

HAMMERHEAD

R H Y T H M S T A T I O N

INTRODUCTION

I created Hammerhead when I was a student, in the mid-90s. These were the days of Napster, Fasttracker and gaudy Winamp skins. The internet was still in its infancy: slow, tiny and mostly inhabited by geeks, nerds and students. Email was the hot new way to communicate, and instead of social media, we had Usenet and mailing lists.

Musical instruments were going through a bit of a revolution. Roland, who had just introduced the MC-303 (unknowingly inventing a new genre of musical instruments called the *Groovebox*), were among the first mainstream manufacturers to recognise a growing need for boxes full of knobs designed for making electronic dance music.

It's hard to overstate just how important this time was for electronic musicians. For the first time, mainstream instruments were being designed specifically with making contemporary dance music in mind. Until then, dance music was made using (and abusing) gear that was intended for other purposes (TB-303, anyone?), or resorting to underground software like Amiga Trackers, etc.

This is the context in which I made Hammerhead. It was my first music application; a bit of a weekend-project to be honest. But it accidentally happened to be one of the first drumcomputers which could be easily run on your home computer and which was made for electronic drums, rather than as an accompaniment tool for guitar practice.

I didn't expect more than a handful of users beside myself - some housemates, friends and perhaps some classmates. Eventually a friend posted Hammerhead on Usenet and within a short time I saw hundreds of thousands of downloads, overloading the university server that was hosting my application (which was quite a feat since there were so few people on the internet back then). Over the years, millions of people have downloaded and played with Hammerhead. A humbling thought.

I have been making music software and apps in my spare time ever since, but Hammerhead has always been the most special and dear to my heart.

25 years later, I feel confident about revisiting my little shark. The new Hammerhead you're looking at is a respectful, grown-up interpretation of the original concept. It's still fun, it's still simple, it's still playful and a little naive. It's still friendly to people who may have never used a drumcomputer before. And it still feels like a little 90s *groovebox*. But this time it fits in your pocket, it integrates with your mobile plugin ecosystem and it offers much more room for creative expression.

If you remember playing with the original, I hope Hammerhead brings back many good memories. If you're new to Hammerhead, I wish you many hours of fun and inspiration.



1 - STEP BUTTONS

These buttons were the primary way of programming drums on original drum computers from the 1980s and 1990s. Each button represents a (16th) step in the sequence and can be switched on and off like a toggle.

When your channel is configured to use fewer than 16 steps, the excess steps are simply ignored. You can also draw your notes in the "velocity lane" in the parameter panel. When velocity is 0, the step is OFF, if velocity > 0, the step is ON.

2 - CHANNEL BUTTONS

Hammerhead has 8 channels. Each channel has its own sound (e.g. a kickdrum or a clap). You can activate a channel for editing by tapping its Channel button once. This lets you change the sound of a channel and finetune the steps in that channel.

Tap the channel button of the active panel to pop up the Sound selection panel instead.

Note: if you long-press a Channel button, it will quickly SOLO that channel. Long-press it again to disable the SOLO state.

3 - SOUNDS BUTTON

This button pops up the "Sound selection panel" where you can change the selected sound for the currently active channel. The features of this panel are discussed below.

4 - MIXER BUTTON

This brings up the "Mixer panel" where you can change the volume level, panning, distortion and compression settings for each channel..

5 - SHUFFLE

Shuffle adds a groove/swing to your beats, to make the rhythm less staccato.

6 - SOUL

Who said drumcomputers don't have a soul? This one has! Soul (very subtly) affects several aspects of your rhythm to make them feel more human:

- It applies an 'analog' push-pull timing to the duration of steps, which was derived by carefully analyzing many recordings of the TR-808 of Egyptian Lover (known for his groovy drum machine beats).
- It adds minimal variations in pitch, decay and velocity to any sound you trigger.

The ebb and flow of Soul is tied to a simulated heartbeat of a very laid back drummer. Dial down the Soul-knob if you like your patterns completely rigidly stuck to the grid (not judging).

7 - VOLUME

Does exactly what it says on the tin: it changes the output volume.

8 - PATTERN SELECTION BUTTONS

Each Hammerhead track has 8 patterns which can be switched between manually, randomly or sequentially (in ascending order).

Patterns can be selected by tapping on them. The editor immediately switches to the selected pattern for editing. If the playback mode is set to "Manual" then playback will also switch to this selected pattern as soon as the current pattern is done playing (it will play repeatedly until you select another pattern).

Visually, you can distinguish empty patterns (no background color), used patterns (gray background colors), the currently visible pattern (light background) and the currently playing/audible pattern (white outline).

9 - COPY/PASTE PATTERN

These buttons let you copy and paste patterns. When you paste a pattern it will completely replace any pattern data already present in that pattern slot.

10 - LOAD/SAVE PRESET

You can load and save your current track or load one of the included factory presets and templates using these buttons.

There is no difference between saving in standalone mode or when Hammerhead is hosted as an Audio Unit plugin. Your saved presets will be available in both modes.

11 - DISTORTION

Distortion offers different ways of making your drums sound grungy or dirty. The different soundmodes are called "models" and can be switched between via the Model selector.

The amount/strength of distortion is set globally, but you can select per channel whether a channel gets applied. You can do this via the Mixer panel.



12 - COMPRESSOR

Compression is a production technique which makes your audio mode 'compact' so you can raise the volume of the total mix to make everything louder.

Most compressors have several settings to specify how the compression should respond to peaks in the audiostream and how to dynamically change levels over time accordingly. Hammerhead offers a simplified way of using compression by offering several Models and an Amount dial. The different Models are designed to match different drum styles and tempos/grooves.



13 - GLITCH

Glitch is a straightforward way to add chaos to your drums. While you can use the "Retrigger" parameter to program glitchy patterns manually, it is sometimes fun to simply dial in a global amount of glitchiness and let the universe decide.

The Chaos parameter determines how chaotic the repetition patterns can get and the Chance parameter lets you specify the chance that a glitch will trigger.

14 - MUTATION

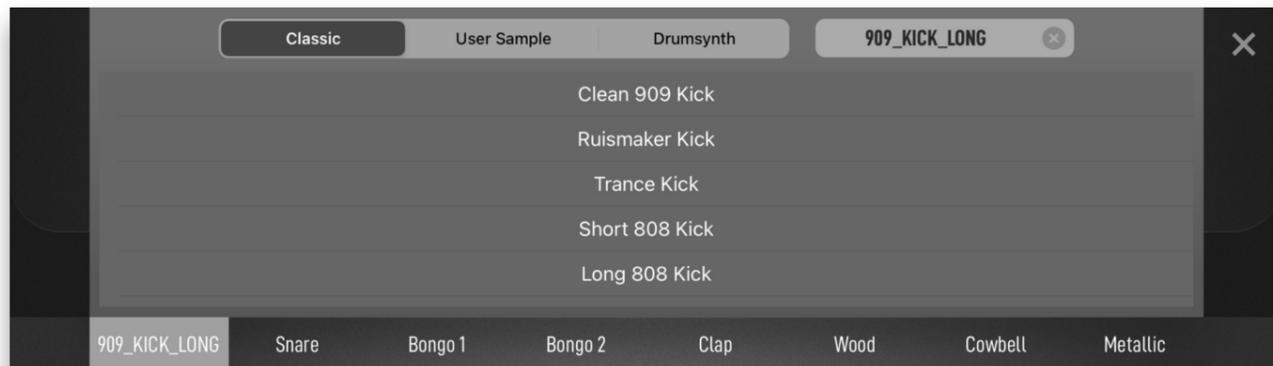
Mutation occasionally triggers a different step than the one that should be triggered. By dialing in a modest amount of mutation you can make each pass through a pattern sound different.

Mutation, like Glitch, is global effect applied to all channels. If you want control over trigger-probability in individual channels you can use the "Chance" parameter to specify per step what its trigger chance is.

Note: while randomness plays a large role in the Glitch and Mutation effects, there are also clever algorithms at work which analyze your beats to make sure that glitches and mutations occur in a musical way.

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SOUNDS PANEL: CLASSIC SOUNDS

Hammerhead contains all the sounds you remember from last century's original version. They are a kind of best-of collection of drum sounds and loops from mid-90s dance music, ranging from jungle to trance and house music and 90s hiphop and swingbeat.

Additionally, a small set of sounds has been added which I had already compiled at the time to be put into a successor of Hammerhead. So: just as classic, but new for Hammerhead.

Obviously, modern drum machines and samplers often come with a metric ton of drum sounds but that's not in the spirit of Hammerhead. To understand the sound selection of Hammerhead, you'll have to imagine it being a little 90s Groovebox, with a carefully curated set of drums. Just enough to cover as many bases as possible, but still small

enough to fit into the small capacity of an expensive ROM chip (or to be downloadable via a slow modem on a landline, as we used to do back in the day).

Hammerhead's selection of factory ("classic") sounds is still representative of this way of thinking and you'll be surprised how well some of the original sounds have held up after all this time.



SOUNDS PANEL: DRUMSYNTH

Hammerhead's drumsynth is a percussion synthesizer designed to offer quite some sonic flexibility with the smallest possible set of controls. This ensures that you can always quickly dial in a thump, a bip or a thwack you were missing in your track without having to sift through your entire collection of drum samples.

The drumsynth consists of three blocks: the oscillator block, the noise block and the resonator.

The oscillator block creates the 'tonal' aspect of a drum sound. Kickdrums, snaredrums, toms, they all rely heavily on this block.

The noise block is tuned to provide the typical noise ingredients for snaredrums (and the noise is pre-filtered to resemble the frequency spectra of 808 and 909 snares).

The resonator turns the initial impulse of your drumsound into a resonating string which adds a metallic or even robotic sound-tail for a wider variety of percussive sound effect purposes.

Pitch - This provides the base tuning of the primary oscillator. Note that changing the pitch in the sequencer's parameter lane will automatically transpose this oscillator

Sine / Triangle / Square - lets you select the waveform of the oscillator for creating different timbres

Modulator FM & Drop - This is a bi-polar knob controlling the pitch modulation of the oscillator over time. At center-value (12 o'clock) there will be no pitch modulation.

Move the dial to the right to make the pitch drop from a high frequency to the base frequency; higher settings make for higher drops.

Move the dial to the left to select FM (frequency modulation) instead. You can use FM to create atonal/bell/metallic sounds. The further to the left, the more extreme the FM effect will be.

Modulator Rate - Use this for setting the speed/rate of the modulation. When FM is selected it will determine the frequency of the modulator wave. When pitch drop is selected it will specify how quickly (steeply) the pitch will drop.

Envelope Decay - This sets the decay rate of the volume envelope of the main oscillator, ranging from short and snappy to long (for those booming 808 basses)

Noise Balance - determines the level balance between the oscillator and the noise generator. When switched all the way to the left there will be no noise mixed in

Filter - the noise block uses several bandpass and highpass filters to create different noise frequency profiles. Use this dial to tune them from emphasis on lower frequency bands to higher frequency bands

Decay - lets you set the decay rate of the noise volume envelope (which can be set separately from the oscillator envelope decay)

Resonator Level - Sets how much of the resonator should be mixed into the sound

Resonator Frequency - The resonant frequency of the resonator string, ranges from a low rattle to a high metallic whirr

Resonator Decay - The dampening of the resonance on the resonator string. Higher frequencies need longer decay settings, because they 'die down' faster



SOUNDS PANEL: USER SAMPLE (WAV IMPORT)

In addition to the Classic sounds you can import your own samples. Each channel can have its own sound, which are then saved into the preset you save (or stored in the saved state when hosted as an Audio Unit plugin).

Important: technically you can import samples up to 30 seconds long, but I recommend limiting yourself to modest one-shot samples and loops. Audio Units on iOS have strict memory limits, which are enforced by the system. Limits differ per iOS version, and there is (bizarrely) no way for the plugin to predict when the limit will be crossed; iOS will simply kill all instances of the plugin when it happens. So to stay on the safe side, don't import entire punkrock albums into your channels.

Duration - This will let you set the duration (in bars) of your imported samples. If set to zero, Hammerhead will treat the sample as a 'one shot' sample and play it as it was imported.

When duration is set to 1 bar or higher, the sample will be treated as a loop instead and pitched to fit the current tempo. Obviously it's your responsibility to use cleanly cut loops for optimal results.

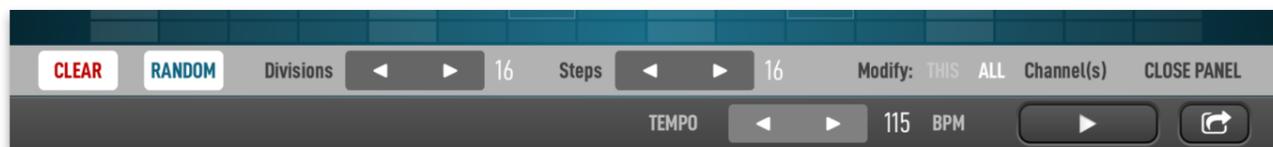
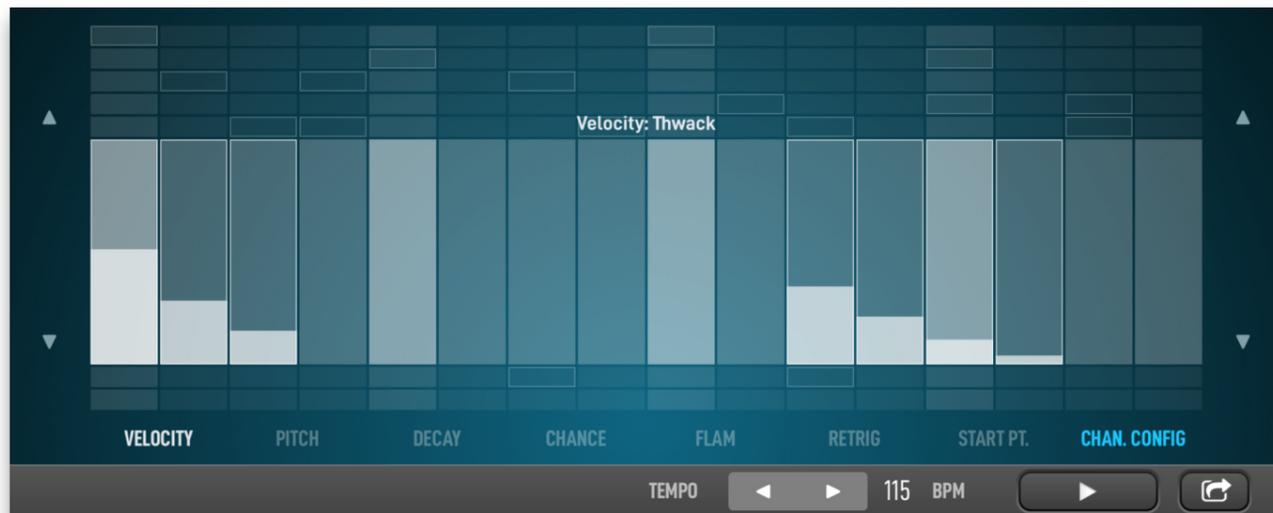
Choke mode - When triggering a choke-enabled sample, any other currently playing choke-enabled sample will be killed ("choked"). This is particularly useful for hihats, where you can - for instance - kill an open hihat with a closed hihat in another channel

Clear Sample Data - this will clear the currently loaded sample data in this channel and free up the memory.

Note: imported samples will be pre-processed and converted to floating point stereo sound data for faster performance. Therefore saved presets/projects may be bigger than the original imported WAV samples.

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PARAMETER LANES / STEP FINETUNE SETTINGS

In this screen you can finetune the sound and behavior of individual steps in the sequence. E.g. you can adjust the velocity, pitch and trigger-probability per step.

Velocity - The volume level of individual drum hits. By 'drawing in' velocity in steps, you essentially add them to the sequence (as an alternative to programming using the step buttons).

Pitch - This lets you transpose steps up or down 1 octave in semitone steps. You could also use this to play simple melodies or basslines with your samples. The pitch of the original sample/instrument is treated as the center-note.

Decay - Sets the individual decay time of steps. When set to full the sound will play until it ends or is cut short by another trigger.

Chance - The trigger probability of each step. Set to full means a 100% chance to be triggered. Lower settings mean the step may be triggered less frequently. Use this to make your patterns different with every pass.

Flam - This triggers a softer ghost note together with the actual trigger. The value of this parameter determines the time between ghost note and main hit.

Retrig - retriggers a step a set number of times in quick succession. This can be used to create rolls that exceed the resolution of the sequencer, but also to program your own 'glitched drum effect'.

Start Pt. - sets the start point of a triggered sample. Imagine each sample being chopped into 8 equally-sized chunks. This setting lets you choose which of those chunks to start in. Use this as a poor-man's sample slicer for loops and sound effects.

Note: Start Pt. 8 (last) will trigger a soft-choke on the current sound.

Chan. Config - brings up the channel setting panel

CHANNEL CONFIG PANEL

This little popup palette offers several settings which can be applied to individual channels (or to all channels simultaneously).

Clear - Use this to clear the current channel, or all channels at once. It will not only remove all notes, but also reset all other parameters to their neutral settings. This is the fastest way to erase a full pattern.

Random - creates random drum patterns. For best results, keep kick and snare on channels 1 and 2, hihats on the last two channels and all other percussion in between. Because patterns can get quite dense, usually you should mute or clear one or two channels if you feel the result is too much.

Divisions/Steps - this lets you set the time signature of your track by setting the number of steps that make up a full bar. For regular 4/4 beats keep it on 16. Steps are the number of divisions you want to sequence. If steps < divisions the sequence will loop until restarted.

Divisions and steps can be set independently per channel for interesting polyrhythms and polymeters.

Modify This/All - lets you choose whether your modifications are applied to the currently active channel or to all channels at once.

Close Panel - summons a troupe of clowns and dancing elephants

BOTTOM EDGE PANEL

Tempo - sets the tempo of the pattern (only available in standalone mode)

Play/pause - enables or disables playback of the internal sequencer

Export - lets you export the current track as a Hammerhead preset, e.g. via Airdrop, email, iCloud, etc.



MIXER PANEL

The mixer panel lets you adjust the volume levels and panning of all channels, select which channels will be compressed and/or distorted and set mutes.

Distort - This enables or disables the distortion effect for each channel. The distortion/waveshaper model and strength can be set globally on the main screen.

Compress - Like distortion, this setting toggles the compression effect for all channels. When enabled, the channel is summed with all other compressed channels and sent through the compressor. The compressor responds to the levels of all these combined channels. The compression model and strength can be set globally from the main screen.

Level & Pan - These controllers set the level and panning (stereo position) of your channels. Move the puck up to increase volume.

Note: level settings are only applied to the master/mix outputs. Multi-output channels from the Audio Unit plugin are output as is.

Mute - This will mute/unmute individual channels.

Note: long-pressing a channel's name button will quickly enable or disable SOLO mode for that channel.

MIDI CONTROL

Hammerhead has several ways of using MIDI, when hosted as an Audio Unit plugin.

Triggering notes - Drum sounds can be triggered using the General MIDI or Ruismaker mapping. Since there is no overlap between these mappings Hammerhead simply listens and responds to both. No need for changing settings.

Changing patterns - While Hammerhead's internal sequencer is playing you can switch patterns (as if you're manually changing them via the UI) using the C1 - G1 notes (C0-G0 in some hosts). Note that this will also switch playback mode of the internal sequencer to "Manual" if it was set to "Random" or "Sequence".

Triggering patterns ('Cliquench') - If Hammerhead's internal sequencer is stopped, the MIDI processor is 'armed' for pattern triggering. Using C1-G1 MIDI notes (C0-G0 in some hosts) you can trigger patterns as if they are sampled loops. They will keep looping until you send a Note Off again or trigger another pattern.

MIDI OUT - Hammerhead's internal sequencer also sends out MIDI notes. This is useful for driving other drum apps with Hammerhead's sequencer, or for recording drum patterns in a MIDI sequencer for further editing. Retriggers and glitch effects are not reflected in the MIDI sent out of Hammerhead (because they're not created by the sequencer but by an audio effect), but mutations are.

Note: Make sure you switch off Hammerhead's internal sequencer after you've recorded a pattern and you want to play it back again - or notes may be double-triggered (by the external sequencer, and by Hammerhead's internal sequencer).

