

BallRoomX

Kinetic Ball Looper — extended

Operation Manual



Six balls travel around a room. Each one carries a loop it recorded from your audio and plays it at the speed it moves. The walls of the centre arena change what a loop does when a ball hits them, and the corridors around it change a ball's speed, direction and pitch as it passes through. Three FX cannons fire effect balls that infect the loops they touch.

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1 Introduction

BallRoomX is a looper played like an instrument. Each note you play launches a ball into the centre of a room. The ball records a short take of the incoming audio, then plays it back in a loop while it moves. The loop's playback speed follows the ball's speed, so every collision and every change of motion is heard as a bend in pitch and timing.

Around the centre arena runs a ring of corridors. When doors are open, balls leave the arena and travel through cells that change their speed, direction or pitch, record a new take, or send them back to their starting state. The four arena walls carry functions too — reverse the loop, restart it, halve or double its rate and more — so the paths of the balls become an evolving arrangement of loops. On top of that, BallRoomX fires effect balls into the arena: a loop ball hit by one plays through that effect for a while.

Main features

- Six balls (voices), each with its own loop of 0.1 to 5 seconds recorded from the stereo input.
- Playback speed driven by the ball's motion: launch speed, velocity, collisions, the **SPEED** cells and the **RATE** knob.
- Two pitch modes: **TAPE** (speed changes pitch, like tape) and **LOCK** (granular, pitch stays put).
- Two playback modes: **ROLL** (loops play continuously) and **HIT** (a one-shot on each wall hit).
- A **room**: the centre arena plus a ring of ten cells — three **SPEED** cells, three **DIRECTION** cells, two **PITCH** cells, **RECAPTURE** and **HOME**.
- Eight doors between the arena, the corridors and the columns, each closed, open or automatic (random, or by CV).
- Sixteen wall functions on the four arena walls.
- **VOICES** control for 1 to 6 balls, one direction lever and one **LIFE** knob for all balls, **KICK** and **CLEAR**.
- **HOLD** and **LIFE** modes: balls that last as long as the note, or that live on their own for a set time.
- Keyboard transposition around a root note.
- A stereo output per ball; CV outputs for ball positions, wall hits and cell changes; CV inputs for a sequencer, per-ball gates and notes, kick, clear, speed, rate and the eight doors.
- Three **FX cannons** with ten effects (drive, fold, crush, grain, stutter, comb, ring, sweep, echo, chop), each linked to the motion of the ball it infects, with an optional **CONTAGION** mode.
- Ball size, gravity, launch aim and spread, a function for ball-to-ball collisions, a chance per wall, selectable pitch-cell intervals, **KEEP / RESTORE** per strip, a current (**FLOW**) around the ring and an adjustable door width.
- A live room display, and factory patches organised by theme.

About this manual

Chapter 2 gets you making sound in a couple of minutes. Chapter 3 explains how BallRoomX thinks, and chapter 4 describes the room, its cells and its doors; chapters 5 and 6 cover the FX balls and the extra physics controls. Chapters 7 to 10 are the reference for every control, the display, the walls and the back panel. The last chapters cover signal flow, playing techniques, patches and automation, troubleshooting and specifications.

2 Getting started

Creating the device

Create BallRoomX from the Instruments section of the browser. Reason gives it its own sequencer track with a note lane, and connects its main **OUT** to the mixer. BallRoomX makes no sound of its own: it needs audio to record.

Connecting a source

Flip the rack (Tab) and connect a stereo audio source to **IN** on the back panel — a drum machine, a synth, a loop player, an audio track's output, anything. For a mono source, feed the same signal to both L and R (with a Spider Audio splitter, for example); otherwise the balls play on the left only.

Note. The IN meter in the LOOP section lights when a signal reaches the input. If it stays dark, the balls will record silence.

First sound in five steps

1. Make sure the source is playing (start the transport if it is a sequenced device).
2. Load the patch *01 Basics / Init*, or keep the default settings. With the default settings every door is closed, so the balls stay in the centre arena.
3. Play and hold a note. A ball appears in the arena with a bright ring while it records, then plays its loop as it bounces.
4. Hold a few more notes: up to six balls, each with its own take of the input recorded at a different moment.
5. Push the TOP, LEFT, RIGHT and BTM door levers in the ROOM section to the middle (OPEN). Balls now leave the arena and change speed, direction and pitch as they pass through the cells of the ring.

Release the keys and the balls fade out with the release time. Switch **LIFE / HOLD** to LIFE if you want the balls to carry on without holding the keys. Then try giving the four arena walls functions with the wall knobs.

Firing an effect

With a few balls playing, click **FIRE** in the FX 1 section. An FX ball shoots out of the top-left corner of the arena. Every loop ball it touches plays through FX 1's effect (Drive by default) for the TIME set in the section, shown by a ring of dots around the ball. Click FIRE again to remove the FX ball.

3 How BallRoomX works

Balls, takes and loops

BallRoomX has six balls, numbered and coloured 1 (red), 2 (blue), 3 (green), 4 (yellow), 5 (purple) and 6 (orange). Each ball is a voice. When a note starts a ball:

- The ball is launched from its own starting point in the centre arena (in the direction set by AIM and SPRD, random by default).
- It starts recording its **take**: the next LENGTH seconds of the input.
- About 30 milliseconds later it starts playing what has been recorded so far. The loop grows while the take is recording, and once the take is complete the ball loops the whole of it.
- It keeps playing until it is released — by the note ending (HOLD mode), by its life running out (LIFE mode), by a CHOK wall, by CLEAR, by VOICES being turned down, or by being replaced by a new note.

The room

The balls start in the centre arena, a square with four walls: 1 top, 2 right, 3 left and 4 bottom. Each wall has a **function** applied to a ball's loop when the ball hits it (chapter 9). Around the arena runs a ring: a SPEED corridor along the top, a DIRECTION corridor along the bottom, and a column on each side. The ring is divided into ten **cells**; entering a cell changes something about the ball. Eight **doors** connect the arena to the ring and the corridors to the columns. Chapter 4 describes them in detail.

Speed is playback rate

A ball plays its loop at a rate equal to its current speed divided by the SPEED knob setting it was launched with — multiplied by the **RATE** knob and by any rate change from HALF / DOUBLE walls or the PITCH cells. A ball moving at the SPEED setting plays at exactly the RATE setting. When two balls collide, they exchange speed: one speeds up and the other slows down, and both drift back to their own speed over the **RECOV** (recovery) time. A SPEED cell gives a ball a new speed of its own — and so a new playback rate. The overall playback rate of a ball is limited to 8x.

The launch speed is set by the **SPEED** knob and changed by velocity: with **VEL** up, a harder note launches a faster ball. SPEED only affects balls launched after you change it. To change the playback rate of everything at once, use RATE.

Note. Velocity also sets the level of each ball. A soft note gives a quieter ball, whatever the VEL setting.

TAPE and LOCK

TAPE plays the loop like a tape: faster is higher, slower is lower, and reverse is backwards. **LOCK** reads the loop with short overlapping grains, so the speed changes how fast the loop moves through its material but not its pitch.

ROLL and HIT

- **ROLL**: each ball plays its loop continuously, wrapping smoothly from end to start.
- **HIT**: a ball is silent in flight. Every hit on an arena wall fires a *shot*: the loop plays once, from its start (or its end when the ball plays in reverse), and fades out at the other end. The outer walls of the room do not fire shots. With a COLL function set, a contact between two balls fires a shot too.

In HIT mode, the direction and pitch changes made by the cells are applied at the ball's next wall hit, together with its shot.

HOLD and LIFE

- **HOLD:** a ball lives as long as its key (or gate) is held. Releasing the key fades the ball out over the release time.
- **LIFE:** key releases are ignored. Each ball lives for the time set by the LIFE knob, then fades out. The clock runs only while the ball is playing, and turning LIFE re-times the balls in flight. Fully up, balls live forever.

Switching from LIFE back to HOLD releases every ball whose key has already been released, and keeps the ones still held.

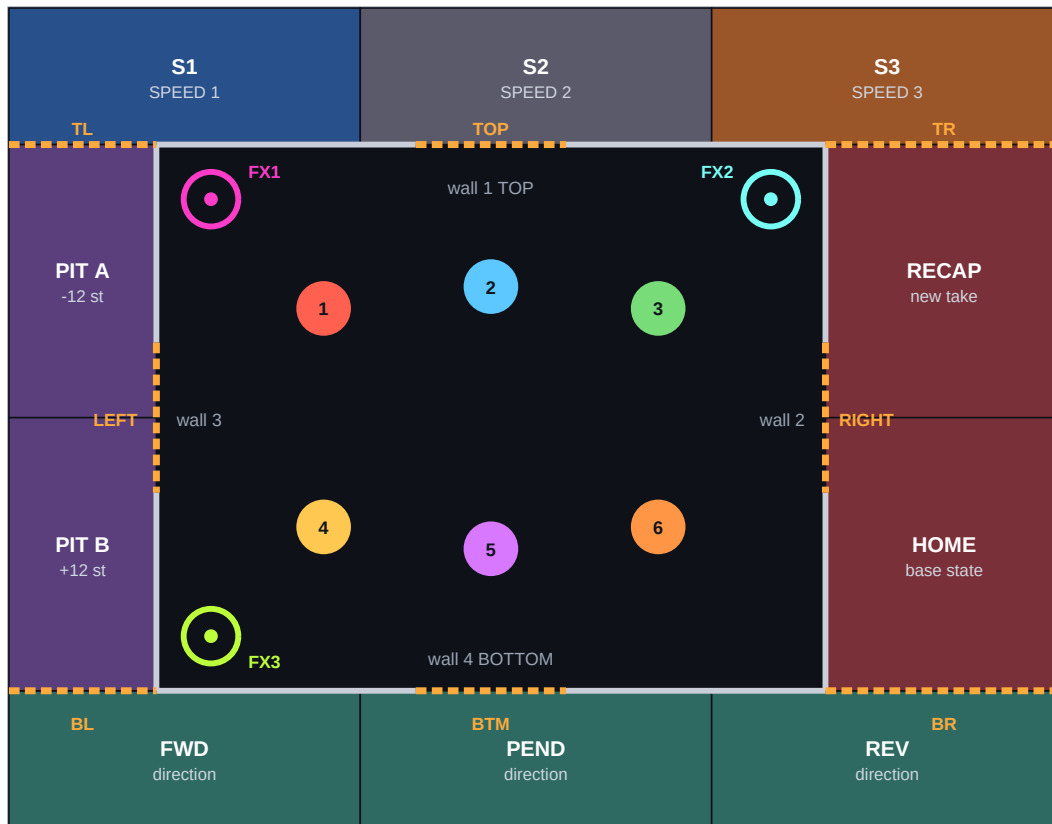
Which ball plays a note

The **VOICES** knob sets how many balls notes can use (1 to 6). A new note takes the first free ball among them. When all are busy, it replaces a ball that is already releasing, or else the oldest ball; the replaced ball fades out quickly (in about 40 ms) while the new one starts. Turning VOICES down releases the balls above the new number.

The six BALL GATE inputs on the back address a ball directly: gate 1 always plays ball 1, replacing whatever ball 1 was doing. A BALL GATE plays its ball even when VOICES is set lower than that ball's number.

4 The room

The room is the centre arena plus the ring of corridors around it. The map below shows the ten cells of the ring, the arena walls and the eight doors (dashed amber), with the starting points of the six balls and the three FX cannons.



The room. Top: the SPEED corridor. Bottom: the DIRECTION corridor. Left and right: the columns.

Cells

Entering a cell changes something about the ball. Only an entry counts: a ball staying inside a cell is not changed again, and a cell takes effect only on a ball that is playing. The centre arena itself has no property. The corner squares of the ring belong to the corridors.

Cell	Where	What it does
SPEED 1-3	Top corridor, left to right	The ball takes the speed of the cell (SPD 1, 2 or 3 knob, scaled by the ball's velocity) and glides to it over the RECOV time. Its playback rate follows. KEEP: the speed stays after the ball leaves; RSTR: its previous speed returns.
FWD, PEND, REV	Bottom corridor, left to right	Sets the loop direction to forward, pendulum or reverse. KEEP: the direction stays; RSTR: the previous direction returns on leaving.
PIT A / PIT B	Left column, upper / lower half	Shifts the ball's rate by the PIT A / PIT B interval (-12 / +12 semitones by default). RSTR (default): the rate returns when the ball leaves the column; KEEP: it stays.
RECAPTURE	Right column, upper half	The ball records a fresh take of the input and carries on with it. If the current take is still recording, or has not yet been heard through once, the new take waits until it has.
HOME	Right column, lower half	The ball's base state: rate x1 and the direction set by the DIR lever, and every effect cured.

Note. In HIT mode the direction and pitch changes from the cells are applied at the ball's next wall hit, with its shot.

Doors

There are eight doors. Four are gaps in the middle of the arena walls (TOP, RIGHT, LEFT, BTM): they connect the arena to the SPEED corridor, the DIRECTION corridor and the two columns. Four are in the corners of the ring (TL, TR, BL, BR): each one connects a corridor to a column — S1 with the upper left cell, S3 with RECAPTURE, FWD with the lower left cell, REV with HOME. A closed door is a wall; an open door lets balls through.

CLOSED (down)	The door is shut.
OPEN (middle)	The door is open.
AUTO (up)	The door opens while its DOOR GATE CV input is above 0.5, and also opens at random: CHANCE sets how often (0 to 4 openings per second), and HOLD how long each opening lasts (0.1 to 10 s).

- A door never closes on a ball: if a ball is in the gap, the door waits until it is clear.
- The walls on either side of a centre door keep their function on both faces: a ball in the ring hitting the outside of an arena wall triggers that wall's function too, and its WALL GATE.
- The outer walls of the room, and the corner doors when closed, are plain bounces: no function, no shot, no gate.
- With every door closed, the balls never leave the arena and BallRoomX behaves like a six-ball Ballooper.
- The width of the four centre doors is set by DOOR in the STRIPS + section (chapter 6).

5 FX balls and infections

BallRoomX has three FX slots. Each one has a **cannon** in a corner of the arena — FX 1 top-left, FX 2 top-right, FX 3 bottom-left — that fires an **FX ball**. When an FX ball touches a loop ball, that ball is **infected**: its sound goes through the slot's effect for the slot's **TIME**.

Firing

FIRE is on/off: while it is on (or while the FIRE CV input is above 0.5), the slot's FX ball is in play. Switch it off and the FX ball dissolves. The cannon fires diagonally into the arena, within about 20 degrees, at the speed of the **SPEED** knob (velocity plays no part). A cannon never fires onto a ball: if a ball is in front of the muzzle, the shot waits.

What an FX ball is — and is not

- It moves with the same physics as the loop balls: it bounces off walls and balls and goes through open doors.
- It is not a voice: it makes no sound, triggers no wall function, wall gate or shot, has no X/Y output, is not counted by **VOICES** and is ignored by **CLEAR**. **KICK** does send it in a new direction.
- Of all the cells, only the **SPEED** corridor affects it.

Infection

- On contact, the loop ball's sound is processed by the effect. The effect fades in over 30 ms and out over 150 ms, so infections never click.
- The infection lasts for the slot's **TIME**: 0.5 s to 60 s on the same curve as **LIFE**; fully up, it is permanent. Another hit by the same FX ball restarts the time.
- A ball can carry all three effects at once; they are processed in order FX 1, then FX 2, then FX 3.
- **AMT** is live: it acts at once on every ball carrying that effect. The **AMT** CV input is added to the knob.
- An infection survives a **RECAPTURE**. It is cured by **HOME**, by a **CURE** wall, by a new note starting in that ball, and when the ball dies.

Contagion

With **CONTAGION** on, an infected loop ball passes its effects to the balls it collides with. Each effect goes to the ball that has less of it, with the donor's remaining time — never a fresh **TIME** — so an outbreak dies out on its own unless **TIME** is set to permanent.

The ten effects

Every effect is linked to the motion of the ball it is on. **AMT** is the main amount in every case.

Effect	What it is	Linked to the ball
DRIVE	Saturation.	Drive rises with the ball's speed.
FOLD	Wavefolder.	The amount of folding follows the speed.
CRUSH	Downsampling and bit reduction.	Cleaner as the ball rises in the room (Y).
GRAIN	Four grains read from the ball's last second of sound.	AMT sets spray and density; each wall hit re-seeds the grains.
STUTTER	Repeats a slice of the ball's sound, 250 ms down to 15 ms with AMT .	Every wall hit grabs a new slice.
COMB	Plucked-string comb filter tuned to the ball's note.	Feedback = AMT .

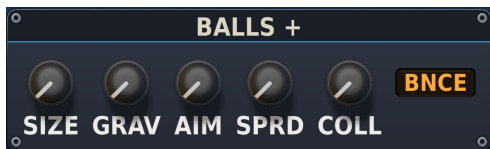
Effect	What it is	Linked to the ball
RING	Ring modulator.	Carrier = the ball's note x a ratio chosen by X position (1/2, 1, 3/2, 2, 3).
SWEEP	Resonant filter.	Cutoff follows the ball's height (Y); AMT sets resonance and depth.
ECHO	Delay.	Delay time = the ball's last wall-to-wall time (up to 1 s).
CHOP	Tremolo gate.	Rate = the ball's speed x AMT.

Note. The INFECT gate output on the back gives a 25 ms gate each time a ball is infected; its level tells which slot did it (1/3 = FX 1, 2/3 = FX 2, 1 = FX 3).

6 Physics and strips

The bottom row of the BallRoomX panel changes how the balls move, how the walls fire and how the ring behaves.

BALLS +



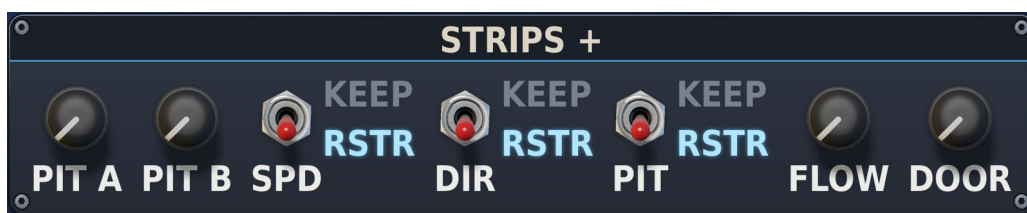
SIZE	Ball size in 7 steps, from much smaller to larger than BallRoom's balls (4th step = BallRoom's size). Every size fits through every door. Applies to all balls.
GRAV	Gravity: pulls the balls down, from none to strong. It scales with the speed, so the arcs keep their shape at every SPEED setting.
AIM	Launch direction of new balls: RND (random, as in BallRoom) or one of eight fixed diagonal directions.
SPRD	Spread around AIM: up to plus or minus 180 degrees. Ignored when AIM is RND.
COLL	A function applied to both balls when they touch, chosen from the 16 wall functions (readout next to the knob). BNCE = nothing, as in BallRoom. Fires once per contact; in HIT mode a contact also fires a shot.

WALL CHANCE



TOP, RGT, LFT, BTM	The probability that the wall's function fires when a ball hits it; otherwise the ball just bounces (and in HIT mode still fires a shot). 100 % (fully up) by default.
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STRIPS +



PIT A / PIT B	The intervals of the two pitch cells in the left column (they replace BallRoom's OCT -1 / OCT +1): -24, -12, -7, -5, +5, +7, +12 or +24 semitones. Default -12 (PIT A, upper) and +12 (PIT B, lower).
SPD KEEP / RSTR	SPEED corridor. KEEP (default): a ball keeps the cell's speed after leaving. RSTR: its previous speed returns when it leaves the corridor.
DIR KEEP / RSTR	DIRECTION corridor. KEEP (default): the direction stays. RSTR: the previous direction returns on leaving.
PIT KEEP / RSTR	Pitch column. RSTR (default): the rate returns on leaving the column. KEEP: the shift stays.
FLOW	A current around the ring. Centre: none. Right of centre: clockwise; left: anticlockwise, stronger toward the ends. Balls in the ring are carried round; with all doors open the room becomes a whirlpool.
DOOR	Width of the four centre doors, 7 steps (4th step = BallRoom's width). Widening is immediate; narrowing waits until no ball is in any of the four gaps.

HOME always restores the base state, whatever the KEEP / RSTR settings.

7 Front panel reference



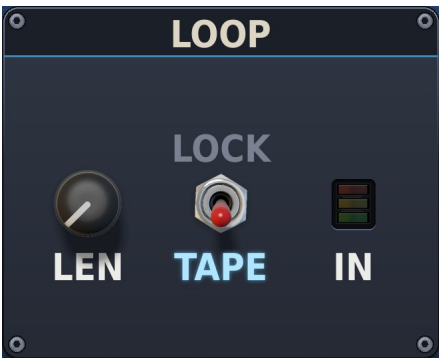
The front panel.

Header: name, ball lamps and patches



The six coloured lamps next to the name show the state of each ball: dark when the ball is free, lit while it records, plays or fades out. The patch section shows the current patch, with buttons to step through patches, open the browser and save (chapter 13).

LOOP



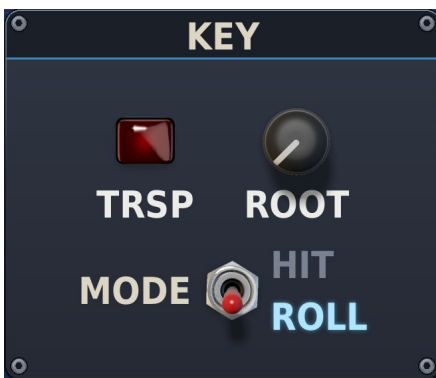
LEN	The length of each take: 0.1 to 5 seconds (0.7 s at the centre). Applies to takes started after the change.
TAPE / LOCK	Pitch mode for new balls. TAPE: varispeed — speed changes pitch. LOCK: granular — pitch stays put.
IN	Input level meter.

MOTION



RATE	Master playback rate for all balls: 0 to 8x. 1x at the centre, 2x at about two thirds, 8x fully up; 0.5x at a quarter, stopped fully down. Acts immediately on every ball.
SPEED	Launch speed of new balls, in 11 steps from 0.10 to 2.50 room crossings per second (0.50 by default). A ball at the SPEED setting plays at the RATE setting.
VEL	Velocity amount. At 0 every ball is launched at the SPEED setting; fully up, velocity 127 doubles the launch speed and soft notes launch slower balls.
RECOV	Recovery: the time a ball takes to return to its own speed after a collision, and to glide to a SPEED cell's speed — 50, 100, 200, 350, 500 ms, 1, 2 or 5 s.

KEY



TRSP	Transpose. Off: every note plays its loop at the original pitch. On: the note transposes the loop relative to ROOT, up to two octaves up or down (TAPE: speed changes too; LOCK: pitch only).
ROOT	The note that plays the loop untransposed (C3 by default). Also the note of a BALL GATE without a note CV.
MODE	ROLL: continuous loops. HIT: one-shots on wall hits. The lit word shows the mode.

Strip under the display



VOICES	How many balls notes can use: 1 to 6 (the readout shows the number). Turning it down releases the balls above it.
DIR	Loop direction of every ball: FWD (down), REV (middle) or PEND (up; forward and back, slowing at each end). This is the direction balls start with and return to at HOME or on a RSET wall.
LIFE	How long balls live in LIFE mode: 0.5 s fully down, about 5 s at the centre, about 37 s at 90 %; above that the clock slows right down (about 90 s at 95 %, ten minutes near the top), and fully up balls live until released some other way. Acts on balls in flight.
LIFE / HOLD	HOLD: balls live while their key or gate is held. LIFE: key releases are ignored and balls live for the LIFE time.
KICK	Sends every ball in flight off in a new random direction, keeping its speed. FX balls too.
CLEAR	Releases every playing ball: each fades out with the release time. FX balls stay.

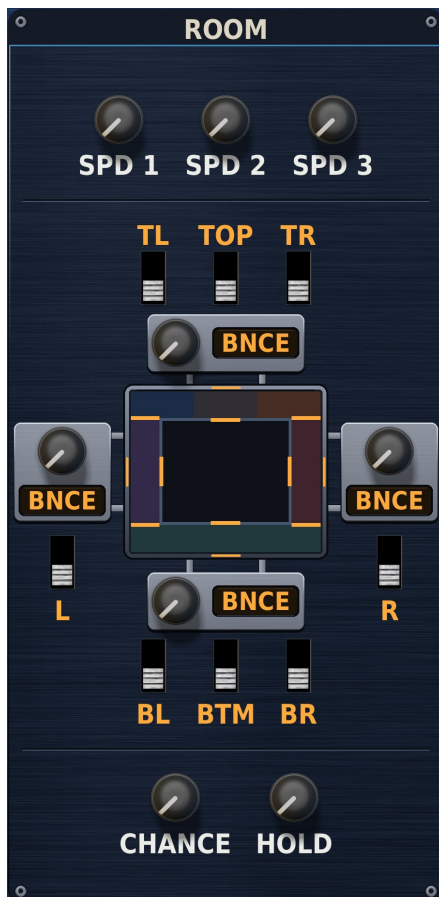
Output row



ATK	Attack time of each ball's envelope, 0 to 2 seconds.
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REL	Release time, 10 ms to 10 seconds: the fade when a key is released, a life runs out, a CHOK wall hits, CLEAR is pressed or VOICES is turned down.
DRY	Mixes the incoming audio into the main output, unprocessed.
PAN	Spreads the balls across the stereo field: ball 1 left to ball 6 right. At 0 every ball is centred. Also applies to the ball outputs.
BALLS	Level of the balls, on the main output and the ball outputs (unity at about 70 %). Leaves DRY alone.
VOL	Master volume of the main output and the ball outputs (unity at about 70 %).

ROOM



SPD 1, 2, 3	The speeds of the three SPEED cells, from the same 11-step table as SPEED. Defaults 0.24, 0.50 and 0.95 crossings per second.
Door levers	TL, TOP, TR, L, R, BL, BTM, BR — one per door, placed like the doors around the small room map: CLOSED (down), OPEN (middle) or AUTO (up).
Wall knobs	The four knobs around the map, with their readouts, set the functions of the arena walls: top, left, right and bottom, as placed. The readout shows the function: BNCE, FLIP, FWD, REV, PEND, RSTA, HALF, DBL, RSET, RAND, CHOK, RCAP, BUMP, DAMP, CURE or KICK.
CHANCE	How often AUTO doors open at random: from never (fully down) to 4 times per second.
HOLD	How long a random opening lasts: 0.1 to 10 seconds.

FX row



TYPE	The effect of the slot: DRIV, FOLD, CRSH, GRAN, STUT, COMB, RING, SWEP, ECHO or CHOP (readout). Defaults: FX 1 Drive, FX 2 Grain, FX 3 Comb.
AMT	Amount of the effect, live on every ball carrying it.
TIME	How long an infection lasts: 0.5 s to 60 s (about 5.5 s at the centre); fully up, permanent.
FIRE	Puts the slot's FX ball in play (lit) or removes it.
CONTAGION	On: infected balls pass their effects on when they collide.

The BALLS +, WALL CHANCE and STRIPS + sections are described in chapter 6.

Folded panel



Folded front panel.

Folded, BallRoomX shows its name, the six ball lamps and the patch section.

8 The display

The display shows the whole room live: the arena in the centre and the ten cells of the ring around it. Each ball is drawn in its colour at its position, with marks that tell you what its loop is doing:

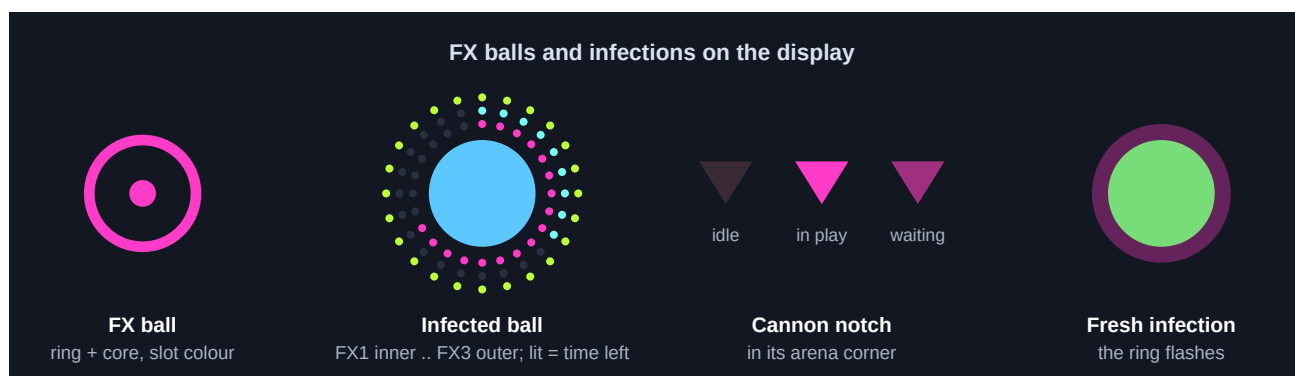


- **Recording:** a bright ring around the ball while its take is being recorded.
- **Loop position:** a small dark dot orbits inside the ball — one turn is one pass through the loop.
- **Brightness:** in HIT mode a ball is dim in flight and lights up while a shot plays.
- **Rate rings:** one darker ring inside the ball for each octave its rate has been shifted (walls or cells).
- **Centre dot:** the ball is moving faster than its launch speed.
- **Life dots:** in LIFE mode, a ring of dots around the ball empties as its life runs out.
- **Releasing:** a fading ball turns dim with a dull red ring.
- **Wall dust:** a short orange mark appears where a ball has just hit an arena wall, and settles away.
- **Flash:** a ball flashes when it collides with another ball or fires a shot.

Cells and doors

- Each cell is tinted by its kind: SPEED cells from blue (slow) to orange (fast) following their knobs, DIRECTION cells teal, PITCH cells violet, RECAPTURE and HOME red.
- Each cell carries a small sign: chevrons for the speeds, triangles for the directions, minus and plus for the pitch cells, a record dot for RECAPTURE and a framed dot for HOME.
- A cell glows briefly when a ball enters it.
- Doors: an amber bar is a closed door; two short stubs at the edges of the gap are an open door; a half amber bar is a door waiting for a ball to clear the gap before it closes.

FX balls



- An FX ball is a hollow ring in its slot colour (FX 1 magenta, FX 2 cyan, FX 3 lime) with a small core.
- The cannon notch in each corner is faint when idle, lit while its ball is in play, and blinks while a shot waits for a clear muzzle.

- An infected ball wears one ring of dots per slot (FX 1 innermost); the lit part shows the time left, a full ring is permanent, and a fresh infection flashes.

Note. The display shows the state of the engine; it does not react to clicks.

9 Wall functions

Each arena wall applies its function to a ball's loop at the moment the ball hits it — from inside the arena or, through an open door, from the ring outside. Any function can be set on any wall, and the same function on several walls. In HIT mode, every hit (except CHOK and RCAP) also fires a shot after the function is applied. The same list is used by COLL for contacts between balls, and WALL CHANCE can make a wall skip its function.

Function	What it does	Typical use
BNCE Bounce	Nothing changes. The ball just bounces. In HIT mode the hit still fires a shot.	Neutral; the default.
FLIP Reverse	Reverses the loop's direction with a short smooth turn. In pendulum, reverses the swing.	Back-and-forth movement.
FWD Forward	Sets the loop to play forward.	Use with REV on opposite walls.
REV Reverse dir.	Sets the loop to play backward.	
PEND Pendulum	Turns pendulum playback on; if the ball is already in pendulum, turns it off.	
RSTA Restart	Jumps back to the start of the loop (the end in reverse), with a short crossfade. ROLL mode only.	Retrigger rhythms.
HALF Half	Halves the ball's rate (an octave down in TAPE). Accumulates, down to 1/8.	
DBL Double	Doubles the ball's rate (an octave up in TAPE). Accumulates, up to 8x.	Octave jumps.
RSET Reset	Returns the ball's rate to normal and its direction to the DIR lever.	Undoes HALF/DBL and turns.
RAND Random	Jumps to a random point of the loop (ROLL), or starts the shot from one (HIT).	Glitchy textures.
CHOK Choke	Releases the ball: it fades out with the release time.	A wall that eats balls.
RCAP Recapture	The ball records a fresh take of the input and carries on with it.	Loops that follow the input.
BUMP Bump	Speeds the ball up by 1.6x (at most 3x its own speed, and never above 8 crossings per second); RECOV brings it back. Its rate swoops up and back down.	Pitch swoops.
DAMP Damp	Slows the ball to half speed (never below 0.2x its own speed); RECOV brings it back.	Pitch dips.
CURE Cure	Removes every effect the ball carries.	A clean-up wall.
KICK Kick	Sends this ball off in a new random direction, keeping its speed.	Breaks repeating paths.

Note. Direction changes, restarts and jumps never cut the sound: they wait for a running crossfade or turn to finish (a few milliseconds) and then apply smoothly.

10 Back panel reference



The back panel.

Audio



IN (L/R)	Stereo input. Every ball records from it.
OUT (L/R)	Main output: the six balls (panned, BALLS level) plus DRY, at the VOL level. Auto-routed to the mixer.
BALL 1-6 (L/R)	One stereo output per ball, with its pan, its effects, BALLS and VOL applied. A ball still also plays on the main output.

CV inputs



SEQUENCER NOTE / GATE	Plays the device from a CV sequencer like MIDI notes. Any gate above zero starts a note and the gate value is the velocity. A note change while the gate stays high starts a new ball. The gate falling (or the cable being removed) is a note-off.
BALL GATES G1-G6	Each gate plays its own ball directly, whatever VOICES is set to. Any value above zero triggers; the gate value is the velocity. HOLD: the gate falling releases the ball. LIFE: the falling gate is ignored.
BALL NOTES N1-N6	Optional note for each BALL GATE (standard note CV), read when the gate rises. With TRSP on it transposes the ball. Not connected: the ball plays ROOT.



KICK	A rising CV (above 0.2) kicks every ball, like the KICK button.
CLEAR	A rising CV (above 0.2) releases every playing ball, like the CLEAR button.
SPEED	Raises the launch speed of new balls: 0 = the SPEED knob, 1 = twice as fast.
RATE	Added to the RATE knob: +1 moves it half its range up, -1 half its range down.



DOOR GATES IN	One per door (TOP, RIGHT, LEFT, BTM, TL, TR, BL, BR). A door set to AUTO opens while its CV is above 0.5. A door set to CLOSED or OPEN ignores its input.
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CV outputs



X1-X6, Y1-Y6	Each ball's position in the whole room: X from 0 (left) to 1 (right), Y from 0 (bottom) to 1 (top). 0 when the ball is not playing.
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WALL GATES	TOP, RIGHT, LEFT, BTM: a 25 ms gate each time a ball hits that arena wall (from either side). The level follows the impact speed: 2 crossings per second or more gives a full-level gate.
ZONE	A 25 ms gate each time a ball enters a cell (or comes back into the arena), with the same level rule.

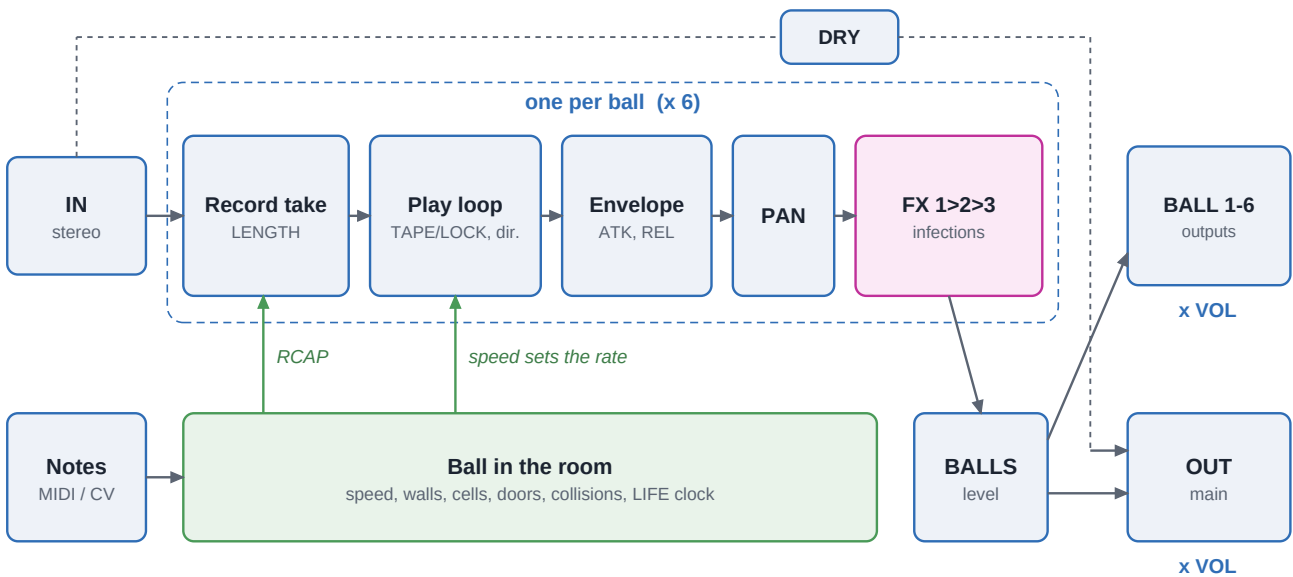
FX balls



FIRE 1-3	Gate inputs: an FX ball is in play while its FIRE CV is above 0.5 or its FIRE button is on.
AMT 1-3	Added to the AMT knob of each slot.
INFECT	A 25 ms gate each time a ball is infected. Level = the slot: 1/3 FX 1, 2/3 FX 2, 1 FX 3.

11 Signal flow

The diagram shows the path of the audio for one ball. The six balls work the same way, in parallel, and are mixed together on the main output.



- A ball records from IN into its own take.
- The take is played in TAPE or LOCK mode, in the ball's direction, at a rate set by RATE, the ball's speed, the walls, the cells and the transposition.
- The envelope (ATK, REL) and the note velocity set the ball's level; PAN places it in the stereo field.
- The ball's infections process it in order FX 1, FX 2, FX 3. A ball with no infection passes untouched.
- BALLS sets the level of all balls; each ball goes to its BALL output and to the main OUT, where DRY adds the input signal.
- VOL sets the final level of the main output and the ball outputs.

12 Playing BallRoomX

From the keyboard

Each key launches a ball; six keys fill the room. Because each ball records a different moment of the input, playing notes at different times captures different parts of your source. Play notes again to replace the oldest balls with fresh takes.

Velocity

Velocity always sets the level of a ball. With VEL up, it also sets the launch speed — and so the playback rate.

Shaping the room

With the doors closed the room is a classic arena. Opening the centre doors lets the balls reach the cells: the top door leads to the SPEED corridor, the bottom door to the DIRECTION corridor, the left door to the PITCH column and the right door to RECAPTURE and HOME. The corner doors join corridors and columns, so balls can go round the ring without coming back to the arena.

Playing from CV

Connect a CV sequencer to SEQUENCER NOTE and GATE to play the device like a keyboard. To play the balls one by one, use the BALL GATES; each always plays the same ball, and an optional BALL NOTE gives it its own pitch.

Recipes

Open plan

All four centre doors OPEN, SPD 1/2/3 spread wide (slow, medium, fast). Balls leave the arena and come back with new speeds, directions and octaves: one held chord turns into a moving arrangement.

Breathing room

All doors on AUTO, CHANCE around a third, HOLD short. The room opens and closes on its own; the ZONE output can trigger a percussion sound each time a ball changes cell.

Doors on the beat

Doors on AUTO with CHANCE at 0, and gate tracks from a sequencer into the DOOR GATES: the room opens in time with the music.

Bouncing drums

Drum loop into IN, MODE on HIT, LEN short (0.2 to 0.4 s), SPEED high, centre doors open. Each arena wall hit fires a slice; RAND on two walls adds variations.

Fresh material

LIFE mode with LIFE fully up, the right centre door open: balls play forever and record a new take every time they pass through RECAPTURE.

Spreading infection

CONTAGION on, FX 1 on FOLD with TIME around the middle, a CURE wall on top: an outbreak runs through the balls and dies out.

Rain

GRAV around the middle, AIM on one of the upward directions, large balls, MODE HIT: balls arc up and fall back, firing shots.

Whirlpool

FLOW well off centre, all doors open: balls are swept round the ring through the cells.

13 Patches and automation

Patches

A BallRoomX patch stores every panel setting. The recorded takes are not stored — they are always recorded fresh from the input. Use the arrows in the patch section to step through patches in the current folder, the folder button to open the browser, and the disk button to save.

Factory patches

01 Basics	Init — the default settings. Bouncer — fast balls, velocity-sensitive. Tape Spin — FLIP walls, every ball forward. Slow Drift — slow balls, long envelope.
02 Rooms	Open Room — five balls, speed cells 0.16 / 0.50 / 1.60, every door open. Auto Doors — every door on AUTO. Ping Room — HIT mode, centre doors open. Glitch — HIT, RAND and RSTA walls, corner doors on AUTO.
03 Life	Fireflies — LIFE mode, HIT, five balls, automatic doors. Eternal — LIFE mode, balls that never die.
04 FX	Outbreak — CONTAGION, FX 1 on FOLD, a CURE wall on top. Grain Rain — FX 1 and FX 2 on GRAIN, centre doors open. Echo Pit — FX 1 ECHO permanent, FX 3 COMB. Crusher — HIT with CRUSH, CHOP and STUTTER.
05 Physics	Gravity — gravity and large balls. Whirlpool — strong FLOW, every door open. Bumpers — COLL on FLIP, BUMP and DAMP walls. Marbles — small balls, five voices, HIT.

Automation

The knobs, levers and buttons of the front panel can be automated in the sequencer, including performance automation in note clips. Right-click a control and choose *Edit Automation*, or move it while recording.

MIDI controllers

BallRoomX supports Reason's Remote for control surfaces, and responds to these MIDI CC numbers on its sequencer track (every front-panel control except KICK and CLEAR):

CC	Control	CC	Control	CC	Control	CC	Control
13	LEN	30	Wall 3 (left)	49	Door BR	70	AIM
14	TAPE / LOCK	31	Wall 4 (bottom)	50	FX 1 TYPE	71	SPRD
15	MODE	33	DIR	51	FX 2 TYPE	72	Chance TOP
16	RATE	34	LIFE / HOLD	52	FX 3 TYPE	73	Chance RGT
17	SPEED	35	LIFE	53	FX 1 AMT	74	Chance LFT
18	VEL	36	SPD 1	54	FX 2 AMT	75	Chance BTM
19	RECOV	37	SPD 2	55	FX 3 AMT	76	PIT A
20	TRSP	39	SPD 3	56	FX 1 TIME	77	PIT B
21	ROOT	40	CHANCE	57	FX 2 TIME	78	SPD KEEP/RSTR
22	ATK	41	HOLD (doors)	58	FX 3 TIME	79	DIR KEEP/RSTR
23	REL	42	Door TOP	59	FX 1 FIRE	80	PIT KEEP/RSTR
24	DRY	43	Door RIGHT	60	FX 2 FIRE	81	FLOW
25	PAN	44	Door LEFT	61	FX 3 FIRE	82	DOOR
26	VOL	45	Door BTM	62	CONTAGION	83	BALLS
27	VOICES	46	Door TL	63	SIZE		
28	Wall 1 (top)	47	Door TR	68	GRAV		
29	Wall 2 (right)	48	Door BL	69	COLL		

14 Troubleshooting

No sound at all	Check that a signal reaches IN (the meter lights), and that BALLS and VOL are up.
Balls appear but are silent	In HIT mode balls are silent between wall hits — and a ball in the ring never hits an arena wall unless it comes back. In ROLL mode, the source may have been silent when the take was recorded: play the note again or send the ball through RECAPTURE.
Some notes play no ball	VOICES is set low: notes only use that many balls (a new note replaces the oldest).
Balls never leave the arena	Every centre door is closed. Set a door lever to OPEN, or to AUTO with CHANCE up.
FIRE does nothing	The cannon waits while a ball is in front of it; the notch blinks until the muzzle is clear.
An effect never goes away	TIME is fully up (permanent). Send the ball HOME, use a CURE wall, or play a new note.
AUTO doors never open	CHANCE is fully down and nothing is connected to the DOOR GATES inputs.
A door stays open after being closed	A ball is in the gap; the door closes as soon as it is clear.
The pitch keeps going up or down	HALF / DBL walls accumulate, and SPEED cells give balls new speeds that stay. Send balls HOME, add a RSET wall, or set the walls back to BNCE.
Balls stop on their own	LIFE mode with a short LIFE, a CHOK wall, or VOICES turned down.
Balls never stop	LIFE mode with LIFE fully up. Switch to HOLD, turn LIFE down, or press CLEAR.
Turning SPEED does nothing to the sound	SPEED sets the launch speed of new balls only. Use RATE for every ball at once.
Loops are too short at 192 kHz	At 192 kHz the longest take is 2.5 seconds (5 seconds at every other sample rate).
The loops are gone after reopening the song	Takes are recorded live and are not saved with the song or the patch.

15 Specifications

Device type	Instrument, 8U, with note lane. Rack Extension for Reason (Jukebox SDK 5).
Voices	6 balls, each with its own take and stereo output; VOICES limits notes to 1-6.
Take length	0.1 to 5 s (2.5 s maximum at 192 kHz).
Playback rate	0 to 8x per ball (RATE x speed x walls and cells).
Transposition	Plus or minus 24 semitones around ROOT.
Launch speed	0.10 to 2.50 crossings per second, up to 2x more with the SPEED CV.
Room	Centre arena with 4 function walls; ring of 10 cells; 8 doors (closed / open / auto).
FX	3 slots, 10 effects, infection time 0.5 to 60 s or permanent, contagion.
Physics	16 wall functions, ball size, gravity, aim, spread, collision function, wall chance, pitch cells, keep / restore, flow, door width.
Envelope	Attack 0 to 2 s, release 10 ms to 10 s.
Ball life (LIFE mode)	0.5 s to about 37 s, then slower clocks up to unlimited.
Audio	1 stereo input; 1 stereo main output + 6 stereo ball outputs.
CV inputs	Sequencer note + gate, 6 ball gates, 6 ball notes, kick, clear, speed, rate, 8 door gates, 3 FX fire, 3 FX amount.
CV outputs	12 ball position (X, Y per ball), 4 wall gates, zone gate, infect gate.
Sample rates	All sample rates supported by Reason.
Patches	Reason patch format (.repatch), 18 factory patches in 5 folders.
Memory	About 48 MB per instance.

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