Beat Machine S3 – User Manual (beta 2)

Functions in Red still need work

Modes / Inner Button	**Bank**	**Colour**	**Click Action**	**Hold Click**	**Combo Hold Click**	**Dial 1**	**Dial 2**	**Dial 3**	**Dial 4**	**Dial 5**	**Dial 6**	**Dial 7**	**Dial 8**
Global	0					**Tempo**	**Density**	**Evolve**	**Swing**	**Drive**	**Filter**	**Length**	**Volume**
Mix **A**	1	Red		1-8: Play sound		Vol 1	Vol 2	Vol 3	Vol 4	Vol 5	Vol 6	Vol 7	Vol 8
FX **B**	2	Orange				Reverb Amount	Delay Level	Delay Time					LED brightness
Sequence **C**	3	Light Green	Tap Tempo	1-16: Select factory pattern preset	FX - 1-16: Select user pattern preset Mix - 1-16: Save user pattern preset	Tempo Fine Control	Generative Complexity	Slice Amnt	Shrink or Expand Pattern	Accent	Step Size	Key	Scale
Generate **D**	X	Blue	New Euclidean Kit Pattern		Mix – Two-three kit pattern FX – Probability Pattern Seq – Polyrhythm kit pattern Stutter – Init empty pattern Part – Euclidean part Part & Mix – Two-three part Part & FX – Probability Part Part & Seq – Polyrhythm part Sound – Generate Kit sound Part & Sound – Gen Part Sound								
Play **E**	X	Green	Start/Stop										
Stutter **F**	4	Purple		1-16: Stutter length		Stutter Length							
Part **G**	5	Aqua		1-8: Select part 9-16: Mute Part		Part BPM (& Seq fine control)	Part Density	Part Evolve	Rotate	Part Align	Part Octave	Part Length	Part Range
Sound **H**	6	Pink		1-16: Select factory sound preset	FX - 1-16: Select user sound preset Mix - 1-16: Save user sound preset	Osc Balance	Pitch	Mod Rate	Mod Depth	Noise Cutoff	Attack	Tone Decay	Noise Decay

Quick Start Guide

Power on. Beat Machine (BM) wooden, use Switch next to USB port. BM PCB, connect to a powered USB cable and connect audio to headphones or mixer.

UI Orientation

There are two rings of **LEDs** and **button** pairs. 16 in an outer ring and 8 in an inner ring. The outer ring shows and edits the rhythmic pattern of the current part. The inner ring relates to the BMs operating mode, or state, and these LEDs pair with 8 inner buttons.

The inner ring of **buttons** are labelled A to F and trigger actions (e.g. play and stop) or change 'modes'. *Hold* buttons G to C to temporarily change mode or *double-click* to lock to a mode. The dial's change function in each mode.

Dials are numbered 1 to 8 in clockwise order, starting at 12 o'clock (sorry, no dial labelling on alpha version). Dial adjustment triggers a yellow LED indicator of dial value on the outer LED ring. Dials latch to the previous value when you change mode, so you may need to rotate a dial to find the latching value before the parameter changes.

Instant Gratification

Press Button E (green) to start and stop a sequence – On BM Wooden if there is LED activity but no sound, check the speaker-toggle switch on the back.

Dial 1 adjusts tempo, … (see matrix chart), dial 8 adjusts Volume. On BM Wooden, the centre dial also adjusts the volume.

It's a **generative** drum machine, so generate a new sequence by pressing button D (blue).

It's **probabilistic**, and dial 2 controls step probability, from 0% on the left (drop out some steps) through 100% in the middle (play pattern normally), and 200% on the right (fill in some step gaps).

Manual Pattern Edit

The outer row of buttons is numbered 1 – 16. Buttons **toggle steps** on/off in the current part (kick drum is part 1, snare is part 2, hats are part 3, …).

Change **parts** by holding button G (Part mode) and pressing outer button 1 – 8. LEDs will redraw to show the current part's pattern. Active steps in each part use a different colour, and non-active steps are a dull aqua colour. If patterns are less than 16 steps, LEDs on non-used steps are off.

Change part **volume** – hold button H to go into Mix mode and use dials 1 – 8 to adjust the volume of parts (voices/tracks/instruments) 1 – 8.

Mute parts by holding button G (Part mode) and press outer button 9 – 16. LEDs 9-16 will flash when their parts are muted. Press again to unmute.

Initialise an **empty pattern** by holding button B (FX) and pressing button D (Generate). This also resets the pattern length to 16 steps, if required. Now add your own steps to each part.

Generative Pattern Algorithms

Euclidean rhythms - generate a new Euclidean pattern by pressing button D (Generate).

Polyrhythms – generate a new polyrhythm by holding button C (Sequence) and pressing button D (Generate).

2 and 3 step rhythms - generate a new Small Duration Pattern by holding button A (mix) and pressing button D (Generate).

Probabilistic rhythms – generate a new structured random pattern by holding button B (FX) and pressing button D (Generate).

Generate Algorithmic Patterns for Each Part

For a new Euclidean pattern on the current part only, hold button G (Part) and press button G (Generate). For a new 2-3 step part, hold button H (Mix) and press G. Hold button C (Sequence) and press G for a new polyrhythm pattern on the current part.

Updating individual parts with generated rhythms, allows patterns to have a mix of rhythms generated by different algorithms and then edited manually to your liking.

Each of the 8 parts uses a different highlight **colour** for active steps on the outer ring of LEDs. The same colours are used on the inner ring of mode button LEDs. Starting with red on inner button and part 1, yellow next, and so on clockwise. Looking at the inner LEDs can be a reminder of which colour is used for which part. Be aware that the LEDs can show different shades of a ‘colour’ at different intensities.

Modes and Dials

The BM defaults to Global mode where the **dials** correspond to Tempo, Density, Evolve, Swing, Drive, Filter, Length, which effect all parts.

The dials can have other functions when in a different mode (see the matrix). To temporarily enter a different mode, hold down button A, B, C, G or H, then turn a dial. To lock the BM in a mode, double click an inner button G to C. To go back to Global mode, click any button G to C.

Change The Sounds

It’s a **multitimbral** synthesizer. All sounds are generated in real time. Each part uses the same synthesis engine.

Change **sound presets** by holding button H (Sound mode) and pressing outer buttons 1-16 (only some slots currently have a factory preset…).

Edit sounds by holding button H to enter Sound mode. Then use dials 1-8 to change sound parameters. Dial 1 changes the balance between tone and noise, dial 2 changes the tone pitch, … see the chart above. Double-clicking on button H will lock the BM in Sound mode for extended sound design sessions. Click button again to exit back to Global mode.

All parts use the same synthesis engine, but by convention (and a bit by design) part 1 is a kick drum, part 2 is a snare, part 3 is hi hat, part 4 is a clap, part 5 is a clave, part 6 is a tom, part 7 is wooden percussion, and part 8 is metallic percussion. A synth architecture diagram is shown on the Synth Controls page of this user guide.

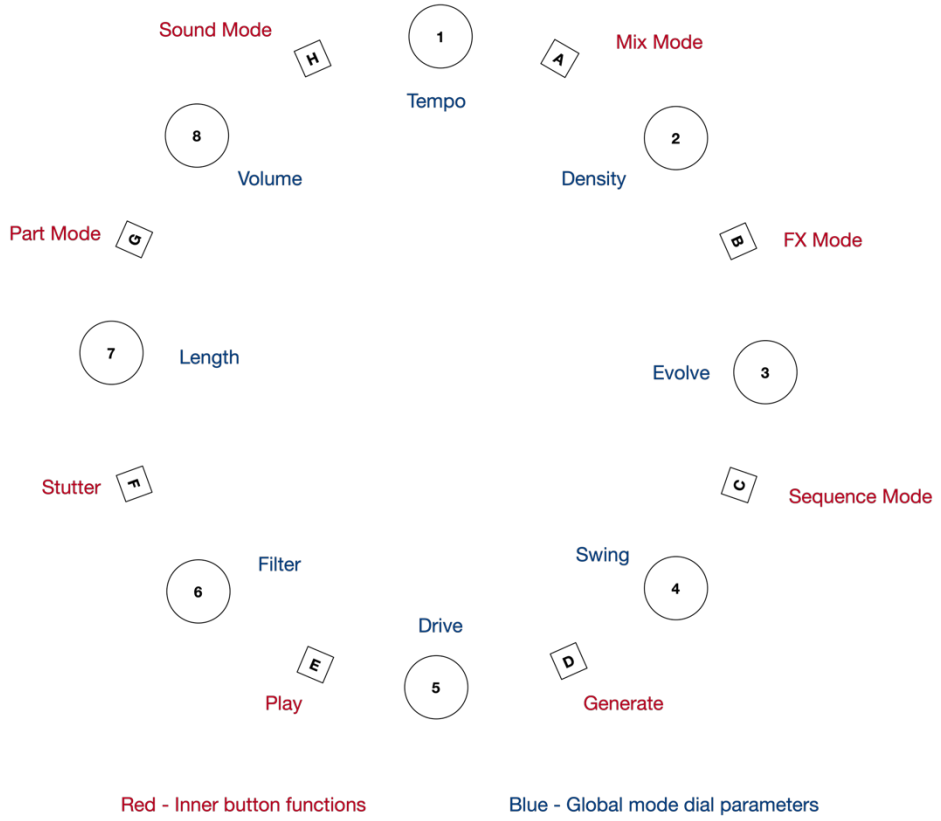
Go Nuts

Parts can be of different **lengths**, allowing for **polymetric** patterns. Hold button G to select Part mode. Turn dial 7 to adjust the length of the current part. Go to a different part and repeat the process.

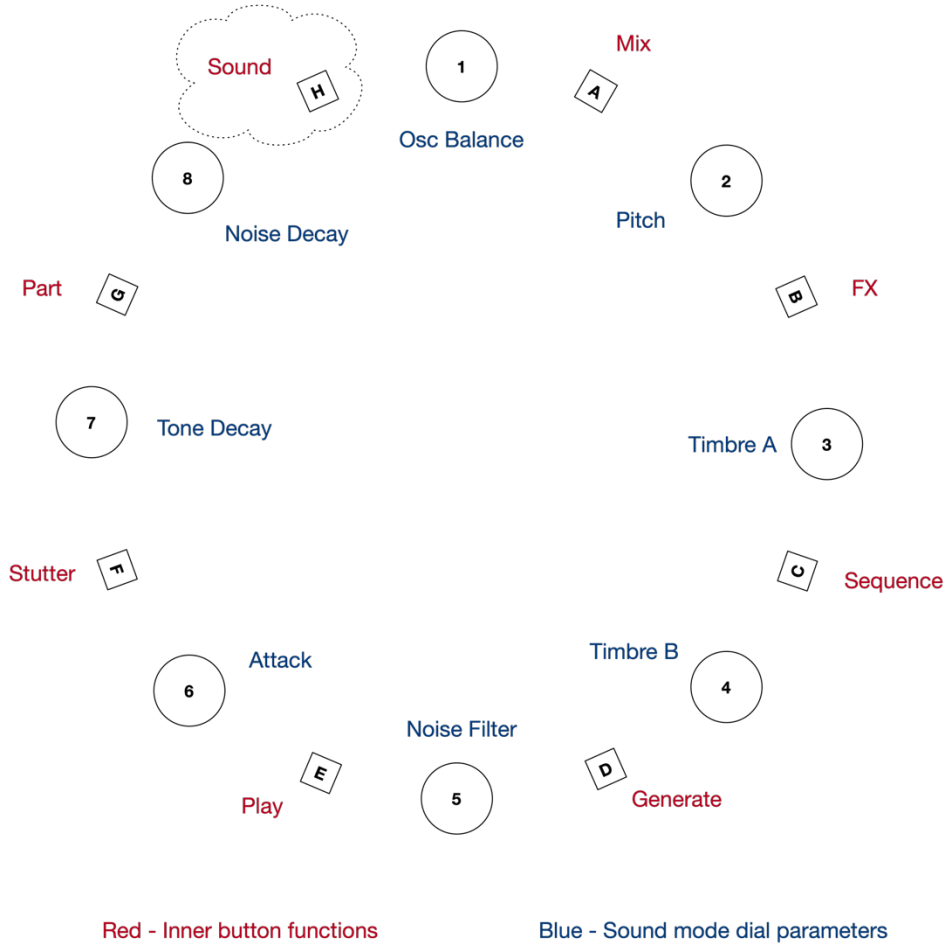
Rotate a part. Hold button G to select Part mode and turn dial 4 to shift the metrical phase of the current part. (Think of Reich's 'Clapping Music').

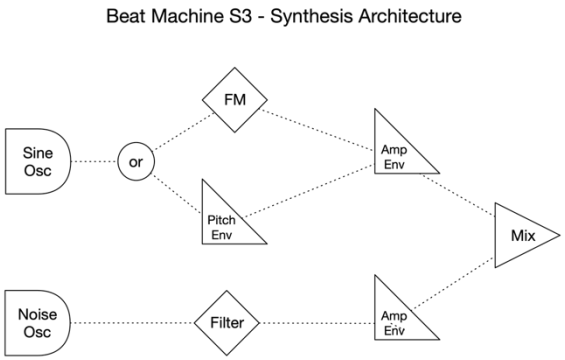
Parts can be at different tempi, allowing for time **phasing** of patterns (Think of Reich's 'Piano Phase'). Hold button G to select Part mode and turn dial 1 to change the tempo of the current part in 10 BPM increments. For finer tempo adjustments (1 BPM increments) Hold button C to select Sequence mode and turn dial 1. Change to another part and repeat for even more polymetric shenanigans.

Global Mode Controls

Buttons	Dials	
• Play – Stop (E) • Stutter (F) • Part Select (G+1:8) • Part Mute (G+9:16) • Part Generate (G+D) • Pattern Generate (D) • Polymetric Gen (C+D) • 2&3Step Gen (B+D) • Probabilistic Gen (A+D) • Init Pattern (H+D)	1. Tempo 2. Density 3. Evolve 4. Swing 5. Drive 6. Filter 7. Length 8. Volume	

Synthesis Controls

Buttons	Dials	
• Sound Mode (H)	1. Oscillator Balance 2. Pitch 3. FM Ratio / Pitch Env On 4. FM Mod Depth / Pitch Env Depth 5. Noise Filter 6. Attack 7. Tone Decay 8. Noise Decay	



Parameter details

Tempo – 120 BPM by default. When adjusting, BPM changes in 10 bpm increments at each of the 16 steps, from 40 BPM at step 1 to 120 BPM at step 9, to 190 BPM at step 16. To fine tune the tempo in 1 BPM increments, hold the Sequence button (C) then turn dial 1 – this increases the base tempo up to 15 BPM, from 0 increase at step 1. Change the tempo of the current part individually by holding the Part button (G) and moving dial 1 for 10 BPM increments, or hold Sequence (C) & Part (G) to increase it in 1 BPM increments. Finally, tap tempo using the Sequence button (C) – 4 or more taps are required to set a tempo.

Density – Determines the probability that a step with sound, or not. Density defaults to 100% and ranges from 0% to 200% with 100% being at step 9.

Timbre – Most of the sound synthesis controls are obvious from their names, however the two timbre controls have dual functionality. Timbre control A (dial 3) switches between FM Ratio and Pitch Env On/Off. When dial 3 is at zero there is no FM and a pitch envelope on the tone is enabled. Timbre control B (dial 4) then control the depth of the pitch envelope; with 0 in the centre, to the left is increasing upward pitch bend, to the right is increasing downward pitch bend (typical of a TR-808 kick or Simmonds tom). When dial 3 is above zero is turns on FM and adjusts the Carrier:Modulator ratio. Dial 4 then adjusts the modulation depth.

TBC…

Factory Presets

There are 16 built-in preset patterns and 16 preset sounds. All presets include 8 parts each. Patterns and Sounds are independent, so you can mix and match as you like. Factory presets can't be overwritten so they are always available.

Action	Button Combination	LED Feedback
Load Sound	Hold Sound + Press Step 1–16	Yellow = loaded
Load Pattern	Hold Sound + Press Step 1–16	Yellow = loaded

User Presets

There are slots for 16 user preset patterns and 16 use preset sounds. All presets include 8 parts each. These factory presets can be overwritten so you can update them as often as you like – for example, to put a collection together for a performance. Pattern presets capture the tempo and density settings at the time of saving.

Action	Button Combination	LED Feedback
Load Sound	Hold Mix + Hold Sound + Press Step 1–16	Green = loaded, Red = empty
Save Sound	Hold FX + Hold Sound + Press Step 1–16	Cyan = saved, Red = error
Load Pattern	Hold Mix + Hold Sequence + Press Step 1–16	Green = loaded, Red = empty
Save Pattern	Hold FX + Hold Sequence + Press Step 1–16	Cyan = saved, Red = error