CANCUN FX MIDI PATCH AND IMPLEMENTATION CHARTS

The Cancun's many features are controlled via standard MIDI Controller messages, RPNs (registered parameter numbers), NRPNs (non-registered parameter numbers) and SYSEX. This document assumes an advanced knowledge of MIDI and it's purpose is not to explain these concepts but rather to document the features available. For more information, please consult a reference work about MIDI.

This document is divided into three parts: Patch List, MIDI Implementation, and Special Controls.

1. PATCH LIST

GENERAL MIDI SOUNDS

These apply to all channels except for 10. Note that PC stands for Program Change.

PC	GENERAL MIDI	PC	GENERAL MIDI	PC	GENERAL MIDI	PC	GENERAL MIDI
1	(Grand) Piano 1	33	Acoustic Bass	65	Soprano Sax	97	FX 1 (rain)
2	(Bright) Piano 2	34	HQ Finger Bass	66	Alto Sax	98	FX 2 (soundtrack)
3	(El. Grd) Piano 3	35	HQ Picked Bass	67	Tenor Sax	99	FX 3 (crystal)
4	Honky-tonk Piano	36	Fretless Bass	68	Baritone Sax	100	FX4 (atmosphere)
5	El. Piano 1	37	Slap Bass 1	69	Oboe	101	FX 5 (brightness)
6	El. Piano 2	38	Slap Bass 2	70	English Horn	102	FX 6 (goblins)
7	Harpsichord	39	Synth Bass 1	71	Bassoon	103	FX 7 (echoes)
8	Clavi	40	Synth Bass 2	72	Clarinet	104	FX 8 (sci-fi)
9	Celesta	41	Violin	73	Piccolo	105	Sitar
10	Glockenspiel	42	Viola	74	Flute	106	Banjo
11	Music Box	43	Cello	75	Recorder	107	Shamisen
12	Vibraphone	44	Contrabass	76	Pan Flute	108	Koto
13	Marimba	45	Tremolo Strings	77	Blown Bottle	109	Kalimba
14	Xylophone	46	Pizzicato Strings	78	Shakuhachi	110	Bag pipe
15	Tubular Bells	47	Orchestral Harp	79	Whistle	111	Fiddle
16	Santur	48	Timpani	80	Ocarina	112	Shanai
17	Drawbar Organ	49	String Ensemble 1	81	Lead 1 (square)	113	Tinkle Bell
18	Percussive Organ	50	String Ensemble 2	82	Lead 2 (sawtooth)	114	Agogo
19	Rock Organ	51	Synth Strings 1	83	Lead 3 (calliope)	115	Steel Drums
20	Church Organ	52	Synth Strings 2	84	Lead 4 (chiff)	116	Woodblock
21	Reed Organ	53	Choir Aahs	85	Lead 5 (charang)	117	Taiko Drum
22	Accordion (french)	54	Voice Oohs	86	Lead 6 (voice)	118	Melodic Tom
23	Harmonica	55	Synth Voice	87	Lead 7 (fifths)	119	Synth Drum
24	Tango Accordion	56	Orchestra Hit	88	Lead8 (bass+lead)	120	Reverse Cymbal
25	Ac. Guitar (nylon)	57	Trumpet	89	Pad 1 (fantasia)	121	Gt. Fret Noise
26	Ac. Guitar (steel)	58	Trombone	90	Pad 2 (warm)	122	Breath Noise
27	El. Guitar (jazz)	59	Tuba	91	Pad 3 (polysynth)	123	Seashore
28	El. Guitar (clean)	60	Muted Trumpet	92	Pad 4 (choir)	124	Bird Tweet
29	El. Guitar (muted)	61	French Horn	93	Pad 5 (bowed)	125	Teleph. Ring
30	Overdriven Guitar	62	Brass Section	94	Pad 6 (metallic)	126	Helicopter
31	Distortion Guitar	63	Synth Brass 1	95	Pad 7 (halo)	127	Applause
32	Guitar harmonics	64	Synth Brass 2	96	Pad 8 (sweep)	128	Gunshot

SOUND VARIATIONS

These apply to all channels except for 10. Note that PC stands for Program Change and C0 stands for controller 0 value (zero for General Midi capital sounds.) To select variation, Send CTRL 0, then PC

SOUND NAMES CONVENTIONS :

- w - pan type sound (low notes sent to left, high notes sent to right)
- d - other velocity response
- v - velocity split type sound
- - special release on sound

PC	GENERAL MIDI	C0	1st VAR	C0	2nd VAR	C0	3rd VAR
1	(Grand) Piano 1	8	Piano 1w	16	Piano 1d		
2	(Bright) Piano 2						
3	(El. Grd) Piano 3						
4	Honky-tonk Piano						
5	El. Piano 1	8	Detuned EP 1	16	El. Piano 1v	24	60's El. Piano
6	El. Piano 2	8	Detuned EP 2	16	El. Piano 2v		
7	Harpsichord	8	Coupled Hps.			24	Harpsi o
8	Clavi						
9	Celesta						
10	Glockenspiel						
11	Music Box						
12	Vibraphone						
13	Marimba						
14	Xylophone						
15	Tubular Bells	8	Church Bell	9	Carillon		
16	Dulcimer (Santur)						
17	Drawbar Organ	8	Det. Organ 1	16	60's organ1	32*	Organ 4
18	Percussive Organ	8	Det. Organ 2			32*	Organ 5
19	Rock Organ						
20	Church Organ	8	Ch. Organ 2	16	Ch. Organ 3		
21	Reed Organ						
22	Accordion (french)	8	Acc. (Italian)				
23	Harmonica						
24	Tango Accordion						
25	Ac. Guitar (Nylon)	8	Ukulele	16	Nylon Gt. o	32*	Nylon Gt. 2
26	Ac. Guitar (Steel)	8	12-str. Guitar	16	Mandolin		
27	El. Guitar (jazz)	8	Hawaiian Gt.				
28	El. Guitar (clean)	8	Chorus Gt.				
29	El. Guitar (muted)	8	Funk Gt.	16	Funk Gt. 2		
30	Overdriven Guitar						
31	Distortion Guitar	8	Feedback Gt.				
32	Guitar harmonics	8	Gt. Feedback				
33	Acoustic Bass						
34	HQ Finger Bass	8	Finger Bass				
35	HQ Picked Bass	8	Picked Bass				
36	Fretless Bass						
37	Slap Bass 1						
38	Slap Bass 2						
39	Synth Bass 1	1	Syn Bass 101	8	Synth. Bass 3		
40	Synth Bass 2	8	Synth. Bass 4	16	Rubber Bass		

PC	GENERAL MIDI	C0	1st VAR	C0	2nd VAR	C0	3rd VAR
41	Violin	8	Slow Violin				
42	Viola						
43	Cello						
44	Contrabass						
45	Tremolo Strings						
46	Pizzicato Strings						
47	Orchestral Harp						
48	Timpani						
49	String Ensemble 1	8	Orchestra				
50	String Ensemble 2						
51	Synth Strings 1	8	Syn Strings 3				
52	Synth Strings 2						
53	Choir Aahs	32*	Choir Aahs 2				
54	Voice Oohs						
55	Synth Voice	8	Synrh Voice2				
56	Orchestra Hit						
57	Trumpet						
58	Trombone	1	Trombone 2				
59	Tuba						
60	Muted Trumpet						
61	French Horn	1	Fr. Horn				
62	Brass Section	8	Brass 2				
63	Synth Brass 1	8	Syn Brass 3	16	AnalogBrass1		
64	Synth Brass 2	8	Syn Brass 4	16	AnalogBrass2		
65	Soprano Sax						
66	Alto Sax						
67	Tenor Sax						
68	Baritone Sax						
69	Oboe						
70	English Horn						
71	Bassoon						
72	Clarinet						
73	Piccolo						
74	Flute						
75	Recorder						
76	Pan Flute						
77	Blown Bottle						
78	Shakuhachi						
79	Whistle						
80	Ocarina						
81	Lead 1 (square)	1	Square	8	Sine Wave		
82	Lead 2 (sawtooth)	1	Saw	8	Doctor Solo		
83	Lead 3 (calliope)						
84	Lead 4 (chiff)						
85	Lead 5 (charang)						
86	Lead 6 (voice)	8	Lead Voice2				
87	Lead 7 (fifths)						
88	Lead8 (bass+lead)						
89	Pad 1 (new age)						
90	Pad 2 (warm)						
91	Pad 3 (polysynth)						
92	Pad 4 (choir)	8	Pad Choir2				
93	Pad 5 (bowed)						
94	Pad 6 (metallic)						
95	Pad 7 (halo)						
96	Pad 8 (sweep)						

PC	GENERAL MIDI	C0	1st VAR	C0	2nd VAR	C0	3rd VAR
97	FX 1 (rain)						
98	FX 2 (soundtrack)						
99	FX 3 (crystal)	1	Syn Mallet				
100	FX4 (atmosphere)						
101	FX 5 (brightness)	8	Brigthness2				
102	FX 6 (goblins)	8	Goblins2				
103	FX 7 (echoes)	1	Echo Bell	2	Echo Pan		
104	FX 8 (sci-fi)						
105	Sitar	1	Sitar2				
106	Banjo						
107	Shamisen						
108	Koto	8	Taisho Koto				
109	Kalimba						
110	Bag pipe						
111	Fiddle						
112	Shanai						
113	Tinkle Bell						
114	Agogo						
115	Steel Drums						
116	Woodblock	8	Castanets				
117	Taiko Drum	8	Concert BD				
118	Melodic Tom	8	Melo Tom 2				
119	Synth Drum	8	808 Tom	9	Elec Perc 1		
120	Reverse Cymbal						

32* : This variation can also be obtained by sending variation # 24.

SFX VARIATIONS

These apply to all channels except for 10.

PRG#	General MIDI	CTRL 0= 1	CTRL 0= 2	CTRL 0= 3	CTRL 0= 4	CTRL 0= 5	CTRL 0= 6	CTRL 0= 7	CTRL 0= 8	CTRL 0= 9
121	Gt. Fret Noise	Gt. Cut Noise	String Slap							
122	Breath Noise	Fl. Key Click								
123	Seashore	Rain	Thunder	Wind	Stream	Bubble				
124	Bird Tweet	Dog	Horse Gallop	Bird 2						
125	Teleph. Ring	Teleph. Ring 2	Door Creaking	Door Closing	Scratch	Wind chime				
126	Heli-copter	Car Engine Start	Car Breaking	Car Pass	Car Crash	Police Siren	Train	Jet Takeoff	Starship	Burst Noise
127	Applause	Laughing	Screa-ming	Punch	Heart Beat	Footstep				
128	Gunshot	Machine gun	Lasergun	Explo-sion						

NOTE:

To select a variation, first send variation number (Controller #0) then send program change number.

DRUM SET TABLE (MIDI CHANNEL 10)

	Prog 1 : HQ STD SET1	Prog 2: HQ STD SET2	Prog 9: HQ ROOM SET	Prog 17 : HQ POWER SET	Prog 25 : HQ ELEC. SET
27 - D#1	High Q				
28 - E1	Slap				
29 - F1	Scratch Push				
30 - F#1	Scratch Pull				
31 - G1	Sticks				
32 - G#1	Square Click				
33 - A1	Metronome Click				
34 - A#1	Metronome Bell				
35 - B1	HQ STD1 Kick2	HQ STD2 Kick2	HQ Room Kick2	HQ Power Kick2	HQ Elec Kick2
36 - C2	HQ STD1 Kick1	HQ STD2 Kick1	HQ Room Kick1	HQ Power Kick1	HQ Elec Kick1
37 - C#2	Side Stick				
38 - D2	HQ STD1 Snare1	HQ STD2 Snare1	HQ Room Snare1	Gated Snare	Elec SD
39 - D#2	Hand Clap				
40 - E2	Snare Drum 2	HQ STD2 Snare2	HQ Room Snare1	HQ Power Snare1	HQ Elec Snare1
41 - F2	HQ Low Floor Tom		HQ Power Low Tom2	HQ Power Low Tom2	Elec Low Tom2
42 - F#2	Closed Hi Hat [EXC1]				
43 - G2	HQ High Floor Tom		HQ Power Low Tom1	HQ Power Low Tom1	Elec Low Tom1
44 - G#2	Pedal Hi-Hat [EXC1]				
45 - A2	HQ Low Tom		HQ Power Mid Tom2	HQ Power Mid Tom2	Elec Mid Tom2
46 - A#2	Open Hi-Hat [EXC1]				
47 - B2	HQ Low-Mid Tom		HQ Power Mid Tom1	HQ Power Mid Tom1	Elec Mid Tom1
48 - C3	HQ Hi Mid Tom		HQ Power Hi Tom2	HQ Power Hi Tom2	Elec Hi Tom2
49 - C#3	Crash Cymbal 1				
50 - D3	HQ High Tom		HQ Power Hi Tom1	HQ Power Hi Tom1	Elec Hi Tom1
51 - D#3	Ride Cymbal 1				
52 - E3	Chinese Cymbal				Reverse Cymbal
53 - F3	Ride Bell				
54 - F#3	Tambourine				
55 - G3	Splash Cymbal				
56 - G#3	Cowbell				
57 - A3	Crash Cymbal 2				
58 - A#3	Vibraslap				
59 - B3	Ride Cymbal 2				
60 - C4	Hi Bongo				
61 - C#4	Low Bongo				
62 - D4	Mute Hi Conga				
63 - D#4	Open Hi Conga				
64 - E4	Low Conga				
65 - F4	High Timbale				
66 - F#4	Low Timbale				
67 - G4	High Agogo				
68 - G#4	Low Agogo				
69 - A4	Cabasa				
70 - A#4	Maracas				
71 - B4	Short Whistle[EXC2]				
72 - C5	Long Whistle[EXC2]				
73 - C#5	Short Guiro [EXC3]				
74 - D5	Long Guiro [EXC3]				
75 - D#5	Claves				
76 - E5	Hi Wood Block				
77 - F5	Low Wood Block				
78 - F#5	Mute Cuica [EXC4]				
79 - G5	Open Cuica [EXC4]				
80 - G#5	Mute Triangle [EXC5]				
81 - A5	Open Triangle[EXC5]				
82 - A#5	Shaker				
83 - B5	Jingle Bell				
84 - C6	Belltree				
85 - C#6	Castanets				
86 - D6	Mute Surdo [EXC6]				
87 - D#6	Open Surdo [EXC6]				
88 - E6					

NOTES :

Blank : Same sound as "Standard Set"

[EXC] : Sounds with same EXC number are mutually exclusive

DRUM SET TABLE (MIDI CHANNEL 10)

	Prog26 : HQ TR808 SET	Prog 27: HQ DANCE SET	Prog 33: JAZZ SET	Prog 41 : BRUSH	Prog 49 : ORCHESTRA	Prog 57 : SFX SET
27 - D#1					Closed Hi Hat	*
28 - E1					Pedal Hi-Hat	*
29 - F1					Open Hi Hat	*
30 - F#1					Ride Cymbal	*
31 - G1						*
32 - G#1						*
33 - A1						*
34 - A#1						*
35 - B1	HQ 909 BD	HQ Dance Kick	Jazz BD2	Jazz BD2	Concert BD 2	*
36 - C2	HQ 808 BD	HQ Elec Kick2	Jazz BD1	Jazz BD1	Concert BD 1	*
37 - C#2	808 Rim shot					*
38 - D2	808 Snare Drum	HQ Dance snare1		Brush Tap	Concert SD	*
39 - D#2				Brush Slap	Castanets	High Q
40 - E2	HQ 909 Snare	HQ Dance snare2		Brush Swirl	Concert SD	Slap
41 - F2	808 Low Tom2	Elec Low Tom2			Timpani F	Scratch Push
42 - F#2	808 CHH [EXC1]	808 CHH [EXC1]			Timpani F#	Scratch Pull
43 - G2	808 Low Tom2	Elec Low Tom1			Timpani G	Sticks
44 - G#2	808 CHH [EXC1]	808 CHH [EXC1]			Timpani G#	Square Click
45 - A2	808 Mid Tom2	Elec Mid Tom2			Timpani A	Metronome Click
46 - A#2	808 OHH [EXC1]	808 OHH [EXC1]			Timpani A#	Metronome Bell
47 - B2	808 Mid Tom1	Elec Mid Tom1			Timpani B	Guitar Slide
48 - C3	808 Hi Tom2	Elec Hi Tom2			Timpani c	Gt Cut Noise (down)
49 - C#3	808 Cymbal				Timpani c#	Gt Cut Noise (up)
50 - D3	808 HiTom1	Elec Hi Tom1			Timpani d	Double Bass Slap
51 - D#3					Timpani d#	Key Click
52 - E3		Reverse Cymbal			Timpani e	Laughing
53 - F3					Timpani f	Screaming
54 - F#3						Punch
55 - G3						Heart Beat
56 - G#3	808 Cowbell					Footsteps1
57 - A3					Concert Cymbal2	Footsteps2
58 - A#3						Applause
59 - B3					Concert Cymbal1	Door Creaking
60 - C4						Door Closing
61 - C#4						Scratch
62 - D4	808 High Conga					Wind Chime
63 - D#4	808 Mid Conga					Car Engine Start
64 - E4	808 Low Conga					Car Breaking
65 - F4						Car Pass
66 - F#4						Car Crash
67 - G4						Police Siren
68 - G#4						Train
69 - A4						Jet Take-off
70 - A#4	808 Maracas					Helicopter
71 - B4						Starship
72 - C5						Gun Shot
73 - C#5						Machinegun
74 - D5						Lasergun
75 - D#5	808 Claves					Explosion
76 - E5						Dog
77 - F5						Horse Gallop
78 - F#5						Birds
79 - G5						Rain
80 - G#5						Thunder
81 - A5						Wind
82 - A#5						Sea Shore
83 - B5						Stream
84 - C6						Bubble
85 - C#6						*
86 - D6						*
87 - D#6						*
88 - E6					Applauses	*

NOTES :

*: No sound

Blank : Same sound as "Standard Set"

[EXC] : Sounds with same EXC number are mutually exclusive

DRUM SET TABLE (MIDI CHANNEL 10)

	Prog 65 : STANDARD SET	Prog 73: ROOM SET	Prog 81 : POWER SET	Prog 89 : ELECTR. SET	Prog 90: TR-808 SET
27 - D#1	High Q				
28 - E1	Slap				
29 - F1	Scratch Push				
30 - F#1	Scratch Pull				
31 - G1	Sticks				
32 - G#1	Square Click				
33 - A1	Metronome Click				
34 - A#1	Metronome Bell				
35 - B1	Kick drum2/Jazz BD2				
36 - C2	Kick drum1/Jazz BD1		Power Kick	Elec BD	808 Bass Drum
37 - C#2	Side Stick				808 Rim shot
38 - D2	Snare Drum 1		Gated Snare	Elec SD	808 Snare Drum
39 - D#2	Hand Clap				
40 - E2	Snare Drum 2			Gated Snare	
41 - F2	Low Floor Tom	Room Low Tom2	Room Low Tom2	Elec Low Tom2	808 Low Tom2
42 - F#2	Closed Hi Hat [EXC1]				808 CHH [EXC1]
43 - G2	High Floor Tom	Room Low Tom1	Room Low Tom1	Elec Low Tom1	808 Low Tom2
44 - G#2	Pedal Hi-Hat [EXC1]				808 CHH [EXC1]
45 - A2	Low Tom	Room Mid Tom2	Room Mid Tom2	Elec Mid Tom2	808 Mid Tom2
46 - A#2	Open Hi-Hat [EXC1]				808 OHH [EXC1]
47 - B2	Low-Mid Tom	Room Mid Tom1	Room Mid Tom1	Elec Mid Tom1	808 Mid Tom1
48 - C3	Hi Mid Tom	Room Hi Tom2	Room Hi Tom2	Elec Hi Tom2	808 Hi Tom2
49 - C#3	Crash Cymbal 1				808 Cymbal
50 - D3	High Tom	Room Hi Tom1	Room Hi Tom1	Elec Hi Tom1	808 HiTom1
51 - D#3	Ride Cymbal 1				
52 - E3	Chinese Cymbal			Reverse Cymbal	
53 - F3	Ride Bell				
54 - F#3	Tambourine				
55 - G3	Splash Cymbal				
56 - G#3	Cowbell				808 Cowbell
57 - A3	Crash Cymbal 2				
58 - A#3	Vibraslap				
59 - B3	Ride Cymbal 2				
60 - C4	Hi Bongo				
61 - C#4	Low Bongo				
62 - D4	Mute Hi Conga				808 High Conga
63 - D#4	Open Hi Conga				808 Mid Conga
64 - E4	Low Conga				808 Low Conga
65 - F4	High Timbale				
66 - F#4	Low Timbale				
67 - G4	High Agogo				
68 - G#4	Low Agogo				
69 - A4	Cabasa				
70 - A#4	Maracas				808 Maracas
71 - B4	Short Whistle[EXC2]				
72 - C5	Long Whistle[EXC2]				
73 - C#5	Short Guiro [EXC3]				
74 - D5	Long Guiro [EXC3]				
75 - D#5	Claves				808 Claves
76 - E5	Hi Wood Block				
77 - F5	Low Wood Block				
78 - F#5	Mute Cuica [EXC4]				
79 - G5	Open Cuica [EXC4]				
80 - G#5	Mute Triangle [EXC5]				
81 - A5	Open Triangle[EXC5]				
82 - A#5	Shaker				
83 - B5	Jingle Bell				
84 - C6	Belltree				
85 - C#6	Castanets				
86 - D6	Mute Surdo [EXC6]				
87 - D#6	Open Surdo [EXC6]				
88 - E6					

2. MIDI IMPLEMENTATION

CANCUN FX™ MIDI IMPLEMENTATION CHART

Manufacturer: Voyetra Turtle Beach, Inc. Date:1/11/99 Version: 1.00

Model: GMS963200B (Roland)

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	X	1 - 16	
	Changed	X	1 - 16	
Note Number		X	0 - 127	
Velocity	Note ON	X	O	
	Note OFF	X	O	
After Touch	Keys	X	X	
	Channel	X	O	
Pitch Bend		X	O	
Program Change		X	O	
Control Number	0	X	O	Bank Select
	1	X	O	Mod Wheel
	5	X	O	Portamento Time
	6	X	O	Data entry
	7	X	O	Volume
	10	X	O	Pan
	11	X	O	Expression
	64	X	O	Sustain Pedal
	65	X	O	Portamento On/Off
	66	X	O	Sostenuto Pedal
	67	X	O	Soft Pedal
	80	X	O	Reverb Program
	81	X	O	Chorus Program
	91	X	O	Reverb Depth
	93	X	O	Chorus Depth
	98	X	O	Non-reg param LSB
	99	X	O	Non-reg param MSB
	100	X	O	Reg. Param LSB
	101	X	O	Reg. Param MSB
	120	X	O	All Sound Off
	121	X	O	Reset All Controllers
	123	X	O	All Notes Off
	126	X	O	Mono On
	127	X	O	Poly On
System Exclusive		X	O	

2-1 DETAILED MIDI IMPLEMENTATION

2.11 STANDARD MIDI CONTROLLERS

MIDI MESSAGE	HEX CODE	DESCRIPTION	COMPATIBI-LITY
NOTE ON	9nH kk vv	Midi channel n(0-15) note ON #kk(1-127), velocity vv(1-127). vv=0 means NOTE OFF	MIDI
NOTE OFF	8nH kk vv	Midi channel n(0-15) note OFF #kk(1-127), vv is don't care.	MIDI
PITCH BEND	EnH bl bh	Pitch bend as specified by bh|bl (14 bits) Maximum swing is +/- 1 tone (power-up). Can be changed using " pitch bend sensitivity ". Center position is 00H 40H.	GM
PROGRAM CHANGE	CnH pp	Program (patch) change. Specific action on channel 10 (n=9) : select drumset. Refer to sounds / drumset list. Drumsets can be assigned to other channels (see SYSEX MIDI channel to part assign and part to rhythm allocation)	GM/GS
CHANNEL AFTERTOUCH	DnH vv	vv pressure value. Effect set using Sys. Ex. 40H 2nH 20H-26H	MIDI
MIDI RESET	FFH	Reset to power-up condition	
CTRL 00	BnH 00H cc	Bank select : Refer to sounds list. No action on drumset. cc=64 reserved for dream sound editor	GS/ DREAM
CTRL 01	BnH 01H cc	Modulation wheel. Rate and maximum depth can be set using SYSEX	MIDI
CTRL 05	BnH 05H cc	Portamento time.	MIDI
CTRL 06	BnH 06H cc	Data entry : provides data to RPN and NRPN	MIDI
CTRL 07	BnH 07H cc	Volume (default=100)	MIDI
CTRL 10	BnH 0AH cc	Pan (default=64 center)	MIDI
CTRL 11	BnH 0BH cc	Expression (default=127)	MIDI/GM
CTRL 64	BnH 40H cc	Sustain (damper) pedal	MIDI
CTRL 65	BnH 41H cc	Portamento ON/OFF	MIDI
CTRL 66	BnH 42H cc	Sostenuto pedal	MIDI
CTRL 67	BnH 43H cc	Soft pedal	MIDI
CTRL 80	BnH 50H vv	Reverb program vv=00H to 07H (default 04H) 00H : Room1 01H : Room2 02H : Room3 03H : Hall1 04H : Hall2 05H : Plate 06H : Delay 07H : Pan delay	DREAM
CTRL 81	BnH 51H vv	Chorus program vv=00H to 07H (default 02H) 00H : Chorus1 01H : Chorus2 02H : Chorus3 03H : Chorus4 04H : Feedback 05H : Flanger 06H : Short delay 07H : FB delay	DREAM
CTRL 91	BnH 5BH vv	Reverb send level vv=00H to 7FH	GS
CTRL 93	BnH 5DH vv	Chorus send level vv=00H to 7FH	GS
CTRL 120	BnH 78H 00H	All sound off (abrupt stop of sound on channel n)	MIDI
CTRL 121	BnH 79H 00H	Reset all controllers	MIDI
CTRL 123	BnH 7BH 00H	All notes off	MIDI
CTRL 126	BnH 7EH 00H	Mono on	MIDI
CTRL 127	BnH 7FH 00H	Poly on (default power-up)	MIDI
CTRL CC1	BnH ccH vvH	Assignable Controller 1. cc=Controller number (0-5Fh), vv=Control value (0-7Fh). Control number (ccH) can be set on CC1 CONTROLLER NUMBER (Sys. Ex 40 1x 1F). The resulting effect is determined by CC1 controller function (Sys.Ex. 40 2x 40-4A)	GS
CTRL CC2	BnH ccH vvH	Assignable Controller 2. cc=Controller number (00h-5Fh), vv=control value (0-7Fh). Control number can be set on CC2 CONTROLLER NUMBER (Sys.Ex. 40 1x 20). The resulting effect is determined by CC2 controller function (Sys.Ex.40 2x 50-5A).	

2.12 REGISTERED PARAMETER NUMBERS

RPN 0000H	BnH 65H 00H 64H 00H 06H vv	Pitch bend sensitivity in semitones (default=2)	MIDI/GM
RPN 0001H	BnH 65H 00H 64H 01H 06H vv	Fine tuning in cents (vv=00 -100, vv=40H 0, vv=7FH +100	MIDI
RPN 0002H	BnH 65H 00H 64H 02H 06H vv	Coarse tuning in half-tones (vv=00 -64, vv=40H 0, vv=7FH +64	MIDI

2.13 NON-REGISTERED PARAMETER NUMBERS

MIDI MESSAGE	HEX CODE	DESCRIPTION	COMPATIBILITY
NRPN 0108H	BnH 63H 01H 62H 08H 06H vv	Vibrate rate modify (vv=40H -> no modif)	GS
NRPN 0109H	BnH 63H 01H 62H 09H 06H vv	Vibrate depth modify (vv=40H -> no modif)	GS
NRPN 010AH	BnN 63H 01H 62H 0AH 06H vv	Vibrate delay modify (vv=40H -> no modif)	GS
NRPN 0120H	Bnh 63H 01H 62H 20H 06H vv	TVF cutoff freq modify(vv=40H -> no modif)	GS
NRPN 0121H	BnH 63H 01H 62H 21H 06H vv	TVF resonance modify (vv=40H -> no modif)	GS
NRPN 0163H	Bnh 63H 01H 62H 63H 06H vv	Env. attack time modify(vv=40H ->no modif)	GS
NRPN 0164H	BnH 63H 01H 62H 64H 06H vv	Env. decay time modify(vv=40H -> no modif)	GS
NRPN 0166H	BnH 63H 01H 62H 66H 06H vv	Env. release time modif(vv=40H ->no modif)	GS
NRPN 18rrH	BnH 63H 18H 62H rr 06H vv	Pitch coarse of drum instr. note rr in semitones (vv=40H -> no modif)	GS
NRPN 1ArrH	BnH 63H 1AH 62H rr 06H vv	Level of drum instrument note rr (vv=00 to 7FH)	GS
NRPN 1CrrH	BnH 63H 1CH 62H rr 06H vv	Pan of drum instrument note rr (40H = middle)	GS
NRPN 1DrrH	BnH 63H 1DH 62H rr 06H vv	Reverb send level of drum instrument note rr (vv=00 to 7FH)	GS
NRPN 1ErrH	BnH 63H 1EH 62H rr 06H vv	Chorus send level of drum instrument note rr (vv=00 to 7FH)	GS
NRPN 37xxH	BnH 63H 37H 62H xx 06H vv	Special Synthesis features controls (see §3-1-below)	DREAM

2.14 DETAILED SYSEX MESSAGES

7	F0H 7EH 7FH 09H 01H F7H	General MIDI reset	GM
Standard Sysex	F0H 7FH 7FH 04H 01H 00H ll F7H	Master volume (ll=0 to 127, default 127)	GM
SYSEX	F0H 41H 00H 42H 12H 40H 00H 00H dd dd dd dd xx F7H	Master tune (default dd= 00H 04H 00H 00H) -100.0 to +100.0 cents. Nibblized data should be used (always four bytes). For example, to tune to +100.0 cents, sent data should be 00H 07H 0EH 08H	GS
SYSEX	F0H 41H 00H 42H 12H 40H 00H 04H vv xx F7H	Master volume (default vv=7FH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 00H 05H vv xx F7H	Master key-shift (default vv=40H, no transpose)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 00H 06H vv xx F7H	Master pan (default vv=40H, center)	
SYSEX	F0H 41H 00H 42H 12H 40H 00H 7FH 00H xx F7H	GS reset	GS
SYSEX	F0H 41H 00H 42H 12H 40 01H 10H vv1 vv2 vv3 vv4 vv5 vv6 vv7 vv8 vv9 vv10 vv11 vv12 vv13 vv14 vv15 vv16 xx F7h	Voice reserve : vv1= Part 10 (Default vv=2) vv2 to vv10 = Part 1 to 9 (Default vv=2) vv11 to vv16= Part 11 to 16 (Default vv=0)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 30H vv xx F7H	Reverb type (vv=0 to 7), default = 04H 00H : Room1 01H : Room2 02H : Room3 03H : Hall1 04H : Hall2 05H : Plate 06H : Delay 07H : Pan delay	GS

SYSEX	F0H 41H 00H 42H 12H 40H 01H 31H vv xx F7H	Reverb character, default 04H	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 33H vv xx F7H	Reverb master level, default = 64	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 34H vv xx F7H	Reverb time	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 35H vv xx F7H	Reverb delay feedback. Only if reverb number=6 or 7 (delays)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 38H vv xx F7H	Chorus type (vv=0 to 7), default = 02H 00H : Chorus101H : Chorus2 02H : Chorus303H : Chorus4 04H : Feedback 05H : Flanger 06H : Short delay 07H : FB delay	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3AH vv xx F7H	Chorus master level, default = 64	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3BH vv xx F7H	Chorus feedback	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3CH vv xx F7H	Chorus delay	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3DH vv xx F7H	Chorus rate	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3EH vv xx F7H	Chorus depth	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 02H nn xx F7H	MIDI channel to part assign, p is part (0 to 15), nn is MIDI channel (0 to 15, 16=OFF). This SYSEX allows to assign several parts to a single MIDI channel or to mute a part. Default assignment : part MIDI channel 0 9 (DRUMS) 1-9 0-8 10-15 10-15	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 15H vv xx F7H	Part to rhythm allocation, p is part (0 to 15), vv is 00 (sound part) or 01 (rhythm part). This SYSEX allows a part to play sound or drumset. There is no limitation of the number of parts playing drumset. Default assignment : part 0 plays drums (default MIDI channel 9) all other parts play sound.	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 40H v1 v2 ... v12 xx F7H	Scale tuning, n is MIDI channel (0 to 15), v1 to v12 are 12 semi-tones tuning values (C, C#, D, ... A#, B), in the range -64 (00H) 0 (40H) +63(7FH) cents. This SYSEX allows non chromatic tuning of the musical scale on a given MIDI channel. Default v1, v2, ... ,v12 = 40H, 40H,...,40H (chromatic tuning). Scale tuning has no effect if the part is assigned to a rhythm channel or if the sound played is not of chromatic type.	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 1AH vv xx F7H	Velocity slope from 00H to 7FH (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 1BH vv xx F7H	Velocity offset from 00H to 7FH (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 1FH vv xx F7H	CC1 Controller number (00-5FH) (default = 10H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 20H vv xx F7H	CC2 Controller number (00-5FH) (default = 11H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 00H vv xx F7H	Mod pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 01H vv xx F7H	Mod tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 02H vv xx F7H	Mod Amplitude control (-100%-+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 03H vv xx F7H	Mod lfo1 rate control (default = 40H). n is don't care. Rate is common on all channels	GS

SYSEX	F0H 41H 00H 42H 12H 40H 2nH 04H vv xx F7H	Mod lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 05H vv xx F7H	Mod lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 06H vv xx F7H	Mod lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 10H vv xx F7H	Bend pitch control (-24,+24 semitone) (default = 42H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 11H vv xx F7H	Bend tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 12H vv xx F7H	Bend Amplitude control (-100%-+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 14H vv xx F7H	Bend lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 15H vv xx F7H	Bend lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 16H vv xx F7H	Bend lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 20H vv xx F7H	CAF pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 21H vv xx F7H	CAF tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 22H vv xx F7H	CAF Amplitude control (-100%-+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 24H vv xx F7H	CAF lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 25H vv xx F7H	CAF lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 26H vv xx F7H	CAF lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 40H vv xx F7H	CC1 pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 41H vv xx F7H	CC1 tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 42H vv xx F7H	CC1 Amplitude control (-100%-+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 44H vv xx F7H	CC1 lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 45H vv xx F7H	CC1 lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 46H vv xx F7H	CC1 lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 50H vv xx F7H	CC2 pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 51H vv xx F7H	CC2 tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 52H vv xx F7H	CC2 Amplitude control (-100%-+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 54H vv xx F7H	CC2 lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 55H vv xx F7H	CC2 lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 56H vv xx F7H	CC2 lfo1 tva depth (0-100%) (default = 0H)	GS

NOTES :

NRPN sending method : CTRL#99=high byte, CTRL#98=low byte, CTRL#6=vv

Example : NRPN 0108H = 40H -> CTRL#99=1, CTRL#98=8, CTRL#6=64

x or xx means " don't care "

3. SPECIAL MIDI CONTROLS

Various features and effects are controlled by NRPN MIDI messages. These include the 4 band parametric EQ, spatializer, chorus, reverb, master volume and more.

3.11 4 BAND EQ LEVELS

NRPN # (HIGH|LOW)	DESCRIPTION		POWER-UP DEFAULT
3700H	Equalizer Low band (bass)	0=-12dB, 40H=0dB, 7FH=+12dB	60H
3701H	Equalizer Med Low band	0=-12dB, 40H=0dB, 7FH=+12dB	40H
3702H	Equalizer Med High band	0=-12dB, 40H=0dB, 7FH=+12dB	40H
3703H	Equalizer High band (treble)	0=-12dB, 40H=0dB, 7FH=+12dB	60H

BAND LEVEL

00H	20H	40H	60H	7FH
-12dB	-6dB	0dB	+6dB	+12dB

Default =060h (+6dB) for LB-HB, =040h(0dB) for MLB-MHB

Note that setting a band to +12dB may result in audible distortion. Reduce the Master Volume (see 3.12) to prevent distortion.

3.12 MASTER VOLUME & EQ FREQ. CUTOFF

NRPN # (HIGH|LOW)	DESCRIPTION		POWER-UP DEFAULT
3707H	Master Volume	0 to 7FH	7FH
3708H	Equalizer Low cutoff freq	0=0Hz, 7FH=4.7 kHz	0CH
3709H	Equalizer Med Low cutoff freq	0=0Hz, 7FH=4.2 kHz	1BH
370AH	Equalizer Med High cutoff freq	0=0Hz, 7FH=4.2 kHz	72H
370BH	Equalizer High cutoff freq	0=0Hz, 7FH=18.75 kHz	40H

BAND FREQUENCY (0-7FH), LINEAR SCALE

BAND	RANGE	DEFAULT
LB	0-4.7Khz	0CH
MLB	0-4.2Khz	1BH
MHB	0-4.2Khz	72H
HB	0-18.75Khz	40H

3.13 OTHER CONTROLS

NRPN # (HIGH|LOW)	DESCRIPTION		POWER-UP DEFAULT
3715H	General Midi reverb send send,7FH=max	0=no send,40H=default	40H
3716H	General Midi chorus send send,7FH=max	0=no send,40H=default	40H
3718H	Post effects applied on GM	0= Post effects not applied 7Fh=Post effects applied	7FH
371AH	Post effects applied on Reverb/Chorus	0= Post effects not applied 7Fh=Post effects applied	7FH

Post effects are spatializer effect + equalizer effect. This Nrpn must be 0 (post effect not applied) if both spatializer and equalizer are unselected using Nrpn 3755H (see paragraph 3.21).

NRPN # (HIGH|LOW)	DESCRIPTION		POWER-UP DEFAULT
3720H	Spatializer effect volume effect	0= no effect, 7FH= maximum	00H
3722H	General Midi volume	0 to 7FH	7FH
3723H	General Midi pan	0=left, 40H=center, 7FH=right	40H
372CH	Spatializer effect delay	0=shortest to 7Fh=longest	1DH
372DH	Spatializer effect input	0=stereo 7Fh=mono	00H

3.21 TURNING EFFECTS ON/OFF

Various effects can be completely turned off which will increase the available polyphony.

NRPN # (HIGH|LOW)	DESCRIPTION		POWER-UP DEFAULT
3755H	Effects on/off	See below	3BH

Midi message code (in hexadecimal) : B0H 63h 37h, B0H 62h 55h, B0H 06h vv

Each bit of vv byte is used for selecting an effect ON or OFF as following :

7	6	5	4	3	2	1	0
0	0	REV	CHR	OM2	OM1	EQ2	EQ1

For example, vv=00111011 (3B hex, or 59 dec.) sets all effects on (default). Polyphony will be decreased for every effect that is enabled.

REV bit=1 : Reverb ON, polyphony decreased by 13

CHR bit=1 : Chorus ON, polyphony decreased by 3

OM2, OM1 bits : output mode select :

- OM2=0, OM1=0 : Spatializer effect OFF
- OM2=1, OM1=0 : Spatializer effect ON, polyphony decreased by 2. Spatializer parameters can be controlled using nrpn 3720h (volume), 372Ch (delay time), and 372Dh (stereo/mono)

EQ2, EQ1 bits : Equalizer

- EQ2=0, EQ1=0 : equalizer off
- EQ2=1, EQ1=0 : 2 band equalizer, polyphony decreased by 4
- EQ2=1, EQ1=1 : 4 band equalizer, polyphony decreased by 8

NOTES :

If Equalizer and spatializer are OFF, Nrpn 3718H, 3719H, 371AH, 371Bh must be all=0 (see paragraph 1.4 below), otherwise no sound will be output.

3.22 POLYPHONY COMPUTATION CHART

The following chart shows the polyphony required for each effect. The available polyphony is 64 minus the polyphony required by the effects on.

FEATURE	**REQUIRED POLYPHONY**	**POWER-UP DEFAULT**
Reverb	13	On (13)
Chorus	3	On (3)
Spatializer	2	On (2), volume=0
Equalizer 4 bands (2 bands)	8 (4)	On 4 bands (8)

The power-up available polyphony is 38 voices (64 -13-3-2-8). The maximum available polyphony with all features OFF is 64 voices.

APPENDIX

INSTRUMENTS REQUIRING 2 VOICES (2 LAYER INSTRUMENT).

PC	C0	Name
4	0	Honky-tonk Piano
5	8	Detuned EP 1
	8	Detuned EP 2
7	8	Coupled Hps.
17	8	Det. Organ 1
18	8	Det. Organ 2
19	0	Rock Organ
20	8	Ch. Organ 2
22	0	Accordion (french)
	8	Acc. (Italian)
24	0	Tango Accordion
26	8	12-str. Guitar
28	8	Chorus Gt.
31	8	Feedback Gt
40	0	Synth Bass 2
	8	Synth Bass 4
49	8	Orchestra
51	8	Synth Strings 3
52		Synth Strings 2
56		Orchestra Hit
61		French Horn
62	8	Brass 2
63		Synth Brass 1
	8	Synth Brass 3
64		Synth Brass 2
81		Lead 1 (square wave)
82		Lead 2 (saw wave)
83		Lead 3 (calliope)
84		Lead 4 (chiff)
85		Lead 5 (charang)
86		Lead 6 (voice)
87		Lead 7 (fifths)
88		Lead8 (bass+lead)
89		Pad 1 (new age)
91		Pad 3 (polysynth)
93		Pad 5 (bowed)
94		Pad 6 (metallic)
95		Pad 7 (halo)
97	0	FX 1 (rain)
98	0	FX 2 (soundtrack)
99	0	FX 3 (crystal)
100	0	FX4 (atmosphere)
101	0	FX 5 (brightness)
102	0	FX 6 (goblins)
103	8	Echo Pan
104	0	FX 8 (sci-fi)
108	8	Taisho Koto
123	0	Seashore
	1	Rain
	3	Wind
	4	Stream
	5	Bubble
124	0	Bird
125	5	Wind chime
126	7	Jet Takeoff
	8	Starship
	9	Burst Noise
127	0	Applause
128	2	Laser gun
	3	Explosion