

- 1 Output level
- 2 Blend control
- 3 Power: 9V center negative, 100 mA
- 4 Audio output
- 5 Expression/CV input (controls **freq**)
- 6 Audio input (also switches power)
- 7 Bit reduction / modulation rate
- 8 Sampling frequency
- 9 Bit reduction (**crush**) / modulation (**mod**) selection
- 10 **mod** - waveform (triangle/square/random)
crush - input gain (low/medium/high)
- 11 On/bypass indicator
- 12 True bypass footswitch

Thank you for purchasing the Red Panda **bitmap**. The **bitmap** is a bitcrusher, which reduces the sampling rate and resolution of your signal. When a digital signal is resampled at a lower sampling rate, it creates copies of the signal (aliasing). These copies fold back down to lower frequencies, creating new partials that are not harmonics of the original signal.

When too few bits are used to represent a signal, each sample is rounded to the nearest allowed value and no longer matches the true signal level. The rounding errors cause noise, called quantization noise, because the actual signal is approximated using a small set of values.

Crush Mode

In **crush** mode, the middle knob sets the number of bits used to represent the signal, from 24 bits down to 1 bit including fractional bits. Middle settings add quantization noise and nonlinear distortion, similar to early samplers. Extreme settings create square wave fuzz or dying battery sounds.

The **freq** knob sets the sampling rate. To see how it works, tune the Freq knob so that it sounds good on the root note, then play a scale. Higher sampling rates can add sizzle to drum sounds. Middle rates create inharmonic sounds similar to ring modulation, but which track the notes in strange ways. Low sampling rates warp the signal into new inharmonic melodies.

Use the level (**hi/lo**) switch to adjust the input gain based on signal level:

- **hi** for single-coil pickups, or light strumming
- middle for most guitars
- **lo** for drum machines, synthesizers, and line-level signals

Choosing a level that does not match the input signal causes no harm and creates interesting effects. Using the **lo** setting on quiet signals will cause the signal to sputter and cut out. Using the **hi** setting on line-level signals will give a more saturated sound.

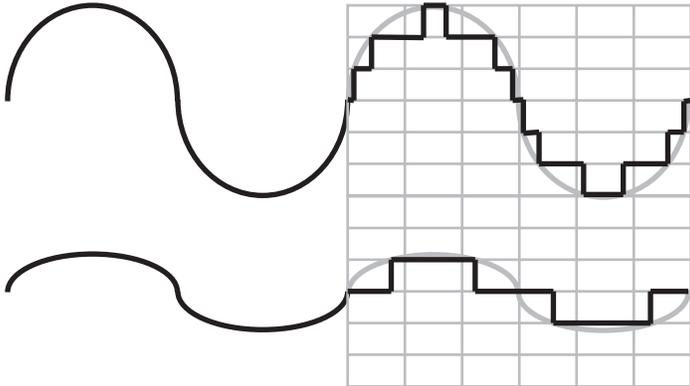
Mod Mode

In **mod** mode, the **freq** knob sets the sampling rate, as in **crush** mode. Instead of bit reduction, the middle knob sets the modulation rate for the sampling rate. Sample rate modulation causes aliasing frequencies to shift above and below the set rate. Lower rates add motion, while higher rates shred the signal into new textures. The waveform switch selects the modulation waveform. Use the **mix** knob to blend with your original signal.

bitmap

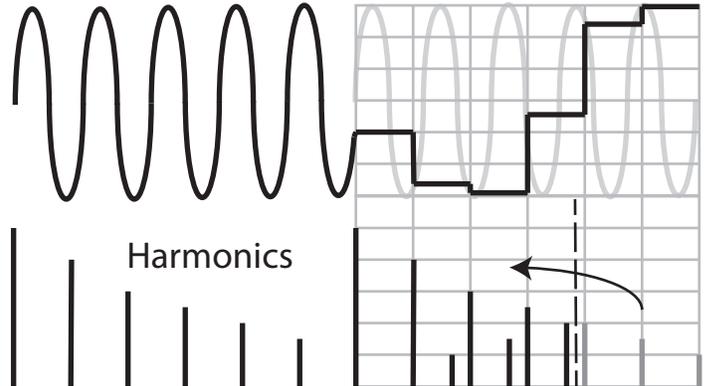
Bit Depth

Bit reduction reduces the number of allowed signal levels. The smoothness of the output signal is related to both the input signal level and the number of bits.



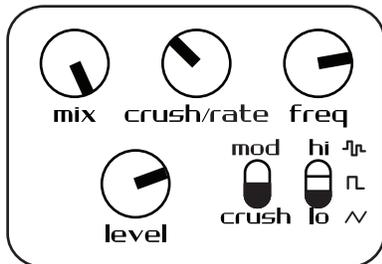
Sample Rate

When a signal is sampled at too low a rate, upper harmonics fold back to lower frequencies.

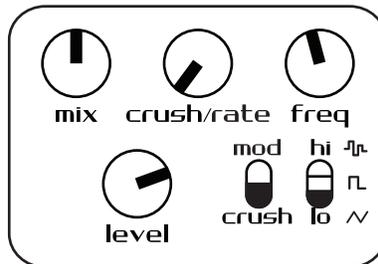


Sample Settings

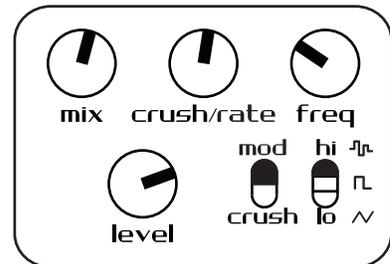
Sound: 8-bit Sampler



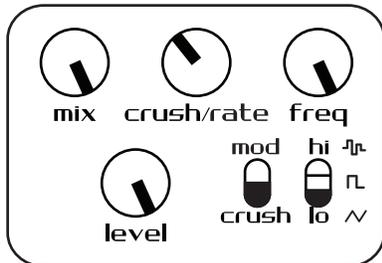
Sound: Overtones



Sound: Random Modulation

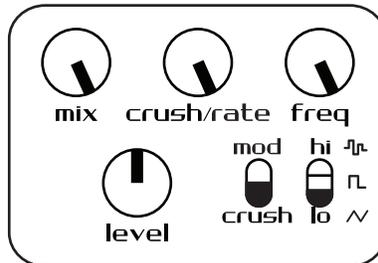


Sound: Octave Fuzz

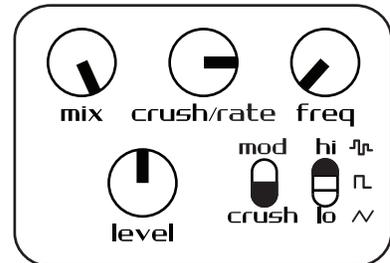


Use neck pickup, treble rolled back, volume 20%

Sound: Square Wave Fuzz



Sound: Video Game Bass



Expression Pedals

Plug an expression pedal into the **exp** jack to control the **freq** knob. Any expression pedal with a 10k-50k ohm linear pot will work. For example, the Roland EV-5, Moog EP-3, M-Audio EX-P, or Mission Engineering EP-1. You can also use an Electro-Harmonix 8-Step Program to sequence the sampling rate. For control voltages, 0-3.3V on the tip is the correct range, but so you can send +5V and use the **freq** knob to bring it down to 3.3V. The **bitmap** has current limiting in case you use a TS cable, but it is best to use a 1/4" TRS cable with the ring unconnected. The Expert Sleepers "floating ring" cable is an easy way to do that. We also sell suitable cables at store.redpandalab.com.

When an expression pedal is used, the **freq** knob sets the maximum value. If your expression pedal has a minimum value knob, you can control the knob over a specific range of values.

Warranty

This product is warranted against defects in materials or workmanship for one (1) year from date of original purchase. It does not cover damages or wear resulting from accident, misuse, abuse, or unauthorized adjustment and/or repair. Should this product require service (or replacement at our option) while under warranty, please contact info@redpandalab.com.