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SVF 42

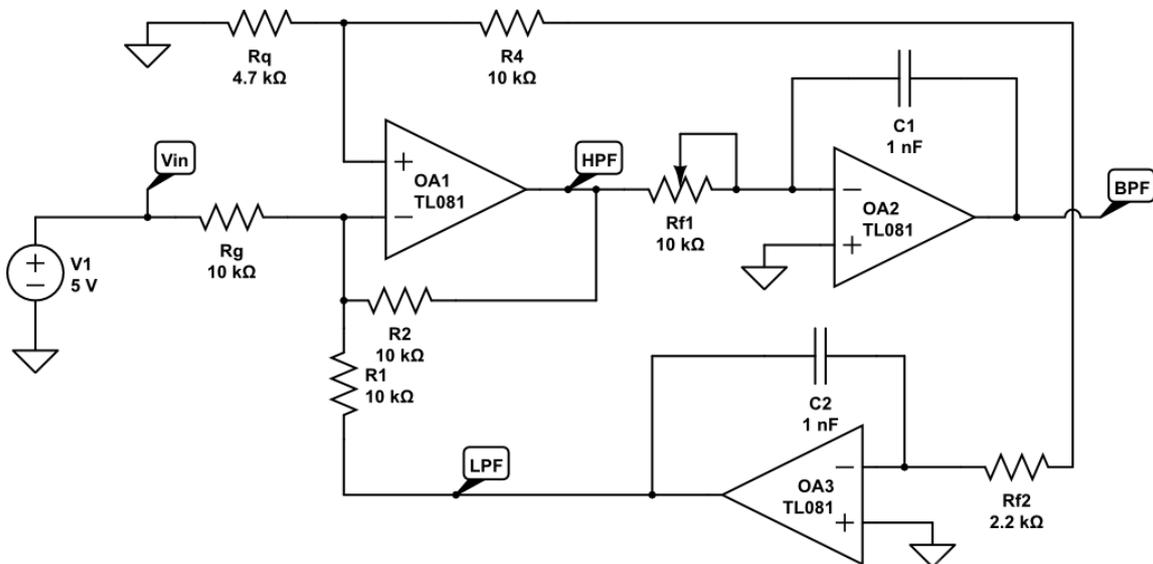
User Manual

Table of contents

| | |
|---|----|
| Introduction | 3 |
| Installation | 5 |
| Windows : | 5 |
| OSX : | 5 |
| Parameters overview | 6 |
| Detailed description | 7 |
| 1. Filter section ON/OFF | 7 |
| 2. Filter cutoff frequency knob and LED ring | 7 |
| 3. Filter resonance knob | 7 |
| 4. High resonance warning LED | 7 |
| 5. Filter mode selection buttons | 7 |
| 6. 2 poles / 4 poles mode switch | 7 |
| 7. Input envelope follower modulation amount | 7 |
| 8. Resonance modulation switch | 8 |
| 9. Input envelope follower attack time and release time | 8 |
| 10. Input envelope and Sidechain input level LEDs | 8 |
| 11. Sidechain input modulation amount | 8 |
| 12. Sidechain input attack time and release time | 8 |
| 13. Cutoff CV input modulation amount | 8 |
| 14. Resonance CV input modulation amount | 8 |
| 15. LFO rate knob | 8 |
| 16. LFO waveform selector | 8 |
| 17. MIDI sync switch | 9 |
| 18. LFO level LED | 9 |
| 19. LFO modulation amount | 9 |
| 20. LFO stereophonic phase setting | 9 |
| 21. LFO resonance modulation switch | 9 |
| 22. Soft Clip switch | 9 |
| 23. Audio output LED meters | 9 |
| 24. Dry / Wet knob | 9 |
| 25. Output gain knob | 9 |
| Support | 10 |

Introduction

The SVF-42 is an analog state variable filter emulation. The main difference with similar competitors plugins is that we didn't use FFT algorithms. Instead, we carefully modeled every electronic component of the original circuitry. The following diagram describes the electronic circuit emulated by our core algorithm (filter section only).



This approach implies greater use of available computing power, but an audio result of much better quality and more accurate.

SVF stands for State Variable Filter. While 42... well, some may say that it is the Answer to the Ultimate Question of Life, the Universe, and Everything, but some others may also recognize a reference to a real piece of hardware (an analog state variable filter!) that existed in 2000 - 2001, and that inspired a little bit the development of this plugin.

That actual real-life hardware used a chip from Texas Instruments™, the UAF42. Although the electronic circuit is similar, this device lacked of personality in the audio result of the filter itself, but the functionalities around the filter, like a LFO, and an externally triggered envelope generator, made it a hit and it was used a lot by techno producers, as well as hip-hop musicians.

Acid, Rock, Techno, Hip Hop, Fidget, Dubstep... one Filter!

With the SVF-42, we wanted to create a quality filter that would have a warm analog sound, EXTREME resonance ability, along with functionalities adapted to modern music production techniques.

All the parameters are driven with simulated analog level behaviour thanks to our AnalogValue technology.

The filter itself isn't your average filter. We spent a lot of time adjusting with passion every internal parameter (or let's say every virtual electronic component !) to obtain the best sounding filter we could achieve.

The base cutoff frequency parameter range from 16 Hz to 16 kHz. Then it can be modulated with an envelope follower on the audio input, or from a sidechain input (see your DAW software documentation to find out how to route audio signals to a secondary VST audio input). The LED ring around the cutoff knob will indicate the actual modulated value while the envelopes LEDs are brighter on higher input levels.

A LFO with 6 waveforms, syncable with the host's tempo, and with a stereophonic phase adjustment parameter, will allow you to do all the wah-wah-wah you'll need !

The resonance parameter can be set so extreme that we had to implement a warning sign that lights up when the output level can become too hot, depending on the number of poles used. It can also be modulated with all the same sources previously described.

CV in a plugin!

Nowadays DAW softwares all offer many parameter modulation abilities, but unfortunately the results are often too mechanical. This is why we developed the VirtualCV technology. Basically, VirtualCV inputs are like VST parameters but only accessible through your DAW's automation interface. You can use any possibility given by your DAW or external virtual devices, such as MAX4Live EXT for example. This automated parameter is then converted by VirtualCV in a virtual 0 to 5 VDC analog control voltage signal, modulating respectively the cutoff frequency or the resonance parameter of the filter, in a much more analog-ish way, eliminating hard steps and avoiding bad sounding transitions.

MIDI control.

If you need a more precise way to control the cutoff frequency, you can also use MIDI notes. Simply route one of your DAW's MIDI track to the SVF-42 (see your DAW's documentation on how to route MIDI signals) and it will respond to MIDI notes by setting the cutoff frequency to the appropriate value, with a glide speed that can be adjusted with the envelope attack time parameter.

Overdrive it!

At the output stage, the SVF-42 is equipped with a quality stereo LED meter, and an output gain knob. But what you'll notice first is probably that SOFT CLIP button !

As the filter section can deliver such high audio levels, the most natural and realistic way to limit these was to implement a unique high quality soft clip algorithm. You can obtain subtle warm analog clipping, or heavy distortions. Just put as much resonance and output gain as you'll need to obtain the desired sound !

Installation

To install the SFV-42 audio plugin simply follow these easy steps :

Windows :

1. Unzip the downloaded file using your favourite de-zipping tool.
2. Copy the whole folder in your VST folder. Usually it's located in C:\Program Files\Steinberg\VSTplugins or C:\Program Files\VST or a custom folder you created for your DAW.
3. Run your DAW software.
4. Enjoy !

OSX :

1. Unzip the downloaded file using your favourite de-zipping tool.
2. Copy the bundle in the following folder : root/Libraries/Audio/Plugins/VST
3. Copy the documentation in the folder of your choice.
4. Run your DAW software.
5. That's it !

Parameters overview



1. Filter section ON/OFF
2. Filter cutoff frequency knob, surrounded by LED ring indicating real actual modulated cutoff frequency.
3. Filter resonance knob
4. High resonance warning LED
5. Filter mode selection buttons (LPF, BPF or HPF)
6. 2 poles / 4 poles mode switch
7. Input envelope follower modulation amount
8. Resonance modulation switch
9. Input envelope follower attack time and release time parameters
10. Input envelope and Sidechain input level LEDs
11. Sidechain input modulation amount
12. Sidechain input attack time and release time parameters
13. Cutoff CV input modulation amount
14. Resonance CV input modulation amount
15. LFO rate knob
16. LFO waveform selector
17. MIDI sync switch
18. LFO level LED
19. LFO modulation amount
20. LFO stereophonic phase setting knob
21. LFO resonance modulation switch
22. Soft clip ON/OFF
23. Audio output LED meters
24. Dry/Wet knob
25. Output gain knob

Detailed descriptions

In this section you'll find the detailed explanations on each parameter listed above.

1. Filter section ON/OFF

Turn ON or OFF the filter section of the SVF-42. Only the filter virtual circuitry is bypassed when turned OFF. Other controls like the Soft Clip and Output gain remain active and still affect the sound. LFO, envelope, sidechain and CV controls are also still active, but as the filter isn't active, they don't have any audible effect. You can still visualize the modulation on the frequency cutoff LED ring however. This could be useful if you're jamming live and you want to prepare a modulated filter effect and do not want to apply it until all the parameters are set how you want them.

2. Filter cutoff frequency knob and LED ring

With that knob you can control the filter base cutoff frequency. It ranges from 16 Hz to 16 kHz.

As the SVF-42 offers a lot of modulation possibilities, the real actual cutoff frequency will probably often differs from the knob position. This is the reason why we implemented a LED ring around the knob, to indicate in real time the actual modulated cutoff frequency. Modulation can vary cutoff frequency from 10 Hz to 18 kHz.

3. Filter resonance knob

This knob sets the resonance factor of the filter. It can go up to extreme resonance values, so be careful with that one ! Self-oscillation can also be achieved under some circumstances, but the SVF-42 has been developed to be able to use high resonance level based on the audio input material only, avoiding "pollution" by artificial self-oscillation algorithm often encountered in digital analog filter emulation plugins.

4. High resonance warning LED

This LED is a simple warning to let you know that your current resonance and filter settings can induce very high output levels.

5. Filter mode selection buttons

With these three buttons you can choose between the following filter modes :

- LPF (Low Pass Filter) mode
- BPF (Band Pass Filter) mode
- HPF (High Pass Filter) mode

6. 2 poles / 4 poles mode switch

Here you can switch the filter poles between 2 or 4. Keep in mind that in 4 poles mode, the resonance of the filter is multiplied and thus you'll maybe have to adjust the resonance setting accordingly.

7. Input envelope follower modulation amount

With that knob you can set the amount of positive or negative modulation of the cutoff frequency, based on the main audio input envelope follower.

8. Resonance modulation switch

Use that switch to modulate the resonance level instead of the cutoff frequency from the envelope follower or sidechain input.

9. Input envelope follower attack time and release time

These two setting screws let you adjust the attack and release times of the main audio input envelope follower.

10. Input envelope and Sidechain input level LEDs

These LEDs serve as level meters for the envelope follower and sidechain input levels. The brighter is the LED, the higher is the level.

11. Sidechain input modulation amount

Sets the amount of positive or negative modulation of the cutoff frequency, based on the auxiliary sidechain audio input. You can use the sidechain input to modulate the SVF-42 with the level of another audio track. To find out how to route an external audio signal on the sidechain input, please refer to your DAW's user manual. Usually the sidechain input will be referred as "SVF-42 3/4" or something similar.

12. Sidechain input attack time and release time

Like the envelope follower screws, these let you adjust the sidechain input envelope attack and release times.

13. Cutoff CV input modulation amount

The cutoff frequency CV (Control Voltage) input is simulated using a VST parameter that you can control via your DAW's automation functionalities to make it vary from 0V to 5V. This parameter then drives a VirtualCV input that can be used to modulate the cutoff frequency in a more analog-ish way than with traditional parameter automation, simulating electronic condensers charge and discharge. This knob let you set the amount (positive or negative) of modulation applied on the cutoff frequency.

14. Resonance CV input modulation amount

The second VirtualCV input is used to modulate the resonance parameter. This knob is used to set the positive or negative amount of modulation applied on the resonance parameter.

15. LFO rate knob

Here you can set the rate/frequency of the LFO.

16. LFO waveform selector

You can choose between 6 LFO waveforms :

- sinusoidal
- triangular
- ramp up
- ramp down
- square
- random (S&H)

As there are actually two LFOs running in parallel, one for each stereo channel, if you choose the random waveform, you'll notice a panning effect, due to the fact that different random modulation value will be applied on each stereo channel.

17. MIDI sync switch

When that button is switched on, you can synchronize the LFO rate with your host DAW's tempo.

18. LFO level LED

The brighter is the LED, the higher is the LFO level.

19. LFO modulation amount

Sets the amount of modulation to apply to the cutoff frequency.

20. LFO stereophonic phase setting

With this knob you can adjust the phase shift between the left and right LFO, inducing panning effects.

21. LFO resonance modulation switch

When turned ON, the LFO modulates the resonance parameter instead of cutoff frequency.

22. Soft Clip switch

Turns ON or OFF the soft clip algorithm. Clipping occurs starting at about 0.1 dBFS and limits at about 2 dBFS. A harder limiter is always ON and limits to 12 dBFS to prevent excessive levels with higher resonance settings.

23. Audio output LED meters

To visualize output levels.

24. Dry / Wet knob

Use it to mix between full dry (no filter effect at all) and full wet (100% filtered audio). Keep in mind that the output gain and soft clip (if turned ON) will still be applied to the audio.

25. Output gain knob

Amplify or dim the audio output. This gain parameter is applied before the soft clipping.

MIDI control

You can use a MIDI keyboard or sequencer / pattern on your host DAW to control the cutoff frequency of the filter. The "glide" time will be the same as the attack time set for the audio input envelope follower.

To find out how to route MIDI to a VST plugin, check your host DAW's documentation.

Hints and tips

As for every audio gear you probably already are using, the best way to know every aspect of a device is to experiment with it. However, here are a few hints and tips on how to obtain the best results with the SVF-42.

This VST plugin was developed with high resonance ability in mind. But high resonance means very high audio levels. To tame these, we recommend to use an external audio compressor in your effects chain, placed right after the SVF-42. Set it with fast attack time and adjust the release time to meet your needs in term of desired presence of that audio track in your mix.

Support

Product support

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