

Hocus

A synth organ with 4 transposable tone wheels, 29 built-in registrations, 2 rotary speaker effects with a simulated Leslie foot-switch and some crazy multi-interval vibratos.

How to use:

----- Presets -----

There are lots of really nice presets!

A list of all Presets can be seen on page 8 of this document.

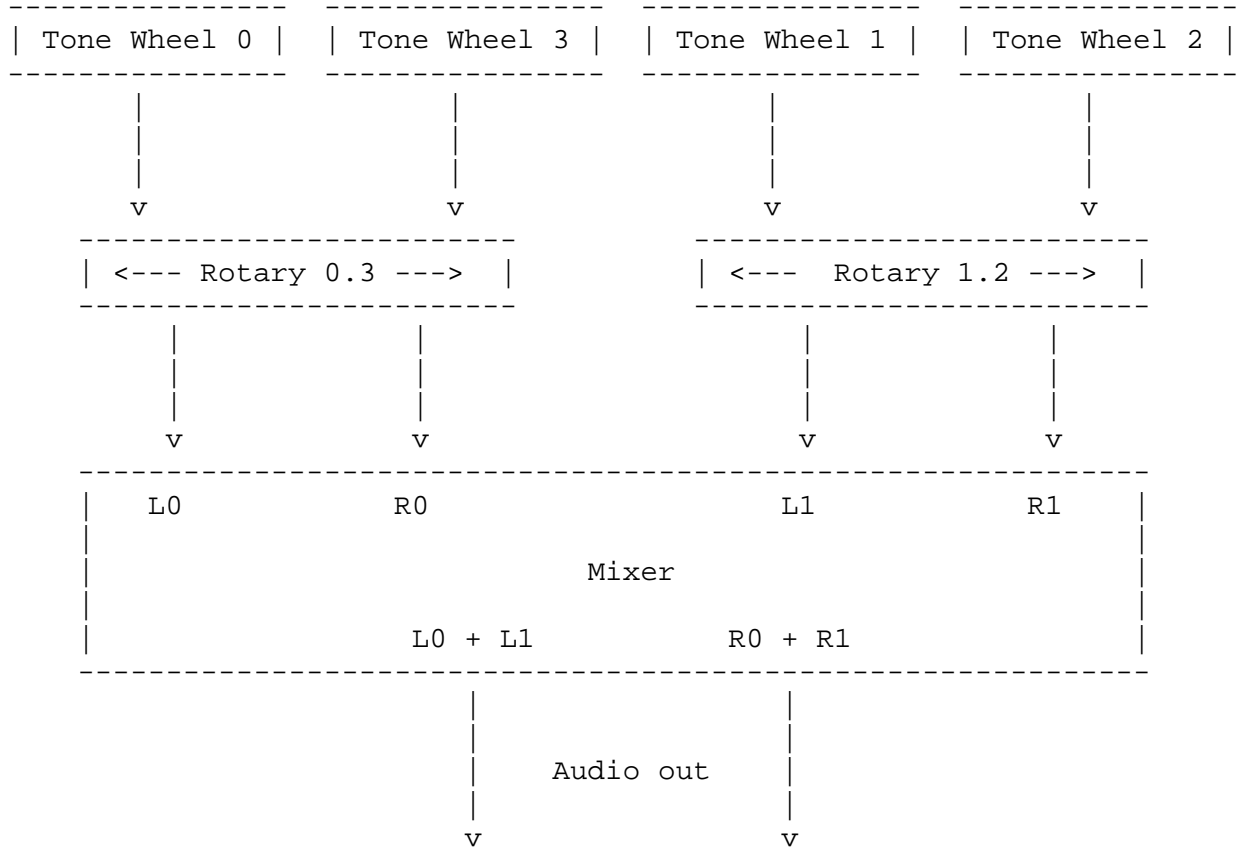
Load preset sounds by *Double-Tapping* the right button and then pressing any "white" key.

Note: A list of all types of button presses this synth uses, including "*Double-Tapping*" can be seen on page 9 of this document.

Play with these presets, and check out the cool Leslie effects as you play notes on the keyboard!

If you want to have more control over lots of cool and warped sounds available with the Hocus synth, the following pages will explain how.

==== Audio Flow Diagram for the Hocus Organ ====



The audio outputs of tone wheels 0 and 3 are fed into Rotary 0.3 (a rotary speaker effect) which dynamically pans them in stereo and sends the stereo output to the Mixer as inputs L0 and R0.

Likewise, the audio of tone wheels 1 and 2 are fed into Rotary 1.2, which sends its output to the Mixer as inputs L1 and R1.

The Mixer combines inputs L0 and L1, and inputs R0 and R1, to produce a master stereo signal out.

==== The Tone Wheel ====

Each Tone Wheel contains a Registration control, a Transpose control, a Vibrato, a Gain, and a Percussive Decay.

R E G I S T R A T I O N

H a r m o n i c s	
	1 2 3 4 5 6 7 8 9
1
2
3
4
5
6
7
8
9
10

T R A N S P O S E

^	+12
.	.
.	.
.	+6
.	.
.	0
.	.
.	-6
.	.
v	-12

V I B R A T O

FREQ	DEPTH
FADE	
Time	In or Out
SHAPE	RANGE
Triangle	Positive
Rising	Negative
Falling	Pos & Neg
Square	
	INTERVAL
	1 . 12

G A I N

Level
Overdrive

On or Off

D E C A Y

Time

The **REGISTRATION** control is what produces the basic sound of the tone wheel. It mixes the fundamental frequency for the tone with one or more harmonics, each at its own volume level. This is similar to the drawbars found on some electric organs. Unlike electric organs Hocus does not allow you to inter-actively move individual drawbars. Instead it pre-figures them in a number of set registrations which can be selected via a pot (see below). In the diagram above the selected registration mixes the fundamental at 100% with the 2nd harmonic at 80% with the 4th harmonic at 60% with the 6th harmonic at 40% with the 8th harmonic at 20%.

The **TRANSPOSE** control shifts the tone wheel's pitch, in semi-tone increments, from the note played. For example, if the transpose for a given tone wheel is set to +7, then a 'C' played on the keyboard will sound as the 'G' above it.

The **VIBRATO** has the following seven parameters:

- 1) **FREQ** - frequency of vibrato
- 2) **DEPTH** - intensity of vibrato
- 3) **FADE TIME** - amount of time over which to fade the vibrato in or out.
(if this value is 0 then the fade is disabled).
- 4) **FADE DIR** - direction of fade: fade in or fade out
- 5) **SHAPE** - the vibrato waveform:
 - triangle wave
 - rising sawtooth
 - falling sawtooth
 - square wave
- 6) **RANGE** - the range over which the vibrato fluctuates:
 - *positive : fluctuate from above the note played to the note played
 - *negative : fluctuate from below the note played to the note played
 - *pos & neg : fluctuate from above the note played
to below the note played
- 7) **INTERVAL** - the maximum number of semitones (1 to 12) over which
to range (assuming DEPTH is 100%)

Note: a "normal" organ vibrato would have a **FREQ** of around 3, a **DEPTH** of 25%, a **FADE TIME** of 0 (meaning no fade), a **SHAPE** of Triangle, a **RANGE** of Pos & Neg, and an **INTERVAL** of 1.

The **GAIN** control adds distortion to the tone. When Overdrive is on, the effect becomes nonlinear :)

If the Time parameter for the Percussive **DECAY** is non-zero then the tone volume will decay to silence over that period of time once played. This mimics the action of percussive stops found on some electric organs.

==== PLAYING THE KEYBOARD ====

Hocus is a mono-touch instrument: you can play one note at a time.

To raise the keyboard by an octave, *Tap* the right button once.

To lower the keyboard by an octave, *Tap* the left button once.

==== AUTO-SUSTAIN ====

Like a normal organ Hocus will stop sustaining a note once you lift your finger from the key.

Hocus has an auto-SUSTAIN feature which, when enabled, is like having a sustain pedal constantly depressed. Notes will sustain indefinitely.

You can stop a sustaining note by pressing it's key again.

The auto-SUSTAIN feature is enabled and disabled via the Settings Menu (see below).

==== SIMULATED LESLIE FOOT-SWITCH ====

The classic Leslie rotary speaker came equipped with a dual foot-switch for ramping the rotation speed of the speaker. By stepping on the right foot-switch the rotation of the speaker would gradually accelerate to a fast speed. By stepping on the left foot-switch the rotation of the speaker would gradually decelerate to a slow speed.

Hocus simulates this foot-switch via a *Tap-Press* on the two on-board buttons. (Think of a *Tap-Press* as a *Double-Tap*, but with the 2nd tap held for a longer period of time).

To accelerate the speed of the rotary speakers, *Tap-Press* the right button.

To decelerate the speed of the rotary speakers, *Tap-Press* the left button.

You can continue playing while the rotary speakers are changing speeds. In fact, it can really liven up the sound if you change the rotation speed back and forth as you play.

Note: Certain presets (see below) internally restrict the rotary position of the speakers. When these presets are being used the simulated Leslie foot-switch will have little audible effect.

==== USING THE POTS TO CONTROL PARAMETERS ====

The pots can be used to control 18 different parameters, a pair at a time.

By *Pressing* (not *Tapping*) the left and right buttons you can change which pair of parameters the pots control. Each time a button is *Pressed*, its associated LED (red LED for left button, blue LED for right button) will change state (from OFF to ON to BLINKING, back to OFF etc.)

Below is a chart showing which pair of parameters the pots control when the LEDs are in a given state.

Note: ' before a parameter name indicates that changes to the parameter are applied to the currently SELECTED tone wheel only. The selected tone wheel can be changed via the Settings Menu (see below).

red LED	blue LED	top POT	bot POT
OFF	OFF	'REGISTRATION	'TRANSPOSE
ON	OFF	'VOLUME	'DETUNE
BLINK	OFF	'percussive DECAY	'vibrato INTERVAL
OFF	ON	'vibrato FREQ	'vibrato DEPTH
ON	ON	'vibrato SHAPE**	'vibrato RANGE***
BLINK	ON	'vibrato TIME	'vibrato FADE****
OFF	BLINK	'gain LEVEL	'gain OVERDRIVE*
ON	BLINK	rotary 0.3 FREQ	rotary 0.3 DEPTH
BLINK	BLINK	rotary 1.2 FREQ	rotary 1.2 DEPTH

' changes are applied to the SELECTED tone wheel only

* left-of-middle = overdrive OFF, right-of-middle = overdrive ON

** from left to right, in 45-degree increments:
Triangle / Rising Sawtooth / Falling Sawtooth / Square.

*** from left to right, in 60-degree increments:
positive and negative / positive / negative

**** left-of-middle = FADE In, right-of-middle = FADE Out

==== ENSEMBLE vs ISO OUTPUT ====

Hocus normally outputs audio from all 4 tone wheels in stereo as depicted in the Audio Flow Diagram (see first page).

It is also possible to output the audio of just the SELECTED tone wheel, bypassing the rotary effects and mixer. This is called ISO output.

ISO output is useful when you want to hear exactly how edits to a tone wheel's parameters effect its sound, without being distracted by the output from the other tone wheels.

ENSEMBLE and ISO output are set via the Settings Menu (see below).

ENSEMBLE output is automatically restored when a preset is loaded.

==== USING THE SETTINGS MENU ====

You can change various aspects of Hocus by using the Settings Menu.

To access the Settings Menu *Double-Tap* the left button. The LEDs will now start blinking on and off in alternation: this tells you that the Settings Menu is active. When the Settings Menu is active the keys will no longer play notes but each key will choose a particular setting as described below.

The Settings Menu is active until you press a key on the keyboard, after which the Settings Menu is automatically exited (restoring the prior user interface state).

You can exit the Settings Menu without choosing a setting by *Double-Tapping* the left button a second time.

The list below describes what actions are taken when a key on the keyboard is pressed:

Key	Action
C	SELECT tone wheel 0
D	SELECT tone wheel 1
E	SELECT tone wheel 2
F	SELECT tone wheel 3
G	SUSTAIN On
A	SUSTAIN Off
A#	ISO output
B	ENSEMBLE output

==== Guide to Hocus Presets ====

Load presets by *Double-Tapping* the right button and then pressing any key on the keyboard.

The presets are as follows:

Key	Name	Description
---	----	-----
C	Stock	stock "simple" organ sound
C#	Rocker*	distortion on lower 2 tone wheels
D	Perc	percussive decay on tone wheels 2 & 3
D#	Friction*	overdriven gain and octave-widening vibrato on tone wheels 0 & 3
E	Pipe	multiple registrations
F	Punchy	gain on tone wheel 2; 7 Hz vibrato on tone wheel 3
F#	Pipe2	multiple registrations
G	Murk	dark intervals; slow rising-sawtooth vibrato fading out on tone wheel 2
G#	Farfisa*	cheezy vibrato; registrations use a mix of odd and even harmonics
A	Perc2	percussive decay on tone wheels 2 & 3
A#	GiddyUp	fun with square-wave vibratos
B	area51	detuned tones and opposing saw-tooth vibratos with minor-3rd ranges

* restricted rotary positions: Leslie foot-switch has little effect

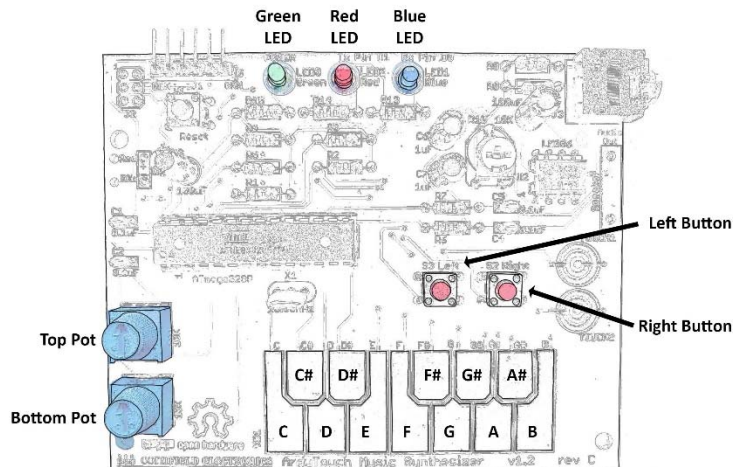
Types of button presses:

Tap: quickly tap a button

Press: long-press a button

Double-Tap: quickly double-tap a button

Tap-Press: think of this as a *Double-Tap* but with the second tap being of a longer duration.



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Created by Bill Alessi & Mitch Altman.
