Pittsburgh Modular — "Generator"

- Manual PDF

Manual PDF / source

Pittsburgh Modular Generator for dense, hyper-complex percussion

The **Pittsburgh Modular Generator** is basically a **dual analog FM percussion voice / chaotic modulation source**. Based on the manual, it is especially strong for:

- **FM-based drum synthesis**
- **Metallic percussion**
- **Clicks, zaps, knocks, toms, woodblock-like tones**
- **Nintendo / zipper / atonal digital-ish artifacts**
- **Self-patched rhythmic modulation**
- **Layered pseudo-polyrhythmic motion** from interacting oscillator rates

It is **not a precision melodic oscillator**: - it uses **exponential CV** - it **does not track 1V/oct** - it is **not temperature compensated**

That makes it less ideal for strict tonal sequencing, but **excellent for percussion, texture, unstable FM hits, and rhythmically animated drum voices**.

What the module gives you for percussion

From the manual:

- **2 oscillators**
- **Oscillator 2 is internally FM'd by Generator 1 Index Out**
- **External FM input** can be routed to either oscillator
- **Shape control** continuously shifts both oscillators between triangle/square relationships
- **Index section** is effectively a **VCA on Generator 1 output**
- **Index CV** allows envelopes to dynamically control the amount of Generator 1 sent to:
- the **Index OUT**
- and therefore the **internal FM amount to Oscillator 2**

That means Generator is perfect for **transient-controlled FM percussion**, where the attack of an envelope changes not just loudness but **spectral violence**.

Core concept for complex percussion

The key to using Generator for dense rhythm is:

1. Treat **Generator 2** as the **main struck body / resonant drum tone**
2. Treat **Generator 1** as the **modulator / transient exciter**
3. Use **Index CV** with envelopes, gates, bursts, euclidean triggers, or clock divisions to create **different FM bursts per hit**
4. Use the **External FM input** for a second modulation layer from:
5. another oscillator
6. clocked stepped CV
7. a random source
8. a trigger/gate stream
9. even Generator 2 itself

This gives you **nested rhythmic behavior**: - amplitude contour from your VCA/envelope - FM contour from Index CV - waveform contour from Shape modulation - cross-rhythm from external modulation routing

---

Important behavior to exploit

1. Oscillator 2 is the “main percussion body”

Because **Generator 2 is internally FM’d by Generator 1 Index Out**, it naturally becomes the oscillator that gets the most animated timbral strikes.

Use Generator 2 for: - main audio output - metallic hits - tom/drum cores - unstable bell-ish percussion - aggressive click-noise impacts

2. Generator 1 is both a sound source and FM driver

Generator 1 can do two jobs: - be heard directly via output **1** - act as the internal FM source via the **Index** section

This is very useful for layered percussion: - **Out 2** = body - **Index Out** = transient layer / brighter attack layer / second voice - **Out 1** = pre-VCA raw modulator tone for further processing

3. The Index knob is inverted in function

The manual states:

- **Full left = 100% gain**
- **Full right = 0% gain**

And: - turn **full right** to get the **full effect of CV input** - turn **full left** to force **100% regardless of CV**

This is crucial.

Practical meaning:

- If you want **dynamic FM per trigger**, set the **Index knob mostly right**
- Then patch an **envelope or trigger-derived CV** into **Index CV**
- That way each hit can have different FM intensity

This is one of the best features for percussion because you can make every transient uniquely sharp.

Best patch roles in a rhythm system

As a dedicated percussion voice

Use it as: - kick-ish FM thud - tom - metallic snare layer - glitch percussion - industrial hi-hat / clang source - zappy fill voice

As a modulation engine for other percussion

At low or mid rates it can provide: - asymmetric LFO-like modulation - audio-rate FM bursts - unstable waveform modulation - rhythmic audio-rate CV for filter pings, LPGs, VCAs, or wavefolders

As a dual-layer percussion generator

Because you have: - output **1** - output **2** - **Index Out**

you can derive multiple related percussion layers from one module.

Patch strategies for dense rhythmic music

1. Classic FM drum patch

This follows the spirit of the manual's patch example.

Patch:

- Take **Output 2** as your main audio
- Patch an **envelope** into **Index CV**
- Set **Gen 1** to **low**
- Set **Gen 2** to **mid**
- Tune fine frequency knobs by ear
- Run **Output 2** into a VCA or LPG
- Trigger the envelope from your rhythm sequencer

Result:

- short envelope = clicky/zappy
- medium decay = tom/conga/woodblock
- higher FM amount = metallic/industrial
- lower FM amount = more drum-like

Make it denser:

Use different trigger streams for: - the amplitude envelope - the Index CV envelope

For example: - VCA envelope on a 5-step loop - Index envelope on a 7-step loop

This creates **timbral polyrhythm**, even if the audible hits occur in a simpler meter.

---

2. Polyrhythmic transient vs body patch

Use separate rhythmic structures for: - **when the sound happens** - **when the FM spikes happen**

Patch:

- Main audio: **Output 2**
- Envelope A to VCA: triggered every quarter-note subdivision in one meter
- Envelope B to **Index CV**: triggered by a different clock division / euclidean pattern

Example:

- VCA opens on a 4-step repeating pattern
- Index CV fires on a 5-step euclidean pattern

Result:

Some hits are: - clean - some are metallic - some are explosive - some are dull

This creates the feeling of **complex percussion phrasing without needing a separate voice for each variation**.

---

3. Audio-rate self-patched chaos percussion

The manual explicitly gives an external FM path with attenuverter and destination switch.

Patch:

- Patch **Output 2** into **External Input**
- Set destination switch to **Generator 1**
- Listen to **Index Out** or **Output 2**

- Modulate **Index CV** with envelopes
- Adjust the external FM attenuverter around center

Why it works:

Now Osc 2 modulates Osc 1 externally, while Osc 1 internally influences Osc 2 through the Index path.

This creates: - recursive FM interaction - unstable attack spectra - pseudo-noise bursts - very sharp mechanical percussion

Best for:

- glitch snares
- bit-crushed-sounding zaps
- electro percussion
- IDM fills

---

4. Three-output layered drum architecture

Generator is unusually useful because it effectively gives you multiple related outputs.

Use:

- **1** = raw Generator 1
- **2** = Generator 2
- **Index Out** = post-VCA Generator 1

Patch idea:

- **Output 2** -> lowpass gate = body
- **Index Out** -> highpass/filter/VCA = click/attack
- **Output 1** -> wavefolder/distortion = noisy edge

Trigger different VCAs/envelopes for each layer with different pattern lengths.

Result:

One module becomes a **multi-layer composite drum**: - sub/body - attack - metallic tail

That is excellent for dense arrangements because one trigger can generate a very articulated hit.

---

5. Irregular meter patch

For complex time signatures, use Generator as a timbrally responsive voice rather than trying to force pitch sequences.

Example rhythm structure:

- Main triggers in **11/8**
- Index accents in **7**
- Shape modulation in **5**
- External FM bursts in **3**

Patch:

- Trigger envelope to VCA in 11-step pattern
- Trigger another envelope to **Index CV** in 7-step pattern
- Modulate **Shape** slowly with a 5-step sequencer or stepped random
- Send a clocked CV/gate source to **External Input** routed to Gen 1 or Gen 2 at a 3-step cycle

Result:

The drum voice evolves through a long composite cycle. Even if the hit rate is constant, the **spectral identity** of each hit keeps shifting, which is exactly what makes advanced rhythmic music feel alive.

Making it punchy and percussive

1. Use very short envelopes into Index CV

The Index path is your friend for attack design.

Short envelope into **Index CV** gives: - FM spike at the front of the sound - bright attack - percussive knock - “stick hit” sensation

Longer envelope gives: - metallic tail - laser tom - unstable sustained clang

For punch: - keep Index envelope **fast attack** - short to medium decay - use VCA envelope shorter than the FM decay for hard impacts

---

2. Tune oscillator ranges strategically

Manual notes: - 3-way range switch per oscillator - left = low - center = high - right = mid

Useful combinations:

- **Gen1 low / Gen2 mid** = strong percussion starting point
- **Gen1 low / Gen2 high** = sharper metallic/hat-like
- **Gen1 mid / Gen2 low** = unstable drum bass / tearing low percussion
- **Gen1 high / Gen2 high** = noisy digital chirps, tiny hits, harsh ticks

For hyper-detailed drums, don’t just think “pitch” — think: - body oscillator range - modulator oscillator range - ratio instability

---

3. Exploit the shape knob as a percussion macro

From the manual: - full left: - Gen1 = square - Gen2 = triangle - full right: - Gen1 = triangle - Gen2 = square

That means one knob changes both oscillators in opposite ways.

For percussion:

- more **triangle** = rounder, more fundamental
- more **square** = brighter, buzzier, more upper harmonics

Technique:

Perform or sequence the **Shape** knob/CV externally if possible through recording passes or manual moves: - left for round body with edgy modulator - right for buzzy body with softer modulator

This is very effective for creating contrast across polyrhythms: - one repeating phrase with one shape area - another phrase with shape shifted - resample multiple passes

---

4. Use trigger/gate signals as FM sources

The manual says external input accepts **CV and audio-rate signals**.

A trigger or gate patched into **External Input** can create abrupt frequency spikes.

Patch:

- Clock divider or burst generator -> External Input
- Destination to Gen1 or Gen2
- Use attenuverter to control polarity/amount

Result:

- click injection
- knock transients
- stepped pitch smears
- broken-machine accents

This is especially good for: - compound meters - ratchets - tuplets - accent systems independent of hit timing

---

5. Use the attenuverter for asymmetrical motion

The external FM control is an **attenuverter** and zeros at **12 o'clock**.

This is extremely useful because: - positive FM amount gives one family of attacks - negative/inverted FM amount gives another

So a rhythm source modulating external FM can feel totally different depending on polarity.

Technique:

For one section: - slight negative FM for woody, sucked-in attacks

For another: - positive FM for more explosive metallic edges

This gives variation without repatching.

How to build polyrhythms and complicated patterns with this module

Generator itself is not a trigger sequencer, so the complexity comes from **how you drive it**. The best method is to separate rhythm into layers:

Layer 1: hit timing

Use your main trigger sequencer for when the drum sounds.

Layer 2: timbral accents

Use a different sequencer/clock division to control: - Index CV - external FM input - waveform changes - VCA amplitude variation

Layer 3: modulation timing

Patch unrelated clocked CV into: - External Input - oscillator EXP inputs - downstream filter cutoff / wavefolder / VCA decay

This way the ear hears: - one pattern as the hit structure - another pattern as the spectral structure - another as the accent structure

That is how you get **apparent hyper-complex rhythm** from one voice.

Specific advanced patch recipes

A. 5:7 metallic drum cycle

Patch:

- Output 2 to VCA/audio out
- 5-step trigger pattern to amplitude envelope
- 7-step trigger pattern to Index CV envelope
- Gen1 low, Gen2 mid
- Shape around center-right
- Index knob mostly right for CV responsiveness

Sound:

A repeating drum line where only some hits flare into metallic tones, making a composite 35-step phrase before full repetition.

B. 4-against-3 glitch percussion

Patch:

- Straight 16th-note pulse to VCA envelope
- Triplet clock or /3 pattern to External Input
- Route external FM to Gen1
- Patch Output 2 into External Input for partial self-mod if you want more aggression
- Listen to Index Out

Sound:

Steady pulse with rotating glitch emphasis, useful for broken techno, IDM, or footwork-style syncopation.

C. Complex snare from one module

Patch:

- Output 2 = body
- Index Out = crack
- Output 1 = noisy ring
- Mix all three externally
- Give each its own envelope/VCA/filter if possible

Settings:

- Gen1 high or mid
- Gen2 mid
- Index CV short decay
- Shape toward square-rich side
- Add external trigger burst to FM input

Sound:

Snare-like composite with: - transient crack - metallic shell - noisy tail

---

D. Euclidean tom network

Patch:

- Euclidean pattern A triggers VCA envelope for Output 2
- Euclidean pattern B triggers Index CV
- Euclidean pattern C sends stepped CV to Gen2 EXP
- Shape manually set or slowly modulated

Sound:

Toms that seem to play independent rhythmic roles even though they come from one synthesized source.

E. Broken hi-hat / digital tick voice

Settings:

- both oscillators high
- shape toward square emphasis
- short VCA envelope
- short, sharp Index CV
- trigger/gate into external FM input

Sound:

Harsh, alias-like, hat/tick/chirp sounds that are perfect for fast polymetric detail layers.

Performance tips

Use Output 2 and Index Out together

This is one of the best live strategies: - **Output 2** for the stable core - **Index Out** for aggression

Mute/unmute or crossfade them during performance to create: - dry drum - FM-heavy accent version - fills - breakdown transitions

Ride the Index knob live

Because the Index knob changes how much Generator 1 is sent onward, it acts like a **timbral intensity macro**.

Live movement can shift a part from: - woody percussion - to clanging FM - to shrieking unstable noise

Sweep the range switches for fills

Changing oscillator range between low/mid/high can produce dramatic phrase transitions: - low for drum fill - mid for tom/bell - high for glitch spray

Very effective for end-of-bar accents.

Best supporting modules to pair with Generator

To get the most out of Generator for hyper-complex percussion, pair it with:

- **Trigger sequencer** with polymeter/euclidean capability
- **Burst generator**

- **Clock divider / multiplier**
- **Multiple envelopes**
- **VCAs/LPGs**
- **Filter or resonant lowpass**
- **Wavefolder/distortion**
- **Sequential switch**
- **Sample and hold / stepped random**
- **Logic module** for combining rhythms

Especially useful: - one envelope for amplitude - one envelope for Index CV - one modulation source for external FM - one VCA or LPG after the audio output

---

Practical workflow for dense percussion tracks

If you want “composed complexity”

Program: - hit pattern in one meter - Index accents in another - external FM changes in another - shape changes by section

This gives repeatable complexity.

If you want “alive machine complexity”

Self-patch: - Output 2 to External Input - Trigger bursts to Index CV - Slight random CV to EXP - Shape near unstable sweet spots

This gives organic, chaotic, evolving percussion.

If you want “punchy club percussion”

Keep it disciplined: - short VCA envelope - short Index envelope - low/mid oscillator settings - filtered Output 2 for body - lightly mixed Index Out for click

---

Summary

The **Pittsburgh Generator** is excellent for **dense, advanced percussion music** because it combines:

- **2 oscillators**
- **internal FM routing**
- **external FM routing**
- **a CV-controlled Index/VCA stage**
- **shared waveform morphing**

Its real strength is not conventional melody but **rhythmically controlled timbral variation**. For polyrhythms and complex time signatures, the best approach is to let one pattern decide **when the hit occurs**, and let other unrelated patterns decide:

- how much FM it gets
- which oscillator is disturbed
- how sharp the transient is
- how bright or square the waveform is

That creates the illusion of many interacting percussion voices from a single module.
