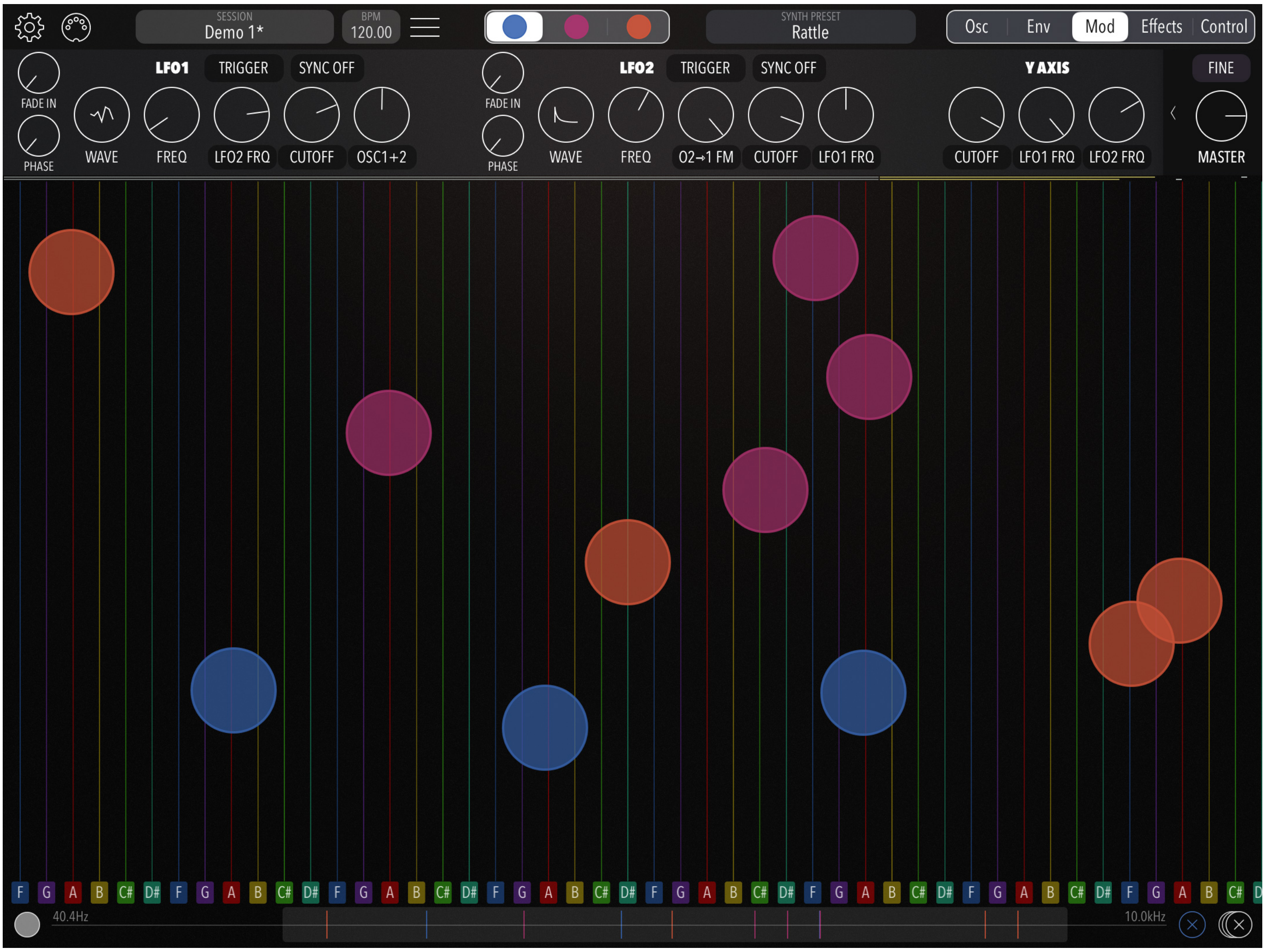
SHOOM

User Guide

1.2.1

OVERVIEW



Shoom is an expressive XY pad synthesizer. Or, more precisely, three identical synthesizers in one app. It is capable of playing any pitch in the audible range and doesn't necessarily limit you to a particular scale. Nevertheless, if you do want to use scales, Shoom can deliver anything from common 12-tone equal tempered to xenharmonic and microtonal.

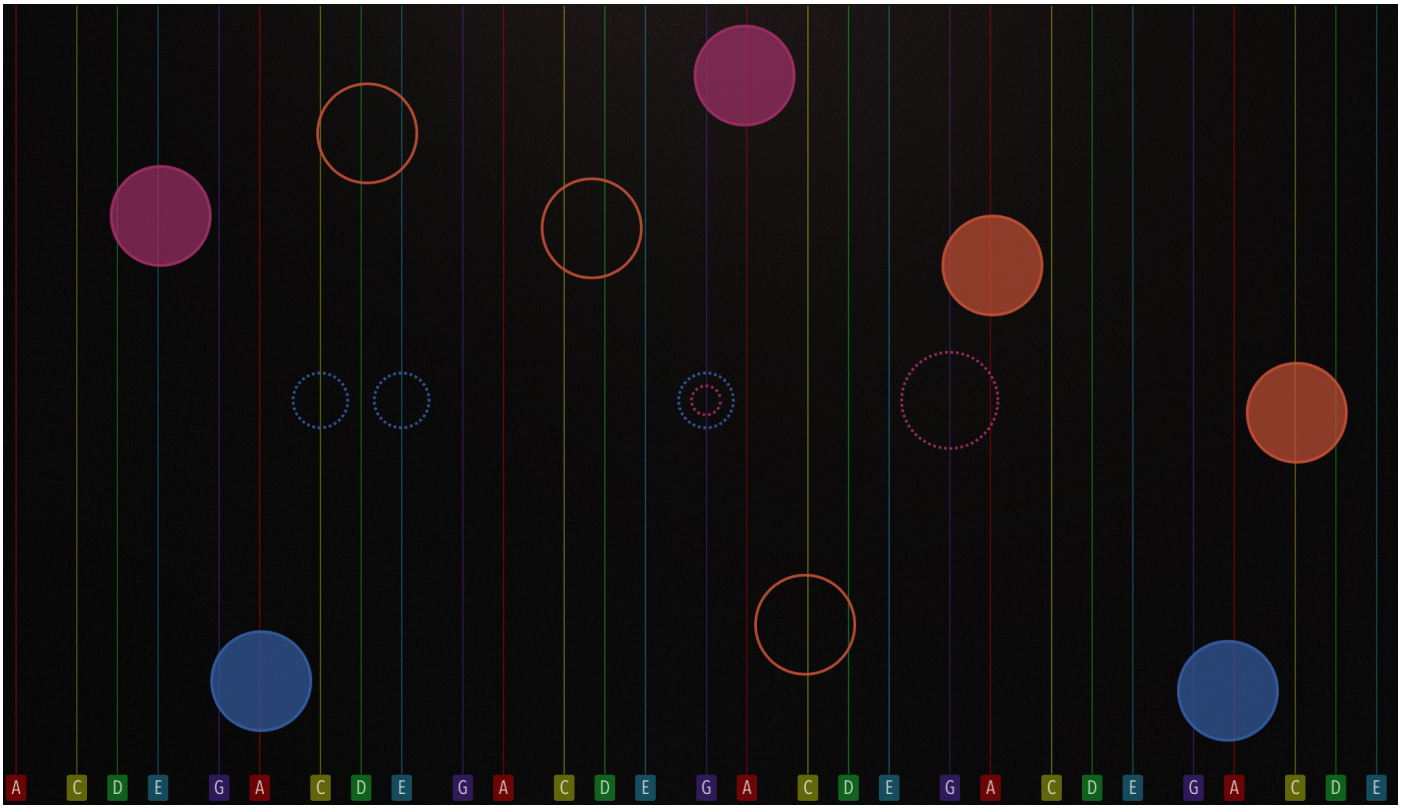
Features:

- Three independent synthesizers
- 8–20,000 Hz pitch range
- Slide freely or snap notes to scale with adjustable glide rate
- Microtonal and non-octave repeating scales support
- MIDI note input (including MPE), CC control and clock sync
- Optional remapping of MIDI notes to the pitches of the selected scale
- Bluetooth MIDI support
- Inter-App Audio support with main mix and individual synth outputs
- Audiobus 3 support (see audiob.us for more information)
- Ableton Link support (see ableton.com/link for more information)
- 120+ bundled presets
- Import and export of presets and CC maps

Synthesizer engine features:

- Adjustable polyphony, up to 30 voices
- Two oscillators with 4 waveforms and PWM, and one noise generator
- Oscillator FM cross-modulation
- 4-pole (24 dB/octave) resonant low pass filter with overdrive and pitch tracking
- 2 variable slope ADSR envelopes for amplitude and filter cutoff
- 2 LFOs with 9 waveforms, up to 3 out of 12 simultaneously assignable parameters, trigger and global running modes, fade-in and phase controls
- Y-axis position / MIDI CC#74 as modulation source with up to 3 of 15 simultaneously assignable parameters
- MIDI channel pressure / polyphonic aftertouch as modulation source with up to 3 of 15 simultaneously assignable parameters
- MIDI velocity modulation of amplitude and filter envelopes
- Note pan randomizer
- Built-in stereo delay and reverb effects

MAIN SCREEN



Touch the playing pad to make a sound. The horizontal axis controls the pitch. The vertical axis has no hardwired parameter and can be assigned to a set of parameters in the Mod section.

Each note you play is displayed as a **circle**, with its color signifying which one of the synthesizers is playing the note. Circles can be either filled or empty. An **empty** circle can be thought of as a *'momentary'* note and will be released when you lift your finger. A **filled** circle is a *'latching'* note and will be held even if you lift your finger. Latching notes can still be moved freely with subsequent touches. To **release**, you can either **double tap** it or use **release all** buttons described later in this section.

> **Note:** Controlling four or more notes at a time may interfere with iOS multitasking gestures, therefore it is recommended to disable them in system **Settings > General**.

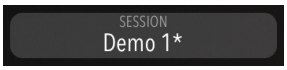
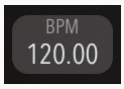
Dotted circles represent notes input from a MIDI source. The size of the circle is proportional to the note's initial velocity and its fill opacity is proportional to pressure. In MPE mode, its vertical position tracks the Y-axis (CC#74) value received from the source. Please refer to MIDI for more details on MIDI setup.

Vertical lines are **note markers** that represent the pitches of the currently selected scale, with red lines corresponding to its first degree. The labels in the bottom display note names for scales based on 12-tone octave-repeating tunings, or scale degree numbers otherwise. See Session Settings for more details.

Note markers can function as mere guides, or be used to 'snap' what you play to the nearest scale pitch (see Control).

Frequency range control allows narrowing the playing area to a particular range of frequencies. Double-tap to quickly switch between the narrow and full range. Vertical lines

represent synthesizer voices to aid tracking voices outside the currently selected range.

	Selects whether the newly input notes will be released or held when you release the finger. Also affects the notes being touched at the moment
	Releases all notes of the currently selected synthesizer
	Releases all notes of all synthesizers
	Opens the Global Settings menu
	Opens the MIDI menu
	Displays the name of the current **session**. Tap to load, save or manage your sessions
	Displays the current tempo in **BPM**. Text color indicates the following: ◦ white - using internal tempo ◦ violet - external tempo, cannot be changed from Shoom (IAA or MIDI clock) ◦ green - external tempo, but can be changed and proposed to other apps or devices (as is the case with Ableton Link) Tap to open a popup where you can adjust the tempo
	Opens the Session Settings menu
	Selects between the three **synthesizers**
	Displays the name of the current **preset** for the selected synth. Tap to load, save or manage your synth presets
	Selects the **controls page** for the current synth
	Toggles **fine adjustment** mode for knobs on and off
	Sets the **master output level**, i.e. the level of all synthesizers mixed together
	Reveals the **Synth Mixer** panel. (Absent on 11" and larger iPad models, where the panel is visible at all times)
	The knobs set the mix levels for the three synthesizers. While they function similarly to the **Level** knobs in the Amp Envelope section, their values are stored as part of a session and do not affect synth presets themselves. The dots under the knobs double as simple level indicators for the synths.

SYNTHESIZER CONTROLS

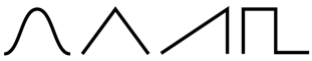
OSC

This page contains controls for signal generators and the mixer. Shoom features two oscillators and one noise generator for each synthesizer voice.

OSC1 AND OSC2

Both oscillators have the following controls:

WAVE sets the waveform. You can choose between sine, triangle, sawtooth and pulse (square).



PW (Pulse Width) sets the pulse width of the waveform. Works only with pulse wave.

OCTAVE, **SEMITONES** and **CENTS** knobs control the pitch of an oscillator relative to what you play on the pad.

OSC2 has an additional **2→1 FM** knob, which brings in an element of the Frequency Modulation synthesis technique. It controls the amount (or *index*, in FM terms) by which the frequency of OSC1 (*carrier*) is modulated with the output of OSC2 (*modulator*). Note that this amount is independent of the OSC2 level set in the mixer section.

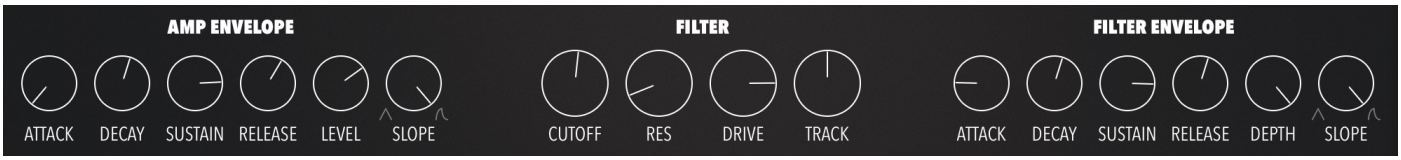
NOISE

COLOR controls the frequency contents of the noise generator. The middle position is approximately white noise. Turn counterclockwise to cut high frequencies (make it 'darker'), and clockwise to cut low frequencies ('brighter').

MIXER

OSC1, **OSC2** and **NOISE** knobs set the level (volume) of corresponding sound sources before the summed audio is sent to filter.

ENV



This page contains controls for the filter and the envelope generators. Shoom features a 24 dB/octave resonant filter and two ADSR envelope generators modulating amplitude and filter cutoff frequency.

AMP ENVELOPE

The amplifier envelope modifies the amplitude of the sound. This envelope has four stages: attack, decay, sustain and release.

ATTACK sets the time it takes for a note to reach its highest amplitude (fade in).

DECAY sets the time it takes for a note to reach the SUSTAIN value.

SUSTAIN sets the amplitude of a note after it passes the ATTACK and DECAY stages.

RELEASE sets the time it takes for a note to fade out when it's released.

LEVEL sets the overall volume level of the envelope.

SLOPE allows changing the envelope curve. Full counterclockwise is linear, clockwise rotation yields a progressively steeper exponential curve.

> **Note:** Similarly to classic analog envelope generators, DECAY and RELEASE knobs set the respective rates rather than times. This means that the actual decay and release durations will depend on the SUSTAIN value.

FILTER

CUTOFF sets the cutoff frequency. The frequencies higher than this value will be attenuated, while frequencies lower than this value will pass through.

RES (Resonance) controls the boost of the frequencies near the cutoff.

DRIVE controls the amount of filter overdrive.

TRACK controls the amount of filter pitch tracking. At zero (middle) position, no tracking is applied, and all sounds are filtered equally. Positive values yield higher cutoff frequencies for higher notes, while negative values have the opposite effect.

FILTER ENVELOPE

The filter envelope modulates the cutoff frequency of the filter. This envelope is identical to the amp envelope, except for the **DEPTH** control, which sets the amount by which the envelope affects the cutoff frequency. This amount can be both positive and negative. In the middle position, the envelope has no effect.

MOD

This page gives access to Shoom's modulation capabilities. The modulation sources are two LFOs as well as the vertical axis position of voices on the playing pad.

LFO1 AND LFO2

Both low-frequency oscillators offer the same set of controls.

TRIGGER / GLOBAL. In TRIGGER mode, each synthesizer voice uses its own LFO which is retriggered each time you play a new note. In GLOBAL mode, all voices use the same LFO.

> **Hint:** If you apply modulation to LFO frequency when it is in TRIGGER mode, different voices can have their LFOs not only in different phases, but with different rates, which can give an interesting effect.

SYNC ON / OFF. When sync is off, the LFO has an arbitrary frequency set in Hz. When it's on, the frequency is synchronized with the tempo.

WAVE sets the waveform of the LFO. Available options are sine, triangle, sawtooth, reverse sawtooth, two variations of exponential decay, square, random sample and hold, and continuous linear random wave.

FREQ sets the frequency of the LFO within a range of 0.02–40 Hz. When synced to tempo, it sets the frequency as a subdivision ranging from 8 whole notes to $\frac{1}{64}$.

FADE IN sets the time it takes for the LFO to reach its full amplitude after you play a note.

PHASE allows you to set the starting point of the waveform.

Each LFO can modulate up to 3 parameters (*destinations*).

The knobs control the amount by which the parameter is affected by the LFO signal. This amount can be positive or negative. In the middle position, the LFO has no effect.

The buttons under the knobs select the parameters to be modulated. Available destinations are:

- OSC frequency (both oscillators)
- OSC1/2 frequency
- OSC1/2 pulse width
- OSC2→1 FM depth
- OSC1/2 level
- Noise level
- Amp level
- Filter cutoff frequency
- LFO1/2 frequency (LFO2 frequency for LFO1 and vice versa)

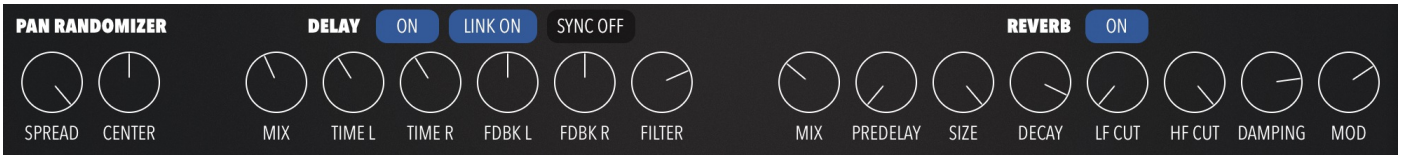
Y AXIS

This section allows you to make the vertical position of a note on the playing pad or an MPE-capable MIDI controller (CC#74) affect up to 3 parameters. The knobs and destination selection buttons are identical to those in LFO sections, except there are three more available parameters:

- LFO1/2 frequency (both are available)
- LFO1/2 depth

This section is also duplicated in the Control page for convenience when working with external controllers.

EFFECTS



The sound generated by the synthesizers can be processed through built-in effects. Each synthesizer has its own stereo delay and reverb effect units. Each unit has a dedicated **ON / OFF** switch. Make sure to turn it off if you are not using the effect, as it will reduce CPU load and power consumption.

PAN RANDOMIZER

Randomly selects a position in the stereo field for each played note.

CENTER sets the initial pan position (before randomization is applied).

SPREAD sets the maximum amount by which the initial position can be shifted in both left and right directions. Set to zero to disable randomization.

DELAY

LINK ON / OFF. When off, the left and right channels can have different delay times and feedback rates. Turn on to link the channels.

SYNC ON / OFF. When sync is off, the delay times can be set to an arbitrary value in milliseconds. When it's on, the delay times are synchronized to the tempo.

MIX controls the blend between the original and delayed signal. Full counterclockwise is original only, middle position is equal amounts of both, full clockwise is delayed signal only.

TIME L / R set the delay time for the respective channel within a range of 5–3000 ms. When synced to tempo, it sets the time as a subdivision ranging from $1/32$ triplet to 1 whole note.

FDBK L / R control the feedback amount for the respective channel. Setting it to 0 will lead to only one delay repeat, while 100 will yield infinite repeats.

FILTER controls the cutoff frequency of the low-pass filter applied to the delay repeats.

REVERB

MIX controls the blend between the dry and wet (reverb) signal. Full counterclockwise is dry only, middle position is equal amounts of both, full clockwise is wet signal only.

PREDELAY sets the amount of time between the dry signal and the onset of reverb.

SIZE controls the size of the virtual reverb room.

DECAY controls the length of the reverb tail.

LF CUT and **HF CUT** sets the frequency below and above which, respectively, the sound is attenuated before being processed by the reverb algorithm.

DAMPING sets the frequency above which the reverb decay is shortened, simulating natural absorption of high frequencies.

MOD controls the amount of modulation used by the reverb algorithm.

CONTROL

This page allows you to adjust how the synthesizer responds to what you play on the pad and/or a MIDI controller.

LOCK (XY PAD)

PITCH LOCK. When set to on, locks horizontal movements of synthesizer voices, thus preventing pitch changes.

SNAP (XY PAD)

ON / OFF. Controls whether the voice pitch will snap to pitches of the selected musical scale. **GLIDE** controls the time it takes to slide in pitch from one note to the next. **INITIAL**. When set to on, the newly played note will start exactly on a scale pitch. **LEGATO**. When set to on, the envelopes and LFOs will not retrigger when a note snaps to a new pitch.

Y AXIS (XY PAD AND MPE)

This section allows you to make the vertical position of a voice on the playing pad or on an MPE-capable MIDI controller (CC#74) affect up to 3 parameters.

The buttons under the knobs select the parameters to be modulated:

- OSC frequency (both oscillators)
- OSC1/2 frequency
- OSC1/2 pulse width
- OSC2→1 FM depth
- OSC1/2 level
- Noise level
- Amp level

- Filter cutoff frequency
- LFO1/2 frequency
- LFO1/2 depth

The knobs control the amount by which the parameter is affected by the Y-axis position. This amount can be positive or negative.

This section is also duplicated in the Mod page for convenience when playing using the XY pad.

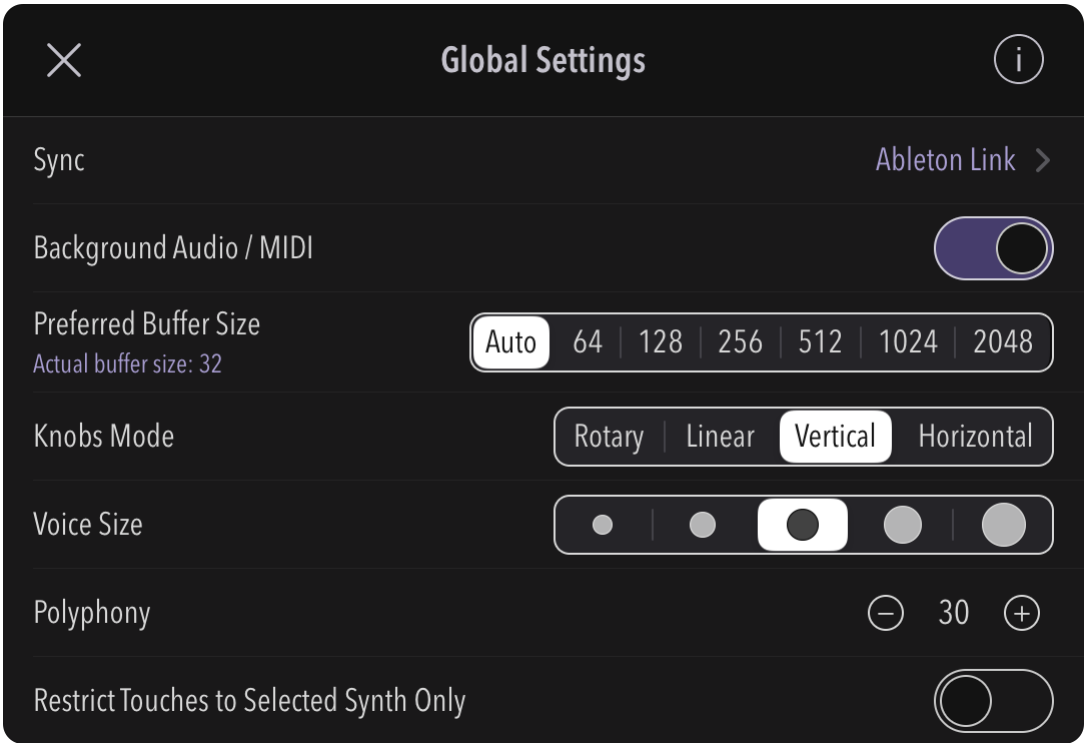
PRESSURE (MIDI)

Sets up which parameters and by what amount are affected by the pressure signal from a MIDI controller. Shoom responds to both Channel Pressure and Polyphonic Aftertouch events. The former is the preferred option in MPE context, the latter - in non-MPE context. Available parameters are the same as in the Y Axis section

VELOCITY (MIDI)

The knobs control by what amount the amplifier and filter envelopes are affected by the velocity of MIDI Note On events. The further clockwise, the bigger the dynamic range.

GLOBAL SETTINGS



Sync indicates the selected external tempo source. No indication means the app is using internal tempo. Tap to open Sync menu.

Background Audio / MIDI switch controls the ability to play audio and process MIDI events when Shoom is running in the background. When the app is launched from Audiobus, this switch is bypassed and background audio / MIDI is always on.

Preferred Buffer Size. Use this to change the audio buffer size. **Auto** means no preference. This setting may be overridden by other apps with higher priority. The actual buffer size is displayed on the left.

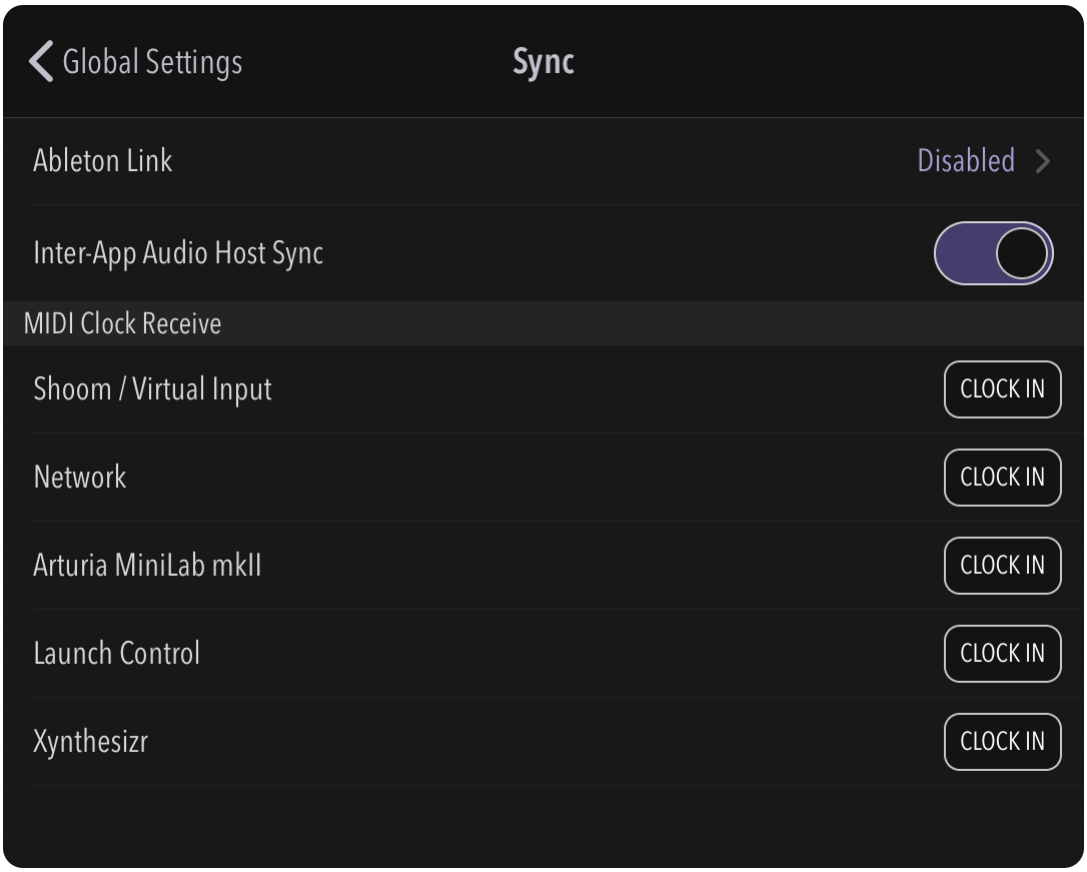
Knobs Mode controls how all knobs across the app respond to touches.

Voice Size controls the size of the visual representation (circles) of synthesizer voices on the playing pad.

Polyphony set the maximum allowed number of synthesizer voices across all three synthesizers.

Restrict Touches to Current Synth Only determines if you will be able to pick up held notes of synthesizers that are not currently selected.

SYNC



Shoom can use external tempo information to sync LFO rates and delay times (provided that corresponding controls are enabled in Mod and Effects pages). Available options are:

- **Ableton Link**. Apps can share clock on a single device and/or over a wireless network. Visit https://www.ableton.com/link/ for more information.
- **Inter-App Audio** (IAA) **Host Sync**. Enables Shoom to receive tempo from an IAA host app (if connected).
- **MIDI clock** from another app or hardware device, selectable from the sources list. If the clock master app is set up to send to virtual MIDI port *Shoom*, select *Shoom / Virtual Input*.

> **Note:** Using MIDI clock is not recommended unless synchronizing with external hardware devices. In general, Ableton Link and IAA provide better accuracy and stability.

MIDI

OVERVIEW

Shoom supports MIDI note input (including **MPE** - *MIDI Polyphonic Expression*) and CC control over parameters as well as synchronization of LFOs and delay effect to external tempo via MIDI clock. This section deals with note input and CC. For MIDI clock, please refer to Sync.

The app treats note and CC inputs independently (at least with Core MIDI, more on that below), which can be useful, for instance, with a knobs-and-buttons MIDI controller for parameter control and various other sources for note input.

When talking of note inputs, it is implied that affected events include not only Note On and Note Off, but these as well:

- Pitch Bend
- Channel Pressure
- Polyphonic Aftertouch
- Program Change
- CC#6 (RPN/NRPN Data Entry MSB)
- CC#38 (RPN/NRPN Data Entry LSB)
- CC#64 (Sustain pedal)
- CC#74 (MPE Y-axis / Timbre, only in MPE mode)
- CC#100 (RPN LSB)
- CC#101 (RPN MSB)
- CC#120 (All Sound Off)
- CC#123 (All Notes Off)

That being said, Shoom does not exclude the listed CC events from being used in a CC map. It will display a warning, but it is up to you to decide if it is necessary to remap to a different CC#.

In general, there are three **individual** inputs for the three synths and one called **'Selected Synth'** that routes MIDI events to the currently selected synthesizer (with a bit of extra logic to avoid, for instance, hanging notes when switching synths). In the case of MIDI CC mapping, there is also a **Session** page for session-level parameters and actions.

When using **Core MIDI** directly in Shoom, you can select from which sources to receive CC events, and which source goes to which of the synth note inputs.

In the case of **Inter-App Audio** (IAA) and **Audiobus MIDI** (AB MIDI), it works a bit differently.

With **IAA**, Shoom presents itself as 4 instruments:

- Selected Synth & Session
- Synths 1-3

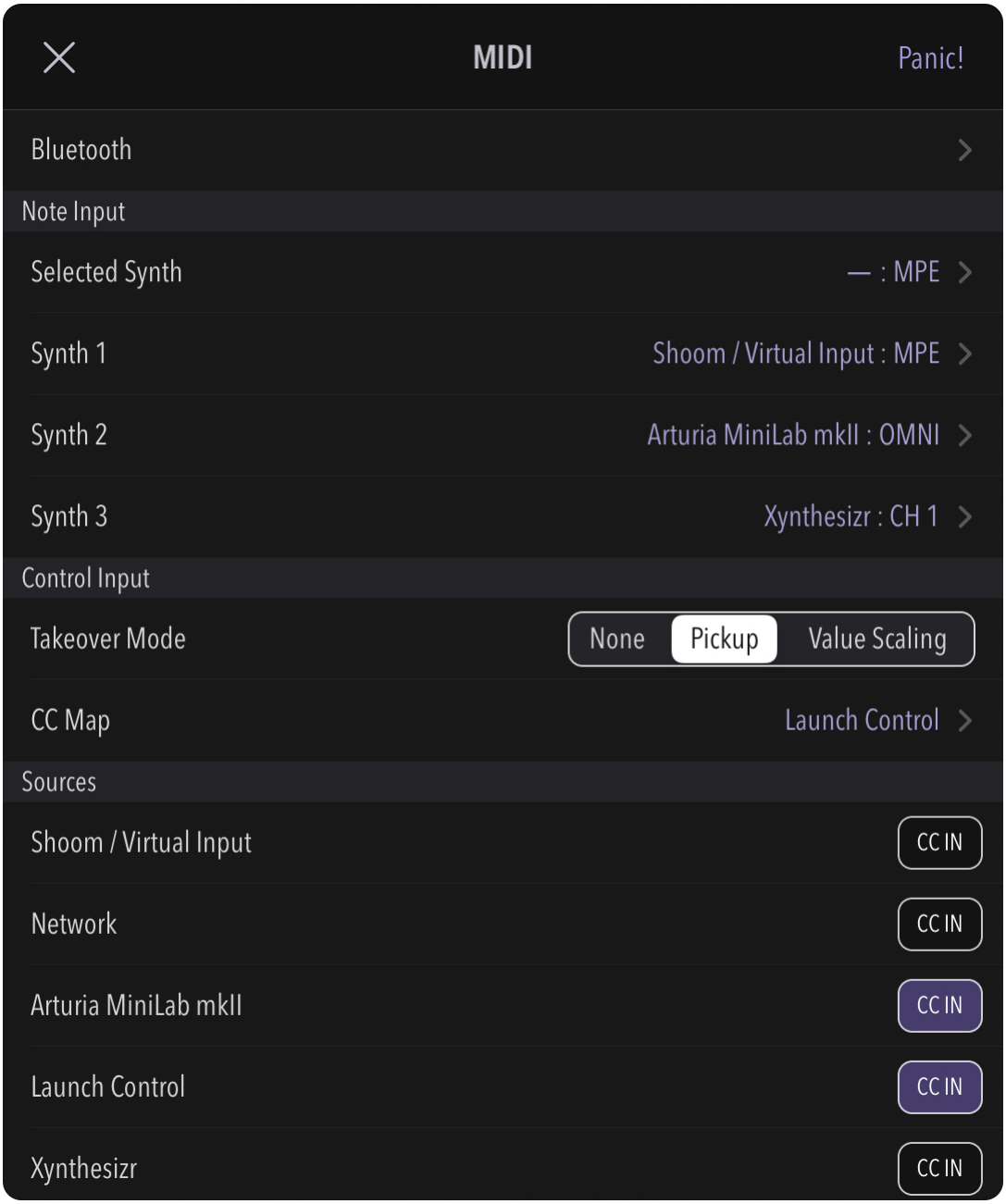
With **AB MIDI**, as its routing is more flexible, there are 5 receiver ports:

- Session (CC only)
- Selected Synth
- Synths 1-3

For both IAA and AB MIDI the notes and associated events are routed accordingly and CC

events are routed straight to the corresponding CC Map page, disregarding their MIDI channel.

MIDI SETTINGS



Panic! - tap this button to release all MIDI notes in case they have been left hanging.

Bluetooth opens the system menu for managing Bluetooth MIDI connections. When a Bluetooth device is connected, it is automatically added to the sources list.

Note Input section indicates the currently connected MIDI source and the input mode or channel. Tap a row to edit its MIDI Note Input configuration.

Takeover Mode helps to avoid abrupt changes when parameter values in Shoom do not match those of hardware controls. For instance, this can happen after changing a preset, manually tweaking the control in the app, or when using *Current Synth* mappings (see MIDI CC Map) and switching between synths. Available modes are:

- **None** – the control value is immediately sent to the destination parameter, often resulting in sudden destination parameter value jump.
- **Pickup** – moving the hardware control has no effect until it reaches the value of its

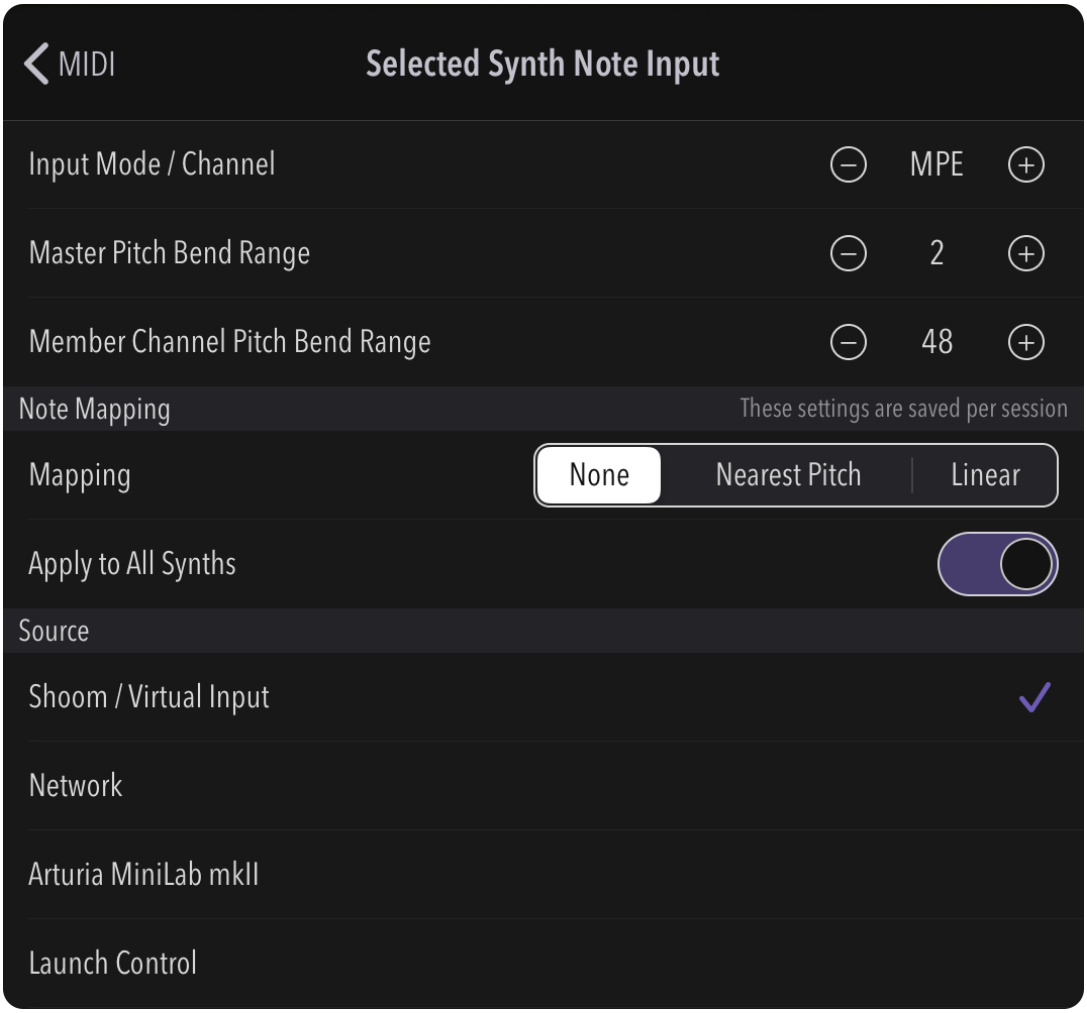
destination parameter. After that, the destination value tracks 1:1 as normal.

- **Value Scaling** – the hardware control value is compared to the destination parameter and changes are scaled accordingly until the values converge. After that, the destination value tracks 1:1 as normal.

CC Map displays the name of the map currently in use and opens the MIDI CC Map editing window.

Sources section allows you to select Core MIDI ports from which the app will receive MIDI CC messages. If you have Shoom selected as a destination in another app, enable *Shoom / Virtual Input* here.

MIDI NOTE INPUT



Input Mode / Channel sets the receiving mode and channel:

- **MPE** (channel 1 is the master channel, channels 2-16 are member channels)
- **OMNI** (receive on all channels)
- Channels **1-16**

> **Hint:** If Shoom doesn't respond to Y-axis movements on your MPE controller, that is most likely because this is set to OMNI instead of MPE.

Shoom can receive the MIDI MPE Configuration (MCM, RPN 6) and Pitch Bend Sensitivity (RPN 0) messages to automatically setup the input mode and master and member channel pitch bend ranges when an MPE controller is connected. The app supports only the MPE Lower

Zone, so make sure the controller is configured accordingly.

(Master) Pitch Bend Range sets the ± range in semitones for Pitch Bend events on the Master Channel in MPE mode or any applicable channels in OMNI or single-channel mode.

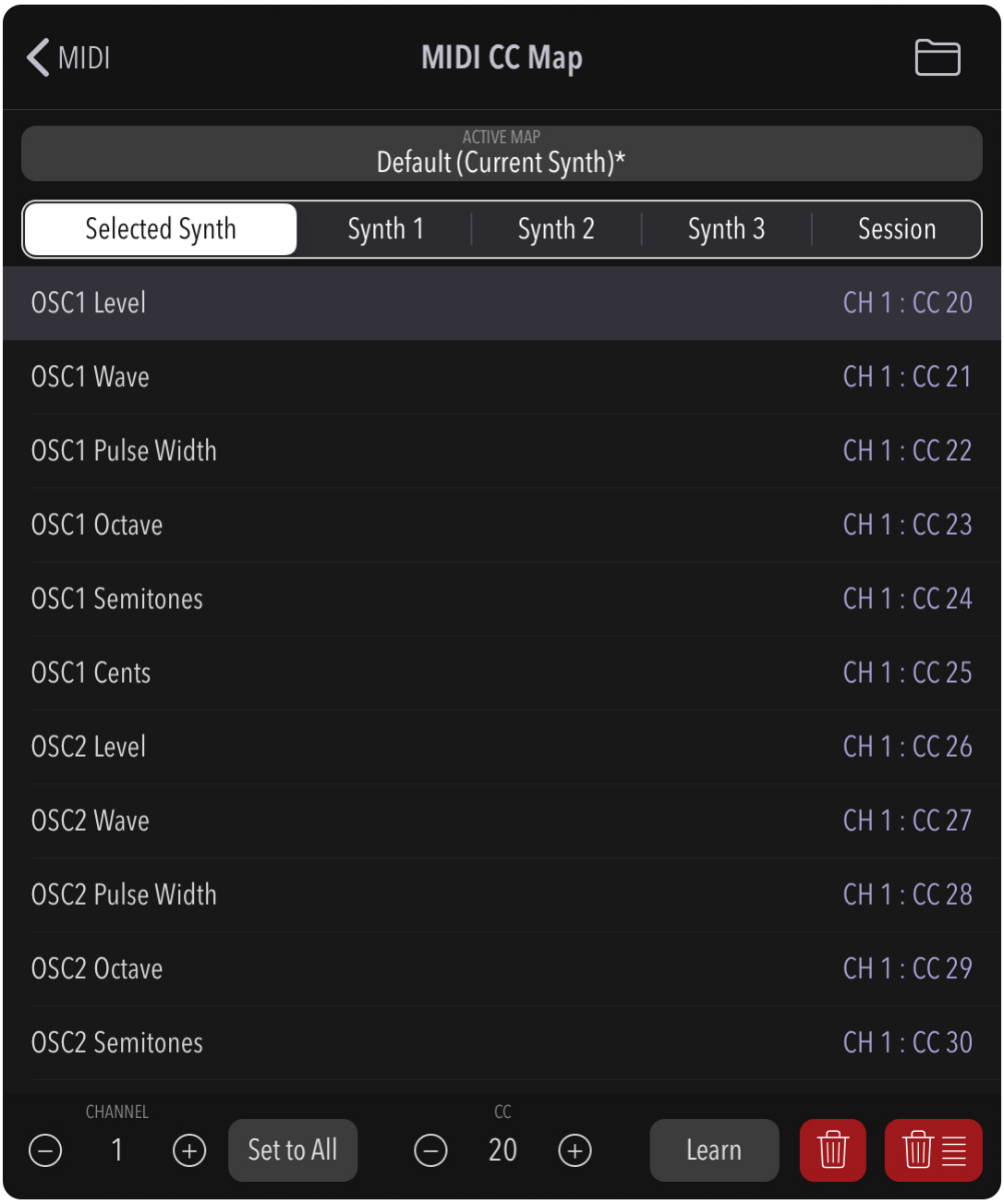
Member Channel Pitch Bend Range *(MPE only)* sets the ± range in semitones for Pitch Bend events on MPE Member Channels.

Note Mapping sets the way MIDI notes are mapped to the currently selected scale (see Session Settings):

- **None** leaves the MIDI note pitches as is
- **Nearest Pitch** plays the pitch of the scale that is closest to the input MIDI note. In this mode you can also choose if the note is '*rounded*' strictly **up**, **down**, or **auto**, i.e. whichever way is the shortest
- **Linear** allows you to select the **reference MIDI note** that will correspond to the scale's base frequency set in Session Settings. Scale notes above and below the reference will be sequentially mapped to the MIDI notes above and below the reference

The **Source** section selects a Core MIDI port from which to receive notes. If you have Shoom selected as a destination in another app, select *Shoom / Virtual Input* here.

MIDI CC MAP



Use this window to configure MIDI control of Shoom.

There are five destination targets available, each with its own set of parameters:

- **Synths 1, 2, 3**
- **Current Synth** – has the same set of parameters as the aforementioned targets, but allowing the same hardware controls to be used for all three synthesizers, with the actual destination depending on the current selection
- **Session**

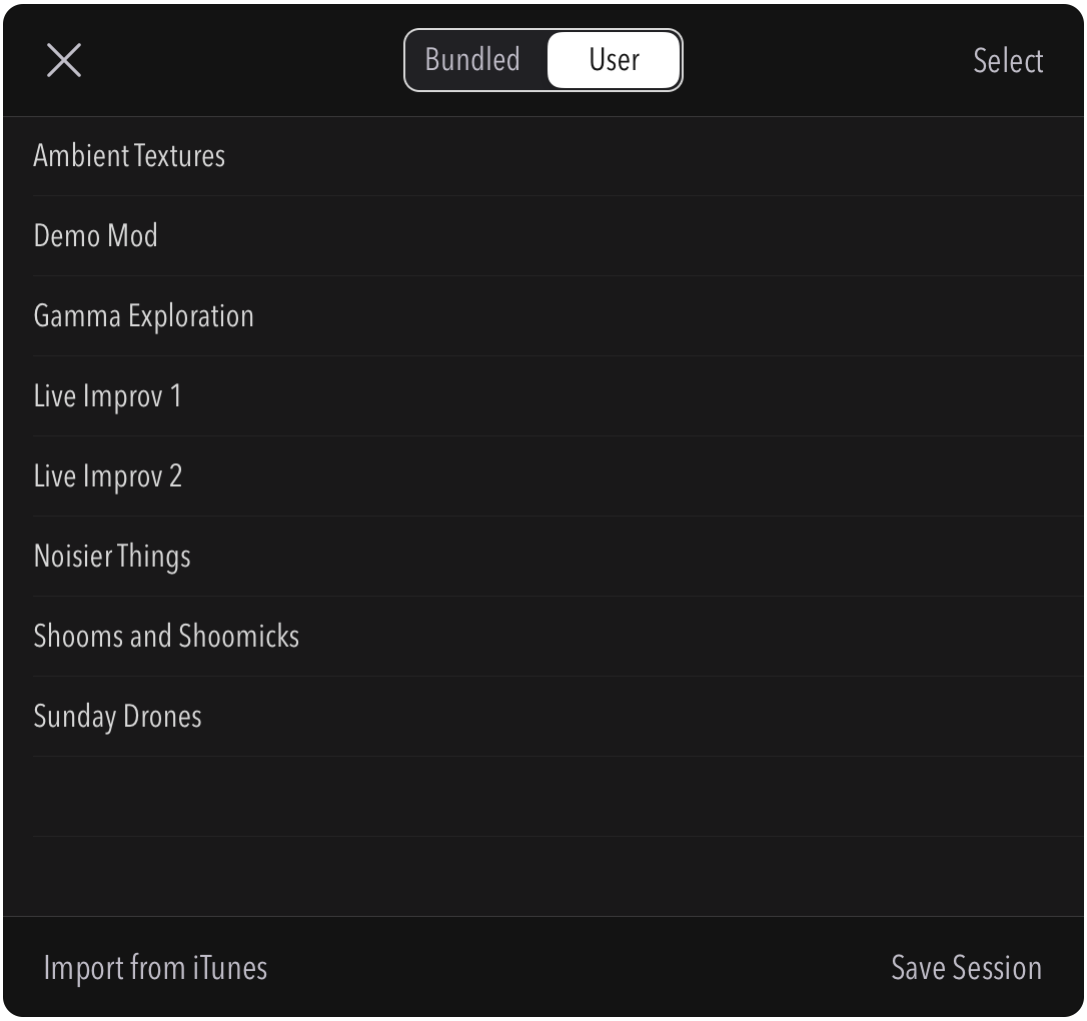
Select a parameter in the list and assign channel and CC below, or tap **Learn** and turn a knob or press a button on your controller to automatically assign corresponding values.

clears the currently selected assignment.

clears all assignments for the current target.

Tap in the top right to load, save, delete, rename, import or export maps.

SESSIONS



Use this dialog window to manage your sessions. Bundled sessions can only be loaded.

Tap a session in the list to **open**.

Tap **Save Session** in the bottom right to **save**.

Swipe right to left on a session in the list to reveal the **Delete** and **Rename** buttons.

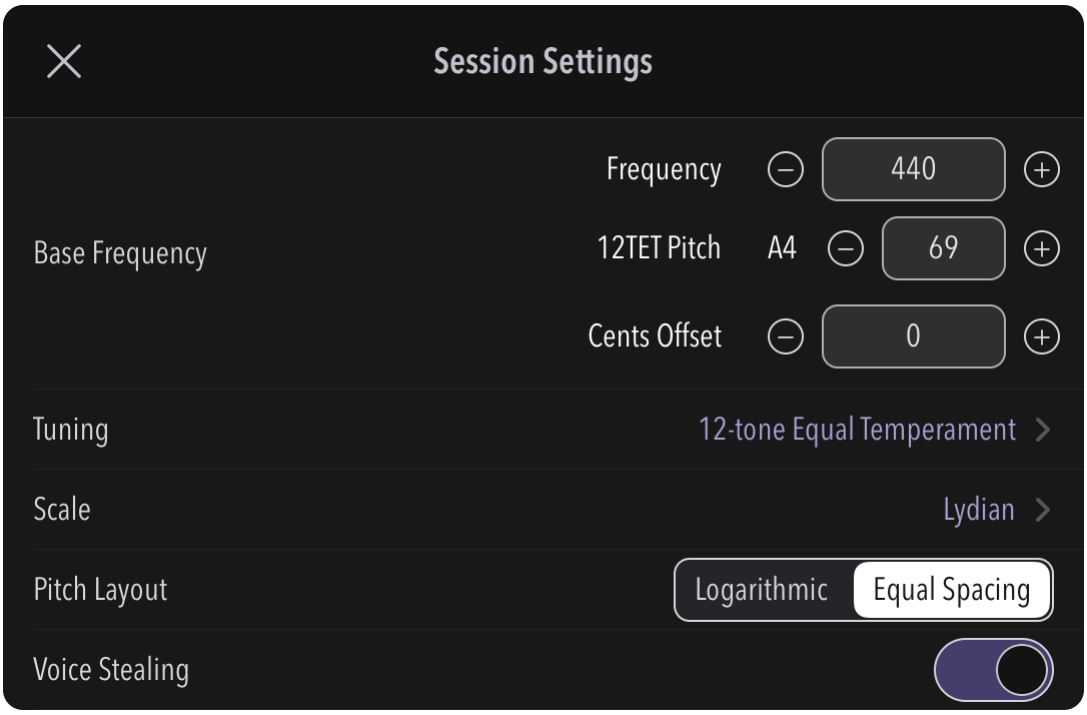
To **export** one or more sessions, tap **Select** in the top right, select, then tap and choose the destination.

The is two ways you can **import** sessions:

- Use the standard 'Open in…' dialog from another app
- Put the session files in the Shoom's File Sharing folder using iTunes. Then tap **Import from iTunes** in the bottom left of this window. This method can be useful if you need to import multiple files.

SESSION SETTINGS

This modal window gives access to session parameters (in other words, those that are used by all three synthesizers, but are not global).



Base Frequency sets the root pitch of the musical scale being used. It can be set as an arbitrary frequency or a note in 12-tone Equal Temperament with an optional offset.

You may notice that the note also has an octave specified. If the scale is *octave-repeating*, which commonly used scales are, it can be simply ignored. However, if you are using a *non-octave-repeating scale* such as the *Bohlen–Pierce scale*, the octave does have significance.

Tuning (in the sense of *tuning system*) defines a set of pitches (related to the base pitch) that can be used in derivative scales. E.g. *12-tone Equal Temperament*, various *Just Intonation* systems, *Meantone temperament*, etc.

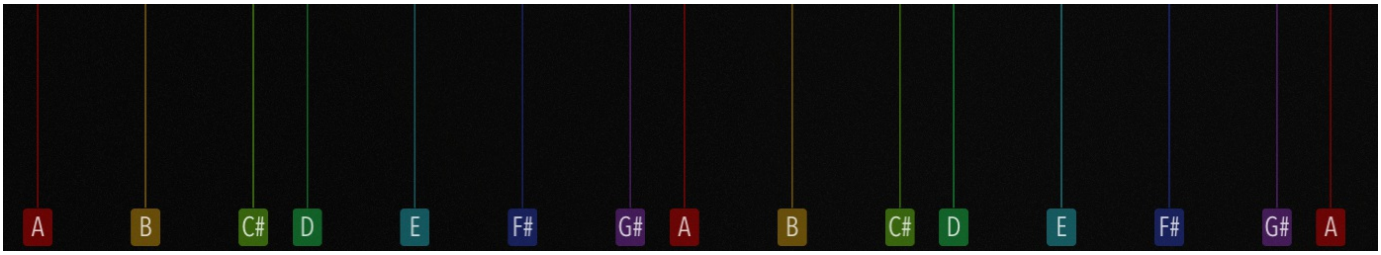
In Shoom, each tuning has a number of associated scales, which are defined as subsets of parent tunings' sets of pitches. For example, 12-tone Equal Temperament has the chromatic scale containing all the pitches, as well as major, minor and a number of other scales which omit some of the pitches.

Scale allows you to choose a scale from the list associated with the selected tuning.

You can create your own custom tunings and scales, see Scale.

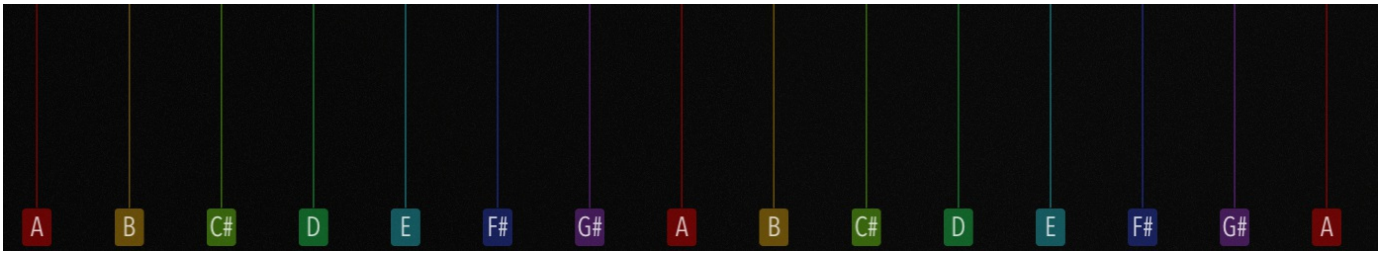
Pitch Layout defines the way scale note markers are positioned in the playing pad:

- With **Logarithmic** layout, the whole frequency range follows a single logarithmic scale (in line with human perception of intervals), and pitches are laid out as they appear in the range. Proportionally larger gaps between note markers correspond to proportionally larger intervals between pitches. For example, pitches a tone apart will be separated by twice the distance between pitches a semitone apart.



A major scale using **Logarithmic** layout.
Spacing reflects the scale structure (tone, tone, semitone, tone, tone, tone, semitone).

- **Equal spacing** layout positions note markers at equal distances between each other for ease of playing. It is as if the frequency space is compressed for wider intervals between scale degrees and expanded for narrower intervals, while still being laid out logarithmically between each pair of adjacent note markers.



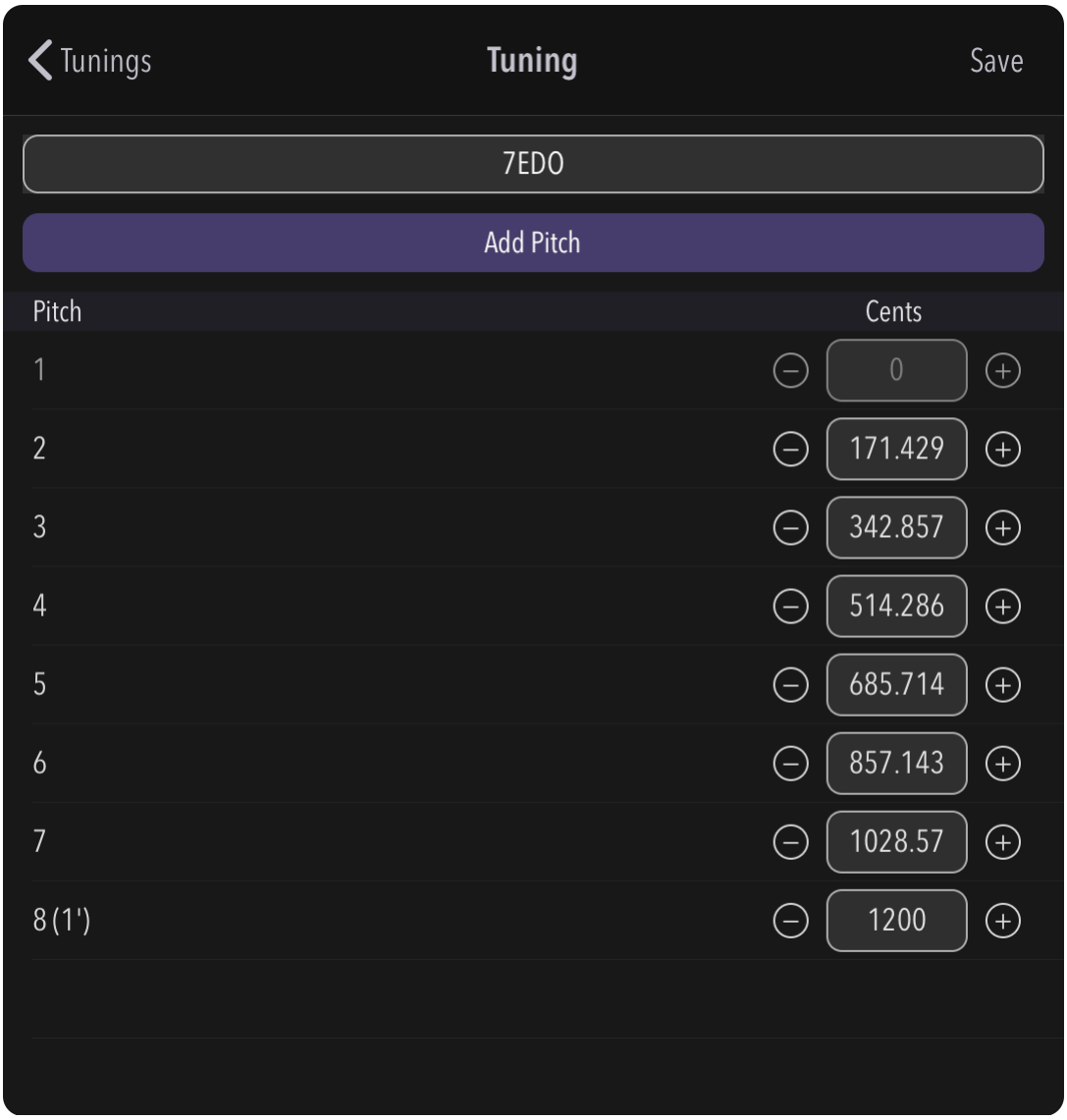
A major scale using **Equal Spacing** layout.
Scale structure is obscured, but it is generally easier to play.

As is to be expected, this setting makes no visible difference with scales made of equally-spaced notes (such as chromatic and whole-tone scales).

Voice Stealing controls how synthesizers behave when maximum polyphony is reached and a new note is requested to be played. If enabled, a synth will stop playing the note that has been playing the longest. If disabled, the new note will be ignored.

TUNING

To create a new tuning, tap the **+** button in the **User** tab of the tunings list window. To rename, edit or delete an existing user tuning, swipe right to left and tap one of the respective buttons.



Use the **Add Pitch** button to add a required number of pitches. To delete a pitch, swipe right to left and tap **Delete**.

Each pitch has a **Cents** control that defines the interval from the base pitch. To change its value, use **–** and **+** buttons, or keyboard (allows fractional input).

Note that the last pitch is also labeled as **1'**. This signifies that this is the interval by which the tuning (and thus all derived scales) repeats. For common octave-repeating scales, this value should be 1200.

Make sure you have input a name for your tuning and tap **Save**. If you are editing an existing tuning and have changed its name, it will be saved as new.

For each user-defined tuning Shoom automatically generates a scale containing all pitches. This scale cannot be edited or deleted.

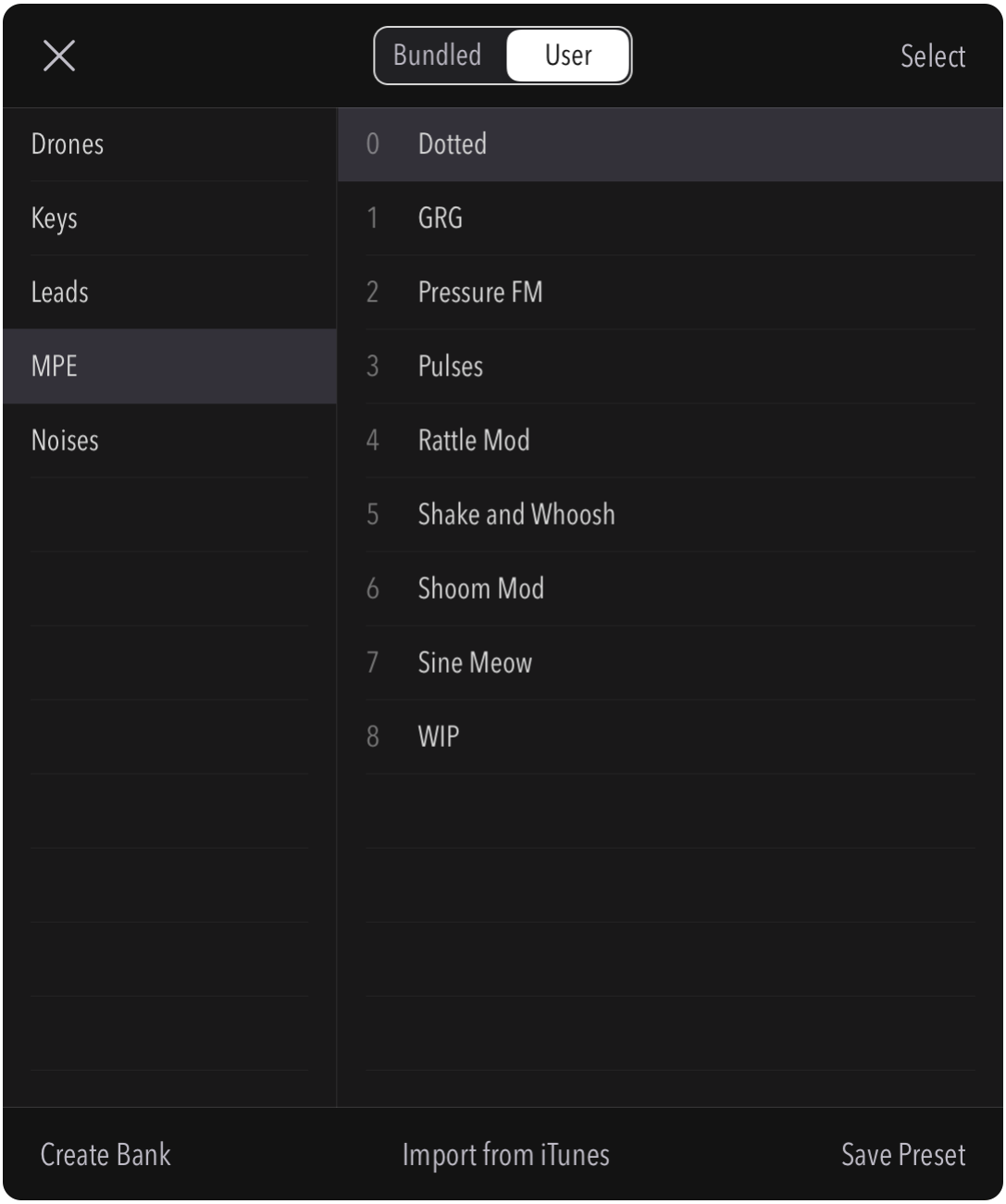
SCALE

To create a new scale, tap the **+** button in the **User** tab of the scales list window. To rename, edit or delete an existing user scale, swipe right to left and tap one of the respective buttons.

Select the tuning pitches you want to include in the scale.

Make sure you have input a name for your scale and tap **Save**. If you are editing an existing scale and have changed its name, it will be saved as new.

SYNTH PRESETS



Use this dialog window to manage your synth presets. Bundled presets can only be loaded, not saved, deleted or renamed.

This window shares most of its functionality with the previously described Sessions window, the exception being that it organizes presets in banks. The numbers to the left of preset names are their respective MIDI Program Change values.

To create a new bank, tap **Create Bank** in the bottom left. To **rename** or **delete**, swipe from right to left on the bank, and tap one of the respective buttons.