DD: On=7FH, Off=00H
11110111	F7	End of Exclusive

(3-5-3-7) Velocity Sense Depth

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00001001	09	Velocity Sense Depth
0ddddd	DD	DD: 00H - 7FH
11110111	F7	End of Exclusive

(3-5-3-8) Velocity Sense Offset

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00001010	0A	Velocity Sense Offset
0ddddd	DD	DD: 00H - 7FH
11110111	F7	End of Exclusive

(3-5-3-9) Rotary Speed Control

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	Clavinova ID
01101000	68	CLP-990
00110001	31	Sub ID
00000000	00	don't care
00001110	0E	Rotary Speed Control
0ddddd	DD	DD: On=7FH, Off=00H
11110111	F7	End of Exclusive

MIDI Data Format

(3-5-3-10) Key-off sound start

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	CLP-990
00000001	01	Common
00110001	31	Sub ID
0000nnnn	0N	N=MIDI Channel
00010000	10	Key-off sound enable
0kkkkkkk	KK	Key Note Number
11110111	F7	End of Exclusive

(3-5-3-11) Key-off sound mute

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
01110011	73	CLP-990
00000001	01	Common
00110001	31	Sub ID
0000nnnn	0N	N=MIDI Channel
00001111	0F	Key-off sound mute
0kkkkkkk	KK	Key Note Number
11110111	F7	End of Exclusive

(3-5-4) Others

(3-5-4-1) MIDI MASTER TUNING (Only reception)

binary	hexadecimal	
11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1N	When N is received N=0-F, whichever is received. When N is transmitted N always=0.
00100111	27	Model ID
00110000	30	Sub ID
00000000	00	
00000000	00	
0mmmmmm	MM	Master Tune MSB
0llllllll	LL	Master Tune LSB
0ccccccc	CC	don't care
11110111	F7	End of Exclusive

Tuning of all channels is changed simultaneously.

Values MM and LL are used as the MIDI master tuning value. (Values N and CC are ignored.)

T=M-128

T: Actual tuning value (-99 cents - +99 cents)

M: 0-3 bits of value MM are regarded as MSB, and 0-3 bits of value LL are regarded as LSB.: Byte value (28 - 228)

This setting cannot be reset by GM System On or XG System On.

< Table 1-1 >

Parameter Basic Address

	Parameter Change Address			Description
	(H)	(M)	(L)	
SYSTEM	00	00	00	System
	00	00	7E	XG System On
	00	00	7F	All Parameter Reset
MULTI PART08	00	00		Multi Part 1
	:	:	:	:
	08	0F	00	Multi Part 16
	08	10	00	Reserved
	:	:	:	:
	:	:	:	:

< Table 1-2 >

MIDI Parameter Change table (SYSTEM)

Address (H)	Size	Data	Parameter Name (H) (H)	Description	Default Value(H)
00	00	00	0000	Master Tune	00 04 00 00
		01	..07FF	1st bit3-0 -> bit15-12	(0400)
		02		2nd bit3-0 -> bit11-8	(Not reset by XG/GM On.)
		03		3rd bit3-0 -> bit7-4	
		04	1 00..7F	Master Volume	7F
		05	1	Not Used	
		06	1 28..58	Transpose	40
		7D	n		
		7E	00	XG System On	00=XG System on
		7F	00	All Parameter Reset	00=on (receive only)
TOTAL SIZE 6					

< Table 1-3 >

MIDI Parameter Change table (MULTI PART)

Address (H)	Size	Data	Parameter Name (H) (H)	Description	Default Value (H)
08	nn	01	1 00..7F	Bank Select MSB	7F (Part10), 00 (Others)
	nn	02	1 00..7F	Bank Select LSB	00
	nn	03	1 00..7F	Program Number	00
	nn	08	1 28..58	Note Shift	01 (Part10)
	nn	09	2 00..FF	Detune	40
	nn	0A		1st bit3..0 -> bit7..4	08 00 (80)
	nn	0B	1 00..7F	Volume	0..127
	nn	0C	1 00..7F	Velocity Sense Depth	64
	nn	0D	1 00..7F	Velocity Sense Offset	0..127
	nn	0E	1 00..7F	Pan	40
	nn	11	1 00..7F	Dry Level	L64..C..R63 (0..64..127)
	nn	12	1 00..7F	Dry Level	0..127
	nn	13	1 00..7F	Chorus Send	0..127
	nn	14	1 00..7F	Reverb Send	0..127
	nn	14	1 00..7F	Variation Send	0..127
	nn	23	1 28..58	Bend Pitch Control	0..127
	nn	35	1 00..01	Rev Note Message	-24..+24[semitones]
	nn	35	1 00..01	Rev Note Message	0:OFF 1:ON

XG sound source

1. Channel messages

1.1 Note on/note off

These messages convey keyboard performance data.

Range of note numbers received = 0 (C2)...60 (C3)...127 (G8)
Velocity range = 1...127 (Velocity is received only for note-on)

When the Multi Part parameter "Rcv NOTE MESSAGE" = OFF, that part will not receive these messages.

For a drum part*, key-off is not received if the DrumSetup parameter Rcv NOTE OFF = OFF.

For a drum part, key-on is not received if the DrumSetup parameter Rcv NOTE ON = OFF.

* Drum Part indicates that the Multi Part parameter PART MODE is "set to DRUM, DRUMS1, DRUMS2."

1.2 Control changes

These messages control volume or pan etc.

Their functions are differentiated by the control number (Ctrl#).

If the Multi Part parameter Rcv CONTROL CHANGE = OFF, that part will not receive control changes.

1.2.1 Bank Select

This message selects the voice bank.

Control#	Parameter	Data Range
0	Bank Select MSB	0, 64, 126, 127 (Normal voice, SFX voice, SFX kit, Drum kit)
32	Bank Select LSB	0...127

The Bank Select data will be processed only after a Program Change is received, and then voice bank will change at that time.

If you wish to change the voice bank as well as the voice, you must transmit Bank Select and Program Change messages as a set, in the order of Bank Select MSB, LSB, and Program Change.

1.2.2 Modulation

This message is used primarily to control the depth of vibrato, but the depth of the following 7 types of effect can be controlled.

The effect of this message can be changed by the following parameters.

- Multi Part Parameter
 1. MW PITCH CONTROL
 2. MW FILTER CONTROL
 3. MW AMPLITUDE CONTROL
 4. MW LFO PMOD DEPTH
 5. MW LFO FMOD DEPTH
 6. MW LFO AMOD DEPTH
- Effect1 Parameter
 7. MW VARIATION CONTROL DEPTH
(Valid when Variation Effect is assigned to a part as Insertion)

By default, an LFO Pitch Modulation (PMOD) effect will apply.

Control#	Parameter	Data Range
1	Modulation	0...127

If the Multi Part parameter Rcv MODULATION = OFF, that part will not receive Modulation.

1.2.3 Portamento Time

This message controls the degree of Portamento (refer to 1.2.9).

Control#	Parameter	Data Range
5	Portamento Time	0...127

When Portamento (control number 065) is ON, this regulates the speed of the pitch change.

A value of 0 is the shortest portamento time, and 127 is the longest portamento time.

If the receive channel is a drum part, Portamento Time is not received.

1.2.4 Data Entry

This message sets the value of the parameter which was specified by RPN MSB/LSB (see 1.2.22) and NRPN MSB/LSB (see 1.2.21).

Control#	Parameter	Data Range
6	Data Entry MSB	0...127
38	Data Entry LSB	0...127

1.2.5 Main Volume

This message controls the volume of each part.

This is used to adjust the volume balance between parts.

Control#	Parameter	Data Range
7	Main Volume	0...127

When the Multi Part parameter Rcv VOLUME = OFF, that part will not receive Main Volume.

With a value of 0 there will be no sound, and a value of 127 will be the maximum volume.

1.2.6 Panpot

This message control the panning (stereo location) of each part.

Control#	Parameter	Data Range
10	Pan	0...64...127

When the Multi Part parameter Rcv PAN = OFF, that part will not receive Panpot. 0 is left, 64 is center, and 127 is right.

1.2.7 Expression

This message controls expression (dynamics within a musical line) for each part.

It is used to create volume changes during a song.

Control#	Parameter	Data Range
11	Expression	0...127

If the Multi Part parameter Rcv EXPRESSION = OFF, that part will not receive Expression.

1.2.8 Hold1

This message controls sustain pedal on/off.

Control#	Parameter	Data Range
64	Hold1	0...63,64...127 (OFF, ON)

When this is ON, currently-sounding notes will continue to sound even if note-off messages are received.

If the Multi Part parameter Rcv HOLD1 = OFF, that part will not receive Hold1.

1.2.9 Portamento

This message controls portamento on/off.

Control#	Parameter	Data Range
65	Portamento	0...63,64...127 (OFF, ON)

When this is ON, the pitch will change smoothly between notes. The time over which the pitch changes is adjusted by Portamento Time (see 1.2.3). Also, when the Multi Part parameter MONO/POLY MODE = MONO, the tone will also change smoothly (legato) if Portamento = ON.

If any of the following Multi Part parameter settings apply, that part will not receive Portamento.

- Rcv PORTAMENTO = OFF
- PART MODE = DRUM, DRUMS1, DRUMS2

1.2.10 Sostenuto

This message controls sostenuto pedal on/off.

Control#	Parameter	Data Range
66	Sostenuto	0...63,64...127 (OFF, ON)

If sostenuto is turned on while a note is sounding, that note will be sustained until sostenuto is turned OFF.

If the Multi Part parameter Rcv SOSTENUTO = OFF, that part will not receive Sostenuto.

1.2.11 Soft Pedal

This message controls soft pedal on/off.

Control#	Parameter	Data Range
67	Soft Pedal	0...63,64...127 (OFF, ON)

The sound will become mellower when Soft Pedal is ON.

If any of the following Multi Part parameter settings apply, that part will not receive the Soft Pedal.

- Rcv SOFT PEDAL = OFF
- PART MODE = DRUM, DRUMS1, DRUMS2

1.2.12 Harmonic Content

This message adjusts the resonance of the filter that is specified for the sound.

Control#	Parameter	Data Range
71	Harmonic Content	0...64...127 (-64...0...+63)

Since this is a relative change parameter, it specifies a boost or cut relative to 64.

Higher values will produce a more distinctive sound.

For some sounds, the effective range may be less than the possible range of settings.

1.2.13 Release Time

This message adjusts the EG release time that was specified by the sound data.

Control#	Parameter	Data Range
72	Release Time	0...64...127 (-64...0...+63)

Since this is a relative change parameter, it specifies an increase or decrease relative to 64.

Increasing this value will lengthen the release that follows a note-off.

MIDI Data Format

1.2.14 Attack Time

This message adjusts the EG attack time that was specified by the sound data.

Control#	Parameter	Data Range
73	Attack Time	0...64...127 (-64...0...+63)

Since this a relative change parameter, it specifies an increase or decrease relative to 64. Increasing this value will make the attack more gradual, and decreasing this value will make the attack sharper.

1.2.15 Brightness

This message adjusts the cutoff frequency of the low pass filter specified by the sound data.

Control#	Parameter	Data Range
74	Brightness	0...64...127 (-64...0...+63)

Since this is a relative change parameter, it specifies an increase or decrease relative to 64. Lower values will produce a more mellow sound. For some sounds, the effective range may be less than the possible range of settings.

1.2.16 Portamento Control

This message specifies the portamento source key number (the key number at which portamento will begin).

Data of 0...127 specifies the portamento source key.

When Portamento Control is received, the currently-sounding pitch will change at a Portamento Time of 0 to the key of the next-received note-on of the same channel.

Control#	Parameter	Data Range
84	Portamento Control	0...127 (C-2...G8)

This is received even if Rcv PORTAMENTO = OFF.

1.2.17 Effect1 Depth(Reverb Send Level)

This message specifies the send level for the reverb effect.

Control#	Parameter	Data Range
91	Effect1 Depth	0...127

Increasing this value will produce a richer reverb. The effect of the value will depend on the state of the reverb effect.

1.2.18 Effect3 Depth(Chorus Send Level)

This message specifies the send level for the chorus effect.

Control#	Parameter	Data Range
93	Effect3 Depth	0...127

Raising this value will increase the modulation or spaciousness. The effect of the value will depend on the state of the chorus effect.

1.2.19 Effect4 Depth (Variation Effect Send Level)

This message specifies the send level for the variation effect.

Control#	Parameter	Data Range
94	Effect4 Depth	0...127

However, this is not received if the Variation Effect parameter Variation Connection = 0 (Insertion).

1.2.20 Data Increment/Decrement (for RPN)

This message increases or decreases the parameter value specified for RPN (see 1.2.22), by increments of 1.

Control#	Parameter	Data Range
96	RPN Increment	--
97	RPN Decrement	--

The data byte is ignored.

1.2.21 NRPN (Non-registered parameter number)

This message is used to specify a sound parameter (such as vibrato, filter, EG, drum setup etc.) as an offset value.

Use NRPN MSB and NRPN LSB to specify the parameter that you wish to modify, and then use Data Entry (see 1.2.4) to set the value for the specified parameter.

Control#	Parameter	Data Range
98	NRPN LSB	0...127
99	NRPN MSB	0...127

If the Multi Part parameter Rcv NRPN = OFF, that part will not receive NRPN.

The following NRPN messages can be received.

NRPN MSB	NRPN LSB	Data Entry *1 MSB LSB	Parameter name and value range
01	08	mm -- *2	Vibrato rate mm: 00 - 64 - 127 (-64...0...+63)
01	09	mm --	Vibrato depth mm: 00 - 64 - 127 (-64...0...+63)
01	10	mm --	Vibrato delay mm: 00 - 64 - 127 (-64...0...+63)
01	32	mm --	Low pass filter cutoff f frequency mm: 00 - 64 - 127 (-64...0...+63)
01	33	mm --	Low pass filter resonance mm: 00 - 64 - 127 (-64...0...+63)
01	99	mm --	EG attack time mm: 00 - 64 - 127 (-64...0...+63)
01	100	mm --	EG decay time mm: 00 - 64 - 127 (-64...0...+63)
01	102	mm --	EG release time mm: 00 - 64 - 127 (-64...0...+63)
20	rr	mm --	Drum low pass filter cutoff frequency rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
21	rr	mm --	Drum low pass filter resonance rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
22	rr	mm --	Drum EG attack rate rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
23	rr	mm --	Drum EG decay rate rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63) The effect will apply both to Decay 1 and 2.
24	rr	mm --	Drum instrument pitch coarse rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
25	rr	mm --	Drum instrument pitch fine rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
26	rr	mm --	Drum instrument level rr: drum instrument note number mm: 00 - 127(0...maximum)
28	rr	mm --	Drum instrument panpot rr: drum instrument note number mm: 00, 01-64-127(RND, L63...C...R63)
29	rr	mm --	Drum instrument reverb send level rr: drum instrument note number mm: 00 - 127(0...maximum)
30	rr	mm --	Drum instrument chorus send level rr: drum instrument note number mm: 00 - 127(0...maximum)
31	rr	mm --	Drum instrument variation send level rr: drum instrument note number mm: 00 - 127(0...maximum) (when Variation Connection = SYSTEM) mm: 00, 01-127 (OFF,ON) (when Variation Connection = INSERTION)

MSB 20-31 (for drums) is received when Multi Part parameter PART MODE = DRUMS1, 2.

*1 Refer to 1.2.4

*2 '--' indicates that the setting value is ignored.

1.2.22 RPN (Registered parameter number)

This message is used to specify part parameters such as Pitch Bend Sensitivity or Tuning etc. as an offset value.

Use RPN MSB and RPN LSB to specify the parameter that you wish to modify, and then use Data Entry (see 1.2.4) to set the value of the specified parameter.

Control#	Parameter	Data Range
100	RPN LSB	0...127
101	RPN MSB	0...127

If the Multi Part parameter Rcv RPN = OFF, that part will not receive this message.

The following RPN messages can be received.

RPN MSB	LSB	Data Entry *1 MSB LSB	Parameter name and value range
00	00	mm -- *2	Pitch bend sensitivity mm: 00-24 (0...+24 semitones) Specify up to 2 octaves in semitone steps
00	01	mm ll	Fine tuning mm ll:0000-100 cents : : mm ll:64000 cents : : mm ll:127127+100 cents [Note]mm ll: 00 127 (= -87.5) cents is followed by 01 00 (= -87.4) cents.
00	02	mm --	Coarse tuning mm: 40 - 64 - 88 (-24...0...+24 semitones)
127	127	-- --	RPN Null This sets RPN and NRPN numbers to an unset state. Internal data is not affected.

*1 Refer to 1.2.4
*2 '-' indicates that the setting value is ignored.

1.2.23 Assignable controller

By assigning a control change number of 0...95 to a part, the specified effect can be controlled.

This device allows two control change numbers (AC1 and AC2) to be specified for each part.

The following parameters specify the effect of AC1 and AC2.

- Multi Part Parameter
 1. AC1, AC2 PITCH CONTROL
 2. AC1, AC2 FILTER CONTROL
 3. AC1, AC2 AMPLITUDE CONTROL
 4. AC1, AC2 LFO PMOD DEPTH
 5. AC1, AC2 LFO FMOD DEPTH
 6. AC1, AC2 LFO AMOD DEPTH
- Effect1 Parameter
 7. AC1, AC2 VARIATION CONTROL DEPTH
(Valid if Variation Effect is assigned to a part as Insertion)

The AC1 control change number is specified by the Multi Part parameter AC1 CONTROLLER NUMBER, and the AC2 control change number is specified by the Multi Part parameter AC2 CONTROLLER NUMBER.

1.3 Channel mode messages

These messages specify the basic operation of a part.

1.3.1 All Sound Off

This message silences all currently-sounding notes on the corresponding channel. However, the settings of channel messages such as Hold 1 and Sostenuato will be maintained.

Control#	Parameter	Data Range
120	All Sound Off	0

1.3.2 Reset All Controllers

This message resets the following controllers to their default values.

Controller	Value
Pitch bend change	=0 (center)
Channel pressure	0 (off)
Polyphonic key pressure	0 (off)
Modulation	0 (off)
Expression	127 (maximum)
Hold	0 (off)
Portamento	0 (off)
Sostenuato	0 (off)
Soft pedal	0 (off)
Portamento control	Reset the portamento source note number that was received
RPN	Number unset, internal data is not affected.
NRPN	Number unset, internal data is not affected.

The following data is not changed
Parameter values specified by program change, bank select MSB/LSB, volume, pan, effect send levels 1, 3, 4, RPN and NRPN.

Control#	Parameter	Data Range
121	Reset All Controllers	0

1.3.3 All Note Off

This message turns off all notes which are currently on for the corresponding part. However, if Hold 1 or Sostenuato are on, notes will continue to sound until these are turned off.

Control#	Parameter	Data Range
123	All Note Off	0

1.3.4 Omni Off

Perform the same processing as when All Note Off is received.

Control#	Parameter	Data Range
124	Omni Off	0

1.3.5 Omni On

Perform the same processing as when All Note Off is received.

Control#	Parameter	Data Range
125	Omni On	0

1.3.6 Mono

Perform the same processing as when All Sound Off is received, and if the value (mono number) is in the range of 0...16, set the corresponding channel to Mode4* (m = 1).

Control#	Parameter	Data Range
126	Mono	0...16

* Mode4 is a state in which only channel messages on the specified channel will be received, and notes will be sounded individually (monophonically).

1.3.7 Poly

Perform the same processing as when All Sound Off is received, and set the corresponding channel to Mode3*.

Control#	Parameter	Data Range
127	Poly	0

* Mode3 is when channel messages will be received only on the specified channel, and will be sounded polyphonically.

1.4 Program change

This message reports sound selection changes and changes the program number of the receiving channel.

In order to include changes to the voice bank, Program Change and Bank Select messages must be sent as a set (see 1.2.1).

When RevPROGRAM CHANGE=OFF for Multi Part Parameter, the program change for that part is not received.

1.5 Pitch bend

This message conveys movements of the pitch bender.

This message is generally used to modify the pitch of a part, but the depth of the following seven effects can be controlled.

The effect of this message can be modified by the following parameters.

- Multi Part Parameter
 1. BEND PITCH CONTROL
 2. BEND FILTER CONTROL
 3. BEND AMPLITUDE CONTROL
 4. BEND LFO PMOD DEPTH
 5. BEND LFO FMOD DEPTH
 6. BEND LFO AMOD DEPTH
- Effect1 Parameter
 7. BEND VARIATION CONTROL DEPTH
(Valid when Variation Effect is assigned to a part as Insertion)

By default, the Pitch Control effect is applied.

If the Multi Part parameter Rcv PITCH BEND CHANGE = OFF, that part will not receive pitch bend messages.

1.6 Channel aftertouch

This message conveys the pressure which is applied to the keyboard after playing a note in order to create tonal changes (for an entire MIDI channel). The pressure can be controlled for each part. This message will affect the currently-sounding notes.

The effect of this message will be determined by the settings of the following parameters.

- Multi Part Parameter
 1. CAT PITCH CONTROL
 2. CAT FILTER CONTROL
 3. CAT AMPLITUDE CONTROL
 4. CAT LFO PMOD DEPTH
 5. CAT LFO FMOD DEPTH
 6. CAT LFO AMOD DEPTH
- Effect1 Parameter
 7. CAT VARIATION CONTROL DEPTH
(Valid when the Variation Effect is assigned to a part as Insertion)

By default, there will be no effect.

If the Multi Part parameter Rcv CHANNEL AFTER TOUCH = OFF, that part will not receive Channel Aftertouch.

MIDI Data Format

1.7 Polyphonic aftertouch

This message conveys the pressure that is applied to the keyboard after playing a note (for individual note numbers).

The pressure can be controlled independently for each note. This message will affect currently-sounding notes.

The effect of this message is determined by the following Multi Part parameters.

1. PAT PITCH CONTROL
2. PAT FILTER CONTROL
3. PAT AMPLITUDE CONTROL
4. PAT LFO PMOD DEPTH
5. PAT LFO FMOD DEPTH
6. PAT LFO AMOD DEPTH

By default, there will be no effect.

The effect will apply to note numbers 36...97.

In the case of either of the following Multi Part parameter settings, that part will not receive Polyphonic Aftertouch.

- Rcv CHANNEL AFTER TOUCH = OFF
- PART MODE = DRUM, DRUMS1...4

2. System exclusive messages

2.1 Parameter changes

This device uses the following parameter changes.

[UNIVERSAL REALTIME MESSAGE]

- 1) Master Volume

[UNIVERSAL NON REALTIME MESSAGE]

- 1) General MIDI System On

[XG PARAMETER CHANGE]

- 1) XG System on
- 2) XG System parameter change
- 3) Multi Effect1 parameter change
- 4) Multi Part parameter change
- 5) Drums Setup parameter change

[MU128 NATIVE PARAMETER CHANGE 2]

- 1) Current Performance parameter change

[Others]

- 1) Master tuning

2.1.1 Universal realtime messages

2.1.1.1 Master Volume

11110000	F0H	= Exclusive status
01111111	7FH	= Universal Real Time
01111111	7FH	= ID of target device
00000100	04H	= Sub-ID #1 = Device Control Message
00000001	01H	= Sub-ID #2 = Master Volume
*0sssssss	SSH	= Volume LSB
0ttttttt	TTH	= Volume MSB
11110111	F7H	= End of Exclusive
or,		
11110000	F0H	= Exclusive status
01111111	7FH	= Universal Real Time
0xxxxnnn	XNH	= Device Number, xxx = don't care
00000100	04H	= Sub-ID #1 = Device Control Message
00000001	01H	= Sub-ID #2 = Master Volume
0sssssss	SSH	= Volume LSB
0ttttttt	TTH	= Volume MSB
11110111	F7H	= End of Exclusive

When this is received, the Volume MSB will be reflected by the System parameter MASTER VOLUME.

* The binary expression 0sssssss is expressed in hexadecimal as SSH. The same applies elsewhere.

2.1.2 Universal non-realtime messages

2.1.2.1 General MIDI System On

11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
01111111	7FH	= ID of target device
00001001	09H	= Sub-ID #1 = General MIDI Message
00000001	01H	= Sub-ID #2 = General MIDI On
11110111	F7H	= End of Exclusive
or,		
11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
0xxxxnnn	XNH	= N:Device Number, X:don't care
00001001	09H	= Sub-ID #1 = General MIDI Message
00000001	01H	= Sub-ID #2 = General MIDI On
11110111	F7H	= End of Exclusive

When this message is received, the SOUND MODULE MODE is set to XG, and all MIDI messages defined by GM will be received.

All data except for MIDI Master Tuning will be restored to the default value.

However this message will not be received in any of the following cases.

Since approximately 50[ms] is required in order to process this message, be sure to allow an appropriate interval before sending the next message.

2.1.3 XG parameter change

This message sets XG-related parameters. Each message can set a single parameter. The message format is as follows.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:device Number
01001100	4CH	Model ID
0ggggggg	GGH	Address High
0mmmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0sssssss	SSH	Data
:	:	:
11110111	F7H	End of Exclusive

For parameters whose Data Size is 2 or 4, the appropriate amount of data will be transmitted as indicated by Size.

2.1.3.1 XG System On

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:device Number
01001100	4CH	Model ID
00000000	00H	Address High
00000000	00H	Address Mid
01111110	7EH	Address Low
00000000	00H	Data
11110111	F7H	End of Exclusive

When On is received, the SOUND MODULE MODE will be set to XG.

Since approximately 50[ms] are required in order to execute this message, please allow an appropriate interval before transmitting the next message.

2.1.3.2 XG System parameter change

This message sets the XG SYSTEM block (refer to tables <1 - 1>, <1 - 2>).

2.1.3.3 Multi Effect1 parameter change

This message sets the MULTI EFFECT1 block (refer to tables <1 - 1>, <1 - 3>).

2.1.3.4 Multi Part parameter change

This message sets the MULTI PART block (refer to tables <1 - 1>, <1 - 4>).

2.1.3.5 Drums Setup parameter change

This message sets the DRUMS SETUP block (refer to tables <1 - 1>, <1 - 5>).

2.1.4 Other parameter changes

2.1.4.1 Master tuning

This message simultaneously modifies the tuning of all channels.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:device Number
00100111	27H	Model ID
00110000	30H	Address High
00000000	00H	Address Mid
00000000	00H	Address Low
0000mmmm	0MH	Master Tune MSB
00001111	0LH	Master Tune LSB
0xxxxxxx	XXH	don't care
11110111	F7H	End of Exclusive

Normally, the XG SYSTEM message MASTER TUNE should be used (refer to table <1-2>).

2.2 Bulk dump

This device uses the following bulk dump messages.

[XG BULK DUMP]

- 1) XG System bulk dump
- 2) Multi Effect1 bulk dump
- 3) Multi Part bulk dump
- 4) Drums Setup bulk dump

2.2.1 XG bulk dump

This message sets XG-related parameters. Unlike parameter change messages, a single message can modify multiple parameters. The message format is as follows.

```

11110000 FOH Exclusive status
01000011 43H YAMAHA ID
0000nnnn ONH N:Device Number
01001100 4CH Model ID
0sssssss SSH ByteCountMSB
0ttttttt TTH ByteCountLSB
0ggggggg GGH Address High
0mmmmmmmm MMH Address Mid
01111111 LLH Address Low
0vvvvvvvv VVH Data
:
:
0kkkkkkkk KKH Check-sum
11110111 F7H End of Exclusive
    
```

Address and Byte Count are given in tables 1-n. Byte Count is indicated by the total size of the Data in tables 1-n.

Bulk dump and dump request messages are received when the beginning of the block is specified as the 'Address'.

'Block' indicates the unit of the data string that is indicated in tables 1-n as 'Total size'. Check sum is the value that produces a lower 7 bits of 0 when the Start Address, Byte Count, Data, and the Check-sum itself are added.

2.2.1.1 XG System bulk dump

This message sets the XG SYSTEM block (refer to tables <1 - 1>, <1 - 2>).

< Table 1-1 >

Parameter Base Address
MODEL ID = 4C

Parameter	Address			Description
	(H)	(M)	(L)	
XG SYSTEM	00	00	00	System
	00	00	7D	Drum setup Reset
	00	00	7E	XG System On
	00	00	7F	All Parameter Reset
EFFECT 1	02	01	00	Effect 1 (Reverb, Chorus, Variation)
MULTI PART	08	00	00	Multi Part 1
	:	:	:	:
	08	0F	00	Multi Part 16
DRUM	30	0D	00	Drum Setup 1
	31	0D	00	Drum Setup 2

Address	Parameter
3n 0D 00	note number 13
3n 0E 00	note number 14
:	:
3n 5B 00	note number 91

< Table 1-2 >

MIDI Parameter Change table (XG SYSTEM)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
00 00 00	4	00 - 0F	MASTER TUNE	-102.4...0...+102.3[cent]	00 04 00 00
01		00 - 0F		1st bit3-0→bit15-12	
02		00 - 0F		2nd bit3-0→bit11-8	
03		00 - 0F		3rd bit3-0→bit7-4	
				4th bit3-0→bit3-0	
04	1	00 - 7F	MASTER VOLUME	0...127	7F
05	1		not used		
06	1	28 - 58	TRANSPOSE	-24...0...+24[semitones]	40
7D	1	N	DRUM SETUP RESET	N: Drum setup number(0,1)	--
7E	1	00	XG SYSTEM ON	00=XG system ON (receive only)	--
7F	1	00	ALL PARAMETER RESET	00=ON (receive only)	--
TOTAL SIZE	07				

2.2.1.2 Multi Effect1 bulk dump

This message sets the MULTI EFFECT1 block (refer to tables <1 - 1>, <1 - 3>).

2.2.1.3 Multi Part bulk dump

This message sets the MULTI PART block (refer to tables <1 - 1>, <1 - 4>).

2.2.1.4 Drums Setup bulk dump

This message sets the DRUMS SETUP block (refer to tables <1 - 1>, <1 - 5>).

3. Realtime messages

3.1 Active sensing

a) Transmission not transmitted.

b) Receive

Once FE has been received, failure to receive any MIDI message for an interval longer than approximately 300 msec will cause processing to be performed as if ALL SOUND OFF, ALL NOTE OFF, and RESET ALL CONTROLLERS messages were received, and the unit will reset to a condition in which FE was never received.

MIDI Data Format

< Table 1-3 >

MIDI Parameter Change table (EFFECT 1)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
02 01 00	2	00 - 7F	REVERB TYPE MSB	refer to Effect Program List	01(=HALL1)
		00 - 7F	REVERB TYPE LSB	refer to Effect Program List	0
02	1	00 - 7F	REVERB PARAMETER 1	refer to Effect Program List	12(depends on reverb type)
03	1	00 - 7F	REVERB PARAMETER 2	refer to Effect Program List	0A(depends on reverb type)
04	1	00 - 7F	REVERB PARAMETER 3	refer to Effect Program List	08(depends on reverb type)
05	1	00 - 7F	REVERB PARAMETER 4	refer to Effect Program List	0D(depends on reverb type)
06	1	00 - 7F	REVERB PARAMETER 5	refer to Effect Program List	31(depends on reverb type)
07	1	00 - 7F	REVERB PARAMETER 6	refer to Effect Program List	00(depends on reverb type)
08	1	00 - 7F	REVERB PARAMETER 7	refer to Effect Program List	00(depends on reverb type)
09	1	00 - 7F	REVERB PARAMETER 8	refer to Effect Program List	00(depends on reverb type)
0A	1	00 - 7F	REVERB PARAMETER 9	refer to Effect Program List	00(depends on reverb type)
0B	1	00 - 7F	REVERB PARAMETER 10	refer to Effect Program List	00(depends on reverb type)
0C	1	00 - 7F	REVERB RETURN	--oB...oDB...+6dB(0...96...127)	40
0D	1	01 - 7F	REVERB PAN	L63...C...R63	40
TOTAL SIZE 0E					
02 01 10	1	00 - 7F	REVERB PARAMETER 11	refer to Effect Parameter List	00(depends on reverb type)
11	1	00 - 7F	REVERB PARAMETER 12	refer to Effect Parameter List	04(depends on reverb type)
12	1	00 - 7F	REVERB PARAMETER 13	refer to Effect Parameter List	32(depends on reverb type)
13	1	00 - 7F	REVERB PARAMETER 14	refer to Effect Parameter List	08(depends on reverb type)
14	1	00 - 7F	REVERB PARAMETER 15	refer to Effect Parameter List	40(depends on reverb type)
15	1	00 - 7F	REVERB PARAMETER 16	refer to Effect Parameter List	00(depends on reverb type)
TOTAL SIZE 6					
02 01 20	2	00 - 7F	CHORUS TYPE MSB	refer to Effect Program List	41(=CHORUS1)
		00 - 7F	CHORUS TYPE LSB	refer to Effect Program List	0
22	1	00 - 7F	CHORUS PARAMETER 1	refer to Effect Program List	06(depends on chorus type)
23	1	00 - 7F	CHORUS PARAMETER 2	refer to Effect Program List	36(depends on chorus type)
24	1	00 - 7F	CHORUS PARAMETER 3	refer to Effect Program List	4D(depends on chorus type)
25	1	00 - 7F	CHORUS PARAMETER 4	refer to Effect Program List	6A(depends on chorus type)
26	1	00 - 7F	CHORUS PARAMETER 5	refer to Effect Program List	00(depends on chorus type)
27	1	00 - 7F	CHORUS PARAMETER 6	refer to Effect Program List	1C(depends on chorus type)
28	1	00 - 7F	CHORUS PARAMETER 7	refer to Effect Program List	40(depends on chorus type)
29	1	00 - 7F	CHORUS PARAMETER 8	refer to Effect Program List	2E(depends on chorus type)
2A	1	00 - 7F	CHORUS PARAMETER 9	refer to Effect Program List	40(depends on chorus type)
2B	1	00 - 7F	CHORUS PARAMETER 10	refer to Effect Program List	40(depends on chorus type)
2C	1	00 - 7F	CHORUS RETURN	--oB...oDB...+6dB(0...96...127)	40
2D	1	01 - 7F	CHORUS PAN	L63...C...R63(1...64...127)	40
2E	1	00 - 7F	SEND CHORUS TO REVERB	--oB...oDB...+6dB(0...96...127)	0
TOTAL SIZE 0F					
02 01 30	1	00 - 7F	CHORUS PARAMETER 11	refer to Effect Parameter List	2E(depends on chorus type)
31	1	00 - 7F	CHORUS PARAMETER 12	refer to Effect Parameter List	40(depends on chorus type)
32	1	00 - 7F	CHORUS PARAMETER 13	refer to Effect Parameter List	0A(depends on chorus type)
33	1	00 - 7F	CHORUS PARAMETER 14	refer to Effect Parameter List	00(depends on chorus type)
34	1	00 - 7F	CHORUS PARAMETER 15	refer to Effect Parameter List	00(depends on chorus type)
35	1	00 - 7F	CHORUS PARAMETER 16	refer to Effect Parameter List	00(depends on chorus type)
TOTAL SIZE 6					
02 01 40	2	00 - 7F	VARIATION TYPE MSB	refer to Effect Program List	05(=DELAY L,C,R)
		00 - 7F	VARIATION TYPE LSB	refer to Effect Program List	0
42	2	00 - 7F	VARIATION PARAMETER 1 MSB	refer to Effect Program List	1A(depends on variation type)
		00 - 7F	VARIATION PARAMETER 1 LSB	refer to Effect Program List	05(depends on variation type)
44	2	00 - 7F	VARIATION PARAMETER 2 MSB	refer to Effect Program List	0D(depends on variation type)
		00 - 7F	VARIATION PARAMETER 2 LSB	refer to Effect Program List	03(depends on variation type)
46	2	00 - 7F	VARIATION PARAMETER 3 MSB	refer to Effect Program List	27(depends on variation type)
		00 - 7F	VARIATION PARAMETER 3 LSB	refer to Effect Program List	08(depends on variation type)
48	2	00 - 7F	VARIATION PARAMETER 4 MSB	refer to Effect Program List	27(depends on variation type)
		00 - 7F	VARIATION PARAMETER 4 LSB	refer to Effect Program List	08(depends on variation type)
4A	2	00 - 7F	VARIATION PARAMETER 5 MSB	refer to Effect Program List	00(depends on variation type)
		00 - 7F	VARIATION PARAMETER 5 LSB	refer to Effect Program List	4A(depends on variation type)
4C	2	00 - 7F	VARIATION PARAMETER 6 MSB	refer to Effect Program List	00(depends on variation type)
		00 - 7F	VARIATION PARAMETER 6 LSB	refer to Effect Program List	64(depends on variation type)
4E	2	00 - 7F	VARIATION PARAMETER 7 MSB	refer to Effect Program List	00(depends on variation type)
		00 - 7F	VARIATION PARAMETER 7 LSB	refer to Effect Program List	0A(depends on variation type)
50	2	00 - 7F	VARIATION PARAMETER 8 MSB	refer to Effect Program List	00(depends on variation type)
		00 - 7F	VARIATION PARAMETER 8 LSB	refer to Effect Program List	00(depends on variation type)
52	2	00 - 7F	VARIATION PARAMETER 9 MSB	refer to Effect Program List	00(depends on variation type)
		00 - 7F	VARIATION PARAMETER 9 LSB	refer to Effect Program List	00(depends on variation type)
54	2	00 - 7F	VARIATION PARAMETER 10 MSB	refer to Effect Program List	00(depends on variation type)
		00 - 7F	VARIATION PARAMETER 10 LSB	refer to Effect Program List	20(depends on variation type)
56	1	00 - 7F	VARIATION RETURN	--oB...oDB...+6dB(0...96...127)	40
57	1	01 - 7F	VARIATION PAN	L63...C...R63(1...64...127)	40
58	1	00 - 7F	SEND VARIATION TO REVERB	--oB...oDB...+6dB(0...96...127)	0
59	1	00 - 7F	SEND VARIATION TO CHORUS	--oB...oDB...+6dB(0...96...127)	0
5A	1	00 - 01	VARIATION CONNECTION	INSERTION , SYSTEM	0
5B	1	00 - 7F	VARIATION PART NUMBER	Part1	7F
				OFF(127)	
5C	1	00 - 7F	MW VARIATION CONTROL DEPTH	-64...0...+63	40
5D	1	00 - 7F	BEND VARIATION CONTROL DEPTH	-64...0...+63	40
5E	1	00 - 7F	CAT VARIATION CONTROL DEPTH	-64...0...+63	40
5F	1	00 - 7F	AC1 VARIATION CONTROL DEPTH	-64...0...+63	40
60	1	00 - 7F	AC2 VARIATION CONTROL DEPTH	-64...0...+63	40
TOTAL SIZE 21					
02 01 70	1	00 - 7F	VARIATION PARAMETER 11	refer to Effect Parameter List	00(depends on variation type)
71	1	00 - 7F	VARIATION PARAMETER 12	refer to Effect Parameter List	3C(depends on variation type)
72	1	00 - 7F	VARIATION PARAMETER 13	refer to Effect Parameter List	1C(depends on variation type)
73	1	00 - 7F	VARIATION PARAMETER 14	refer to Effect Parameter List	40(depends on variation type)
74	1	00 - 7F	VARIATION PARAMETER 15	refer to Effect Parameter List	2E(depends on variation type)
75	1	00 - 7F	VARIATION PARAMETER 16	refer to Effect Parameter List	40(depends on variation type)
TOTAL SIZE 6					

< Table 1-4 >

MIDI Parameter Change table (MULTI PART)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
08 nn 00	1	00 - 20	ELEMENT RESERVE	0	part10 = 0 other parts = 2
nn 01	1	00 - 7F	BANK SELECT MSB	0...127	part10 = 7F other parts=0
nn 02	1	00 - 7F	BANK SELECT LSB	0...127	00
nn 03	1	00 - 7F	PROGRAM NUMBER	1...128	00
nn 04	1	00-0F,7F	Rcv CHANNEL	A1...A16, OFF	Part No.
nn 05	1	00 - 01	MONO/POLY MODE	MONO , POLY	01
nn 06	1	00 - 02	SAME NOTE NUMBER KEY ON ASSIGN	SINGLE, MULTI, INST(for DRUM)	01
nn 07	1	00 - 03	PART MODE	NORMAL, DRUM, DRUMS1, 2	Part10=2 other parts=0
nn 08	1	28 - 58	NOTE SHIFT	-24...0...+24[semitones]	40
nn 09	2	00 - 0F	DETUNE	-12.8...0...+12.7[Hz]	08 00
nn 0A		00 - 0F		1st bit3-0→bit7-4 2nd bit3-0→bit3-0	
nn 0B	1	00 - 7F	VOLUME	0...127	64
nn 0C	1	00 - 7F	VELOCITY SENSE DEPTH	0...127	40
nn 0D	1	00 - 7F	VELOCITY SENSE OFFSET	0...127	40
nn 0E	1	00 - 7F	PAN	RND, L63...C...R63	40
nn 0F	1	00 - 7F	NOTE LIMIT LOW	C-2...G8	00
nn 10	1	00 - 7F	NOTE LIMIT HIGH	C-2...G8	7F
nn 11	1	00 - 7F	DRY LEVEL	0...127	7F
nn 12	1	00 - 7F	CHORUS SEND	0...127	00
nn 13	1	00 - 7F	REVERB SEND	0...127	28
nn 14	1	00 - 7F	VARIATION SEND	0...127	00
nn 15	1	00 - 7F	VIBRATO RATE	-64...0...+63	40
nn 16	1	00 - 7F	VIBRATO DEPTH	-64...0...+63	40(drum part ignores)
nn 17	1	00 - 7F	VIBRATO DELAY	-64...0...+63	40(drum part ignores)
nn 18	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...+63	40
nn 19	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...+63	40
nn 1A	1	00 - 7F	EG ATTACK TIME	-64...0...+63	40
nn 1B	1	00 - 7F	EG DECAY TIME	-64...0...+63	40
nn 1C	1	00 - 7F	EG RELEASE TIME	-64...0...+63	40
nn 1D	1	28 - 58	MW PITCH CONTROL	-24...0...+24[semitones]	40
nn 1E	1	00 - 7F	MW LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn 1F	1	00 - 7F	MW AMPLITUDE CONTROL	-100...0...+100[%]	40
nn 20	1	00 - 7F	MW LFO PMOD DEPTH	0...127	0A
nn 21	1	00 - 7F	MW LFO FMOD DEPTH	0...127	00
nn 22	1	00 - 7F	MW LFO AMOD DEPTH	0...127	00
nn 23	1	28 - 58	BEND PITCH CONTROL	-24...0...+24[semitones]	42
nn 24	1	00 - 7F	BEND LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn 25	1	00 - 7F	BEND AMPLITUDE CONTROL	-100...0...+100[%]	40
nn 26	1	00 - 7F	BEND LFO PMOD DEPTH	0...127	00
nn 27	1	00 - 7F	BEND LFO FMOD DEPTH	0...127	00
nn 28	1	00 - 7F	BEND LFO AMOD DEPTH	0...127	00
TOTAL SIZE	29				
nn 30	1	00 - 01	Rcv PITCH BEND	OFF, ON	01
nn 31	1	00 - 01	Rcv CH AFTER TOUCH(CAT)	OFF, ON	01
nn 32	1	00 - 01	Rcv PROGRAM CHANGE	OFF, ON	01
nn 33	1	00 - 01	Rcv CONTROL CHANGE	OFF, ON	01
nn 34	1	00 - 01	Rcv POLY AFTER TOUCH(PAT)	OFF, ON	01
nn 35	1	00 - 01	Rcv NOTE MESSAGE	OFF, ON	01
nn 36	1	00 - 01	Rcv RPN	OFF, ON	01
nn 37	1	00 - 01	Rcv NRPN	OFF, ON	XGmode=01, GMmode=00
nn 38	1	00 - 01	Rcv MODURATION	OFF, ON	01
nn 39	1	00 - 01	Rcv VOLUME	OFF, ON	01
nn 3A	1	00 - 01	Rcv PAN	OFF, ON	01
nn 3B	1	00 - 01	Rcv EXPRESSION	OFF, ON	01
nn 3C	1	00 - 01	Rcv HOLD1	OFF, ON	01
nn 3D	1	00 - 01	Rcv PORTAMENTO	OFF, ON	01
nn 3E	1	00 - 01	Rcv SOSTENUTO	OFF, ON	01
nn 3F	1	00 - 01	Rcv SOFT PEDAL	OFF, ON	01
nn 40	1	00 - 01	Rcv BANK SELECT	OFF, ON	XGmode=01, GMmode=00
nn 41	1	00 - 7F	SCALE TUNING C	-64...0...+63[cent]	40
nn 42	1	00 - 7F	SCALE TUNING C#	-64...0...+63[cent]	40
nn 43	1	00 - 7F	SCALE TUNING D	-64...0...+63[cent]	40
nn 44	1	00 - 7F	SCALE TUNING D#	-64...0...+63[cent]	40
nn 45	1	00 - 7F	SCALE TUNING E	-64...0...+63[cent]	40
nn 46	1	00 - 7F	SCALE TUNING F	-64...0...+63[cent]	40
nn 47	1	00 - 7F	SCALE TUNING F#	-64...0...+63[cent]	40
nn 48	1	00 - 7F	SCALE TUNING G	-64...0...+63[cent]	40
nn 49	1	00 - 7F	SCALE TUNING G#	-64...0...+63[cent]	40
nn 4A	1	00 - 7F	SCALE TUNING A	-64...0...+63[cent]	40
nn 4B	1	00 - 7F	SCALE TUNING A#	-64...0...+63[cent]	40
nn 4C	1	00 - 7F	SCALE TUNING B	-64...0...+63[cent]	40
nn 4D	1	28 - 58	CAT PITCH CONTROL	-24...0...+24[semitones]	40
nn 4E	1	00 - 7F	CAT LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn 4F	1	00 - 7F	CAT AMPLITUDE CONTROL	-100...0...+100[%]	40
nn 50	1	00 - 7F	CAT LFO PMOD DEPTH	0...127	00
nn 51	1	00 - 7F	CAT LFO FMOD DEPTH	0...127	00
nn 52	1	00 - 7F	CAT LFO AMOD DEPTH	0...127	00
nn 53	1	28 - 58	PAT PITCH CONTROL	-24...0...+24[semitones]	40
nn 54	1	00 - 7F	PAT LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn 55	1	00 - 7F	PAT AMPLITUDE CONTROL	-100...0...+100[%]	40
nn 56	1	00 - 7F	PAT LFO PMOD DEPTH	0...127	00
nn 57	1	00 - 7F	PAT LFO FMOD DEPTH	0...127	00
nn 58	1	00 - 7F	PAT LFO AMOD DEPTH	0...127	00
nn 59	1	00 - 5F	AC1 CONTROLLER NUMBER	0...95	10

MIDI Data Format

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
nn 5A	1	28 - 58	AC1 PITCH CONTROL	-24...0...+24[semitones]	40
nn 5B	1	00 - 7F	AC1 LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn 5C	1	00 - 7F	AC1 AMPLITUDE CONTROL	-100...0...+100[%]	40
nn 5D	1	00 - 7F	AC1 LFO PMOD DEPTH	0...127	00
nn 5E	1	00 - 7F	AC1 LFO FMOD DEPTH	0...127	00
nn 5F	1	00 - 7F	AC1 LFO AMOD DEPTH	0...127	00
nn 60	1	00 - 5F	AC2 CONTROLLER NUMBER	0...95	11
nn 61	1	28 - 58	AC2 PITCH CONTROL	-24...0...+24[semitones]	40
nn 62	1	00 - 7F	AC2 LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn 63	1	00 - 7F	AC2 AMPLITUDE CONTROL	-100...0...+100[%]	40
nn 64	1	00 - 7F	AC2 LFO PMOD DEPTH	0...127	00
nn 65	1	00 - 7F	AC2 LFO FMOD DEPTH	0...127	00
nn 66	1	00 - 7F	AC2 LFO AMOD DEPTH	0...127	00
nn 67	1	00 - 01	PORTAMENTO SWITCH	OFF, ON	00
nn 68	1	00 - 7F	PORTAMENTO TIME	0...127	00
nn 69	1	00 - 7F	PITCH EG INITIAL LEVEL	-64...0...+63	40
nn 6A	1	00 - 7F	PITCH EG ATTACK TIME	-64...0...+63	40
nn 6B	1	00 - 7F	PITCH EG RELEASE LEVEL	-64...0...+63	40
nn 6C	1	00 - 7F	PITCH EG RELEASE TIME	-64...0...+63	40
nn 6D	1	01 - 7F	VELOCITY LIMIT LOW	1...127	01
nn 6E	1	01 - 7F	VELOCITY LIMIT HIGH	1...127	7F
TOTAL SIZE	3F				
nn = PART NUMBER					

In the case of a DRUM PART, the following parameters will have no effect.

- BANK SELECT LSB
- MONO/POLY MODE
- SCALE TUNING
- PORTAMENTO
- PITCH EG

< Table 1-5 >

MIDI Parameter Change table (DRUM SETUP)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
3n rr 00	1	00 - 7F	PITCH COARSE	-64...0...+63	40
01	1	00 - 7F	PITCH FINE	-64...0...+63[cent]	40
02	1	00 - 7F	LEVEL	0...127	depend on the note
03	1	00 - 7F	ALTERNATE GROUP	OFF,1...127	depend on the note
04	1	00 - 7F	PAN	RND,L63...C...R63	depend on the note
05	1	00 - 7F	REVERB SEND	0...127	depend on the note
06	1	00 - 7F	CHORUS SEND	0...127	depend on the note
07	1	00 - 7F	VARIATION SEND	0...127	7F
08	1	00 - 01	KEY ASSIGN	SINGLE , MULTI	00
09	1	00 - 01	Rcv NOTE OFF	OFF , ON	depend on the note
0A	1	00 - 01	Rcv NOTE ON	OFF , ON	01
0B	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...63	40
0C	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...63	40
0D	1	00 - 7F	EG ATTACK RATE	-64...0...63	40
0E	1	00 - 7F	EG DECAY1 RATE	-64...0...63	40
0F	1	00 - 7F	EG DECAY2 RATE	-64...0...63	40
TOTAL SIZE	10				

n:Drum Setup Number(0 - 1)
rr:note number(0D - 5B)

In the following cases, all Drum Setups will be initialized.

- XG SYSTEM ON received
- GM SYSTEM ON received
- DRUM SETUP RESET received (only setup applies)

[Note]

When a part to which a Drum Setup is assigned receives a program change, the assigned Drum Setup will be initialized.
If the same Drum Setup is assigned to two or more parts, changes in Drum Setup parameters (including program changes)will apply to all parts to which it is assigned.

MIDI Implementation Chart

YAMAHA [Clavinova]
Model: CLP-990/990M

MIDI Implementation Chart [Preset sound source]

Date: 20 April, 2000
Version: 1.0

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 – 16 1 – 16 *1	1 – 16 1 – 16 *1	Memorized
Mode	Default Messages Altered	3 X *****	1 X X	Poly Mode only
Note Number	: True voice	0 – 127 *****	0 – 127 0 – 127	
Velocity	Note on Note off	O 9nH, v=1 – 127 X 8nH, v=1 – 127	O v=1 – 127 O	
After Touch	key's Ch's	X X	X O	
Pitch Bender		X	O 0 – 24 semi	
Control Change	0, 32 1 5 7, 10, 11 6, 38 64, 66, 67 65 71 – 74 84 91, 93, 94 96, 97 98, 99 100, 101 120 121	O X X O O O X X X O X X O X X O X X	O X X O O O X X X O O X O O O O	Bank Select Modulation Portamento Time Data Entry Portamento Sound Controller Portamento Cntrl Effect Depth RPN Inc, Dec NRPN LSB, MSB RPN LSB, MSB All sounds off Reset All Controllers
Program Change	: True #	O *****	O	
System Exclusive		O	O	
System Common	: Song Position : Song Select : Tune	X X X	X X X	
System Real Time	: Clock : Commands	O O	X O	
Aux Messages	: Local ON/OFF : All Notes Off : Active Sense : Reset	X X O X	X O (123 – 127) O X	
Notes : *1 = You can select the part transmit/receive channels from the panel.				

Mode 1: OMNI ON, POLY
Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO
Mode 4: OMNI OFF, MONO

O: Yes
X: No

MIDI Implementation Chart

YAMAHA [Clavinova]
Model: CLP-990/990M

MIDI Implementation Chart [XG sound source]

Date: 20 April, 2000
Version: 1.0

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	X	1 – 16	
	Changed	X	1 – 16	
Mode	Default	X	3	
	Messages	X	3.4 (m=1) *2	
	Altered	*****	X	
Note Number		X	0 – 127	
	: True voice	*****	0 – 127	
Velocity	Note on	X	O 9nH, v=1 – 127	
	Note off	X	X	
After Touch	key's	X	O *1	
	Ch's	X	O *1	
Pitch Bender		X	O 0 – 24 semi *1	
Control Change	0, 32	X	O *1	Bank Select
	1, 5, 7, 10, 11	X	O *1	
	6, 38	X	O *1	Data Entry
	64 – 67	X	O *1	
	71 – 74	X	O *1	Sound Controller
	84	X	O *1	Portamento Cntrl
	91, 93, 94	X	O *1	Effect Depth
	96, 97	X	O *1	RPN Inc, Dec
	98, 99	X	O *1	NRPN LSB, MSB
	100, 101	X	O *1	RPN LSB, MSB
Program Change		X	O 0 – 127	
	: True #	*****		
System Exclusive		X	O	
System Common	: Song Position	X	X	
	: Song Select	X	X	
	: Tune	X	X	
System Real Time	: Clock	X	X	
	: Commands	X	X	
Aux Messages	: All Sound Off	X	O (120, 126 – 127)	
	: Reset All Cntrls	X	O (121)	
	: Local ON/OFF	X	X	
	: All Notes Off	X	O (123 – 125)	
	: Active Sense	X	O	
	: Reset	X	X	
Notes : *1 = receive if switch is on. *2 = m is always treated as "1" regardless of its value.				

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

O: Yes
X: No

Specifications

Item	CLP-990 / CLP-990M
Keyboard	88 keys (A1 - C7)
Sound source	AWM Dynamic Stereo Sampling
Polyphony	[Panel presets] max. 128 voices + [XG] max 32 voices
Voice selection	Panel preset for manual performance: 25 voices XG voices for XG/GM/DOC song playback: 480 voices + 12 drum kits
Effect	Reverb, chorus, brilliance, variation effect
Controls	Dual, split, metronome, transpose, various settings (voice, song, MIDI file, other)
Display	LCD
Recording/playback	16-track recording/playback, tempo adjustment
Disk drive	3.5-inch floppy disk drive (2DD and 2HD compatible)
Pedal	Damper, sostenuto, soft
Demo songs	6 voice demo songs, 50 piano songs (preset songs)
Jacks/connectors	AUX out (R, L/L+R): Output impedance 600Ω AUX in (R, L/L+R): Input impedance 10kΩ/Input sensitivity 0.26V Headphone jacks x 2, TO HOST connector, MIDI connectors (IN, OUT, THRU), AUX PEDAL jack
Main amplifiers	60W x2
Speakers	16cm x2, 2.5cm (dome) x 2
Dimensions (W x D x H)	1384mm x 570mm x 1033mm 54-1/2" x 22-7/16" x 40-11/16"
Weight	95kg, 209lbs., 7 oz
Attachment	Keyboard cover, music stand

- * Specifications and description in this owner's manual are for information purposes only. Yamaha Corp. reserves the right to change or modify products or specifications at any time without prior notice. Since specifications, equipment or options may not be the same in every locale, please check with your Yamaha dealer.

