

KBN-C

KINETIC BOUNCING NOTE CATCHER

OPERATION MANUAL



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CONVENTIONS USED IN THIS MANUAL

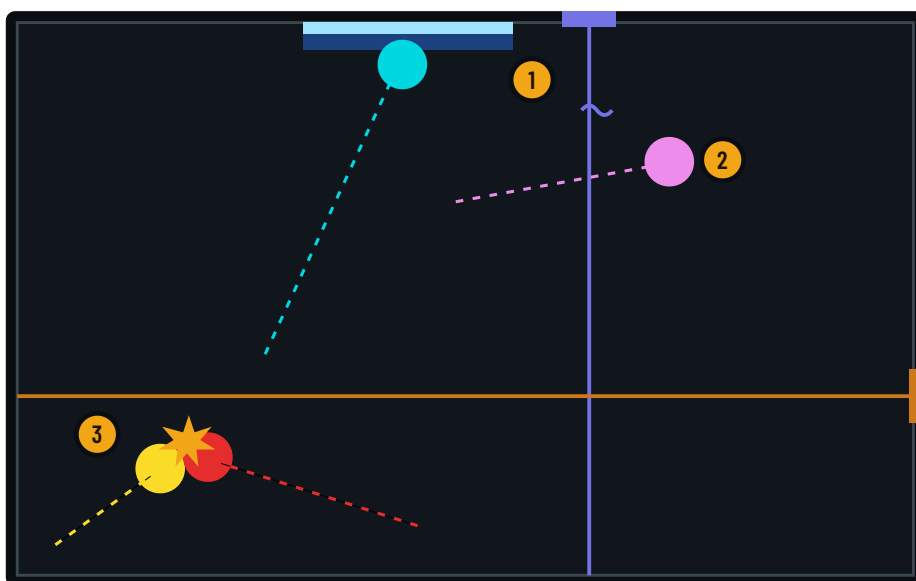
Panel labels are printed like **RUN** or **LIFE**. Numbers in amber circles **4** refer to the front panel overview on page 4; letters **B** refer to the back panel on page 5. Note names follow Reason's convention: **C3 is middle C** (MIDI note 60). Ball slots are identified by colour as well as number: **1** cyan, **2** pink, **3** yellow, **4** red, **5** green, **6** blue, **7** violet, **8** white.

1 INTRODUCTION

KBN-C is a note player for Reason's rack. It sits above an instrument and listens to the notes you play or sequence – but instead of simply handing them on, it **catches** each one in a ball.

The ball launches from the centre of an enclosed arena and replays its note every time something happens to it: a bounce off a wall, a pass through one of two trip lines, a collision with another ball. Up to eight balls share the arena, each with its own colour, speed and personality.

The result is a generative instrument with a very direct control surface. Your hands decide *what* plays – the pitches, the chords, how hard you strike – and the arena decides *when*. Speed, lifetime, timing grid, scale, velocity and the two trip lines let you steer that decision anywhere between free-floating ambience and tight, quantized patterns.



1 WALL

The ball replays its note or chord. The wall flashes.

2 TRIP LINE

A burst of MULT notes, stepping by JUMP.

3 COLLISION

Both balls replay their notes (COLL = TRIG).

DEVICE TYPE	Rack Extension Player(note player), 6U
BALLS	8 slots, each with its own activity, speed (11 steps)and hit probability
CAPTURE	One note or a chord of up to 4 notes per ball; pitch sets launch direction, velocity sets pace
NOTE SOURCES	4 walls · 2 movable trip lines with note bursts · ball-to-ball collisions
TIMING	Free or quantized to 12 grid values · note lengths from 1/8 to a whole note at song tempo
PITCH	12 roots × 10 scales · snap captured notes and/or line steps to the scale
DYNAMICS	Velocity follows ball speed within a MIN-MAX range, with random variation and adjustable tracking
CV	8 gate/note pairs and 8 X/Y position pairs out · 33 CV inputs for triggers, balls and lines

2 FRONT PANEL AT A GLANCE

The front panel is organised in three bands. The top band holds the transport-style controls, the arena and the first ball page. The middle strip sets pitch, velocity and the two trip lines. The bottom band shows what has been captured, the second ball page and the FLOW settings. Most controls drawn on the dark display areas can be clicked or dragged directly.

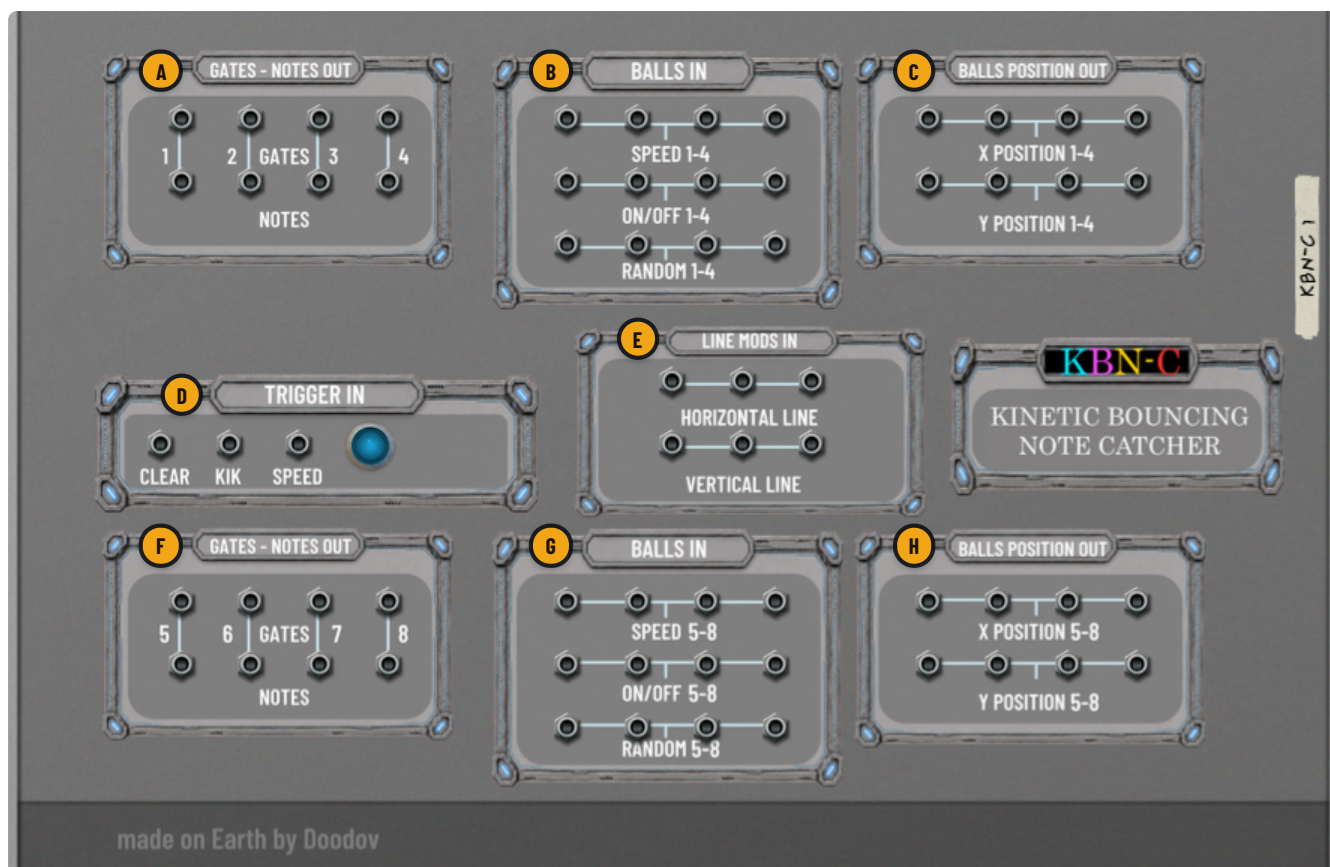


1	ON device on/off	chapter 4.3	2	RUN KICK CLEAR MODE	chapter 7
3	SYNC RECOVERY GATE	chapter 7	4	Arena: balls, walls, trip lines	chapter 6
5	Balls 1-4 page	chapter 8	6	ROOT NOTES LINES SCALE	chapter 11
7	Velocity MIN MAX VAR	chapter 10	8	LINE H trip line panel	chapter 12
9	LINE V trip line panel	chapter 12	10	Capture cards	chapter 13
11	LIFE TRACK CHORD THRU	chapter 13	12	Balls 5-8 page	chapter 8
13	FLOW: SPREAD COLL FILL	chapter 14			

EDIT ON THE DISPLAYS

Ball ON buttons and discs, SPEED cells, RND buttons and probability bars, every control on the two trip-line panels and the trip-line tabs in the arena respond to clicks and drags. Each edit is a normal undoable step in Reason.

3 BACK PANEL AT A GLANCE



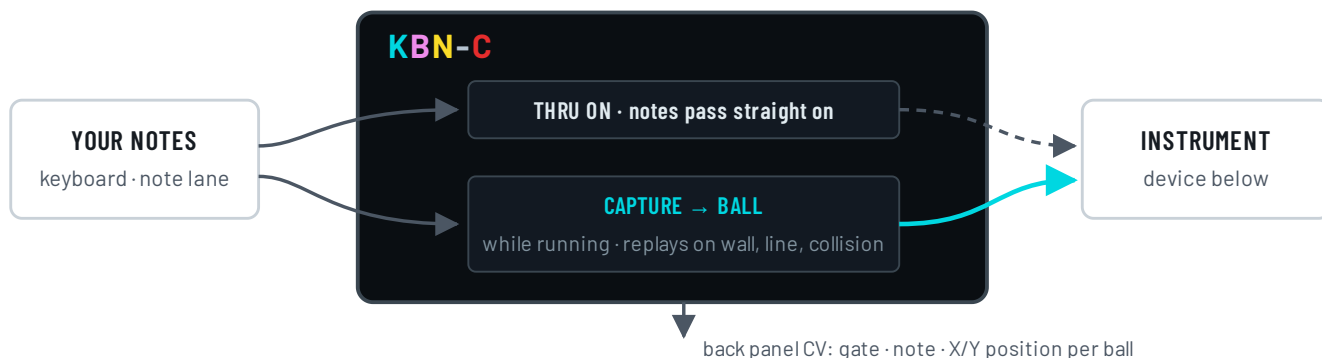
GROUP	CONTENTS
A	Gates – Notes out 1–4 Gate output (top row) and note output (bottom row) for balls 1–4
B	Balls in 1–4 SPEED, ON/OFF and RANDOM CV inputs for balls 1–4
C	Balls position out 1–4 X position (top row) and Y position (bottom row) of balls 1–4
D	Trigger in CLEAR and KIK trigger inputs, global SPEED CV input, blue PHANTOM button
E	Line mods in Horizontal line row and vertical line row; in each row, left to right: POSITION, ON/OFF, RANDOM
F	Gates – Notes out 5–8 As A, for balls 5–8
G	Balls in 5–8 As B, for balls 5–8
H	Balls position out 5–8 As C, for balls 5–8

Every socket is described in detail in chapter 15. Hovering over a socket in Reason shows its full name.

4 SETTING UP

4.1 INSERTING KBN-C

KBN-C is a **Player**. Players attach to an instrument device and process the notes on their way to it: whatever you play on the instrument's track, and whatever its note lane contains, passes through KBN-C first. Insert KBN-C on the instrument you want it to drive, just as you would any other Player.



Two things leave KBN-C towards the instrument: your incoming notes, if **THRU** is on, and the notes replayed by the balls. Every ball also drives a gate/note CV pair and an X/Y position pair on the back panel, so KBN-C can play or modulate other devices at the same time. KBN-C can be combined with other Players; it catches whatever reaches it.

Sounds with a defined attack — plucks, mallets, pianos, bells, percussive synths — show off the bouncing most clearly. Long pads work too, especially with longer **GATE** values.

4.2 RUNNING AND STOPPING

Balls only move, and new notes only become balls, while KBN-C is **running**. The red lamp under **RUN** shows the state; while running, the title letters K, B, N and C also light up for ball slots 1, 2, 3 and 4 when those slots are active.

SITUATION	WHAT HAPPENS
Reason's transport starts	KBN-C starts running automatically.
Transport playing, you press RUN	Toggles KBN-C off, and on again with the next press.
Transport stopped, you press RUN	Starts or stops KBN-C on its own, so you can jam without rolling the sequencer.
Reason's transport stops	KBN-C always stops, even if it was started with RUN.

While KBN-C is stopped, the balls freeze where they are and their **LIFE** clock pauses. Nothing is lost: press **RUN** or start the transport and they carry on. Incoming notes still pass through if **THRU** is on, but they do not launch new balls. Line bursts and delayed chord voices that were still pending when KBN-C stopped are dropped; notes already sounding finish at their gate length.

4.3 ON/OFF AND BYPASS

The round **ON** button **1** at the top left switches KBN-C off. Reason's own Bypass has the same effect. In both states KBN-C generates nothing: sounding notes are released, gate and note CV outputs drop to zero and the balls freeze in place. Incoming notes always pass straight through to the instrument, whatever **THRU** is set to. When switched Off, the displays are dimmed; when bypassed, the arena shows **BYPASSED**. Switch back and everything resumes exactly where it stopped. **KICK** and **CLEAR** keep working in both states.

5 THE CAPTURE MODEL

Everything in KBN-C starts with a note-on. This chapter follows a note from the moment it arrives until its ball leaves the arena.

5.1 FROM NOTE TO BALL

While KBN-C is running, each incoming note-on:

- is moved onto the current scale, if **NOTES** is lit (chapter 11);
- joins the ball launched just before it, if **CHORD** is on and it arrives within 80 ms (5.5);
- otherwise claims a ball slot (5.4) and launches a new ball from the centre of the arena, with a tiny random offset.

Once caught, a note belongs to its ball. Releasing the key has no effect — the ball keeps replaying the note until it leaves the arena (5.6).



5.2 LAUNCH DIRECTION: THE CHROMATIC CLOCK

The pitch of a note decides where its ball heads. Picture a clock face with C at twelve o'clock: **C launches straight up**, and every semitone turns the launch one "hour" (30°) clockwise. D# heads right, F# straight down, A left. The octave does not matter — C1 and C5 leave in the same direction.

Each launch adds up to $\pm 10^\circ$ of random variation (the shaded wedges). The four notes that would travel exactly along an axis — C, D#, F# and A — are nudged slightly off it, so a ball never gets stuck shuttling between two opposite walls.

In the diagram, a C major triad played with **CHORD** off launches three balls: C up, E towards four o'clock, G towards seven.

5.3 LAUNCH SPEED: VELOCITY

Each slot has a **SPEED** setting (chapter 8). The velocity of the captured note scales that speed **for the whole life of the ball**: velocity 1 travels at about half the set speed, velocity 64 at the set speed and velocity 127 at one and a half times. Soft notes drift, hard notes dart — and because hit velocity follows ball speed (chapter 10), hard-played notes also replay louder. Collisions change a ball's speed temporarily, but it always settles back to its own scaled speed (**RECOVERY**, 6.3).

5.4 SLOTS, FILL AND REPLACING THE OLDEST

There are eight slots, so there can be up to eight balls. Only slots that are **active** — their **ON** button lit, or their ON/OFF CV high — accept notes. The **FILL** switch on the FLOW panel decides which free slot a new note takes:

FILL	BEHAVIOUR
CYCLE	Notes go round the free active slots in turn, so successive notes spread across all eight colours and speed settings.
FIRST	A note always takes the lowest-numbered free active slot. Slot 1 is reused the moment it becomes free, which makes voicing predictable: set slots 1-2 slow and 3-8 fast, and your first notes drift while any overflow darts.

When every active slot already holds a ball, the **oldest** ball (the one launched earliest) is removed, its notes are released cleanly, and the new note takes its slot. This happens in both FILL modes. If no slot is active at all, notes are not captured.

5.5 CHORDS

With **CHORD** on (the default), the first note-on launches a ball immediately, and any further notes arriving within **80 ms** join that same ball, up to four notes. A repeated pitch is ignored. Every hit then replays the whole chord. A chord

played normally lands well within the window; a slowly rolled chord, or very fast single notes, may be split into several balls or merged into one.

The note that launched the ball is the chord's **root**. It sets the direction and, together with its velocity, the speed. It is also the note sent to the ball's NOTE CV output, and the reference for line bursts, which move the whole chord in parallel (chapter 12). **SPREAD** on the FLOW panel strums the chord: each further voice sounds SPREAD milliseconds after the previous one (chapter 9).

With **CHORD** off, every note-on launches its own ball.

5.6 HOW A BALL LEAVES THE ARENA

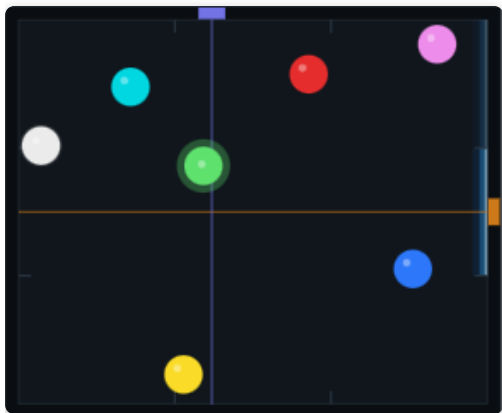
CAUSE	WHAT HAPPENS TO ITS NOTES
LIFE runs out	The ball disappears and its notes are released immediately.
Replaced by a newer note	As above (5.4).
Its slot is switched OFF	As above. The slot also stops accepting notes until switched on again.
CLEAR (button or CV)	Soft clear. All balls vanish at once and pending bursts, queued hits and strummed voices are dropped, but notes already sounding ring out to the end of their gate.

Stopping the transport or switching KBN-C Off does not remove balls; they simply freeze.

5.7 THRU

THRU decides what happens to the notes you play. **On**: they pass straight to the instrument as well, so you hear your note first and then the ball's replays. **Off**: they are swallowed, and only the balls are heard. Switching THRU off while holding keys releases those notes cleanly. When KBN-C is Off or bypassed, incoming notes always pass through. The pass-through note is never altered: with **NOTES** lit you hear exactly what you played, followed by the ball's scale-corrected version.

6 THE ARENA



The arena 4 is a closed box. Balls move in straight lines, bounce off the four walls and off each other, and pass freely through the two trip lines. Only slots that hold a captured note show a ball.

6.1 WALLS

Every wall bounce replays the ball's note or chord. The part of the wall that was hit flashes blue. If the ball's **RND** is lit, each wall hit sounds only with the probability set on its bar (chapter 8) – the ball always bounces, only the note is skipped.

6.2 COLLISIONS

Balls collide like billiard balls of equal weight: they exchange momentum along the line of impact, so a fast ball hitting a slow one can pass most of its speed on. With **COLL** on the FLOW panel set to **TRIG**, a collision replays **both** balls' notes, at a velocity based on how hard they met. Set to **OFF**, balls still collide but silently. Collision notes are not affected by a ball's RND probability.

A freshly launched ball does not trigger collision notes for its first 150 ms (it still bounces). This keeps several notes played at once from setting off a burst of collisions at the centre.

6.3 RECOVERY

After a collision, a ball may be moving faster or slower than its setting. **RECOVERY** 3 sets how long it takes to settle back, from 50 ms to 5 s. Short values keep each ball close to its own pace, so the rhythm of each slot stays recognisable. Long values let the energy of a collision ripple through the arena for several seconds.

6.4 KICK

KICK 2 sends every ball off in a new random direction without changing its speed. Use it to break up a pattern that has settled into a loop. The KIK socket on the back panel does the same from a trigger. A slot that is switched on also gets a fresh random direction.

6.5 TRIP LINES IN THE ARENA

The horizontal line is orange, with its grab tab on the right edge of the arena. The vertical line is violet, with its tab above the arena. **Drag a tab** to move its line; when a line is on, you can also grab it anywhere along its length. A switched-off line and its tab are drawn dimmed. When a ball crosses a line that is on, it starts a note burst (chapter 12), and the line gives a short shiver whenever a burst note actually sounds.

A line placed right against a wall is never crossed, because balls turn around before their centre reaches it.

6.6 READING THE ARENA

YOU SEE	IT MEANS
A coloured ball	That slot holds a captured note or chord.
Blue flash along a wall	A wall hit produced a note at that spot.
A ball briefly pulsing	It played a collision or burst note.
A line shivering	A crossing just produced a burst note.
A faint second line	Line POSITION CV has moved the effective crossing point there (PHANTOM on, chapter 15).
BYPASSED banner	Reason has bypassed the device (4.3).
All displays dimmed	KBN-C is switched Off with ON (4.3).

7

CONTROLS SECTION



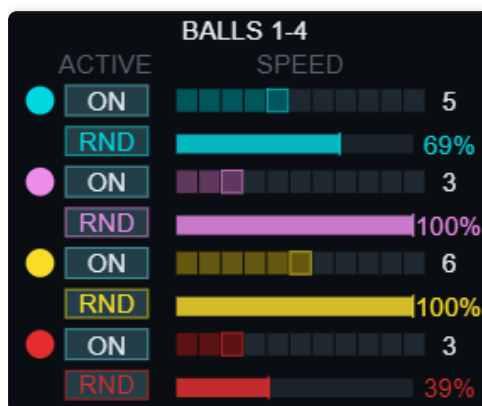
The top-left section **2 3** holds the controls that start, stop and time KBN-C. RUN, KICK and CLEAR are momentary buttons; they cannot be automated, but KICK and CLEAR have CV trigger inputs.

The value of each knob is printed under it. **MODE** is a two-position switch, with its setting shown below.

CONTROL	VALUES	FUNCTION
RUN	button	Starts and stops KBN-C (4.2). The red lamp below shows the running state.
KICK	button	Sends every ball in a new random direction, keeping its speed (6.4).
CLEAR	button	Soft clear: removes all balls, lets sounding notes ring out (5.6).
MODE	FREE · QUANT	FREE: hits sound the instant they happen. QUANT: while the transport plays, hits are released on the SYNC grid (9.1).
SYNC	1/1 · 1/2 · 1/2T · 1/4D · 1/4 · 1/8D · 1/8 · 1/8T · 1/16D · 1/16 · 1/16T · 1/32	The grid used by QUANT and by trip-line Q, and the time span of one trip-line burst (chapter 12).
RECOVERY	50 ms · 100 ms · 200 ms · 350 ms · 500 ms · 1 s · 2 s · 5 s	How long a ball takes to settle back to its speed after a collision (6.3).
GATE	1/8 · 1/4 · 1/2 · whole note	Length of every note (and CV gate) at the current tempo (9.2).

Defaults: MODE QUANT, SYNC 1/8, RECOVERY 350 ms, GATE 1/4. QUANT is a safe default because KBN-C always plays free while the transport is stopped.

8 BALL PAGES



The speed steps are spaced so that each one is noticeably faster than the last. The table shows roughly how long a ball takes to travel from the left wall to the right wall, depending on the velocity it was captured with (5.3). Diagonal paths, collisions and SPEED CV change these figures.

8.2 LOWER ROW: RND AND PROBABILITY

RND arms a probability gate on the ball's **wall hits**. The bar beside it sets the chance, 0–100%: click or drag along it. At 69%, roughly seven wall hits out of ten produce a note. The ball always bounces; only the note is skipped. Collisions and trip-line bursts are not affected — lines have their own OUT probability.

When RND is unlit, the bar is dimmed and every wall hit sounds. Patching the slot's RANDOM CV input arms RND automatically (chapter 15).

Two identical pages set up the eight slots: **BALLS 1–4** **5** at the top right and **BALLS 5–8** **12** at the bottom. Each slot has two rows.

8.1 UPPER ROW: ON AND SPEED

ON (or the coloured disc beside it) makes the slot active. Switching a slot off removes its ball at once, with its notes released, and the slot stops accepting notes. When the slot's ON/OFF CV input is patched, the CV decides instead.

SPEED: click one of the 11 cells, or drag along the row. The number on the right shows the step, 1 to 11.

STEP	VELOCITY 64	VELOCITY 1	VELOCITY 127
1	9.2 s	18 s	6.1 s
2	5.7 s	11 s	3.8 s
3(default)	3.8 s	7.7 s	2.6 s
4	2.6 s	5.2 s	1.8 s
5	1.8 s	3.7 s	1.2 s
6	1.3 s	2.6 s	0.87 s
7	0.97 s	1.9 s	0.64 s
8	0.73 s	1.5 s	0.49 s
9	0.57 s	1.2 s	0.38 s
10	0.46 s	0.92 s	0.31 s
11	0.37 s	0.73 s	0.24 s

PHANTOM MARKERS

When SPEED or RANDOM CV is patched and the back-panel PHANTOM button is lit, a light vertical marker shows where the CV has actually moved the value. The lit cell or bar stays at your panel setting.

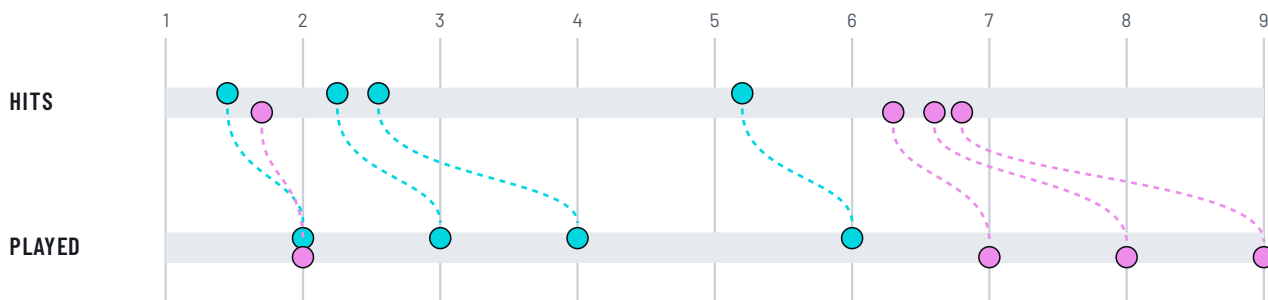
9

TIMING AND ARTICULATION

9.1 FREE AND QUANT

In **FREE** mode every wall and collision hit sounds the instant it happens, giving loose, un-gridded rhythms that follow the physics exactly.

In **QUANT** mode, while the transport is playing, hits are collected per ball and released on the **SYNC** grid, **one hit per ball per step**. A ball that hits faster than the grid queues its hits and plays them back in turn on the following steps. Up to 16 hits can wait per ball; beyond that, the oldest waiting hits are dropped. When the transport stops, or you switch to FREE, the most recent waiting hit of each ball plays immediately and the rest are discarded.



Each step releases at most one waiting hit per ball; a ball hitting faster than the grid queues its hits and plays them in turn.

QUANT has no effect while the transport is stopped: KBN-C then plays free, so a stopped jam never sounds silent. Trip-line bursts are not queued; they follow their line's own **Q** button instead (12.4).

BALANCING SPEED AND SYNC

In QUANT mode, a fast ball on a slow grid builds up a queue and starts to lag behind the arena. If the sound stops matching what you see, choose a finer SYNC value, lower the SPEED, or switch to FREE.

9.2 GATE LENGTH

GATE sets how long each note lasts, in note values at the song tempo: 1/8 (half a beat), 1/4 (one beat), 1/2 (two beats) or a whole note (four beats). The tempo is followed whether the transport is playing or not. If a ball hits again while its note is still sounding, the note restarts with the new hit. Notes inside a trip-line burst are shortened to 80% of their spacing so that fast bursts stay articulated.

9.3 SPREAD: SAME-NOTE SEPARATION AND STRUM

SPREAD on the FLOW panel, from 0 to 100 ms, has two jobs:

- **Same-note separation.** When several balls play the same pitch at the same moment, the hits are staggered SPREAD milliseconds apart instead of landing on top of each other, where the instrument would hear a single note.
- **Chord strum.** A chord ball sounds its voices one after another, each SPREAD milliseconds after the previous.

At 0 the display reads OFF: identical notes coincide and chords play as blocks. The default of 10 ms is just enough to keep unisons audible without sounding late.

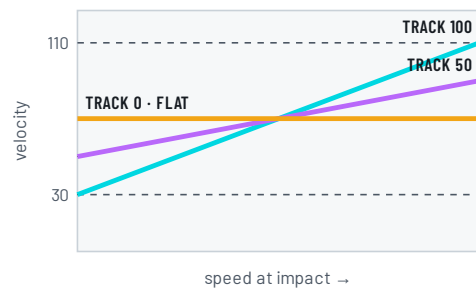
NO HANGING, NO CUT-OFFS

When several balls hold the same pitch, KBN-C keeps count: that note is released only when the last ball holding it lets go. Shared notes never cut each other short and never hang.

10 DYNAMICS

The velocity of every note KBN-C plays comes from **speed at impact**. A wall hit or line crossing uses the ball's own speed; a collision uses how fast the two balls closed in on each other.

CONTROL	RANGE	FUNCTION
MIN	0-127	Velocity of the slowest hits. Default 30.
MAX	0-127	Velocity of the fastest hits. Default 110. If MIN is set above MAX, the two are swapped.
VAR	±0-20	Random variation added to each hit, kept within MIN-MAX. Default ±10.
TRACK	0-100	How strongly speed affects velocity. 100: full range. 0 (FLAT): every hit at the middle of the range, plus VAR. On the Capture panel.



Because captured velocity also sets a ball's pace (5.3), notes you play harder travel faster and replay louder. Collisions can briefly lift or lower a ball's speed, and its velocity follows. The table gives a feel for the default range, for a ball captured at velocity 64 moving at its set speed, with VAR at 0:

SPEED STEP	1	3	5	6	8	10	11
Velocity	33	37	44	49	64	84	97

Only a hard-played note on the fastest steps, or a strong collision, reaches MAX. The GATE CV outputs carry the same velocity as a level between 0 and 1.

11 PITCH: ROOT, SCALE, NOTES, LINES



ROOT (C to B) and **SCALE** (6) define a musical frame. Two buttons decide who follows it; both are lit by default.

BUTTON	LIT	UNLIT
NOTES	Each captured note is moved to the nearest note of the scale at the moment of capture . The ball keeps the corrected note for all its hits and on its NOTE CV output. A note exactly between two scale notes moves down. Each note of a chord is corrected on its own.	Balls keep exactly the notes you played.
LINES	Trip-line JUMP steps count scale degrees . If the ball's note is outside the scale, the burst first moves it to the nearest scale note.	JUMP steps count semitones , starting from the ball's note as it is.

Changing ROOT or SCALE does not re-tune balls already in the arena, because notes are corrected when they are captured. It does affect the next bursts on the trip lines. With the Chromatic scale, NOTES changes nothing.

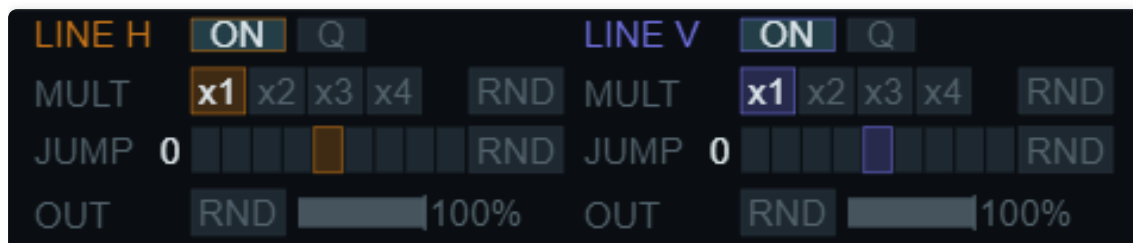
11.1 SCALES

SCALE	NOTES WITH ROOT = C	SCALE	NOTES WITH ROOT = C
Chromatic	all 12 notes	Blues	C E $\flat$ F F $\sharp$ G B $\flat$
Major	C D E F G A B	Dorian	C D E $\flat$ F G A B $\flat$
Natural Minor	C D E $\flat$ F G A $\flat$ B $\flat$	Mixolydian	C D E F G A B $\flat$
Harmonic Minor	C D E $\flat$ F G A $\flat$ B	Whole Tone	C D E F $\sharp$ G $\sharp$ A $\sharp$
Pentatonic Major	C D E G A		
Pentatonic Minor	C E $\flat$ F G B $\flat$		

THRU AND NOTES

The notes you play are passed through unchanged. With THRU on and NOTES lit, an out-of-scale note is heard once as played, then corrected on every ball hit. Turn THRU off if you want to hear only in-scale notes.

12 TRIP LINES

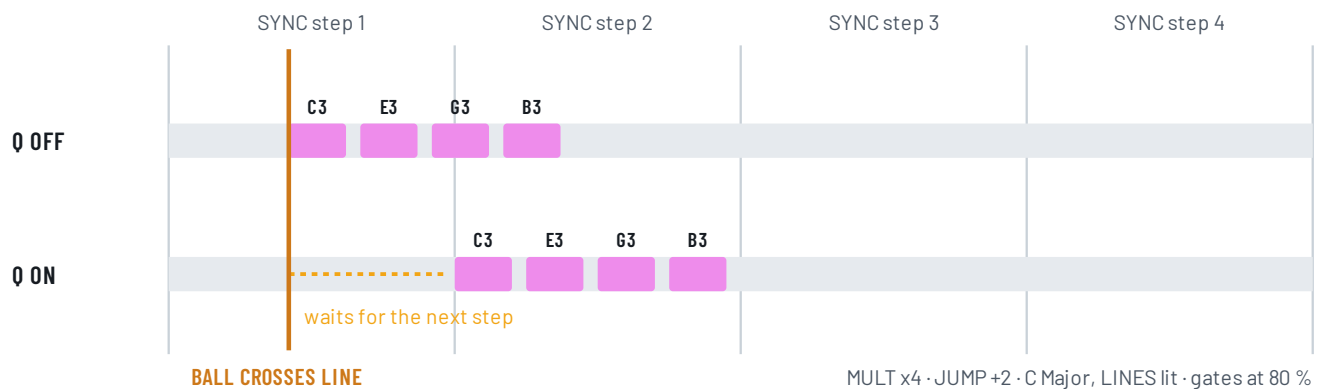


Two identical panels control the **LINE H** horizontal line **8** and the **LINE V** vertical line **9**. Set a line's position by dragging its tab in the arena (6.5). Every other setting is clicked or dragged on the panel.

CONTROL	VALUES	FUNCTION
ON	on · off	Enables the line. Patching its ON/OFF CV input overrides the button.
Q	on · off	Starts each burst on the next SYNC step while the transport plays (12.4).
MULT	x1 · x2 · x3 · x4	Number of notes in a burst.
RND (MULT row)	on · off	Random note count for every crossing: 2 notes (40%), 3 notes (40%) or 4 notes (20%). MULT is ignored.
JUMP	-4 ... +4	Step between successive burst notes, in scale degrees or semitones (see LINES, chapter 11). The number left of the cells shows the value. 0 repeats the note.
RND (JUMP row)	on · off	Each step of the burst takes a new random JUMP between -4 and +4.
RND (OUT row)	on · off	Arms the output probability: each burst note sounds only with the chance set on the bar.
OUT bar	0–100%	Output probability, click or drag. The line shivers only for notes that actually sound.

12.1 HOW A BURST WORKS

When a ball crosses a line that is on, it starts a **burst**: MULT notes spread evenly over **one SYNC step**. The first note is the ball's own note or chord; each following note moves by JUMP from the one before. With SYNC at 1/8 and MULT at x4, a crossing plays four 32nd notes. The velocity of all notes in the burst is taken from the ball's speed at the crossing.



In the example above, with C Major and LINES lit, JUMP +2 walks up in thirds: C3, E3, G3, B3. With LINES unlit the same setting walks in whole tones: C3, D3, E3, F#3.

12.2 ONE BURST PER BALL

Each ball carries one burst at a time. If it crosses a line again — the same one or the other — before its burst has finished, the new crossing replaces it. Bursts stop when KBN-C stops.

12.3 CHORDS ON THE LINES

A chord ball bursts with its whole chord. The root follows the JUMP steps and the other voices move in parallel, keeping their distance in semitones from the root. With LINES lit, the root stays in the scale, but upper voices may step outside it — the chord keeps its shape.

12.4 Q: BURSTS ON THE GRID

Bursts ignore **MODE**: even in QUANT mode, a burst starts right at the crossing. Light a line's **Q** to change that. While the transport is playing, the burst then waits for the next SYNC step and plays from there, so line crossings land on the grid. The two lines' Q buttons are independent. When the transport is stopped, Q has no effect. If a ball crosses again while a Q'd burst is still waiting, the newer crossing wins.

13 CAPTURE PANEL



13.1 CAPTURE CARDS

The left part of the panel **10** shows one card per slot, in the slot's colour. A **filled disc** means the slot holds a ball; a **hollow ring** means it is empty. The card shows the captured note or chord (for example C3 E3 G3), or --- when empty. The bar along the bottom of an occupied card shows how much **LIFE** remains; with LIFE at HOLD, it stays full and dimmed.

13.2 LIFE

LIFE **11** sets how long a ball lives, from 0.5 s to 60 s, on an exponential scale so that short values can be set precisely. The value is shown below the knob in seconds. Fully clockwise is **HOLD**: the ball stays until it is replaced by a newer note, its slot is switched off or you press CLEAR.

A ball's life only counts down while KBN-C is running. Changes to LIFE apply to balls already in the arena, so turning it down can retire older balls straight away.

13.3 TRACK

Sets how strongly ball speed affects velocity: 100 is fully proportional, 0 (FLAT) plays every hit at the middle of the MIN-MAX range. See chapter 10.

LIFE KNOB	LIFETIME
0 (fully left)	0.5 s
20	1.3 s
40	3.5 s
60	9.1 s
80	24 s
99	60 s
100 (fully right)	HOLD

13.4 CHORD AND THRU

SWITCH	ON	OFF
CHORD	Notes arriving within 80 ms share one ball, up to 4 notes (5.5). Default.	Every note launches its own ball.
THRU	Incoming notes also pass straight to the instrument (5.7). Default.	Incoming notes are swallowed; only the balls play.

14 FLOW PANEL



The FLOW panel **13** gathers three settings that shape how notes flow out of the arena.

CONTROL	VALUES	FUNCTION
SPREAD	OFF, 1-100 ms	Staggers identical notes from different balls and strums chord voices (9.3). Default 10 ms.
COLL	TRIG · OFF	TRIG: collisions replay both balls' notes. OFF: collisions are silent bounces (6.2). Default TRIG.
FILL	CYCLE · FIRST	Which free slot a new note takes: in turn, or always the lowest-numbered (5.4). Default CYCLE.

15 CV CONNECTIONS

All CV inputs and outputs use Reason's standard ranges. "Bipolar" inputs respond to both positive and negative CV: an LFO swings the value either side of the panel setting, while a unipolar source such as an envelope only pushes it one way. Trigger inputs react when the CV rises above 0.2.

15.1 OUTPUTS

SOCKET	GROUP	SIGNAL
GATES 1-8	A F	While a ball's note sounds: the hit velocity as a level from 0 to 1; otherwise 0. Length follows GATE.
NOTES 1-8	A F	The ball's note as note CV (MIDI note / 127), holding its value between hits. Chord balls send their root.
X POSITION 1-8	C H	Horizontal ball position: 0 at the left wall, 1 at the right.
Y POSITION 1-8	C H	Vertical ball position: 0 at the bottom wall, 1 at the top.

A gate/note pair connects directly to the Sequencer Control inputs of a monophonic instrument, so each ball can play its own device. Position outputs read 0 for an empty slot and while KBN-C is Off or bypassed; gate and note outputs are also 0 in those states.

15.2 INPUTS

SOCKET	GROUP	TYPE	EFFECT
CLEAR	D	trigger	Same as the CLEAR button: soft clear (5.6).
KICK	D	trigger	Same as the KICK button (6.4).
SPEED	D	bipolar	Global speed. A full positive swing raises every ball by 10 speed steps, a full negative swing lowers it by 10, always within steps 1-11.
SPEED 1-8	B G	bipolar	The same for one ball; adds to the global SPEED CV.
ON/OFF 1-8	B G	gate	When patched, replaces the slot's ON button: above 0.5 = on. Unpatched, the button decides.
RANDOM 1-8	B G	bipolar	When patched, RND is armed and the CV shifts the probability: +1 adds 100%, -1 removes 100%, within 0-100%.
HORIZONTAL LINE, left	E	bipolar	POSITION: shifts the line. +1 moves it by the full arena height (positive = down), within the arena.
HORIZONTAL LINE, middle	E	gate	ON/OFF: when patched, replaces the line's ON button (above 0.5 = on).
HORIZONTAL LINE, right	E	bipolar	RANDOM: arms OUT RND and shifts the OUT probability like the ball RANDOM inputs.
VERTICAL LINE, left · middle · right	E		The same for the vertical line. Positive POSITION CV moves it to the right.

15.3 PHANTOM BUTTON

The blue button in the TRIGGER IN group  shows or hides the **phantom markers** on the front panel. When lit (the default), each value that CV is moving shows where it actually is: a light marker on a ball's SPEED cells or probability bar, a marker on a line's OUT bar, and a faint second line in the arena at a line's CV-modulated position. Your panel settings stay visible as usual. Switching the button off only hides the markers; the CV keeps working.

16 RECIPES

Starting points for exploring. Anything not mentioned stays at its default.

FLOATING BELLS

MODE FREE SPEED 1-3 on all slots LIFE ≈ 20 s
GATE 1/2 THRU OFF RECOVERY 2 s VAR 15

Use a bell, glass or mallet patch with a long release. Play slow single notes and let each one drift, meet the others and retire after twenty seconds or so.

Try Pentatonic Major with NOTES lit and play anything: the arena stays consonant.

THREE-BALL ARPEGGIO

CHORD OFF slots 4-8 OFF SYNC 1/16 GATE 1/8
SPEED 5-7 SPREAD 0

Play a triad. With CHORD off, its three notes become three balls that interlock on a 16th-note grid.

Because only three slots are active, the next triad replaces the previous one note by note: a self-updating arpeggiator you play with chord changes.

STRUMMED BOUNCES

CHORD ON SPREAD 30-50 ms COLL OFF GATE 1/4
MODE FREE

Use a plucked guitar, harp or kalimba. Play chords: every wall hit strums the whole chord, and with collisions silent, each ball keeps a clear pulse.

Set SPREAD to its maximum for slow, harp-like rolls.

GRID RATCHETS

MODE QUANT SYNC 1/8 LINE H ON Q MULT x3 JUMP +1
LINE V ON Q RND on MULT and JUMP

Walls play on eighth notes while every line crossing adds a quantized scale run. The vertical line rolls its own note count and steps, so its runs never repeat exactly.

Lower the OUT probability on one line to thin the runs out.

SLOW VOICES, FAST SPARKLE

FILL FIRST LIFE ≈ 5 s slots 1-2 SPEED 2 slots 3-8
SPEED 8

Play sparsely and your notes land in the slow first slots. Play a flurry and the overflow spills into the fast slots and chatters.

Turn TRACK down to keep the fast balls from overpowering the slow ones.

MOTION AS MODULATION

X POSITION 1 → a filter cutoff CV · Y POSITION 1 → a pan or level CV · GATES 2 + NOTES 2 → a second mono instrument

The balls are also eight moving two-dimensional controllers. Route a ball's position to sound parameters so its movement is heard even between hits.

Feed a slow LFO into the global SPEED input to make the whole arena breathe.

17 AUTOMATION AND MIDI CC

Every front panel parameter except **RUN**, **KICK** and **CLEAR** can be automated in the sequencer and controlled remotely (Combinator rotaries and buttons, Remote). For Combinator programming, the parameters are grouped into general timing, ball activity and speed, ball randomness, capture and flow, pitch and velocity, line H and line V. Trip-line **position** (the tab you drag in the arena) is included; the back-panel PHANTOM button is not.

CC	PARAMETER	CC	PARAMETER
13	Gate Mode	50	Line V Position
14	Sync Resolution	51	Line V Ratchet
15	Recovery Time	52	Line V Jump
16	Gate Length	53	Line V Random Count
17	Ball 1 Active	54	Line V Random Jump
18	Ball 2 Active	55	Line V Random Out
19	Ball 3 Active	56	Line V Probability
20	Ball 4 Active	57	Ball 5 Active
21	Ball 1 Speed	58	Ball 6 Active
22	Ball 2 Speed	59	Ball 7 Active
23	Ball 3 Speed	60	Ball 8 Active
24	Ball 4 Speed	61	Ball 5 Speed
25	Root Note	62	Ball 6 Speed
27	Scale	63	Ball 7 Speed
28	Ball 1 Random	68	Ball 7 Random
29	Ball 2 Random	69	Ball 8 Random
30	Ball 3 Random	70	Ball 5 Probability
31	Ball 4 Random	71	Ball 6 Probability
33	Ball 1 Probability	72	Ball 7 Probability
34	Ball 2 Probability	73	Ball 8 Probability
35	Ball 3 Probability	74	Ball Life
36	Ball 4 Probability	75	Chord Capture
37	Velocity Min	76	Note Thru
39	Velocity Max	77	Fill Mode
40	Velocity Random	78	Vel Tracking
41	Line H On	79	Line H Quantize
42	Line H Position	80	Line V Quantize
43	Line H Ratchet	81	Scale Notes
44	Line H Jump	82	Same-Note Spread
45	Line H Random Count	83	Collision Triggers
46	Line H Random Jump	84	Ball 8 Speed
47	Line H Random Out	85	Ball 5 Random
48	Line H Probability	86	Ball 6 Random
49	Line V On	87	Scale Lines

18

TROUBLESHOOTING

I play notes but no balls appear.

KBN-C is not running: the lamp under **RUN** is dark. Press RUN or start the transport. Also check that at least one slot is **ON** (and not held off by an ON/OFF CV), and that KBN-C is not switched Off or bypassed.

The balls stopped moving.

The transport was stopped, which always stops KBN-C. Press RUN to carry on without the transport.

I hear each note twice.

THRU is on: you hear the note you played, then the ball's first hit. Switch THRU off to hear only the balls.

The sound lags behind what I see, or hits bunch up.

In QUANT mode, balls that hit faster than the SYNC grid queue their hits (9.1). Use a finer SYNC, lower SPEED values or FREE mode.

A note comes out different from the one I played.

NOTES is lit, so captured notes are moved into ROOT and SCALE. Unlight NOTES or choose Chromatic.

Two balls on the same note sound slightly apart.

That is **SPREAD** separating identical notes (9.3). Set it to 0 for exact unisons.

My chord turned into several balls, or separate notes became one ball.

Chord capture groups notes arriving within 80 ms (5.5). Play chords together, and play fast single-note lines with CHORD off.

Balls disappear on their own.

LIFE is below HOLD, or a new note replaced the oldest ball because all active slots were full.

CLEAR didn't silence everything at once.

By design, notes already sounding ring out to the end of their gate. Shorten GATE, or switch slots off for an immediate release.

A trip line never fires.

Check that its **ON** is lit (or its ON/OFF CV is high), that it is not pushed against a wall, and that OUT RND is not set to a very low probability.

Some wall hits are silent.

The ball's RND is lit with a probability below 100%, or its RANDOM CV input is patched and lowering it.

Every performance is different, even with the same notes.

That is KBN-C working as intended: launches include small random variations, so the balls never retrace the same paths. To keep a performance you like, record the instrument's audio.



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