
ADDAC System

Instruments for Sonic Expression

Est.2009

INTRODUCING

# ADDAC406 CLOCK BENDER

USER'S GUIDE . REV1

April.2026

ADDAC System

From Portugal with Love!

# Welcome to:
# ADDAC406 CLOCK BENDER USER'S GUIDE

Revision.01 April.2026

## WELCOME

This module introduces a unique approach to rhythm, it can add complexity to any pattern by superimposing extremely odd divisions creating syncopation and rhythmic complexity.

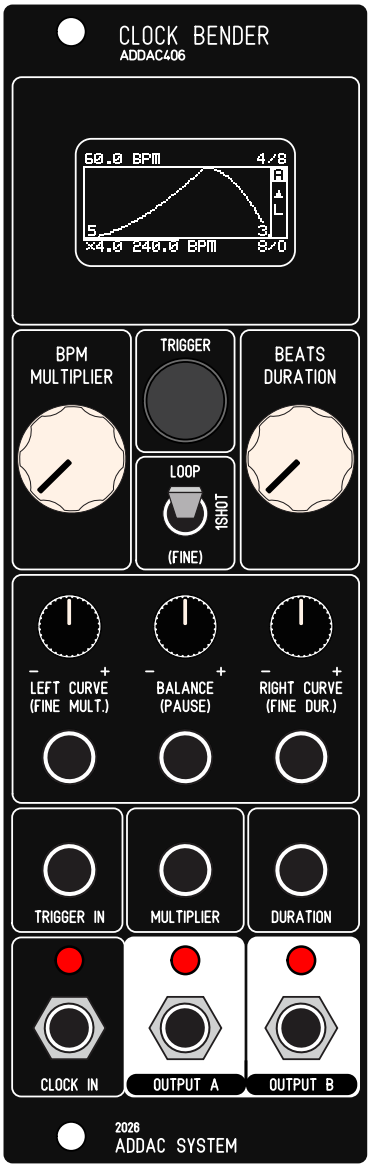
It provides extensive possibilities for rhythmic creation, transforming static rhythmic patterns into dynamic and complex rhythmic layering enhancing the rhythmic foundation set by the primary clock.

It allows users to explore and generate rhythms in previously unattainable ways.

The module operates by taking an input clock signal and generating two new independent outputs that dynamically accelerates or decelerates the BPM toward a user-defined destination BPM over a specified number of beats.

Meaning that the output generation is never constant, they will always be dynamically accelerating or decelerating, where no interval between two pulses is the same, the current interval will always be shorter or longer than the previous interval.

This principle will generate unique metrics that when played against the main clock will create extremely unique patterns, from simple swing /syncopation to beyond free-jazz completely unexpected while mathematically justified metrics.




Tech Specs:
8HP
4.5cm deep
110mA +12V
20mA -12V

# WORKING PRINCIPLE

We'll start with an example to demonstrate a basic configuration.

Patch an input clock to the [CLOCK IN], in this case a 60 BPM clock is patched and detected by the module, the detected BPM is shown on the screen.

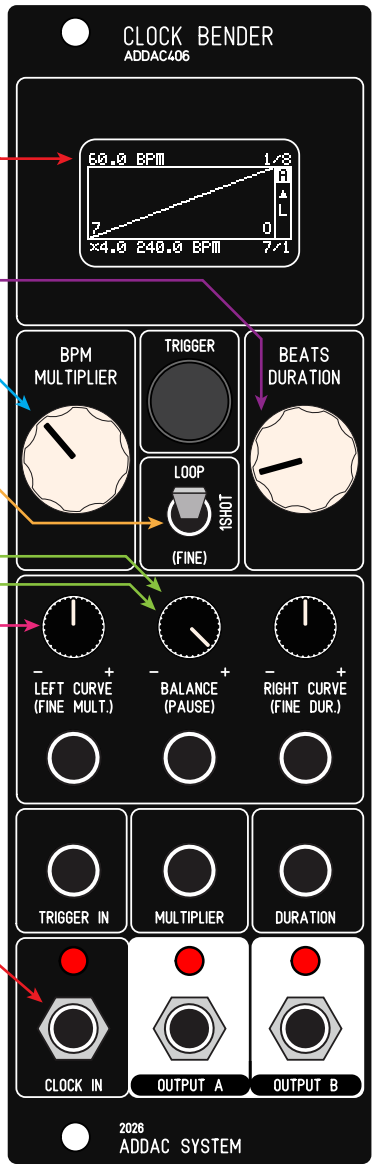
2. Set the [BPM MULTIPLIER] for the destination BPM, in this example this is set at x4 (240 BPM).

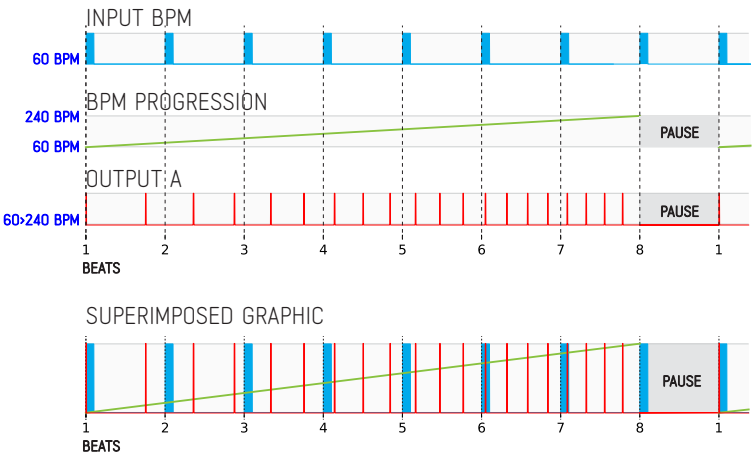
3. Set the [BEATS DURATION] to any number of beats in this case 7 beats.

4. Set the [BALANCE] control fully CW for a ramp progression and [LEFT CURVE] at noon for a linear interpolation.

5. With the switch in the [LOOP] position the module will start generating an output clock that will go from 60 to 240 BPM over the course of 7 beats and continuously loop this new odd pattern/metric.

6. With the switch in the [FINE] position one can adjust the [(PAUSE)] setting to 1 beat, this will make the output wait 1 beat before looping once again.



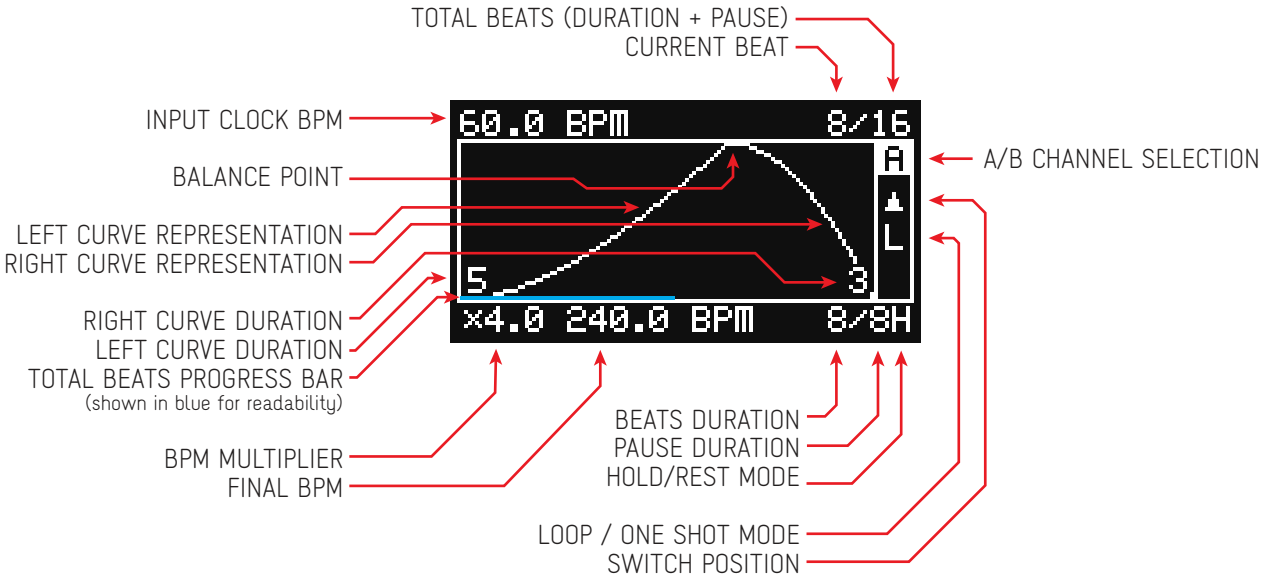




This is the basic concept which can be expanded using the [BALANCE] knob to choose from an inverted saw to triangle to saw to define the progression and changing the progression curves from log to exponential using the [LEFT CURVE] and [RIGHT CURVE] knobs.

Notice how the interval between each output always have a different length as the BPM is dynamically changing.

# SCREEN

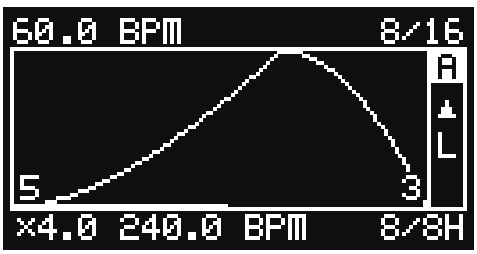
The screen will greatly help monitor the module's state and visualizing all the current settings settings



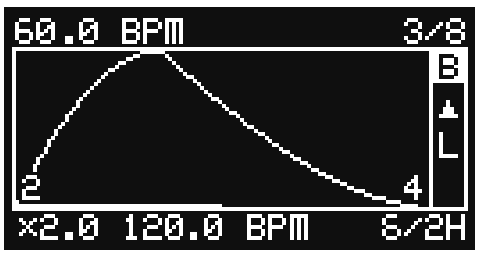

# OUTPUTS A & B

There are 2 independent channels: A & B
Double press the [TRIGGER] button to change between channels, the current channel is shown on the screen.
Settings are independent for each channel, CV inputs will only have effect over the channel currently chosen.
Both A & B output 10ms triggers.

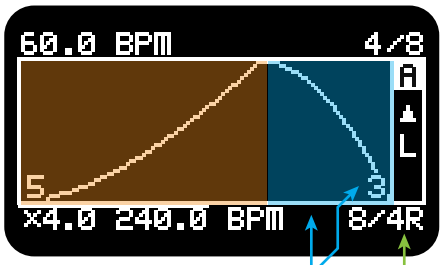
CHANNEL A




CHANNEL B



# BPM PROGRESSION STAGES




The BPM progression goes through 3 stages:

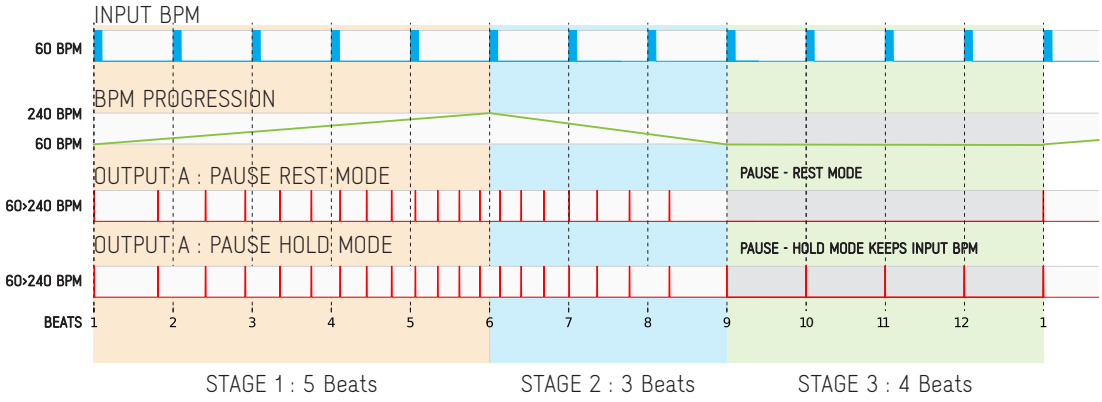
Stage 1:
Accelerating or decelerating from the input BPM to the target BPM
The number of beats of this stage is shown on the corner

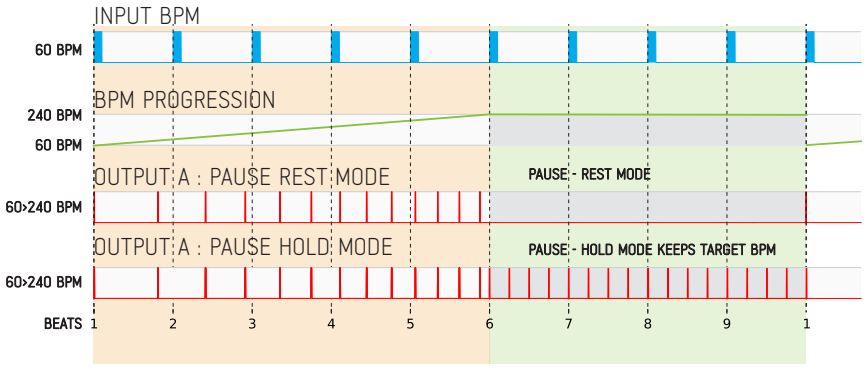
Stage 2:
Accelerating or decelerating from the target BPM to the input BPM
The number of beats of this stage is shown on the corner

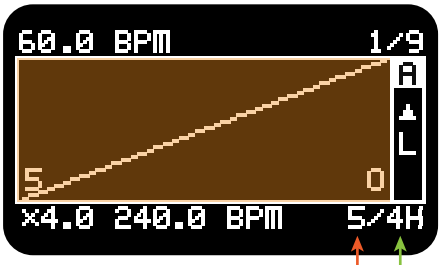
The center point between stage 1 & 2 can be edited using the [BALANCE] knob.
With [BALANCE] CCW or CW stage 1 or 2 is not used.

Stage 3:
The last stage Pauses the acceleration for an X amount of beats
While the acceleration is paused the output at this stage can either be:
R - Rest and stop the output during this stage
H - Hold and keep the output at a steady rate of the last BPM

The [PAUSE] setting can be set to infinite, with this setting it will stay in Rest/Hold Mode until a trigger is received.



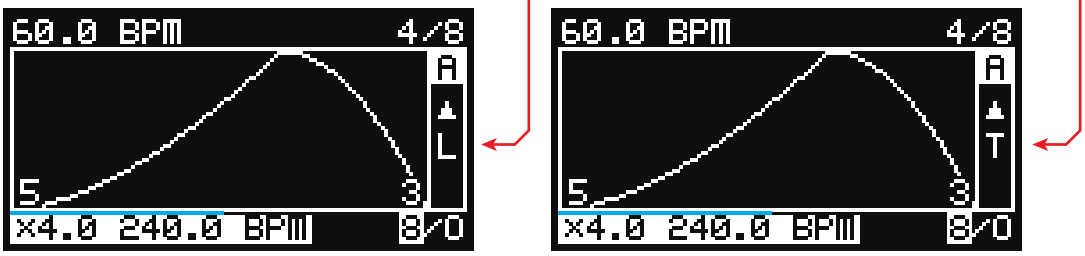



# SWITCH BEHAVIOUR

The 3 position switch allows to choose Loop or One Shot modes.
In Loop mode the BPM progression will keep looping according to its settings.
In One Shot mode the output will stop once it reaches the total beats and will restart once the [TRIGGER] in pressed or a trigger is detected at [TRIGGER IN].

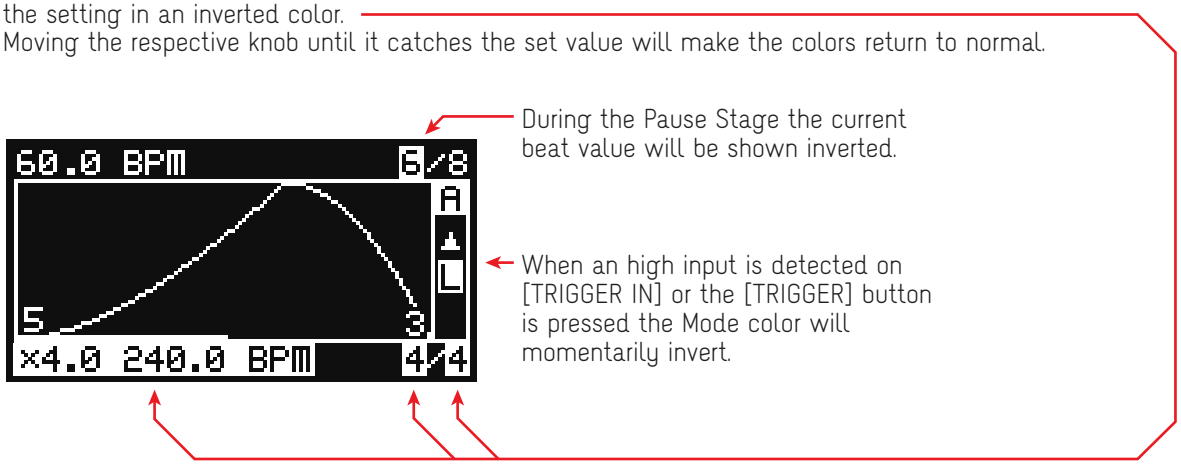

The switch (FINE) position allows access to the [(PAUSE)] parameter but also allows to dial in precise values for [BPM MULTIPLIER] and [BEATS DURATION] that can't be reached using the coarse main knobs.

When in [(FINE)] position the running mode that was being used, Loop or One Shot, will be kept and shown on the screen




# WHITE BACKGROUND CONTROLS

When changing the swich into [(FINE)] or exiting [(FINE)] mode after changing parameters it is usual that your knobs will not be at the correct positions, when this happens the screen will show the setting in an inverted color.
Moving the respective knob until it catches the set value will make the colors return to normal.



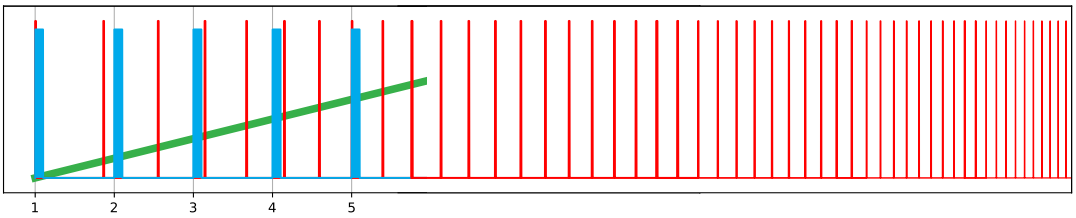
# CLOCK INPUT

The module needs an external clock to operate, the clock input detection expects a steady clock, it takes a few beats to stabilize and, once stable, the detected BPM will be shown on the screen.
If the incoming clock changes the module will detect the change and it will update the BPM once it calculates the new input BPM.

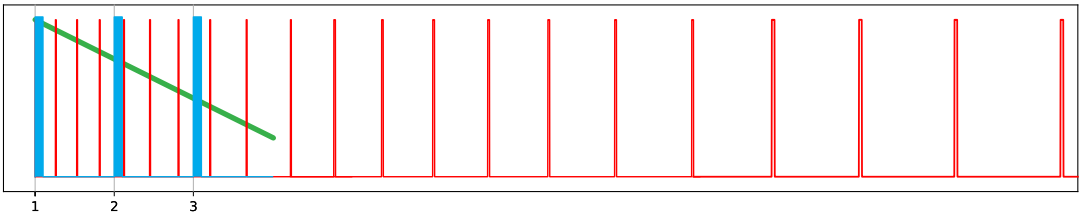
# SUSPENDING THE CLOCK INPUT

If the clock input is removed or paused the BPM progression will stop, the outputs however will still be outputting at the same incremental rate as the last step.
Pressing the [TRIGGER] button at this stage will stop the output.

For example if the clock is suspended while the BPM is speeding up then the output will keep speeding up indefinitely,




If the clock is suspended while slowing down then the output will keep slowing down up to a certain value.



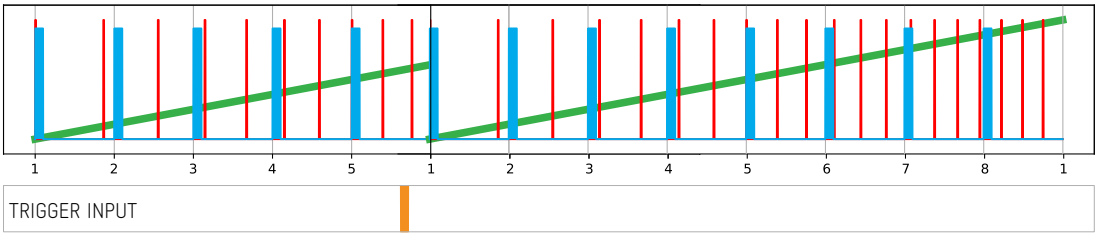

Once the clock input signal is reestablished the progression will start from step 1.

# TRIGGER BEHAVIOUR

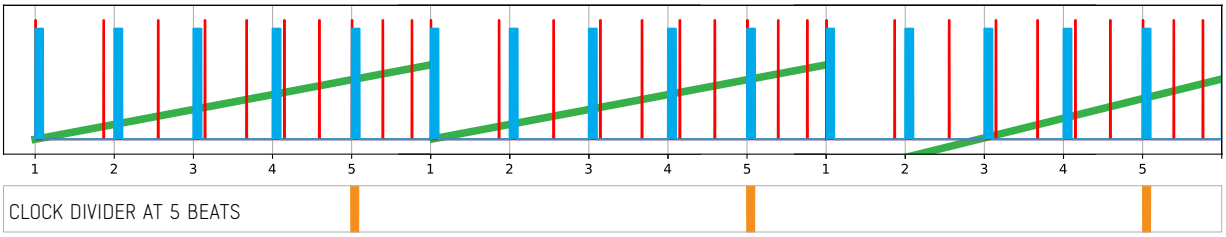
Everytime the BPM progression is running and a trigger is detected, be it the [TRIGGER] button or [TRIGGER IN], the current beat will be reset to 1 on the next beat.
On the example bellow one can see that after the trigger is detected the BPM progression is reset on the next input clock beat, restarting the BPM progression.

If the switch is in [1SHOT] position and BPM progression is not running detecting a trigger will start the BPM progression.

RETRIGGERING IN THE MIDDLE OF A BPM PROGRESSION




Using an external clock divider into the [TRIGGER IN] allows to lock the BPM progression to a smaller part of its duration. This expands even further the possibilities as other metrics will appear that would not be possible to dial in using the module's controls. In the graphic below the same 8 beat progression from above is being truncated at 5 beats using an external clock divider.




# TRIGGER BOTH CHANNELS

Holding the [TRIGGER] button for 2 seconds will trigger both channels A & B.
The [TRIGGER IN] input will only trigger the channel selected.

# SAVE SETTINGS

Holding the [TRIGGER] button for 5 seconds will save all setttings which will be automatically recalled at the next startup. A "Settings Saved" message will appear on the screen.

# FACTORY SETTINGS

Holding the [TRIGGER] button while starting up the module will reset all settings to the default factory settings.

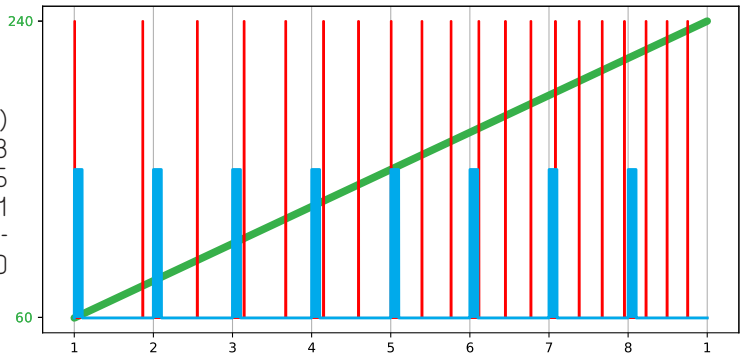
# ALL TRIGGER FUNCTIONS CHEAT SHEAT

PRESS - Resets selected channel progression to step 1
DOUBLE PRESS - Changes selected channel
LONG PRESS (2 seconds) - Resets both channels progression to step 1
LONG PRESS (5 seconds) - Save both channels settings
PRESSED AT STARTUP - Reset to factory settings

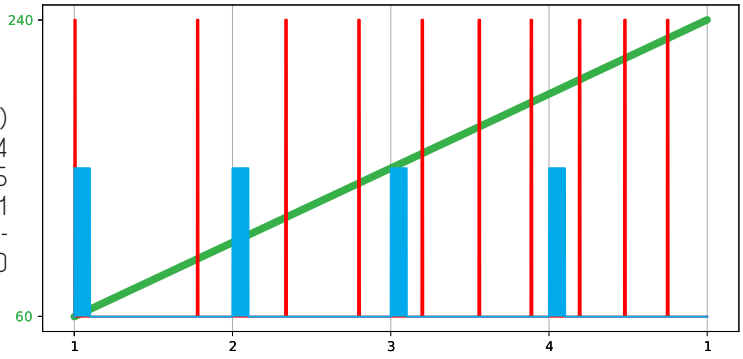
# GRAPHICAL EXAMPLES

All examples have an input clock at 60 BPM
Input Clock in BLUE
Output in RED

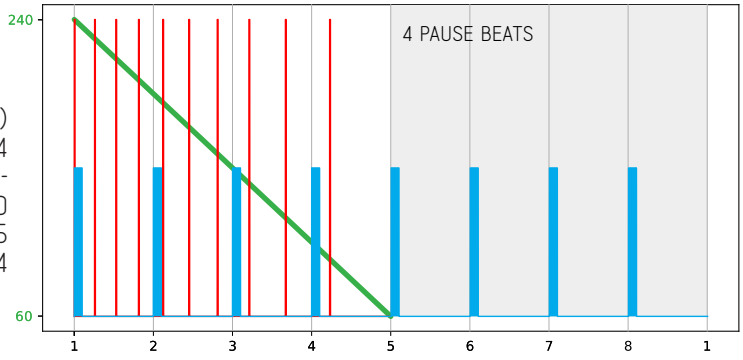
INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 8
Left Curve : 0.5
Balance : 1
Right Curve : -
Pause : 0



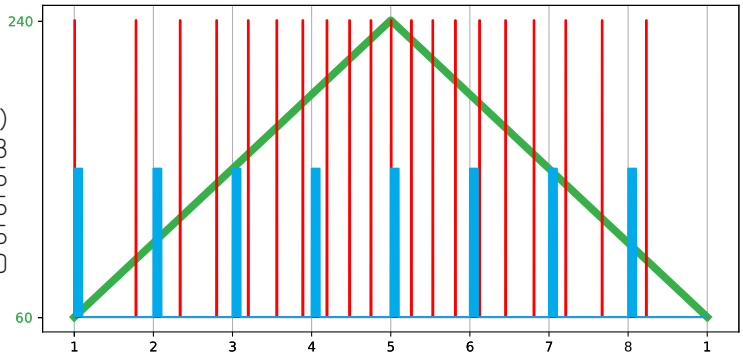

INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 4
Left Curve : 0.5
Balance : 1
Right Curve : -
Pause : 0




INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 4
Left Curve : -
Balance : 0
Right Curve : 0.5
Pause : 4



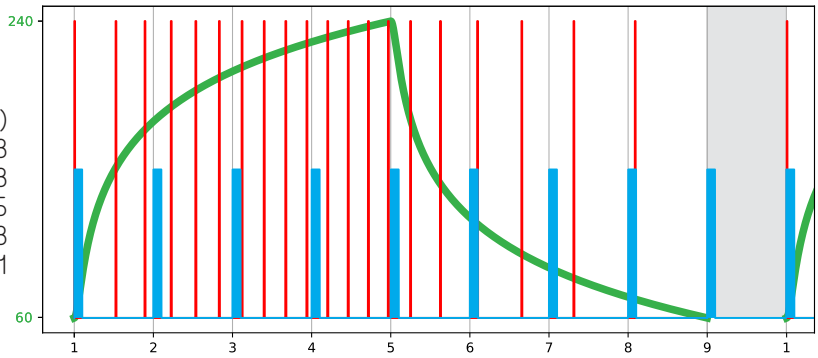

INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 8
Left Curve : 0.5
Balance : 0.5
Right Curve : 0.5
Pause : 0



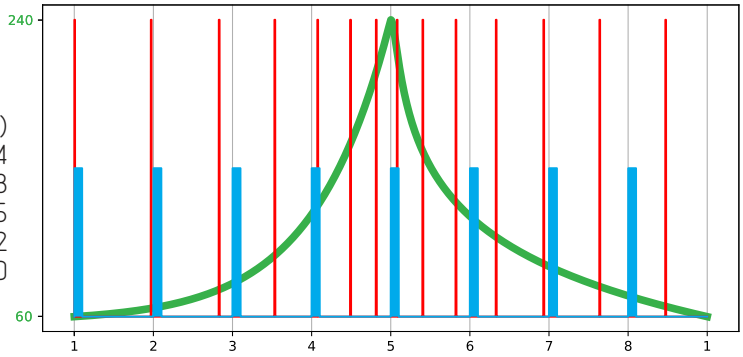
# GRAPHICAL EXAMPLES

All examples have an input clock at 60 BPM
Input Clock in BLUE
Output in RED

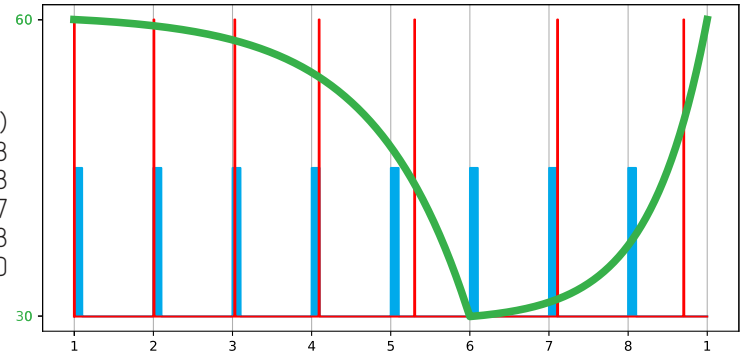
INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 8
Left Curve : 0.8
Balance : 0.5
Right Curve : 0.8
Pause : 1




INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 4
Left Curve : 0.8
Balance : 0.5
Right Curve : 0.2
Pause : 0

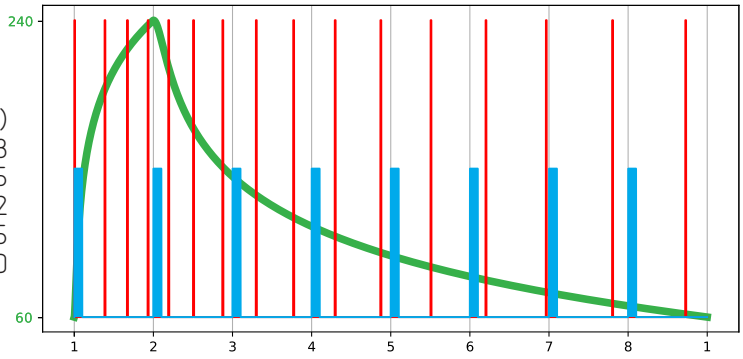



INPUT BPM : 60 BPM
BPM Multiplier : x0.5 (30BPM)
Beats Duration : 8
Left Curve : 0.8
Balance : 0.7
Right Curve : 0.8
Pause : 0

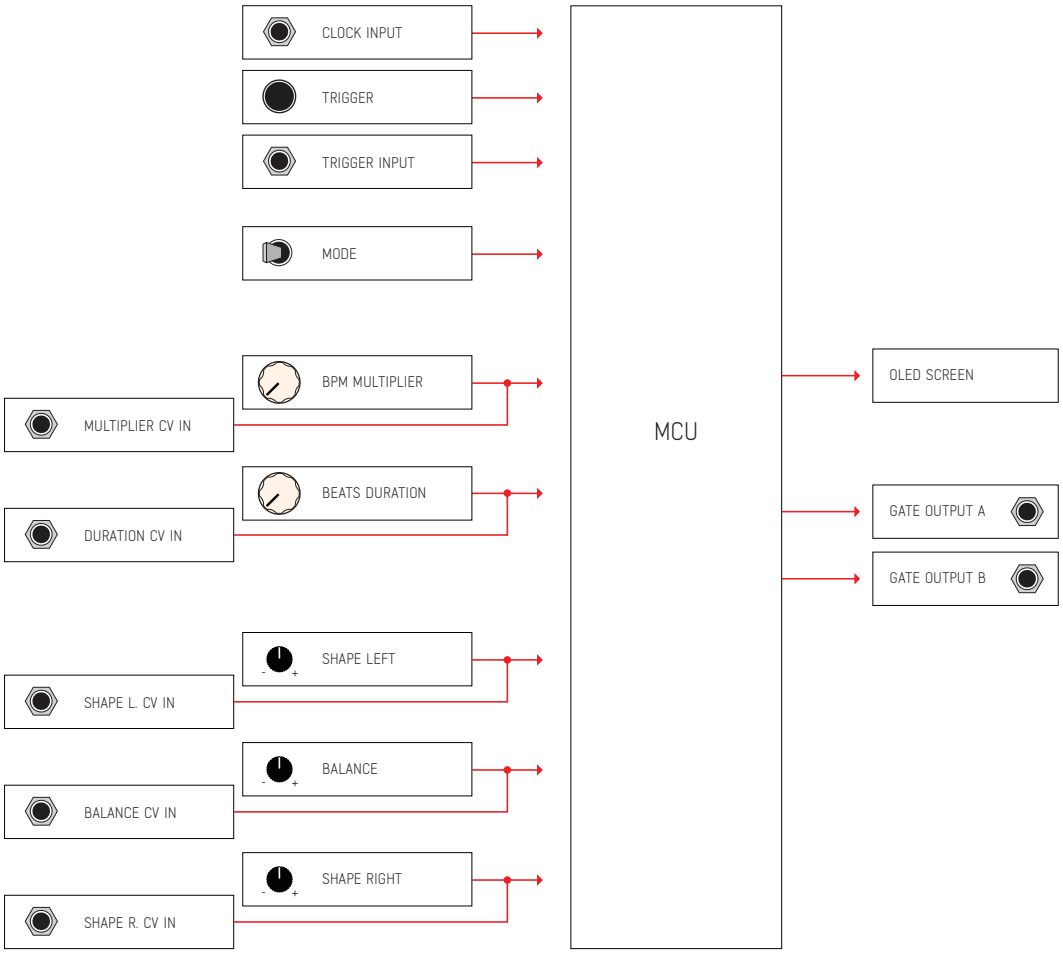



While using a BPM Multiplier value smaller than 1 the curve will invert to show a deceleration.

INPUT BPM : 60 BPM
BPM Multiplier : x4 (240BPM)
Beats Duration : 8
Left Curve : 0.5
Balance : 0.2
Right Curve : 0.5
Pause : 0



# SIGNAL FLOW DIAGRAM



For feedback, comments or problems please contact us at:
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