PM Gray Steps Preset Pack

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Gray Steps is a rather complex digital device. In addition to [Gray Steps manual](#) this document wants to help users getting familiar with capabilities of this module. It describes presets, which are part of this preset pack.

Most presets are built of only common **CA** modules, some use **PM CV Source 8x**, one needs **Centripidity Little Plucker.**

Here is an overview:

Preset	Theme
Gray Steps – Tutorials 1	Varying **start#** and **count**, use of *analog outputs, reverse, auto reverse*
Gray Steps – Tutorials 2	External *restart* control, restart variants *to 0* and *to 1*
Gray Steps – Tutorials 3	Controlling **start#** by CV
Gray Steps – Demo 1	Small preset, that uses **Gray Steps**' analog outputs only to control **Centripidity Little Plucker**
Gray Steps – Demo 2	Bigger preset, that uses all 8 *binary outputs* as gate sources for **CA Poly Envelope** modules as well as *auto reverse* function.

Gray Steps - Tutorials 1

Principle

Kernel is an almost classical synthesizer setup:

Poly Oscillator → **Poly 6-Input Mixer** → **Poly Filter** → **Poly VCA**

Then the poly signal gets split to mono lines in order to adjust panorama separately for each voice. At the end a **Stereo Delay** gives a feeling of room.

What **Gray Steps** has to do:

- *new cycle* output controls envelope generator's sustain

- *step#* output modulates filter cutoff frequency

- *code#* output modulates filter resonance

- *decimal code* voltage is used as pitch signal at the input of a **Poly Quantizer**

- With the help of **Trig To Gate** modules *binary* outputs create gate signals for the **Poly Envelope Generator**

Main settings for Gray Steps

- code generator mode: balanced

- auto restart: on

- restart to   0

- auto reverse cycles   off

- analog outputs (step#, code#, decimal code)

    gain: 5.0 (default)

    offset: 0.0 (default)

- binary output mode: "=" (for all bits)

Variations

Variation 1

It uses

- code start#   24

- code count   16

So sequencer makes 16 steps in each cycle, a very common number. The three analog outputs correspond with three CV channels of a regular analog step sequencer.

According to step series 1, 2, ... 15, 16 *step# output* provides a ramp signal. Also *code# outout* value is a ramp signal. With actual **start#** and **count** parameters, both these output voltages are in same phase.

Decimal code voltage seems to be random like. But it's not. All Gray Codes are a regular series of numbers, that is reproducible every time. Because of this pseudo "randomness" Gray Code seems to be so usable for musical purposes.

A direct use as pitch voltage is not recommendable. Tones would sound "crazy". That's why Quantizer is added. It brings us a harmonic sound.

Variation 2

Here code **start#** is changed to 124 only. Sequencer uses codes at another area within code list. Even a change of this start index brings a fully different melody.

Please feel free to play a bit with start# and count parameters. You can do it with the most left two performance knobs too.

Variation 3

Now **start** index and code **count** differ from previous variation.

Please note: When you switch from variation 2 to 3, Gray Step may stop. That is normal, because parameter changes to rather distant value. So push restart button on Gray Steps module or on VM Performance board and sequencer starts running again.

Variation 4

In this variation all parameters are the same, but reverse button is toggled on. As result you will hear same tone series as in variation 3, but in reverse order.

Variation 5

Here one control is changed:

auto reverse cycles: 4

This means, that sequencer repeats four step cycles. Then it reverses step direction and repeats next four cycles in that direction before it reverses direction again.

You could test what happens, when reverse cycle switch is on other positions.

When you toggle reverse push button, you can even reverse the reversed direction.

Gray Steps – Tutorials 2

Principle

Setup is practically the same as in previous preset. Only one module is added: **Clock Divider**. In this preset **Gay Steps** gets restarted by an external CV.

Main settings for Gray Steps

- code generator mode: balanced

- auto restart: off

- restart to   0

- auto reverse cycles   off

- restart trigger input is connected to second **Clock Divider** output

- analog outputs (step#, code#, decimal code)

  gain: 5.0 (default)

  offset: 0.0 (default)

- binary output mode: "=" (for all bits)

Variations

Variation 1

Sequencer does exactly eight steps and then it stops. That is because **auto restart** button 🔁 is toggled off.

Clock Divider counts 16 clock pulses and then it sends a restart pulse to **Gray Steps**. This resets step counter to 0 and unlocks it.

This setup lets sequencer do 8 steps and then stopping for 8 clock pulses.

Variation 2

Main difference to variation 1 is, that code **count** is set to 12. Now the silent pause is not 8 but only 4 steps long.

Variation 3

Only difference to variation 2: **restart mode slide switch** is set to "1". Now external restart pulse sets sequencer to step 1 (instead of 0 in previous variation). So sequencer stops already after 11 step pulses.

Manipulate slide switch yourself and listen different step numbers.

Gray Steps – Tutorials 3
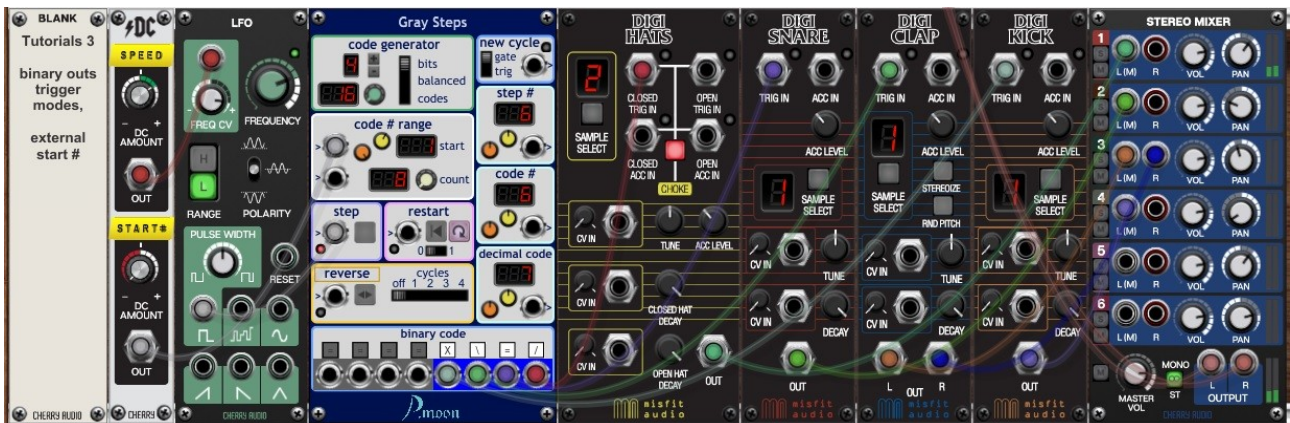
Principle

In this preset **Gray Steps** is used as trigger sequencer for a drum kit. A special feature is, that **start#** parameter is not set manually, but controlled by a CV. *Performance Knob 1* serves as CV source. Alternatively a CV sequencer might do this job.

Main settings for Gray Steps

- code generator mode: 4 bits

- auto restart: on

- code count   8

- restart mode switch   to 0

- auto reverse cycles   off

- binary output mode: (various)

Variations

All **10** variations differ only in **start#** value.

You can play around start index by turning *Performance Knob 1* . *Performance Knob 2* will set number of beats per cycle.

Binary code output modes effect output triggers.

Try some other output modes by left clicking on a mode label. "=" and "/" make no difference. But "\" provides an off beat while "X" creates both on and off beat.

Gray Steps – Demo 1

Principle

This preset is very simplified because used **Centripidity Little Plucker** modules are complete synth voices yet.

Gray Steps tasks:

- analog *step# output* modulates filter cutoff frequency

- *decimal code* voltage modulates voice pitch

PM CV Source 8x acts as handy basic pitch source. It allows a quick setup with a distinct scale, but also manual adjustment for each pitch CV output is possible.

Before pitch CV are sent to **Little Plucker**s, they gets harmonized by **CA Quantizer**s.

In variation 1 Little Plucker sounds a bit strange, when preset is opend. After changing to another variation is sounds better.

Gray Steps – Demo 2

Principle

In this preset Gray Steps works as trigger sequencer. The preset consists of two identical module paths. Each path forms a stereo channel:

4x Super Saw → Mono to Poly → Poly Filter → Poly VCA →

Poly to Mono → Stereo Mixer → Reverb → Output

Variations

Variations 1 to 6 differ in **Gray Steps** parameters **start#** and **count**.

In Variations 7 to 10 **Gray Steps'** *auto reverse* function is used with varying cycle numbers.

Links

This free preset pack is available in Cherry Audio store. Alternatively you can download presets of this pack from P.moon web page:

Gray Steps - Demo 1.voltagepreset

Gray Steps - Demo 2.voltagepreset

Gray Steps - Tutorials 1.voltagepreset

Gray Steps - Tutorials 2.voltagepreset

Gray Steps - Tutorials 3.voltagepreset