ARCTRAX

User Manual

soundsphere

for ArcTrax UWP version 1.0.3.0

Table of Contents

1 Overview

1.1 Introduction

ArcTrax is a software synthesizer designed with an emphasis on ease of sound edit. The structure of the core synthesis engine is slightly simple, but it's equipped with the multiple operation mode for knobs, which enables for making a wide variety of sounds. It also features motion function for controlling the rotation of the knob while voicing. You can easily set up the motion with unified system. Please try to make your own original sound with your out of the box thoughts.
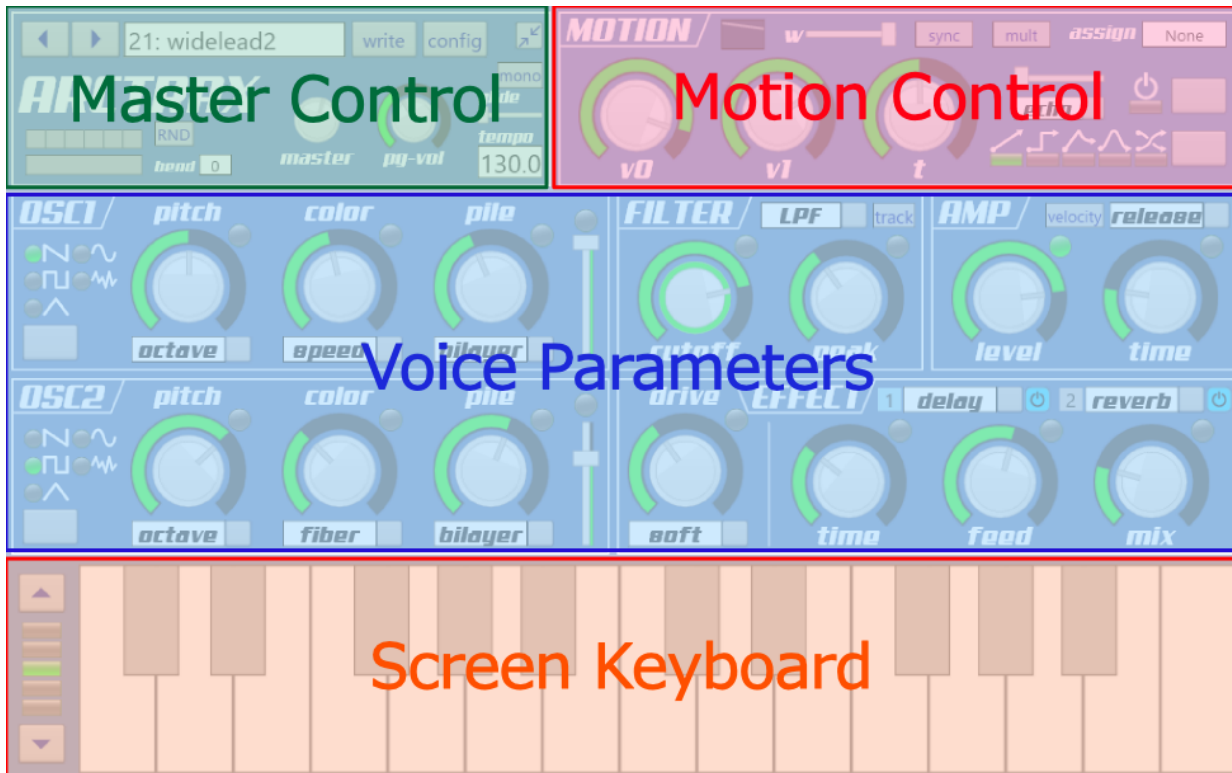
1.2 Structure
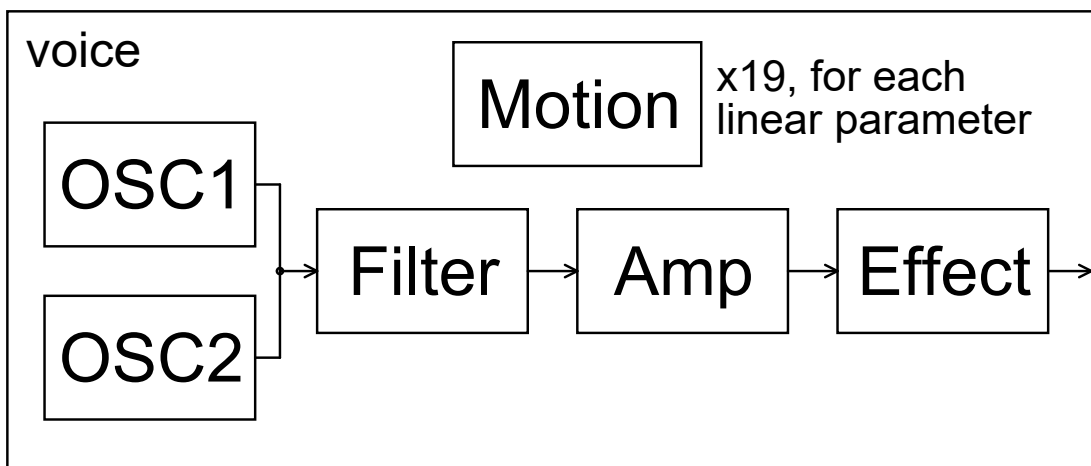
The processing for voice are constructed of 2 oscillators, filter, amplifier and effect. All linear parameters(parameters controlled by knob or slider) have it's own motion function and vary the parameter value along the time from note on. ArcTrax consists of 6 voices and it do this process for each voice.

2 Panel Reference

2.1 Overview

The main panel of ArcTrax is divided into four sections.

- Master Section
- Voice Parameters Section
- Motion Section
- Keyboard Section

In master section, there are parameters commonly used for all voices. Operations for loading and saving programs are also handled here.

In voice parameters section, there are knobs and selectors used for voice processing. All knobs in this section have an individual motion function.

Motion section provides motion parameters for voice parameter knobs. There is a current edit target knob in voice parameters section and the motion parameters for this knob is shown in motion section. The current knob swiches when you control motion-able knobs in the voice parameters section.

In keyboard section, you can play tones with the screen keyboard.

2.2 Controls

Knobs and Sliders
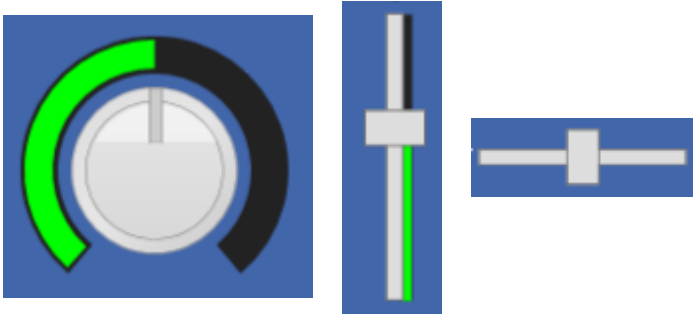
Control the value by dragging with the mouse. To adjust the value, drag vertical direction for the knob, the equivalent direction for vertical or horizontal slider.

Mode selector

Mode selector is used for selecting a mode among several modes. You can shift the selection by clicking attached small button. In addition, a popup will be shown when you click the text-part for the selector, which enables you to select a mode from within available modes.

Waveform selector

Select a waveform in several waveforms. Shift the selection by the button. You can also select a waveform by clicking the LED directly.

Toggle button / indicatior

Toggle buttons or indicators which has on and off states. There are several variations. Click to toggle the state.

2.3 Oscillator

ArcTrax come with two oscillators, OSC1 and OSC2. Both are the same structure. Operation of the oscillator is aggregated into three parameters pitch, color and pile. These parameters have the mode and the level, and the effect varies by the selection of the mode. Color is used for deforming the waveform, and pile is used for controlling unison.
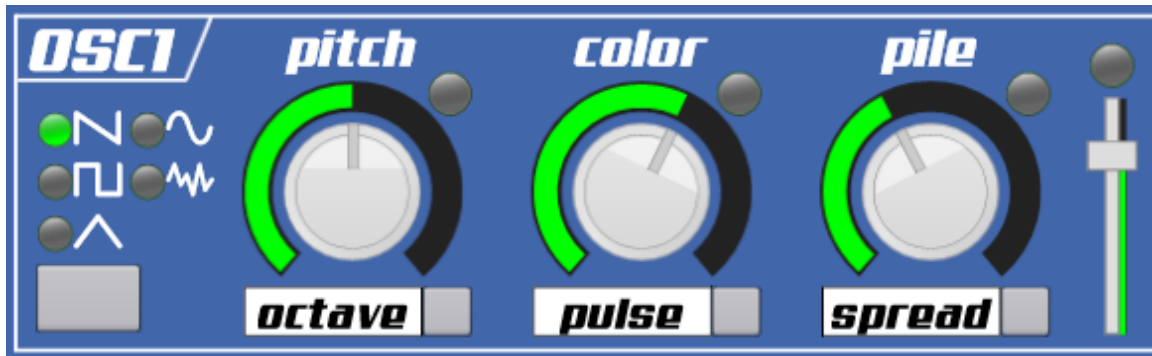
wave (selector at the left end)

Select one of the waveform from Sawtooth/Rect/Triangle/Sinus/Noise. If Noise selected, parameters other than volume will have no effect.

pitch
Adjusts the pitch.

octave	Shift the pitch in octave units.(-3~+3)
semi	Shift the pitch in semitone units.(-12~+12)
fine	Adjust the fine pitch between two semitones. (-1.0~+1.0)
fixed	Specify the fixed pitch by the knob. It generates fixed pitched tone regardless of the input notes.

color
Changes the harmonic structure by deforming the waveform.

none	Just use the basic waveform without deforming it.
pulse	Deform the waveform so that the shape will be pulse-like.
bump	Distort the one of them in two cycles of waveforms.
speed	Boost the phase increment amount relatively from the reference pitch.
fiber	Modulate the phase by sinus wave in each period. The level of the knob affects the pitch of sinus wave and the depth of the modulation.

pile
Stacks multiple waves. The sound generated will be thicker.

none	Use single wave.
sub	Add a wave an octave below relative to base pitch.
dual	Use dual waves detuned each other.
det7	Stack 7 waves detuned each other.
spread	Stack 7 waves detuned each other. The stereo image is expanded spacially.
bilayer	Stack 7 waves detuned each other. 3 of 7 waves are shifted an octave below. The stereo image is expanded spacially.

volume (slider at the right end)
Adjusts the output volume.

2.4 Filter

By passing the waveform through the filter, sound characters such like brightness or clarity can be controlled by suppressing sounds in the specific band.

type (selector)

Select the filter type.

none	Disable the filter and bypass the filter processing.
LPF	Suppress high frequency tones above the cutoff frequency.
BPF	Suppress low and high frequency tones, while keeping tones remained near the cutoff frequency.
HPF	Suppress low frequency tones below the cutoff frequency.

cutoff

Specifies the cutoff frequency.

peak

Lifts the tones near cutoff frequency. Specify the band range and strength of the peak.

track

Specifies whether the cutoff frequency changes following the input note.

The cutoff frequency is determined by the level of the cutoff knob if track is off. On the other hand, if track is on, the cutoff frequency is shifted constant pitch difference relative to the input note pitch.

2.5 Amplifier

Amplifier controls the volume of generating tones. There are two operation modes, release and decay. If you want it more expressive, you can use the motion of the level knob.

level

Specifies the gain of the amplifier. The gain is 0.0 for minimum level of the knob, 1.0 for center, and 4.0 for maximum.

mode (selector)

Select the operation mode.

release	Decrease the volume of tones after note off.
decay	Decrease the volume of tones after note on.

time

Specifies the release or decay time, depends on the selection of the mode.

velocity

Affects velocity to volume when notes are played with a MIDI keyboard.

2.6 Effect

There are drive effect for distort the wave shape and spacial effect like delay. The spacial effect has two slots. The first slot is for delay or phasor and flanger, and the second slot is for reverb.

drive

Distorts the waveforms. Select a mode by the selector and adjust the strength of the effect by the knob level.

none	Bypass the signal.
soft	Overdrive the wave and apply soft clip.
hard	Overdrive the wave and apply hard clip.

There are two effect slots for spacial effect, Effect1 and Effect2. Three knobs show the parameters of the effect slot currently selected.

select (button 1,2)
Set Effect1 or Effect2 as the current effect for edit.

on/off (button with power-on symbol)
Enable or disable the effect, for Effect1 and Effect2 respectively.

type1 (selector)

Select the type of Effect1. The role of three parameters change depends on the selected effect type.

|	
none	Disable Effect1.
delay	Apply Short delay. time:delay time, feed: amount of feedback, mix: mix ratio
tdelay	Apply Tempo delay. Delay time is synchronized to the tempo. time: delay time, feed: amount of feedback, mix: mix ratio
chorus	Apply chorus effect. rate:frequency of modulation, depth: modulation amount, mix: mix ratio
phasor	Apply phasor effect. depth:strength, feed: amount of feedback, mix: mix ratio
flanger	Apply flanger effect. time: delay time, feed: amount of feedback, mix: mix ratio

type2 (selector)

Select the type of Effect2. In the current implementation, reverb is only available.

none	Disable Effect2.
reverb	Apply reverb effect. time:reverb time, feed: amount of feedback, mix: mix ratio

2.7 Motion

In motion section, there are controls for the motion attached to the edit target knob in voice parameters section.
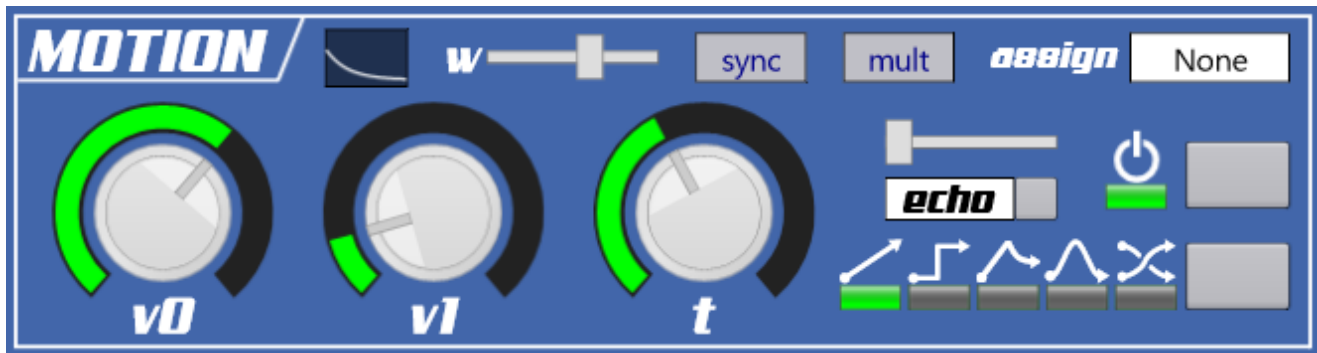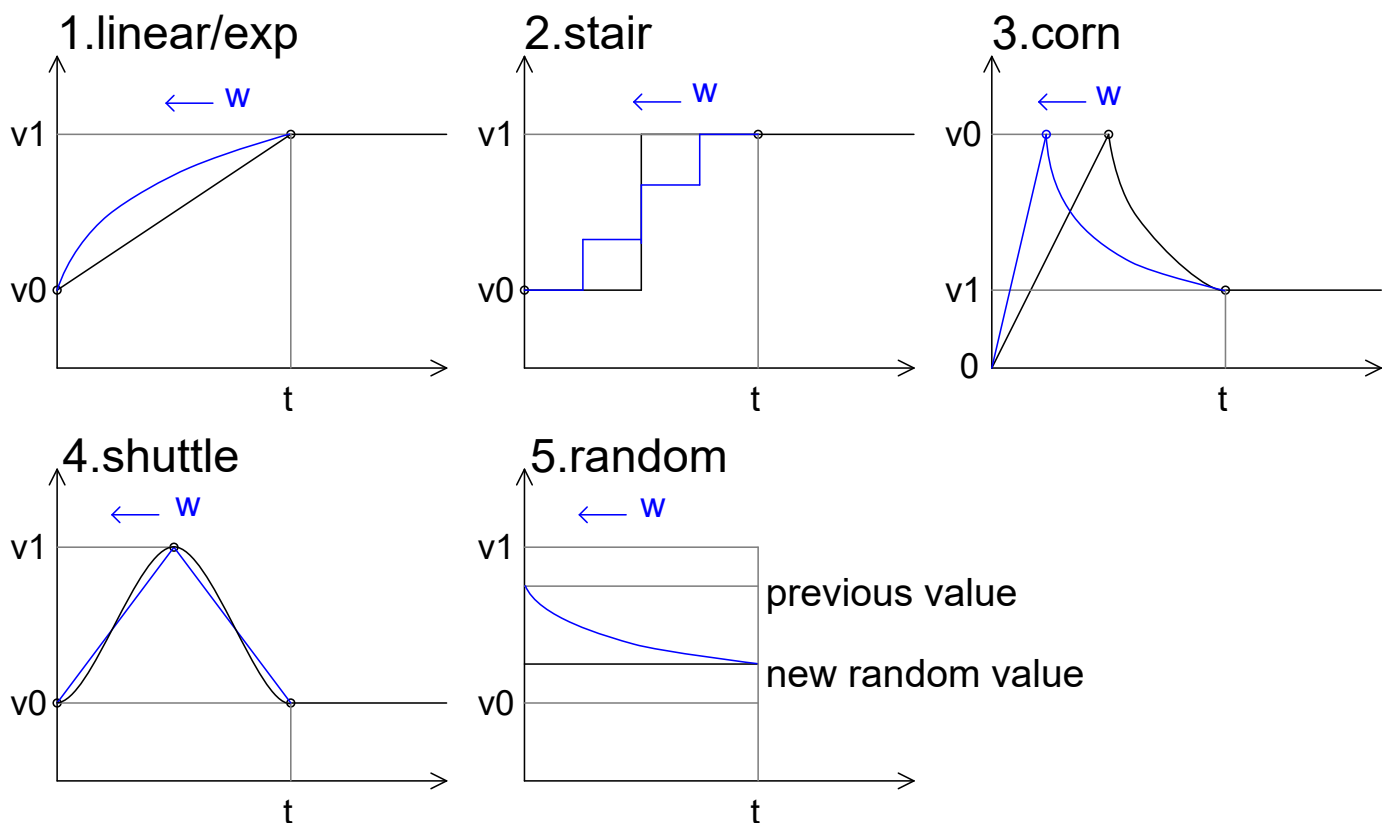

on/off (button labeled power-on symbol)
Enable or disable the motion for current edit target knob.

wave (waveform selector)
Select the motion waveform.

w
Deforms the motion waveform. The shape of deformed wave is shown in the scope at left next to the slider.

Available motion waveforms and the effect of w parameter are illustrated.

v0

Specifies the pivot value 0 of the motion. The role varies rely on the selection of the waveform.

v1

Specifies the pivot value 1 of the motion. The role varies rely on the selection of the waveform.

t

Specifies the time took for one motion cycle.

loop (selector and slider near power-on button)

Set the loop mode and adjust the level used in the mode.

echo	Repeat the motion, reducing the range of level difference. Specify the attenuation rate by the slider. It will be one shot motion for the minimum level of the slider, and infinite loop for the maximum level.
slow	Increase the range of the level difference gradually along the time. Specify the time took when the levels fit v0 and v1.
await	After note on, wait a little and starts the motion. Specify the time by the slider.

sync

It gets synchronized the time specified by the t parameter to the tempo.

mult

Multipy the output parameter value and original knob level if this turned on.

assign

Assign the MIDI value such like velocity or pitch bend to current knob. If you use this function, the motion have disabled. v0 and v1 is used for specifying the mapping range.

About the current edit target knob

There is one edit target knob for motion in the voice parameters section. The edge of this knob is highlighted in green. Motion section shows motion parameters attached this knob. This motion target knob is switched each time you edit knob in voice parameters section.

There is a LED at the top right corner of each motion-able knob, showing whether attached motion is enabled. The state of this LED is linked to on/off button in motion section if the knob is edit target. You can enable or disable attached motion for each knob by clicking this LED regardless of whether the knob is edit target or not.

2.8 Master

In master section, there are controls for parameters used commonly among all voices.
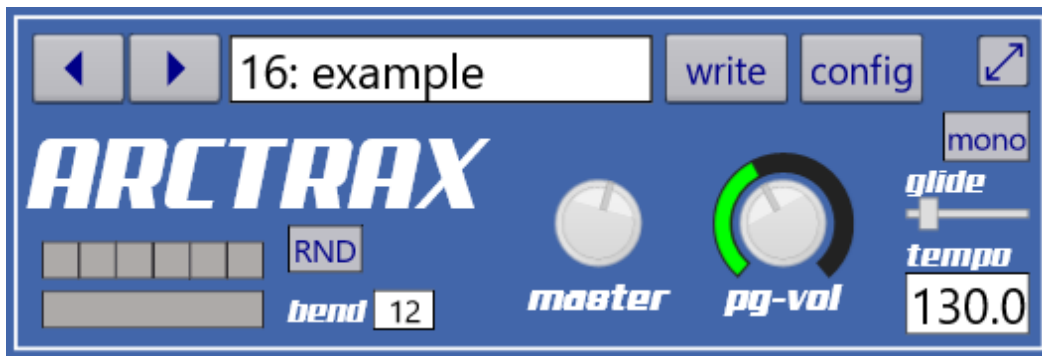
master
Specifies the global master volume. This volume isn't changed when you switch programs.

pg-vol
Specifies the volume of the current program. This level is stored in program data and loaded when you switch programs.

glide
Specifies the portamento time.

mono
Enable or disable monophonic mode. In monophonic mode, multiple notes cannot be voiced at the same time.

tempo
Specifies the tempo used in sync mode of motion or tempo delay.

RND
Randomize synthesis parameters. Some parameters in master section are excluded for randomization.

bend
Specifies the pitch bend range in note number units. This value has an effect when you control the bender of MIDI keyboard.
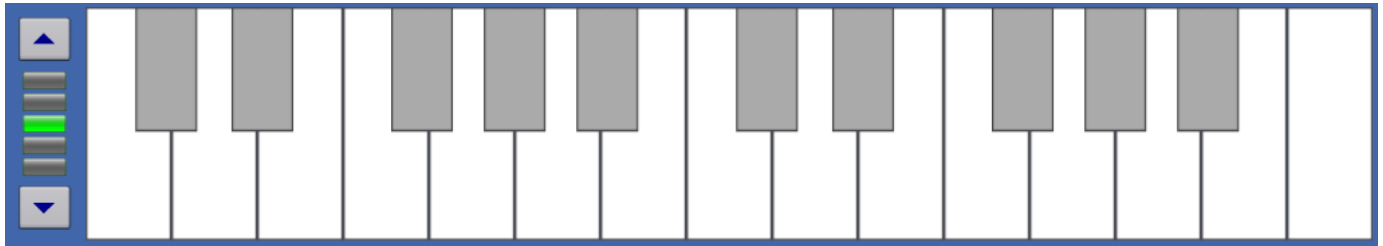
voice states (6 cells under the logo)
Display the voicing state of voices.

level (gauge at the bottom left corner)
Displays the maximum level of output wave.

2.9 Keyboard

Play tones by pressing the key. It also displays holding keys when you play tones with PC keyboard or external MIDI keyboard.

octave (buttons and indicators at the left end)

Specifies the octave. The note numbers are shifted in octave units when you play screen keyboard or PC keyboard. If you play with a MIDI keyboard, this parameter has no effect.

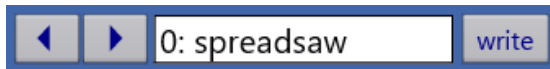Assignation for PC keyboard are illustrated below.

3 Program Management

3.1 Load and Save

Load the program

Shift current program by pressing buttons at the top left corner of the main panel. There is a textbox showing current program name next to these buttons. The program selection panel opens with Read mode if you click this text area. There are Read and Write modes for the program selection panel and the behavior of the selection differs.

A set of 24 programs is called bank in ArcTrax. In program selection panel, select a bank at the bank list at the left side, and select a program from the programs listed on the right side. In Read mode, the program loaded if you click it. The panel closes if you double click it. The current program is highlighted in blue in this program list.

Store the program
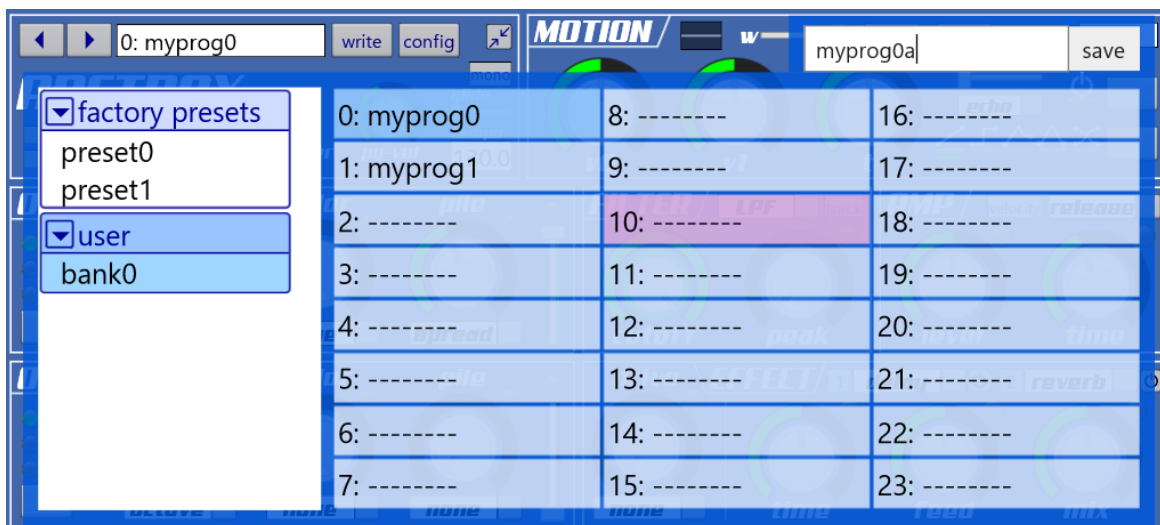
The program selection panel opens with Write mode if you click the write button in the main panel. In write mode, you can overwrite the current program or save it to another program slot. The destination slot for the saving is highlighted in red and can be changed by clicking another. Specify the new name for the program in the textbox at the top right and press save button to write it to the slot.

3.2 Manage Programs

In Read mode, the context menu is shown if you right click a program slot. You can do operation for the program such like to rename, copy or paste with the commands in this context menu.

Manage the banks and boxes
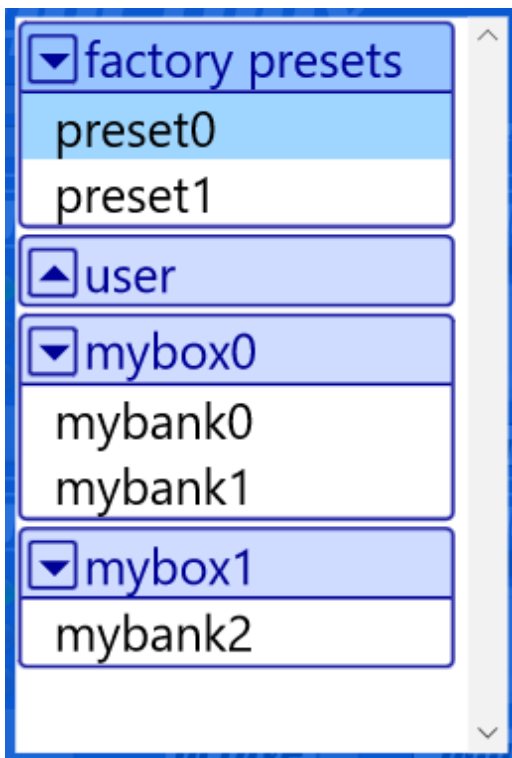
There is the bank list used for managing the banks at the left side of the program selection panel. A folder contains some banks is called the box in this list. Toggle extraction state of the box by clicking the header part of the box. To add a new box to bank list, right click on the blank space below boxes, and select the command 'add new box' from the context menu. To add a new bank to the box, right click the header part of the box and select the command 'add new bank' from the context menu. To move or re-order a box or bank, hold the header part of the bank or the box a second and it will go floating state. Then move it to the location where you want to insert.
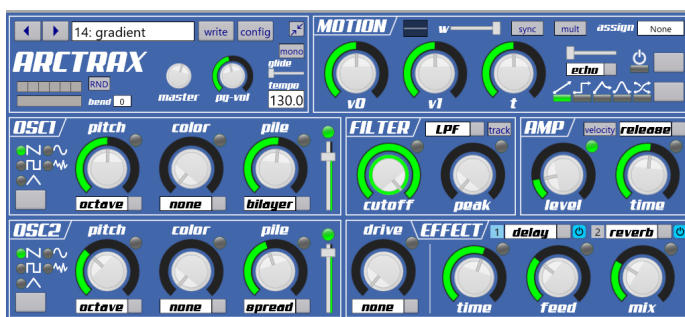
4 Configurations

Configuration panel is shown by pressing the config button in master section. There are four tabs in this panel; General, Audio, MIDI and About. Click outside the panel to close this.

4.1 General Tab
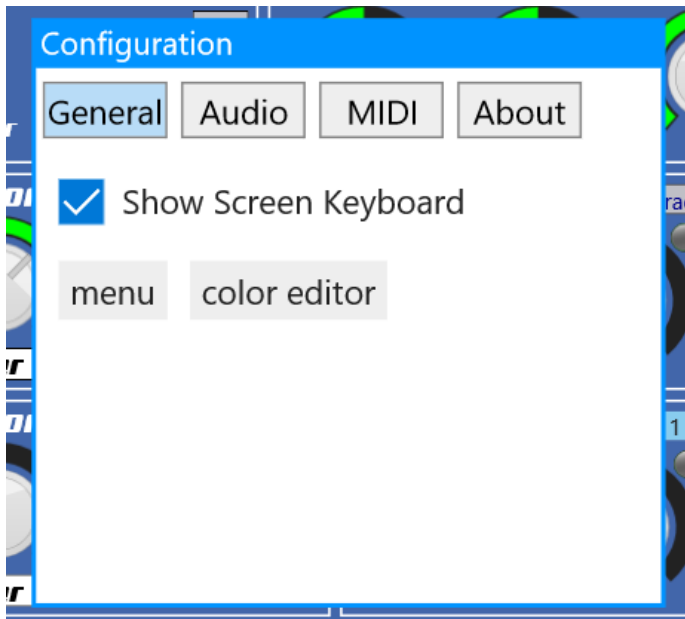
Show Screen Keyboard

Toggle visibility of the screen keyboard shown at the bottom of the main pael. The view got narrow if the keyboard is hidden.
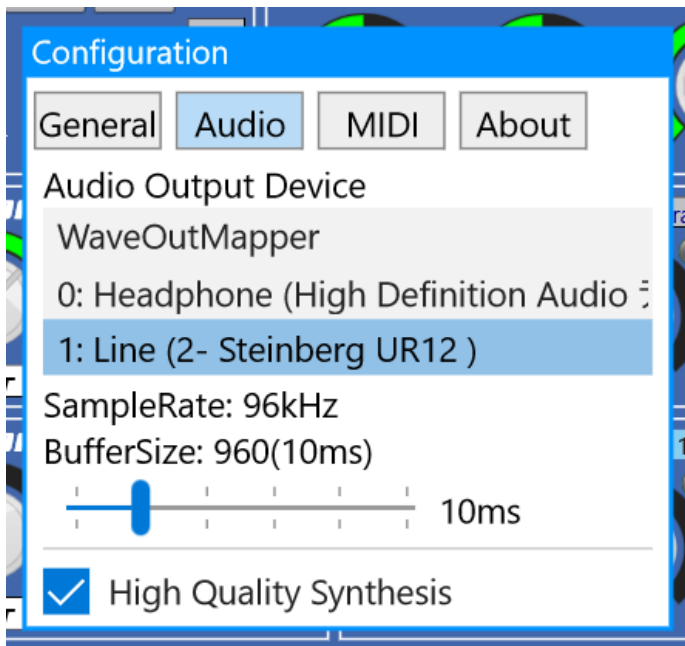

menu

Open the menu. There is a command for restoring color configuration.

color editor

Open color configuration panel.

4.2 Audio Tab

Audio Output Device

Select an audio device used for rendering generated sounds.

SampleRate

It shows the sampling rate used in synthesis processing. The sampling rate is determined automatically depending on the selection of the audio device. In Windows, the OS has the sampling rate configuration for each device.

BuffserSize

Specifies the buffer size for audio rendering. Less buffer makes it less latency, but it tends to cause more glitch. If it is set to the left end of the gauge, the rendering task runs the device with the minimum buffer size supported by the device. If the device responds to the lowest-latency configuration request in Wasapi Shared Mode, it will be driven with small buffers less than 10ms. Otherwise, the device is driven with the buffer size equivalent to 10ms the default buffer duration supported by the OS.

High Quality Synthesis

If you uncheck this check-box, processes requeires much calculation quantity such like band-limiting of oscillators or interpolations are omitted and the alternative lightweight implmentations are used. It also degrades the quality of reverb and make the CPU load lower. If the spec of your machine is not so good and output sounds have glitches, please try to uncheck this.

Sampling rate selection in configuration of Windows

The sampling rate used in the internal processing of Arctrax relies on the sampling rate of the audio output device. You can change the selection of the sampling rate of the device in the configuration panel of the OS. Notice it may also affect to other applications such like browser or media players if the device is set as the default audio playback device. To configure the device, open the property of playback device in sound configuration and select the sampling rate. What sampling rate is supported depends on the device.
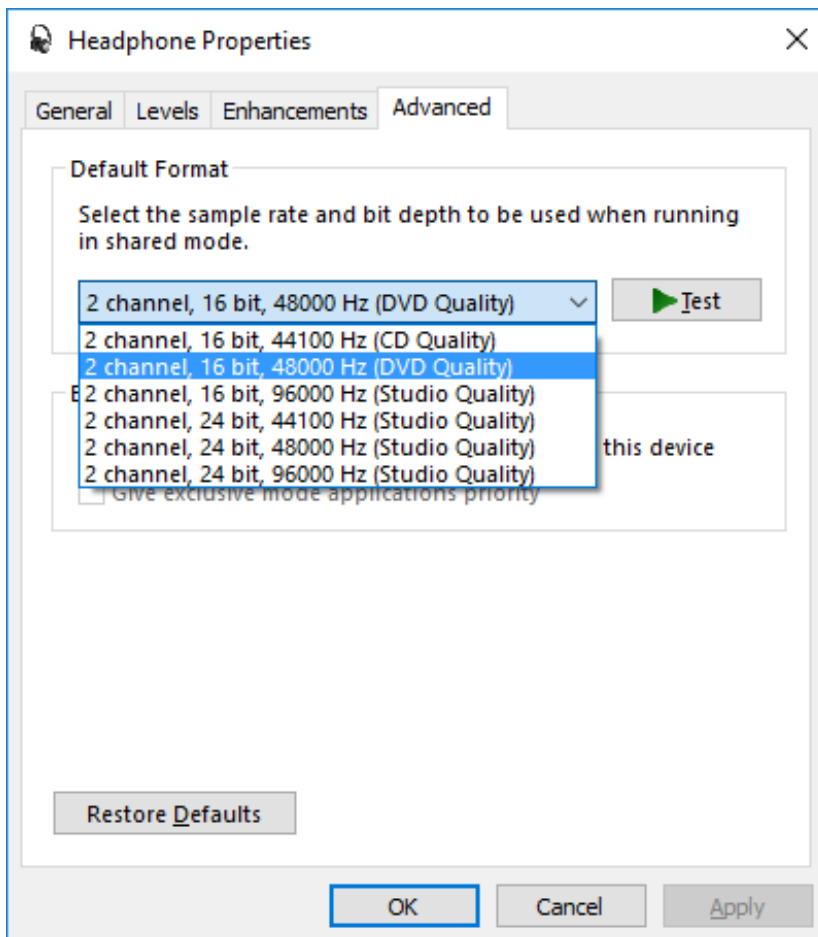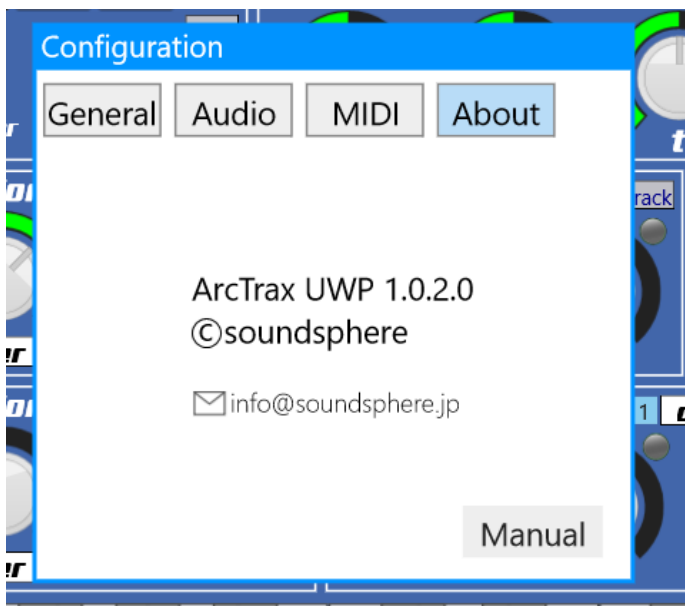
4.3 MIDI Tab

MIDI Input Device

Available midi input devices are listed. Select the device used for playing.

4.4 About Tab

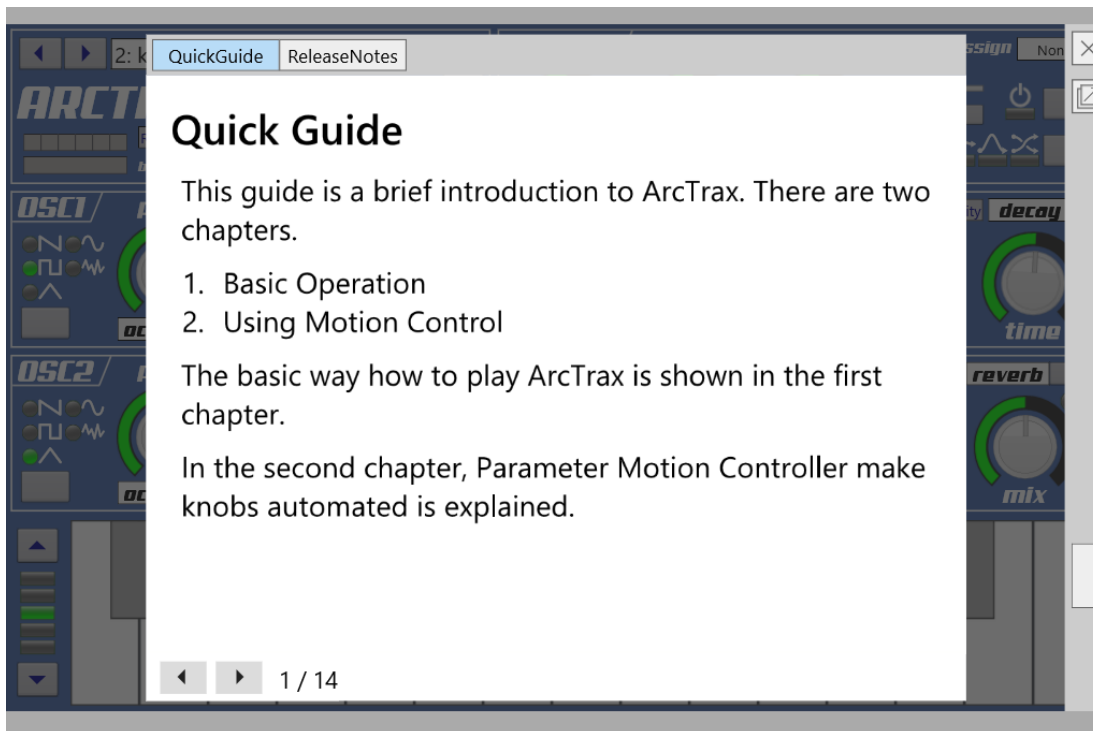In About tab, the version number of this app is displayed.

Manual

Open the document view.

5 Other Views

5.1 Docuemnt View

Document view displays documents come with this app.

Quick Guide
Show the quick guide. A brief usage of the app is explained in this document.

Release Notes
Show release notes. There are update histories of the app.

There are 3 buttons on the right edge of the document view. These buttons are used for changing how the view displayed.

 Close the document view.

 Open the document view in another window.

 Minimize the document view. If this button is pressed when the document view is minimized, the document view will be shown again.

5.2 Color Customization

Since GUI of ArcTrax is composed of vector graphics, It is easy to edit colors and the configuration panel for customizing colors is provided. In this panel, you can specify color for GUI parts respectively.
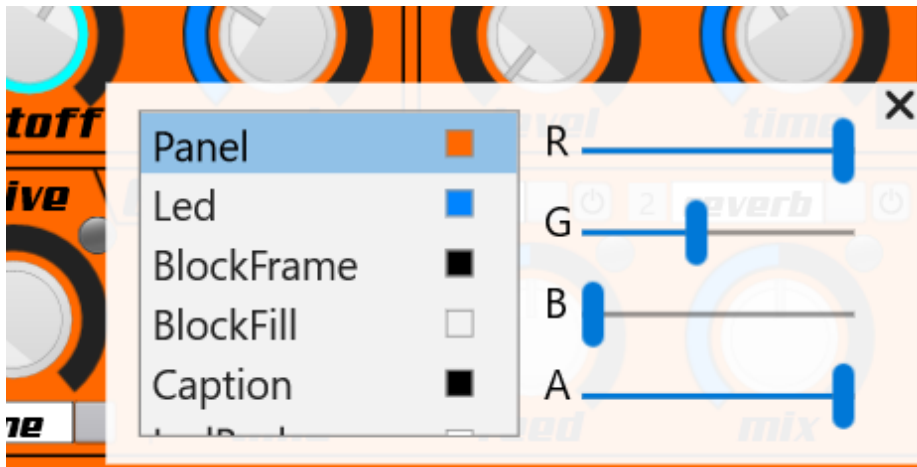
Color configuration panel is open by pressing the 'color edit' button at the General tab of configuration panel. In this panel, edit target is selected from the listbox at the left, and specify the color of the target with sliders R,G,B,A. In the list, the color of corresponds GUI element is inverted while you are holding the mouse on an entry in order to check which part of the GUI is the target.

5.3 Adjustment of Screen

Full Screen View

Pressing the full screen mode button in the master section, the app will be displayed with whole the screen without the title bar.