SYNTH

a moog music guide to

ESIZED

creating percussive sounds

PERCU

through analog synthesis

SSION

Moog Music's Guide To Analog Synthesized Percussion

Creating tones for reproducing the family of instruments in which sound arises from the striking of materials with sticks, hammers, or the hands.

The First Step

The first step in synthesizing a sound, percussive or otherwise, is understanding how to visualize sonic information in terms of the control parameters of your synthesizer.

Most synthesizers employ a 4-stage amplifier envelope to control a sound's volume over time. These 4 "stages" are commonly labeled: **ATTACK, DECAY, SUSTAIN & RELEASE.**

COMMON VOLUME ENVELOPES

UN-MUTED BASS DRUM

HORNS

TIGHT SNARE

ADSR

amplitude

attack · decay · sustain · release
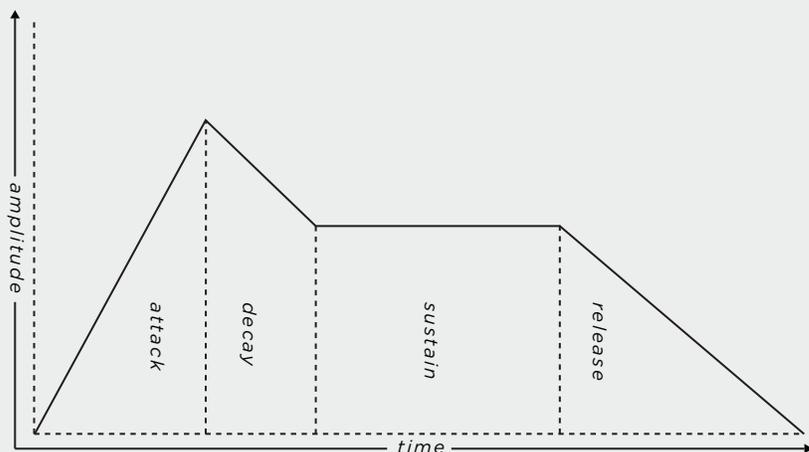
time

ATTACK: The amount of time it takes a sound to rise from zero to maximum when a key is depressed.

DECAY: The amount of time it takes a sound to descend from maximum level to sustained level.

SUSTAIN: The level at which a sound remains while a key is held, after the Decay stage is complete.

RELEASE: The amount of time it takes for a sound to descend from its sustained level to zero.

AMP. ENVELOPE

ATTACK　　DECAY　　SUSTAIN　　RELEASE

ATTACK　　DECAY　　SUSTAIN　　RELEASE

tight *boom* *tight* *boom*
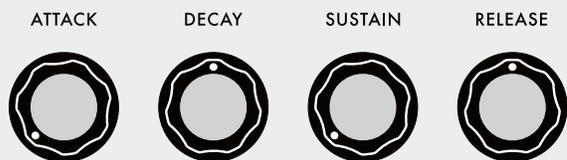
To synthesize a drum sound, begin by creating a percussive amplifier envelope. When striking a drum head, the sound does not "swell" in, nor does it continue to sustain if you hold the stick against the head. With this in mind, set the Attack and Sustain parameters to their minimum position.
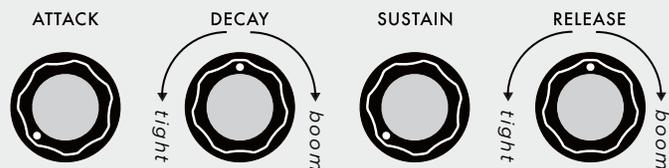
Percussive sounds are typically played by quickly striking and releasing a medium, (think of finger drumming on an MPC). With this in mind, use the Amplifier Envelope's Release control to determine how long or short a sound "rings out" after a note is release. The Decay control will influence your Release settings when Sustain is set to zero, so set Decay to center position until you get a feel for it.

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Sound Source

Now that you have a percussive amplifier envelope, you need a sound source. Kicks, snares, toms, & cymbals can all be created using a similar amplifier envelope with different harmonic content. Synthesizers offer many tools with which to create harmonic content including oscillators, filters, noise generators and modulation.

Oscillators

These are a synthesizer's primary source of sound. Oscillators create different waveforms that can be used to determine the complexity of harmonic content before it is sent through the filter section.

Wave Shapes

**TRIANGLE:** Contains exponentially descending odd harmonics. Use with noise for pitched tom drums.

SAW: Contains all integer harmonics. Use for warm, articulate percussion

SQUARE: Contains only odd harmonics. Its hollow sound is good for low register kick drums.

NOISE: Contains all frequencies. Noise is used to create snares, and to add acoustic qualities to synth percussion.
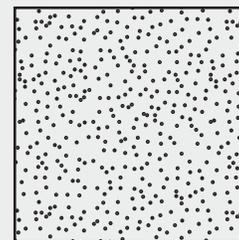
FILTER SECTION

FILTER: The filter can be driven into self-oscillation by setting it's Resonance control to maximum. At this point the filter becomes a sine wave generator perfect for creating massive 808-style kicks & toms. The Cutoff parameter of a self-oscillating filter now controls its frequency, while the KB AMOUNT knob determines how the keyboard's pitch effects the Cutoff frequency.
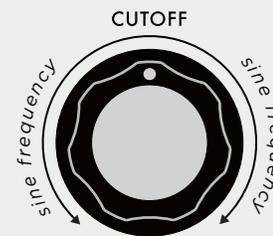
DON'T FORGET: *Experimentation & learning will reward you with a lifetime of rich synthesizer experiences.*

CUTOFF

sine frequency

sine frequency

RESONANCE

MULTI**DRIVE**

self oscillation

PRESETS

BANK PATCH

ACTIVATE PANEL ▶

PITCH

MIDI — ○

FINE TUNE

− +

GLIDE RATE

4 6
2 8
0 10

−2 −1 0 +1 +2

◀ ▶

OCTAVE

MODULATION

LFO RATE

1.5 6
0.4 25
0.1 100

SOURCE

FILT EG

PITCH AMT

4 6
2 8
0 10

PITCH AMT

OSC 2 ONLY

FILTER AMT

4 6
2 8
0 10

WAVE AMT

4 6
2 8
0 10

OSCILLATORS

1

OCTAVE

8' 4'
16' 2'

HARD SYNC

OSC 2

WAVE

2

OCTAVE

8' 4'
16' 2'

FREQUENCY

−1 +1
−3 +3
−5 +5
−7 +7

WAVE

MIXER

OSC 1

4 8
2 10
0 12

SUB OSC

4 8
2 10
0 12

OSC 2

4 8
2 10
0 12

NOISE

4 8
2 10
0 12

FILTER

CUTOFF

320Hz 1.2KHz
80Hz 5KHz
20Hz 20KHz

RESONANCE

4 6
2 8
0 10

MULTI**DRIVE**

EG AMOUNT

0
−5 +5

KB AMOUNT

4 6
2 8
0 10

ENVELOPES

ATTACK

10 1

M-SEC 1 10 SEC

DECAY

10 1

M-SEC 1 10 SEC

SUSTAIN

4 6
0 10

RELEASE

10 1

M-SEC 1 10 SEC

FILTER

AMPLIFIER

ATTACK

10 1

M-SEC 1 10 SEC

ATTACK

DECAY

10 1

M-SEC 1 10 SEC

DECAY

SUSTAIN

4 6
0 10

SUSTAIN

RELEASE

10 1

M-SEC 1 10 SEC

RELEASE

OUTPUT

MASTER

4 6
2 8
0 10

HEADPHONE

4 6
2 8
0 10

SUB PHATTY | SUBTRACTIVE ANALOG SYNTHESIZER

Designed & Handcrafted By Moog Music In Asheville, NC

moog

MOD WHEEL must be up • LFO RANGE SELECTION set to high (Manual pg.28) •   *• FILTER SLOPE set to 1 Pole (Manual pg.28) • LFO GATE RESET set to ON (Manual pg.25)*

PRESETS

BANK PATCH

ACTIVATE PANEL ▶

PITCH

MIDI — ○

FINE TUNE

− +

GLIDE RATE

4 6
2 8
0 10

−2 −1 0 +1 +2

◀ ▶

OCTAVE

MODULATION

LFO RATE

1.5 6
0.4 25
0.1 100

SOURCE

FILT EG

PITCH AMT

4 6
2 8
0 10

PITCH AMT

OSC 2 ONLY

FILTER AMT

4 6
2 8
0 10

WAVE AMT

4 6
2 8
0 10

OSCILLATORS

1

OCTAVE

8' 4'
16' 2'

HARD SYNC

OSC 2

WAVE

2

OCTAVE

8' 4'
16' 2'

FREQUENCY

−1 +1
−3 +3
−5 +5
−7 +7

WAVE

MIXER

OSC 1

4 8
2 10
0 12

SUB OSC

4 8
2 10
0 12

OSC 2

4 8
2 10
0 12

NOISE

4 8
2 10
0 12

FILTER

CUTOFF

320Hz 1.2KHz
80Hz 5KHz
20Hz 20KHz

RESONANCE

4 6
2 8
0 10

MULTI**DRIVE**

EG AMOUNT

0
−5 +5

KB AMOUNT

4 6
2 8
0 10

ENVELOPES

ATTACK

10 1

M-SEC 1 10 SEC

DECAY

10 1

M-SEC 1 10 SEC

SUSTAIN

4 6
0 10

RELEASE

10 1

M-SEC 1 10 SEC

FILTER

AMPLIFIER

ATTACK

10 1

M-SEC 1 10 SEC

ATTACK

DECAY

10 1

M-SEC 1 10 SEC

DECAY

SUSTAIN

4 6
0 10

SUSTAIN

RELEASE

10 1

M-SEC 1 10 SEC

RELEASE

OUTPUT

MASTER

4 6
2 8
0 10

HEADPHONE

4 6
2 8
0 10

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PITCHED TOMS Panel

PRESETS — BANK · PATCH · ACTIVATE PANEL ▶

PITCH — MIDI ◯ · FINE TUNE (− +) · GLIDE RATE (0 2 4 6 8 10) · −2 −1 0 +1 +2 · ◀ ▶ OCTAVE

MODULATION — LFO RATE (0.1 0.4 1.5 6 25 100) · SOURCE (FILT EG) · PITCH AMT (0 2 4 6 8 10) · PITCH AMT / OSC 2 ONLY · FILTER AMT (0 2 4 6 8 10) · WAVE AMT (0 2 4 6 8 10)

OSCILLATORS — 1 OCTAVE (16' 8' 4' 2') · HARD SYNC / OSC 2 · WAVE · 2 OCTAVE (16' 8' 4' 2') · FREQUENCY (−7 −5 −3 −1 +1 +3 +5 +7) · WAVE

MIXER — OSC 1 (0 2 4 6 8 10 12) · SUB OSC (0 2 4 6 8 10 12) · OSC 2 (0 2 4 6 8 10 12) · NOISE (0 2 4 6 8 10 12)

FILTER — CUTOFF (20Hz 80Hz 320Hz 1.2KHz 5KHz 20KHz) · RESONANCE (0 2 4 6 8 10) · MULTIDRIVE · EG AMOUNT (−5 0 +5) · KB AMOUNT (0 2 4 6 8 10)

ENVELOPES — FILTER: ATTACK (M-SEC 1 ... 10 SEC) · DECAY (M-SEC 1 ... 10 SEC) · SUSTAIN (0 2 4 6 8 10) · RELEASE (M-SEC 1 ... 10 SEC)
AMPLIFIER: ATTACK (M-SEC 1 ... 10 SEC) · DECAY (M-SEC 1 ... 10 SEC) · SUSTAIN (0 2 4 6 8 10) · RELEASE (M-SEC 1 ... 10 SEC)

OUTPUT — MASTER (0 2 4 6 8 10) · HEADPHONE (0 2 4 6 8 10) 🎧

SUB PHATTY | SUBTRACTIVE ANALOG SYNTHESIZER
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RIDE/PING Panel

PRESETS

BANK PATCH

ACTIVATE PANEL ▶

PITCH

MIDI — ○

FINE TUNE
− +

GLIDE RATE
2 · 4 · 6 · 8 · 0 · 10

-2 -1 0 +1 +2

◀ ▶
OCTAVE

MODULATION

LFO RATE
1.5 · 6 · 0.4 · 25 · 0.1 · 100

SOURCE
FILT EG

PITCH AMT
2 · 4 · 6 · 8 · 0 · 10

PITCH AMT
OSC 2 ONLY

FILTER AMT
2 · 4 · 6 · 8 · 0 · 10

WAVE AMT
2 · 4 · 6 · 8 · 0 · 10

OSCILLATORS

1
OCTAVE
16' · 8' · 4' · 2'

HARD SYNC
OSC 2

WAVE

2
OCTAVE
16' · 8' · 4' · 2'

FREQUENCY
-1 +1 · -3 +3 · -5 +5 · -7 +7

WAVE

MIXER

OSC 1
4 · 8 · 2 · 10 · 0 · 12

SUB OSC
4 · 8 · 2 · 10 · 0 · 12

OSC 2
4 · 8 · 2 · 10 · 0 · 12

NOISE
4 · 8 · 2 · 10 · 0 · 12

FILTER

CUTOFF
320Hz · 1.2KHz · 80Hz · 5KHz · 20Hz · 20KHz

RESONANCE
2 · 4 · 6 · 8 · 0 · 10 · 12

MULTIDRIVE

EG AMOUNT
0 · -5 · +5

KB AMOUNT
2 · 4 · 6 · 8 · 0 · 10

ENVELOPES

ATTACK
10 · 1 · M-SEC 1 · 10 SEC

DECAY
10 · 1 · M-SEC 1 · 10 SEC

SUSTAIN
4 · 6 · 2 · 8 · 0 · 10

RELEASE
10 · 1 · M-SEC 1 · 10 SEC

FILTER

ATTACK
10 · 1 · M-SEC 1 · 10 SEC

DECAY
10 · 1 · M-SEC 1 · 10 SEC

SUSTAIN
4 · 6 · 2 · 8 · 0 · 10

RELEASE
10 · 1 · M-SEC 1 · 10 SEC

AMPLIFIER

ATTACK DECAY SUSTAIN RELEASE

OUTPUT

MASTER
4 · 6 · 2 · 8 · 0 · 10

HEADPHONE
4 · 6 · 2 · 8 · 0 · 10

🎧

SUB PHATTY | **SUBTRACTIVE ANALOG SYNTHESIZER**
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MOD WHEEL must be up • LFO RANGE SELECTION set to high (Manual pg.28) • • *FILTER SLOPE set to 1 Pole (Manual pg.28) • MULTI TRIG set to ON (Editor)*

PRESETS

BANK PATCH

ACTIVATE PANEL ▶

PITCH

MIDI — ○

FINE TUNE
− +

GLIDE RATE
2 · 4 · 6 · 8 · 0 · 10

-2 -1 0 +1 +2

◀ ▶
OCTAVE

MODULATION

LFO RATE
1.5 · 6 · 0.4 · 25 · 0.1 · 100

SOURCE
FILT EG

PITCH AMT
2 · 4 · 6 · 8 · 0 · 10

PITCH AMT
OSC 2 ONLY

FILTER AMT
2 · 4 · 6 · 8 · 0 · 10

WAVE AMT
2 · 4 · 6 · 8 · 0 · 10

OSCILLATORS

1
OCTAVE
16' · 8' · 4' · 2'

HARD SYNC
OSC 2

WAVE

2
OCTAVE
16' · 8' · 4' · 2'

FREQUENCY
-1 +1 · -3 +3 · -5 +5 · -7 +7

WAVE

MIXER

OSC 1
4 · 8 · 2 · 10 · 0 · 12

SUB OSC
4 · 8 · 2 · 10 · 0 · 12

OSC 2
4 · 8 · 2 · 10 · 0 · 12

NOISE
4 · 8 · 2 · 10 · 0 · 12

FILTER

CUTOFF
320Hz · 1.2KHz · 80Hz · 5KHz · 20Hz · 20KHz

RESONANCE
2 · 4 · 6 · 8 · 0 · 10 · 12

MULTIDRIVE

EG AMOUNT
0 · -5 · +5

KB AMOUNT
2 · 4 · 6 · 8 · 0 · 10

ENVELOPES

ATTACK
10 · 1 · M-SEC 1 · 10 SEC

DECAY
10 · 1 · M-SEC 1 · 10 SEC

SUSTAIN
4 · 6 · 2 · 8 · 0 · 10

RELEASE
10 · 1 · M-SEC 1 · 10 SEC

FILTER

AMPLIFIER

ATTACK
10 · 1 · M-SEC 1 · 10 SEC

DECAY
10 · 1 · M-SEC 1 · 10 SEC

SUSTAIN
4 · 6 · 2 · 8 · 0 · 10

RELEASE
10 · 1 · M-SEC 1 · 10 SEC

ATTACK DECAY SUSTAIN RELEASE

OUTPUT

MASTER
4 · 6 · 2 · 8 · 0 · 10

HEADPHONE
4 · 6 · 2 · 8 · 0 · 10

🎧

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