

DreamBlaster X16 MIDI Specs

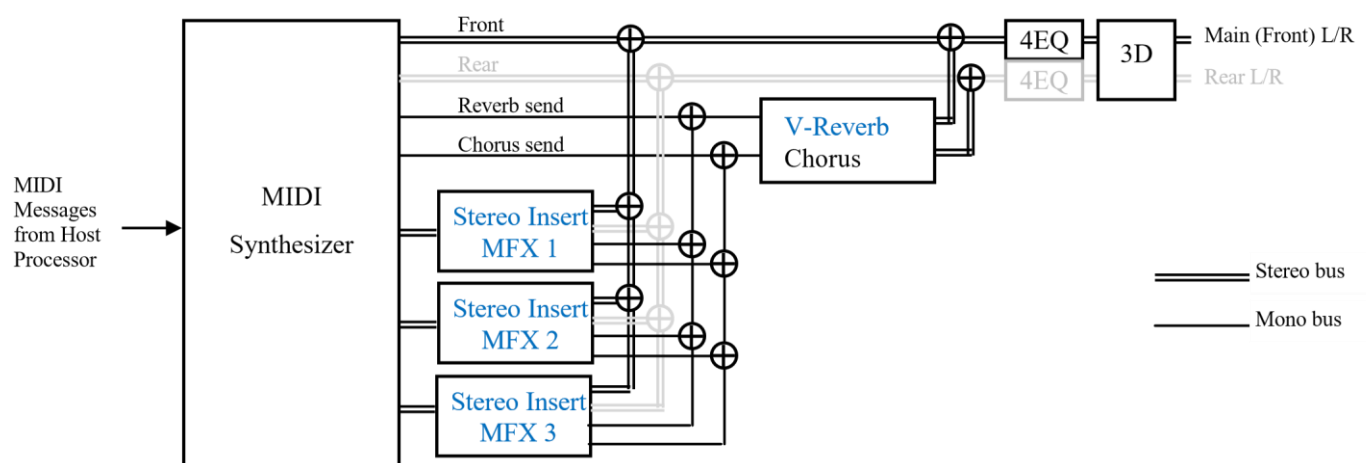
Serdaco BVBA - www.serdashop.com

Introduction

This document describes the MIDI specification for the Serdaco DreamBlaster X16 soundcard. It is also applicable to the X16GS soundcard. More information about the soundcard hardware is available at the webshop :

- X16 Soundcard: <https://www.serdashop.com/DreamBlaster-X16>
- X16GS Soundcard : <https://www.serdashop.com/DreamBlaster-X16GS>

Signal Processing Synoptic



Features of X16 MIDI Synthesizer

- SAM5716 + 1 gigabyte soundbank Flash + stereo DAC
- Expansion header for optionally adding additional DAC (rear sound)
- Full GM/™ implementation
- up to 256 voice polyphony
- 64 MIDI channels
- ™ compatible Reverb, Chorus
- 3 Stereo Insert Multi-Effects blocks (Distortion, Equalizer, Compressor, Chorus/Flanger/Phaser/Tremolo/Rotary, Delay)
- 4-bands Equalizer
- Serial and USB MIDI
- Fast soundbank loading using X16 Manager software



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Contact: www.serdashop.com/Contact

DREAM Special NRPN Controls

NRPN sending method:

CTRL#99=high byte, CTRL#98=low byte, CTRL#6=vv

Example:

In order to set General Master Volume (NRPN 3707h) to value 64 (40h), send

- CTRL#99=56 (37h) (MIDI code: 0B0h 063h 037h)
- CTRL#98=07 (07h) (MIDI code: 0B0h 062h 007h)
- CTRL#6 =64 (40h) (MIDI code: 0B0h 006h 040h)

MIDI channel must be 0 for all these NRPNs.

NRPN # (High Low)	Description	Power-up default
General		
3707h	Master volume 0 (mute) to 7Fh (max)	7Fh
3755h	3D Spatializer / Equalizer ON/OFF (bit 2: 3D, bit1: Front EQ, bit 0: Rear EQ)	EQ ON, 3D off
3758h	Main (Front) Reverb level (0 to 7Fh)	7Fh
375Eh	Main (Front) Output level (0 to 7Fh, 0=mute, ... 40h=0dB, ... 7Fh=+6dB)	7Fh (+6dB)
Main (Front) Output 4-bands Equalizer		
3708h	Equalizer Low Band Gain 0=-12dB ... 40h=0dB ... 7Fh=+12dB	58h (+4.5dB)
3709h	Equalizer Low Mid Band Gain 0=-12dB ... 40h=0dB ... 7Fh=+12dB	38h (-1.5dB)
370Ah	Equalizer High Mid Band Gain 0=-12dB ... 40h=0dB ... 7Fh=+12dB	38h (-1.5dB)
370Bh	Equalizer High Band Gain 0=-12dB ... 40h=0dB ... 7Fh=+12dB	58h (+4.5dB)
370Ch	Equalizer Low Band Freq 0=40Hz ... 7Fh=1056Hz (40+value*8)	08h (~100Hz)
370Dh	Equalizer Low Mid Band Freq 0=60Hz ... 7Fh=8188Hz (60+value*64)	07h (~500Hz)
370Eh	Equalizer High Mid Band Freq 0=60Hz ... 7Fh=8188Hz (60+value*64)	3Eh (~4KHz)
370Fh	Equalizer High Band Freq 0=1kHz ... 7Fh=~5kHz (1000+value*32)	7Dh (5KHz)
3710h	Equalizer Low Mid Band Q 0:Q=0.3 ... 7Fh:Q=~20 (0.3+value*20/128)	03h (~0.707)
3711h	Equalizer High Mid Band Q 0:Q=0.3 ... 7Fh:Q=~20 (0.3+value*20/128)	03h (~0.707)
Spatializer 3 Effect		
371Ch	Spatializer effect volume 0=no effect, till 7Fh=maximum effect	0
371Dh	Spatializer effect delay time 0=0ms, till 7Fh=max delay time	0
371Eh	Spatializer effect input mode 0=stereo, else mono	0
371Fh	Spatializer effect output mode 0=2 speaker, else 4 speaker	0
Front/Rear Mix		
38xxh	Front/Rear mix of MIDI channel xxh xxh=0 to 0Fh if port 1, 10h to 1Fh if port 2, 20h to 2Fh if port 3, 30h to 3Fh if port 4 value = 0 to 7Fh: 0=all Front, 40h=center, 7Fh=all Rear	0

X16 soundbank selection NRPN controls

NRPN # (High Low)	Description	Power-up default
5300h	Value MSB: 1-7 : select corresponding soundbank slot	Depends on dip switch position (see user manual)

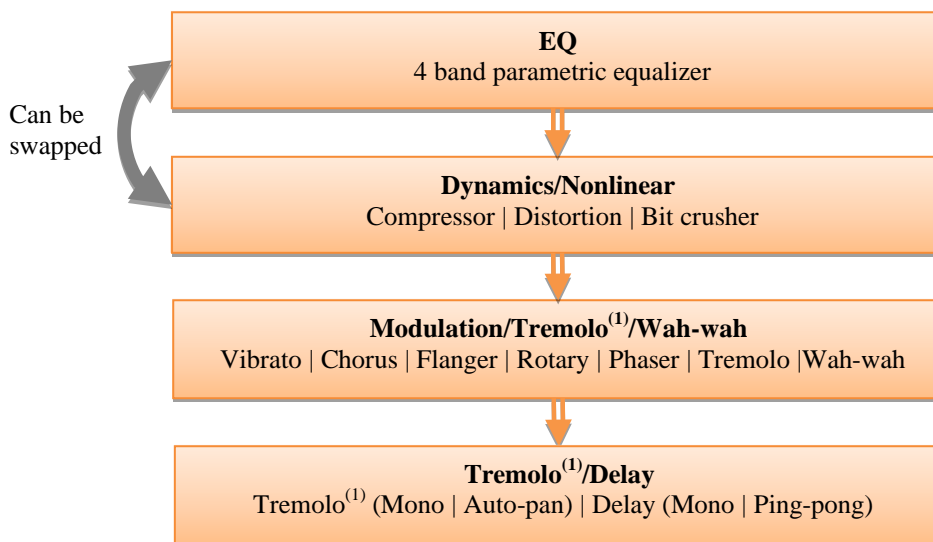
Stereo Insert Multi-Effects

For using the Stereo Insert Multi-Effects a single MIDI part (or also several) can be switched to “Insert FX ON”. In this case these MIDI parts are going through the insert effect block first and after into mixing (Main L/R, Rear L/R, Reverb and Chorus send).

MIDI message to switch Insert Effect ON:

NRPN #	Description	default
39xxh	Set Insert FX mode ON/OFF for MIDI channel xxh xxh=0 to 0Fh if port 1, 10h to 1Fh if port 2, 20h to 2Fh if port 3, 30h to 3Fh if port 4 value 0 = normal track mode, 1 = connected to IMFX1, 2 = to IMFX2, 3 = to IMFX3	0

This Multi-Effect configuration is running in one DSP:



⁽¹⁾Tremolo can be selected either in the Modulation or in the Tremolo/Delay block, but not in both simultaneously (see “Configuration” NRPN below)

Insert Effect NRPN Controls

Stereo Insert MFX1 is controlled by NRPN controls send on MIDI channel1, MFX2 by MIDI channel 2, MFX3 by MIDI channel 3.

Configuration

NRPN	Description
0x0C00	Effects Configuration: <ul style="list-style-type: none"> • 0 = Off • 1 = Dyn -> EQ -> Mod/Wah -> Tremolo/Delay • 2 = Dyn -> EQ -> Mod/Tremolo /Wah -> Delay • 3 = EQ -> Dyn -> Mod/Wah -> Tremolo/Delay • 4 = EQ -> Dyn -> Mod/Tremolo /Wah -> Delay

Compressor

NRPN	Description
0x0100	0 = Off, 1 = On

0x0102	Attack Time: 0 = fast attack (96µs) ... 0x7FFF=slow attack (120ms)
0x0103	Release Time: 0 = fast release (15ms) ... 0x7FFF=slow release (6s)
0x0104	Ratio: 0 = 1:1 ... 0x7FFF = Limiter
0x0105	Threshold : 0 = -Inf ... 0x7FFF = 0dB
0x0106	Makeup Gain (Boost) in dB 0 = 0dB ... 0x7FFF = +18dB

Distortion

NRPN	Description
0x0800	0 = Off, 1 = On
0x0801	Type: <ul style="list-style-type: none"> • 0 = Overdrive: gentle transistor saturation • 1 = Distortion: heavier transistor saturation • 2 = Fuzz1: smooth fuzz • 3 = Fuzz2: nasty fuzz • 4 = Tube: tube saturation • 5 = Asymmetrical: sort of single side (half wave) saturation
0x0802	Input Brightness: 0 = min ... 0x7FFF = max
0x0803	Distortion Amount (Drive) : 0 ≈unity gain ... 0x7FFF = maximum gain, depends on type
0x0804	Output Brightness: 0 = min ... 0x7FFF = max
0x0805	Output Level: 0 = 0.0 ... 0x7FFF = 1.0

Bit Crusher

NRPN	Description
0x0400	0 = Off, 1 = On
0x0401	Bit Resolution: 0 = full 24 bit resolution, 1...16 = bit resolution in bits
0x0402	Down-Sampling Factor : 1...16
0x0403	Output Brightness: 0 = min ... 0x7FFF = max
0x0404	Output Volume: 0 = 0.0 ... 0x7FFF = 1.0

4 Bands Parametric EQ

NRPN	Description
0x0900	0 = Off, 1 = On
0x092n ⁽¹⁾	Band type: <ul style="list-style-type: none"> • 0 = Off • 1 = Low pass 6dB • 2 = Low pass 12dB • 3 = Low shelf • 4 = Peak/Notch • 5 = High shelf • 6 = High pass 6dB • 7 = High pass 12dB
0x093n ⁽¹⁾	Frequency in Hz: 20 ... 20000
0x094n ⁽¹⁾	Q in range: 0.1 ... 16
0x095n ⁽¹⁾	Gain in range: -24 ... 0...+24 dB (only for Peak/Notch, Low shelf and High shelf)

(1) 'n' in range 0..3 = EQ band

Modulation Effect

NRPN	Description
0x0300	0 = Off, 1 = On
0x0301	Type: 0 = Chorus, 1 = Vibrato, 2 = Flanger, 3 = Phaser, 4 = Rotary
0x0302	Waveform: 0 = Triangle, 1 = Sine
0x0303	Level: 0 = 100% dry ... 0x7FFF = 100% wet (Chorus, Flanger, Phaser). N/A for Vibrato (100% wet)
0x0306	Depth: 0 = 0.0 ... 0x7FFF = 1.0
0x0307	Rate: 0 = 0Hz ... 0x7FFF ≈ 10Hz.
0x0308	Modulation Delay: Chorus: 0x0 = 0.25ms ... 0x7FFF ≈ 20ms Flanger: 0x0 = 0.125ms ... 0x7FFF ≈ 10ms others: N/A
0x0309	Feedback: 0 = no feedback ... 0x7FFF = max
0x030B	Rotary Slow / Fast selector: 0 = Slow, else Fast Rate
0x030C	Rotary fast modulation rate: 0 = 0Hz ... 0x7FFF = ~10Hz.
0x030D	Rotary Acceleration Time : time it takes to go from slow to fast Rate: 0 = 5.8s ... 0x7FFF = 0.2s
0x030E	Rotary Brake Time: time it takes to go from fast Rate to slow Rate: 0 = 5.8s ... 0x7FFF = 0.2s
0x030F	Rotary speaker directivity: 0 = omnidirectional ... 0x7FFF = maximum directivity
0x0310	Rotary Mic Angle: angle between stereo pickup microphones: 0 = 0°, 1 = 45°, 2 = 90°, 3 = 135°, 4 = 180°

Wah-Wah

NRPN	Description
0x0200	0 = Off, 1 = On
0x0201	Mode: 0 = Dyn up, 1 = Dyn down, 2 = Dyn up sharp, 3 = LFO
0x0202	Filter type: 0 = Low pass, 1 = Band pass
0x0203	Filter center frequency: 0 = min ... 0x7FFF = max
0x0204	Filter Resonance: 0 = min ... 0x7FFF = max
0x0205	Dyn wah Sensitivity: 0 = none ... 0x7FFF = max
0x0206	Dyn wah Decay time: 0 = 10ms ... 0x7FFF = 5s
0x0207	LFO Amount: 0 = none ... 0x7FFF = max
0x0208	LFO Rate: 0 = 0Hz ... 0x7FFF ≈ 10Hz.

Tremolo

NRPN	Description
0x0500	0 = Off, 1 = On
0x0501	Type: 0 = Mono (tremolo), 1 = Stereo (auto-pan)
0x0503	Shape 0 = Triangle ... 0x7FFF = Square

0x0504	Depth: 0 = none ... 0x7FFF = max
0x0505	Modulation Rate: 0 ≈ 1Hz ... 0x7FFF ≈ 20Hz

Delay

NRPN	Description
0x0700	0 = Off, 1 = On
0x0701	Type: 0 = Mono, 1 = Stereo (ping-pong)
0x0702	Level: 0 = 0.0 ... 0x7FFF = 1.0
0x0703	Pre low pass filter cutoff frequency: 0≈2kHz ... 0x7FFF=off
0x0705	Delay time : 0 = 0 ... 0x7FFF = 1365ms
0x0706	Delay feedback: 0 = 0 ... 0x7FFF = 99%
0x0707	Feedback high frequency damping amount: 0 = 0 ... 0x7FFF ≈ 99%

Mix

NRPN	Description
0x0A00	Main Volume
0x0A01	Main L/R pan
0x0A02	AUX Volume
0x0A03	AUX L/R pan
0x0A04	Reverb send level
0x0A05	Chorus send level

Detailed MIDI Implementation

4 ports of 16 channels are provided for a total of 64 channels. MIDI Message “F5 nn” is used to switch between the two ports (nn=1 till 4).

MIDI Message	HEX Code	Description	Compatibility
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 2pH 20H-26H	MIDI
CTRL 00	BnH 00H cc	Bank select : Refer to sounds list. No action on drumset	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 71	BnH 47H cc	TVF Resonance modify (same as nrpn 0121h)	GM/GS
CTRL 72	BnH 48H cc	Env release time modify (same as nrpn 0166h)	GM/GS
CTRL 73	BnH 49H cc	Env attack time modify (same as nrpn 0163h)	GM/GS
CTRL 74	BnH 4AH cc	TVF cutoff freq modify (same as nrpn 0120h)	GM/GS
CTRL 75	BnH 4BH cc	Env decay time modify (same as nrpn 0164h)	GM/GS
CTRL 76	BnH 4CH cc	Vibrato rate modify (same as nrpn 0108h)	GM/GS
CTRL 77	BnH 4DH cc	Vibrato depth modify (same as nrpn 0109h)	GM/GS
CTRL 78	BnH 4EH cc	Vibrato delay modify (same as nrpn 010Ah)	GM/GS
CTRL 84	BnH 54H vv	Portamento control	GS
CTRL 91	BnH 5BH vv	Reverb send level vv=00H to 7FH	GM/GS
CTRL 93	BnH 5DH vv	Chorus send level vv=00H to 7FH	GM/GS
CTRL 98	BnH 62H vv	NRPN low	MIDI
CTRL 99	BnH 63H vv	NRPN high	MIDI
CTRL 100	BnH 64H vv	RPN low	MIDI
CTRL 101	BnH 65H vv	RPN high	MIDI
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 2p 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 2p 50-5A).	GS
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
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	BnH 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) (note 6)	GS
NRPN 1ArrH	BnH 63H 1AH 62H rr 06H vv	Level of drum instrument note rr (vv=00 to 7FH) (note 6)	GS
NRPN 1BrrH	BnH 63H 1BH 62H rr 06H vv	Front/Rear mix of drum instrument note rr (vv=00 to 7FH) (note 6)	DREAM
NRPN 1CrrH	BnH 63H 1CH 62H rr 06H vv	Pan of drum instrument note rr (40H = middle) (note 6)	GS
NRPN 1DrrH	BnH 63H 1DH 62H rr 06H vv	Reverb send level of drum instrument note rr (vv=00 to 7FH) (note 6)	GS
NRPN 1ErrH	BnH 63H 1EH 62H rr 06H vv	Chorus send level of drum instrument note rr (vv=00 to 7FH) (note 6)	GS
Standard Sysex	F0H 7EH 7FH 09H 01H F7H	General MIDI reset (note 4)	GM
Standard Sysex	F0H 7FH 7FH 04H 01H 00H ll F7H	Master volume (ll=0 to 127, default 127) (note 4). Not reset by GS reset	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 (note 4)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 00H 04H vv xx F7H	Master volume (default vv=7FH) (note 4) Not reset by GS reset.	GS
SYSEX	F0H 41H 00H 42H 12H 40H 00H 05H vv xx F7H	Master key-shift (default vv=40H, no transpose) (note 4)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 00H 06H vv xx F7H	Master pan (default vv=40H, center) (note 4)	
SYSEX	F0H 41H 00H 42H 12H 40H 00H 7FH 00H xx F7H	GS reset (note 4)	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) (note 4)	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 (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 31H vv xx F7H	Reverb character, default 04H (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 32H vv xx F7H	Reverb Pre-LPF, 0 to 7, default 0 (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 33H vv xx F7H	Reverb master level, default = 64 (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 34H vv xx F7H	Reverb time (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 35H vv xx F7H	Reverb delay feedback. Only if reverb number=6 or 7 (delays) (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 37H vv xx F7H	Reverb pre delay time (vv=0 to 7Fh = 0ms to 127ms). Only if reverb number=0 to 5 (reverbs)	GS

SYSEX	F0H 41H 00H 42H 12H 40H 01H 38H vv xx F7H	Chorus type (vv=0 to 7), default = 02H 00H : Chorus1 01H : Chorus2 02H : Chorus3 03H : Chorus4 04H : Feedback 05H : Flanger 06H : Short delay 07H : FB delay (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 39H vv xx F7H	Chorus Pre-LPF, 0 to 7, default = 0 (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3AH vv xx F7H	Chorus master level, default = 64 (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3BH vv xx F7H	Chorus feedback (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3CH vv xx F7H	Chorus delay (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3DH vv xx F7H	Chorus rate (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3EH vv xx F7H	Chorus depth (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3FH vv xx F7H	Chorus send level to reverb, default=0 (note 5)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 02H 00H vv xx F7H	EQ Low Freq, vv: 0=200Hz, 1=400Hz, default 0	GS
SYSEX	F0H 41H 00H 42H 12H 40H 02H 01H vv xx F7H	EQ Low Gain, vv: 0=-12dB, 40h=0dB, to7Fh=+12dB, default 60h=+6dB	GS
SYSEX	F0H 41H 00H 42H 12H 40H 02H 02H vv xx F7H	EQ High Freq, vv: 0=3KHz, 1=6KHz, default 0	GS
SYSEX	F0H 41H 00H 42H 12H 40H 02H 03H vv xx F7H	EQ High Gain, vv: 0=-12dB, 40h=0dB, to7Fh=+12dB, default 60h=+6dB	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. (note 3) Default assignment : <u>part</u> <u>MIDI channel</u> 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. (note 3)	GS

SYSEX	F0H 41H 00H 42H 12H 40H 1pH 40H v1 v2 ... v12 xx F7H	Scale tuning, p is part (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 part. 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. (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 1AH vv xx F7H	Velocity slope from 00H to 7FH (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 1BH vv xx F7H	Velocity offset from 00H to 7FH (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 1FH vv xx F7H	CC1 Controller number (00-5FH) (default = 10H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 20H vv xx F7H	CC2 Controller number (00-5FH) (default = 11H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 00H vv xx F7H	Mod pitch control (-24,+24 semitone) (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 01H vv xx F7H	Mod tvf cutoff control (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 02H vv xx F7H	Mod Amplitude control (-100%+100%) (default=40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 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 2pH 04H vv xx F7H	Mod lfo1 pitch depth (0-600 cents) (default=0AH) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 05H vv xx F7H	Mod lfo1 tvf depth (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 06H vv xx F7H	Mod lfo1 tva depth (0-100%) (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 10H vv xx F7H	Bend pitch control (-24,+24 semitone) (default = 42H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 11H vv xx F7H	Bend tvf cutoff control (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 12H vv xx F7H	Bend Amplitude control (-100%+100%) (default=40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 14H vv xx F7H	Bend lfo1 pitch depth (0-600 cents) (default=00H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 15H vv xx F7H	Bend lfo1 tvf depth (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 16H vv xx F7H	Bend lfo1 tva depth (0-100%) (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 20H vv xx F7H	CAF pitch control (-24,+24 semitone) (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 21H vv xx F7H	CAF tvf cutoff control (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 22H vv xx F7H	CAF Amplitude control (-100%+100%) (default=40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 24H vv xx F7H	CAF lfo1 pitch depth (0-600 cents) (default=00H) (note 3)	GS

SYSEX	F0H 41H 00H 42H 12H 40H 2pH 25H vv xx F7H	CAF lfo1 tvf depth (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 26H vv xx F7H	CAF lfo1 tva depth (0-100%) (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 40H vv xx F7H	CC1 pitch control (-24,+24 semitone) (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 41H vv xx F7H	CC1 tvf cutoff control (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 42H vv xx F7H	CC1 Amplitude control (-100%--+100%) (default=40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 44H vv xx F7H	CC1 lfo1 pitch depth (0-600 cents) (default=00H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 45H vv xx F7H	CC1 lfo1 tvf depth (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 46H vv xx F7H	CC1 lfo1 tva depth (0-100%) (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 50H vv xx F7H	CC2 pitch control (-24,+24 semitone) (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 51H vv xx F7H	CC2 tvf cutoff control (default = 40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 52H vv xx F7H	CC2 Amplitude control (-100%--+100%) (default=40H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 54H vv xx F7H	CC2 lfo1 pitch depth (0-600 cents) (default=00H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 55H vv xx F7H	CC2 lfo1 tvf depth (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2pH 56H vv xx F7H	CC2 lfo1 tva depth (0-100%) (default = 0H) (note 3)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 4pH 22H nn xx F7H	with 'p'=MIDI track, 'nn': 0 = track in normal mode, 1 = send to MFX1, 2 = send to MFX2, 3 = send to both MFX	GS / DREAM

- Notes :**
1. 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.
 2. x or xx means « don't care » 3.
- Cross system exclusive :
- Address can be 040h xxh xxh or 050h xxh xxh
- If address=040h xxh xxh : system exclusive applies to midi port 1 (midi channels 0-Fh) if received on midi port1 , applies to midi port 2 (midi channels 10-1Fh) if received on midi port 2.
- If address=050h xxh xxh, cross system exclusive : applies to port 2 if received on port1, applies to port 1 if received on port2
4. Non cross system exclusive applying only on receiving port :
 - System exclusive applies to midi port 1 (midi channels 0-Fh) if received on midi port1.
 - System exclusive applied to midi port 2 (midi channels 10-1Fh) if received on midi port2.
 5. Non cross system exclusive applying on both ports :
 - System exclusive will be applied to all midi channels (0-1Fh). Can be received on port 1 or port 2 indifferently. This is the case for all system exclusive concerning reverb and chorus because reverb and chorus are the same for both ports 1 and 2.
 6. Drumset edit Nrpn : 4 different drumset edit tables are implemented :
 - 1 for midi port 1 channel 10
 - 1 for midi port 2 channel 10
 - 1 for midi port 1 channels 1-9 or 11-16 : for all these channels, edit table is the same
 - 1 for midi port 2 channels 1-9 or 11-16 : for all these channels, edit table is the same

X16 Soundbank specification

Several soundbanks are available for X16, which support up to 7 soundbanks uploaded to the flash slots.

As an example, you find below information on the GMBK5X128 Dream Cleanwave soundbank, which is preloaded on X16.

The **GMBK5X128** Sound Bank contains more than 400 carefully recorded and edited sounds, including full General MIDI sound set and top quality additional sounds:

- 128 GM instruments
- 269 variation instruments (including 128 “MT-32” variations)
- 9 drum sets + 1 SFX set

This Sound Bank is built based on sounds from **Dream-CleanWave-5000©** Sound Package.

GMBK5X128 MAIN SOUNDS - GENERAL MIDI (all channels except 10)

Pgm: Program Change # (1-128)

Pgm	Name	Pgm	Name	Pgm	Name	Pgm	Name
1	Acoustic Grand Piano	33	Acoustic Bass	65	Soprano Sax	97	Ice Rain
2	Bright Acoustic Piano	34	Fingered Bass (J-Bass)*	66	Alto Sax	98	Soundtrack
3	Electric Grand Piano	35	Picked Bass 1*	67	Tenor Sax	99	Crystal
4	Honky-Tonk Piano	36	Fretless Bass	68	Baritone Sax	100	Atmosphere
5	Electric Piano 1	37	Slap Bass 1	69	Oboe	101	Brightness
6	Electric Piano 2	38	Slap Bass 2	70	English Horn	102	Goblin
7	Harpichord	39	Synth Bass 1	71	Bassoon	103	Echo Drops
8	Clavinet	40	Synth Bass 2	72	Clarinet	104	Star Theme
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	Bottle Blow	109	Kalimba
14	Xylophone	46	Pizzicato Strings	78	Shakuhachi	110	Bagpipe
15	Tubular Bell	47	Harp	79	Whistle	111	Fiddle
16	Santur	48	Timpani	80	Ocarina	112	Shanai
17	Hammond Organ	49	String Ensemble	81	Square Lead	113	Tinkle Bell
18	Percussive Organ	50	Slow String Ensemble	82	Saw Lead	114	Agogo
19	Rock Organ	51	Synth Strings 1	83	Synth Calliope	115	Steel Drums
20	Church Organ 1	52	Synth Strings 2	84	Chiffer Lead	116	Woodblock
21	Reed Organ	53	Choir Aahs	85	Charang	117	Taiko
22	French Accordion	54	Voice Oohs	86	Solo Synth Vox	118	Melodic Tom 1
23	Harmonica	55	Synth Voice	87	5th Saw Wave	119	Synth Drum

24	Bandoneon	56	Orchestra Hit	88	Bass & Lead	120	Reverse Cymbal
25	Nylon-String Guitar	57	Trumpet	89	Fantasia Pad	121	Guitar Fret Noise
26	Steel-String Guitar	58	Trombone	90	Warm Pad	122	Breath Noise
27	Jazz Guitar	59	Tuba	91	Polysynth Pad	123	Seashore
28	Clean Electric Guitar	60	Muted Trumpet	92	Space Voice Pad	124	Bird
29	Muted Electric Guitar	61	French Horns	93	Bowed Glass Pad	125	Helicopter
30	Overdriven Guitar	62	Brass Section 1	94	Metal Pad	126	Telephone 1
31	Distortion Guitar	63	Synth Brass 1	95	Halo Pad	127	Applause
32	Guitar Harmonics	64	Synth Brass 2	96	Sweep Pad	128	Gun Shot

* Note: using new sound compared to GMBK5X128 sound bank V1

SOUND VARIATIONS (all channels except 10)

Pgm: Program Change # (1-128)

C0: Bank Change # (MIDI Control 0) value (0-127, value 0 for General MIDI capital sounds)

Pgm	C0	Name	C0	Name	C0	Name	C0	Name
5	1	Electric Piano 1-2	8	Soft Electric Piano	9	Detuned EP 1	16	FM-SA Electric Piano
5	24	60's Electric Piano	25	Hard Rhodes				
6	1	Electric Piano 2-2	8	Detuned Electric Piano	9	Detuned EP 2	16	St.FM Electric Piano
6	24	Hard FM Electric Piano						
7	8	Coupled Harpsichord						
13	16	Barafon						
15	8	Church Bell	9	Carillon				
16	1	Santur 2						
17	1	Organ 101	2	Organ 1	8	Detuned Organ 1	9	Organ 109
17	16	60's Organ 1	33	Even Bar	40	Organ Bass		
18	1	Organ 201	2	Organ 2	8	Detuned Organ 2	9	Detuned Organ-2
19	8	Rotary Organ	16	Rotary Organ Slow	24	Rotary Organ Fast		
20	8	Church Organ 2						
22	8	Accordion Italian						
25	8	Ukulele	16	Nylon Guitar-o	24	Velo Harmonics		
26	1	Steel String Guitar	8	12 String Guitar	9	Nylon+String	16	Mandolin
26	32	Steel Guitar 2						
27	8	Hawaiian Guitar						
28	1	Clean Guitar	8	Chorus Guitar	9	Chorus Guitar-2		
29	8	Funk Guitar						
30	1	Overdrive Guitar-2						

31	8	Feedback Guitar						
32	8	Guitar Feedback	16	Acoustic Gtr Harmonics				
33	1	Fingered Bass	2	Fingered Bass X				
34	1	Picked Bass Soft	2	Picked Bass				
37	1	Slap bass 2-2						
39	1	Synth Bass 1-2	8	Synth Bass 3	9	TB303 Bass	10	Tekno Bass 2
39	11	Tekno Bass	12	Seq 303 Overdrive	13	Seq 303	16	Reso SH Bass
40	1	Synth Bass 2-2	2	Modular Bass 2	3	Seq Bass	4	Analog Bass
40	5	Synth Bass 201	8	Synth Bass 4	16	Rubber Bass	17	SH101 Bass 1
40	18	SH101 Bass 2	19	Smooth Bass				
49	8	Orchestra 2						
51	8	Synth Strings 3						
56	8	Impact Hit	9	Philly Hit				
57	1	Trumpet 2	2	Trumpet-Solo	8	Flugel Horn	24	Bright Trumpet
60	1	Muted Trumpet-2	2	Bright Muted Trumpet				
62	8	Brass 2	16	Brass Fall				
63	8	Synth Brass 3						
64	8	Synth Brass 4						

Pgm	C0	Name	C0	Name	C0	Name	C0	Name
65	1	Soprano Saxophone						
66	1	Alto Saxophone	8	Hyper Alto				
67	8	Breathy Tenor						
68	1	Bariton Saxophone						
70	1	English Horn-2						
71	1	Bassoon-2						
72	8	Bass Clarinet						
81	1	Square Wave	8	Sine Wave				
82	1	Saw Wave						
90	3	Rotary String						
103	2	Echo Pan						
108	8	Taisho Koto						
116	8	Castanets						

117	8	Concert Bass Drum						
118	8	Melodic Tom 2						
119	8	808 Tom	9	Electronic Percussion				

SFX VARIATIONS (all channels except 10)

Pgm	C0=1	C0=2	C0=3	C0=4	C0=5	C0=6	C0=7	C0=8	C0=9
121	Guitar Cut Noise	String Slap	Bass Slide	Pick Scrape					
122	Flute Key Click								
123	Rain	Thunder	Wind	Stream	Bubble				
124	Dog	Horse Gallop	Bird 2						
125	Telephone 2	Door Creaking	Door Closing	Scratch	Wind Chimes				
126	Car-Engine	Car-Stop	Car-Pass	Car-Crash	Siren	Train	Jet Plane	Starship	Burst Noise
127	Laughing	Screaming	Punch	Heart Beat	Footsteps				
128	Machine Gun	Laser Gun	Explosion						

MT32 compatible sound list can be accessed on Bank Change #127, not shown in above sound lists.

DRUM SET TABLE (MIDI Channel 10)

Note#	Prog 1 : STD SET1	Prog 9: ROOM SET	Prog 17 : POWER SET	Prog 25: ELEC. SET	Prog 26: TR808 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	STD1 Kick2				
36 - C2	STD1 Kick1		Power Kick	Elec Kick	808 BD
37 - C#2	Side Stick				808 Rim shot
38 - D2	STD1 Snare1		Gated Snare	Gated Snare	808 Snare Drum
39 - D#2	Hand Clap				

40 - E2	Snare Drum 2			Elec Snare1	
41 - F2	Low Floor Tom	Power Low Tom2	Power Low Tom2	Elec Low Tom2	808 Low Tom2
42 - F#2	Closed Hi Hat [EXC1]				808 CHH [EXC1]
43 - G2	High Floor Tom	Power Low Tom1	Power Low Tom1	Elec Low Tom1	808 Low Tom2
44 - G#2	Pedal Hi-Hat [EXC1]				808 CHH [EXC1]
45 - A2	Low Tom	Power Mid Tom2	Power Mid Tom2	Elec Mid Tom2	808 Mid Tom2
46 - A#2	Open Hi-Hat [EXC1]				808 OHH [EXC1]
47 - B2	Low-Mid Tom	Power Mid Tom1	Power Mid Tom1	Elec Mid Tom1	808 Mid Tom1
48 - C3	Hi Mid Tom	Power Hi Tom2	Power Hi Tom2	Elec Hi Tom2	808 Hi Tom2
49 - C#3	Crash Cymbal 1				808 Cymbal
50 - D3	High Tom	Power Hi Tom1	Power 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					

Note#	Prog 33: JAZZ	Prog 41 : BRUSH	Prog 49 : ORCHESTRA	Prog 57 : SFX SET	Prog 128: CM -64/32
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	Jazz BD2	Jazz BD2	Concert BD 2	*	Kick drum
36 - C2	Jazz BD1	Jazz BD1	Concert BD 1	*	Kick drum
37 - C#2				*	Rim Shot
38 - D2		Brush Tap	Concert SD	*	Snare Drum
39 - D#2		Brush Slap	Castanets	High Q	Hand Clap
40 - E2		Brush Swirl	Concert SD	Slap	Elec Snare Drum
41 - F2			Timpani F	Scratch Push	Acoustic Low Tom
42 - F#2			Timpani F#	Scratch Pull	Closed Hi-Hat [Exc1]
43 - G2			Timpani G	Sticks	Acoustic Low Tom
44 - G#2			Timpani G#	Square Click	Open Hi-Hat 2
45 - A2			Timpani A	Metronome Click	Acoustic Middle Tom
46 - A#2			Timpani A#	Metronome Bell	Open Hi-Hat 1 [Exc1]
47 - B2			Timpani B	Guitar Slide	Acoustic Middle Tom
48 - C3			Timpani c	Gt Cut Noise (down)	Acoustic High Tom
49 - C#3			Timpani c#	Gt Cut Noise (up)	Crash Cymbal
50 - D3			Timpani d	Double Bass Slap	Acoustic High Tom
51 - D#3			Timpani d#	Key Click	Ride Cymbal
52 - E3			Timpani e	Laughing	*
53 - F3			Timpani f	Screaming	*
54 - F#3				Punch	Tambourine
55 - G3				Heart Beat	*
56 - G#3				Footsteps1	Cowbell
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				Wind Chime	
63 - D#4				Car Engine Start	
64 - E4				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				Helicopter	
71 - B4				Starship	
72 - C5				Gun Shot	
73 - C#5				Machinegun	Vibrato Slap
74 - D5				Lasergun	*
75 - D#5				Explosion	Claves
76 - E5				Dog	Laughing
77 - F5				Horse Gallop	Scream
78 - F#5				Birds	Punch
79 - G5				Rain	Heart Beat
80 - G#5				Thunder	Footsteps 1
81 - A5				Wind	Footsteps 2
82 - A#5				Sea Shore	Applauses
83 - B5				Stream	Creaking
84 - C6				Bubble	Door
85 - C#6				*	Scratch
86 - D6				*	Wind Chimes
87 - D#6				*	Car-Engine
88 - E6			Applauses	*	Car-Stop
89 - F6	*				Car-Pass
90 - f#6	*				Car-Crash
91 - G6	*				Siren
92 - G#6	*				Train
93 - A6					JetPlane
94 - A#6					Helicopter
95 - B6					StarShip
96 - C7					Gun Shot
97 - C#7					Machine Gun
98 - D7					Laser Gun
99 - D#7					Explosion
100 - E7					Dog
101 - F7					Horse Gallop
102 - F#7					Birds
103 - G7					Rain
104 - g#7					Thunder
105 - A7					Wind
106 - A#7					SeaShore
107 - B7					Stream
108 - C8					Bubble

Notes:

*: No sound Blank: Same sound as "Standard Set"

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



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