

BLOOD CELLS AUDIO

www.bloodcellsaudio.com

Mangle

Passive Audio Mangler



Compliance



This product is in conformity with the following standards:

EN 55032:2012/AC:2013, EN 55035:2017, EN 61000-3-2:2014, EN 61000-3-3:2013

RoHS2: 2011/65/EU

WEEE: 2012/19/EU

Overview

Mangle is a passive audio processor, produced in collaboration with Swedish composer and sound artist VAAAL. It's perfect for glitches, sliced-and-diced audio obliterations, wrecked distortions, and murky textures. It can be smooth, it can also act like a guillotine for your audio signals.

Rather than using the +/-12V power rails of the eurorack system, Mangle is powered by YOU, and what you choose to insert into the Power Input jack. Run audio into Mangle, then add whatever type and shape of CV you'd like into the PWR In jack. That CV will drive the circuitry and manipulate your audio from wildly overdriven, to voltage-starved and wrecked...and whatever interesting tones lie in-between. You can therefore think of Mangle as a strange (and perhaps brutalist) VCA, where the audio level is manipulated by powering up and down the actual circuitry the audio is passing through.

For extra tweaking, there are two circuits to route audio between: One circuit uses a quality built-in audio chip, the other circuit uses a chip that is user-swappable via the front panel. This second chip can be a source of fresh flavors, and experimentation is definitely encouraged.

Additional features include hard and soft asymmetrical diode clipping, a Bias CV input for further experimentation, a Snuff switch to kill the power to the module for a 100% passive mode, and a Gain switch to really push things into overdrive if needed. There is also a power-through jack for passing the powering-CV out to other adjacent Mangle modules.

Features

- Switch between the built-in circuitry, and a user-swappable chip on the front panel for different flavors.
- Switchable asymmetrical soft/hard clipping.
- Switchable gain.
- Snuff kills incoming power CV for 100% passive mode.
- Bias: Run CV into this at any rate to manipulate even further.
- PWR thru: Passes incoming PWR CV to a downstream Mangle/etc.

WHAT'S IN THE BOX

- Mangle module
- 2 audio chips
- 2 mounting screws

Anatomy

1. AUDIO IN: AC-coupled

2. AUDIO OUT: AC-coupled

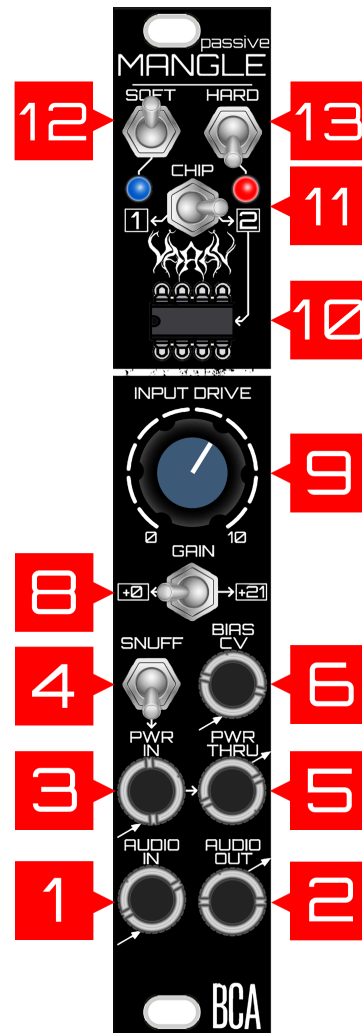
3. POWER IN: Plug in whatever type of CV you'd like. Mangle responds to positive voltage only. LFO's are safe to plug in, but note the negative swing will be discarded.

4. SNUFF SW: Prevents the Power CV from reaching the circuitry - basically a 100% passive mode. This is not a mute...audio will still be heard, and could be muffled/interesting.

5. PWR THRU: Typically used to daisy-chain Mangles. First patch into the PWR IN of the downstream Mangle, then connect to the PWR THRU of the upstream Mangle. This prevents momentarily shorting out the powering source.

6. BIAS CV: Affects the voltage offset added to the audio. Try fast pulses to modulate the sound. Too much voltage and you'll kill your headroom - lower the Input Drive knob for more effect.

8. GAIN SW: Gives a +21dB gain boost if you really want to push into overdrive. If the incoming audio signal is already very hot (or the Power In CV is very low), there may not be much of a noticeable difference, as you may already be overdriving the circuit - there's only one way to find out.



9. INPUT DRIVE: An attenuator for the audio signal (Pre circuitry). Open it up to really drive the chip.

10. IC2: User-installed 2-channel DIP op amp. Experiment with different flavors. See the [Chip section](#) below for details on installation and choices.

11. CHIP SW: Choose between the built-in chip (IC1 NE5532), and the user-installed chip (IC2). The middle position is a kill. See [Chip section](#).

12. SOFT SW: Asymmetrical soft-clipping. Depending on input level, it tends to kick on at higher gains. Adds a round fatness.

13. HARD SW: Engages asymmetrical hard-clipping. Harsher/edgier.

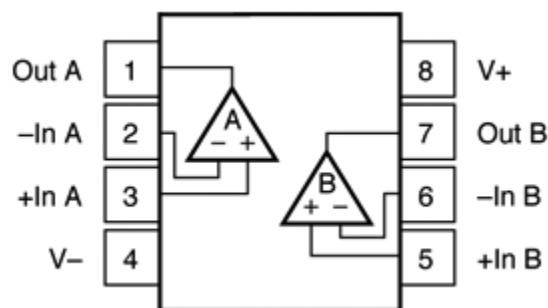
Tips:

- Power In CV can be anything from the eurorack system - it's all safe to use, even LFO's that swing negative (negative voltage is blocked). Switch on/off as fast or slow as you'd like - there is a lot to play with here with fast and slow starvation. It's also cool to put a constant voltage source into an attenuator (or use a BCA 221.x2) and perform the Power In manually.
- You can even unplug the audio input and power the circuitry on and off at audio rates with CV, which will make an oscillator. Take it even further and plug an oscillator into the audio input, while powering the chip on/off at audio rates, then enjoy more complex harmonies and/or total collisions between the chip and oscillator.
- Play with Power In CV vs. the Input Drive knob. There's a relationship between the level of power you provide via the Power In, and the Input Drive...lower Power CV means there is a lower ceiling in terms of max signal level. And that also means it's easier to overdrive the circuitry with incoming signals. Higher Power In CV gives you more wiggle room with levels of course.
- Bias CV: For a more noticeable effect from this, start turning down the Input Drive knob. Play with CV shape/frequency, etc.
- There are some weird and interesting tones to be found at lower voltage-starved levels...apply some make-up gain after the module to bring those interesting things back up to a useful level (such as with a BCA MUM). See what's lurking down there.

Chip Selection and Installation

IC2 is a user-swappable chip. Two chips of different flavors are included with Mangle, but please feel free to acquire your own to play with. As long as it is a **2-channel opamp matching the pinout below**, give it a go. This pinout can be verified by looking at the datasheet for your opamp of choice. The opamp must be a typical **8-pin DIP package with 2.54mm spacing between pins (aka pitch)**. Basically these are the typical IC's that look like dead bugs. If you have doubts, feel free to shoot us an email (info@bloodcellsaudio.com) with a link and/or part #.

2-channel opamp pinout:



A note on choices: All opamp models are different to some degree...some are faster than others, some overdrive differently, some are more power-hungry, etc. The built-in IC1 is a famed audio opamp (NE5532) which has been used in audio products forever, from preamps to console subsystems and so on. It's a badass. The 2 included installable chips are a TL072, which is another famous audio chip of a different architecture (but older and noisier than 5532), as well as an RC4580, another quality audio opamp. The point is, it's worth experimenting around with as you can get different personalities from each.

PSA: This part of the module is meant to be experimental. We can't test with all the chips out there, therefore you use this feature at your own risk - in other words, some chips just may not like to be used in this manner and may not perform well, or possibly will not live to tell the tale (but we hope you were recording during their death).

Some recommended options for IC2 (that we have tested with these):

NJM4580

NJM2068

JRC4558

LM358

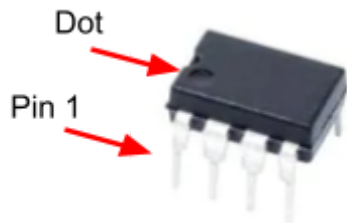
LM386

LM4562

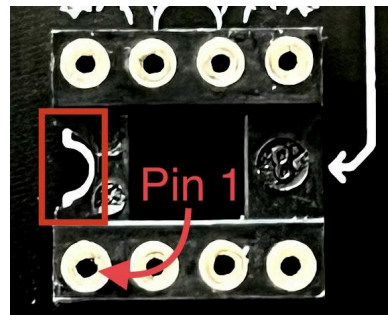
TL072

IC2 Installation: *First unplug any cables going into the Audio and Power CV input, then proceed. Orientation is critical! All opamps have either a dot/notch/line on them to show you where pin 1 is located. Make sure this mark is on the **left side** when putting on a new chip - it should match the notch on the front panel socket. Installing the chip backwards will not work and may damage the chip. (Yada yada BCA is not responsible for smoked chips). Note, you may need to slightly bend the legs of the opamp inwardly to fit into the socket, as oftentimes they come bowed outward a bit. Take your time and don't force it.*

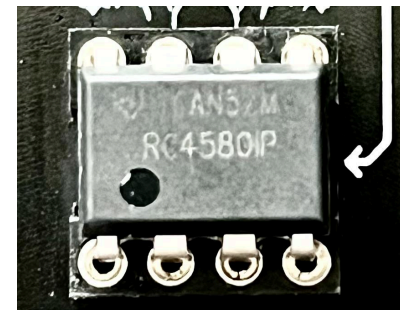
Dot shows Pin 1 on IC



Notch shows Pin 1 on Socket



IC Installed into Socket



Technical Specs

Width	4HP
Depth	1.4 cm
Input Impedance	100K ohms
Output Impedance	330 ohms