-isms

utility functionality

listed from left to right, the available utility functions follow the isms structure of composition to control to synthesis. this concept allows cables to be short and patches to be neatly-structured without too strictly defining sonic outcomes.

usb switch

switchable interface for rear-mounted usb connection

a usb device (eg. monome grid) can be attached to the usb port on the rear of the case. the device is directly powered by *isms'* power system, avoiding noise bleeding into the audio system.

the usb signal is then routed via the two usb panels labeled **A** & **B**. use the switch to quickly flip between two grid-enabled modules, or connect one side to a nearby computer.

mixer

control voltage mixer with attenuators and offsets

ideal for combining control voltages to create new cv signals for your patch. the inputs labeled **1** and **2** are attenuated, and/or inverted, by the two controls of the same name. the remaining two inputs add with unity gain, **+**, and inverted unity gain, **-**, into the **mix** output.

with nothing attached to the two variable inputs, these function as constant voltage sources, adding -5v to +5v to the mix.

when using to combine triggers or gates, the inverted inputs can function as 'cancel' inputs to do an XOR logical comparison (either one or the other, but not both).

audio signals can also be mixed, with interesting possibilities available when using the voltage offsets. inverted mixing of multiple waveforms from the same oscillator will often have drastically different effects.

bus (2)

three channel signal bus with level indication

in order to facilitate cleaner patches three signals can be passed between either end of *isms*. this denecessitates long patch cables hanging across your system. the three signals are displayed on the leds immediately above in the matching triangular layout. only positive signals will illuminate the leds.

inverting attenuator (2)

two inverting attenuators or constant voltage sources

attenuators decrease your signal from full level down to zero. in additon signals applied to the input can be inverted as well as attenuated. the **level** control will zero out any signal when set to the middle position, increasing to unity in the clockwise direction. turning level counter-clockwise will increase the level to unity with inverted polarity of the input signal.

with no **in** connected, the **out** provides a constant voltage source, set by the **level** control. voltage travels from -5v to +5v.

gate (3)

three multimode vactrol gates with envelope functionality

gates add dynamics into a patch coupled with optional spectral control. the **level** input takes a control voltage to open the gate, passing signal from **in** to **out**. control voltage can also be gated with varying effects depending on the mode.

vca mode: attenuates the signal with the level control. the sound is unchanged at full level, and silenced at minimum.

lpg mode: the classic buchla lowpass-gate in 'both' mode. volume and high-frequency content are reduced simultaneously, mimicing the behaviour of acoustic instruments.

lpd mode: an extension of the lpg mode. higher levels add non-linear distortion to the input. the impact is to add harmonics at higher levels, while decreasing high frequencies as level is decreased.

being a vactrol-based circuit there is a characteristic slew applied to the **level** input. rising control responds very quickly, while falling signals take longer to fade away. this effect can be used to great effect when sending a trigger or gate to the **level** input, 'plucking' the gate. the result is a short percussive sound without the need for a dedicated envelope.

when no cable is connected to the **in** jack, a static +5v offset is instead applied. triggering the level input in this case will cause the characteristic vactrol envelope to appear at the **out** jack. this envelope's shape is further affected by the mode.

lfo & noise

multiple waveform low frequency oscillator and two noise flavours

the low frequency oscillator outputs both triangle and square waveforms simultaneously, swinging from -5 to +5v. **rate** of oscillation is controlled by the panel knob, as well as 1volt/octave cv input. panel range is from 5s cycles up to about 100Hz, though can extend slightly beyond with additional cv input.

two noise outputs are available for white and pink noise. white noise is spectrally flat and ideal for use in percussive sounds like cymbals or snares. pink noise is weighted toward bass frequencies and is a great source for noisey FM modulation, or simply adding to an audio mix for some extra grit. both noise outputs run approximately -5 to +5v.

input

external audio input with rear-mounted 1/4" jack and gain stage

an external audio source can be connected to the rear 1/4" jack and amplified with the **gain** control. designed for line level signals, though guitars or microphones will work with high gains. in the latter cases some kind of stompbox, or preamp will lessen impedance imbalance issues and improve frequency response. the input is balanced for line-level signals on a TRS 1/4" jack.

gate extractor & envelope follower outputs are available for use as control elements. these outs are especially useful when using *isms* as a sound processing tool, enabling procedural interactions (**gate**) and amplitude sensitive modulations (**follow**). gate sensitivity is highly dependent on the gain setting.

spring

spring reverb driver with rear-mounted RCA jacks for external tank interfacing

attach the included spring tank to the rear of the case. be sure to connect white to white, and red to red. having the spring external from the case allows the springs to be manipulated with preparations or physical interaction. the circuit is calibrated for springs with 310ohm input and 2.5kohm output, though tanks with different impedance will work with varying bandwidth effects.

the **mix** control allows a simple dry/wet balance to be set, though more complex spring processing is possible with external modules when set to fully wet.

output

three-input mixer with rear-mounted 1/4" jacks and level controls per input

with both 1/4" jacks attached the panning of each channel is defined per input. when only a single jack is attached to the **left** jack all three channels are summed equally to that 1/4" output. outputs are impedance balanced at nominal +4dBu, though this level can be exceeded with all three inputs connected, so be sure you're not overloading the receiving mixer / soundcard input.

headphone

high-powered headphone driver with rear-mounted 1/4" stereo jack.

the audio signal is mirrored from the **output** section though retains the panning arrangement regardless of whether the main out is mixed to only the left channel. plenty of volume is available so be careful not to set the panel control too high.

when sending a mono signal from the left main **output**, the headphone out is very useful for isolating which channel is sending a given sound.

alternatively the left & right **outputs** can be used as mono A & B outs with the addition of an external mixer. thus the headphones provide cueing of both channels independently, the external mixer is used to control the level of each part, while the **center** channel is present in both channel A & B.