bent.fm lite quick start guide

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WHAT IS **bent.fm lite**?

Are you tired of scouring garage sales or shelling out serious money for old devices to circuit bend? Are you a fanatic for the sound and experience of working with circuit-bent instruments, but worry about taking your fragile and valuable gear on the road? Do you like cutting-edge glitch synth sounds, wild digital distortions, and aleatoric data sequences?

bent.fm lite is for you.

bent.fm lite brings computer simulation of circuit bending to the iPhone for the first time. **bent.fm lite** contains no samples. **bent.fm lite** is a mathematical model of a single FM synthesis operator, modeled on the chip level via Bit Bending technology. **bent.fm lite** models every bit in the serial data streams that pass between chips, and lets you reroute them at will, discovering new, awesome, noisy, glitchy sounds!

With **bent.fm lite**, we're taken the first steps towards a computer model of circuit bending that preserves the spirit of exploration and creative discovery that is such an important part of circuit bending.

Please don't hesitate to contact us with bug reports / comments / feature or help requests / hellos / &c.

We hope you enjoy **bent.fm lite**!

— Kurt James Werner (kurt@bent.fm) & Mayank Sanganeria (mayank@bent.fm)

GENERAL

This is the quick start guide for **bent.fm lite**. This quick start guide should equip you with everything you need to know to get started using **bent.fm lite** right away.

Control of **bent.fm lite** is separated into three categories:

1. playing the keyboard

2. synthesis parameters

3. circuit bends

The keyboard is always visible, and allows you to simply play **bent.fm lite** by touching the appropriate key.

Only one of the two remaing screen (synthesis parameters (&c.) and circuit bends) is visible at once. You can switch between them by pressing the ">" button in the lower right corner of the screen.

At any time, you can pull up an overlay with short descriptions of each of the screen's controls by pressing the "???" button in the lower right corner of the screen. Touch anywhere on this overlay to dismiss it, or press the ">" to dismiss it and switch screens.

Watch the accompanying quick start video at `http://bent.fm` to see all of the controls from this guide in action.

SYNTHESIS PARAMETERS (&C.)

On this screen, you can control synthesis parameters, reset **bent.fm lite**, and manage preset patches.

The four knobs in the upper left corner of the screen ("Attack," "Decay," "Sustain," & "Release") control parameters of **bent.fm lite**'s amplitude envelope generator (which is output by the ADSR chip).

Touch the "keyboard/ribbon" switch to toggle **bent.fm lite** between keyboard mode and ribbon mode. In keyboard mode, pitches will be quantized to the nearest semitone (though precision is limited by the "nbits" knob). In ribbon mode, pitch can vary continuously (though again, precision is limited by the "nbits" knob), like the ribbon controllers of yore (or a Theremin).

Once you've found an awesome patch (setup of ADSR, mod.index, clock bends, nbits, and bend matrix patch bay state), you'll want to save it. The preset manager lets gives you access to factory presets and lets you manage your own.

Touch the name of the currently selected preset to pop up a dialog box ("Select Preset").

From here, you can select one of the factory presets, one of your saved presets, or create a new preset. Touch one of the factory presets or one of your presets and then "done" in the upper right to select it. Select "Add new..." to open a second dialog box ("New Preset Name"), where you can name the new preset. Select "Cancel" on either dialog box to exit without taking any action. You can't overwrite factory presets, or make presets named "Add new..." or "error." Creating a new preset automatically saves **bent.fm lite**'s state to the new preset name.

Press "reset" to reset **bent.fm lite** to its factory presets if you want to start over from a blank slate.

Once a preset name is selected, you can touch "load" to load the selected preset, touch "save" to save the selected preset, or touch "delete" to delete the selected preset. Careful, if you delete a preset, there's no going back!

Circuit Bends

On this screen, you can control circuit bends via the bend matrix patch bay, fine and octave clock bends, and control word length decimation.
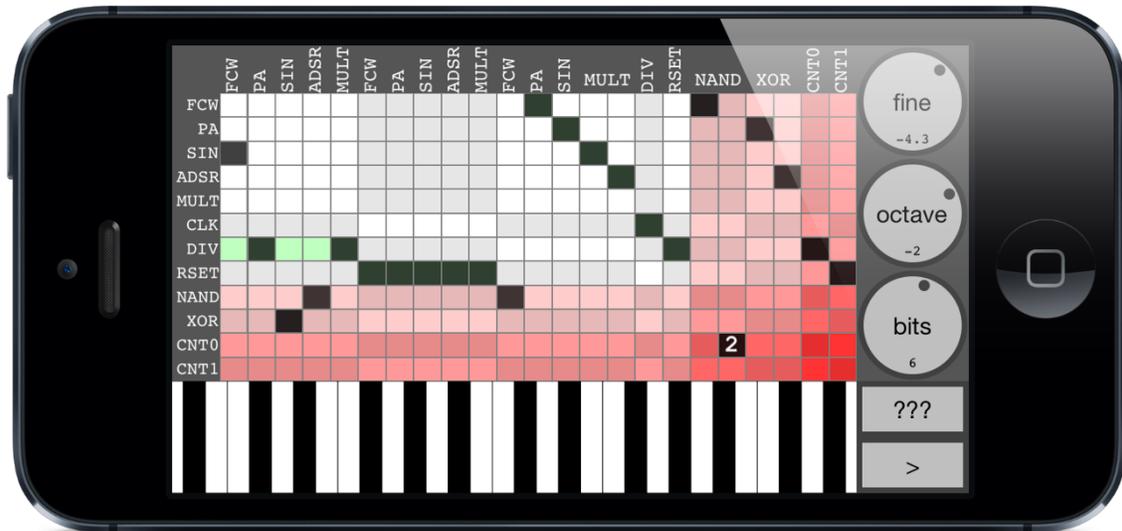
The bend matrix patch bay is the most important part of ben.fm lite. The bend matrix patch bay is where bit bending happens, it is where you can reroute the digital signals of **bent.fm lite**, and discover how to turn its puny sine wave synth factory setup into a glitchy distorted monster, or algorithmic chiptunes generator, or something entirely new.

Touch squares on the bend matrix patch bay to connect a chip input (row) to a chip output (column). The bottom two rows correspond to the outputs of binary counters (whose inputs are the last two columns), and must have their pins specfied (they are 16-bit binary counters). To select a particular pin out from these counters, touch and drag on one of the squares. The hexadecimal digit that is displayed will tell you which binary digit is being output.

One of the most common techniques for circuit bending is the "clock bend." In addition to a computer simulation of Bit Bending (via the bend matrix patch bay), **bent.fm lite** allows you to simulate the "clock bends" that you'll find on many circuit-bent devices. The "fine" clock bend knob lets you adjust the pitch of the clock signal (CLK on the bend matrix patch bay) continuously between its factory setting and one octave (12 semitones) lower. The current pitch of the clock signal (in semitones) is displayed at the bottom of the knob. The "octave" clock bend knob lets you adjust the octave of the clock signal. This is implemented via a binary counter (DIV) that you can interact with on the bend matrix patch bay.

The "nbits" knob lets you control the length of the data encoding word that is used by each chip. So, this affects the precision of everything in **bent.fm lite**, including the amplitude quantization, pitch precision, and precision of encodings between chips. Turning this knob down engages a sort of architecture-level bitcrushing, and can often collapse digital noise into glitchy melodic sequences.

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