

# 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<sup>1</sup> various parameters using incoming MIDI clock rate and PPQN scalars, 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) global EXTERNAL clock mode.** 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<sup>2</sup>. 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 scalar. 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 scalars 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

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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<br>(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<br>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.<br><u>Altering or selecting any parameter sets it as the current one being mapped</u> |
| 12 | Expression controller<br>Select                                                               | 0-4                  | 0=modheel 1=velocity 2=breath 3=aftertouch 4=XPLFO                                                                                                                                     |
| 13 | Expression scaler value                                                                       | 0-127 <u>bipolar</u> | 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/ Additive                                                               |
| 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<br>127 = unmodified speech levels                                |

|    |                                                                                                                                                                                        |                |                                                                                                                                                                                                                            |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 64 | Freeze & Looper Control<br>*in looper mode, set up<br>Echo vol and delay time<br>first. Recommend setting<br>Global Drums and RUN off<br>while creating loops from<br>multiple patches | 0/127, and 1-8 | 127 = punch in if echoFreeze ON<br>0 = punch out if echoFreeze ON<br>1= LPfreeze off, 2= LPfreeze on<br>3=modFreeze off, 4=modFreeze on<br>5=echoFreeze off, 6=echoFreeze on<br>7=punch mode overwrite<br>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<br>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)<br>1 = drums off<br><br>* See also CC 102                                                                                                                                                          |
| 73 | Filter DeResonate                                                                                                                                                                      | 0-127          | Reduce ROM speech filter<br>resonances<br>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<br>1 or 127 = RUN<br>2 = D-RUN off<br>3 = D-RUN on*<br>4 = STOP ALL<br>audio with fades<br><b>5 = PANIC STOP</b>                 | *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.<br><br><b>Stop all audio immediately,<br/>Clear all MIDI notes</b>                                                               |
| 103 | DRIFT control                                            | 0=off, 1/127=on,<br>2 =clear,<br>3= load temp<br>4= save temp<br>5= load perm<br>6= save perm<br>7= delete perm<br>8=save scaled<br>perm | 0 halt drift and retain current values<br>1 enable continuous drift<br>2 clear drift buffer<br>3 load-from / 4 save-to<br>temp drift buffer<br>5 load / 6 save / 7 delete /8 save-<br>scaled<br>permanent buffer (select buffer 0-<br>127 using NRPN CC 98 = 64, or 0-999<br>using CC98 = 118) |
| 104 | DRIFT rate                                               | 0-127                                                                                                                                    |                                                                                                                                                                                                                                                                                                |
| 105 | Revert / Reload patch                                    | any non-0 value                                                                                                                          | sets new loop restore vals                                                                                                                                                                                                                                                                     |
| 106 | Randomize Commands                                       | 0-7, 127                                                                                                                                 | 0 = (no effect)<br>1 = rand Loop/Word + Synth params<br>2 = rand Loop/Word: sets new loop<br>restore vals if speak on (CC109)<br>3 = rand Synth params<br>4 = rand Drums (but not Kits)<br>5 = undo (rand / drift)<br>6 = rand internal Drum kits<br>7= restore Loop/Word<br>127 = rand All    |
|     | CC 6 = 1, 3, or 127 always<br>sets new loop restore vals |                                                                                                                                          |                                                                                                                                                                                                                                                                                                |
| 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<br>1 = LOOP reFILT on<br>resets filter each LOOP cycle<br>2 =Speak off: Loops, not Words<br>3= Speak on, multiword<br>4= Speak on, single word<br>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 | <u>Not used</u>   |           |                       |
| 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                                              |
| 30 | TAIKO  | Taiko drums                                                    |
| 31 | DAX a  | custom daxophone kit                                           |
| 32 | DAX b  | custom daxophone kit                                           |
| 33 | DAX c  | custom daxophone kit                                           |
| 34 | PERC   | custom percussion kit                                          |
| 35 | PICA   | custom found sound kit                                         |
| 36 | EPIC   | Epic sound kit                                                 |
| 37 | TABLA  | Tabla kit                                                      |
| 38 | WOOD   | Log drum kit                                                   |
| 39 | BALI   | custom Balinese tingklik xylophone                             |
| 40 | RAND   | random kit (0-39) for each drum note (excludes DAX c)          |
| 41 | RAND2  | random kit (0-37) excludes tonal kits WOOD and BALI, and DAX c |
| 42 | USER1  | user defined Kit 1 (see NRPN CC 98 = 110)                      |
| 43 | USER2  | user defined Kit 2 (see NRPN CC 98 = 111)                      |
| 44 | USER3  | user defined Kit 3 (see NRPN CC 98 = 112)                      |

## 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     | <p>CC output control<sup>1</sup></p> <p><b>Status out messages</b> (CC 6 =16,17) are CC or NRPN commands that mirror those sent to the GND-1T, except on channel 16</p> <p>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</p> | <p>0 = all off</p> <p>1 = all out</p> <p>2 = LFO 1 out off</p> <p>3 = LFO 1 out to CC 115</p> <p>4 = LFO 2 off</p> <p>5 = LFO 2 out to CC 116</p> <p>6 = SLFO1 off</p> <p>7 = SLFO1 out to CC 117</p> <p>8 = CLFO1 off</p> <p>9 = CLFO1 out to CC 118</p> <p>10 = AHDSR off</p> <p>11 = AHDSR out to CC 119</p> <p>12 = loop sync note out off</p> <p>13 = loop sync note out on</p> <p>14 = morphing note out off</p> <p>15 = morphing note out on</p> <p><b>16 = Status Out off</b></p> <p><b>17 = Status Out On</b></p> <p>18 = loop-end note out off</p> <p>19 = loop-end note out on</p> | <p><u>All sent on midi CH 16</u></p> <p>Note # 60</p> <p>Note # 48</p> <p>Note # 61</p> |

|   |    |                                                                                                                            |                                                                |                                                                                                                                                                                                  |
|---|----|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | 7  | ABS/REL CC mode                                                                                                            | 0=absolute (default)<br>else relative                          | Relative mode is only available for unipolar 0-127 continuous parameters                                                                                                                         |
| 0 | 8  | Morph time                                                                                                                 | 0 = fastest morph (immediate)<br>127 = slowest morph (minutes) | Applies to single morphed patch changes, and block-morphing                                                                                                                                      |
| 0 | 9  | Wait Time                                                                                                                  | 0 = negligible<br>127 = minutes                                | 'patch hold' between morph transitions in Block morphs                                                                                                                                           |
| 0 | 10 | Morph Block size                                                                                                           | 0-99                                                           | Number of patches in the morphing block:<br>0-99<br>0 = single patch self-randomizing each cycle                                                                                                 |
| 0 | 11 | Morph order                                                                                                                | 0-3                                                            | 0=sequential<br>1=random<br>2=sequential no drum morphs or randomization<br>3=random no drum morphs or randomization                                                                             |
| 0 | 12 | Morph control                                                                                                              | 0-7                                                            | 0 = single morph off<br>1= single morph on<br>2= block morph off<br>3= block morph on<br>4= manual morph off<br>5= manual morph on<br>6=inhibit PPQN morph<br>7=allow PPQN morph (default)       |
| 0 | 13 | MIDI drum map                                                                                                              | 0-2                                                            |                                                                                                                                                                                                  |
| 0 | 14 | Loop mode control<br><br>*additive LP mod mode disables mod quantize, and causes LFO rates to be absolute (LPsnc override) | 0-5                                                            | 0 = multiplicative mod (allows Q)<br>1= additive mod (turns off Quant)<br>2= quantize off<br>3= quantize on (sets multipic)<br>4= disable FILTER reset LPcycle<br>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<br>1 = exclude pitch and drum mods<br>2 = include pitch<br>3 = exclude pitch<br>4 = include drum mods<br>5 = exclude drum mods<br>* drum mods = drate/dtrig here                                                                            |
| 0 | 17 | Patch, Driftbuffer, or Scene increment or decrement        | Patch: inc = 1, dec =127<br>Driftbuf: inc = 2, dec =126<br>Scene: inc = 3, dec =125                                                      | Patch +- applies to instant and morphed patch changes<br>Driftbuffers and Scenes are also activated                                                                                                                                                                         |
| 0 | 18 | Soft bends, FLIP, and Invert Plasma                        | 0-5                                                                                                                                      | 0 = soft bends off<br>1=soft bends on (applies to Gravity and Plasma curves)<br>2=Flip off, 3= on<br>4=invert-Plasma off, 5= on                                                                                                                                             |
| 0 | 19 | Inhibit DIN SysEx (speeds up USB sysex)                    | 0 (default)= send SysEx to DIN<br>else inhibit DIN SysEx.                                                                                | Not accessible from GND-1T in S/A                                                                                                                                                                                                                                           |
| 0 | 20 | LFO 1 and 2 modes                                          | 0-9                                                                                                                                      | 0 both absolute<br>1 both Loop scaled<br>2 LFO 1 absolute<br>3 LFO 1 Loop scaled<br>4 LFO 2 absolute<br>5 LFO 2 Loop scaled<br>6 LFOs restart on key or run<br>7 LFOs free<br>8 pulsar off<br>9 pulsar on                                                                   |
| 0 | 21 | USB Audio out MODE                                         | 0 = off<br>1 = synth + drums<br>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<br>1= chromatic quantization<br>2= major scale<br>3= harmonic minor scale<br>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,<br>2=invert mod off, 3=invert mod on                                                                                                                                                                                                       |

|   |    |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | 24 | MORPH and WAIT progress output control (NRPN output to chan 16)                                                                                                                                                                                                                                   | 0 = disabled (default)<br><br>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)<br><br>For <b>Clock Step</b> modes the StepRate parameter sets MIDI clocks per Step.<br><b>Key Step</b> increments the Patch on each note-on event.<br><b>Drum step</b> mode sets a patch offset from the block start patch according to the current drum note value 0-7 | 0 = off<br><br>1=on, 2=onSync<br>3=keyStp (note-on step)<br>4=KeySync<br>5=MIDI clkStp (table5)<br>6=MIDI clkSync<br>7=DrmStep (table 6)<br>8=DrmSync<br><br>9=DriftBuffer stepmorph<br>10=Key DriftBuffer Step<br>11=Clock DriftBuffer Step<br>12=Drum DriftBuffer Step | Morph Step Modes use instant patch changes rather than morphing gradually. All step modes except keyStp/keySnc use the <b>StepRate</b> 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. <b>Sync</b> variants restart the loop on each step.<br><b>Driftbuffer Step Morphing</b> steps between different permanent drift buffers (rather than patches) |
| 0 | 26 | STEP RATE<br>Used when MORPH STEP MODE is set to 1,2,5 or 6 (see above)                                                                                                                                                                                                                           | 0 -127<br>0=slowest<br>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<br><br>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.<br>To release <i>all</i> excludes* set CC6=2, and to set them set CC6=3.<br>* except MIDI clock mode (see user manual P20). "All" includes some parameters not accessible via CC10/11                                                                                                  |
| 0 | 28 | SAVE GLOBAL PARAMETERS<br>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)<br>Used when MORPH STEP MODES 1,2,5 or 6                                                                                                                                                                                                   | 0 -127<br>64=equal duty cycle (all intervals same length)<br>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<br>1,5=modw (5=modw matrix off)<br>2,6=velocity (6=vel matrix off)<br>3,7=breath (7= breath matrix off)<br>4,8=aftertouch (8=after matrix off)                                                                                                                        |
| 0 | 32 | MFO mode<br>The original (Type I) MFO oscillator sync tracks Pitch-pot and MIDI notes for a single ROM contour pitch value.<br>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<br>1 = osc sync Type I<br>127= osc sync Type II<br><br>2=AM turbo off<br>3=AM turbo on<br>4=MFO-mod affects MFO depth<br>5=MFO-mod affects MFO rate<br>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:<br>apply Env (AHD) to OSC Energy                                                                                                                                                                                                            | 0-7                               | 0=off, 1=AHD,2=AHD->0,<br>3=2+LPfrz, 4=2+modFrz,<br>5=AHDcycle, 6=5+LPfrz<br>7= 5+modFrz+modExcludes                                                                                                                                                                        |
| 0 | 36 | Drum rate mod, and improv, quantization                                                                                                                                                                                                             | 0-5                               | 0=both off, 1=both on<br>2=Dratemod-Q off, 3=on<br>4=Improv-Q off, 5= on                                                                                                                                                                                                    |
| 0 | 37 | ADSR retrigger source                                                                                                                                                                                                                               | 0-12                              | 0 = all off<br>1 = Loop (tempo) off<br>2 = Loop (tempo) on<br>3 = LFO1 off<br>4 = LFO1 on<br>5 = LFO2 off<br>6 = LFO2 on<br>7 = SLFO off<br>8 = SLFO on<br>9 = CFO off<br>10 = CLFO on<br>11=RunEnv off<br>12=RunEnv on (trigger env on RUN: allows 'live' sustain control) |
| 0 | 38 | XP freeze mode                                                                                                                                                                                                                                      | 0-3                               | 0=XP Loop frz<br>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)<br>3=XP Drift                                                                                                                                                                                                                                                         |
| 0 | 39 | KeyDown Retrigger Events<br><br>"key+" indicates additional keydown events when there is already a key down                  | 0-8          | 0 = no Loop or Env restart<br>1 = Both on, Attack from last val<br>2 = key+ restarts Loop = off<br>3 = key+ restarts Loop = on<br>4 = key+ no AHDSR ENV retrig<br>5 = key+ ENV retrig from last env val<br>6 = key+ ENV restart from 0<br>7= any key restarts MFO off<br>8= any key restarts MFO |
| 0 | 40 | Pitch mod modes                                                                                                              | 0-3          | 0= unipolar non-inverted +<br>1= unipolar inverted -<br>2 = bipolar non inverted +/-<br>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<br><br>Tempo and LFO clock scaling is disabled if these aparameters are direct MIDI synced (see P1-3) | 0-9          | 0 = all off<br>1 = all on<br>2 = Tempo PPQN scaling off<br>3 = Tempo on<br>4 = LFO1+2 off<br>5 = LFO1+2 on<br>6 = LP leng off<br>7 = LP leng on<br>8 = Drum rate off<br>9 = Drum rate on                                                                                                         |
| 0 | 45 | Post Filter Type                                                                                                             | 0-3          | 0= Hicut (1 <sup>st</sup> order)<br>1= LPF classic ladder (4 <sup>th</sup> order)<br>2= LPF State Variable (2 <sup>nd</sup> order)<br>3= LPF diode ladder (4 <sup>th</sup> order)                                                                                                                |
| 0 | 46 | Post Filter Keytrack                                                                                                         | 0-1          | 0=off<br>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*<br>* I-drums are not sent to analog output for mode 2                                                                                                                                                                                                                   |

|   |    |                                                                             |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                         |
|---|----|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | 54 | Echo Select input:<br>PostFilter, Drums, USB                                | 0-6                                                                                                        | 0=PF, 1= Drums, 2=PF+D, 3=usb,<br>4=usb+PF, 5=usb+D, 6=All                                                                                                                                                                                                                                                                                              |
| 0 | 55 | Global echo and drums<br>(prevents change on<br>patch loads or<br>morphing) | 0-3                                                                                                        | 0=off<br>1=only Echo params are global<br>2=only Drums are global<br>3= both echo and drums global                                                                                                                                                                                                                                                      |
| 0 | 56 | DRIFT mode                                                                  | 0-2                                                                                                        | 0=synth, 1=drums, 2=both                                                                                                                                                                                                                                                                                                                                |
| 0 | 57 | NULL BENDS* 1/2<br>(and Bend mods)                                          | Any value                                                                                                  | *Nulls target bend params if<br>morphing                                                                                                                                                                                                                                                                                                                |
| 0 | 58 | TOUCH RELEASE TIME<br>(sensor response time)                                | 0 = fastest<br>127=slowest                                                                                 |                                                                                                                                                                                                                                                                                                                                                         |
| 0 | 59 | TOUCH ATTACK TIME<br>(sensor response time)                                 | 0 = fastest<br>127=slowest                                                                                 |                                                                                                                                                                                                                                                                                                                                                         |
| 0 | 60 | DRUM DECAY SCALER                                                           | 0 = shortest decay<br>127=unaltered                                                                        | When < 127, this shortens all<br>drum sounds in the current patch                                                                                                                                                                                                                                                                                       |
| 0 | 61 | DRUM OUTPUT MODE<br>SELECT                                                  | 0-2                                                                                                        | 0=MIDI, 1=internal, 2=both                                                                                                                                                                                                                                                                                                                              |
| 0 | 62 | Dsrc=0 select                                                               | 0-3                                                                                                        | 0= trig on ROM update (Tempo)<br>1 = clk- = trig every 8 clocks<br>2 = clk+ = every 4 clocks<br>3 = clk = every 6 clocks (16ths)                                                                                                                                                                                                                        |
| 0 | 63 | Individual Drum Note<br>Mutes                                               | 0, 1 or 127,<br>10-17,<br>20-27<br><br>All mutes are ineffective if<br>MUTES is off/inactive<br>(CC 6 = 0) | 0 = Drum note mutes inactive<br>1, 127 = Drum note mutes active<br>10 =Kick mute off, 20 = mute on<br>11 =Snare mute off, 21 = mute on<br>12 =CHat mute off, 22 = mute on<br>13 =OHat mute off, 23 = mute on<br>14 =Ltom mute off, 24 = mute on<br>15 =Htom mute off, 25 = mute on<br>16 =Clap mute off, 26 = mute on<br>17 =Rim mute off, 27 = mute on |
| 0 | 64 | Permanent Drift Buffer<br>select                                            | 0-127<br>* See CC98=118 for 0-999                                                                          | Load /Save using CC 103                                                                                                                                                                                                                                                                                                                                 |
| 0 | 65 | Scene select 0-999<br>(previously 0-127)                                    | CC 38 = 0-99<br>CC6 = scene bank 0-9                                                                       | Load /Save using CC 98=66                                                                                                                                                                                                                                                                                                                               |
| 0 | 66 | Scene<br>Load/Save/Delete                                                   | Load=1, Save=2, Delete=3                                                                                   |                                                                                                                                                                                                                                                                                                                                                         |
| 0 | 67 | Erode Bend                                                                  | 0=off, else on                                                                                             | Erosion rate varies with Tempo<br>parameter ( new in FW 241103 )                                                                                                                                                                                                                                                                                        |
| 0 | 68 | Note XP mode                                                                | 0-10                                                                                                       | 0=off, 1=mWL 2=Brth, 3= AfterT,<br>4= patch change (re C 60)<br>5 = pitched patch changes<br>6 = as for 5, but no patch change<br>for legato notes<br>7 = morph offset re middle C 60<br>without pitch change<br>8,9 = morph offset + pitch with<br>morph steps of 2, 5 per semitone<br>10 = manual morph split mode:<br>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 <ul style="list-style-type: none"> <li>Set to off for external clocks</li> </ul> | 0-3                                                           | 0= GND-1T generated clock off<br>1= clock active if running<br>2=clock always active<br>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)<br>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+Lfes, 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<br>1= Tempo Mod, DPat Swing<br>2= Tempo Swing, DPat Mod<br>3= Both Mod                                                                                               |
| 0 | 77 | GLOBAL EXTERNAL MIDI CLOCK MODE                                                               | 0/1<br>(See page 1)                                           | 0 = off (power up default)<br>1 = on                                                                                                                                               |
| 0 | 78 | NUDGE LOOP                                                                                    | Any non-zero value<br>* NOTE switches off WORD mode if active | Shifts the loop ROM address by a small amount. Restore address is unaffected.                                                                                                      |
| 0 | 79 | STEADY GAIN<br><br>* 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<br>Only available for MIDI clocked Dsrc0 modes<br><br>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<br>Also disables drum map modulation during that beat to retain a consistent kick sound on beat 1                                                       |
| 0 | 81 | Start SLFOs at MIN value*<br>* if LFOs are unclocked Free must also be off<br><br>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)<br>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<br><br><b>Note that this scaler is overwritten by the Drift Depth value whenever that parameter changes.</b><br><br><b>And is set to 1.0 when continuous Drfit or XDRIFT are activated.</b> | Scales the current driftbuffer values by 0 – 1.0 (127).                                                                                                                                                                      |
| 0 | 84 | ONE SHOT MODE (for Note-on events)<br>See also NRPN<br>CC 98 = 6, CC 6 = 18/19                                                                   | 0=off<br>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<br>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 | 100              | High Resolution expression map scaler values in the range -127 to +127 | CC 38 = scaler sign (0 = pos, else neg)<br>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)<br>CC6 = 0-99 (send last)                                     |                                                                                                                      |
| 0 | 102              | High Resolution multi-mod MIX in the range -99 to +99                  | CC 38 = sign (0 = positive)<br>CC6 = 0-99 (send last)                                     |                                                                                                                      |
| 0 | 103              | High Resolution multi-mod W1 in the range -99 to +99                   | CC 38 = sign (0 = positive)<br>CC6 = 0-99 (send last)                                     |                                                                                                                      |
| 0 | 104              | High Resolution multi-mod W2 in the range -99 to +99                   | CC 38 = sign (0 = positive)<br>CC6 = 0-99 (send last)                                     |                                                                                                                      |
| 0 | 105              | High Resolution multi-LFO in the range -99 to +99                      | CC 38 = sign (0 = positive)<br>CC6 = 0-99                                                 | Affects LFOs, SLFO, CLFO                                                                                             |
| 0 | 106              | High resolution FILTER (10 bits)                                       | CC 38 = fraction step 0-7<br>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<br>CC6 = 0-127 (send last)                                           | fraction steps are 0.125 each<br>CC6 value same as CC 92                                                             |
| 0 | 108              | High resolution PITCH (11 bits)                                        | CC 38 = fraction 0-15<br>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<br>CC6 = 0-127 (semitones)                                           | fractions steps are 0.125 each<br>CC6 value same as CC 92                                                            |
| 0 | 110              | User1 kit define                                                       | CC 38 = drum number<br>CC6 = kit 0 - 41 (table2)                                          | 0=kick, 1=snare, 2=chat, 3=ohat, 4=ltom, 5=htom, 6=clap, 7=rim<br>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 <sup>2</sup> | MIDI Dmap0 define                                                      | CC 38 = drum number:<br>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<br>CC6 = hundreds digit                                                      | Valid range 1 -500                                                                                                   |
| 0 | 118              | Extended range driftbuffer select                                      | CC 38 = 0-99<br>CC6 = hundreds digit                                                      | Valid range 0-999<br>Load /Save using CC 103                                                                         |
| 0 | 119              | High resolution ECHO DELAY (10 bits)                                   | CC 38 = fraction 0-7<br>CC6 = 0-127 (send last)                                           | fraction steps are 0.125 each<br>CC6 value same as CC 51                                                             |
| 0 | 121              | INIT Initialize GND-1T param for words                                 | 0=word type INIT<br>else keyboard patch INIT                                              | *See next page                                                                                                       |
| 1 | Param CC         | XP mapping shortcut                                                    | CC 38 =controller<br>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 received 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 | 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

In addition, all clock sync PPQN scalars 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:

| <u>CC 10 value</u> | <u>Parameter</u>              |
|--------------------|-------------------------------|
| 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 = XPIfo 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 XPIfo (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 XPIfo = 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 XPIfo = 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 XPIfo = 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.

Permanent 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 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    |