Make Noise Mysteron — Digital Waveguide Module

The **Mysteron** is a voltage controlled dual digital waveguide algorithm that is a bit of a mystery even to those of us involved in its design. Despite being completely digital, it is highly organic, displaying variation in outcome often seen only in nature. It is a formless blob of DSP that you grow, modulate and patch program into new sounds, some vaguely recognizable and others completely otherworldly. The range of sounds possible is quite large. From pianissimo to fortissimo, short percussive bursts to bowed, sustaining pitches. The two waveguides can be pitched together or independently, mutated with harmonic or inharmonic waveforms and fed back into themselves or each other.

COARSE PITCH ROTARY & LED: Sets length of waveguide or perceived pitch of sound, roughly 5 octaves. Quantized mode when set fully CCW. The **"Mystery" LED** indicates mutations. It flashes slowly on bowed/cross-feedback modes, and flashes quickly in quantized mode.

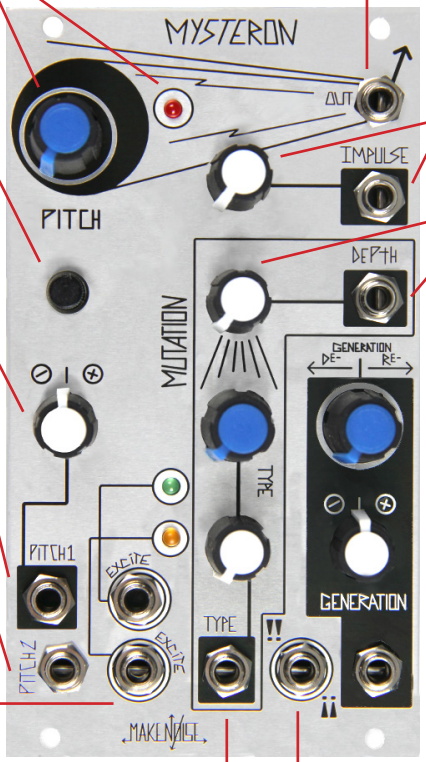
FINE PITCH ROTARY: Adjust perceived pitch by +/- 12%.

PITCH 1 CV INPUT & ATTENUVERTOR: The **Pitch 1 CV Input** is the exponential pitch control input. It is not applicable in quantized mode. Range: +/-5V. The associated **Pitch 1 Attenuvertor** is a bipolar control which adjusts the level of the signal coming into the Pitch 1 CV Input.

PITCH 2 CV INPUT: The exponential pitch control input. Range: 0V to +5V. Quantized mode range: 0V to +3V. Response is 1V/Oct. Engage quantize mode for superior tracking.

EXCITE INPUTS & LEDS: Gate inputs for excitation. Mysteron will create no sound unless you patch something to at least one of these inputs. Requires a clock/gate signal amplitude of at least 1.5V and width of at least 6ms. The associated **Excite LEDs** provide visual indication of the Mysteron's excitation.

TYPE ROTARY, ATTENUATOR & CV INPUT: The **Type Rotary** sets the Type of Mutation. The **Type CV Attenuator** is a unipolar level control for the Type CV Input. The **Type CV Input** is a unipolar CV input for the Type parameter. Range: 0V to +5V.



OUTPUT: AC coupled audio output. Range: ~10Vpp (depending on settings; especially Impulse).

IMPULSE CV INPUT & ATTENUATOR: The **Impulse CV Input** is unipolar. Range: 0V to +5V. The associated **Impulse Attenuator** sets the strength of excitation, allowing for control over amplitude and harmonics. It is a unipolar combo control. With nothing patched to Impulse CV In, it works as a standard panel control. With a signal patched, it works as a level control for that signal. Must be set greater than 0% to achieve an audible sound.

DEPTH CV INPUT & ATTENUATOR: The **Depth CV Input** is unipolar. Range: 0V to +5V. The associated **Depth Attenuator** sets how much the waveguides are mutated. It is a unipolar combo control. With nothing patched to Depth CV In, it works as a standard panel control. With a signal patched, it works as a level control for that signal.

GENERATION ROTARY, ATTENUVERTOR & CV INPUT: The **Generation Rotary** sets feedback of the output of the waveguides back to their inputs. At 12 noon there is no feedback. Degenerative feedback is CCW from NOON, and Regenerative feedback is CW from NOON. The **Generation CV Attenuvertor** is a bipolar attenuator for Generation CV In. The **Generation CV Input** is a bipolar signal input. Range: +/-4V.

!! IN (GATE): This is the gate input for determining the algorithm behavior. With Mutation Depth fully CCW, this changes the response of the Excite parameter for bowed attack. When not fully CCW, cross couples feedback paths of waveguides into each other (the "Mystery" LED Flashes to indicate the status). Requires a clock/gate signal amplitude of at least 1.5V and width of at least 6ms to operate.

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Making Sound: When the Mysteron is Excited (via the Excite Inputs), a burst of energy (in the form of noise and other waveforms) is injected into the waveguide. The Impulse parameter sets the strength of this excitation, thus allowing for control over both amplitude and harmonics. Impulse must be set greater then 0% to achieve audible sound. At lower settings, the sound will have fewer harmonics and less impact. This parameter could also be used as a digital VCA while the Mysteron is self-oscillating.The Excite inputs are wired in a normalization scheme, so that with either one patched, the other is triggered as well. Using both Excite inputs results in the two waveguides having different lengths, with the possibility of creating two independent pitches and timbres.

Controlling Pitch: The Pitch control sets the length of both waveguides. The length of the waveguide determines perceived pitch of the resulting sound. It will also alter the timbre of the sound. The Pitch Rotary, Pitch 1 and Pitch 2 all have an exponential response with a range of roughly 5 octaves. At the lowest end, the sounds are lower pitched and take longer to decay. Therefore, it is harder to discern the pitch, as there are greater harmonics. At the middle, the sounds are shorter and have fewer harmonics, making it easier to discern their pitch. At the highest end, the sounds have the potential to become so short it is hard to determine the pitch. Changes to the Pitch controls are applied to the most recently excited waveguide. If both waveguides are excited together, then both are the same length. The Excite inputs are normalled so patching into just one excites both together. Using both Excite Inputs independently, it is possible to have the two waveguides at different lengths, thus making two differently-pitched sounds. Removing all modulation from the Pitch 1 CV In, and setting the Pitch Rotary fully CCW engages quantize mode. The Mysteron remains in quantize mode as long as the Pitch Rotary remains at 0% with nothing patched into Pitch 1 CV In. Quantize mode is indicated by the double flashing of the "Mystery" LED. This forces the Mysteron to adhere to a 12-tone chromatic scale, with the pitch determined by Pitch 2 CV In. This is excellent for using the Mysteron in a melodic way alongside other sound sources such as an STO or DPO VCO.

Sound Sculpting: Once the Mysteron is excited, the Generation Rotary sets the feedback of the output of the waveguide back to the input. Degenerative feedback saps energy from the algorithm, making the sounds shorter and more percussive. Regenerative Feedback grows energy in the algorithm, making the sounds longer and less percussive. At 100% feedback, the sound is almost a bowed type dynamic. With Depth fully CCW (no Mutation), the "!!" Gate Input engages an alternate response to the Excite inputs for a bowing effect. With Depth greater than 0%, the "!!" Gate Input cross couples the output of each waveguide into the input of the other waveguide. This is influenced by the analog acoustic modeling synthesis of Ron Berry. With Mutations occurring, the results are more complex and depend upon the Type and Depth settings. The Mystery LED flashes to indicate these behaviors. The Mutation section features contains the Depth and Type controls. With Depth set fully CCW, Type will do nothing. To hear the effects of Type, Depth must be turned to at least 10%. Depth sets the amount of mutated energy injected into the waveguide and Type selects the form of mutation. What is actually happening is that the waveguide is being excited more than just noise. The Type control is scanning through other waveforms to be used to excite the waveguide. Depth blends these other waveforms with the noise (from 0% WT/100% Noise to 100% WT/0% Noise). This dramatically changes the timbre and pitch of the sound. The "Mystery" LED lights to indicate Mutation. All other controls (Pitch, Impulse, Generation, !!) are still effective during Mutation.

Tips & Tricks: 1) The Impulse parameter could be used as digital VCA. 2) For melodic tracking, set the Pitch Rotary fully CCW (quantize mode), and use only Pitch 2. Fine Tune will help to match the Mysteron to a VCO tuning. 3) For simplest usage, patch a gate or clock to only one Excite input.