

# XYNTHESIZR

## User Guide

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# OVERVIEW

**Xynthesizr** is a streamlined yet capable 32-step matrix sequencer/synthesizer with generative features.

- Create patterns and modify them in real time, or let Xynthesizr do it for you using its morphing algorithms
- Change scale and key, or transpose within a scale on-the-fly
- Tweak parameters of the internal synthesizer or output MIDI to your favorite apps and devices
- Record and share your creations

## General features:

- MIDI support for syncing and sending notes to synths, samplers and drum machines
- Notes to MIDI channel mapping for driving multiple apps or devices simultaneously
- MIDI input to control transposition with note messages and synthesizer/sequencer parameters with CC messages
- Ableton Link 3 support (see [ableton.com/link](https://ableton.com/link) for more information)
- Audiobus 3 support (see [audiob.us](https://audiob.us) for more information)
- Inter-App Audio support
- 40+ bundled presets
- Save, export and import your own patterns and presets
- Record and export audio

## Sequencer features:

- Gestures to easily edit patterns on-the-fly
- [Conway's Game of] Life-like cellular automata and probability-based pattern morphing
- Limit pattern morphing to a selected area of the grid
- Variable tempo, step length subdivision and pattern length
- Variable velocity per step
- Selectable keys and scales with ability to transpose in real time
- An option to tie consecutive notes of same pitch to make longer notes
- Shift and flip patterns

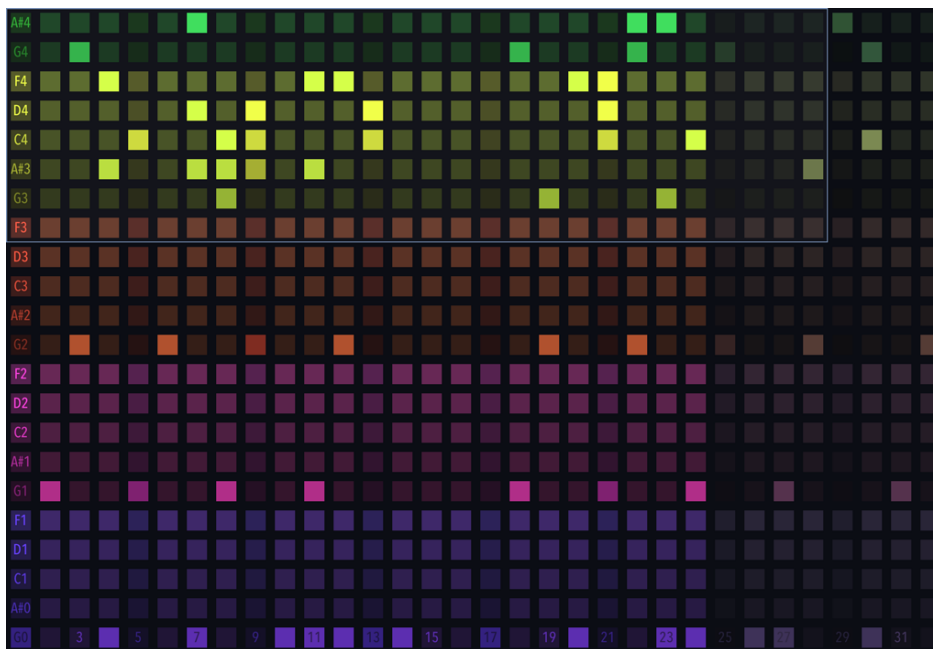
- Create and use your own scales and Life-like cellular automata rules
- Color-coded octaves

### **Synthesizer and FX feature:**

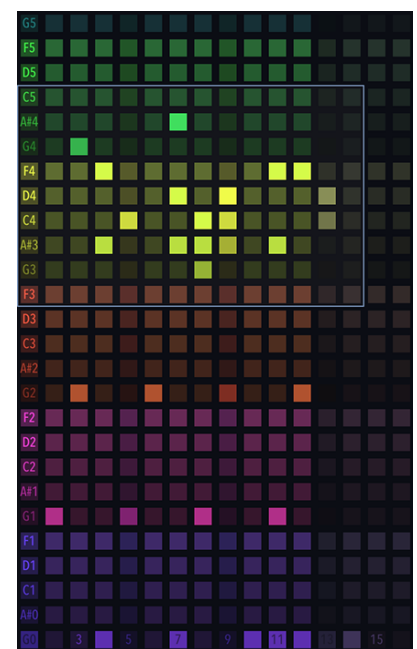
- 32-bit floating point sound engine
- 16 voice polyphony
- 2 antialiased oscillators per voice
- 4 waveforms (sine, triangle, sawtooth, square)
- 4-pole (24 dB/oct) low-pass resonant filter
- 2 ADSR envelope generators (amplitude and filter cutoff frequency)
- 2 LFOs to modulate 4 selectable LFO targets (filter frequency, pitch, amplitude, second oscillator detune)
- Stereo delay, reverb and randomized panner

# MAIN SCREEN

## SEQUENCER GRID



iPad



iPhone

The **grid** is an array of buttons that provides a means of creating sequencer patterns. The vertical axis corresponds to pitch, while the horizontal axis corresponds to time.

The buttons are color-coded in such a way that the notes that belong to the same scale repeat period (normally an octave, but not necessarily so for custom scales) are represented with buttons of same color. This allows you to easily see where each step of the scale is located on the grid.

The names of notes for each of the rows are displayed over the buttons on the left side of the grid. These can be switched off in [Settings](#). There are several gestures with which you can edit the grid:

- 1-finger tap – add or remove a single note
- 1-finger slide – add or remove multiple notes
- 2-finger tap – remove notes of a certain color (tap again to undo)
- 3-finger tap – clear all notes (tap again to undo)

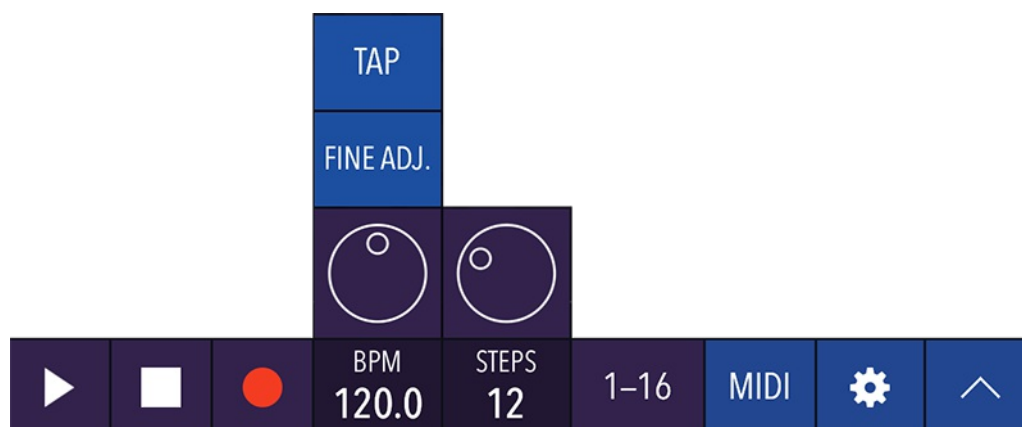
You can also clear and undo clear pattern by:

- Shaking your device
- Tapping the CLEAR button in the [Sequencer](#) section of [SEQ panel](#)




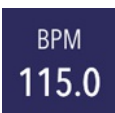
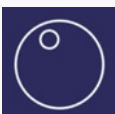
## BOTTOM PANEL










iPad



iPhone (5.5")

	Starts the sequence, or pauses it if it's already playing.
	Stops the sequence if it is playing or paused.
	Starts or stops recording audio output. When recording is stopped, an action sheet will appear asking if you want to export the recording. The recorded files will also be available via iTunes file sharing. You can play, manage and export your files later in <a href="#">Settings</a> > Recordings.
	Displays the current tempo in BPM (beats per minute). <i>iPad:</i> To use the tap tempo function, press on this button repeatedly. <i>iPhone:</i> Tap this button to reveal tempo controls including a tempo adjustment knob, a tap tempo button and a fine adjustment knob.
	Rotate this knob to change the tempo.

	<p>Tap this button to enable precise tempo adjustments using the knob. To return to normal mode just tap the button again.</p>
	<p>Controls the number of sequence steps to be played on each repeat, can be set to any number from 1 to 32.  <i>iPhone:</i> Tap the steps button first to reveal this knob. Tap again to hide.</p>
	<p><i>(iPhone only)</i>  This button (labeled '1-16' or '17-32') indicates the currently visible part of the grid and allows you to navigate between the two parts.</p>
	<p><i>(iPad only)</i>  Each of these buttons reveals a corresponding control panel (<a href="#">synthesizer</a>, <a href="#">sequencer</a>, and <a href="#">velocity</a>).</p>
	<p><i>(iPad and 5.5" iPhone only, available in <a href="#">Settings</a> on smaller devices)</i>  Opens <a href="#">MIDI Settings</a>.</p>
	<p><i>(iPad, 5.5" and 4.7" iPhone only, available in the <a href="#">Control Panel</a> on smaller devices)</i>  Opens general <a href="#">Settings</a>.</p>
	<p><i>(iPhone only)</i>  Opens the synthesizer and sequencer <a href="#">Control Panel</a>.</p>

(iPad only, available on the PRST/VEL tab of the [Control Panel](#) on iPhone)

Use these buttons to load, save and manage your songs.

A 'song' contains all the synthesizer settings as well as the pattern, BPM, number of steps, sequencer and morph settings.

The large button displays the name of the current song. Tap this button to choose and load a song.

'Built-in' tab of this dialog contains songs that are bundled with the app.

'Custom' tab contains songs made by the user.

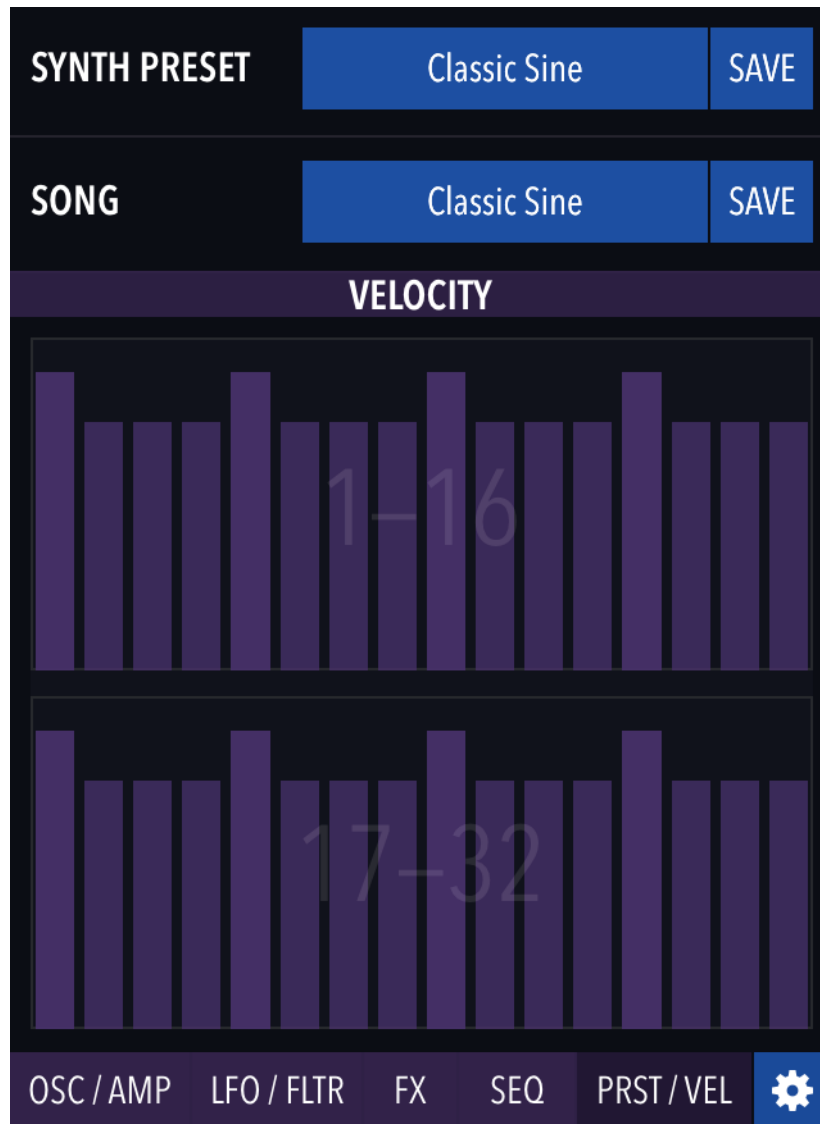
You can delete your song by doing a left swipe on a table cell. Built-in songs cannot be deleted.

To save a song, just tap the **SAVE** button and name your song.

SONG	
Area 25*	SAVE

# CONTROL PANEL

(iPhone only)



The tab bar at the bottom of this panel switches between different sections of synthesizer and sequencer settings. The **gear button** (*iPhone 4" only*) located to the right of this tab bar opens the [Settings](#) screen.

Although grouped differently, the controls found here are functionally the same as in the iPad version of the UI. Please refer to [SYNTH](#), [SEQ](#) and [VEL](#) panel sections of this guide for a description of the available controls.

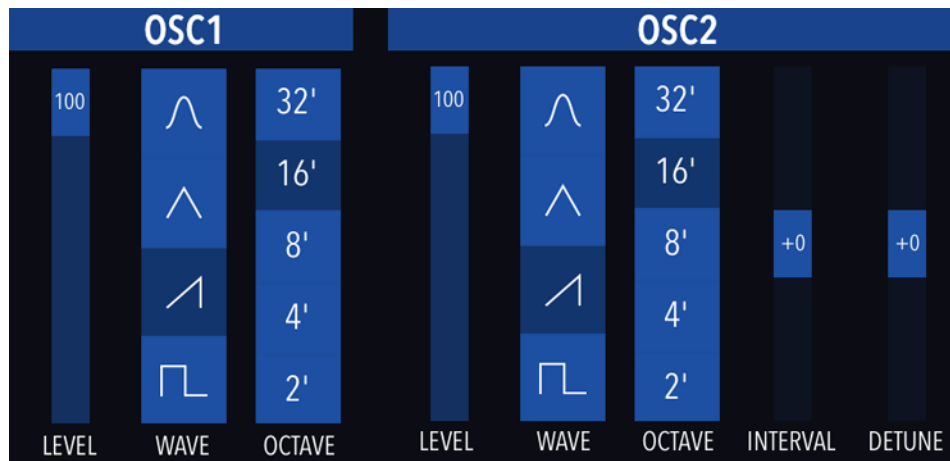


## SYNTH PANEL

(iPad // OSC/AMP, LFO/FLTR, FX tabs of the Control Panel on iPhone)

### OSC1 & OSC2

Oscillators generate the sound that is then processed in other modules of a synthesizer. Xynthesizr features two oscillators per each synthesizer voice. Each of the oscillators has the following controls.



**LEVEL.** Sets the volume of oscillator signal.

**WAVE.** Sets the waveform. Each oscillator has the option of generating a sine, triangle, sawtooth, or square wave. Each waveform has a different set of harmonics.

**OCTAVE.** Sets the pitch of the oscillator in octave steps. The settings are in feet notation, wherein the lower the number, the higher the pitch.

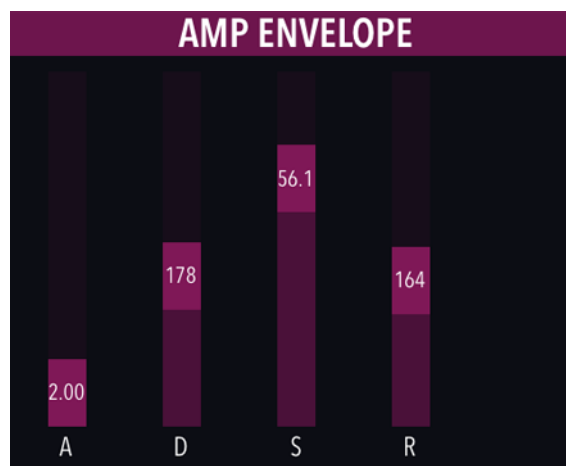
The second oscillator (**OSC2**) has additional pitch controls.

**INTERVAL.** Adjusts the pitch of the oscillator in the range of -1 to +1 octave in semitone steps (-12 to +12 semitones).

**DETUNE.** Allows for precise tuning of the oscillator in the range of -50 to +50 cent.

### AMP ENVELOPE

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



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

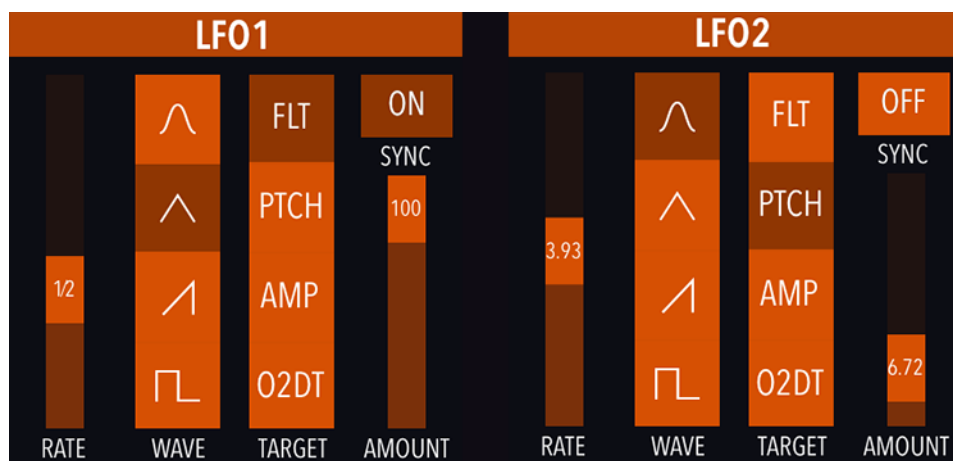
**D** (*Decay*) sets the time it takes for a note to reach the **S** (sustain) value.

**S** (*Sustain*) sets the amplitude of a note after it passes the **A** and **D** stages.

**R** (*Release*) sets the time it takes for a note to fade out when it's released.

## LFO1 & LFO2

Both of the LFOs (low frequency oscillators) feature the same controls, and let you modulate 2 parameters simultaneously.



**RATE** adjusts the frequency of the oscillator waveform within a range of 0.02–20 Hz.

**WAVE** sets the waveform of the oscillator.

**TARGET** sets the parameter to modulate. Each LFO can modulate one of the following parameters:

- **FLT** - filter cutoff frequency
- **PTCH** - pitch of both oscillators

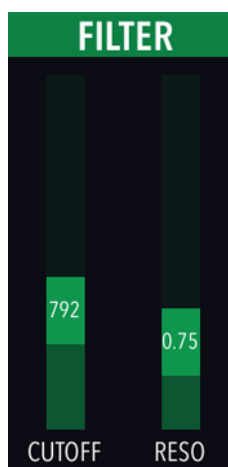
- **AMP** - amplitude of both oscillators
- **O2DT** - pitch (detune) of the second oscillator (same as the **DETUNE** slider in **OSC2** section)

**AMOUNT** controls how much the LFO signal affects the **TARGET** parameter.

**SYNC** turns on or off synchronization of LFO rate with the tempo.

## FILTER

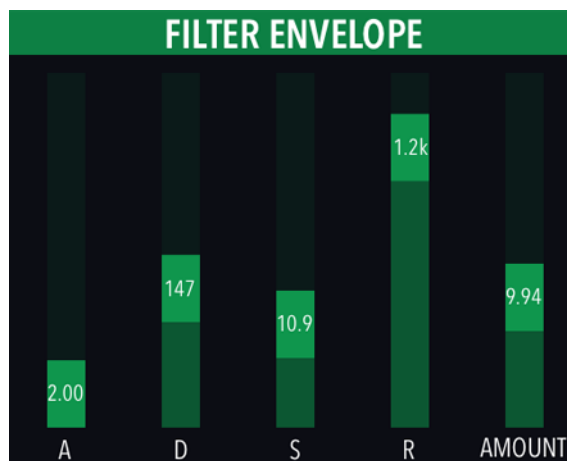
Xynthesizr features a 4-pole (24 dB/octave) low-pass resonant filter.



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

**RESO** (Resonance, also known as Emphasis or Q) controls the boost of the frequencies near the cutoff.

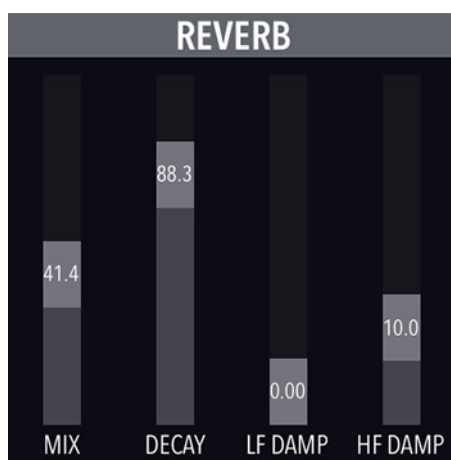
## FILTER ENVELOPE



The filter envelope modulates the cutoff frequency of the filter. This

envelope has the same four stages (attack, decay, sustain, and release) as the amplitude envelope. The **AMOUNT** slider controls how much the envelope signal affects the cutoff.

## REVERB



**MIX** controls the mix of dry and wet (reverb) signals. 0 is only the dry signal, 50 is equal amounts of both, 100 is wet signal only.

**DECAY** sets the time it takes for the reverb signal to decay. The higher the value, the longer the reverb.

**LF DAMP** controls dampening of low frequencies in the reverb signal. The higher the value, the faster the low frequencies decay.

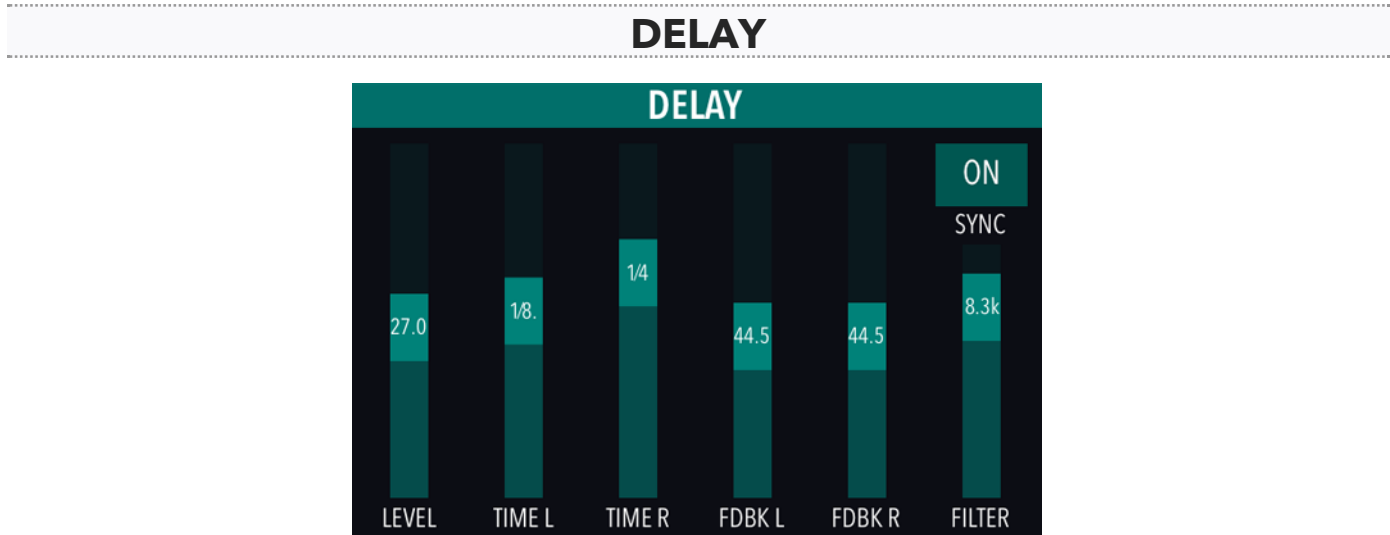
**HF DAMP** controls dampening of high frequencies in the reverb signal. The higher the value, the faster the high frequencies decay.

## PAN



This is not a typical panner that just modulates the stereo position of the whole audio signal. Instead, it randomly selects a position for each note separately. The **WIDTH** slider controls how far to the left or right it can be.

0 means center only, 100 means anywhere from full left to full right.



**LEVEL** controls the volume of the delayed signal.

**TIME L, TIME R** control the delay time for the left and right channels respectively.

**FDBK L, FDBK R** control the feedback amount for the left and right channels respectively. 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.

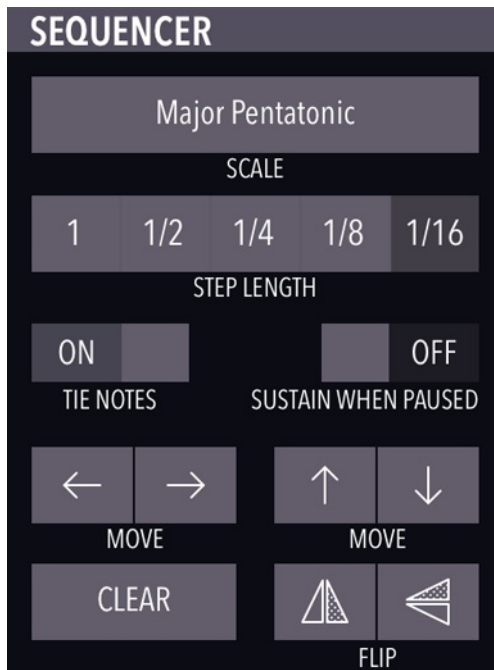
**SYNC** turns on or off synchronization of delay time with the tempo.

# SEQ PANEL

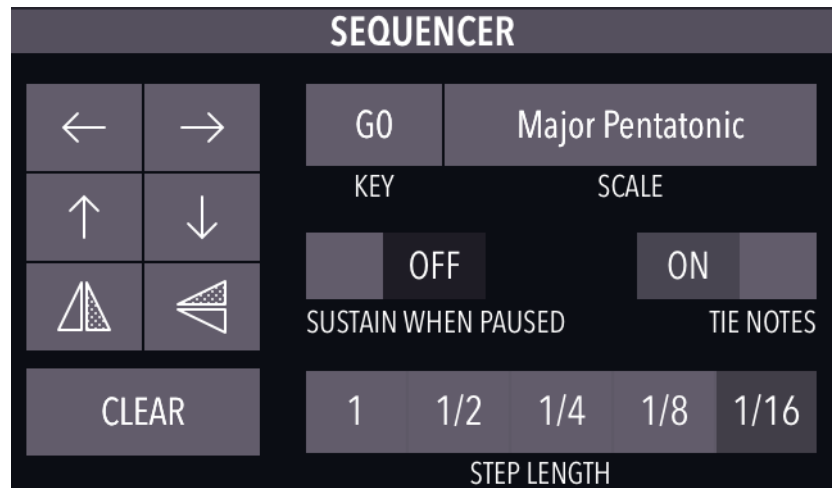
(iPad // SEQ tab of the Control Panel on iPhone)

## SEQUENCER

This sections controls the sequencer's general parameters.



iPad

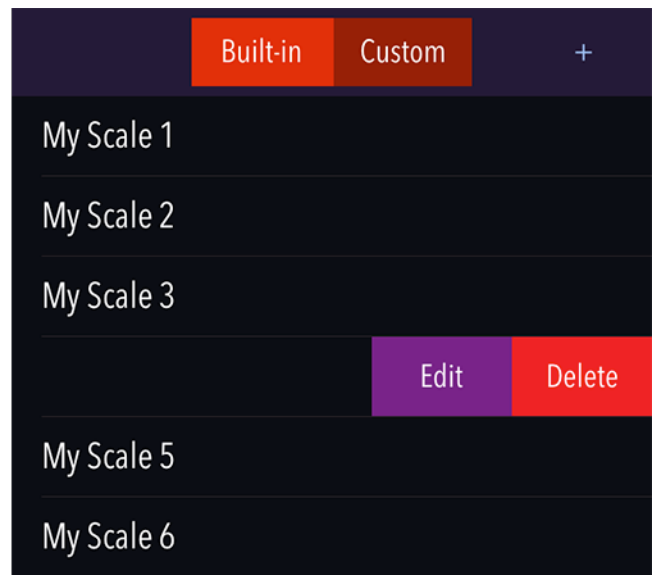
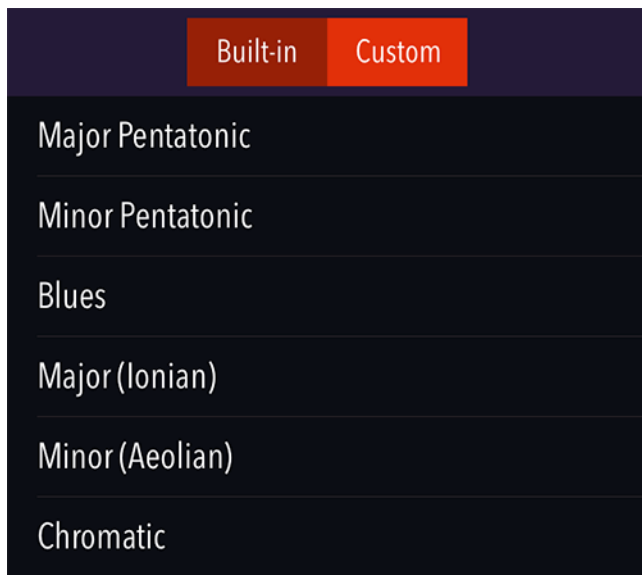


iPhone

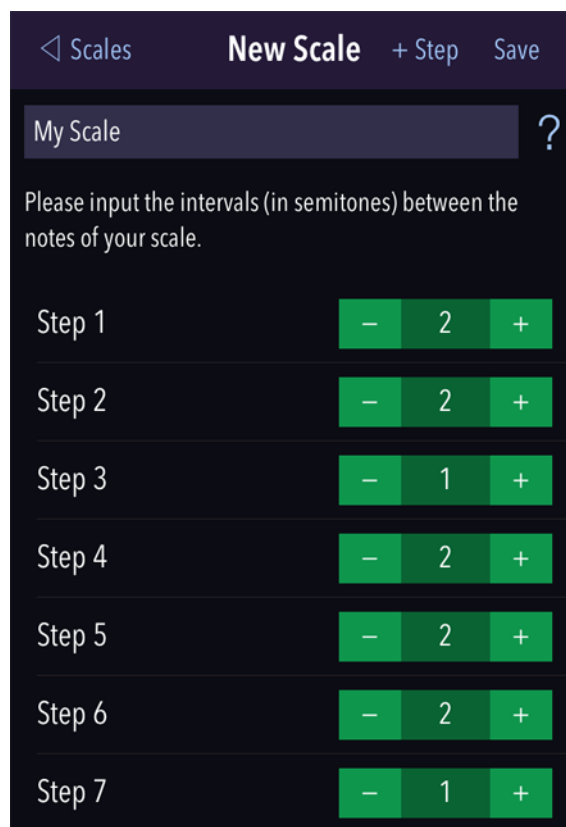
**KEY** button (*iPhone only*) displays the current key and transposition. Tap it to open the [Key and Transposition](#) dialog which lets you select the key note and octave for your sequence.

*For iPad*, the Key and Transposition controls are always present on the SEQ panel.

**SCALE** button displays the current scale. Tap it to open the scale selection dialog. This dialog lets you choose one of existing scales, or create your own.



To create a new scale, tap the **+** button on the **Custom** tab of the scale selection dialog.



Enter a name for the scale, and set up its interval pattern. To do that, add the necessary number of steps with the **+ Step** button, and set intervals between the steps with the stepper controls. The intervals are set in semitones. For example, in a *major scale*, there will be 7 scale steps with intervals 2, 2, 1, 2, 2, 2, 1, which correspond to the interval pattern *W-W-H-W-W-W-H* (or *T-T-S-T-T-T-S*), where W means whole step, and H means half step (or T - tone, and S - semitone). When you're done, tap **Save**.

To edit or delete an existing custom scale, swipe left on the table cell to

reveal respective buttons.

**SUSTAIN WHEN PAUSED** engages or disengages the mode in which the sequencer continues to play current notes when you tap the pause button.

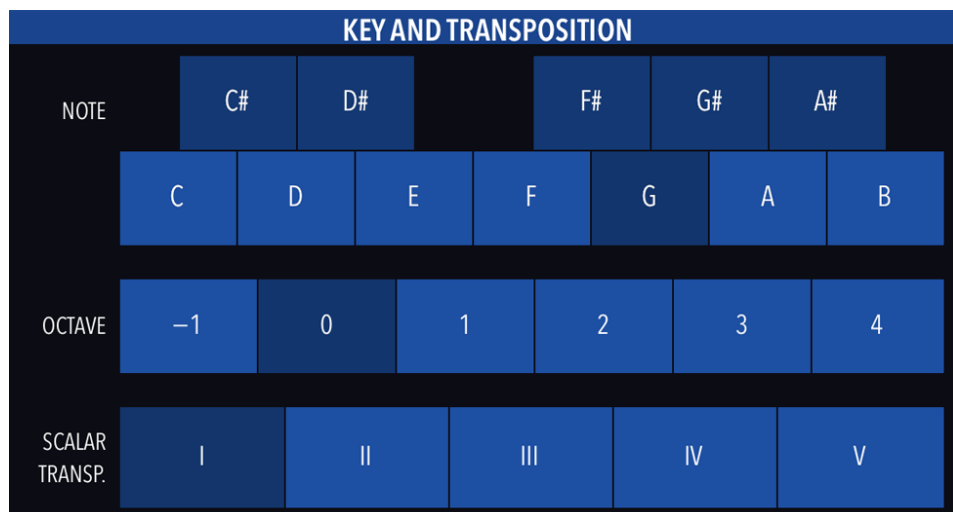
**TIE NOTES** makes the sequencer play multiple consecutive notes of the same pitch as one long note.

**STEP LENGTH** sets the relative length of a sequencer step in fractions of the whole note.

Six **PATTERN EDIT BUTTONS** allow you to shift or flip the sequencer pattern vertically or horizontally.

**CLEAR** button deletes the pattern (tap it again to undo).

## KEY AND TRANSPOSITION



The iPad screen displays the 'KEY AND TRANSPOSITION' settings. It features three main sections: 'NOTE', 'OCTAVE', and 'SCALAR TRANSP.'. The 'NOTE' section has buttons for C#, D#, F#, G#, and A#, with C, D, E, F, G, A, and B selected. The 'OCTAVE' section has buttons for -1, 0, 1, 2, 3, and 4, with 0 selected. The 'SCALAR TRANSP.' section has buttons for I, II, III, IV, and V, with I selected.

iPad



The iPhone screen displays the 'Key and Transposition' settings. It features three main sections: 'Note', 'Octave', and 'Scalar Transposition'. The 'Note' section has buttons for C#, D#, F#, G#, and A#, with C, D, E, F, G, A, and B selected. The 'Octave' section has buttons for -1, 0, 1, 2, 3, and 4, with 0 selected. The 'Scalar Transposition' section has buttons for I, II, III, IV, and V, with II selected. At the bottom, there is a 'Change immediately' switch set to 'ON'.

iPhone

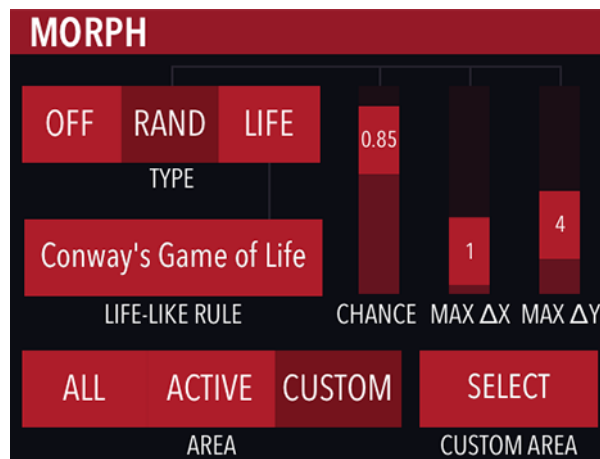
This section lets you select the key note and octave for your sequence.

It also features a **Scalar Transposition** setting which allows you to transpose the sequence by a fixed number of scale steps. This allows you to access any mode of a selected scale, or play Xynthesizr like an arpeggiator.

*iPhone only:* Changes are applied immediately if **Change Immediately** switch is ON, and when tapping **Done** if the switch is OFF.



## MORPH



This sections controls the engine that can automatically modify (morph) the sequencer pattern. Morphing is triggered every time a pattern is to be repeated.

**TYPE** is the master control for this section. It allows you to disable pattern morphing (**OFF**), or to select one of the two morphing algorithms: randomized (**RND**) or Life-like cellular automaton (**LIFE**). The **CHANCE**, **MAX ΔX** and **MAX ΔY** sliders work only in conjunction with the former, and the **LIFE-LIKE RULE** setting only with the latter.

**RND** morphing works by randomly moving the existing notes within limits specified by the parameters.

**CHANCE** sets the probability for a note to be moved.

**MAX ΔX** and **MAX ΔY** set the maximum distance a note can move horizontally and vertically, respectively (e.g. when it is set to 5, a note can move a random distance between 0 and 5).

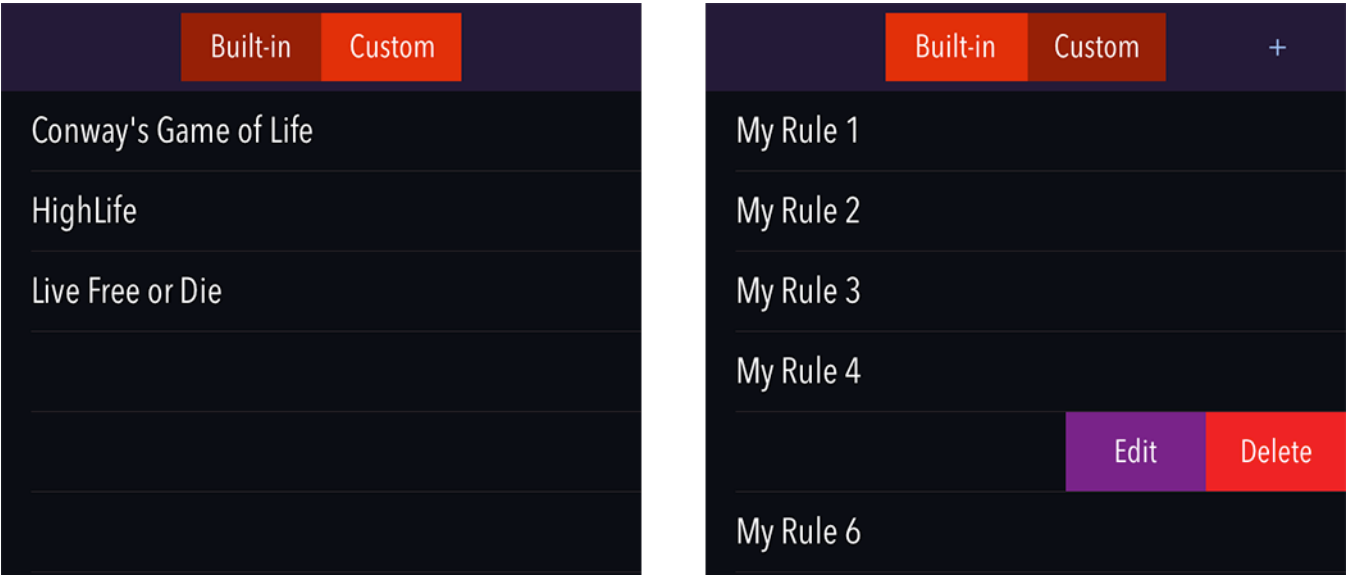
**LIFE** morphing applies the rules of *Life-like cellular automata* (the most widely known variant of which is the *Conway's Game of Life*) to the sequencer grid.

Basically, the future state (ON or OFF) of each cell depends on current states of 8 cells around it. In Xynthesizr, the transition (between 'now' and 'future') happens when a pattern is about to start over. A life-like rule set consists of the *birth* and *survival* rules. For example, the Game of Life rules are: birth - 3, survival - 2, 3. The birth rule means that an OFF cell will become ON if there are 3 ON cells (not more and not less) surrounding it. The survival rule means that an ON cell will remain ON if it is surrounded

by either 2 or 3 ON cells.

You can find in-depth information on Life-like cellular automata on [wikipedia.org](https://wikipedia.org) and [conwaylife.com](https://conwaylife.com)

**LIFE-LIKE RULE** button displays the current Life-like rule. Tap it to open the rules selection dialog. This dialog lets you choose one of existing rules, or create your own.



To create a new Life-like rule, tap the **+** button on the **Custom** tab of the rules selection dialog.



Enter a name for the rule, and set up its *birth* and *survival* parts by selecting the necessary numbers of surrounding cells. When you're done, tap **Save**.

To edit or delete an existing rule, swipe left on the table cell to reveal respective buttons.

**AREA** sets the area of the grid to which morphing is applied. It can be

either all 32 steps of the grid (ALL), only the number of steps set with the **STEPS** control (ACTIVE), or a custom area than can be selected using the **SELECT** button (CUSTOM). The latter can be useful if you want to keep your bassline the same while randomizing the melody on top of it, or to limit the range of morphing. Current area is displayed inside a light blue rectangle on the grid.

SYNTH PRESET

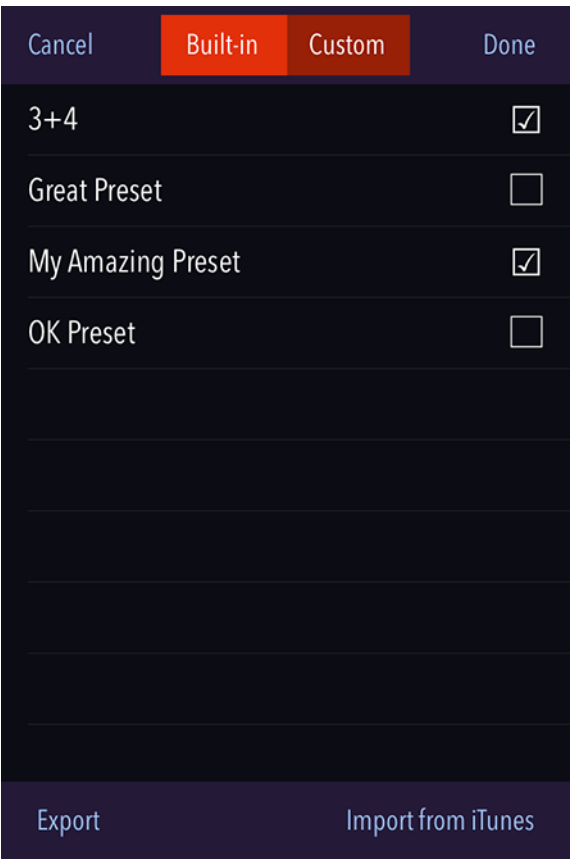
A preset stores all the synthesizer and FX settings, but doesn't store any sequence-specific data.



The large button displays the name of current preset. Tap this button to open preset selection dialog where you can choose and load a preset.

'Built-in' tab of this dialog contains presets that are bundled with the app.

'Custom' tab contains presets made by the user. This tab also allows you to export or import presets.



To export presets, tap the **Select** button, mark the presets, tap **Export**

and choose the desired export option.

To import a preset, you can simply open the file from another iOS app. Another way to do this is to put the file(s) in Xynthesizr's File Sharing folder via iTunes on your desktop computer, and tap **Import from iTunes** in this dialog. Xynthesizr will look for appropriate files in its folder and import them as presets.

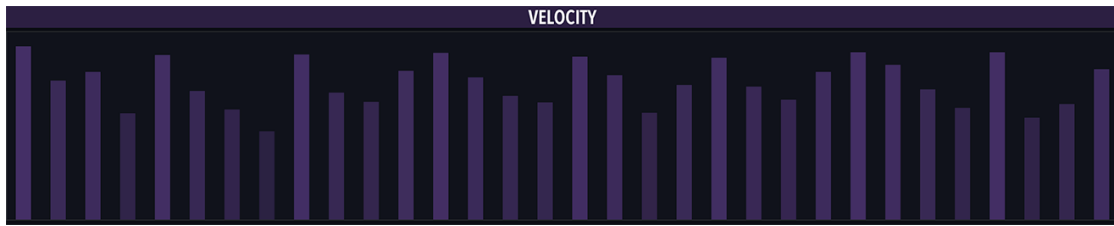
To save a preset, tap the **SAVE** button and name your preset.

You can delete your presets by doing a left swipe on a table cell. Built-in presets cannot be deleted.

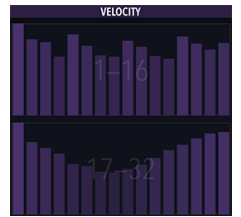
# VEL PANEL

*(iPad // PRST/VEL tab of the Control Panel on iPhone)*

## VELOCITY



iPad



iPhone

The sliders in this section set the velocity for each of the sequencer steps. When used with internal synthesizer, velocity affects the maximum values of amp and filter envelopes.

# SETTINGS

Close

Settings

Background Audio / MIDI

ON

Ableton Link

Enabled >

Load Song Immediately

Otherwise, wait until the end of the pattern

OFF

Note and Step Labels

OFF

NAMES

NUMBERS

Knobs Mode

ROTARY

LINEAR

Recordings

>

About

>

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

**Ableton Link** row indicates Link state. Tap to configure Link or check connected apps.

**Note:** Enabling Link changes some aspects of Xynthesizr's behavior, namely:

- Loading a song doesn't change current tempo
- Changing the number of steps and/or step length makes the app recalculate the current step to stay in sync measure-wise

**Load Song Immediately** switch. When you load a song while another song is being played, and this switch is set to OFF, the app will wait until the pattern reaches its end before starting to play the newly selected song. Otherwise, the song will start playing immediately.

**Note Names and Step Numbers** control allows you to have the rows of the sequencer grid labeled either with note names in scientific pitch notation (**NAMES**) or with MIDI note numbers 0-127 (**NUMBERS**). Steps are labeled if any of these options is selected. When set to **OFF**, both note and step labels are hidden.

**Knobs Mode** controls the behavior of BPM and STEPS knobs.

**Recordings** opens the Recordings screen where you can play, delete, and export recorded audio files.

**About** opens the About screen where you can check app version, read the user guide, send feedback and report bugs.

# MIDI

CloseMIDIPanic!

MIDI

ON

MIDI Buffer Size

SMALL

MEDIUM

LARGE

Xynthesizr Sound Engine

ON

Turn this off to reduce CPU load if you are sequencing other apps or devices

Output Channel Mapping

>

Input Channel

—

OMNI

+

Note Input Behavior

KEY CHANGE

SCALAR TRANSPOS.

CC Mapping

LEARN

Destinations

Virtual Output

NOTES OUT

CLOCK OUT

Network Session 1

NOTES OUT

CLOCK OUT

Sources

To use MIDI clock input, disable Ableton Link

Virtual Input

CC IN

NOTES IN

CLOCK IN

Network Session 1

CC IN

NOTES IN

CLOCK IN

**Panic!** Tap this button to reset MIDI if you are experiencing problems such as hanging notes.

**MIDI switch.** Turns MIDI events processing on or off.

**MIDI Buffer Size.** Try setting this to **MEDIUM** or **LARGE** if you are experiencing timing inconsistencies.

**Xynthesizr Sound Engine.** Turns on or off the internal synthesis & FX engine. It's a good idea to set this to OFF when you're using Xynthesizr as



a sequencer for other apps or devices, because it will save a substantial amount of CPU and battery time.

**Output Channel Mapping.** Opens a dialog where you can route different note groups to different MIDI channels.

MIDI		Output Channel Mapping		
Octave (or other scale repeat interval)		Channel		
1		-	1	+
2		-	3	+
3		-	2	+
4		-	4	+
5		-	2	+
6		-	2	+
7		-	2	+
8		-	1	+

On the left are numbers of note groups that correspond to a particular octave (or other range, if you are using a non-octave repeating scale) and a particular color on the sequencer grid. On the right are steppers that let you set the MIDI channel for the note group. You can use these to help you route MIDI notes to multiple synths, samplers, and drum machines.

**Note:** The large number of these note groups stems from the fact that, in Xynthesizr, it is possible to create a 'scale' consisting of just one note, thus making each grid row a separate group.

**Input Channel.** Sets the MIDI channel to receive messages from. Can be set to OMNI to receive from all channels.

**Note Input Behavior.** Lets you select how Xynthesizr changes the Key and Transposition settings according to input MIDI notes. The transposition can be either chromatic (**KEY CHANGE**) or scalar (**SCALAR TRANSPOS.**).

**CC Mapping.** The **LEARN** button opens a dialog to map synthesizer and sequencer parameters to CC controls of a MIDI source. In this dialog, select a parameter you want to control, then move a knob in your hardware or software MIDI controller. You should see a CC number over the selected control. Repeat the procedure for all parameters that you want to control externally. To remove an assignment, select the parameter and tap **Clear**. To remove all assignments, tap **Clear All**.

**Destinations** section lets you select which MIDI event to send to which MIDI ports. Xynthesizr can send MIDI events of two types: notes on/off and sync (clock, start, stop).

**Sources** section lets you select from which MIDI port to receive clock, note and CC messages.

Xynthesizr can receive clock from only one of the existing ports. When none of the sources is selected, the app will use its internal clock to sequence notes. When a source is selected, it will sync to external clock, and the digits on the BPM button will turn light blue.

**Note:** MIDI clock input will be automatically disabled when using Link or Inter-App Audio sync.

## Q&A

**Q: How can I reveal Audiobus panel without adding or removing notes?**

A: Try sliding your finger on the bottom of the screen (over the arrow button in the bottom bar).

**Q: Why are there 22 (26, 27) note groups in MIDI Output Channel Mapping?**

A: The large number of these note groups stems from the fact that it is possible to create a 'scale' consisting of just one note (and a lesser than octave repeat interval), thus making each grid row a separate group. Usually you will not use more than 5 or 6 of them.

If you haven't found an answer for your question in this manual, please send a message to [contact@yuriturov.com](mailto:contact@yuriturov.com)