Speak & Glitch GND-1T MIDI Reference

Rev 2. x (FW 250325 and later)

MIDI clocks

The firmware update released in March 2025 added improved ability of the GND-1T to sync processes both within, and external to the GND-1T, by using MIDI clocks. In addition to the previous ability to scale[1] various parameters using incoming MIDI clock rate and PPQN scalers, there are now several **direct clock-sync options**. The GND-1T can also act as a **BPM clock master sending clocks over all 3 MIDI ports** (USB, USB-Host and DIN).

The rate of the internal MIDI clock when acting as a clock master is set by the "clk BPM" parameter that's available on the MIDI page in stand-alone operation, or using NRPN CC98=117 via MIDI. **BPM is a patch-specific parameter that can be fully mapped via the expression matrix**, so it can be manipulated by modwheel, velocity, breath control, aftertouch, and automated using the XPlfo. The **internal MIDI clock** can be switched between off, on-during-run, always on, and internal-clocks-only (always on, no clocks sent out over MIDI). In stand-alone operation hold [ALT] and tap the clk BPM button to toggle through these modes. Or **from the main Patch page**, hold Xpress and tap the patch number button to toggle the internal clock on / off. For MIDI control see NRPN CC 98=73 and 72. When block morphing is set to a *clocked morphing mode*, the internal clock is always on (unless global EXTERNAL clock is on – see below) and overrides individual patch clock settings

When using external clocks be sure to set the internal clock off. Alternatively, for FW 250525 and later, double tap the BPM button on the MIDI page to switch the GND-1T into (or out of) <u>global EXTERNAL clock mode.</u> In this mode, the GND-1T ignores the patch-specific clock mode parameter and instead always uses the external MIDI clock, including on patch load or revert commands. This allows a common external clock rate to be applied to all patches. Global EXT mode is disabled by default on power up, and can also be set using NRPN with CC 98 =77, CC 6 = 0/1 (1=enabled).

Five processes within the GND-1T can be directly controlled by the MIDI clock. The first of these is the **Drum trigger timing**. To enable this, set the Dsrc=0 parameter on the Drum1 page to one of the three clk modes[2]. Selectable trigger times correspond to 8ths (clk-), 16ths(clk), or 16th triplets (clk+). The rate of those triggers is subsequently limited using the Drate parameter by dropping triggers that occur faster than the Drate cutoff allows. At a low Drate values, you will always get slow drum triggers even for fast MIDI clock rates (or fast Tempos if Dsrc=0 is set to ROM). But the clock-based triggers that are allowed to pass through, are always aligned with the originating MIDI clock drum triggers. Be sure to set Dsrc to 0 if you want only clock derived triggers, otherwise you will also mix in audio-based triggers that can occur on any MIDI clock cycle in clocked modes. To allow Dclk triggers and Drate to vary together with BPM, enable the Drate clkScale button on the MIDI page.

1. The four buttons in the middle column of the MIDI page are the previously available *clock scaling* enables for Tempo, LFO, Loop length, and Drate. While these don't sync those parameters directly to the MIDI clock, they scale the patch's default values for them according to the clock BPM rate and each parameter's respective PPQN scaler. This has the benefit of retaining complex modulations of those parameters.
2. The three new clk modes replace the previous LFO drum trigger modes. To retain LFO/Drum sync with the new Dsrc=0 clk modes, enable direct LFO clk sync on the MIDI page, as well as "D sync" on the LFO page.

When drum triggers are MIDI clocked, **DPmod (pattern mod) becomes a bipolar Drum Swing control** (64 = no swing). Swing is applied to the time division selected by the current Dsrc=0 clk setting. By design, the **clocked drum modes are affected less by variations in the underlying patch**. Accordingly, the effect of patch randomization commands on the drums is milder for Dsrc=0 set to clk modes than for ROM mode.

Three additional patch-specific parameters that can be directly synced to internal or external MIDI clocks are **Echo delay time, LFO 1&2 rates, and Tempo (ROM update rate).** Enable these on the MIDI page using the clkSync button options. Clocked LFO and Steprate pots share a common mapping of pot-value to number of MIDI clocks, which is shown in Table 5. When the LFO rates and drums are both direct synced, the LFO rate Loop-sync buttons (LP snc) on the LFO page become Drum Sync buttons (D snc). Activating them aligns the LFO rate updates with the drum triggers. Subsequent Drate limiting is however an asynchronous process.

Direct clock sync of the Tempo parameter causes slower ROM update rates than usual in the GND-1T because MIDI clocks are fairly slow compared to the internal unclocked rates often used by the 1T (especially with intelligible speech). **A clocked Tempo value of 100 causes ROM updates to occur every 4 MIDI clocks**. Each Tempo change of +5 decrements that by 1 clock, and -5 increments it by 1. So for example, reducing Tempo from 100 to 90, adds 2 clock cycles for a total of 6 clocks per update (sixteenths). The maximum rate corresponding to a ROM update on every clock is applied for any clocked Tempo values of 115 and above. Since **randomization commands don't affect clk sync** options on the MIDI page they cause a smaller range of Tempo randomizations when Tempo is clocked.

Use the clock-scaling method described on the previous page to retain faster Tempos that scale proportionally with MIDI clock rates. Direct synced Tempos are probably most useful when used to sequence more general sound fragments from ROM at musical/timed intervals. Since direct-syncing Tempo means syncing ROM updates, setting the Drums "Dsrc=0" parameter to ROM means Drum triggers by extension will also be clock synced. **Tempo modulation in clocked mode becomes a Tempo swing control**. When either LFO or Tempo are direct synced, their MIDI clock PPQN scalers are ineffective.

The single global parameter that can be direct synced is **Block Step Morphing** when StepMode is set to **ClkStep** or **ClkSync** mode (the latter restarts the loop on each step). The StepRate parameter in this case determines how many MIDI clocks go by between steps (table 5).

Clock synced Step morphing can also be achieved using **Drum Step** and **Drum Sync Step** modes if Dsrc=0 is set to a clk mode. In these modes, each of the 8 drum sounds selects a different patch from the 8 patches starting at the block-start. Blocksize and Order settings are ignored, with exception of the "-D" Order option that specifies no drum morphing. StepRate in this mode determines how many drum triggers elapse between patch changes (table 6).

For a listing of the additional changes made by the firmware releases since November 2024, see the latest Firmware Instructions document

Contents

Table 1 MIDI CC functions

CC	Function	Range	Comments
0	Bank select	0-9	
1	Modwheel	0-127	
2	Breath control	0-127	
3	Plasma	0-127	Modifies the effect of Gravity
4	DRIFT depth	0-127	* GLOBAL, not patch specific *
5	Portamento	0-127	
6	NRPN data MSB		
7	POST FILTER Volume (sets synth volume)	0-127	Synth & AUX IN are always routed through Post Filter, drum and USB PF sends are optional
9	Amplitude AHDSR depth	0-127	Mixer between rectangular and AHDSR ENV
10	Expanded XP param select Use instead of CC11 for parameters not accessed via MIDI CC 0-127	0-21	See table 7
11	Expression param select	0-127	MIDI CC of any continuous parameter in this list. If omitted, the last edited parameter is used. Altering or selecting any parameter sets it as the current one being mapped
12	Expression controller Select	0-4	0=modheel 1=velocity 2=breath 3=aftertouch 4=XPLFO
13	Expression scaler value	0-127 bipolar	0=max neg, 64=0, 127 = max pos
14	Attack	0-127	
15	Hold	0-127	
16	Decay	0-127	
17	Sustain	0-127	
18	Release	0-127	
19	Tempo (ROM update rate)	0-127	If clocked, Tempo 100=update every 4 clocks. An increase of 5 (115 max) subtracts a clock, decrease adds one

20	LFO1 rate	0-127	See table 5 for MIDI clocked rates
21	LFO2 rate	0-127	See table 5 for MIDI clocked rates
22	Attack/Decay mod	0-127	Uses Pitch mod mix waveform
23	Cross mod LFO1+2+SLFO	0-127	
24	SLFO Slow LFO rate	0-127	
25	CLFO Chaos LFO rate	0-127	
26	XPLFO mix	0-127	
27	XPLFO mod wav1	0-nummodwav	See Table 3
28	Osc Waveshape	0 – 80	16 steps cross fading between consecutive wavs vox, saw, sqr, pnz, pwm, sqr-oct (table 3)
29	Osc Brightness	0-127	
30	Brightness mod Dep	0-127	Additive with folding
31	Brightness mod Mix	0-127	From Filter mod block
32	LFO 1+2 mod depth	0-127	Uses BENDS mix waveform
33	Pitch	0-117	MIDI note values
34	Pitch mod depth	0-127	Additive
35	Pitch mod mix	0-127	
36	Pitch mod wav1	0-nummodwav	See Table 3
37	Pitch mod wav2	0-nummodwav	See Table 3
38	NRPN DATA LSB		
39	Plasma bend mod depth	0-127	Additive
40	Filter	0-127	(see also CC 73)
41	Filter mod depth	0-127	Additive with folding
42	Filter mod mix	0-127	
43	Filter mod wav1	0-nummodwav	See Table 3
44	Filter mod wav2	0-nummodwav	See Table 3
45	Speech ROM “loop blur”	0-127	0=no effect,127=max blur
46	Loop length	0-127	
47	LP leng mod depth	0-127	Multiplicative or/ Addditive
48	LP leng mod mix	0-127	
49	Lp leng mod wav1	0-nummodwav	See Table 3
50	Lp leng mod wav2	0-nummodwav	See Table 3
51	Echo Delay Time	0-127	
52	Glitch	0-127	
53	Glitch bend mod depth	0-127	Additive with folding
54	Gravity	0-127	
55	Gravity bend mod depth	0-127	Additive with folding
56	Flux	0-127	
57	Flux bend mod depth	0-127	Additive with folding
58	Warp	0-127	
59	Drums Overdrive	0-127	
60	Bend mod mix	0-127	
61	Bend mod wav1	0-nummodwav	See Table 3
62	Bend mod wav2	0-nummodwav	See Table 3
63	Unvoiced Speech Energy Reduction	0-127	0 = unvoiced signals off 127 = unmodified speech levels

64	Freeze & Looper Control *in looper mode, set up Echo vol and delay time first. Recommend setting Global Drums and RUN off while creating loops from multiple patches	0/127, and 1-8	127 = punch in if echoFreeze ON 0 = punch out if echoFreeze ON 1= LPfreeze off, 2= LPfreeze on 3=modFreeze off, 4=modFreeze on 5=echoFreeze off, 6=echoFreeze on 7=punch mode overwrite 8=punch mode dub
65	PStereo (phase)	0-127	
66	FStereo (filter)	0-127	
67	BStereo (bend)	0-127	
68	BStereo Mod (bendmod)	0-127	Multiplicative
69	Drum src mix	0-127	0 = speech ROM updates 127= synth audio
70	Drum volume	0-127	
71	Drum vel out variation	0-127	
72	DRUM MUTE	0-1	0 = drums on (mute off) 1 = drums off * See also CC 102
73	Filter DeResonate	0-127	Reduce ROM speech filter resonances At max, speech filter = allpass
74	Drum trigger sensitivity	0-127	
75	Drum trig sens mod	0-127	Additive
76	Drum trig sens mod mix	0-127	
77	Drum rate	0-127	
78	Drum rate mod	0-127	Additive
79	Drum pattern	0-127	
80	Drum pattern mod	0-127	Additive with folding
81	Drum rate+pat mod mix	0-127	
82	Drum mod wav1	0-nummodwavs	Table 3
83	Drum mod wav2	0-nummodwavs	Table 3
84	Drum improv/rand	0-127	Randomizes timing
85	Drum map mod depth	0-127	
86	XPLFO mod wav2	0-nummodwav	
87	XPlfoScaler	0-127	
88	Tune	0-127	
89	Post Filter mod wav1	0-nummodwav	
90	Post Filter mod wav2	0-nummodwav	
91	Echo Repeats	0-127	
92	Post Filter cutoff	0-127	
93	Post Filter mod depth	0-127	
94	Post Filter resonance/Q	0-127	
95	Post Filter mod mix	0-127	
96	Xpression Freeze Thresh	0-127	
97	Post Filter Overdrive	0-127	

98	NRPN param low byte		
99	NRPN param high byte		
100	Osc Drive (pre filter)	0-127	64=unity gain re speech ROM data
101	Tempo mod	0 -127	uses LPleng mod mix signal
102	RUN / STOP	0= STOP 1 or 127 = RUN 2 = D-RUN off 3 = D-RUN on* 4 = STOP ALL audio with fades 5 = PANIC STOP	*D RUN (run drums only) is only effective when in STOP state. MIDI notes can be played while this is active. From STOP, activating D RUN turns off drum Mute. Stop all audio immediately, Clear all MIDI notes
103	DRIFT control	0=off, 1/127=on, 2 =clear, 3= load temp 4= save temp 5= load perm 6= save perm 7= delete perm 8=save scaled perm	0 halt drift and retain current values 1 enable continuous drift 2 clear drift buffer 3 load-from / 4 save-to temp drift buffer 5 load / 6 save / 7 delete /8 save-scaled permanent buffer (select buffer 0-127 using NRPN CC 98 = 64, or 0-999 using CC98 = 118
104	DRIFT rate	0-127	
105	Revert / Reload patch	any non-0 value	sets new loop restore vals
106	Randomize Commands CC 6 = 1, 3, or 127 always sets new loop restore vals	0-7, 127	0 = (no effect) 1 = rand Loop/Word + Synth params 2 = rand Loop/Word: sets new loop restore vals if speak on (CC109) 3 = rand Synth params 4 = rand Drums (but not Kits) 5 = undo (rand / drift) 6 = rand internal Drum kits 7= restore Loop/Word 127 = rand All
107	Word Bank select	0-4	See Table 7 (sets loop restore vals)
108	Word index (in bank)	0-59	See Table 7 (sets loop restore vals)
109	Play mode	0-5	0 = LOOP reFILT off 1 = LOOP reFILT on resets filter each LOOP cycle 2 =Speak off: Loops, not Words 3= Speak on, multiword 4= Speak on, single word 5= Speak on, babble (random words)
110	Tempo clk PPQN scaler	0-127	24=unity @120bpm (1=24x, 0=48x)
111	LFO clk PPQN scaler	0-127	
112	LP length clk PPQN scaler	0-127	
113	Drum rate clk PPQN scaler	0-127	
114	MFO rate	0-127	
115	MFO fine tune	0-127	

116	MFO offset	0-127	
117	MFO Amp mod	0-127	
118	MFO Pitch mod	0-127	
119	MFO Filter mod	0-127	
120	Stop all sound	Any value	
121	Not used		
122	MFO mod depth mod	0-127	Multiplicative
123	All notes off		
126	MFO mod mix	0-127	From LPleng mod block
127	Echo Volume	0-127	

Outputs on MIDI channel 16: * see NRPN for additional outputs

CC 115	LFO1 CC OUTPUT
CC 116	LFO2 CC OUTPUT
CC 117	SLFO 1 CC OUTPUT
CC 118	CLFO 1 CC OUTPUT
CC 119	AHDSR / ENV OUTPUT

Table 2. GND-1T internal drum kits

set via NRPN CC 98 = 47, 48, or 49

(custom kits were recorded specifically for the GND-1T)

CC 6 =

0	off*	*setting the main kit to 0 also turns off m1 and m2 mod kits
1	ACE	Rhythm Ace drum machine
2	VNTGE	vintage drumbox
3	CR78a	CR 78 drum machine
4	CR78b	CR 78 drum machine
5	8000a	CR 8000 drum machine
6	8000b	CR 8000 drum machine
7	SYN1	custom Synth Kit 1
8	SYN2	custom Synth Kit 2
9	SYN3	custom Synth Kit 3
10	GAME	custom Synth/Game Kit
11	ELECTRO	custom retro Electro kit
12	ELEC 1	custom Electronic kit 1
13	ELEC 2	custom Electronic kit 2
14	ELEC 3	custom Electronic kit 3
15	ELEC 4	custom Electronic kit 4
16	808a	808 drum machine
17	808b	808 drum machine
18	909a	909 drum machine
19	909b	909 drum machine
20	CLUB a	custom club kit
21	CLUB b	custom club kit
22	MIX a	custom MIX kit
23	MIX b	custom MIX kit
24	ACST a	custom Acoustic kit
25	ACST b	custom Acoustic kit
26	ACST c	custom Acoustic kit
27	ACST d	custom Acoustic kit
28	HARD a	Hard acoustic kit

29	HARD b	Hard acoustic kit
45	LO-FI a	Lo-fi kit (internal kit 30) * added Dec.2025
46	LO-FI b	Lo-fi kit (internal kit 31) * added Dec.2025
30	TAIKO	Taiko drums(internal kit 32)
31	DAX a	custom daxophone kit (internal kit 33)
32	DAX b	custom daxophone kit (internal kit 34)
33	DAX c	custom daxophone kit (internal kit 35)
34	PERC	custom percussion kit (internal kit 36)
35	PICA	custom found sound kit (internal kit 37)
36	EPIC	Epic sound kit (internal kit 38)
37	TABLA	Tabla kit (internal kit 39)
38	WOOD	Log drum kit (internal kit 40)
39	BALI	custom Balinese tingklik xylophone (internal kit 40)
40	RAND	random kit (0-39 excludes DAX c) (internal kit 42)
41	RAND2	random kit (0-37) excludes WOOD, BALI, DAX c (int. kit 43)
42	USER1	user defined Kit 1 (see NRPN CC 98 = 110) (internal kit 42)
43	USER2	user defined Kit 2 (see NRPN CC 98 = 111) (internal kit 42)
44	USER3	user defined Kit 3 (see NRPN CC 98 = 112) (internal kit 42)

Table 3. GND-1T waveshape values

Voiced Oscillator waveform values (set using CC 28)

0	Vocal glottal pulse (from Speak & Spell)
16	Saw
32	Square
48	PWM
64	Pitched Noise
80	Square octave up

Setting values between these causes cross fading between the two flanking waveforms

(LFO) Modulator waveform values (set using mod W1/W2 CC #)

Setting W1 shapes uses LFO1, SLFO1, and CLFO1 rates, and setting W2 uses LFO2, SLFO2, and CLFO2 rates

LFO 1 / 2 rate waveforms

0	Triangle
1	Square
2	Pulse 75% high
3	Pulse 25% high
4	Falling Exponential
5	Rising Exponential
6	Quantized PWM (3 PW steps per cycle)
7	Quantized PWM (4 PW steps)
8	Quantized PWM (5 PW steps)
9	RND RANDOM value each LFO cycle
10	8 RD 8-step RAND
11	6 RD 6-step RAND
12	SRD smoothed RAND

ENV based waveforms

13 ENV AHDSR envelope

14 INV inverse envelope

SLFO and CLFO rate waveforms

15 SLFO slow LFO 1 / 2

16 SLFO 10 thresholded to produce 10% high PW

17 SLFO 25 thresholded to produce 25% high PW

18 SLFO 50 thresholded to produce 50% high PW

19 SLFO 90 thresholded to produce 90% high PW

20 SLFO RP random pulse width on each SLFO cycle

21 SLFO R random value on each SLFO cycle

22 CLFO chaotic LFO 1 / 2

23 CLFO 10 thresholded to produce 10% high PW

24 CLFO 25 thresholded to produce 25% high PW

25 CLFO 50 thresholded to produce 50% high PW

26 CLFO 90 thresholded to produce 90% high PW

27 CLFO R random value on each SLFO cycle

LOOP rate waveforms

28 LP 10 10% high PW

29 LP 50 50% high PW

30 LP RND random values at LOOP rate

Other waveforms

31 OSCENV follows current OSCENV value (raw ROM levels if OSCENV is off)

32 DRUM follows current drum note(0-7), 8 steps of 1/7 spanning 0 –> 1.0

33 reverse order DRUM notes

34 FINE semitone sized constant ~0.059

35 DC = 1 max mod constant

36 SFO 1x2 multiplicaiton of SLFO 1 and SLFO 2

37 SFO1x2T multiplication of SLFO 1 x SLFO 2 thresholded at 0.5 max range

38 lfo.mfo Rungler style shift register waveform with lfo 1 or 2=clock, mfo=data (new in FW 241211)

Modblock (cross) feedback waveforms

39 Bends mod Mix output

40 Brightness mod Mix output

41 Drums rate/pattern mod Mix output

42 Drums trigger mod Mix output

43 Filter mod Mix output

44 Loop(length) mod Mix output

45 MFO mod Mix output

46 Pitch mod Mix output

47 PostFilter mod Mix output

48 XPlfo mod Mix output

Table 3 (continued)

MFO waveforms (set using NRPN CC 98 = 33)

Waveform #	Label	Description
0	SIN	Sinusoid (default)
1	SIN^3	Sinusoid raised to the power 3 (narrow lobes)
2	BROK	Broken Sinusoid (negative part shifted positive, positive part shifted negative) resulting in a sharp transient where sin 0-crossings normally occur
3	FALL	Ramp down
4	RISE	Ramp up
5	P 5	Pulse 5% high
6	P20	Pulse 20 % high
7	P 80	Pulse 80% high
8	P 95	Pulse 95% high
9	SQR	Square 50% high
10	PWM10	10% PWM re SQR at XPlfo rate
11	PWM20	20% PWM re SQR at XPlfo rate
12	PWM40	40% PWM re SQR at XPlfo rate
13	PWM60	60% PWM re SQR at XPlfo rate
14	PWM80	80% PWM re SQR at XPlfo rate
15	PWM	100% PWM re SQR at XPlfo rate

NRPN parameters (CC 99, 98, 6, 38)

Extended control is available using MIDI NRPN commands. To use NRPNs with the GND-1 issue the following CC commands (in this order):

(1) CC 99 (NRPN PARAM MSB) (2) CC 98 (NRPN PARAM LSB):

Together these determine the GND-1 NRPN function / parameter (table 4)

(3) optionally CC 38 (LSB) (4) CC 6 NRPN data (MSB)

e.g. To save or delete a patch:

1. Specify the BANK number (CC99=0, CC98=0, CC6=bank 0-9)

2. Specify the PATCH number within the BANK (CC99=0, CC98=1, CC6=patch 0-99)

3. Issue the delete or save command (CC99=0, CC98=2, CC6: 0=delete, otherwise save)

Parameters only need to be resent when they change. As an example of NRPN use, the following sequence will save the currently active patch to bank 1/ patch 4

CC 99=0

CC 98=0, CC6=1

CC 98=1, CC6=4

CC 98=2, CC6=1 (save rather than delete)

On power up, the GND-1 initializes CC 99 to 0, so setting CC 99 to 0 can usually be omitted unless it has been changed via external control.

Table 4. GND-1T NRPN functions listing

CC 99	CC 98	function	CC 6 data (+CC 38 if specified)	Comments
0	0	Bank number (for delete or save)	0-9	Save sets new loop restore values
0	1	Patch number (for delete or save)	0-99	
0	2	Save/ delete specified patch	0=delete, else save	
0	3	Save/delete current patch	0=delete, 1= save, 2=save to Template	Template serves as 'blank patch' configuration
0	4	Apply / null multi mods	0=null. else apply & then null	
0	5	Clear expression matrix or part thereof	0 = all, 1=modwheel, 2=velocity, 3=breath, 4=aftertouch, 5=XPLFO	
0	6	CC output control[1] Status out messages (CC 6 =16,17) are CC or NRPN commands that mirror those sent to the GND-1T, except on channel 16 These include: patch changes, run/stop, revert, rand (and undo), blockmorph, morph, manual, STPon, drift, Loop/Mod/Echo/Drift freeze, speak mode, loop-reFILTER, drum mute, INIT	0 = all off 1 = all out 2 = LFO 1 out off 3 = LFO 1 out to CC 115 4 = LFO 2 off 5 = LFO 2 out to CC 116 6 = SLFO1 off 7 = SLFO1 out to CC 117 8 = CLFO1 off 9 = CLFO1 out to CC 118 10 = AHDSR off 11 = AHDSR out to CC 119 12 = loop sync note out off 13 = loop sync note out on 14 = morphing note out off 15 = morphing note out on 16 = Status Out off 17 = Status Out On 18 = loop-end note out off 19 = loop-end note out on	<u>All sent on midi CH 16</u> Note # 60 Note # 48 Note # 61

0	7	ABS/REL CC mode	0=absolute (default) else relative	Relative mode is only available for unipolar 0-127 continuous parameters
0	8	Morph time	0 = fastest morph (immediate) 127 = slowest morph (minutes)	Applies to single morphed patch changes, and block-morphing
0	9	Wait Time	0 = negligeable 127 = minutes	'patch hold' between morph transitions in Block morphs
0	10	Morph Block size	0-99	Number of patches in the morphing block: 0-99 0 = single patch self-randomizing each cycle
0	11	Morph order	0-3	0=sequential 1=random 2=sequential no drum morphs or randomization 3=random no drum morphs or randomization
0	12	Morph control	0-7	0 = single morph off 1= single morph on 2= block morph off 3= block morph on 4= manual morph off 5= manual morph on 6=inhibit PPQN morph 7=allow PPQN morph (default)
0	13	MIDI drum map	0-2	
0	14	Loop mode control *additive LP mod mode disables mod quantize, and causes LFO rates to be absolute (LPsnc override)	0-5	0 = multiplicative mod (allows Q) 1= additive mod (turns off Quant) 2= quantize off 3= quantize on (sets multiplic) 4= disable FILTER reset LPcycle 5=reset FILTER each loop cycle
0	15	Bipolar PostFilter mod	0-1	0=unipolar,1=bipolar

0	16	Multi exclude	0 -5	0 = include pitch and drum mods 1 = exclude pitch and drum mods 2 = include pitch 3 = exclude pitch 4 = include drum mods 5 = exclude drum mods * drum mods = drate/dtrig here
0	17	Patch, Driftbuffer, or Scene increment or decrement	Patch: inc = 1, dec =127 Driftbuf: inc = 2, dec =126 Scene: inc = 3, dec =125	Patch +- applies to instant and morphed patch changes Driftbuffers and Scenes are also activated
0	18	Soft Bends, FLIP, and Invert Plasma	0-5	0 = soft bends off 1=soft bends on (applies to Gravity and Plasma curves) 2=Flip off, 3= on 4=invert-Plasma off, 5= on
0	19	Inhibit DIN SysEx (speeds up USB sysex)	0 (default)= send SysEx to DIN else inhibit DIN SysEx.	Not accessible from GND-1T in S/A
0	20	LFO 1 and 2 modes	0-9	0 both absolute 1 both Loop scaled 2 LFO 1 absolute 3 LFO 1 Loop scaled 4 LFO 2 absolute 5 LFO 2 Loop scaled 6 LFOs restart on key or run 7 LFOs free 8 pulsar off 9 pulsar on
0	21	USB Audio out MODE	0 = off 1 = synth + drums 2 = drums	If usb out mode = drums, drums are removed from analog mix output
0	22	Pitch Contour Quantization (previously only steady pitch)	0 = original speech chip ROM pitch contour 1= chromatic quantization 2= major scale 3= harmonic minor scale 4 = steady pitch	In quantized modes, setting Pitch=80, and Tune=64 aligns the keyboard notes with standard A-440Hz tuning, regardless of the selected word or ROM loop address. E.g. with major scale enabled, pressing a “C” replaces the original pitch contour with only notes in C major
0	23	Speech Filter Soft-clip and mod-invert	0-3	0=soft clip off, 1=soft clip on, 2=invert mod off, 3=invert mod on

0	24	MORPH and WAIT progress output control (NRPN output to chan 16)	0 = disabled (default) else progress updates are at this param's value x50ms. E.g. "1" = 50ms updates, "10"= 500ms updates.	When enabled, MORPH progress (0-127) is sent out on chan 16, CC98=8. And WAIT updates (0-127) are sent to CC98=9.
0	25	MORPH STEP MODE (StpMde) For **Clock Step** modes the StepRate parameter sets MIDI clocks per Step. **Key Step** increments the Patch on each note-on event. **Drum step** mode sets a patch offset from the block start patch according to the current drum note value 0-7	0 = off 1=on, 2=onSync 3=keyStp (note-on step) 4=KeySync 5=MIDI clkStp (table5) 6=MIDI clkSync 7=DrmStep (table 6) 8=DrmSync 9=DriftBuffer stepmorph 10=Key DriftBuffer Step 11=Clock DriftBuffer Step 12=Drum DriftBuffer Step	Morph Step Modes use instant patch changes rather than morphing gradually. All step modes except keyStp/keySnc use the **StepRate** parameter to set the rate at which patches change. For DrmStp mode, patches with drums switched off use Drate to set a 'silent' drum trigger rate and select a random next patch. **Sync** variants restart the loop on each step. **Driftbuffer Step Morphing** steps between different permanent drift buffers (rather than patches)
0	26	STEP RATE Used when MORPH STEP MODE is set to 1,2,5 or 6 (see above)	0 -127 0=slowest 127=fastest	When using ClkStp modes, step rate determines number of clocks per step (Table 5), or when using DrmStp modes the number of drum triggers per step(Table 6).
0	27	SET OR RELEASE PARAMETER EXCLUDES (from morphing, rand, drift)	0-3 For CC6= 0 or 1, first select the parameter as for expression mapping using CC11 or CC10	To set or release a single parameter "exclude", first select the parameter using CC 11 (or CC 10, table 7) as for expression mapping. Then use CC6=0 to release an exclude, or CC6=1 to set it. To release *all* excludes* set CC6=2, and to set them set CC6=3. * except MIDI clock mode (see user manual P20). "All" includes some parameters not accessible via CC10/11
0	28	SAVE GLOBAL PARAMETERS Morph & Drift params, PBend ranges, USB IN & PF, Audio User Kits	Any value	Also saves XP vals for parameters that are mappable/assignable
0	29	STEP MODE SWING (alternating step interval duty cycle) Used when MORPH STEP MODES 1,2,5 or 6	0 -127 64=equal duty cycle (all intervals same length) 0 = shortest first interval (33%)	

		are active (see CC98 = 25)	127=longest first interval (167%)	
0	30	Manual morph control value	0-127	If MANUAL patch morphing is enabled
0	31	Manual morphing expression control (selects an external controller that adjusts manual morphing)	0-8	0=off 1,5=modw (5=modw matrix off) 2,6=velocity (6=vel matrix off) 3,7=breath (7= breath matrix off) 4,8=aftertouch (8=after matrix off)
0	32	MFO mode The orignal (Type I) MFO oscillator sync tracks Pitch-pot and MIDI notes for a single ROM contour pitch value. Use Type II when you also want it to track pitch variations imparted by the ROM pitch contour (e.g. in longer loops)	0-6, 127	0 = osc sync off 1 = osc sync Type I 127= osc sync Type II 2=AM turbo off 3=AM turbo on 4=MFO-mod affects MFO depth 5=MFO-mod affects MFO rate 6=MFO-mod affects both
0	33	MFO mod wav	0-15	see table 3
0	34	High Clock Rate	0-1	0=off, else on
0	35	OscEnv: apply Env (AHD) to OSC Energy	0-7	0=off, 1=AHD,2=AHD->0, 3=2+LPfrz, 4=2+modFrz, 5=AHDcycle, 6=5+LPfrz 7= 5+modFrz+modExcludes
0	36	Drum rate mod, and improv, quantization	0-5	0=both off, 1=both on 2=Dratemod-Q off, 3=on 4=Improv-Q off, 5= on
0	37	ADSR retrigger source	0-12	0 = all off 1 = Loop (tempo) off 2 = Loop (tempo) on 3 = LFO1 off 4 = LFO1 on 5 = LFO2 off 6 = LFO2 on 7 = SLFO off 8 = SLFO on 9 = CFO off 10 = CLFO on 11=RunEnv off 12=RunEnv on (trigger env on RUN: allows 'live' sustain control)
0	38	XP freeze mode	0-3	0=XP Loop frz 1=XP mod frz

		* Note that when mod frz is selected, the XPLFO is not included in the threshold calculation to avoid XP freeze lock-up		2=XP echoFrz (looper mode) 3=XP Drift
0	39	KeyDown Retrigger Events "key+" indicates additional keydown events when there is already a key down	0-8	0 = no Loop or Env restart 1 = Both on, Attack from last val 2 = key+ restarts Loop = off 3 = key+ restarts Loop = on 4 = key+ no AHDSR ENV retrig 5 = key+ ENV retrig from last env val 6 = key+ ENV restart from 0 7= any key restarts MFO off 8= any key restarts MFO
0	40	Pitch mod modes	0-3	0= unipolar non-inverted + 1= unipolar inverted - 2 = bipolar non inverted +/- 3 = bipolar inverted -/+
0	41	Pitch add Fifth	0-3	0=off,1=down,2=up,3=modulate between off/down/up using Pmix waveform (depth=max)
0	42	Pitch bend up range	0-48	Semitones (applies to all patches)
0	43	Pitch bend down range	0-48	Semitones (applies to all patches)
0	44	MIDI Clock Sync Enable Tempo and LFO clock scaling is disabled if these aprameters are direct MIDI synced (see P1-3)	0-9	0 = all off 1 = all on 2 = Tempo PPQN scaling off 3 = Tempo on 4 = LFO1+2 off 5 = LFO1+2 on 6 = LP leng off 7 = LP leng on 8 = Drum rate off 9 = Drum rate on
0	45	Post Filter Type	0-3	0= Hicut (1st order) 1= LPF classic ladder (4th order) 2= LPF State Variable (2nd order) 3= LPF diode ladder (4th order)
0	46	Post Filter Keytrack	0-1	0=off 1=on
0	47	Internal Drum map	0 – num kits	0=off, see table 2
0	48	I-Drum map mod1	0 – num kits	0=off, see table 2
0	49	I-Drum map mod2	0 – num kits	0=off, see table 2
0	50	Drums -> PF send	0 – 127	Internal drums send to post filter
0	51	USB audio in level	0 – 127	
0	52	USB audio in -> PF send	0 – 127	USB audio input send to post filter
0	53	USB audio out select	0-2	0=off, 1=mix, 2=I-Drums* * I-drums are not sent to analog output for mode 2

0	54	Echo Select input: PostFilter, Drums, USB	0-7	0=PF, 1=PD+D/3, 2=PF+D, 3= Drums, 4=usb, 5=usb+PF, 6=usb+D, 7=All
0	55	Global echo and drums (prevents change on patch loads or morphing)	0-3	0=off 1=only Echo params are global 2=only Drums are global 3= both echo and drums global
0	56	DRIFT mode	0-2	0=synth, 1=drums, 2=both
0	57	NULL BENDS* 1/2 (and Bend mods)	Any value	*Nulls target bend params if morphing
0	58	TOUCH RELEASE TIME (sensor response time)	0 = fastest 127=slowest	
0	59	TOUCH ATTACK TIME (sensor response time)	0 = fastest 127=slowest	
0	60	DRUM DECAY SCALER	0 = shortest decay 127=unaltered	When < 127, this shortens all drum sounds in the current patch
0	61	DRUM OUTPUT MODE SELECT	0-2	0=MIDI, 1=internal, 2=both
0	62	Dsrc=0 select	0-3	0= trig on ROM update (Tempo) 1 = clk- = trig every 8 clocks 2 = clk+ = every 4 clocks 3 = clk = every 6 clocks (16ths)
0	63	Individual Drum Note Mutes	0, 1 or 127, 10-17, 20-27 All mutes are ineffective if MUTES is off/inactive (CC 6 = 0)	0 = Drum note mutes inactive 1, 127 = Drum note mutes active 10 =Kick mute off, 20 = mute on 11 =Snare mute off, 21 = mute on 12 =CHat mute off, 22 = mute on 13 =OHat mute off, 23 = mute on 14 =Ltom mute off, 24 = mute on 15 =Htom mute off, 25 = mute on 16 =Clap mute off, 26 = mute on 17 =Rim mute off, 27 = mute on
0	64	Permanent Drift Buffer select	0-127 * See CC98=118 for 0-999	Load /Save using CC 103
0	65	Scene select 0-999 (previously 0-127)	CC 38 = 0-99 CC6 = scene bank 0-9	Load /Save using CC 98=66
0	66	Scene Load/Save/Delete	Load=1, Save=2, Delete=3	
0	67	Erode Bend	0=off, else on	Erosion rate varies with Tempo parameter (new in FW 241103)
0	68	Note XP mode	0-10	0=off, 1=mWL 2=Brth, 3= AfterT, 4= patch change (re C 60) 5 = pitched patch changes 6 = as for 5, but no patch change for legato notes 7 = morph offset re middle C 60 without pitch change 8,9 = morph offset + pitch with morph steps of 2, 5 per semitone 10 = manual morph split mode: Plays source patch < C60,

				else target patch
0	69	Touch XP mode	0-9	0=off, 1=mWL 2=Brth, 3= AfterT, 4= PbendUp, 5 =PbendDn, 6=EnvTrig, 7=Env+Breath, 8=NoteTrig, 9=Note+Breath
0	70	Enc XP mode	0-10	0=mWL 1=Brth, 2= AfterT, 3= DriftBuffer, 4=mWL+[XP]DrftBuf, 5 =Brth+[XP]DrftBuf, 6=AfterT+[XP]DrftBuf 7=mWL + [XP]Scene 8=Brth + [XP]Scene 9=AfterT + [XP]Scene 10=BPM + [XP]Scene
0	71	drmRX	0=off, else on	Allow external notes on MIDI channel 10 to trigger internal drum sounds
0	72	sncRun	0=off, else on	Midi Start causes RUN on next clock (also when using the GND-1T internal MIDI clock)
0	73	BPM clk mode • Set to off for external clocks	0-3	0= GND-1T generated clock off 1= clock active if running 2=clock always active 3=internal clock only (no Midi clock out), always on
0	74	BLOCK MORPH PATCH SKIP	Any non-zero value	SKIP instantly to next patch when block morphing (any mode) To change the block start patch instead, use CC 98 =17.
0	75	Direct MIDI clock sync enables for Echo / LFO1,2 /Tempo	0-7	0=All off, 1=Echo, 2=LFOs, 3=Echo+Lfos, 4=Tempo, 5=Tempo+Echo, 6= Tempo+LFOs, 7 = All on
0	76	Select whether to apply Mod or Swing for Tempo and Drum Pattern parameters when clocked	0-3	0= Both Swing 1= Tempo Mod, DPat Swing 2= Tempo Swing, DPat Mod 3= Both Mod
0	77	GLOBAL EXTERNAL MIDI CLOCK MODE	0/1 (See page 1)	0 = off (power up default) 1 = on
0	78	NUDGE LOOP	Any non-zero value * NOTE switches off WORD mode if active	Shifts the loop ROM address by a small amount. Restore address is unaffected.
0	79	STEADY GAIN * In stand-alone operation activate this	0=off, else on	Replaces the speech ROM oscillator energy with a steady level set by the OscGain pot (and its expression values)

		by double tapping the OscGain pot		OscGain pot shows an “S” in the bottom right corner
0	80	STEADY BEAT Only available for MIDI clocked Dsrc0 modes When active, shows an “S” on the D-pat pot on the Drums1 page	0=off, else on	Forces any triggers on beat 1 of clocked bars to include a kick drum Also disables drum map modulation during that beat to retain a consistent kick sound on beat 1
0	81	Start SLFOs at MIN value* * if LFOs are unclocked Free must also be off When active, shows an “m” on the SLFO rate pot on the LFO page	0=off, else on	Start the SLFOs at their minimum value, rather than the default mid-cycle value (when Free is off). This option is not modified by morphing, so its value remains that of the initial source patch when morphing is enabled.
0	82	Generate a new RANDOM VALUED TEMP DRIFT BUFFER	CC 6 = scaler (0 = all zeroes buffer) Excluded parameters get a zero-valued drift offset	Generates a new random driftbuffer scaled by CC6
0	83	Driftbuffer Scaler	0-127 spans 0 to 1.0 **Note that this scaler is overwritten by the Drift Depth value whenever that parameter changes.** **And is set to 1.0 when continuous Drfit or XDRIFT are activated.**	Scales the current driftbuffer values by 0 – 1.0 (127).
0	84	ONE SHOT MODE (for Note-on events) See also NRPN CC 98 = 6, CC 6 = 18/19	0=off else on	Plays the current loop only once on receiving a note-on event, and issues an internal ‘all notes off’ at the end of the loop.
0	85	Restore power-up Global parameters	Any non-zero value	Use this to reset global parameters e.g. after a Scene load
0	86	TAPE ECHO MODE	0=off else on	Uses a tape echo simulation for the echo effect, giving rise to pitch shifts when delay time is changed. Flag is patch specific, but not morphed or randomized.
0	87	NULL ECHO BUFFER (instant null)	Any non-zero value	

0	88	ORBIT (bend param)	CC6 = 0 off CC6 > 0 on	Often works well as an A/B variation for any patch
0	89	DRUM PITCH)	0-127 64 = unity 0= -1 octave 127 = +1 octave	
0	90	Replace the Aftertouch controller signal in the expression matrix with the P mix (Pitch) modulator	CC6 = 0 off CC6 > 0 on	When active, the P mix signal can be used as a second automated expression LFO (in addition to XPlfo) and uses the 'AfterTouch' expression matrix values as P mix scalers for each parameter.
0	91	ORBIT (bend param)	CC6 = 0 off CC6 > 0 on	Often works well as an A/B variation for any patch
0	92	Linear (Speech) Filter Mode: FILTER parameter lowers the Speech formants	CC6 = 0 off CC6 > 0 on	Filter has little effect on resonance levels in this mode. Combine this with Pitch changes to get a wide range of talkers
0	93	Route the Post Filter output via the Echo buffer before sending to output	CC6 = 0 off CC6 > 0 on	Allows delay time (and e.g. Tape Echo pitch shifts) to affect the audio output even when Repeats = 0
0	94	PBLUR (Pitched Blur) modifies the BLUR bend to affect only pitched sounds	CC6 = 0 off CC6 > 0 on	Great for smoothing spoken words without the usual pitch-chirps that can arise at high Blur levels
0	95	Invert ROM pitch contour	CC6 = 0 off CC6 > 0 on	Can makes words sound like questions (shows "?" on the Pitch pot)
0	96	Overdrive Boost Stronger tube distortion.	CC6 = 0 off CC6 > 0 on	When overdrive = 0, provides *unity gain* tube saturation & compression ("+" on overdrive)
0	97	Smooth out the Oscillator PWM steps (normally discrete)	CC6 = 0 off CC6 > 0 on	To hear the effect, select PWM and use a sustained steady note. Note this option is not morphed
0	98	Enable XPlfo and P mix based **mod** freeze automation by running LFOS in 'background mode'	CC6 = 0 off CC6 > 0 on	Normally this isn't possible because mod freeze locks up the LFOs used by XPlfo and P mix.

0	100	High Resolution expression map scaler values in the range -127 to +127	CC 38 = scaler sign (0 = pos, else neg) CC6 = absolute value of the scaler (send last)	Set CC11 and 12 in the usual way first, then send NRPN CCs 99=0, 98=100, 38 (sign), and CC6 (abs val), in that order
0	101	High Resolution multi-mod DEPTH the range -99 to +99	CC 38 = sign (0 = positive) CC6 = 0-99 (send last)	
0	102	High Resolution multi-mod MIX in the range -99 to +99	CC 38 = sign (0 = positive) CC6 = 0-99 (send last)	
0	103	High Resolution multi-mod W1 in the range -99 to +99	CC 38 = sign (0 = positive) CC6 = 0-99 (send last)	
0	104	High Resolution multi-mod W2 in the range -99 to +99	CC 38 = sign (0 = positive) CC6 = 0-99 (send last)	
0	105	High Resolution multi-LFO in the range -99 to +99	CC 38 = sign (0 = positive) CC6 = 0-99	Affects LFOs, SLFO, CLFO
0	106	High resolution FILTER (10 bits)	CC 38 = fraction step 0-7 CC6 = 0-127 (send last)	fraction steps are 0.125, e.g. 7 = 0.875, CC6 value same as CC 40
0	107	High resolution POST FILTER (10 bits)	CC 38 = fraction 0-7 CC6 = 0-127 (send last)	fraction steps are 0.125 each CC6 value same as CC 92
0	108	High resolution PITCH (11 bits)	CC 38 = fraction 0-15 CC6 = 0-127 (semitones)	Fraction steps 0.0625, e.g. 15 = 0.9375, CC6 value same as CC 33
0	109	High resolution TEMPO (10 bits)	CC 38 = fraction 0-7 CC6 = 0-127 (semitones)	fractions steps are 0.125 each CC6 value same as CC 92
0	110	User1 kit define	CC 38 = drum number CC6 = kit 0 - 41 (table2)	0=kick, 1=snare, 2=chat, 3=ohat, 4=ltom, 5=htom, 6=clap, 7=rim Save using Save Global Params
0	111	User2 kit define	As above	Save using Save Global Params
0	112	User3 kit define	As above	Save using Save Global Params
0	113	Revert user kit	User kit (1-3)	Revert to last (global) saved
0	114[2]	MIDI Dmap0 define	CC 38 = drum number: CC6 = MIDI note 0-127	0=kick, 1=snare, 2=chat, 3=ohat, 4=ltom, 5=htom, 6=clap, 7=rim
0	115	MIDI Dmap1 define	As above	
0	116	MIDI Dmap2 define	As above	
0	117	BPM internal MIDI clock rate	CC 38 = 0-99 CC6 = hundreds digit	Valid range 1 -500
0	118	Extended range driftbuffer select	CC 38 = 0-99 CC6 = hundreds digit	Valid range 0-999 Load /Save using CC 103
0	119	High resolution ECHO DELAY (10 bits)	CC 38 = fraction 0-7 CC6 = 0-127 (send last)	fraction steps are 0.125 each CC6 value same as CC 51
0	121	INIT Initialize GND-1T param for words	0=word type INIT else keyboard patch INIT	*See next page
1	Param CC	XP mapping shortcut	CC 38 =controller CC 6 = bipolar depth (64=0)	Single command shortcut for XP mapping. CC 98 sets the parameter via its MIDI CC

1. Note that in addition to the status output (NRPN CC6 = 6) the GND-1 outputs MIDI active sensing at 250ms intervals when MIDI output is otherwise inactive.
2. (NRPN CC98=114) MIDI Dmap 0 also sets the note values that can be received by the GND-1T to trigger the currently selected internal Drum Kit sounds. To disable automated algorithm drum triggers, and only hear receieved drums, turn off DRUMS on the main patch page. Or set the drum trigger parameters on the Drum1 page to zero. To enable/disable channel 10 drum receive responses, toggle “drmRX on/off” parameter on the MIDI page (User manual P20) by holding ALT and tapping the Midi Ch button (User manual P25).

* NRPN CC 98 = 121 “Initialize” reset state (INIT)

Issuing the initialize command, with CC6=0 * sets most GND-1T parameters to 0, with the following exceptions:

Tempo = 75	Loop = 90	Word index = 1	Repeats = 40
Delay = 44	XPlfo scaler = 127	Pitch = 80	Tune = 64
LFO1 rate = 64	LFO2 rate = 64	Drum rate = 64	Drum trig = 64
Drum src = 40	Drum vol = 127	Drum Decay = 127	DrumPitch = 64
DrumVelVar = 100	SLFO rate = 64	CLFO rate = 64	Brightness = 127
PostFilter = 127	Unvoiced = 127	PF(synth) Vol = 127	(env) Hold = 10
Decay = 60	Sustain = 127	Release = 40	OscGain = 64
XPlfoScaler = 127			

* Setting CC6 to any other value produces keyboard patch style INIT, which alters the following values: Loop=0, Word index = 0 (and word mode switched off), OscWave = saw (instead of vox)

All morphing and Freeze modes are switched off. Some more recently added parameters may not be shown.

In addition, all clock sync PPQN scalers are set to 24, resulting in unity scaling at 120 BPM. Furthermore, the pitch parameter expression matrix value linked to breath control is initialized to negative 0.25 of the full range. If the GND-1T touch sensor is mapped to the breath controller, as is the factory default, INIT causes the patch to be initialized with the touch sensor producing a downward pitch shift.

Table 5. Clocked StepRate and LFO1/2 vs. clocks

Pot value	Clocks	Pot value	Clocks	Pot value	Clocks	Pot value	Clocks
127	1	95	14	63	24	31	132
126	1	94	14	62	28	30	144
125	1	93	14	61	28	29	144
124	1	92	15	60	32	28	156
123	1	91	15	59	32	27	156
122	1	90	15	58	36	26	168
121	2	89	16	57	36	25	168
120	2	88	16	56	40	24	180
119	3	87	16	55	40	23	180
118	3	86	17	54	44	22	192
117	4	85	17	53	44	21	192
116	4	84	17	52	48	20	216
115	5	83	18	51	48	19	240
114	5	82	18	50	54	18	264
113	6	81	18	49	54	17	288
112	6	80	19	48	60	16	312
111	7	79	19	47	60	15	336
110	7	78	19	46	66	14	360
109	8	77	20	45	66	13	384
108	8	76	20	44	72	12	408
107	9	75	20	43	72	11	480
106	9	74	21	42	80	10	528
105	10	73	21	41	80	9	576
104	10	72	21	40	88	8	624
103	11	71	22	39	88	7	672
102	11	70	22	38	96	6	720
101	12	69	22	37	96	5	768
100	12	68	23	36	108	4	864
99	12	67	23	35	108	3	960
98	13	66	23	34	120	2	1056
97	13	65	24	33	120	1	1152
96	13	64	24	32	132	0	1536

24 clocks = 1 Qbeat, 96 clocks = 1 bar, 384 clocks = 4 bars, 1536 clocks = 16 bars

Table 6. StepRate vs. Drum Triggers per step

Steprate	Drums	Steprate	Drums	Steprate	Drums	Steprate	Drums
127	1	95	6	63	18	31	56
126	1	94	6	62	19	30	56
125	1	93	6	61	19	29	60
124	1	92	7	60	20	28	64
123	1	91	7	59	20	27	68
122	1	90	7	58	21	26	68
121	1	89	7	57	21	25	72
120	1	88	8	56	22	24	76
119	1	87	8	55	22	23	80
118	1	86	8	54	23	22	80
117	1	85	9	53	23	21	84
116	1	84	9	52	24	20	88
115	2	83	9	51	25	19	92
114	2	82	10	50	25	18	96
113	2	81	10	49	26	17	96
112	2	80	11	48	26	16	112
111	2	79	11	47	27	15	128
110	2	78	11	46	28	14	144
109	3	77	12	45	28	13	160
108	3	76	12	44	29	12	176
107	3	75	13	43	29	11	192
106	3	74	13	42	30	10	192
105	3	73	13	41	31	9	208
104	4	72	14	40	31	8	224
103	4	71	14	39	32	7	240
102	4	70	15	38	36	6	256
101	4	69	15	37	36	5	272
100	4	68	16	36	40	4	288
99	5	67	16	35	44	3	304
98	5	66	17	34	48	2	320
97	5	65	17	33	48	1	336
96	5	64	18	32	52	0	352

Drum triggers per step in DrmStp and DrmSync block morph modes

Table 7. Expanded XPparams (via CC10)

Use CC10 instead of CC11 for expression mapping of these parameters:

CC 10 value	Parameter
0	MULTIMOD
1	MULTIMIX
2	MULTIWAV1
3	MULTIWAV2
4	MULTILFO
5	MFOWAV
6	DRUMPF
7	IDRUMMAP (internal kit)
8	DRUMMOD1 (internal mod kit1)
9	IDRUMMOD2 (internal mod kit2)
10	USBLEVELIN
11	USBMIX
12	PBENDUP
13	PBENDDOWN
14	ECHOSELECT
15	(MIDI) DRUMMAP
16	TOUCH SENSOR RELEASE
17	TOUCH SENSOR ATTACK
18	DRUM_DECAY
19	OSCENV
20	STEP (MORPH) RATE
21	BPM internal clock RATE

Note that adjusting any continuous parameter value via MIDI, or selecting / adjusting it on the GND-1T itself, will set that parameter as the one subsequently being expression mapped

GND-1T SysEx patch data format (all values in hexadecimal)

Each patch is described by 7 consecutive blocks: 1 parameter block, followed by 5 expression matrix blocks, and a final BPM-parameter block. All sysex blocks are delineated by a starting byte F0 and closing byte F7. Following F0, the GND-1T identifier is always 07 07 07. Following that, is the block function descriptor:

7F = main parameter block (contains patch + bank + main parameters)

7E = modw expression matrix

7D = velocity matrix

7C = breath matrix

7B = aftertouch matrix

7A = XPlfo matrix

0F = BPM block describing the patch internal MIDI clock rate and its expression values, as well as several other new parameters (March 2025)

*** When sending a sysex patch to the GND1, the order must be: 1. Param block (block type 7F), 2. XP blocks for modwheel (7E) to XPlfo (7A), and finally the BPM block. Upon receiving all 7 blocks the GND-1T saves the complete patch to SD.

NOTE: upon receiving the initial main parameter block, the GND-1T mutes the audio until the final block has been received.

GND-1T SysEx requests

The GND-1T responds to Sysex patch data requests in the following format:

F0 07 07 07 command patch bank F7

GND-1T patches 0 - 999 over MIDI are split into bank (100s digit) and patch (remainder 0-99). Command specifies which blocks in the patch/bank are requested:

all 7 blocks = 0x64 (includes the BPM block, which can't be requested on its own)

param block = 0x6F

Xp modw = 0x6E

Xp velocity = 0x6D

Xp breath = 0x6C

Xp aftertouch = 0x6B

Xp XPlfo = 0x6A

To check if a patch (in MIDI bank/patch format) exists in the GND-1T send it the following sequence:

F0 07 07 07 37 patch bank F7

It will respond with a message indicating whether the patch exists (0=no, 1=yes), and if so, whether drums are muted for that patch (0 no,1 yes, 2 invalid patch)

F0 07 07 07 37 patch bank exists drum-mute F7

It is also possible to request

(1) The saved preset parameters for the patch number the GND-1T is currently set to
(2) The currently active patch parameters

The sequence in this case requires no patch/bank number:

F0 07 07 07 command F7

In each case the returned bank and patch numbers in the response sysex block(s) inform you of the patch number the GND-1T is set to.

The Sysex command values to request the saved parameters for the current GND-1T patch are:

all blocks = 0x54 (includes the final BPM block)

param block = 0x5F

Xp modw = 0x5E

Xp vel = 0x5D

Xp breath = 0x5C

Xp after = 0x5B

Xp XPlfo = 0x5A

The Sysex command values to request the currently active patch parameters are :

all blocks command = 0x44 (includes the final BPM block)

Param block = 0x4F

Xp modw = 0x4E

Xp vel = 0x4D

Xp breath = 0x4C

Xp after = 0x4B

Xp XPlfo = 0x4A

The parameter block(without expression values) of the currently active patch can also be continuously sent out in smaller 10-parameter chunks using NRPN CC 98 = 122, CC 6 > 0. The GND-1T continuously sends chunks of 10 consecutive values contained in the current patch's sysex Param Block, cycling back to the start of the parameter block having reached its end. The format of these chunks is as follows:

F0 07 07 07 20 param#_lo param#_hi [data 20 nibbles] F7

The current USER1, 2 and 3 audio drum kit assignments can be requested using: F0 07 07 07 3A F7

The response is of the form: F0 07 07 07 3A USER1 (8 bytes) USER2 (8 bytes) USER3 (8 bytes) F7

Where the 8 bytes for each user-kit describe the 8 drum-note kit numbers (table2) in the order Kick, Snare, Chat, Ohat, Ltom, Htom, Clap, Rim.

The current MIDI DRUM MAPS can be requested using: F0 07 07 07 3B F7

The response is of the form F0 07 07 07 3B MAP0 (8 bytes) MAP1 (8 bytes) MAP2 (8 bytes) F7

Where the 8 bytes for each map describe the 8 MIDI drum-notes in the order Kick, Snare, Chat, Ohat, Ltom, Htom, Clap, Rim.

Perrmanent Drift buffers (0-999) values can be requested using: (buffer number=0-99 + 100 x block)

F0 07 07 07 69 buffer_0-99 buffer_block F7

The GND-1T will respond with a message containing the drift offset data, which can be sent to the GND-1T to set those values for that buffer, or change buffer to apply them to another buffer. Note that the block in this case is placed after the data

F0 07 07 07 79 buffer_0-99 00 00 00 00 00
[data] buffer_block F7

To request an entire block of driftbuffers, set the buffer number to 100 rather than 0-99, and specify the block 0-9.

To check if a permanent drift buffer exists:

F0 07 07 07 3D buffer_0-99 buffer_block F7

Responds with

F0 07 07 07 3D buffer_0-99 buffer_block [exists] F7

Where exists =0 means the Drift buffer doesn't exist (free slot), or 1 means it does

NOTE: Driftbuffer sysex commands have changed from FW 250920 onwards to expand the driftbuffer range from 0-127, to 0-999. The change requires the driftbuffer number to be specified using its 0-99 value, followed by the 100s digit (buffer block). However backward compatibility has been preserved so you can also read the older format (0-127) SysEx driftbuffer files.

Scene (0-999) data can be requested using: (scene number = scene_val + 100 x scene-block)

F0 07 07 07 68 scene-val scene-block F7

NOTE: Scene sysex commands have changed from FW 250325 onwards to expand the scene number range from 0-127, to 0-999. The change now requires the scene number to be specified using a 0-99 part of the scene number (scene val), followed by the 100s digit (scene block)

It will respond with a sequence of message blocks containing the Scene information, with command values starting at 78 and going down to 70. Using your MIDI manager, save these 9 consecutive blocks as a single SysEx file, which can be sent back to the GND-1T at a later time to reinstate the Scene. Or modify the Scene val/block number in each of the 9 blocks before sending to save the Scene data to another scene in the GND-1T. Each block takes the form:

F0 07 07 07 78-70 scene-val scene-block [data] F7

To check if a scene exists:

F0 07 07 07 3C Scene-val Scene-block F7

Responds with

F0 07 07 07 3C Scene-val Scene-block [exists] F7

Where exists =0 means the scene doesn't exist (free slot), or 1 means it does

Table 8. GND-1T WORD LISTS

Word Bank >	0	1	2	3	4
Word #					
0	tones 1	above	abscess	achieve	against
1	tones 2	almost	already	ancient	angel
2	tones 3	another	answer	anxious	anything
3	tones 4	approve	beauty	beige	believe
4	tones 5	blood	boulder	brother	built
5	A	bulletin	bullet	bureau	bushel
6	B	business	butcher	calf	caravan
7	C	cherry	chock	child	circuit
8	D	cleanser	colour	comfort	coming
9	E	conquer	correct	corsage	couldn't
10	F	country	couple	courage	cousin
11	G	danger	discover	does	dozen
12	H	dread	dungeon	early	earnest
13	I	earth	echo	egg	enough
14	J	error	every	everyone	extra
15	K	eyebrow	feather	field	finger
16	L	fired	flood	floor	freight
17	M	front	garage	gasoline	glacier
18	N	glove	greater	guard	guess
19	O	guide	half	haste	health
20	P	healthy	heaven	heavy	heroes
21	Q	honey	honour	hostess	hygiene
22	R	improve	instead	iron	is
23	S	island	isle	jealous	journey
24	T	key	language	laugh	laughter
25	U	learn	leather	leisure	lettuce
26	V	library	liquorish	linger	lose
27	W	machine	manger	marry	meadow
28	X	meaning	measure	mechanic	mild
29	Y	minute	mirror	mistake	money
30	Z	mosquito	most	mother	movie
31	0	moustache	narrow	neighbour	niece
32	1	nuisance	ocean	once	onion
33	2	other	outdoor	oven	period
34	3	pianos	pierce	Pint	plague
35	4	pleasant	pleasure	plunger	plural
36	5	police	postage	poultry	pretty
37	6	priest	promise	pull	push
38	7	question	quiet	quotient	range
39	8	ranger	ready	reindeer	relief
40	9	relieve	remove	rhythm	rock
41	10	rural	sardine	says	schedule
42	wrong	school	scissors	search	serious
43	I win	shield	should	shoulder	shovel
44	now spell	sign	ski	smother	soldier
45	now try	someone	sometime	source	say it
46	perfect score	sponge	spread	squad	squash
47	Spell	squat	statue	stomach	stranger
48	that is correct	sugar	sure	surgeon	swamp
49	that is incorrect	swan	swap	sweat	sweater
50	that is right	talk	terror	today	tomorrow
51	the correct spelling of	tonne	tongue	touch	tough
52	try	toward	treasure	trouble	to wed
53	try again	uncover	union	usual	view
54	you are correct	walk	warm	was	wash
55	you are right	watch	water	wealth	weird
56	you win	welcome	wild	wolves	woman
57	as in	wonder	word	workman	world
58	here is your score	worth	yacht	yield	yolk
59	next spell	young	yourself	Youth	zeros