

Firmware updates for the GND-1T will be available on the website to incorporate any bug fixes, or add occasional features. If you believe you've found a bug, please try updating to the latest version. If you still see an issue, please send bug reports to gnd1t@richardvanhoesel.com. The update procedure below requires access to a computer with Windows 10 or later or MAC OS Catalina 10.15 or later. Earlier OS versions may work but have not been tested by us. We recommend closing all other software while performing the update. Note especially the instructions in red if using a MAC.

If you have any trouble, power cycle the GND-1T and reconnect the USB cable to your computer before running the loader again. In particular, if an initial update attempt fails and you get a blank screen, **DON'T PANIC**. It's extremely unlikely you've bricked your synth. Just follow the instructions below to rectify the problem.

Update Instructions:

Check your current firmware by holding the Patch button on your GND-1T during power up, and compare it to the latest version indicated on the website at <https://richardvanhoesel.com/gnd1t>.

Download the latest firmware using the "Latest firmware download" button on the website

You will also need these tools installed:

1. Teensy loader app:

Windows (exe file)

<https://www.dropbox.com/scl/fi/38e6aa1chyjawl9vr2ndu/teensy.exe?rlkey=zya7oeijin9pqt53fw1b7mse7&st=qxrr2b0e&dl=0>

MAC OS (tar file requires unzipping)

<https://www.dropbox.com/scl/fi/et96e1orxejxdzt424gls/teensy-tools-0.60.3-macos.tar?rlkey=e15gjc62cad46x1u8d7qkgt7p&st=uc720z5u&dl=0>

2. TyTools (latest version for Windows or MAC OS)

<https://github.com/Koromix/tytools/releases>

In the TyTools package, we'll be using just TyCommander.

Instructions to load the ehex firmware file:

Please follow these instructions carefully

If using Mac OS, do not use your computer for anything else whilst the firmware update is in progress. It only takes a minute or two. Ensure the firmware installation completes before using your computer for any other purpose or even switching to any other window/software, otherwise the firmware installation may fail.

Start the Teensy app (MAC) or run teensy.exe (Windows):

File>Open Hex File (direct it to where you have downloaded the firmware)

Enable the "Auto" button underneath Help

Start TyCommander:

Press the "Bootloader" button. This will get the Teensy process started, which is all we're using

TyCommander for (you do not need to touch any other buttons in the TyCommander app, just the bootloader button).

The GND-1T screen should go blank at this point.

After a second or two you should see the Teensy program start the upload process, and show 'erasing'.

After up to about 20-30 seconds (and sometimes longer), this should switch to "Programming" and display a progress indicator.

After programming is completed, it's usually a good idea to power cycle the GND-1T to run the new firmware.

Troubleshooting, especially if using Mac:

If after the erasing stage you get an error message (e.g. **"Download failed"**), follow these exact steps:

- Unplug both the usb and the power to the GND-1T.
- Close the teensy app.
- Plug the GND-1T power and usb cables back in.
- The GND-1T screen should still be black (if it instead the GND-1T boots up normally then go back to the start of the instructions above and try again from the beginning).
- Open the teensy app again, and load the firmware into it.
- Press the Auto button again in the teensy app.
- This time the programming phase should start, and there should be no error.

Ensure that the firmware update completes and the GND-1T boots up normally before switching to any other window/software, otherwise the firmware installation may fail. Be sure to close and reopen the Teensy app if retrying an upload. If you try to load the firmware again without closing and reopening the Teensy app, it will likely fail (on Mac).

If you still have any issues just get in touch.

Firmware changes since November 2024:

V2.15A FW250921 *September 21, 2025* Modifies -Drm morph modes (Morph Drift params page) to ensure drum parameter expression values also remain unchanged (previously this wasn't the case).

V2.15 FW250920 *September 20, 2025* Expands the number of driftbuffers to 1000 (rather than 127). See the MIDI reference for details regarding driftbuffer specification via MIDI for values beyond 127 (P27, NRPN CC98 = 118), and the SysEx driftbuffer transfer commands (P34).

Also implements a bugfix for SysEx activated Scene writes to the GND-1T (**recommended if using SysEx Scene transfers**)

V2.14 FW250919 *September 19, 2025* Adds morphing ability for MIDI internal clock mode (off, on-run, always on, internal only). Clock-mode morphing is enabled by default on power-up. Any manual change to the clock mode invokes its *exclude*, which inhibits further changes while morphing. This also applies to the Patch page shortcut "Xpress + patch-number", which toggles the internal MIDI clock on/off. To release the clock-mode *exclude*, hold both Xpress+Patch buttons and tap the patch-number on the main patch page. **Note that the long encoder hold to "release all excludes" doesn't apply to the clock-mode *exclude*.**

V2.13A FW250916 *September 16, 2025* Sysex "Driftbuffer exists" command bugfix

V2.13 FW250915 *September 15, 2025* Added the ability to use any modblock mixer output as an input waveform to any other modblock mixer, essentially providing modulation waveform feedback and cross-feedback. These waveforms have been added at the end of the W1/W2 select lists (see also page 15 of the MIDI reference). Note that selecting a modblock mixer output as a 100%-mixed input into itself will cause the mixer output to remain at a constant value.

V2.12 FW250914 *September 14, 2025* **Moved the ERODE double-tap shortcut** on the main patch page from the metal Patch button **to the Patch-number screen button**. Removed the potential for a note-on activated background RUN state for direct-clock driven patches when sncRun is on (**recommended update**)

V2.11A FW250908 *September 8, 2025* Improved SysEx patch read compatibility so that older pre V2 FW generated SysEx files are better preserved when read into newer firmware versions.

V2.11 FW250907 *September 7, 2025* Added an option to start the SLFOs at their minimum value. To toggle this option, double tap the SLFO rate pot (shows "m" when active). See also NRPN CC98=81 (page 25) in the MIDI REFERENCE document.

V2.10C FW250904 *September 4, 2025* Added a Send Bank option (hold Xpress) to the MIDI SysEx send button when in the SAVE menu

V2.10B FW250902 *September 2, 2025* Bugfix for MIDI activated patch/bank changes for patches that use direct MIDI clock options (**recommended update**)

V2.10A FW250826 *August 26, 2025* Excluded Tempo and/or LFO rate parameters from being affected by DRIFT when they're directly MIDI clocked, and Drums are also MIDI clocked.

V2.10 FW250823 *August 23, 2025* Added "STEADY BEAT" for MIDI clocked drum modes, which triggers a kick drum on every MIDI quarter-beat (every 24 MIDI clocks) whenever D-trig and its modulation allow it. These kick triggers are not affected by D-rate, and momentarily set drum kit modulation to zero to retain a consistent kick drum sound. When STEADY BEAT is active, the Drum pattern pot (D pat) shows an "S" in its bottom right corner. Toggle it by double-tapping the D-pat pot. Or via MIDI send CC 98=80, followed by CC 6 = any non-zero value to turn it on, and CC 6 = 0 to turn it off. Note that STEADY BEAT has no effect on the drums when Dsrc0 = ROM.

V2.09C FW250820 *August 20, 2025* Minor bugfixes

V2.09A FW250816 *August 16, 2025* Eliminated the minor discontinuity that could sometimes occur in the audio stream when a patch was saved while the audio was running. Added the ability to undo patch changes in stand-alone operation using ALT RAND (UNDO) on the main patch page, and recover the previous patch parameters that may not have been saved prior to the patch change. See the ALT PATCH page (P17) in the updated user manual for details.

V2.09 FW250813 *August 13, 2025* Added a shortcut to toggle the ERODE function (Bends2 page) directly from the main Patch page by using a double-tap of the metal ALT/PATCH button. ERODE is great for imparting non-destructive dynamic variations for many patches, and especially useful for melodic (ROM contour quantized) loops.

V2.08A FW250809 *August 9, 2025* Minor display bugfix on the PostFilt/OSC page correcting the split red/blue display of the OscGain pot when its value exceeds 64 but the pot is not selected and STEADY GAIN is on. Releasing the OscGain pot exclude now also releases the STEADY GAIN exclude.

V2.08 FW250803 *August 3, 2025* Added “STEADY GAIN” which when activated replaces the speech ROM oscillator energy with a steady level set by the OscGain pot (and its expression values). When selected, the OscGain pot shows an “S” in the bottom right corner. Toggle this by double-tapping the OscGain pot. Or via MIDI send CC 98=79, CC 6 = any non-zero value to turn it on, and CC 6 = 0 to turn it off. OscEnv AHD level modifiers can still be used in this mode.

V2.07 FW250802 *August 2, 2025* Added a “Type II” MFO oscillator sync mode. The audio-band MFO in the GND-1T can be used to modulate amplitude, pitch, or the speech filter resonances, and can be tuned to be harmonically related to the audio oscillator. Enabling the original OSCsync mode then retains that tuning when you alter Pitch-pot (or its modulation) and/or change the MIDI note, but not when the Rom pitch contour changes.

The new Type II MFO sync option *does* allow the MFO to remain tuned even for ROM pitch-contour changes, which is particularly useful for melodic loops, but also expands the timbral palette more generally. You can select Type II in stand-alone operation on the MFO page, or via MIDI using CC98=32, CC6=127.

V2.06C FW250729 *July 29, 2025* SysEx bugfix to ensure ERODE is always set correctly when sending SysEx Patches to the GND-1T.

V2.06B FW250725 *July 25, 2025* Bugfix for pitch quantization using major scales when BStereo (Bends Stereo) is non-zero, allowing tuned two-note polyphonic sequences to be created.

V2.06 FW250718 *July 18, 2025* Previously Tempo-Mod (Tmd) and Drum-pattern Mod (DPmod) functions were unavailable in *clocked Tempo and Drum modes*, and those screen-pots instead became Tempo Swing and Drum Swing controls. This firmware gives you the option of selecting whether mod or swing functions are in operation for those two parameters (when clocked) by double tapping their pots. Mod and swing cannot be combined as they share a common storage value. Mod/Swing selections are saved and loaded for each Patch. For MIDI control, use NRPN 98 =76 (see the MIDI ref document).

Holding the Xpress button down on the Loop page now also changes the “RAND LOOP” button function to “Nudge LOOP”. This shifts the loop address in ROM by a small amount rather than completely randomizing it. You can also activate it over MIDI using NRPN 98 =78, and sending any non-zero value to CC 6.

V2.05 FW 250709 *July 9, 2025* Minor bug fix correcting the displayed polarity of the Filter

modulation parameter (Fmod). This update won't alter any existing presets, it merely corrects the display.

V2.04 FW 250525 *May 25, 2025* Adds the ability to set the GND-1T in "global external MIDI clock" mode, which disables the internal MIDI clock for all patches and overrides their patch specific MIDI clock parameter. To enable (and disable) global external mode, double-tap the BPM/clock button on the MIDI page so it says "global EXT". Once activated, you can load any patch and retain the external clock sync mode. 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).

V2.03 FW 250512 *May 12, 2025* Adds an additional OscEnv mode ("cycMfz X") that combines continuous AHD cycles with modFreeze during the AHD cycle. In addition, unique to this mode, individual modulators can be 'unfrozen' by activating their mod depth parameter eXcludes. E.g. by manually changing the Fmod parameter (speech filter mod) its exclude is activated, and it is also no longer frozen during AHD cycles in this mode. Note that patch loads and saves do not alter parameter excludes, so loading a previously saved patch that uses this OscEnv mode may not sound the same if current excludes differ from when the patch was saved. To preserve excludes in save/load operations, save the current configuration as a Scene instead.

This FW also eliminates the Drum status lock that in previous FW versions was enforced when echofreeze was activated.

V2.02 FW 250409 *April 9, 2025* Reverts a minor FW250325 code addition that was aimed at improving repeatably of patch loads for highly non-linear patches, but turned out to adversely affect some sounds.

V2.01 FW 250325 E/F *April 3, 2025* Adds a shortcut that allows toggling the internal MIDI clock on or off from the main patch page by holding the metal Xpress button and tapping the patch number button. For patches that use the MIDI clock for any parameter, the clk symbol on the patch number button turns red when turned off, but only after checking there are no active external clocks as well, which takes a second or two.

~~The OscEnv mod-freeze mode now excludes drum modulators, which keep running in that mode (as do PostFilter and the Pitch / Attack-Decay mod blocks). Removed in V2.02~~

Extends Drate to allow higher drum trigger rates when Drate is set in the range 100-127

V2.0 FW 250325 B *March 30, 2025* Revised Tempo rates in clocked mode (see MIDI reference P1-3), and minor change to the sounds in the MIX b drum kit for better contrast re MIX a.

V2.0 FW 250325 *March 25, 2025*

Adds many new features including internal MIDI clock generation and new direct clock sync of Drum triggers, Tempo, LFOs, Echo delay, and Block step morphing. **For full details, see P1-3 of the V2.0 MIDI reference**

V1.06 FW 250120 *January 20, 2025*

Adds the ability to trigger the internal drums via external MIDI note-on events on channel 10. The notes required to trigger the 8 drums correspond to those defined in MIDI DRUM MAP 0. To access

the MIDI Drum mapping page, hold the metal PARAM button down until the Edit index page loads. Then while continuing to hold PARAM, tap the Drum2/WORD button.

The Drum Kit modulation, drum velocity sensitivity, and drum volume and FX parameters remain in effect for external triggers. To disable the automated algorithm drum triggers, and only hear externally triggered drums, turn off DRUMS on the main patch page, or set the drum trigger parameters on the Drum1 page (Dtrig, DTmod) to 0. Adjust the drum trigger values to non 0 values to mix internal and external triggers.

Responses to channel 10 drum notes can be inhibited/enabled using the “drmRX on/off” parameter on the [ALT] MIDI page by holding ALT and tapping the Midi Ch button. This function replaces the ability to inhibit SysEx responses, and SysEx is now permanently enabled.

Adds a new parameter “sncRun on/off”, which when enabled, activates RUN on receiving a MIDI Start and clocks. Toggle this on the MIDI page by holding ALT and tapping the “Thru” button.

Status of both “drmRX” and “sncRun” can be saved for future powerups using SAVE Globals (click the encoder on the main patch page).

Corrected a MIDI latency issue that previously could arise when switching quickly between different screen pages

V1.05 FW 250109 *January 9, 2025*

Added the ability to set Touch expression mode (Tch XP) and Note Expression Mode (Note XP) via MIDI NRPN CC 98 = 69, 70. Added new ENC XP (encoder expression) modes to allow permanent Drift Buffers to be loaded directly from the MAIN PATCH page. New modes:

Driftbuf: Turn the encoder to increment or decrement the current permanent DriftBuffer number. If the buffer exists (i.e. has been saved previously) it is loaded immediately. To skip over buffers and scroll to a particular one, hold [Xpress] while scrolling.

ModWL XPDbf: Turn the encoder to affect modwheel, hold [Xpress] + turn to select DriftBuffer

Breath XPDbf: Turn the encoder to affect breath control, hold [Xpress] + turn to select DriftBuffer

AfterT XPDbf: Turn the encoder to affect aftertouch, hold [Xpress] + turn to select DriftBuffer

V1.04 FW 241225 *December 25, 2024*

New MIDI-clock based drum trigger option, selected by setting the Dsrc=0 selector to “clk” on the Drum1 Page (replaces previous LFO1+2 option). This new option creates a drum trigger every 6 MIDI clocks (i.e. 16th notes). The count can be restarted using a MIDI Start command. The clk based triggers are subsequently rate-limited by the Drate parameter as per usual, which in turn can be varied using clkDrum/ppq Drm. Accordingly, the Drum PPQN controls only affect the Drate parameter, and not the underlying Dsrc clk rate that responds strictly to MIDI clocks.

When this mode is active, as long as clocks are sent to the 1T and Drums are enabled, it will fire drums whenever RUN, run-drums-only, or NoteOn events are issued. The run-drums-only option may be particularly useful for DAW synchronous control of the 1T’s drums/synth along with other devices, but I’m sure you will find various interesting ways to make use of this new mode.

Addition of two new NoteXP modes on the XP mapping page: Patch(4) and Note+Patch (5). These modes allow each key (MIDI note) to play a different patch. Set the patch selected by middle C (MIDI note 60) by selecting a patch in the usual way without pressing any keyboard notes.

Addition of a LOOP Restore function (ALT RAND LOOP on the Loop edit page). Allows restoring the loop ROM address after any number of RAND LOOP commands. Great for restoring e.g. intelligible speech sounds after glitching them out using RAND LOOP. The restore address is reset by Word changes, patch changes and Save commands.

V1.03 FW 241211 *December 11, 2024*

New “Rungler” style modulator waveforms “mfo.lfo1” and “mfo.lfo2”. These are shift register based waveforms sampling the mfo waveform at lfo1 or lfo2 rates.

Addition of two new NoteXP modes on the XP mapping page: Patch(4) and Note+Patch (5). These modes allow each key (MIDI note) to play a different patch. Set the patch selected by middle C (MIDI note 60) by selecting a patch in the usual way without pressing any keyboard notes.

Addition of LOOP Restore function (ALT RAND LOOP) on the Loop edit page, which allows reinstating the original loop (e.g. a spoken word) after multiple RAND LOOP presses. See the Loop edit page in the revised manual.

BLOCK morph button on the main patch page now always shows the number of patches in a block in the top right corner

New SysEx commands to ask the GND-1T whether a specific drift-buffer or Scene exits (MIDI Ref)

Bug fix for “excludes” when using external MIDI control of pot-parameters but not morphing.

V1.02 FW 241103 *November 2024*

Addition of drum overdrive control (Drum2 page), and a new Erode bend (Bends2 page), and deletion of warp-bend parameter. Manual and MIDI ref versions 1.02 describe these two new parameters. Bug fix for the ‘clear parameter’ button on the XP mapping page (and extension to now also allow clearing of global matrix parameters).