

Drum Kit Trigger List

Following is the list of all Pad/Triggers with its MIDI notes, triggered on MIDI channel 10:

Pad	Chan#	Name	Note# (hex)	Note# (decimal)
Kick	1	Head	0x24	36
Snare	2	Head	0x26	38
	3	Rim	0x28	40
Tom1	3	X-Stick	0x25	37
	4	Head	0x30	48
Tom2	5	Rim	0x32	50
	6	Head	0x2D	45
Tom3	7	Rim	0x2F	47
	8	Head	0x2B	43
Tom4	9	Rim	0x3A	58
	10	Head	0x29	41
Ride	11	Rim	0x27	39
	12	Bow	0x33	51
	12	Bell	0x35	53
Crash	12	Edge	0x3B	59
	13	Bow	0x31	49
Crash2	13	Edge	0x37	55
	14	Bow	0x39	57
Hi-Hat	14	Edge	0x34	52
	15	Open	0x2E	46
Hi-Hat	15	Open Edge	0x1A	26
	15	Half Open	0x17	23
	15	Half Open Edge	0x18	24
	15	Near Closed	0x14	20
	15	Near Closed Edge	0x19	25
	15	Closed	0x2A	42
	15	Closed Edge	0x16	22
	15	Pedal Chick	0x2C	44
	15	Pedal Splash	0x15	21

Trigger table sorted by Note#	
20 - G#0	Drum Kit Near Closed HH
21 - A0	Drum Kit HH Pedal Splash
22 - A#0	Drum Kit Closed HH Edge
23 - B0	Drum Kit Half Open HH
24 - C1	Drum Kit Half Open HH Edge
25 - C#0	Drum Kit Near Closed HH Edge
26 - D1	Drum Kit Open HH Edge
27 - D#1	GM set High Q
...	(see GM sound list)
35 - B1	GM set Standard Kick2
36 - C2	Drum Kit Kick
37 - C#2	Drum Kit X-Stick
38 - D2	Drum Kit Snare
39 - D#2	Drum Kit Tom 4Rim
40 - E2	Drum Kit Snare Rim
41 - F2	Drum Kit Tom 4
42 - F#2	Drum Kit Closed HH
43 - G2	Drum Kit Tom 3
44 - G#2	Drum Kit Pedal HH
45 - A2	Drum Kit Tom 2
46 - A#2	Drum Kit Open HH
47 - B2	Drum Kit Tom 2 Rim
48 - C3	Drum Kit Tom 1
49 - C#3	Drum Kit Crash Cymbal
50 - D3	Drum Kit Tom 1 Rim
51 - D#3	Drum Kit Ride Cymbal
52 - E3	Drum Kit Crash 2 Edge
53 - F3	Drum Kit Ride Bell
54 - F#3	GM set Tambourine
55 - G3	Drum Kit Crash Edge
56 - G#3	GM set Cowbell
57 - A3	Drum Kit Crash Cymbal 2
58 - A#3	Drum Kit Tom 3 Rim
59 - B3	Drum Kit Ride Edge
60 - C4	GM set Hi Bongo
...	(see GM sound list)
87 - D#6	GM set Open Surdo

Chan# is the internally used channel for drum sound play. Externally (on MIDI_IN) all these drums sounds are triggered through MIDI channel 10.

Note# 1 till 9 are used to trigger the metronome click sounds (0x01 = "one", 0x02 = "two" etc.).

Other notes on MIDI channel 10 are triggering sounds of the standard GM Percussion sound set.

MIDI channels 1-9 and 11-16 can be used for demo/accompaniment song playback (Bass and other tonal instrument tracks, GM compatible).

Drum Kit Edit

Following is the list of available Edit Controls for the Pads/Triggers mentioned in the table above:

MIDI Message	HEX Code	Description
Pad Instrument Settings ("rr" is the MIDI note number of the according Pad/Trigger**)		
NRPN 16rrH	B9H 63H 16H 62H rr 06H vv	Group vv=0..6 (KICK,SNARE,TOM,RIDE,CRASH,HH,PERC) corresponds to the Prg# of drum set in sound bank -100 ***
NRPN 17rrH	B9H 63H 17H 62H rr 06H vv	Instr vv= 0..maxNB (maxNB depends on Group) corresponds to the Key# in sound bank drum set -1 ***
NRPN 18rrH	B9H 63H 18H 62H rr 06H vv	Coarse Pitch vv=40..64..88 = -24..0..+24 semitones
NRPN 19rrH	B9H 63H 19H 62H rr 06H vv	Fine Pitch vv=0 (no modify)...127 (+1 semitone)
Pad Mixer Settings*		
NRPN 1ArrH	B9H 63H 1AH 62H rr 06H vv	Volume , vv=0..127
NRPN 1CrrH	B9H 63H 1CH 62H rr 06H vv	Panning , vv=0..127, 64 = center
NRPN 1DrrH	B9H 63H 1DH 62H rr 06H vv	Reverb (Ambience) send level, vv=0..127
Pad Extra Settings*		
NRPN 20rrH	B9H 63H 20H 62H rr 06H vv	Envelope release time , range 0..127, 64 = default
NRPN 21rrH	B9H 63H 21H 62H rr 06H vv	Tone (filter cut frequency), range 0..127, 64 = default
NRPN 24rrH	B9H 63H 24H 62H rr 06H vv	Output Assign cc = 0: send to Main L/R cc = 1: to MFX1, =2: to MFX2, =3: to MFX1&2 in stereo mode cc = 4: to MFX3, =5: to MFX4, =6: to MFX3&4 in stereo mode

Notes:

* Pad Mixer and Extra Settings controls are done on internal drum channels (groups of trigger notes, see page 1)

** Edit controls of all Hi-Hat trigger notes are working on same parameter set

*** Soundbank drumset PC#100 is collection of all Kick instruments starting from key 1, PC#101 is collection of all Snare instruments etc. All Hihats drumset (PC#105) should be organized in HH groups as follows:

key#1 is Open HH, key#2 is Half-Open HH, key#3 is Near-Closed HH, key#4 is Closed HH,

key#5 is Open HH Edge, key#6 is Half-Open HH Edge, key#7 is Near-Closed HH Edge, key#8 is Closed HH Edge,

key#9 is HH Pedal Chick, key#10 is HH Pedal Splash, key#11..20 is group next HH sound etc.

Drum-Set (Kit) General Volume, Reverb/Ambience and Equalizer Settings

See "Special NRPN Controls" on page 5

Drum Kit select

All parameters of a Drum Kit will be stored in the Host CPU memory. Upon selection a Drum Kit these parameters will be sent to the 5504 board in a bulk on serial or parallel port. For efficient data transfer be aware that the firmware supports MIDI running status, and is storing NRPN MSB/LSB values.

Realtime control

HiHat pedal

The 5504EDrum accepts MIDI Control 4 message (Foot Controller) to receive the actual position of the Hihat controller pedal. Depending on the Hihat controller value, the triggered sound will not be the same:

Foot Controller value 0 to 11: Note On 46 will play the Open-Hihat sound

Foot Controller value 12 to 31: Note On 46 will play the Half-Open Hihat sound (sizzle)

~~Foot Controller value 32 to 64: Note On 46 will play the "Near-Closed" Hihat sound (sizzle)~~

Foot Controller value 65 to 127: Note On 46 will play the Close Hihat sound

The Host CPU doing the Trigger detection and HH-Pedal should send a HH "Chick" Note On (42) message upon crossing a defined threshold (e.g. value 64). The velocity should be calculated using the speed of pedal action. When "hitting" the Hihat controller pedal (pressing and releasing very quickly), a HH "Splash" Note On (21) message should be sent.

Cymbal choke

For Ride cymbal choke, a Key-Aftertouch message with value 127 should send to Ride-Edge note (59):

AnH 3Bh 7Fh

"n" is the MIDI channel, default n=9 (MIDI channel 10)

All Ride cymbal sounds will be muted (51,53,59).

For Crash cymbal choke, a Key-Aftertouch message with value 127 should send to Crash-Edge note (55).

For Crash2 cymbal choke, a Key-Aftertouch message with value 127 should send to Crash2-Edge note (52).

NB: note played while cymbal edge is pressed are played normally (not choked)!

Special NRPN Controls

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

Example:

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

- CTRL#99=55 (37h) (MIDI code: Bnh 63h 37h)
- CTRL#98=07 (07h) (MIDI code: Bnh 62h 07h)
- CTRL#6 =64 (40h) (MIDI code: Bnh 06h 40h), with "n" is the MIDI channel (default 9)

NRPN # (High Low)	Description	Power-up default
General		
3707h	Synth Master volume	0 (mute) to 7Fh (max)
375Eh	Output Level (pre EQ2)	0=mute, 40h=0dB, to 7Fh=+6dB
3807h	Master Output Level (pre Master EQ4)	0=mute, 60h=0dB, to 7Fh=+6dB
3751h	Auto-Test (see below)	-
Metronome settings		
1701h	Metronome click sound selection	0..5 (Voice, Metronome, Claves, Sticks, Cowbell, Beep)
1A01h	Metronome click level	0 (mute) to 7Fh (max)
Equalizer		
3755h	Equalizer ON/OFF	0=OFF, else ON
3708h	Equalizer Low Band Gain	0=-12dB, 40h=0dB, 7Fh=+12dB
370Bh	Equalizer High Band Gain	0=-12dB, 40h=0dB, 7Fh=+12dB
370Ch	Equalizer Low Band Freq.	0=40Hz, 40h=500Hz, 7Fh=1kHz (see note 1)
370Fh	Equalizer High Band Freq.	0=900Hz, 40h=3kHz, 7Fh=5kHz (see note 1)
Reverb (Ambience) Effect		
0300h	Reverb Level	0 (mute) to 7Fh (max)
0302h	Reverberation Time	0 (shortest) till 7Fh (longest)
0303h	Pre-Low-Pass Filter	0=filter open, till 7=filter closed
0306h	Room Size	0=largest, till 4=smallest
0307h	Reverb Type	0..2=Room, 3..4=Hall, 5=Plate
Master Output Parametric 4-Bands Equalizer		
3855h	Equalizer ON/OFF	0=OFF, else ON
3808h	Low Band Gain	0=-12dB...40h=0dB...7Fh=+12dB
3809h	Low Mid Band Gain	0=-15dB...40h=0dB...7Fh=+15dB
380Ah	High Mid Band Gain	0=-15dB...40h=0dB...7Fh=+15dB
380Bh	High Band Gain	0=-12dB...40h=0dB...7Fh=+12dB
380Ch	Low Band Freq.	0=40Hz...7Fh=1kHz (see note 1)
380Dh	Low Mid Band Freq.	0=60Hz...7Fh=2.5KHz
380Eh	High Mid Band Freq.	0=60Hz...7Fh=10KHz
380Fh	High Band Freq.	0=900Hz...7Fh=5kHz (see note 1)
3810h	Low Mid Band Q-Factor	0:Q=1.0 ...40h:Q=2.0 ...7Fh:Q=~20.0
3811h	High Mid Band Q-Factor	0:Q=1.0 ...40h:Q=2.0 ...7Fh:Q=~20.0
Master Output Compressor/Limiter		
3818h	Compressor ON/OFF: =0 OFF, else ON	OFF
3819h	Attack time: 0=fast attack (0.1ms), ... 60=1ms, ...100=10ms, till 127=slow attack (100ms), exp. Curve	40h
381Ah	Release time: 0=fast release (10ms), ... 60=100ms, ... 100=1s, till 127=slow release (~5s), exp. Curve	40h
381Bh	Threshold: 127=0dB, 64=-6dB, 32=-12dB, 16=-18dB, 8=-24dB, 4=-30dB, 2=-36dB 0=-Inf	7Fh
381Ch	Ratio: 127=1/128, 126=2/128 (1/64), 125=3/128, ... 64=64/128 (1/2), ... 0=1/1	0
381Dh	Boost: 0=1x ... 127=8x	0
381Eh	Knee : 0=hard, else soft	0

Note 1: measured at +6dB with gain boost at +12dB

Auto-Test

Built-in auto-test program is included which can be used for board production testing. To start the Auto-Test, send NRPN 3751H with value 23H. Sine waveforms at different frequencies will be output to the DAC to indicate test in progress (1500Hz, 1125Hz, 750Hz=pass)

Last sine waveform is output constantly to allow test of audio output. Board must be reset to exit test mode and return in normal mode.

Detailed MIDI Implementation

Detailed MIDI implementation for MIDI channel 10:

MIDI Message	HEX Code	Description
NOTE ON	99H kk vv	Note ON #kk(1-127), velocity vv(1-127). vv=0 means NOTE OFF
NOTE OFF	89H kk vv	Note OFF #kk(1-127), vv is don't care.
PROGRAM CHANGE	C9H pp	Drum Kit select, see page 3
KEY AFTERTOUCH	A9H kk vv	Cymbal Choke, see page 4
CTRL 04	B9H 05H cc	Hihat Control, see page 4
CTRL 06	B9H 06H cc	NRPN Data entry, see page 5 and following
CTRL 07	B9H 07H cc	Drum Kit Volume (default=100)
CTRL 98	B9H 62H vv	NRPN low, see page 5 and following
CTRL 99	B9H 63H vv	NRPN high, see page 5 and following
CTRL 120	B9H 78H 00H	All sound off (abrupt stop of sound)
CTRL 123	B9H 7BH 00H	All notes off
NRPN 16rrH	B9H 63H 16H 62H rr 06H vv	Group vv=0..6 (KICK,SNARE,TOM,RIDE,CRASH,HH,PERC) corresponds to the Prg# of drum set in sound bank -100 ***
NRPN 17rrH	B9H 63H 17H 62H rr 06H vv	Instr vv= 0..maxNB (maxNB depends on Group) corresponds to the Key# in sound bank drum set -1 ***
NRPN 18rrH	BnH 63H 18H 62H rr 06H vv	Pitch coarse of drum instr. note rr in semitones: vv=40..64..88 = -24..0..+24 semitones
NRPN 19rrH	BnH 63H 19H 62H rr 06H vv	Pitch fine of drum instr. note rr: vv=0 (no modify)..127 (+1 semitone)
NRPN 1ArrH	BnH 63H 1AH 62H rr 06H vv	Level of drum instrument note rr (vv=00 to 7FH)
NRPN 1CrrH	BnH 63H 1CH 62H rr 06H vv	Pan of drum instrument note rr (40H = middle)
NRPN 1DrrH	BnH 63H 1DH 62H rr 06H vv	Reverb send level of drum instrument note rr (vv=00 to 7FH)
NRPN 1ErrH	BnH 63H 1EH 62H rr 06H vv	Chorus send level of drum instrument note rr (vv=00 to 7FH) (note 6)
NRPN 20rrH	B9H 63H 21H 62H rr 06H vv	Envelope release time , range 0..127, 64 = default
NRPN 21rrH	B9H 63H 20H 62H rr 06H vv	Tone (filter cut frequency), range 0..127, 64 = default
NRPN 24rrH	B9H 63H 24H 62H rr 06H vv	Output Assign cc = 0: send to Main L/R cc = 1: to MFX1, =2: to MFX2, =3: to MFX1&2 in stereo mode cc = 4: to MFX3, =5: to MFX4, =6: to MFX3&4 in stereo mode
NRPN xxyyH	B9H 63H xxH 62H yyH 06H vv	Special NRPN Controls , see page 5 and follows

Detailed MIDI implementation for MIDI channels 1-9 and 11-16:

MIDI Message	HEX Code	Description	Compatibility
NOTE ON	9nH kk vv	Note ON kk(1-127), velocity vv(1-127), vv=0 means NOTE OFF	MIDI
NOTE OFF	8nH kk vv	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: Refer to GM sounds list	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 GM sounds list	GS
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	GS
CTRL 93	BnH 5DH vv	Chorus send level vv=00H to 7FH	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	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
Standard Sysex	FOH 7EH 7FH 09H 01H F7H	General MIDI reset (note 4)	GM
Standard Sysex	FOH 7FH 7FH 04H 01H 00H ll F7H	Master volume (ll=0 to 127, default 127) (note 4). Not reset by GS reset	GM
SYSEX	FOH 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	FOH 41H 00H 42H 12H 40H 00H 04H vv xx F7H	Master volume (default vv=7FH) (note 4) Not reset by GS reset.	GS
SYSEX	FOH 41H 00H 42H 12H 40H 00H 05H vv xx F7H	Master key-shift (default vv=40H, no transpose) (note 4)	GS
SYSEX	FOH 41H 00H 42H 12H 40H 00H 06H vv xx F7H	Master pan (default vv=40H, center) (note 4)	
SYSEX	FOH 41H 00H 42H 12H 40H 00H 7FH 00H xx F7H	GS reset (note 4)	GS
SYSEX	FOH 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	FOH 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	FOH 41H 00H 42H 12H 40H 01H 31H vv xx F7H	Reverb character, default 04H (note 5)	GS
SYSEX	FOH 41H 00H 42H 12H 40H 01H 32H vv xx F7H	Reverb Pre-LPF, 0 to 7, default 0 (note 5)	GS
SYSEX	FOH 41H 00H 42H 12H 40H 01H 33H vv xx F7H	Reverb master level, default = 64 (note 5)	GS
SYSEX	FOH 41H 00H 42H 12H 40H 01H 34H vv xx F7H	Reverb time (note 5)	GS
SYSEX	FOH 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	FOH 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	FOH 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 adresse=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 adresse=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

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