



PIGTRONIX

RESOTRON

RESONANT TRACKING FILTER

User's Guide



All contents ©Absara Audio LLC 2018

Contents

Contents	1
1 Welcome to The Resotron	2
1.1 Features:	3
1.2 Safety Precautions	4
Thank You	4
2 Anatomy and Functions	5
2.1 The Interface	5
Jacks	5
Knobs and Switches	8
3 Getting Started	11
3.1 Basic Hook Up	11
3.2 Guided Tour	12
4 Resotron Back Story:	14
5 Pigtronix Limited Warranty	15

1. Welcome to The Resotron

The Pigtronix Resotron is an all-analog stompbox that brings pitch-tracking capabilities to the world of envelope filter pedals for guitar, bass and beyond. The revolutionary PITCH mode in the Resotron allows the filter to follow the notes you play rather than how hard you hit the strings! This function causes the cutoff frequency of the filter to move around based on what notes the musician plays in real time. Traditional, UP and DOWN (velocity-controlled) envelope modes are also included in the Resotron along with an EXPRESSION input for foot-controlled filter sweeps and CV modulation.

The multi-mode filter at the heart of the Resotron can be set to Low Pass (LPF), Band Pass (BPF) or High Pass (HPF) modes. Each of these voices has a distinctive character which can be manipulated by adjusting the PEAK knob to emphasize frequencies below, at or above the position of the CUTOFF knob. As the PEAK is increased, the resonance or "Q" of the filter becomes more extreme, up to the point of self-oscillation. A SENSITIVITY control sets how dramatically the pedal will respond to playing dynamics in the UP and DOWN envelope modes, while a GLIDE control allows you to set how long it takes for the filter to move between notes in the PITCH mode.

A push-button OSCILLATE function turns the Resotron into an analog synthesizer pedal. This mode shorts out the PEAK knob, effectively setting it to 100% while simultaneously activating a voltage-controlled amplifier (VCA) in the output stage. With the OSCILLATE function turned on, the CUTOFF knob sets the tuning of the synth effect while the VCA instantly follows the volume of your input signal. The synthesizer sounds created by the Resotron can also be radically altered by switching between the LPF, BPF and HPF modes, each of which

has its own distinctive waveform and modulation characteristics when overdriven by the on-board compressor.

Before the signal from the input of the pedal hits the filter inside the Resotron, it passes through an optical compression stage derived from our Philosophers Tone pedal. The increased volume and punch from the compressor can then be mixed into the audio signal using the BLEND control without affecting the SENSITIVITY of the envelope. The Resotron also has a TRIGGER (aka Sidechain) feature which enables the musician to use an external audio source to modulate the filter.

1.1 Features:

- 24db/oct Filter based on the SSM2040 chip
- Low Pass, Band Pass & High Pass Filter options
- Velocity controlled UP & DOWN envelope modes
- Pitch Following envelope function with variable GLIDE
- BLEND control mixes in Philosophers Tone compression
- Expression pedal / 0-5V CV input modulates CUTOFF
- OSCILLATE mode for monophonic synth sounds
- Sidechain TRIGGER input for external audio
- Hardwired True Bypass Switching
- 18VDC Power Supply Included
- 100% Analog Design
- Circuit Design by Nick Cote
- Sound Design by David Koltai

1.2 Safety Precautions

The safety precautions listed below are intended to ensure your safety whenever you use the Resotron.

NEVER OPEN THE CASE - Never try to separate the two pieces of the chassis from one another and/or modify the equipment. Opening this device will effectively void the warranty.

STOP USE IN CASE OF PROBLEM - Stop using the equipment if ever you should notice smoke or a strange odor coming from it. Contact Koltai@pigtronix.com for service.

AVOID HIGH TEMPERATURES & HEAT BUILD UP - Never cover the power supply with cloth or other objects. Built up heat creates a danger of equipment deformation and fire. Do not expose the Resotron to direct sunlight, heating devices, or other extreme temperatures.

USE SPECIFIED POWER ADAPTER ONLY - Be sure to use only the 18-Volt DC 300mA Adapter that came with your Pigtronix Resotron.

DO NOT EXPOSE TO WATER/BEER - To reduce the risk of fire or electric shock, do not expose your Resotron to rain or moisture. If water gets inside the unit, turn off the power.

Thank You

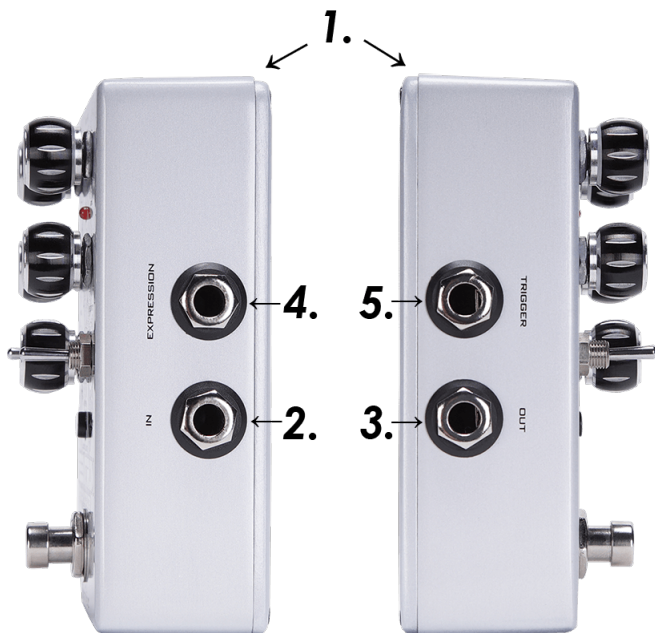
The Resotron represents a decade of continuous R&D involving some of the top minds in the audio industry. Pigtronix would like to formally thank the following individuals for their help in creating the Resotron: Nick Cote, Thomas Elliott, Cyril Lance, Howard Davis, Ben Artes, Ray Heasman, Steve Turnidge, David Buchter, Fischer Mao, Vernon Reid, Doug Wimbish, Fredrick Thordendal and Teddy Kumpel.

—**Pigtronix**

2. Anatomy and Functions

2.1 The Interface

Jacks



1. **DC 18V** - Use only the 18-Volt, 300mA, negative tip power supply that came with your Pigtronix Resotron. Using the wrong power supply is likely to result in a damaged pedal.
2. **INPUT** - Effect input. Plug in your instrument here.
3. **OUT** - Effect output. Plug in your amp, mixer, or DI box here.
4. **EXPRESSION** - The expression pedal input allows remote control of the filter cutoff. A passive foot-controller or active (0-5V) CV signal can be used with the EXPRESSION jack to modulate the cutoff frequency of the filter in parallel with the on-board envelope and pitch tracking systems. When a passive expression pedal is used, the onboard CUTOFF knob sets the maximum sweep range. Since the envelope and pitch following signals are wired in parallel with the expression input, you can effectively use an expression pedal as a wah, with an envelope riding on top of it!

Note: Use a TRS (Stereo) cable to connect a standard, low-impedance (20K) foot controller to the EXPRESSION jack.

Note: Use a TS (Mono) cable to send control voltage (0-5V) signals into the EXPRESSION jack.

5. **TRIGGER** - The trigger input is an auxiliary source for the envelope follower and pitch tracking system. When the TRIGGER jack is in use, the audio signal at the INPUT jack is disconnected from the envelope follower and pitch tracking system that modulates the filter in the Resotron. When using the TRIGGER input, it is recommended that the BLEND knob be set fully counter-clockwise. This allows the signal feeding into the TRIGGER jack to control the filtering of the signal from the INPUT jack. Turning up the BLEND knob when using the TRIGGER input will feed the audio from the TRIGGER jack directly through the compressor and into the main audio path, in parallel with the signal from the INPUT jack.

Note: If identical audio signals are sent to both the INPUT and TRIGGER jacks, a ducking effect will occur when feeding when the BLEND control is set to 12-o-clock. To eliminate this ducking phenomenon, flip the phase of the TRIGGER signal.

Knobs and Switches



6. **ENGAGE** - This footswitch turns the entire Resotron on and off. When the engage light is turned off, the Resotron is true bypassed.
7. **CUTOFF** - This knob sets the resonant frequency of the filter. Depending on the FILTER MODE setting, this position of the CUTOFF knob will produce dramatically different sounds.
8. **PEAK** - This knob sets the amount of resonance in the filter. When the PEAK knob is fully clockwise the VCF will self-oscillate. This creates a sine wave drone that will continue to play regardless of a signal at the INPUT jack. When the OSCILLATE switch is pressed in, the PEAK knob is shorted to maximum.
9. **SENSITIVITY** - This knob sets the responsiveness of the envelope follower in the ENV UP and ENV DOWN modes only. When the SENSITIVITY knob is fully counterclockwise the envelope follower is turned off.
10. **GLIDE** - This knob determines the rate of portamento for the PITCH mode only. This is heard as the time it takes for the filter cutoff to move between the notes you play. Lower GLIDE settings provide a fast, snappy filter motion that jumps quickly between pitches. Higher GLIDE settings cause a more legato filter motion. When the OSCILLATE switch is pressed in, the GLIDE function sets the time it takes for the sine wave voice to move from one note to another. This is heard as a glissando effect.

Note: Turning the GLIDE control fully counter-clockwise will disable the portamento function, providing the fastest, most accurate pitch-tracking.

11. **BLEND** - This knob mixes in Pigtronix signature Philosophers Tone compression before the filter. This powerful optical compression stage adds considerable volume and clean punch to the audio signal, without changing the response of the envelope follower! The compression BLEND knob allows the Resotron to

create robust and loud filter effects without the need to switch on additional boosters or other pedals which can adversely affect the performance of the envelope follower and pitch tracking systems.

12. **FILTER MODE (LPF/BPF/HPF)** - This toggle sets the filter mode for the Resotron. The Resotron has three filter modes, high pass filter, band pass filter, and low pass filter.

In the **LPF (low pass) mode**, the Resotron will filter out all frequencies ABOVE the CUTOFF.

In the **BPF (band pass) mode**, the Resotron will filter out all frequencies AT the CUTOFF.

In the **HPF (high pass) mode**, the Resotron will filter out all frequencies BELOW the CUTOFF.

Note: It is recommended that you begin exploring the Resotron using the LPF mode.

13. **ENVELOPE MODE (ENV↑/PITCH/ENV↓)** - This toggle determines whether the envelope follower or the pitch tracker controls the movement of the cutoff frequency. The Resotron has three different cutoff controls, upward envelope, pitch tracking mode, and downward envelope.

In the **ENV ↑ mode**, the cutoff will move higher as you play harder.

In the **PITCH mode** the cutoff will move around based on the notes you play.

In the **ENV ↓ mode**, the cutoff will move lower as you play harder.

Note: As you switch between the envelope and pitch modes, it may be necessary to adjust the position of the CUTOFF knob to achieve the optimal effect.

14. **OSCILLATE** - When the OSCILLATE switch is pressed in, the PEAK knob is automatically set to maximum, causing the voltage-

controlled filter (VCF) in the Resotron to create a sine-wave synthesizer voice. In this mode, the CUTOFF knob acts as a tune knob for the sine wave voice, providing a wide range of tuning control. It is recommended that the toggle switch on the right be moved to the PITCH setting when using the OSCILLATE function so that the sine wave will follow the notes you play. In this setting, the GLIDE knob causes a portamento effect, allowing the sine wave to glissando as you move between notes. When OSCILLATE is activated, a voltage-controlled amplifier (VCA) that follows the loudness of your playing is turned on at the output to prevent the Resotron from screeching out of control. If the ENV UP or ENV DOWN modes are selected when using the OSCILLATE function, the pitch of the sine wave synthesizer voice will move around based on how hard you play.

3. Getting Started

3.1 Basic Hook Up

1. Unpack your Resotron and place it on a flat, stable surface.
2. **Make sure you are using the 18-Volt DC (negative center) power supply that came with your Pigtronix Resotron.**
3. Plug the power cord into the 18VDC jack on the back of the Resotron and then plug the power adapter into an electrical socket. The Resotron is now powered up. To turn the device off, unplug it from the wall or turn off the power going to the 18VDC supply.
We recommend that you do not leave your Resotron powered up for long periods of time when it is not in use.
4. Plug your instrument into the INPUT jack and plug your amplifier into the OUTPUT jack.

3.2 Guided Tour

The following steps will guide you through the sonic palette of the Resotron and show you how to access the range of tones that it has to offer.

1. Set all of the controls *fully* counter-clockwise, and set each toggle in the up position. Make sure the LED is off. The Resotron is in bypass mode. Play your instrument and make sure a clean sound is passing through the pedal.
2. Turn the CUTOFF knob to 3:00, and the PEAK, and SENSITIVITY knobs to 12:00. Put the FILTER MODE toggle to LPF mode. Click the Engage footswitch to turn the Resotron on. The LED will come on.
3. Play your instrument to hear the low pass filter sweep based on the volume of your instrument.
4. Explore the range of the CUTOFF knob. Adjusting the CUTOFF will change the frequency content of your effected output as well as the range of filter sweeps.
5. Explore the range of the SENSITIVITY knob. Adjusting the SENSITIVITY knob will change how the filter responds to the volume of your instrument.
6. Explore the range of the BLEND knob. Adjusting the BLEND knob will change the blended amount of your instrument and compressed signal into the filter. This allows for additional dynamic control over the headroom of the filter.
7. Toggle the CUTOFF CONTROL from the upwards envelope to the downward envelope to change the direction the filter sweeps.
8. Toggle the CUTOFF CONTROL to the PITCH mode to cause the filter to track to the pitch of your instrument. Explore the range of the CUTOFF knob. In PITCH mode, the filter will

keep the tone consistent as you play in different registers of your instrument.

9. Explore the range of the GLIDE knob. Adjusting the GLIDE knob will change the amount of time it takes for the filter to sweep from frequency to another.
10. Explore the range of the PEAK knob. Adjusting the PEAK knob will change the amount of resonance of the filter, based on where the filter cutoff frequency is, different harmonics of your instrument signal will be emphasized.

Note: Be careful when turning the PEAK knob fully clockwise as this will cause the Resotron to oscillate at a loud volume without VCA gating.

11. Toggle the FILTER MODE between the different the three types of filters to see how the effect changes.
12. Push the OSCILLATE button inward to put the Resotron in synth mode. Start with the FILTER MODE toggle in the LPF mode and the CUTOFF CONTROL toggle in the PITCH mode.
13. Play the highest string on your instrument and adjust the CUTOFF knob so that the pitch of the sine wave voice is in tune with your instrument signal. Once it is in tune, play your instrument in all registers.
14. Toggle the FILTER MODE between the different the three types of filters to see how the effect changes. LPF and BPF mode produce a clean sine wave with the BPF containing some additional harmonics, where as the HPF mode produces a voice with high frequency harmonics seen in a square wave.

4. Resotron Back Story:

The voice of the Resotron is inspired by the Octave CAT synthesizer. In 2012, I scored a vintage Octave CAT in mint condition on Craigslist and was completely blown away by the bass tones I could get out of this synth's self-oscillating filter. Made in Long Island City, NY in the late 1970's and powered by SSM2040 filter chips, the CAT's low-pass filter was capable of creating ultra-smooth sub bass tones when pushed into self-oscillation. The CAT's key-follow function allowed this powerful, self-oscillating filter to be played in tune with the keyboard. It would literally shake the entire Pigtronix factory, rivaling the sonic impact of any instrument in my vast and evolving collection of vintage and new synthesizers.

In 2017, when I began working with design engineer, Nick Cote we set out to create the Resotron by utilizing the pitch-tracking technology from our Mothership 2 pedal to control a network of currently available components arranged in a fashion that would effectively mimic the sound and behavior of SSM2040 chip. We then added the Philosopher's Tone compressor in front of this 24db/octave multi-mode filter engine to create a massive sounding pedal capable of musical envelope filter effects that can be made to accurately follow single-note lines played on any instrument, in real-time. The thoroughly bombastic and out of control self-oscillation that can be achieved by turning the PEAK knob up all the way was then tamed by adding a switchable VCA which watches your input signal to set the output volume of the synth. Mutron III inspired UP and DOWN modes were also added to augment the signature pitch-following abilities found in the Pigtronix Resotron. *I dreamed about making this pedal for years and I hope you love it.* David Koltai, 11/15/2018

5. Pigtronix Limited Warranty

Your Pigtronix effect pedal comes with a 1-year limited warranty on parts and workmanship. During the warranty period we will repair or replace, at our option, defective parts or pedals free of charge, and return them to the owner. Warranty service does not include damaged, modified, or misused pedals and such pedals will be subject to a standard repair charge.

What you must do: First, contact us directly via email and describe the problem to us. If the problem cannot be resolved we will have you send the pedal directly to us for servicing.

How to contact us for warranty service:

Email: tech@pigtronix.com
Phone: 631-331-PIGS (7447)

Warranty Limitations: This warranty does not cover defects resulting from improper or unreasonable use, accident, unauthorized tampering or modifications; and, warranty shall be considered void if Resotron chassis has been opened. Please consult the instructions and warnings in this manual for proper use. Warranty is only valid if your Resotron has been properly registered within 30 days of original purchase date, and upon warranty registration, will be valid for 12 months from original purchase.

To validate your 1-year, limited warranty, please register your Resotron, **within 30 days of purchase**, on the web at:

www.pigtronix.com/warranty