ironhead

Version 1.5   www.ugoaudio.com

Welcome

Thank you for purchasing Ironhead. Your support is greatly appreciated.
Ironhead is a unique, easy to use, morphing percussion synth that provides a wide range of unique synthetic sounds. This manual will guide you through general usage, as well as provide some extra hints and tips to help you get the most out of Ironhead.

I hope you enjoy Ironhead. If you post any music online that makes use of this synth (or any of my other VSTs), please send me an email at to let me know where I can hear it. I am always interested to listen to what people are creating with my VSTs.

Ugo

Installation

Open the zip and place the Ironhead folder in your host's VST folder. Yup, that's it. No annoying copy protection, no tricky registration and no troublesome installers.

Overview of Ironhead

Ironhead may be different from any other drum synth you've worked with...both in terms of sound and interface...and the best way to get to know Ironhead is to just jump right in and start tweaking it. Start exploring the range of each of the vector controls (especially the Tone controls) and you'll quickly get a feel for what sounds Ironhead is capable of and how to find them again when you need them later.

Most of us are used to working with a multitude of knobs and sliders that require us to tweak lots of individual parameters in order to achieve a cool sound. While that method of sound design can be fun, it can also be very time consuming. Additionally, it can get in the way when you are trying to focus on writing a song, but need to change your sound. It is easy to end up getting distracted in detailed parameters and find yourself being pulled out of "song writer mode" and getting stuck into "sound designer mode," thus running the risk of derailing your musical train of thought.

Ironhead was designed so you can put your technical side on hold. Its condensed interface lets you make just a few quick tweaks and get right back into song writing. With Ironhead, the goal is to get you to a cool and interesting percussion sound quickly, without having to get so caught up in all the details of how to get there. It has also been built to provide sounds that will likely be different from the other percussion sources you're working with, increasing the chances of you finding something that will spice up your tracks, while minimizing the chances of overlap with your existing synths and samples. This lets Ironhead work well not just as a primary percussion source but also as a secondary source for layering with loops and other synths.

Interface

Ironhead's GUI has been designed to be fast, easy and fun. All the main sound design in Ironhead is handled by just a few vector controls, each fine tuned for each instrument, and built to provide a wide but always useful range of sounds. This lets you spend less time trying to figure out how to make cool sounds and more time actually making them...think less, do more. For example, want to change your snare sound? Just move the tone control to shape the sound, and use the envelope control to adjust the attack and decay. That's it...only two controls moved and you've got a new snare...it's really that easy. This truly is a synth that does not require you to be a master sound designer to create your own cool synthetic percussion sounds.

Sound

Ironhead's sound is best thought of as synthetic junk percussion and the 15 instruments in Ironhead's kit are named after the types of sounds they produce. Ironhead can go from familiar drum/percussion sounds to wild thumps, knocks, smacks, clangs, and bangs...and always with its own unique character. Use it as a substitute for traditional synth drums to spice up your grooves, or layer it with your favorite drum sources to give your rhythm section more depth and texture. Additionally, Ironhead has 4 stereo outs to assist you in the further shaping of your sounds by using external processing, such as with Tunguska, the included multi effect, or Metallurgy.

Morphing & Variance

To add further life and movement to your grooves, Ironhead offers two types of modulation: Morphing and Variance. Ironhead's morphing allows you morph or switch between two different control states for each instrument. The results can be anything from just a quick jump to a different sound, to subtle shifts and sweeps, to wild experimental sounds. Morphing/switching can be turned on or off individually for each drum and the morphing can be controlled via BPM synced LFO, the mod wheel on your keyboard, midi CC, VST automation, or just with your mouse.

The Variance feature allows you to set an adjustable degree of random variation in the sound. This feature is independently available for each instrument in the kit and, with this function turned on, each hit to that drum will sound randomly different. Lower settings provide subtle variations that are useful for making grooves feel less repetitious, while higher settings can provide dramatically different sounds that are fun for fills and experimental purposes.

More information on these features can be found in the Instrument and Morphing sections.

Key Map

The instruments are mapped to the following keyboard keys:

C#1 Thud 2	D#1 Whack 2		F#1 Tic CL	G#1 Tic PD	A#1 Tic OP		C#2 Bash	D#1 Clang		F#1 Ding 3	G#1 Shake		
C1 Thud 1	D1 Whack 1	E1 Whack 1	F1 Bonk 1	G1 Bonk 1	A1 Bonk 2	B1 Bonk 2	C2 Bonk 3	D2 Bonk 3	E2 Ding 1	F2 Ding 2	G2 Smack		

Note: Depending on your host, the key mapping on the piano roll might start at C3 some hosts count instead of C1. This is because from C0 to C10 and others count from C-2 to C8.

Why the odd names?

The percussion instruments in Ironhead are categorized by, and named after, the types of sounds they make instead of being named after real world instruments. The reason for this is simply because Ironhead's 15 instruments don't sound like common real world instruments, nor do they sound quite like the typical synthetic drums. Also, each of Ironhead's instruments are capable of a range of sounds, many of which can extend well beyond what would normally be expected from, say, a tom or cymbal.

Additionally, some instruments can even overlap into other instrument categories. So to get the most out of Ironhead, it is recommended that you literally think in terms of the kinds of sounds you are looking for, rather than just the type of instrument you might be looking to emulate or take the place of.
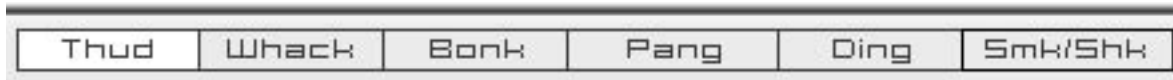
Fine Tuning

Holding down the CTRL key while adjusting a slider to XY knob will allow you to fine tune your setting.
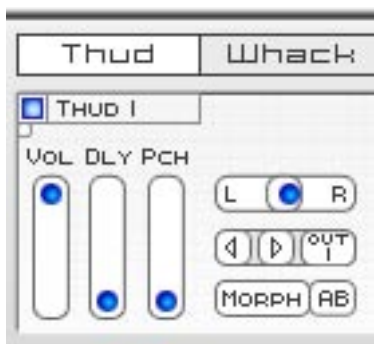
General Controls

Instrument Navigation
Use the named buttons across the top of the interface to jump to the controls for each instrument group.

The following controls work the same for all the instruments in Ironhead.

Mute
Clicking on the instrument name in the upper left hand corner will mute/unmute that instrument.

LED
The little light that shows up below the instrument name/mute just indicates when that instrument is active. It is a handy reference when you are trying to figure out which instrument is making what sound, or when you are using an alternative controller instead of a standard keyboard and need to check on your MIDI note assignments.

Vol
Sets the volume of the instrument.

Dly
Sets the amount of signal that gets sent to the dual delays.

Pch
Adjusts the overall pitch of the instrument.

L/R
This slider adjusts the pan of the instrument.

Output
Dragging this slider up and down lets you set which of Ironhead's 4 stereo outputs the signal will be sent out of. Note that the built in dual delay will only be heard through output 1.

The additional outputs are provided so you can run selected instruments through external processing. This can open up a whole new world of sound design potential for Ironhead. To help get you started on this, I have included Tunguska, a multi effect that (while useful for many purposes) has been designed with Ironhead in mind. For example, try experimenting with sending just the Bonks to Tunguska's pitch shifted granulator, or sending a Thud through Tunguska's distortion and filter, then turn the envelope follower on. (For more information on Tunguska, please see it's manual.)

Want to further warp and mutate your drum sounds? Try sending some of Ironhead's percussion through my other multi effect, Metallurgy (not included) or through any other VST you own.

Morph
Switching this on will allow this instrument to be morphed between it's A and B control states. See the Morphing section on page 14 for more details.

A/B
Clicking this lets you switch the display between the A and B control states. The "A" state is the default for normal usage. When morphing, the A state can be thought of as the starting point of the morph. Conversely, the "B" state can be thought of as the destination. Since the B state only applies to the morphing, it's controls only effect the sound during morphing.

Var
The Variance feature allows you to set an adjustable degree of random variation over the tone. Lower settings will produce more minor/subtle changes, where as higher settings can make each new hit sound dramatically different from the last.
The range that the Variance randomizes within is determined by where you have your Tone control set to. For example, if you have the Tone set in its upper right hand corner, the Variance will randomize within that general area. The higher the Variance setting, the further out of that area the randomizations can go.

Envelope
Adjusts the volume envelope for the instrument. Setting the X axis all the way over to the right will give you an immediate attack. As you bring it further to the left, the attack time gets longer.
This can be useful for taking a bit of the edge off of the noise. Bringing it all the way to the left can mimic backwards sounds. The Y axis controls the decay and release, so higher settings will make the sound ring out longer and lower settings will give you shorter, tighter sounds.

X axis - sets the attack time.
Y axis - sets the length of the decay and release.

Randomizer
On the bottom of the GUI, by the Ugo logo and manual button, you'll find the randomizer. The arrow buttons let you choose whether all the A and/or B states get randomized. An off option is provided as a safety measure.
Clicking on the larger "Randomize" button will start the randomization process.

Pads
Clicking on these will trigger their respective instruments at full velocity. For those who exclusively step program rather than use a MIDI controller, the pads can provide an easy means of triggering the sound so you can hear what you are tweaking. They also light up when Ironhead receives a MIDI note, so also serve as a visual reference when playing back sequences.

Instrument Specific Controls

Thud 1 & 2

These two instruments most closely resemble kick drums, but can also be used for hard knocks and short noise bursts. Both Thuds have different characters. Thud 1 can be softer where as Thud 2 can get brighter and harder sounding.

Thud 1 Tone
This vector control adjusts the general tone and pitch of the instrument.
X axis - adjusts between a softer tone, and a brighter, more distorted tone.
Y axis - controls the pitch of the instrument.

Thud 2 Tone
X axis – adjusts between a solid sound and a more metallic, looser sound.
Y axis – controls the pitch of the instrument.

Noise
This controls works the same for both Thuds. Adjusts between two different attack noises. Both of the noises are relative to the Tone setting, so if the Tone is set higher to be higher, brighter, and sharper, then the noises will be that way too. This relationship between the Tone and Noise controls can produce a wide range of sounds, from dull thumps to hard knocks.

X axis – blends in a short, bright noise.
Y axis – blends in a sort of knocking type noise.

Whack 1 & 2

The main purpose of these two is to take the place of a normal snare sound. Both go well into synthetic territory though and are definitely not your normal snares. In general, Whack 1 is capable of more full bodied tones than Whack 2. However, Whack 2 is more resonant and can provide good strike sounds, such as rim shots. The controls work the same way on both of these instruments.

Tone
X axis – adjusts between a darker, more gritty/distorted tone and a brighter, thinner tone.
Y axis - controls the overall pitch of the instrument.

Bonk 1, 2 & 3

These three are primarily for sounds that are like toms and hand drums. Unlike other instruments in Ironhead of the same type, the three Bonks actually use the exact same engine so there is no

difference in character between them. The Bonks can also go into bass drum territory too, offering a sound where you can really hear the shell and the head, and not just the thump. In addition to sounding cool on its own, low pitched bonks also sound good layered with the kicks.

Like all the other instruments in Ironhead, the Bonks are velocity sensitive. However, unlike the most of the others, the Bonks tone will also change with velocity. Lower velocities give you a softer hit, higher velocities give you a much more pronounced noise that sounds more like when you hit a drum head harder.

Tone
X axis – adjusts between a tighter sound (right) and a looser, more airy and disjointed sound (left.).
Y axis - controls the pitch of the instrument.

Noise
X axis - adds a knock to the hit.
Y axis - adds sizzle to that hit.

The Pangs: Tic, Bash & Clang

Tic

This is the high hat of Ironhead.

Tone
X axis – adjusts between a more or less bit crushed / downsampled sound.
Y axis – controls the pitch, as well as adds in a metallic ring in it's lowest positions.

Cls, Pdl & Opn
These adjust the decay of a closed, pedal and open high hat.

Bash

The Bash is a metallic synthetic noise that is primarily intended to be used as a replacement for a crash cymbal. It can also be used as a splash or even in place of a high hat.

Tone
X axis – adjusts between a more or less filtered sound.
Y axis – controls the pitch.

Clang

This one is somewhere between a ride bell, a normal bell, and some other kind of, metallic, junk yard treasure. The Clang can be particularly fun to morph. Also, the higher your velocity, the more 'stick noise' you will hear in the attack.

Tone
X axis – adjusts between a softer, more hollow metal sound and a brighter more noisy sound.
Y axis – controls the pitch.

Ding 1, 2 & 3

The Dings provide various pitched metal or glass hits, such as bells and pipe and bottle hits. Each Ding has its own character. The upper right hand corner on all three Dings will provide more common bell like sounds and as you explore left and down, you start getting into the more uncommon sounds. Unlike the other Tone controls in Ironhead, the Dings X axis perform some pitch adjustment in addition to it's main job of tonal adjustment. Also, the Y axis controls a bit of the tonal in addition to it's main job of pitch adjustment.

Ding 1

The first of the Dings has a looser, less focused, and more synthetic sound. In its lower left hand area, you can also get a sound that is reminiscent of that classic cheesy 8-bit kind cowbell sound that was nothing like a cowbell but was common in 80's video games.

Tone
X axis – primary tonal adjustment, minor pitch control.
Y axis – primary pitch control, minor tonal adjustment.

Ding 2

This Ding has a more focused and realistic sound than Ding 1 and offers good bell, bottle and pipe hit sounds.

Tone
X axis – primary tonal adjustment, minor pitch control.
Y axis – primary pitch control, minor tonal adjustment.

Ding 3

Towards it's upper right hand corner, Ding 3's tone control provides cowbell sounds. As you explore down and left, Ding 3 can provide deeper and more dissonant sounds than either of the other two Dings. Additionally, the X and Y axis share the pitch and tone adjustments a bit more evenly than on Dings 1 and 2.

Tone
X axis – primary tonal adjustment, minor pitch control.
Y axis – primary pitch control, minor tonal adjustment.

Smack & Shake

Smack

The Smack is good for clap sounds and can also be useful as a substitute for a snare, or to be layered with a snare for a bigger hit.

Tone
X axis – adjusts from a delayed sound to a more solid sound, as well as alters the tone.
Y axis – adjusts the pitch.

Shake

The Shake is useful for creating tambourine sounds, shakers, and can also be used has an alternative to a high hat.

Tone
X axis – adjusts the tone.
Y axis – adjusts the pitch.

Hints: To create a shaker sound, give the Shake a longer envelope attack. For high hat type sounds, use a short attack and short decay/release.

Morph Section

Overview

Morphing is a term that is most commonly associated with computer graphics and is used to describe the process of transforming one object or image into another. Ironhead offers an audio version of this process. Each instrument in Ironhead has two separate sets of vector controls, these are called the A and B states and they can be adjusted however you wish. You can toggle

between the A and B control views by clicking an instrument's A/B button.

The A state controls are the default set and they adjust the sound when the morphing is off. When the morphing is on, you can think of the A state as the starting point of your morph. Conversely, the B state can be thought of as your morph destination. So when you are anywhere in the process of morphing, you are either going to, or returning from, the B state.

To hear the changes you are making to the B state of in instrument, you must first turn on the Morph button (next to the A/B button), then move the Morph slider up into the B position. The morph slider can be moved by any of the following methods:

– Your keyboard's mod wheel
– The built in LFO
– MIDI CC #1
– VST automation
– Your mouse
– The Morph slider's own A/B jump switch

Morph Controls
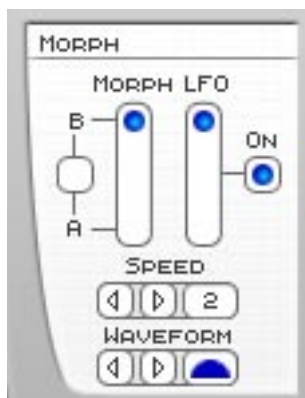
Morph Slider
This is the master control for morphing. With the slider all the way down, you will hear the A state settings. With the slider all the way up, you'll hear the B state settings. Anything in between the two will be some degree of morph.

A/B Jump Button
This is the button next to the Morph slider. When the LFO is off, this button will make the Morph Slider jump between A and B. This is handy for when you just want quick access to the B state sounds, and don't actually need to hear the transition between them. Since the B state can be set to provide totally different sounds than the A state, jumping between A and B states can provide you with super fast access to a whole other kit. And since the morph will only effect the instruments that have their morph switches activated, you can switch only the instruments you want, leaving the rest in their A state sound.

Note that when the LFO is on, the A/B Jump button will switch between the current LFO modulation position and the B state.

LFO
This LFO will modulate the morphing in sync with your host's BPM. LFO Modulation is not a common feature on drum synths (let alone having it control morphing) but it can a fun, creative, and musically useful feature to experiment with.
When the LFO is on, other forms of morph control (mod wheel, etc.) will not work properly. The LFO can be setup to morph slowly or very quickly, and a variety of wave shapes are available.

On
This switch turns the LFO on or off.

LFO Amount Slider
This controls how close to the B state the modulation will go. So the higher the setting, the closer to the B state the maximum point of the morph will be. With the slider all the way up to the top, the morph can go all the way from full A to full B.

Speed
This controls the speed of the LFO, based on divisions of your hosts BPM.

Waveform
This lets you set the waveform shape for the LFO. The options are Sine, Saw, Ramp, Triangle, Square, and S&H (sample and hold / random.)

Delay Section

This delay section consists of two delays running at once. They are both controlled by the same On/Off switch, Feedback slider, and Stereo Slider, but they have independent speed controls. When the delays are set to the same speed, it will sound like you've got a single delay running. But if you set them to different speeds, you can create ping-pong delay effects.

Each instrument in Ironhead has it's own delay send slider. This lets you adjust the amount of delay (and therefore its volume) for each individual instrument.
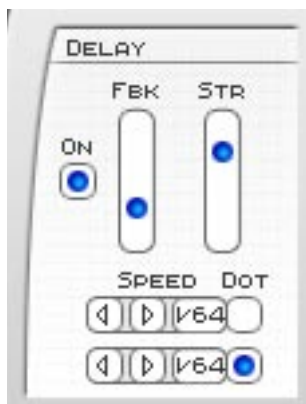
On
Turns the Delay on or off.

Fbk
Adjusts the amount of feedback for the delays. The higher the setting, the longer the delay will continue to repeat.

Str
This adjusts the stereo spread of the two delays when they are set to different speeds. Note that when they are set to the same speed, you will not hear any stereo spread.

Also note that the Pan setting for an instrument will also effect the placement of it's delayed sound.

Speed
These two controls adjust the speed of the delay. The speeds are set to divisions of your host's BPM.

Dot
Turning these on will create dotted note times for the delays. Setting the delays to different speeds, then making one dotted, can produce some cool delay rhythms.

CPU Saving Tips

Ironhead is not always the easiest synth on the CPU, but here are a few tips for minimizing the load.

1. Don't hold down notes, just let the envelopes do the job. Voices stay active for as long as you hold down a key...but there is no sustain stage in Ironhead's envelopes and the decay and release are locked together. So a quick tap of a key will produce a sound of the same length as holding a key down. This will help minimize the number of voices that are active at any given time.

2. Use shorter envelope times. For the same reasons as above, shorter envelope times will make a voice deactivate faster, thus minimizing the number of voices active at the same time. So if you don't need a long release, pulling the release time down could save you some CPU.

3. Ease up on the morphing. Morphing is a whole lot of fun, but it modulates a ton of parameters within Ironhead and that can eat up quite a lot of CPU...and the more instruments you are morphing at once, the more CPU is required to do the job. So morphing selectively, rather than (for example) having the LFO constantly morphing every Tic, Whack, and Bonk hit, will save you a good deal of CPU.

4. When you just need an extra sound, and don't need to hear much (if any) of a sound actually getting morphed...then use the A/B jump switch instead of the mod wheel or the LFO. The jump button gets to you the B state very quickly, thus reducing the amount of modulation time. This will greatly shorten the amount of time the CPU load for a morph is required.

5. Morphing uses up far more CPU when a voice is active. So if you don't need to hear a morph occur and really just need access to that other sound (like in the example above), jump to the B state while in between hits instead of during them. This will let the modulation occur while voices are not active, so virtually no extra CPU is required to get you to the B state.

6. When possible, reduce the number of simultaneous hits. The more instruments that are triggered (or are otherwise active) at once, the more CPU is required.

7. Turn off the Delay and LFO when they are not needed. While neither of these use up all that much CPU just to be on, they do require some. So if you are not using them, turn them off and you'll save a little bit more power.

Known Bugs

Morph slider / refresh rate
When the morph slider moves fast enough it exceeds the GUI's refresh rate, which can cause visual glitches such as making it look like there are two knobs, that the is not moving its full distance, or that it appears twitchy and a bit random. This is just a visual issue though. Fast movements from the LFO, automation or CC/mod wheel, all control the morph properly and the sounds change just as fast and smoothly as they are supposed to.

FL Studio
When Ironhead is loaded you may experience a lag between when you press play and when the sequencer starts. A lag also occurs when pressing the rewind button. This problem is caused by an incompatibility between Ironhead and the reset procedure FL runs every time you play/rewind.

To fix this problem:
1. Press the options button in FL studio (at the top of the screen)
2. Choose the Audio Settings from the drop down menu
3. Turn off "Reset plugins on transport"

Project5
The same problem occurs in Project5. Unfortunately though, this host does not offer the option of turning off the reset so there is no solution for it right now. However, the faster your computer, the less lag you will notice. So if you've got a newer computer, you may not run into this problem at all.

Dual core processors + multiple instances
Unfortunately VSTs built with SynthEdit are not properly compatible with dual core processors. Single instances work fine, but multiple instances can cause crashes in hosts that have multi processor support activated. Jeff McClintock, SynthEdit's creator, is aware of the problem and has mentioned that the fix for it will be in the next update (1.1) of SynthEdit. As soon as Jeff releases this fix, I will release an update to Ironhead to solve this problem. In the meantime, there are a few workarounds for this issue.

1. Make additional copies of the Ironhead dll for each extra instance you expect to need, and give each a new name. (eg: Ironhead2.dll, Ironhead3.dll, etc.) Hosts consider each an individual instance, and therefore do not run into the multiple instance conflict.

2. Freeze each instance before loading another one, especially if your host has an "unload while frozen" option.

3. Turn off multi processing in your host. Of course this is the least desirable of the three options since it negates the benefit of having a dual core, but it does work.

MIDI Assignments

Parameter	MIDI	Parameter	MIDI
Morph Slider	CC1 / Mod Wheel		
Thud 1A Tone X	CC 2	Thud 1B Tone X	NRPN 1
Thud 1A Tone Y	CC 3	Thud 1B Tone Y	NRPN 2
Thud 1A Noise X	CC 4	Thud 1B Noise X	NRPN 3
Thud 1A Noise Y	CC 5	Thud 1B Noise Y	NRPN 4
Thud 1A Env X	CC 7	Thud 1B Env X	NRPN 5
Thud 1A Env Y	CC 8	Thud 1B Env Y	NRPN 6
Thud 1 Mute	CC 97		
Thud 2A Tone X	CC 9	Thud 2B Tone X	NRPN 7
Thud 2A Tone Y	CC 10	Thud 2B Tone Y	NRPN 8
Thud 2A Noise X	CC 11	Thud 2B Noise X	NRPN 9
Thud 2A Noise Y	CC 12	Thud 2B Noise Y	NRPN 10
Thud 2A Env X	CC 13	Thud 2B Env X	NRPN 11
Thud 2A Env Y	CC 14	Thud 2B Env Y	NRPN 12
Thud 2 Mute	CC 102		
Whack 1A Tone X	CC 15	Whack 1B Tone X	NRPN 13
Whack 1A Tone Y	CC 16	Whack 1B Tone Y	NRPN 14
Whack 1A Env X	CC 17	Whack 1B Env X	NRPN 15
Whack 1A Env Y	CC 18	Whack 1B Env Y	NRPN 16
Whack 1 Mute	CC 103		
Whack 2A Tone X	CC 19	Whack 2B Tone X	NRPN 17
Whack 2A Tone Y	CC 20	Whack 2B Tone Y	NRPN 18
Whack 2A Env X	CC 21	Whack 2B Env X	NRPN 19
Whack 2A Env Y	CC 22	Whack 2B Env Y	NRPN 20
Whack 2 Mute	CC 104		
Bonk 1A Tone X	CC 23	Bonk 1B Tone X	NRPN 21
Bonk 1A Tone Y	CC 24	Bonk 1B Tone Y	NRPN 22
Bonk 1A Env X	CC 25	Bonk 1B Env X	NRPN 23
Bonk 1A Env Y	CC 26	Bonk 1B Env Y	NRPN 24
Bonk 1 Mute	CC 105		

Parameter	MIDI	Parameter	MIDI
Bonk 2A Tone X	CC 27	Bonk 2B Tone X	NRPN 25
Bonk 2A Tone Y	CC 28	Bonk 2B Tone Y	NRPN 26
Bonk 2A Env X	CC 29	Bonk 2B Env X	NRPN 27
Bonk 2A Env Y	CC 30	Bonk 2B Env Y	NRPN 28
Bonk 2 Mute	CC 106		
Bonk 3A Tone X	CC 31	Bonk 3B Tone X	NRPN 29
Bonk 3A Tone Y	CC 64	Bonk 3B Tone Y	NRPN 30
Bonk 3A Env X	CC 65	Bonk 3B Env X	NRPN 31
Bonk 3A Env Y	CC 66	Bonk 3B Env Y	NRPN 32
Bonk 3 Mute	CC 107		
Tic A Tone X	CC 67	Tic B Tone X	NRPN 33
Tic A Tone Y	CC 68	Tic B Tone Y	NRPN 34
Tic Mute	CC 108		
Bash A Tone X	CC 69	Bash B Tone X	NRPN 35
Bash A Tone Y	CC 70	Bash B Tone Y	NRPN 36
Bash A Env X	CC 71	Bash Env X	NRPN 37
Bash A Env Y	CC 72	Bash B Env Y	NRPN 38
Bash Mute	CC 109		
Clang A Tone X	CC 73	Clang B Tone X	NRPN 39
Clang A Tone Y	CC 74	Clang B Tone Y	NRPN 40
Clang A Env X	CC 75	Clang B Env X	NRPN 41
Clang A Env Y	CC 76	Clang B Env Y	NRPN 42
Clang Mute	CC 110		
Ding 1A Tone X	CC 77	Ding 1B Tone X	NRPN 43
Ding 1A Tone Y	CC 78	Ding 1B Tone Y	NRPN 44
Ding 1A Env X	CC 79	Ding 1B Env X	NRPN 45
Ding 1A Env Y	CC 80	Ding 1B Env Y	NRPN 46
Ding 1 Mute	CC 111		
Ding 2A Tone X	CC 81	Ding 2B Tone X	NRPN 47
Ding 2A Tone Y	CC 82	Ding 2B Tone Y	NRPN 48
Ding 2A Env X	CC 83	Ding 2B Env X	NRPN 49
Ding 2A Env Y	CC 84	Ding 2B Env Y	NRPN 50
Ding 2 Mute	CC 112		

Parameter	MIDI	Parameter	MIDI
Ding 3A Tone X	CC 85	Ding 3B Tone X	NRPN 51
Ding 3A Tone Y	CC 86	Ding 3B Tone Y	NRPN 52
Ding 3A Env X	CC 87	Ding 3B Env X	NRPN 53
Ding 3A Env Y	CC 88	Ding 3B Env Y	NRPN 54
Ding 3 Mute	CC 113		
Smack A Tone X	CC 98	Smack B Tone X	NRPN 55
Smack A Tone Y	CC 90	Smack B Tone Y	NRPN 56
Smack A Env X	CC 91	Smack B Env X	NRPN 57
Smack A Env Y	CC 92	Smack B Env Y	NRPN 58
Smack Mute	CC 114		
Shake A Tone X	CC 93	Shake B Tone X	NRPN 59
Shake A Tone Y	CC 94	Shake B Tone Y	NRPN 60
Shake A Env X	CC 95	Shake B Env X	NRPN 61
Shake A Env Y	CC 96	Shake B Env Y	NRPN 62
Shake Mute	CC 115		

Credits

Ironhead 1.0
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Special thanks:

– All the beta testers
– Jeff McClintock, for creating SynthEdit
– Steinberg, for inventing VST
– The Yahoo SynthEdit users group
– KVR - www.kvraudio.com
– Jeff Rhodes of Perimeter Sound Arts for all the advice, ideas, and encouragement.

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