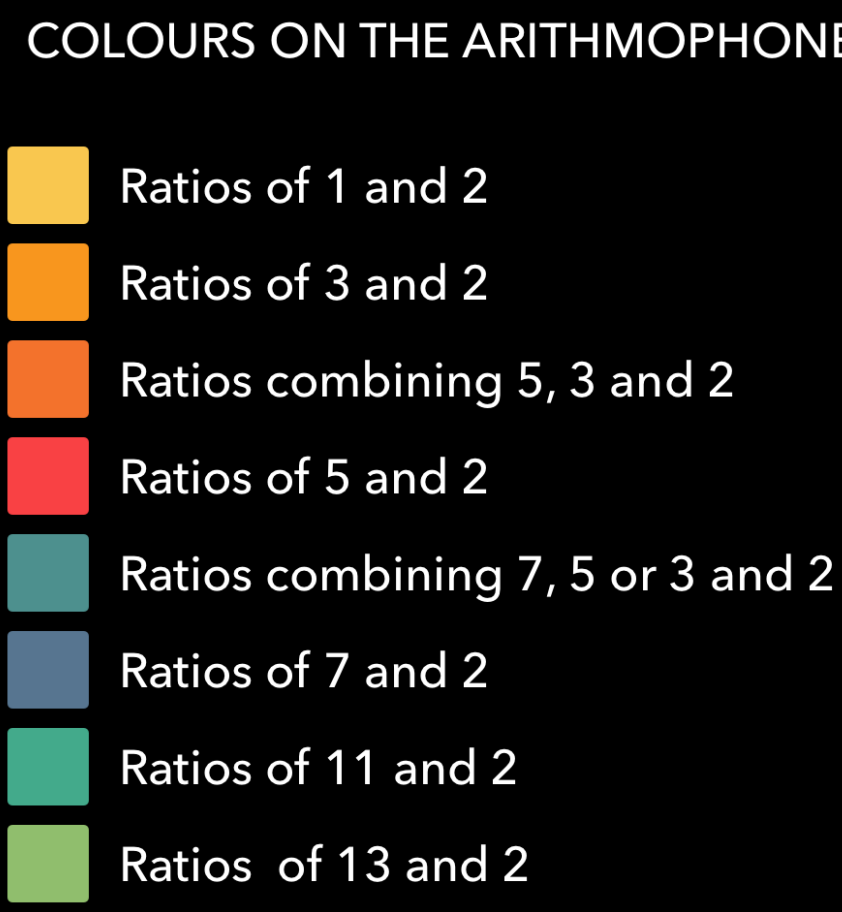
Arithmophone EDO Web App – quickstart guide

INTRODUCTION

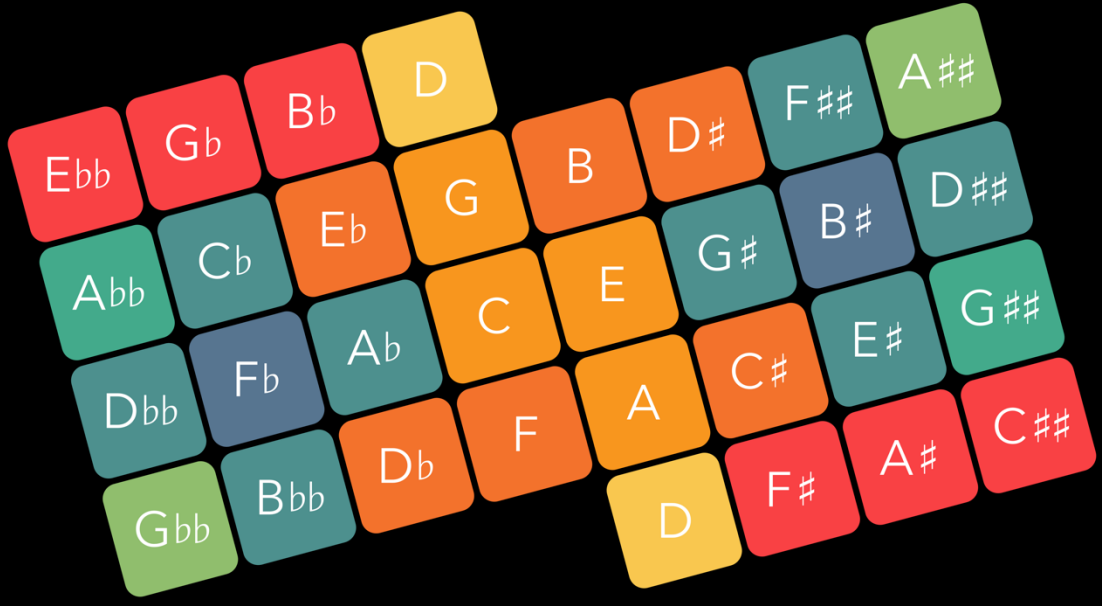
The Arithmophone EDO Web App is a browser-based musical instrument that you can play from any tablet or computer (preferably one with a touch screen). 'EDO' stands for 'Equal Divisions of the Octave'. The Arithmophone EDO features a keyboard that can be set to two such divisions: one with the common 12 notes per octave and one with 31 notes per octave. Read on below for a description of all the functions of the Arithmophone EDO Web App.

KEYBOARD

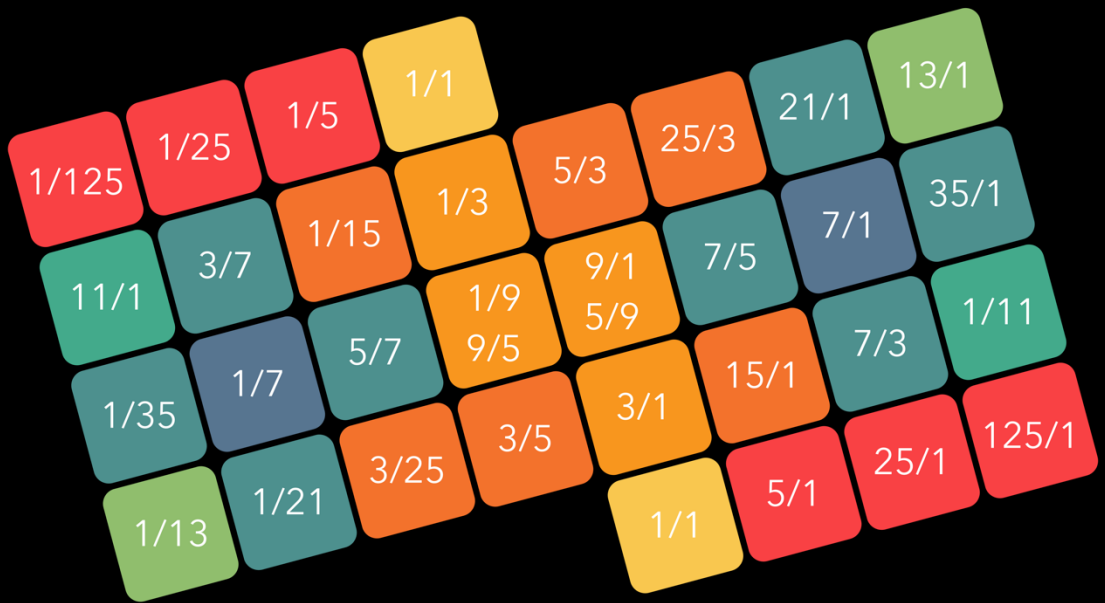
On the Arithmophone EDO, the colours of the keys reflect their approximate ratios with respect to the central note (1/1 ratio), like this:



In 31-EDO mode, the notes are arranged as follows:

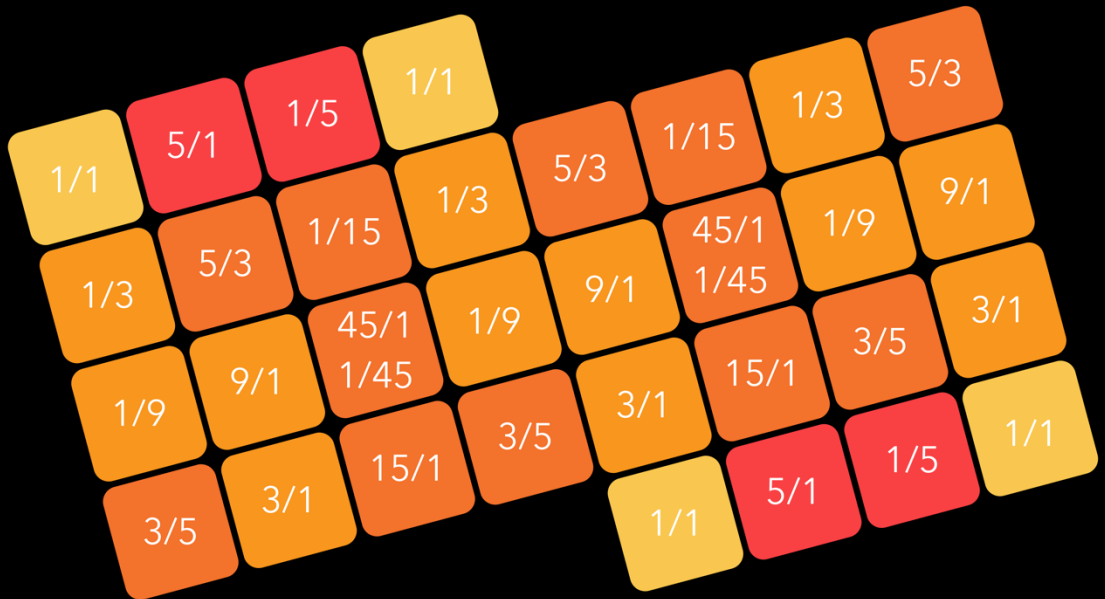


The approximate harmonic intervals of these notes are as follows:



In 12-EDO mode, the notes are arranged as follows:

The approximate harmonic intervals for these notes are:



Some notes on the illustrations above:

- The note names in the 31-EDO illustration follows the 'double sharp/double flat' convention commonly used fot this tuning system. There is a different convention using half sharps and half flats, that is equally valid, but slightly less convenient for our current purposes.

- In 31- EDO, notes with double sharps or double flats are not just 're-spellings' of natural notes, as they are in 12-EDO. In standard tuning, "F##" and "Abb" are identical to G, but in 31-EDO these are actually different notes.

- Each note is split up into two keys. These keys offer the same note across different octaves. This gives the instrument a range of 2 full octaves in 31-EDO mode. In 12-EDO mode, the range is greater: because there are only 12 different notes in this mode, each is repeated 2 or 3 times across the keyboard, allowing one or two extra octaves per note.

- In the illustrations with ratios, these are shown in their 'pure' form, without octave reduction. In actuality these ratios may be multiplied or divided by two any number of times, depending on the octave they are in.

- The ratios presented and the corresponding colour scheme are approximate and are just one possible interpretation among many. For example, the key with ratio 13/1 inscribed produces a note whose frequency is actually more closely approximated by the ratio 105/1. In cases like these, I have chosen the simplest ratio that provides a fairly close approximation (with 'simple' interpreted as 'consisting of small numbers'). There are good musical reasons for doing things like this, which I discuss elsewhere. The point here is to stress that the colouring of the keys should be viewed as a helpful aid in navigating the keyboard and understanding pitch relations between keys, but not as an absolute truth of any kind.

For more detailed information about different tuning systems, the layout of the EDO keyboard and the rationale behind this design, please visit these pages: chielzwinkels.net/arithmophone/background/

CONTROLS & OPTIONS

On Android and Windows devices, you can click the button labeled **F** at the top left of the screen to enter full screen mode. This makes the keys as large as possible for the best playing experience. On Apple iOS/iPad OS devices, full screen mode is blocked for web apps, but you can get a similar result by hiding the toolbar. To do this, you can click on the **AA** icon in the Safari address bar, then select 'Hide Toolbar' in the menu.

The button at the bottom right labeled **O** brings up the options screen, where you can adjust several sound parameters. Once you are finished adjusting sound parameters, you can press the **options** button to close the options screen, this will return you to the keyboard so you can resume playing.

The **EDO** button lets you switch between 12 and 31 tone equal temperaments.

When you select 12-EDO, you will have a familiar 12 notes per octave at your disposal, the same as on any regular MIDI keyboard or piano. When you select 31-EDO, the keyboard is tuned to have 31 different notes per octave. The familiar notes from 12-EDO are still present in the central area of the keyboard (in slightly altered tuning), but towards the sides of the keyboard you will find many new notes not available on any standard piano keyboard.

The three buttons in the middle let you switch between different waveforms:
○ = Sine wave (dark, round sound)
△ = Triangle wave (warm, mellow sound)
□ = Square wave (bright, sparkly sound)

The **mono mode** button engages monophonic mode. In standard mode (the button is blue), the Arithmophone ToneHive can sound up to 4 notes at a time, so you can play chords as well as melodies. In monophonic mode (the button is red), the Arithmophone Korale will sound only one note at a time. This gives a different kind of sound, less like a piano or a guitar and more like a saxophone or a vintage synthesizer.

SLIDERS

The sliders give you more options to change the sound of the Arithmophone EDO. From top to bottom, these sliders have the following functions:

Slider 1: Delay mix

There is a stereo delay on the Arithmophone, that produces echoes to make the sound more wide and spacious. The blue slider determines the amount of delay that is mixed in with the original sound. Low values (slider to the left) give less delay, high values (slider to the right) give more delay. When the slider is completely to the left, there is no delay at all mixed in.

Slider 2: Delay feedback

This slider determines how many echoes are produced by the delay. Low values give only a few echos, while at high values the echoes go on for a long time.

Slider 3: Delay time

This slider determines the time between echoes. At low values, the echoes follow each other very quickly, like in a small room. At high values, there is a lot of time between echoes, like in a large cave or a canyon.

Slider 4: Vibrato

This slider determines the vibrato added to the notes. Vibrato is a slight 'wobble' in pitch that can make notes sound more lively and expressive. At the lowest value there is no effect at all, at the highest value there is a very fast and pronounced effect.

Slider 5: Attack

This slider determines how quickly the notes rise to full volume. Low values give a snappy sound (like a piano or a guitar), high values give a softer start of the sound (like a violin or a cello).

Slider 6: Decay

This slider determines how long the notes ring out. Low values make for short notes, high values make for longer notes.

Slider 7: Transpose

By default, the Arithmophone EDO is tuned to D. With the red slider, you can adjust the pitch up or down in semitone steps, from G (7 semitones below D) up to A (7 semitones above D).