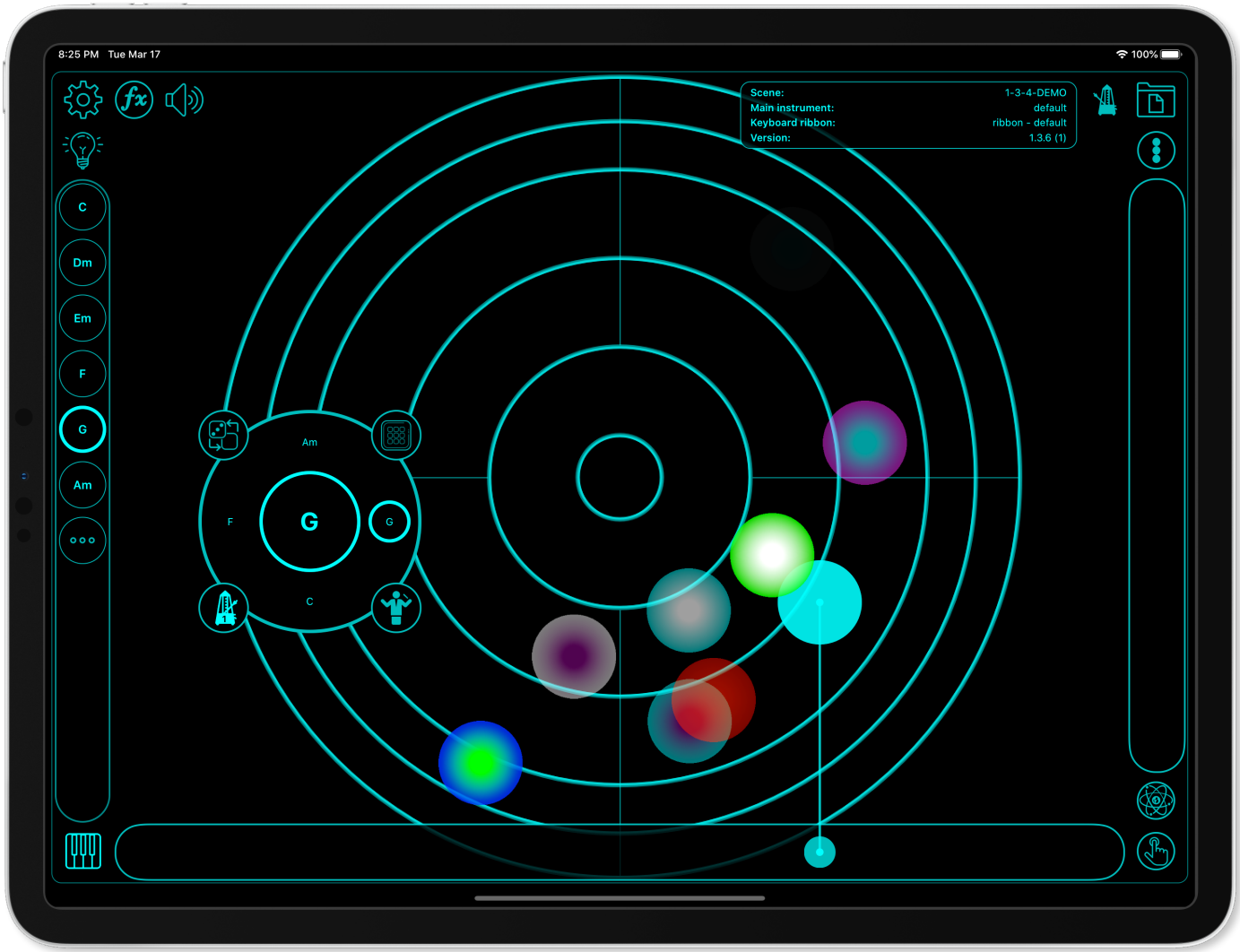
touchscaper user guide - v1.6.x



Welcome

Welcome to the touchscaper user guide! I wanted to create an app that's fun and easy to use, but also expressive and powerful for musicians and non-musicians alike.

I've tried to make this user guide fairly detailed, but please do check out demo and tutorial videos on YouTube. Doug at The Sound Test Room has done some great demos of the arranger and sequencer which should be very inspiring! You can also support Doug via Patreon so he can keep on doing what he's doing.

I really hope you enjoy touchscaper and I look forward to hearing your creations!

Rob Jackson, touchscaper developer.

What is touchscaper?

Touchscaper is an instrument designed to be played by touching the screen and changing the sounds by touch movement. You don't have to be a "proper musician" to get satisfying results, but if you are, touchscaper is very configureable under the hood. Want an F# diminished chord or a double harmonic minor scale? No problem!

In the screen above, the small circles show the initial touch location, and the larger circles and lines track movement as you play the instrument. There are two basic building blocks used in touchscaper.

"Scenes" are a collection of chords and corresponding scales. A simple example would be a C, F and G major chord progression linked together with a C major scale. You could then save this scene as "just about every Country & Western song". Chords are selected from the list on the left of the screen shown above.

"Instruments" are created by combining two of touchscaper's built-in sounds to create interesting and evolving layered effects. Each layer voice is then configured to handle horizontal and vertical touch movement. Moving touch up or down for example, could control the volume level of that voice, and left to right could control the pan position. Expressive instruments can be created by mixing and matching these controllers for different characteristics. You can even add touch automation and drums and bass accompaniment using the built-in 16 step probability sequencer.

Getting started

Touchscaper comes with several preset scenes and instruments accessible from the browser, opened by tapping the folder button, top right. Scenes have an associated instrument, so as you select scenes, the corresponding instrument will also be loaded.

Browse the presets and take a look at how they've been configured to get a better understanding of the more technical details of the app. Often a preset is a good jumping-off point for creating your own scenes and instruments.

Now would be a good time to have a play with the app if you haven't done so already, before going into more detail!

Main instrument views

There are three main playable areas of the screen. The central main "radar" view, the scale "ribbon" to the right, and a conventional piano-style keyboard or additional ribbon accessible from the button, bottom left.

Radar

The "radar" view is probably where you'll make most of your music. Don't worry too much about the lines or circles - they're simply approximate visual guides. The main things to remember about the radar view are:

- Centre rings - low notes
- Outer rings - progressively higher notes
- Lower quarters - more basic chords (increased probability of root notes)
- Upper quarters - less basic chords (reduced probability of root notes)
- Right hand quarters - potentially, more interesting chords!

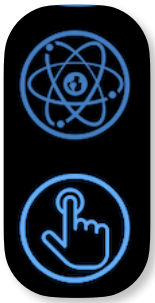
By design, the radar view does not allow you to specify exactly what notes you will hear even if you keep tapping the exact same location. Instead, touchscaper is driven by a probability-based engine that tries to select "good" notes for you depending on where you touch the screen. There's a whole bunch of other stuff going on under the hood too, but that's secret!

I hope that once you get accustomed to this slightly unconventional interface, you'll grow to trust the app to pick good notes for you, and you'll never want to play a major triad on a conventional piano keyboard again! Only joking!

The radar is potentially the most musically expressive part of the app, so please do experiment and explore, in order to get a feel for how the app responds to your touch, just as you would with any other musical instrument.

Hold & orbit modes

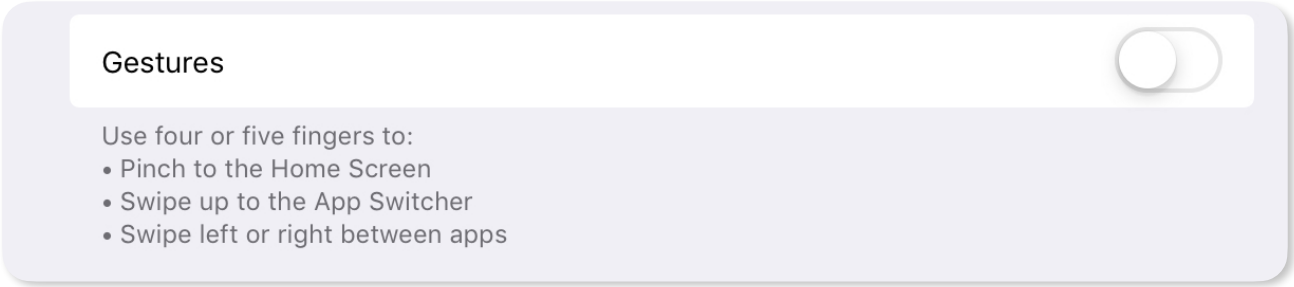
Hold (hand icon) mode allows you to hold notes that are currently being touched. Orbit (satellites icon) mode will animate the controllers to create evolving and shifting sounds.



Performance note about orbit mode

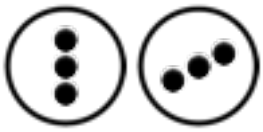
Orbit mode animation can be quite demanding on the CPU, especially for older generation devices. In the advanced settings options, you can turn off the animation while still hearing the orbit variation in the sounds. This uses the same technique used in background mode to save CPU. When orbit animation is disabled, the controller graphics are highlighted with the orbit icon.Special note about iOS multitasking

The radar view can handle multiple touches, however iOS can also interpret multiple touches as multitasking control gestures. You can either limit your radar touches to three (not ideal) or turn off this option from *Settings -> General -> Multitasking & Dock*:



Ribbon (side bar & keyboard ribbon)

The ribbon view is the strip on the right hand side of the screen. It has two modes of operation denoted by the button above it.



The vertical stacked dots represent “chord mode” and the staggered dots, “scale mode”. Depending on the mode, touching within the ribbon controller allows you to rapidly zip through the notes in the current chord or scale in that scene like a prog-rock keyboard wizard!

Keyboard

Occasionally you may find the need for a conventional keyboard so one is provided, accessible from the keyboard button bottom left. Alternatively, you can have a ribbon style keyboard with a different sound.

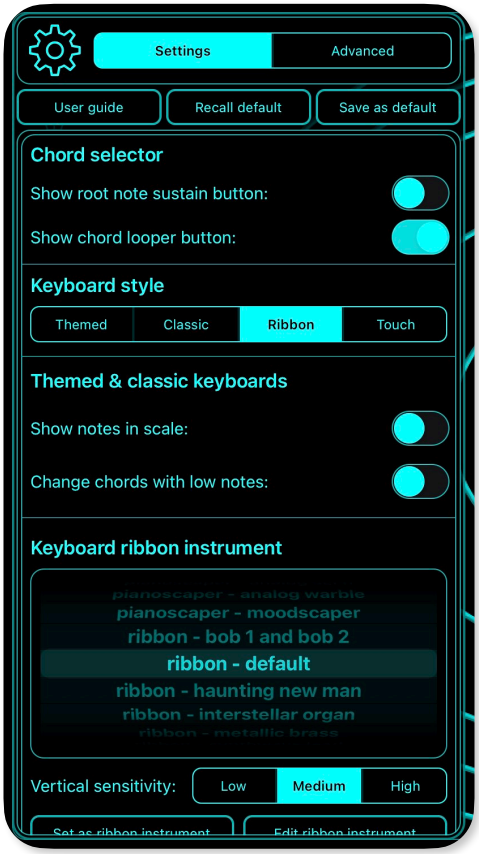
You can also highlight scale notes on the keyboard (via the settings / cog button) and change its theme colour.

Keyboard Ribbon

You can also have a horizontal ribbon keyboard which works in chord or scale notes mode as per the side ribbon. Please note the behaviour of the keyboard ribbon is different to the sidebar ribbon in several ways:

1. You can assign a different instrument to the keyboard ribbon, for example as a lead vs. pad sound.
2. The keyboard ribbon tracks pitch change horizontally so you can whizz up and down chord arpeggios or scales and still have control over volume with vertical touch position.
3. You can add vibrato to notes with side-to-side finger movement whilst holding notes.

Keyboard styles are assigned and edited from the Settings view:



Touch Keyboard

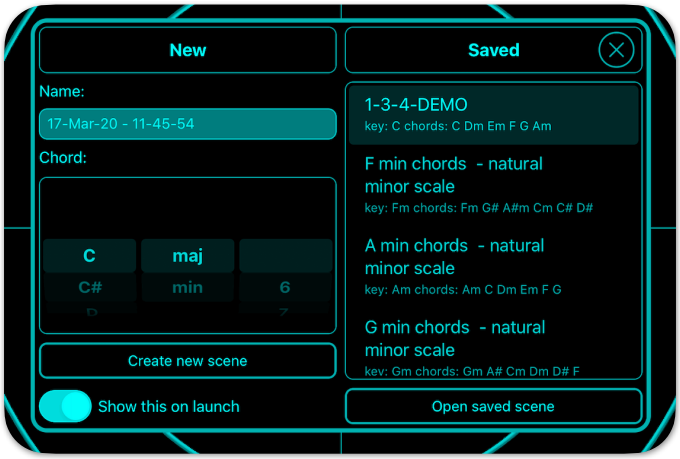
The touch keyboard style is a cross between the main touch instrument view and the keyboard ribbon. The notes are selected from the current chord or scale in the same way that notes are pitch quantised in the ribbon controller. However, vertical and horizontal touch movements are interpreted in the same way as in the main instrument view. Additionally, you have control over note velocity (volume) where touches higher up in the playing surface send higher velocity values. To play quietly, place your touches towards the bottom of the touch keyboard area, and to play increasingly louder notes, place your touches towards the top.

Scenes

Scenes are a way of describing one or more chords and associated scales. The way a scene is configured, determines the notes you hear when the radar or ribbon area is touched. Typically, a scene will represent a chord change in a song so you can use touchscaper to play along with other instruments or musicians.

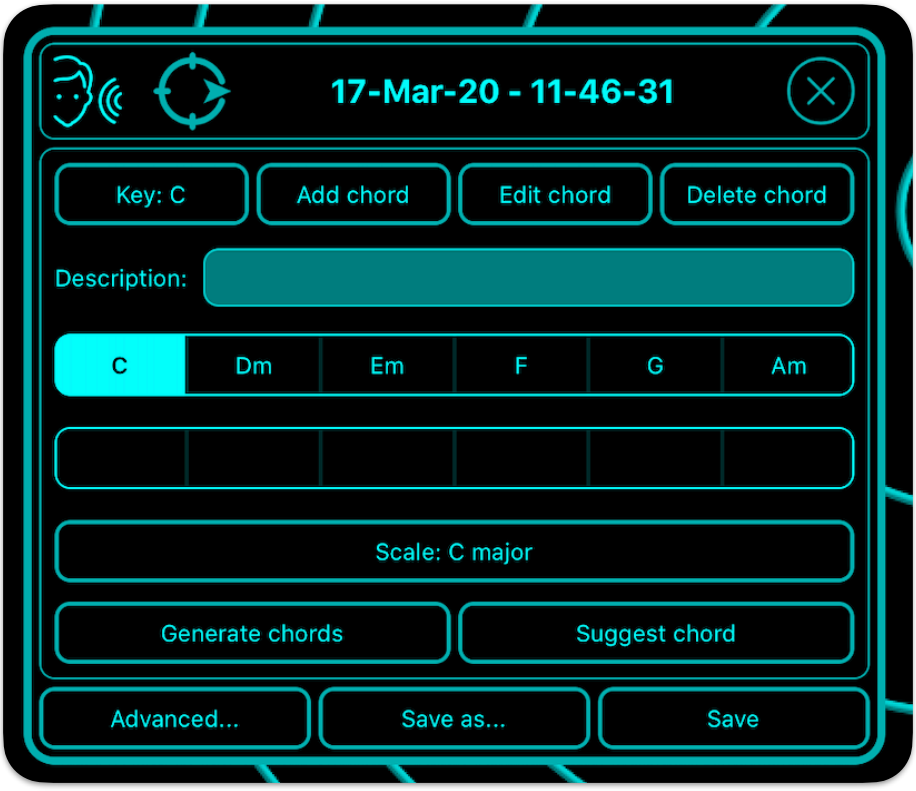
Creating and editing scenes can go down two separate paths. Simple and advanced. It's quite possible that the simple view will get you to where you want to be 90% of the time, so don't worry if the advanced view looks a bit overwhelming at first.

Creating a new scene starts off with specifying a key and initial chord. This helps touchscaper later on when deciding on scales to use alongside subsequent chords added to the scene. Create a new scene by tapping the light bulb "idea" button.



In this example we're kicking off in the key of C major, but don't worry too much about your initial key and chord as they can both be changed later.

Once a key and initial chord have been selected, you can use the simple scene view to build up your chord progression. Here's one with a few chords added already.



As you add chords to the scene, touchscaper will try to find a scale that fits well with that chord in the key that you originally specified. However, you're free to specify a different scale if you like, and touchscaper will try to help you out by ranking them according to "fit" as seen here:

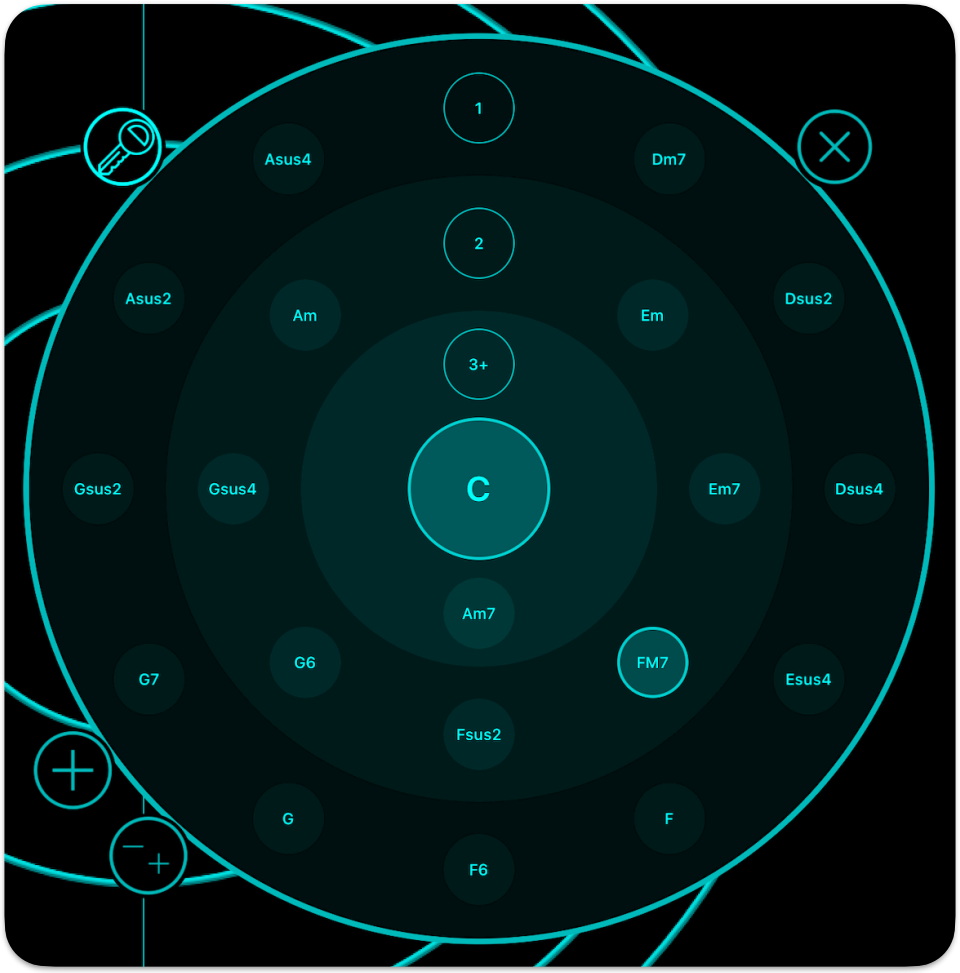
If none of these "conventional" chords or scales are to your tastes, you can specify exactly what notes you want to use from the advanced view. You can also generate chords using the notes of the scale for the root chord. For example, if your scene is in the key of Am, and your scale the A minor natural scale, touchscaper will generate chords that will probably sound good in this key.

As you add chords, you can audition them by enabling the audition button - little man listening icon. Tap the chord in the segmented control to audition the chord.

If you're looking for inspiration when trying to come up with chord progressions, the chord navigator may be useful - check out the next section! Open the chord navigator by tapping the navigate / "compass" button.

Chord navigator

The chord navigator allows you to see chords that share one or more of the same notes. Sometimes this is a good way to build chord progressions that have a sense of a thread running through them. Obviously, you don't need to do that with every chord, but it can be useful if you're trying to figure out a way of getting from one chord to another - for example in a bridge section of a song to get back to the chorus - that sort of thing.

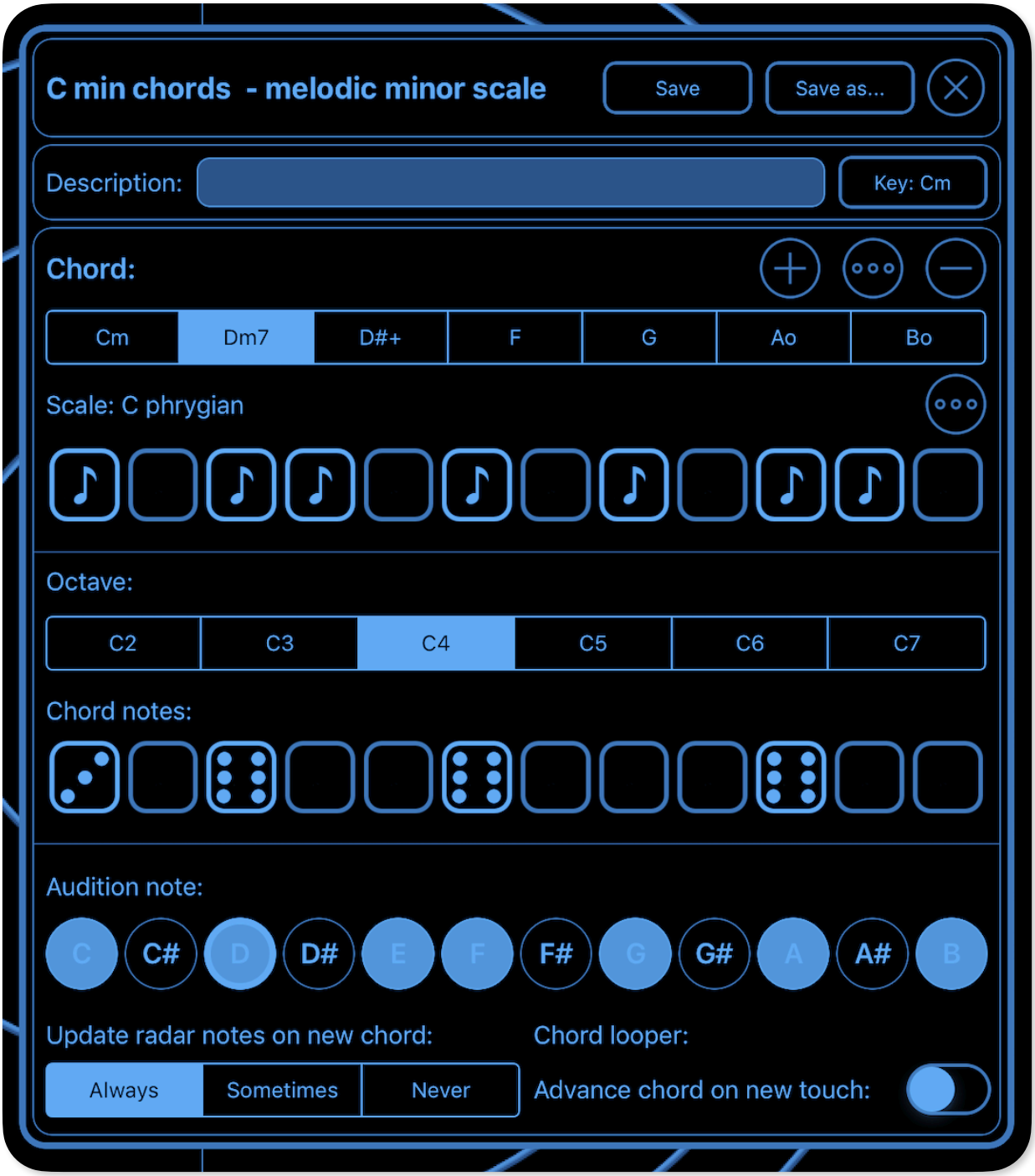


In this example, we're in the key of C and the current chord is C. The chords are arranged by closeness to the current chord in terms of common notes. For example, Am7 has 3 or more notes that are the same as the C chord, its relative major, so it's in the circular "zone" of 3+ common notes. If you're familiar with the key of C, you probably know that a C to Am chord change is very common. Note though, that G6 and FM7 also contain 2 of the same notes, so might be more interesting chords to go to from C. Things also get really interesting if you turn off the key filter. This will result in any chord that contains some of the same notes as your current chord. This can be a good way to generate unusual / "ear grabbing", but still "musical" sounding chord changes and is often how a lot of EDM producers come up with chord changes that "just sound good" without adhering to a specific scale or key.

Suggested chords are based on the current chord selected from the scene view. The large plus button adds a chord, and the - / + changes the current one.

I hope you find the chord navigator interesting, useful and inspiring!

Advanced scene editing



In this example, we're looking at a Dm7 minor chord (in the key of Cm) and the app has pre-populated the C phrygian scale and notes for an Dm7 chord for us already. Note the dice values for the simple minor triad (D, F, and A) are all sixes, whereas the C note that makes the seventh chord is a three. The dice values feed into touchscaper's probability engine so it's possible to get some truly unique and interesting results by tweaking these values or even adding very low probability "accidentals" and so on.

One last thing to note with the advanced view chords, is that you specify the probability values across touchscaper's full 6 octave range (C2, C3, etc.). This allows, for example, touchscaper to only play root only, or root and 5th notes in the lower octaves, which happens to be the default for most automatically populated chords, as 3rd can sound a little "crowded" in the lower registers.

Finally there are options to change chord looper and radar behaviour when new chords are selected from the chord selector strip, so let's look at the selector now.

Chord selection

Chords within the current scene are displayed in a list on the left hand side of the screen. You change chords by tapping the chord you want. The nice thing here is that you don't have to worry about releasing any notes that you already have playing in the radar view as touchscaper will adjust any notes that don't sound "good" with your new chord. You can now switch chords faster than most keyboard players can! And every time you switch, you're very likely to get different inversions of that chord without moving your fingers, similar to the way a keyboard player adds variation to the same chord progression by selecting different notes nearby to the ones currently being played.

For convenience, there is also a shortcut button at the bottom of the chord list that opens the scene view.

Chord looper

The chord looper and arrangement view feature in touchscaper allows you to specify a simple sequence of up to 16 chords, or a more complex song structure using the arrangement view.

The chord looper also has an automatic play mode which changes chords according to the beats and tempo settings accessible from the metronome button. Tap the loop button to start / stop. When the chord loop is playing, the button changes to a metronome with a beat counter.

Chord arrangements can be saved with the scene. You can advance through the chords (in a clockwise direction) quickly and easily by tapping the large central button.

There is an advanced scene chord looper option (advance chord on new touch) to advance through the chord arrangement whenever touchscaper detects a new touch.

The chord looper start / stop function also controls the sequencer. If not using Ableton Link, the sequencer will start after one beat after tapping the loop button. This is useful for live looping - so in 4/4 tap the button on beat 4 and it will start on 1.

You can also open the sequencer and grid views from the main chord looper view which are covered later in this guide.

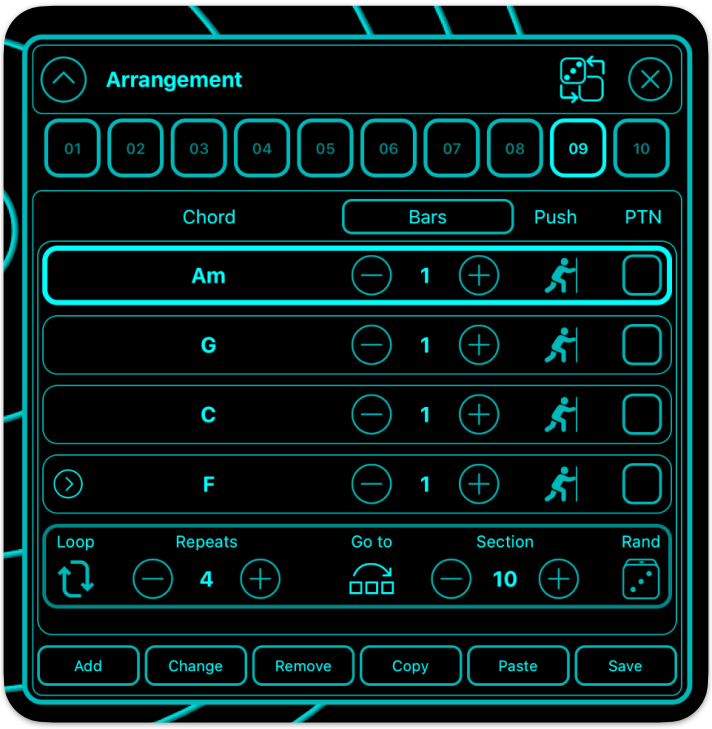
If the chord looper is partially obscured by another view, a long press anywhere on the chord looper will bring its view to the front.

If you find that the chord looper view sometimes gets in the way, you can add a button to hide / show it. From the settings (gear icon) and the Settings tab, turn on the switch "Show chord looper button". Remember to tap the "Save as default" if you want to preserve this settings next time you launch touchscaper. When enabled, a chord looper icon button will appear under the chord selector view that allows you to hide or show the chord looper.

There is also an option to automatically add root notes when changing chords from the sidebar chord view. This switch is labelled "show root note sustain button" which will add a "sustain" button at the top of the chord list.

Arrangement view

To populate the list of chords tap the “conductor” button which opens the arrangement view. Select the chord you want to add or change in the main selector strip on the left.



You can add, change and remove chords from the arrangement view, set the duration of the chord in beats or bars (toggled with the Bars / Beats button), and set whether the chord should be “pushed”.

Turning push on for a chord will result in that chord changing a half-beat (or 1/8 note) ahead of the downbeat for the bar. For example, say you have 4 beats in a bar, and you count: 1-and-2-and-3-and-4-and-1*… etc. Instead of the next chord playing on the 1* beat, it will play on the “and” before it. This technique is very popular in dance music and can create a nice “drive” to a chord progression, or “push” - hence the name.

You arrangement can also have up to 10 sections allowing for verse, chord and bridge type song structures. You can allow each section to loop (as per for footer view shown above) or you can go to another section after a certain number of repeats. You can even go to some other random section for some generative type fun!

For each chord, you can also optionally specify a pattern to use in the sequencer. This pattern will continue to be used until a pattern number is set in another chord change. No value in the PTN box, means that the pattern won’t change. To enable / disable pattern changing, tap the sequencer “dice” button.

When changing sections, touchscaper will wait until the current section has completed before moving on to the next section. The section coming up will flash during the final loop of the current section.

TIPs: If you intend to switch sections manually during a performance, best to set the sections to loop mode otherwise the touchscaper will try and change the sections for you and possibly override the changes you want. If you want to have the same chord change but with a different pattern playing, you can copy and paste the chord progression to a different section and change the pattern.

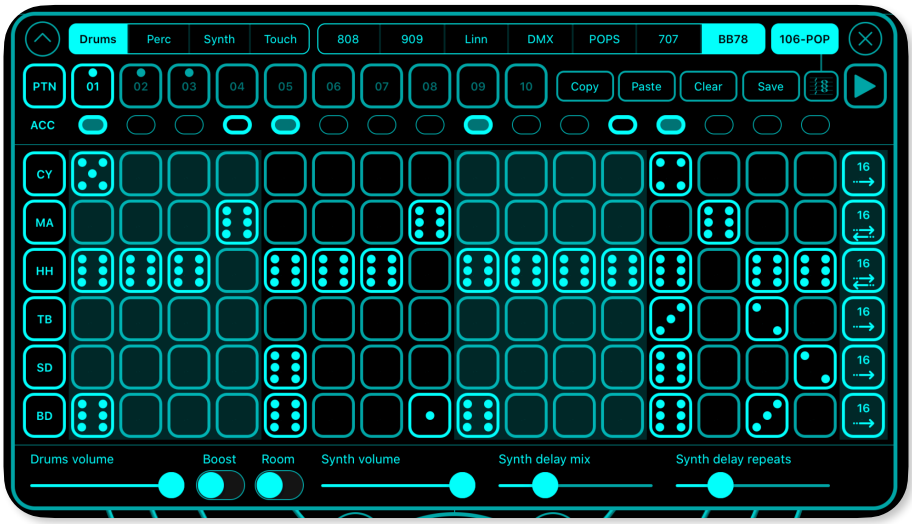
The arrangement view also has a “mini mode” which shrinks the window to only display basic control info for use during performances.

Sequencer view

There are so many great sequencers available in iOS apps, so why do yet another one?

Firstly, the sequencer is integrated with touchscaper's music engine, so it already knows about your chord changes, keys and so forth, so you can get fairly decent bass lines and melodic rhythmic parts up and running without having to worry about specific notes.

Secondly, Integration with the arrangement view means that it's also (I hope) very easy to create quite complex arrangements based on section and corresponding sequencer pattern changes.



The sequencer has four parts - touch, drums, synth and perc, with seven corresponding options for each part. For touch, options relate to whether sequenced touches orbit or not for example, or whether to play chords or sequence an additional synth voice. For the dedicated synth, perc and drums parts, different "instruments" can be selected. The drums instrument can also be enhanced with some compression / limiting "boost" or room ambience. A tempo-based ping-pong delay can also be applied to the synth instrument. SMARP mode affects the synth sound and re-directs the upper C5, 6, and 7 octaves to one of the alternative synth voices, which has a different arpeggiator-based playing style and also has added reverb for spacious dreamy arps! SMARP can also be configured for each octave and this is described in the advanced sequencer options settings.

Touch parts can also be re-assigned to piano chords in their designated octaves - chord 1 has a short decay, and chord 2 has a longer decay. There is also an additional SynthC which is basically an additional synth part. If you don't like the color orb effect, this can be turned off globally in settings.

Up to ten patterns can be stored with each scene's sequence and different options can be set for each pattern allowing the drum sound to change for example going from one pattern to the next. Patterns can either be changed manually or automatically by the arrangement view when the chord looper is running. To set a pattern in the arrangement view, select the pattern you want in the sequencer view, then tap the PTN box for the chord where you want the pattern to change. When the pattern is about to change, the one coming up will flash briefly beforehand.

To activate a step in the pattern, simply tap it. Similar to scene setup, the step is probability-based, so a value of 6 means, always play, down to a value of 1 which means play very occasionally. You can use varying probability values to achieve quite interesting variations automatically. Tapping repeatedly on a step changes its probability. To quickly clear a step, tap down on the step, slide away, then release.

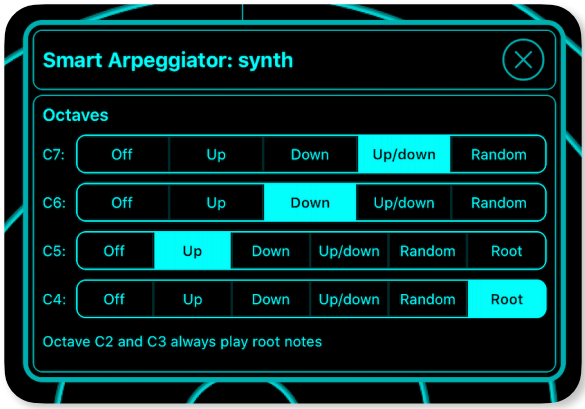
For some dynamics, you can also vary accents on a per-step basis by tapping the step indicator buttons on and off. By default, the accents are on steps 1, 5, 9 and 13. Accents are applied to all sounds on that step.

For the drum parts, the steps correspond to beats. For the touch and bass / synth parts, a random note from the corresponding octave will be selected (C2 is low, C7 is high). Please note there is currently no way to specify exactly which note will occur as this is driven from the scene config, although you might notice that the lower octaves are predominantly root notes in the example scenes.

Advanced sequencer options

Smart arpeggiator

The notes selected for the smart arpeggiator can be configured for each octave track in the sequence. These preferences can be set for the main synth part (when SMARP is enabled) and also for the touch part when using the SynthC option.



When SMARP is switched off, notes will be selected randomly from the notes in the current chord for that octave range. Random will switch between, up, down, and up and down on a random basis.

Imaginative use of the SMARP settings allows you to create slightly more predictable melodic patterns if you like that sort of thing.

Track options

By default, touchscaper sequence patterns comprise six tracks or “lanes”, each with 16 steps. During playback, each step will play once and when the final step is played, the “playhead” is reset to the first step. However, you don’t have to play by those rules if you don’t want to!

You can vary each track to have between 4 and 16 steps and you can vary the direction. Play all steps when changing direction allows you to flip between back and forth or a bounce type behaviour. For example, if you have 4 steps, with the switch on, you would hear step 1-2-3-4-4-3-2-1-1-2-3-4 and so on. With the switch off, you would hear 1-2-3-4-3-2-1-2-3-4 and so on.

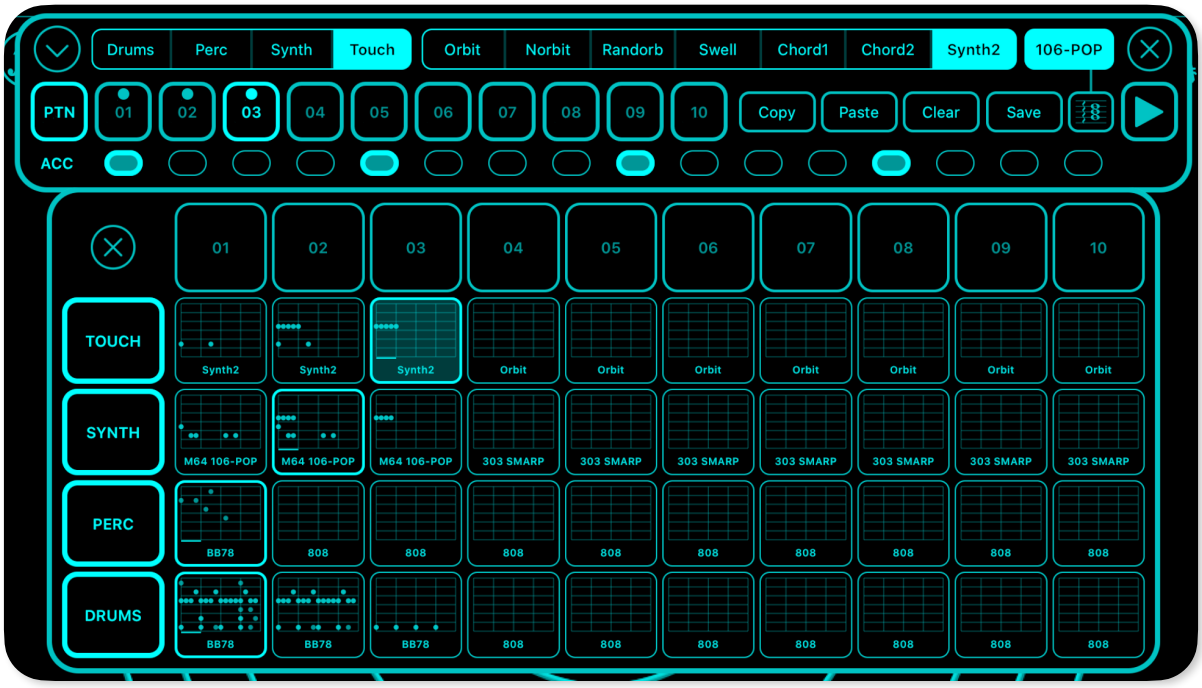
Step multiplier increases the duration of each step for that track. For example, if set to 2, that track will appear to be moving at half the speed of other tracks set to a multiplier of 1. You can also have that step repeatedly play by switching on “play all multiplied steps”.

These advanced features have been designed for those of you who like to experiment, so the best way to get an understanding of these features is to experiment. They can be used to introduce subtle variation or all-out chaos - it’s entirely up to you! I hope touchscaper provides you with interesting and inspiring sequences to use in your music projects.

Sequencer grid view

The grid view is an alternative / top level view of all your sequences for each part in the current scene. You can show and hide the grid view from the main looper view by tapping the grid icon button. The grid view gives you greater flexibility around which pattern(s) you want to hear.

You can get a general idea of what all the patterns are from the “thumbnails” for the steps and the names of the voices you’ve selected for each pattern. Please note in the screenshot, Synth2 is now called SynthC.



Behaviour of the grid is slightly different depending on whether you’re in play mode or not. When you’re not in play mode, tapping one of the patterns in the grid will select that pattern. This is quite handy if you decide you need to tweak that pattern - simply tap the top left arrow to drop down the detailed pattern view then you can edit the steps in that pattern.

In play mode, tapping a pattern will either play that pattern next once the current arrangement section has completed, or will mute the pattern if it is already selected. The behaviour is very similar to popular clip / loop based grid controllers so hopefully it will make sense.

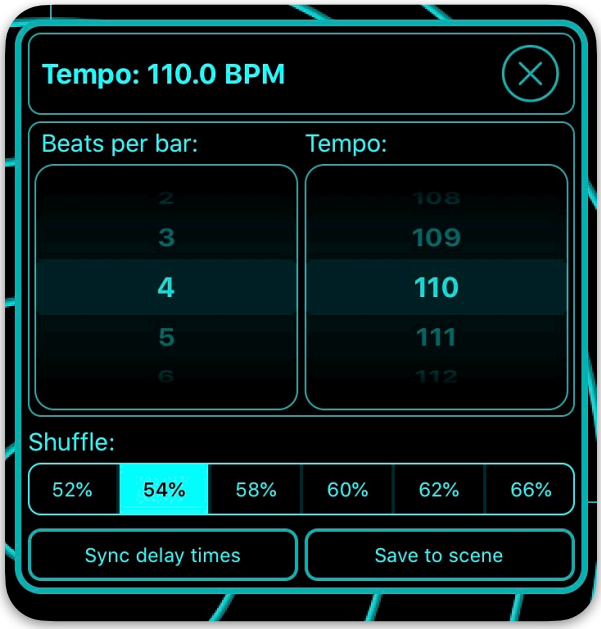
You can also mute and unmute parts by tapping the part buttons on the left.

Tapping the top number buttons will cue-up all the parts at that location.

Tempo view

The tempo view is accessible via the metronome button in the top right of the main view. You can sync delay times and save the beats and tempo as part of the scene's arrangement.

You can also apply variable shuffle or "swing" to add a dance-like feel to your sequence patterns. This is especially effective for beats around 120 BPM. Selecting 52% is extremely subtle, but might introduce just enough bounce to get people moving! To turn off shuffle, tap the selected %age option so that no values are highlighted.



Ableton Link

Ableton Link is a new technology that synchronizes beat, phase and tempo of Ableton Live and Link-enabled iOS apps over a wireless network. It lets you play devices together with the freedom of a live band. Anyone can start and stop their part while others keep playing, and anyone can adjust the tempo and the rest will follow.

You can use Link to play with several instances of Ableton Live, with Live and iOS apps, or even without Live in your setup: using Link-enabled apps on multiple devices, or multiple apps on the same device.

Ableton Link is enabled from the advanced section of the config (cog) settings view. Please note that when you enable Link for the first time you will receive a permissions alert asking for confirmation to allow connections to devices on your local network - this is basically how Link works, so you should allow it.

You can use Ableton Link to synchronise the chord looper and sequencer with other music apps, and if all your apps are in the same time signature, the current beat count (shown on the chord looper metronome) should be the same. When starting and stopping apps, you may notice a slight delay, which is normal due to the apps aligning with each other to the same beat.

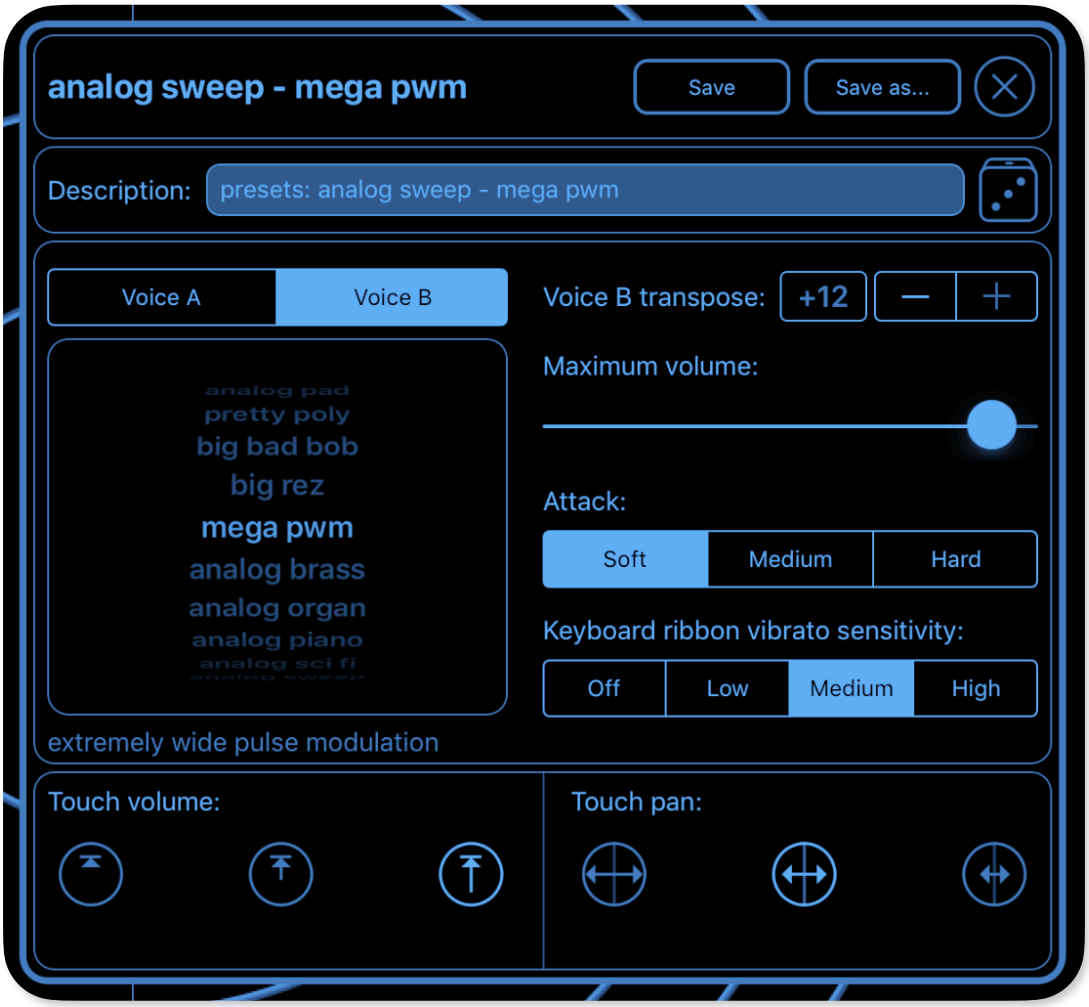
When Sync Start/Stop is enabled in your Ableton Link preferences, you can start and stop other apps in the session from touchscaper and vice versa.

Please note that the behaviour of the play / stop button on the chord looper is slightly different depending on your Ableton Link preferences. If Sync Start/Stop is enabled, the chord looper will start playing straight away. When this setting is not enabled, the looper will initially go into a "waiting" mode (denoted by the flashing metronome) allowing you to decide when the chord looper starts.

Changing the tempo from the tempo view in touchscaper will change the tempo of the Ableton Live session, and changes in tempo from other apps in the session will be adopted by touchscaper. Changes in tempo will also update delay times.

Instruments

Instruments are essentially a combination of two of touchscaper's built-in sounds with some configuration around how the instrument responds to touch movement. Here's an example from one of the presets looking at the "B" voice:



Hopefully voice selection, transpose, volume and attack are fairly self-explanatory, and the best thing to do is experiment!

Tap on the dice button to generate random combinations and settings. Currently there are over 600 possible combinations of voices alone, plus when you factor in touch control, that's quite a lot of potential for different sounds.

If you use the keyboard ribbon option, you can adjust the touch vibrato sensitivity for each voice for interesting expressive possibilities. For example, assign one voice to have low, or no vibrato and the other to have medium or high to create classic lead type sounds.

The touch volume and pan controls are worth looking at in a bit more detail.

Touch control

Touch control is hopefully one of the more interesting and unique elements of touchscaper, hence the name!

With a touch movement, you're not just controlling the instrument, but the actual voice making up that layer, and the note that is currently playing for that touch.

This allows for example, you to play a 3 note chord by holding down three fingers and then pan and control the volume of each individual layer of each note independently, simply by moving your fingers around, thus opening up a new dimension in expression that you don't normally get with most controllers.

Touch control is currently available for volume and pan.

Touch volume

Voice volume is controlled by vertical movement and its configuration has three presets that can be toggled via the following buttons.

This button denotes maximum volume range, meaning the sound for this voice will start from zero volume level and increase as you slide your finger upwards. Sliding your finger back down will reduce the volume of this voice eventually back to zero. This is great for string type swells, especially if your other voice is configured to handle volume differently.

This setting also controls volume with vertical movement except the volume will never be reduced to zero. Instead, minimum volume is around half maximum. Use this setting if you want to hear the sound as soon as you touch the screen, but still want some control over dynamics.

This setting essentially disables any volume control for that particular voice and always plays sounds at the volume determined by the maximum volume setting for that voice.

Note that some of the built-in touchscaper sounds are "one shot" samples (piano type sounds for example) so it doesn't really make sense to control volume of these sounds dynamically. One-shot samples are highlighted in the sound list, and the touch volume button selectors are disabled for that sound.

Touch pan

Voice pan is controlled by horizontal movement according to three presets in a similar way to volume.

This setting allows maximum pan range from hard left to hard right.

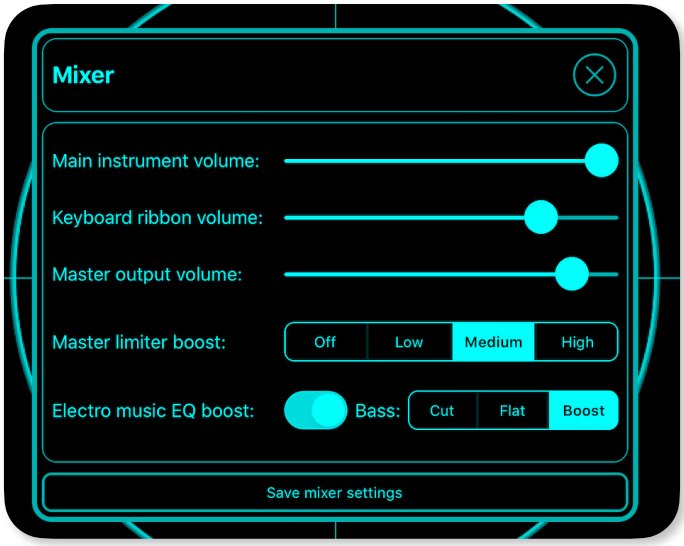
This setting reduces the range of pan movement to around half the maximum width.

This setting disables pan control for that voice.

Please note that touchscaper automatically “spreads” notes by panning (not just voices or instruments) to create a “big” and interesting mix, so even if panning is disabled, you should still get a nice stereo spread for all instruments.

Mixer

The mixer is accessed from the speaker icon at the top left of the screen.



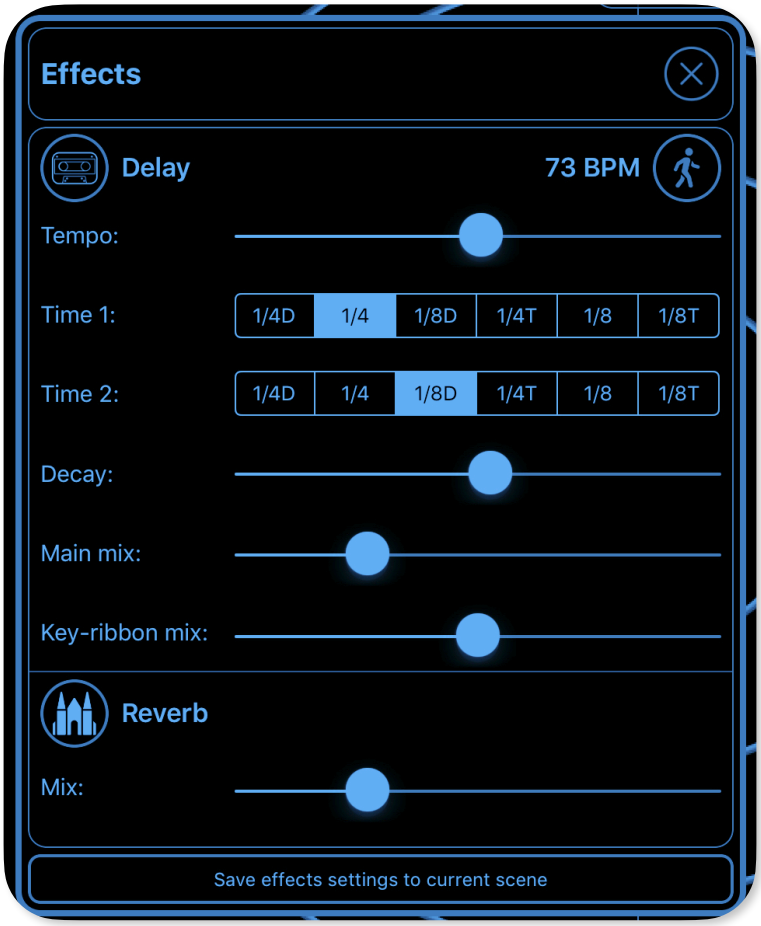
The volume sliders let you adjust the overall balance between the main / touch instrument and keyboard ribbon as well as the overall master volume.

The master limiter boost has variable pre-gain settings, from light to heavy pre-gain boost for a punchy overall sound.

The electro music EQ boost is a 10 band graphic equaliser tuned to add some extra bottom end, reduce muddiness in the mids, and some sparkle to the highs. Note that switching this on will increase the overall volume so you may need to adjust other levels accordingly. You can also separately attenuate or boost the low end.

Effects

Touchscaper includes some popular time-based effects as shown here, accessible from the ***fx*** button.



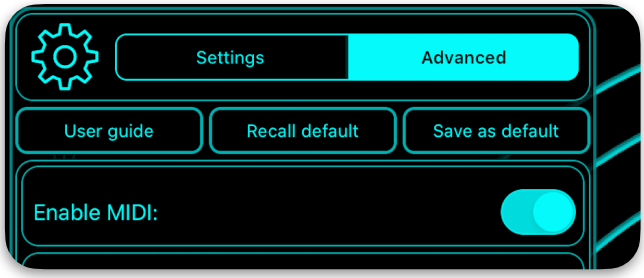
The delay type (tape style or digital) can be selected from Delay button. There are also several reverb types ranging from small room (spot the toilet humour…), up to a 20 second decay time “planetary” reverb.

For convenience, the delay times are calculated from an overall tempo and note values. There is a tempo x2 / x1 multiplier button next to the tempo BPM value. Two delay lines are used, although this is not a traditional stereo ping-pong delay, it’s something a little bit different. You can also adjust the mix of the keyboard ribbon instrument separately.

MIDI

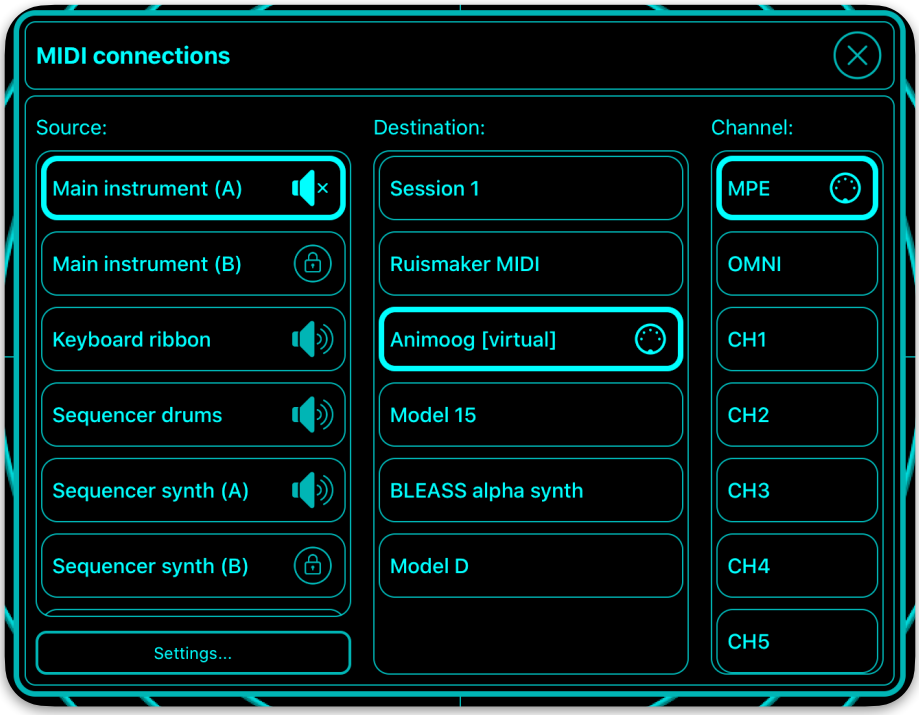
MIDI allows touchscaper to control other instruments by sending note and controller information as MIDI messages using Core MIDI. Right now, possible sources are the main instrument (radar view and side ribbon), the lower keyboard ribbon, and the sequencer synth and chords. This is likely to expand in the future, so please keep an eye out for updates!

MIDI is enabled from the Advanced config view - gears icon, Advanced:



MIDI connections

Once enabled, two new buttons will appear - a MIDI “cable” button, and a triangle “PANIC!” button which sends an “all notes off” message to all the MIDI destinations that touchscaper is aware of. Tapping the MIDI cable button, brings up the connections view:



Any apps that are already running that support connection using Core MIDI will appear in the destination list. A destination can be assigned to a source by selecting the touchscaper instrument source, and then selecting the desired destination. You can also mute the internal touchscaper sounds by tapping the speaker button when the source is highlighted. Note that while you can independently assign A and B from the main instrument and sequencer synth externally, muting occurs for A ***plus*** B internally, i.e. you can’t have A muted, and not B, or vice versa - this is why a speaker button is not shown for the B sources.

Note that you would typically not assign different touchscaper sources to the same destination, but there are possibly times when you might want or need to do that. Just remember that **you may run into problems with polyphony or stuck notes** if you do that, so generally speaking - it’s best not to do that. A legitimate reason to do this might be controlling external hardware, in which case you would use the same destination (your MIDI interface) but assign different sources to different MIDI channels. Another example where you would definitely do this is when using touchscaper in an AUM setup - see the section on that later in this guide.

To un-assign the destination, simply tap it again to free it up. The currently assigned destination corresponding to the highlighted source is shown with a MIDI cable icon. In the screenshot above, the Main instrument (A) source is assigned to the Animoog app using MPE.

When connections have been set up, touchscaper will do its best to remember how things were set up the last time you used an app with that source. However, If an app used previously isn’t running, it won’t appear in the destination list. Note that touchscaper is not able to launch apps itself - you have to take care of that.

If you see an app listed as a destination and you know for sure it’s not running, it may be an “Inter-App Audio Zombie Bug”. The best way to deal with this is probably a power-off and on again. Sometimes firing up the app again (and closing it if you don’t need it) can help, but it depends on the app.

If you don’t see an app listed in the destination list, but it is actually running, this probably because its preferred method of communication is as an AU (AudioUnit) and this is the general direction all modern music apps are taking. While touchscaper is not currently fully AU compatible, there is a way: If you want to use AU apps, then it’s better to use an AU host such as AUM that also allows AU and non-AU apps to communicate.

MIDI channels & MPE

Once a source and destination have been selected, touchscaper needs to know which MIDI channels to use. The most common approach is to send to a destination that accepts messages on all channels using "OMNI" mode. If you're only using apps, sending on specific channel numbers is less common these days, but touchscaper supports it across all 16 MIDI channels which is particularly handy when using external hardware.

If the destination app supports it, touchscaper can send MPE (MIDI polyphonic expression) on up to 8 separate channels. By default, it does this using channels 2 - 9. For MPE, channel 1 is typically used as a "master" channel so this should work fine for most MPE setups.

When configured to use MPE, touchscaper will send aftertouch messages on channels 2-9, with selection based on the one oldest last note off message sent to that channel as recommended in the MPE specification. With MPE each new note will be allocated a different channel. This allows you to effectively change individual sustained notes with aftertouch messages targeting the channel that note resides on.

At the moment, MPE is only supported for the Main instrument (A and B) and keyboard ribbon sources. If a source does not support MPE, the MPE channel has a "locked" icon.

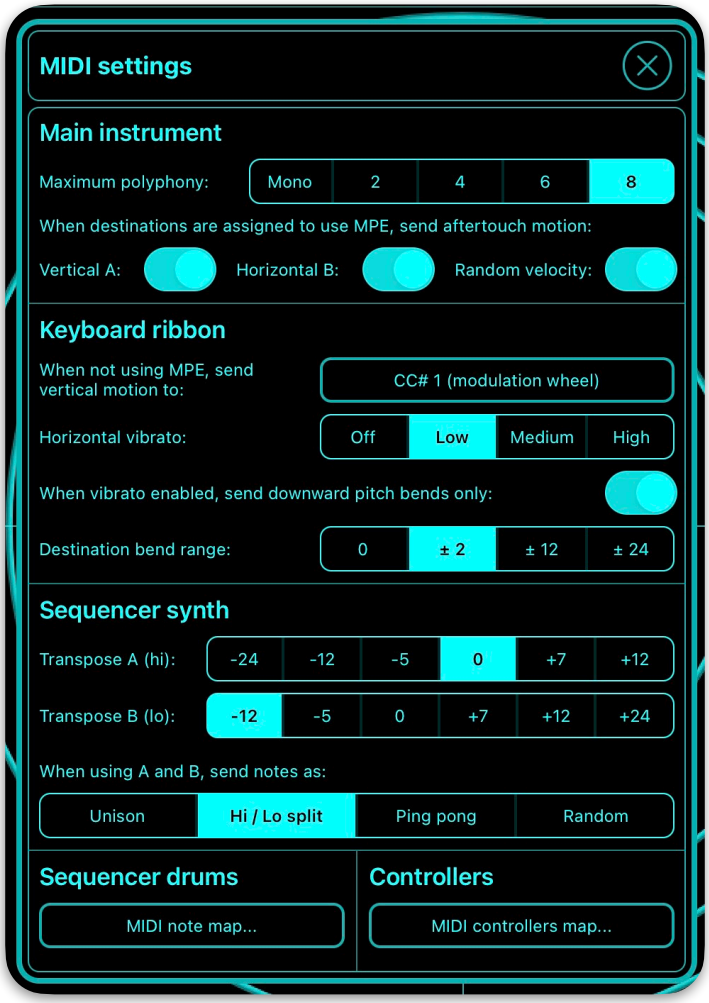
Please note - for MPE to work properly, it must also be set up on the receiving / destination side. Please refer to the documentation for the specific apps you'd like to use, as not all apps support MPE completely if at all, and there are many different approaches taken to support it.

For more detailed information about MPE please refer to:

https://www.midi.org/articles-old/midi-polyphonic-expression-mpe

MIDI settings

For some of the sources and optional controllers, additional configuration can be set up in the MIDI settings view accessible from the Connections view:



Main instrument

For the main instrument, maximum polyphony depends on the capability of the destination app. In many cases, polyphony is reduced to 4 or 6 notes due to the additional per-channel processing required when using MPE. Setting touchscaper to the same polyphony allows the number of main instrument touches to be limited in line with what the destination app can handle.

MPE is typically supported by sending aftertouch or “pressure” controller messages on a per-channel basis and in an ideal world, with each note having its own channel, an MPE controller can dynamically change each individual note in a chord for example. Exactly what happens sonically, is up to the destination instrument, but typical responses include varying volume or filter cutoff frequency according to how much “pressure” is received on that channel / for that note.

When touchscaper is configured to use MPE it will send polyphonic aftertouch messages when you move your fingers in a similar way to how the internal instruments are controlled. However there is a slight difference. Vertical movements send aftertouch to the A destination (if configured) and horizontal movements send aftertouch to the B destination (if configured). This can be turned on or off for each source with the two switches shown. Also, as with the internal touchscaper sounds X and Y is flipped round for the side ribbon.

Random velocity introduces some variation in the velocity of the notes sent to the MIDI destination, between 50 and 100. With the switch in the off position, the velocity is always 100.

Keyboard ribbon

When using MPE the keyboard ribbon will send aftertouch based on vertical movements. Side to side movements are mapped to pitch bend. When not using MPE, vertical movements can be mapped to a designated MIDI CC number. By default, touchscaper will send CC#74 (filter cutoff frequency) to the destination app. When you move along the ribbon, notes are re-assigned according to the current scale or chord. New touches will reset the CC to zero when not using MPE. To disable, tap the CC button and select the unassign option.

While horizontal motion is pitch-quantised, within the quantise boundaries, it's possible to add varying degrees of vibrato. Note that this is actually pitch bend from your finger movements, not an automatic vibrato driven by an LFO. This can be very subtle, or quite extreme depending on the setting from low to high.

There is also the option to only send downward pitch bends. This basically means that with this switch engaged, vibrato pitch bends will never allow notes to go sharp - only flat.

Pitch bend range also depends on how the destination instrument is set up. Common ranges are up and down a whole tone (i.e. +/- 2 semitones) which is the default settings. If your destination instrument is set up to user a wider pitch bend range, select the appropriate option for the destination pitch bend range.

Sequencer synth

Although touchscaper has only one sequencer synth internally, it can optionally drive two destinations using the sequencer synth A and B sources. You don't have to use two - if you just want to use one synth, simply use A and ignore anything to do with sequencer synth B. There are however some interesting options available.

Transpose allows you to independently transpose notes going to A and B. For example, you could transpose A to be +12 (an octave) above B for a "stacked" type sound with two destination synths. Or use the +7 transpose for a "power chord" type effect.

If you want to hear both destination synths at the same time, select unison. Each synth will receive a note on the same step and the notes may be transposed depending on the transpose options.

Hi / Lo split is very similar to the "SMARP" option in the internal sequencer sound engine allowing you to have one synth function in a bass type role, and the other to be more of a melody type sound. In split mode, any step in the sequence in C2-C4 range (bottom 3 sequencer tracks) will go to destination B, and anything in the C5-7 range (top 3 tracks) will go to destination A. You can also get some quite interesting results if you also transpose A an octave down into the range of B, and transpose B up an octave into the range of A.

Ping pong mode, as its name suggests basically assigns all notes generated from the sequencer back and forth between A and B.

Random mode is similar to ping pong, but assigns notes generated from the sequencer randomly to A or B. This can result in quite pleasing and unpredictable variations from your sequences especially if the A and B destinations synths have a distinctly different sound.

Sequencer touch synth (c)

There is currently no additional configuration required for this MIDI source. This will send either chords or single notes depending on whether Chord1, Chord2 or SynthC Touch options are selected.

When SynthC is selected, you effectively have an additional synth sequencer, but without the A/B split options.

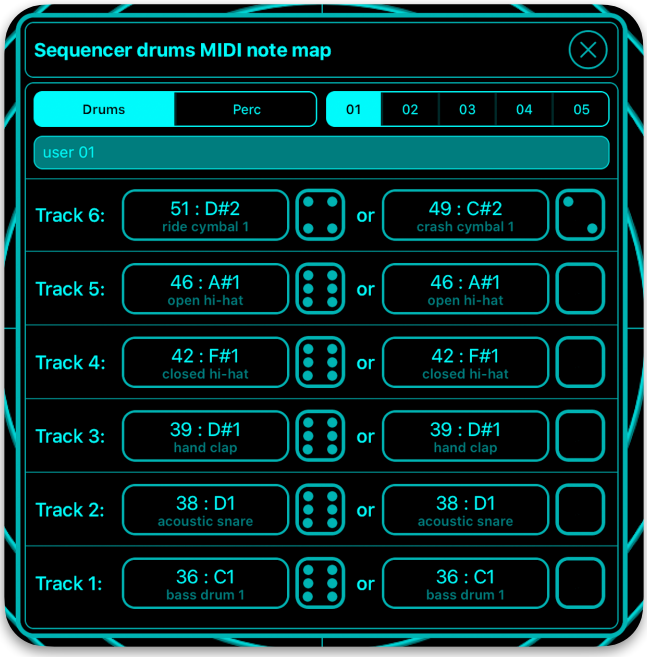
Sequencer drums

Sequencer drums, including percussion can also be assigned to a MIDI destination. In the touchscaper app, you have two separate sequences for drums and percussion, and each sequence has six tracks. When using MIDI, it's maybe better to think of touchscaper as having a generic 12 track drum sequencer as it's entirely up to you what sounds you will hear on each track. You do this by mapping a sequencer track to a particular sound (MIDI note) for the destination app. This is often referred to as a MIDI drum map or "note map". A long time ago, not long after MIDI was invented, there was an attempt to "standardise" drum maps, so that a kick drum sound, for example, would always be assigned to the same note across all MIDI devices and apps. This standard is referred to as "General MIDI" or GM for short. By default, touchscaper uses GM note assignments for drum sounds, but you should keep in mind that not all drum apps do, or sometimes they have a GM map as an option. If you don't hear drum sounds when using the default touchscaper note maps, then the most likely explanation is your target app isn't using a GM map. Please refer to the MIDI spec implementation for the app (or hardware device) to determine which MIDI notes correspond to which sounds.

There are five slots available to set up different note maps and each slot has a drums and percussion section, corresponding to the tracks in the drums and percussion sequencer. Tracks are numbered 1 to 6, bottom to top, as they appear in the sequencer view. Drum maps can also be named.

Each track can be assigned a pair of notes with an associated probability, shown by the dice values. If you want a particular sound to **always** play for that track, set its dice value to 6 by repeatedly tapping the button. As you change the probability for one note assignment in the pair, the other note for that track will increase or reduce accordingly. Say for example, for drums on track 6, you mostly wanted a ride cymbal, but very occasionally wanted a crash cymbal to sound on those sequencer steps, you would assign the two notes to the ride (51) and crash (49) values, and have the ride set to a much higher probability - this is actually the default setting. There are also additional variations set up by default in the percussion section to give you ideas to get you going. When the MIDI note has a GM assignment for a drum sound, it will be shown under the MIDI note value. Tapping the note button will bring up a pick list view to select a different note.

Here is the default note maps for drums:



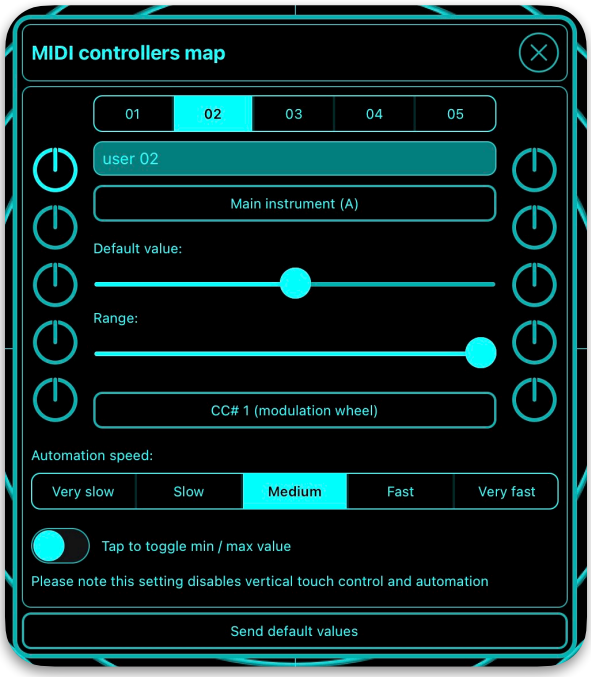
MIDI note velocities

The sequencer sends two different note velocities for synth, chords and drums depending on whether that step is an accent or not. Velocities are as follows:

- Synth - 96 / 112
- Chords - 80 / 96
- Drums - 80 / 127 (some hardware devices treat anything >= 112 as an accent, so this should be OK)

MIDI controllers

For an additional dimension of MIDI control, touchscaper can be set up to send MIDI CC (continuous controller) messages to any MIDI destination configured in the connections view. This means you can effectively tweak a knob or control of another app without having to leave touchscaper and bring up the app that you want to tweak in the foreground, then switch back and forth. This is great for live performance and jam sessions. You can define up to 10 controllers (2 x 5 rotary controls each side) and you can store these in five user slots that can also be named. From the MIDI settings view, tap the MIDI controllers map button to bring up the controllers view:



In the screenshot above, the top left controller has focus. You can change the controller focus by tapping the controller in the map view, or, if the controller is assigned, by tapping the controller in the main / outer view. Note that initially, controllers will be unassigned, so will appear dim in the main view.

To configure a controller, select a slot 01-05, and give it a name if you like. Then select the rotary knob you want to set up. Next, tap the upper source button - this will cycle through the available destinations - basically, all the sources except drums. Please note for this to work, you also need to have configured the MIDI connection properly, but you can do that later if needed. Also, the controllers you set up will be used to send CC messages to whatever (if anything) is connected to that particular source. This allows you to set up generic maps for common controllers - filter cutoff and resonance for example.

Probably the next logical thing to configure is the actual CC you want to target. Initially, this will be unassigned, and the lower button will be labelled “CC# - (not assigned)”. To assign a CC, tap the button and a pick list will appear:

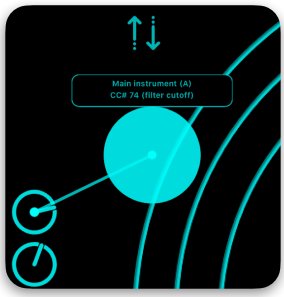
MIDI controllers (continued)

Select the controller number (0-127) you want to change from the pick list, or unassign it. For “standard” controllers the MIDI specification allocation will be shown below the number. Please note that this might vary for different apps and hardware so you will need to check the MIDI implementation section for that particular app or piece of kit - it’s usually a table near the end of the user guide.

In some cases you may also need to map the MIDI controller on the receiving side - please consult the user guide for the app or hardware you want to target. Luckily for us, iOS music apps typically have very good MIDI implementations allowing just about any control that is available on the app’s UI, to be mapped to a MIDI CC number which means there is huge potential to have a lot of fun here!

Once you have a CC number set, it’s probably a good idea to test it. With the default slider around half-way, and the range slider set to max, play a note on the target app - you might need to do this with an attached keyboard, or if the app has a keyboard latch function or something similar, that can be useful. Alternatively, you could send some notes to the app using touchscaper’s sequencer.

While the target app is making a sound, tap down on the controller in the main view, then move your finger up and down. You should see something like this:



As you move the controller up and down, the rotary control pointer should update to show the relative value and depending on what CC you have mapped, you should hear the controller change taking effect. Filter cutoff is a good one to try initially as it’s easiest to hear the change, and of course, it’s a classic! Note the destination and CC mapping is shown above the controller “blob”.

You then might want to fine-tune the controller behaviour further from the map view by changing the default and range sliders. Think of the default value as the “centre” value for the amount you want to change the CC value. Then the range is how much the control will change either side of that centre value. So, with both controls set half way, you have full range control, i.e. 64 plus or minus 64, giving you all 128 values (0-127). However for some controllers, you might not want to actually change the controller over its full range. Filter resonance is a good example - sometimes there’s a “sweet spot” that you want to sweep or you might not want to stray too far into the self-oscillation range of a low-pass filter when changing the resonance. In that case you probably want the default value close to centre, but the range set very low. Please note that the range does not restrict the angle shown on the controller knobs. Reducing the range also means that you get less change for the same vertical movement. The best thing to do is experiment while your target app is producing sound and find the default values and ranges that achieve the results you’re looking for.

Similar to the hold mode in touchscaper’s “radar” view, you can automate controllers. To automatically animate a controller, touch down on the rotary control, and maybe move it slightly to one side. Keeping your finger down, tap the Up / down arrow button that appears below the MIDI icon. This will automatically vary the controller using a random speed based on your Automation speed setting in the map configuration. To stop the automation, tap down again on the controller you want to switch off, then tap the arrows button. You can have multiple controllers automated which is like having 10 extra hands to twiddle knobs! To remove all automated controls, touch down on any automated controller and then double-tap the arrows button.

There is also the option to set the controller to toggle between its minimum and maximum values via a single tap. This is useful for “switch” type MIDI CCs such as sustain pedal and so on. With this option on, animation and touch down / drag to change value is disable for that controller.

For convenience, there is a shortcut to bring up the MIDI controllers map. Touch down on any configured controller, then tap the MIDI icon.

MIDI - a note about AU and AUM

Please note that right now, touchscaper is not implemented as an AudioUnit (AU). For a simple touchscaper MIDI setup, simply launch all the destination apps you want touchscaper to see and you're good to go.

However, the future direction of this sort of connectivity is via AU and there are plans to develop touchscaper more in that direction. In the meantime though, it is possible to communicate with another AU app using touchscaper in a suitable host such as the excellent and ubiquitous AUM.

If you're using AUM, you can either add *single instances* additional synths as IAA audio, then touchscaper will be able to target them individually in the same way as if all the apps were running outside of AUM, i.e. each app will be specifically named in the destination list in the MIDI connections view.

However, an increasing number of apps are now AU-based, which also has the advantage of being able to have *multiple instances* of the same app. While touchscaper will not "see" them as possible destinations, thanks to AUM's flexible routing capability, it's possible to send MIDI to them via AUM virtual MIDI sources.

On the touchscaper side, **you need to select "AUM" as the destination, for each of the sources you want to use**. Note that when using AUM, you should re-use or "share" the destination as it can be considered a "junction" point where the touchscaper sources will then be routed to their final destination within AUM using touchscaper's virtual ports.

As with standalone operation, you can select a specific channel mode for each touchscaper source assigned to the AUM destination "junction". Just **make sure the destination instrument in AUM is set up to be the same** otherwise you may get no sound.

When connected to an IAA host such as AUM, touchscaper makes the following virtual ports available which you can assign to other compatible apps (running as IAA or AU) as appropriate:

- touchscaper (A)
- touchscaper (B)
- touchscaper (ribbon)
- touchscaper (seq synth A)
- touchscaper (seq synth B)
- touchscaper (seq synth C)
- touchscaper (seq drums)

MIDI - a note about IDAM

You can also use touchscaper using Apple's "Integrated Audio and MIDI" simply by connecting your device via USB to a Mac. When enabled on the Mac side from Audio MIDI setup, it will appear as a "IDAM MIDI Host" destination.

When you want to use MPE, remember to configure your soft synth to use it. Different DAW manufacturers have confusingly different terms for MPE, but if it's not referred to as MPE specifically, it's usually called something like MIDI Mono mode, base channel 1, which basically means each voice is behaving like a mono version of the synth on its own channel. Note that base channel 1 is the setting you want, as touchscaper uses channels 2-9.

Other features

- Scenes and instruments can be shared from the main browser view and touchscaper supports the native iOS Files app.
- IAA (Inter-App Audio) is supported and touchscaper is implemented as a generator so you can record its audio output in a suitable IAA host.
- The chord looper and sequencer can be synchronised with other apps using Ableton Link.

And finally…

I hope you enjoy touchscaper, and if you have any questions or comments, please feel free to get in touch: https://www.waverley-instruments.com/robjackson

Also, please do share your musical creations - I can't wait to hear and see what you do with touchscaper!

Happy touchscaping, -Rob