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Former Home of SpinCAD Designer

Can't get Envelope II Control Working Properly

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Can't get Envelope II Control Working Properly (#p2969)

by **nguitar12** » Sun Apr 30, 2017 6:55 pm

So I want to create some autowah and compressor patch using Envelope Control function in SpinCAD however I can't get it working properly at simulation.

I am using Envelope II However I am quite confusion about the parameters fast/slow/max/avg/lavg/ output as well as the attack/decay/ post frep inside the control panel.

Yes I understand how Envelope control work just don't understand what those parameters mean inside SpinCAD. Can someone explain? Thanks

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Re: Can get Envelope Control Working Properly (#p2970)

by **Digital Larry** » Mon May 01, 2017 6:08 am

Hi, thanks for your interest. Envelope II is "experimental", meaning that I brought a bunch of internal signals out to pins so I could see what they are doing. So for the moment my best suggestion is to steer clear of that one and use the regular envelope block.

Another approach you might find useful is to build your own envelope detector using components in the control menu.

For example, take your input to the "Absolute Value" block. The output of that is the rectified audio signal. Take that into a smoother, now it is filtered. Take the output of the Absolute Value block into one input of the "MAXX" block and the output of the smoother into the other input of the "MAXX" block. Now you have a fast attack-slow release envelope follower. You can run this into another smoother if you like to slow down the attack a little bit. Use scale/offset on this before the filter's frequency input to control the sweep range.

Envelope II takes the envelope processing code from Spin's auto-wah code and tries to make an adjustable block out of it, but I didn't quite get that one across the goal line yet. So, you can always go back and find Spin's auto-wah code and use that if that's what you're really after.

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Re: Can get Envelope Control Working Properly (#p2971)

by **nguitar12** » Mon May 01, 2017 7:20 am

> ***Digital Larry wrote:***
> Hi, thanks for your interest. Envelope II is "experimental", meaning that I brought a bunch of internal signals out to pins so I could see what they are doing. So for the moment my best suggestion is to steer clear of that one and use the regular envelope block.
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> For example, take your input to the "Absolute Value" block. The output of that is the rectified audio signal. Take that into a smoother, now it is filtered. Take the output of the Absolute Value block into one input of the "MAXX" block and the output of the smoother into the other input of the "MAXX" block. Now you have a fast attack-slow release envelope follower. You can run this into another smoother if you like to slow down the attack a little bit. Use scale/offset on this before the filter's frequency input to control the sweep range.

> Envelope II takes the envelope processing code from Spin's auto-wah code and tries to make an adjustable block out of it, but I didn't quite get that one across the goal line yet. So, you can always go back and find Spin's auto-wah code and use that if that's what you're really after.

Hi Larry. Thanks for your advice on buliding my own envelope detector. However I am totally confused here because I have no idea what "Absolute Value block" and "MAXX (Maximun)" block mean inside SpinCAD. Also how do I control the attack/release by pot if I design the envelope detector this way? Thanks

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Re: Can't get Envelope II Control Working Properly (#p2972)

by **Digital Larry** » Mon May 01, 2017 10:08 am

Look for those blocks under the "Control" menu. It's over to the right side of the menu bar.

For attack and release there is a block called a "Smoother". It is just a low pass filter with a very low frequency, which you can set in the control panel. To get the rise time from the frequency, just google "low pass filter rise time" (https://en.wikipedia.org/wiki/Rise_time) .

To make these knob adjustable might require hand editing of Spin code, because the Smoother block doesn't have a control input pin. The 1P Low Pass filter block has a frequency control but it's more of a challenge to dial in the right frequency because the control panel value doesn't go down that low. You could try using a scale/offset in front of the frequency input pin of the 1P Low Pass. Set scale offset Output Low to 0.0 and Output High to 0.1. I'm not 100% it will work or how to test it exactly but that's where I'd start.

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Re: Can't get Envelope II Control Working Properly (#p2973)

by **nguitar12** » Mon May 01, 2017 11:45 pm

> ***Digital Larry wrote:***
> Look for those blocks under the "Control" menu. It's over to the right side of the menu bar.
>
> For attack and release there is a block called a "Smoother". It is just a low pass filter with a very low frequency, which you can set in the control panel. To get the rise time from the frequency, just google "low pass filter rise time" (https://en.wikipedia.org/wiki/Rise_time) .
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> To make these knob adjustable might require hand editing of Spin code, because the Smoother block doesn't have a control input pin. The 1P Low Pass filter block has a frequency control but it's more of a challenge to dial in the right frequency because the control panel value doesn't go down that low. You could try using a scale/offset in front of the frequency input pin of the 1P Low Pass. Set scale offset Output Low to 0.0 and Output High to 0.1. I'm not 100% it will work or how to test it exactly but that's where I'd start.

Yes I know where can I find those blocks what I mean is I don't understand exactly how they function. For example I know LFO block is generating a LFO signal to control different parameters. However I have no idea what a "Absolute value" and "Maximun" stand for so I don't know how to use them.

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Re: Can't get Envelope II Control Working Properly (#p2974)

by **Digital Larry** » Tue May 02, 2017 6:00 am

Absolute Value is the ABSA instruction. Maximum is the MAXX instruction. Please reference the Spin FV-1 Assembler manual for more information.

Regarding the use of "MAXX" to create a fast attack, slow release envelope -

Starting with the rectified signal obtained by running audio through ABSA. Typically you will want to low pass filter this to remove audio-rate wiggles, because when you modulate gain or filter frequency at audio rates, it does not sound good. So that means putting the filter frequency below 80 Hz for guitar and 40 Hz for 4-string bass. A single filter will give you identical rise and fall times. To have a fast attack and a slow release, you can put a slow filter (even lower corner frequency) after the first smoothing filter. The fast attack filter goes up (relatively) fast and comes down at the same rate. The slow filter goes up and down at a slower rate. By choosing the maximum of these two, you will get a fast attack and slow release. You may even get a little blip on the top where the fast filter's output is still higher than the slow filter's output. But soon enough the fast filter will decay below where the slow filter is and then MAXX will track the slow filter's output.

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Re: Can't get Envelope II Control Working Properly (#p2975)

by **nguitar12** » Wed May 03, 2017 2:44 am

After some reading to the pdf manuel as well as the definition on spin web site I still have no idea what "ABSA" and "MAXX" instruction is controlling. I decided to give up understanding them and just follow your instruction on buliding my own envelope detector.

I don't know if I understand you correctly but I just got a weak distorted sound out of the simulator. Am I doing something wrong?

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Re: Can't get Envelope II Control Working Properly (#p2976)

by **Digital Larry** » Wed May 03, 2017 9:14 am

Tell me what you're trying to accomplish?

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Re: Can't get Envelope II Control Working Properly (#p2977)

by **Digital Larry** » Wed May 03, 2017 9:29 am

Here's an article talking about an interesting way to do a peak detecting envelope follower.

http://www.edn.com/design/analog/434465 ... low-ripple (http://www.edn.com/design/analog/4344656/Envelope-follower-combines-fast-response-low-ripple)

Back to the FV-1,
ABSA - gives the absolute value. e.g. ABSA(1) = 1. ABSA(-1) = 1 ABSA(0) = 0. Same function as a full wave rectifier.
It might help to put a smoother with a higher frequency for the "attack" part and slower for the "release" part.
The Envelope block puts the attack and release filters in series, which may or may not be a good idea.

MAXX - outputs the higher of the two inputs.

If you are trying to do compression, you want the volume to go down when the detected level goes up. So you need to use scale/offset to change

the offset and direction of the envelope. I would also recommend you find the section on compression at the Spin knowledge base because a more sophisticated approach is possible. I have not tried to do much with dynamics although I have implemented some pretty cool VCF things.

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Re: Can't get Envelope II Control Working Properly (#p2978)

by **nguitar12** » Sat May 06, 2017 7:47 am

My above picture are showing a compressor. Anyway thanks for you explanation on the ABSA and MAXX block. I need some time to better understanding them.

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