

MS-20EX Tutorial 5

Envelopes on Filter, VCO, and more.

Actually, two for the price of one.

Goals: Use envelopes for Cutoff Freq., Peak, VCO level, Modulation, Pulse Width, and Fine Tune with the MS-20EX, and add Kronos effects.

Level: Beginner - Intermediate.

Time: approx. 45 min.

Material: KORG Kronos & MS-20EX Block Diagram.

This tutorial describes step by step how to use envelopes with the KORG Kronos MS-20EX Synth Engine.

This tutorial consists of following parts:

1. Introduction.
2. Program Setup.
3. The EG for the LPF.
4. Fattening the Sound.
5. Experiment: Modulation.
6. EG on VCO Level.
7. More Sound - Copy EXi.
8. The Beauty Pass - Kronosification.
9. It's not a Beast, yet... Three more Tweaks.
10. Play Time.
11. One more thing ... or two.
12. Summary of Settings - Sound 1 and 2 and 3.

A Kronos 61 was used to create this tutorial

For a really fat sound, I may add.

But what about the cool bits at the end?

Don't spoil it, they will find out later.

1. Introduction

It's all about Envelopes and stuff,
with a hint of LFO.

In tutorial 3 - Programming a Laser Harp Sound - the experiment was about creating (more or less) an Elka Synthex Preset 46 (Ring Mod) type sound.

Well actually, you've learned how to use **ring modulation, unison, stereo spread, detune, thickness, two EXis, tone Adjust, etc.**

The 'Laser Harp' was there to keep us focussed.

In tutorial 3 we tried to recreate the Elka sound using the MS-20EX.

Although a great synth, it's not the same synthesizer as the Elka.

The Elka uses, for example, a Filter EG next to the Amp EG.

In tutorial 3 only an Amp EG was used. Clearly, this was not enough.

In this tutorial you will learn how to program and use **filter envelopes and VCO envelopes**.

There is a standard sound on our Kronos which comes 'close' to the Laser Harp sound. At least for the sharp attack.

This is program **I-A056 Piano Wire SW1**, with a hint of **I-A107 Stradivarius Sync**.

This sound is based on the AL-1, which is a completely different synth engine than the MS-20EX.

The goal of this tutorial is: what can we learn from the AL-1 synth engine and use it with our MS-20EX synth engine. The tool is the **EG3** envelope, which will be used as filter EG for the **LPF**.

And **EG4, EG5, EG6**, and a **LFO** for other neat changes.

2. Program Setup

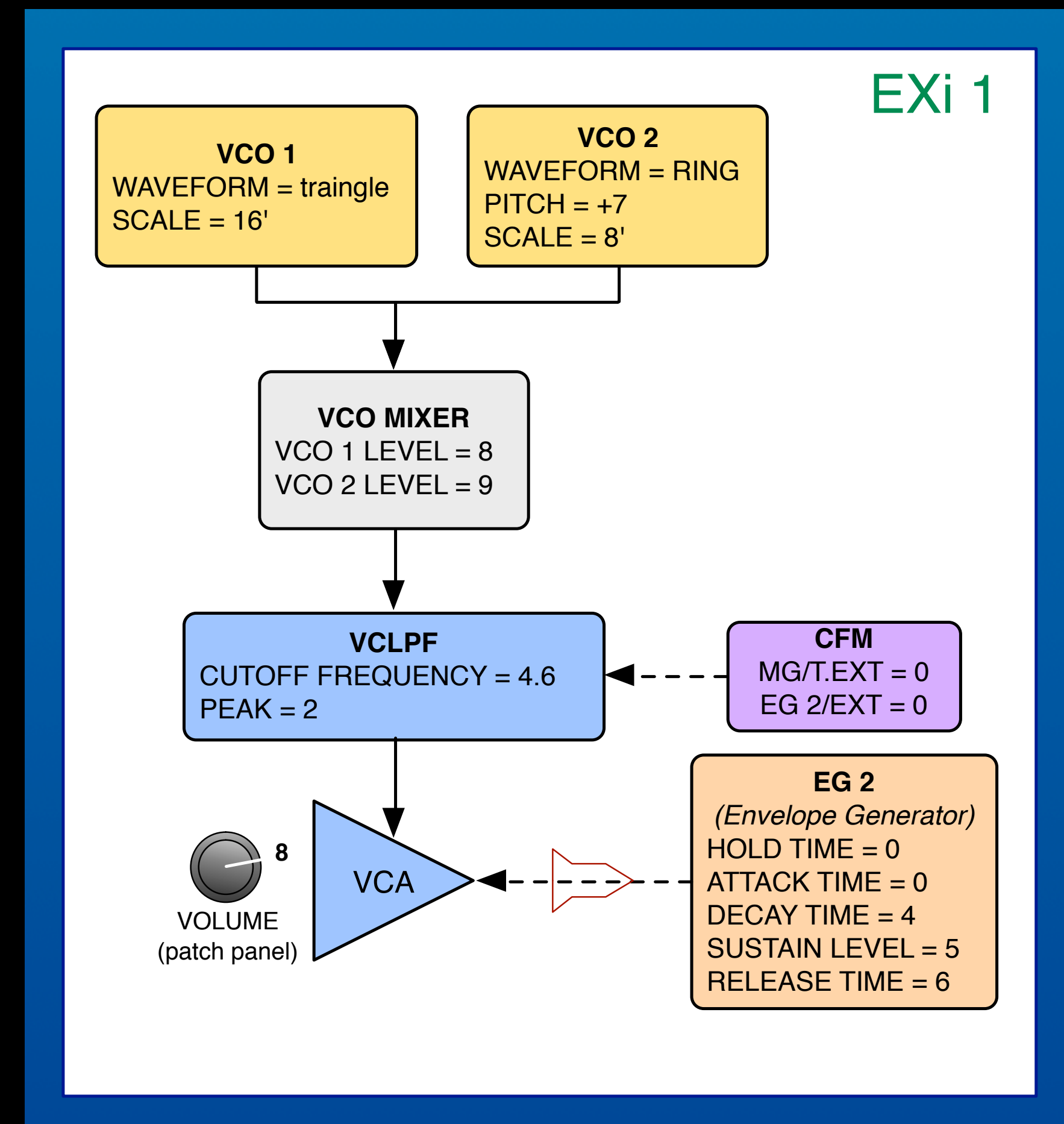
1. Select a free USER Program and select the **Common** tab. Then select the **Basic/Vector** tab and then the **Program Basic** tab. Set the **EXi 1 Instrument Type** to **MS-20EX**.
2. Select the **EXi 1** tab and then the **Osc & Filter** tab, if not selected, and program the sound according to the schema →

Then select the **MG, EG, & Mod** tab and set the values of **EG 2**.

Set **VOLUME = 8** on the **Patch Panel**.

3. Do not forget to save your program. Hint: Select the **Play** tab. Select on the **Page (Main) menu** (top right of screen) **Write Program**.

Program the Sound
to start with



3. The EG

Before we dive into programming the EG, let's first get an idea of what it represents.

For more information, please see [page 211, 7-1: EG1 \(filter\) of the Kronos Parameter Guide](#). Although, this is described in the AL-1 section, it is valid for all synth-engines.

You'll see 4 sections:

1. EG Reset.
2. Envelope, which is graphically depicted above this section.
3. Level Modulation.
4. Time Modulation.

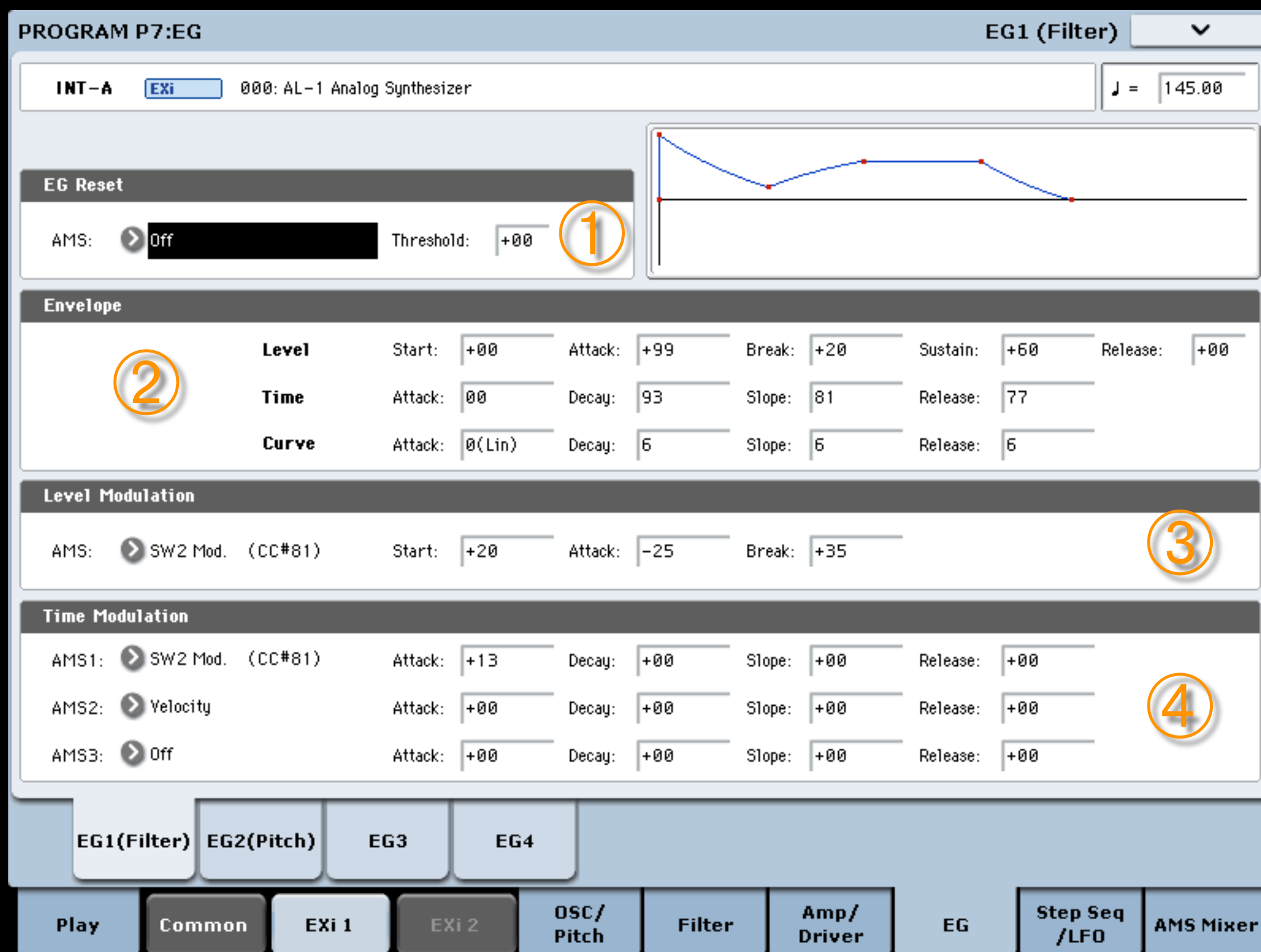
Note that in our tutorial we have EG3, EG4, EG5, and EG6 available.

We use EG3 as filter EG.

In the AL-1 by default EG1 is connected with the filter, but you can alter this if you wish.

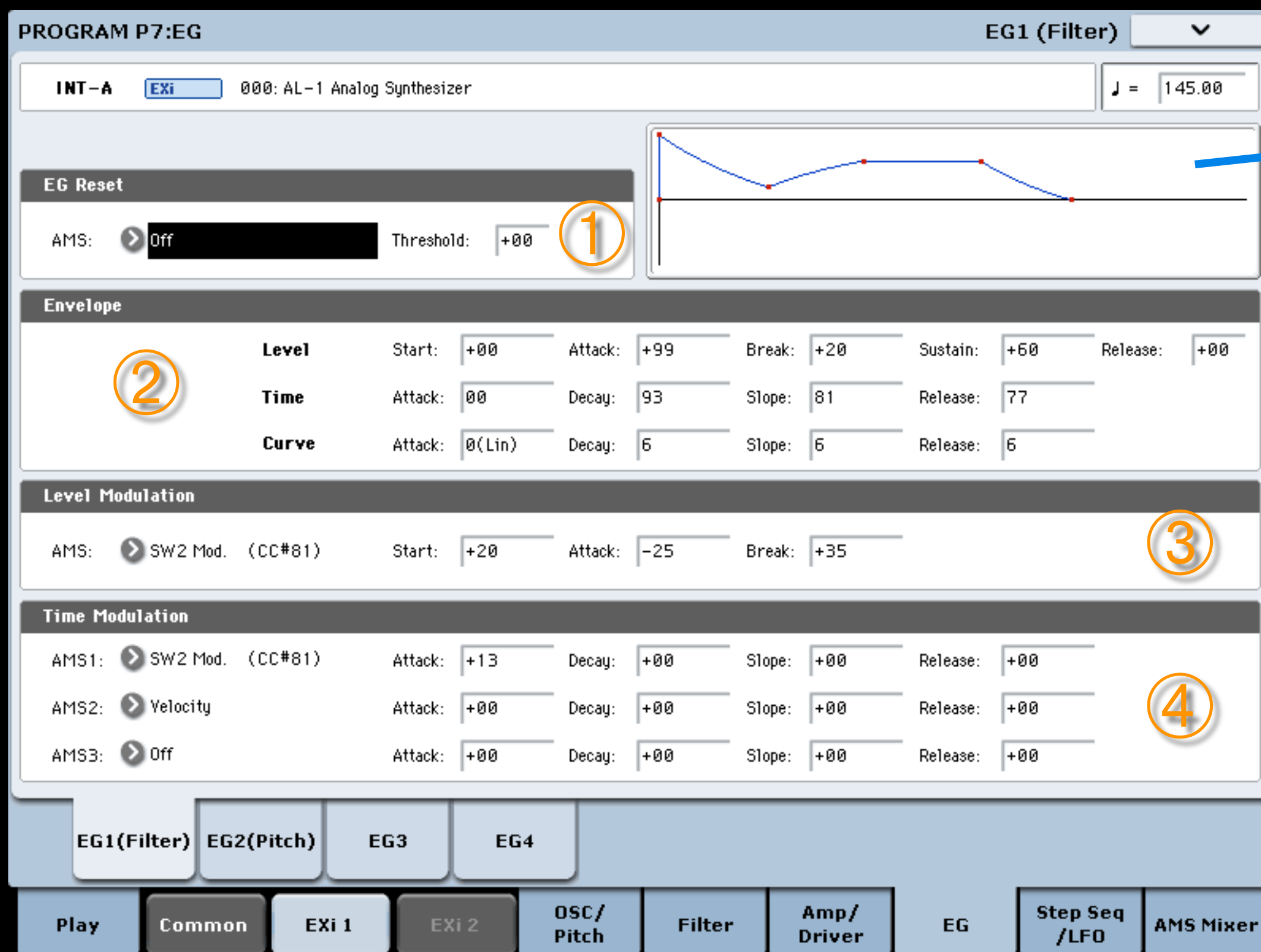
Although, EG1 has the word filter in the tab, it is exactly the same as EG3. The beauty is that we have 4 EGs to our disposal.

Now we will explore the four sections in more detail.



3. The EG

The 4 sections control the following:

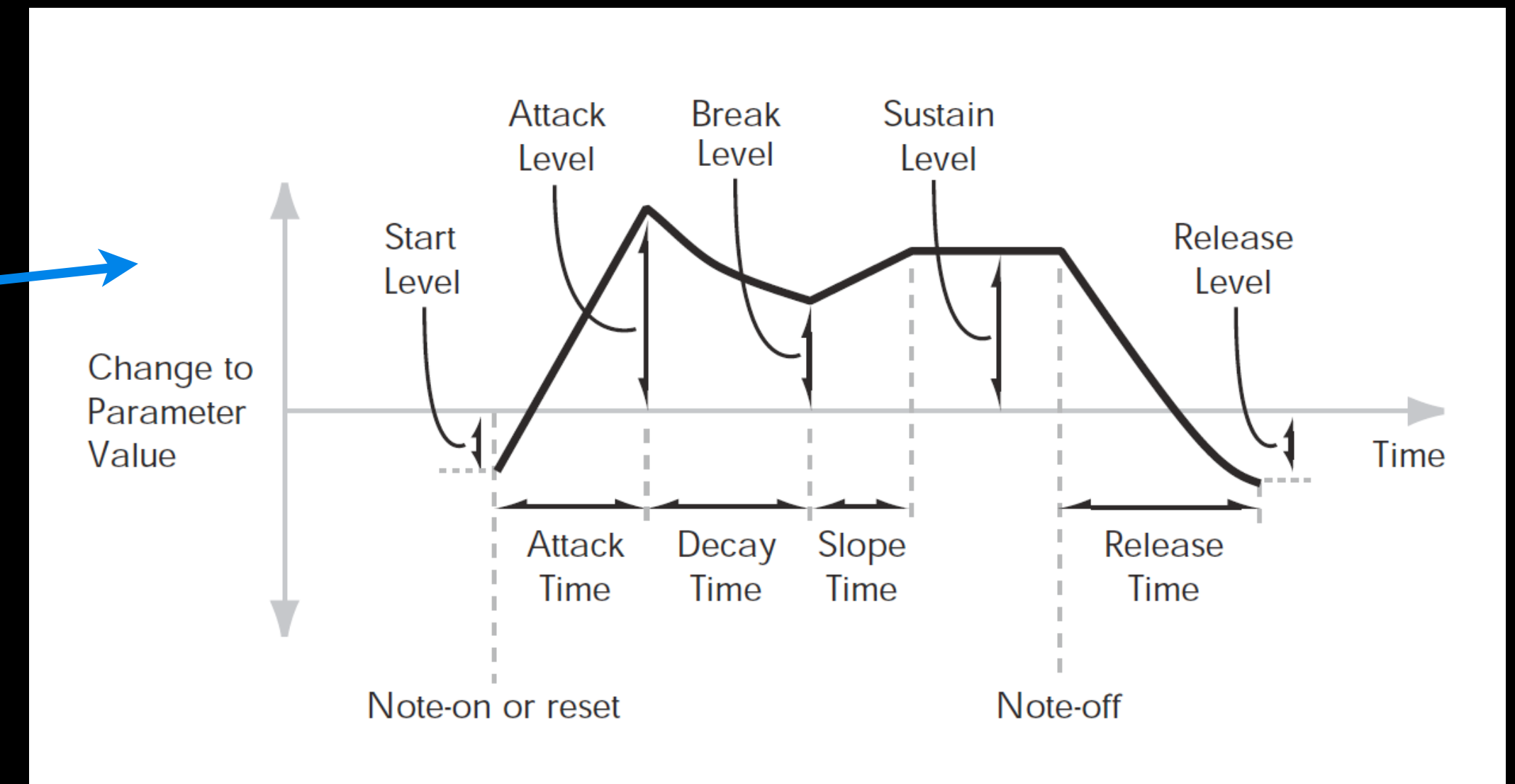


1. EG Reset

This determines when and how the EG resets. We're not using this for our tutorial.

2. Envelope

This is what we'll use to shape the LPF. See the figure below.



3. Level Modulation

These settings let you use an AMS source to control the Level parameters of the EG.

4. Time Modulation

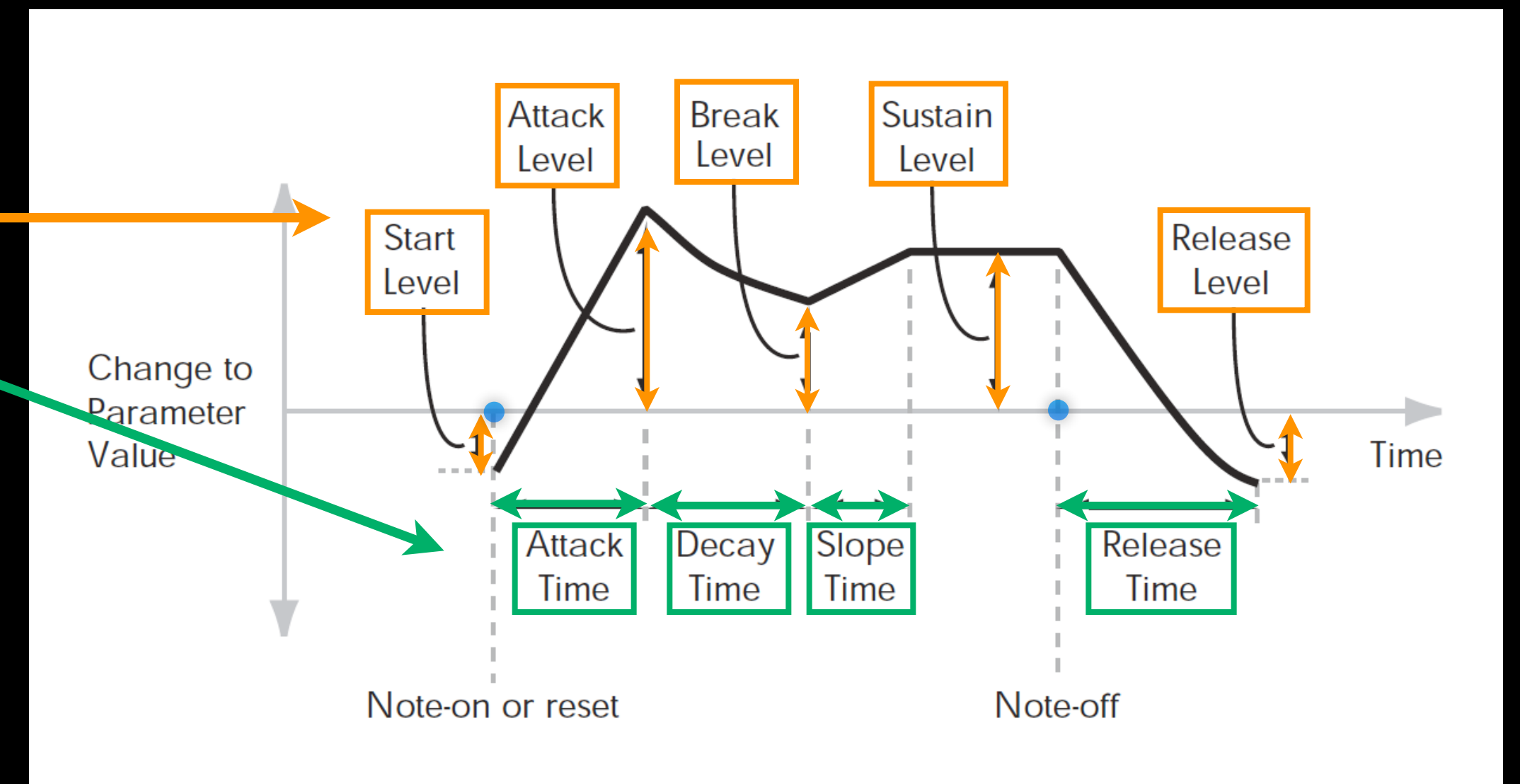
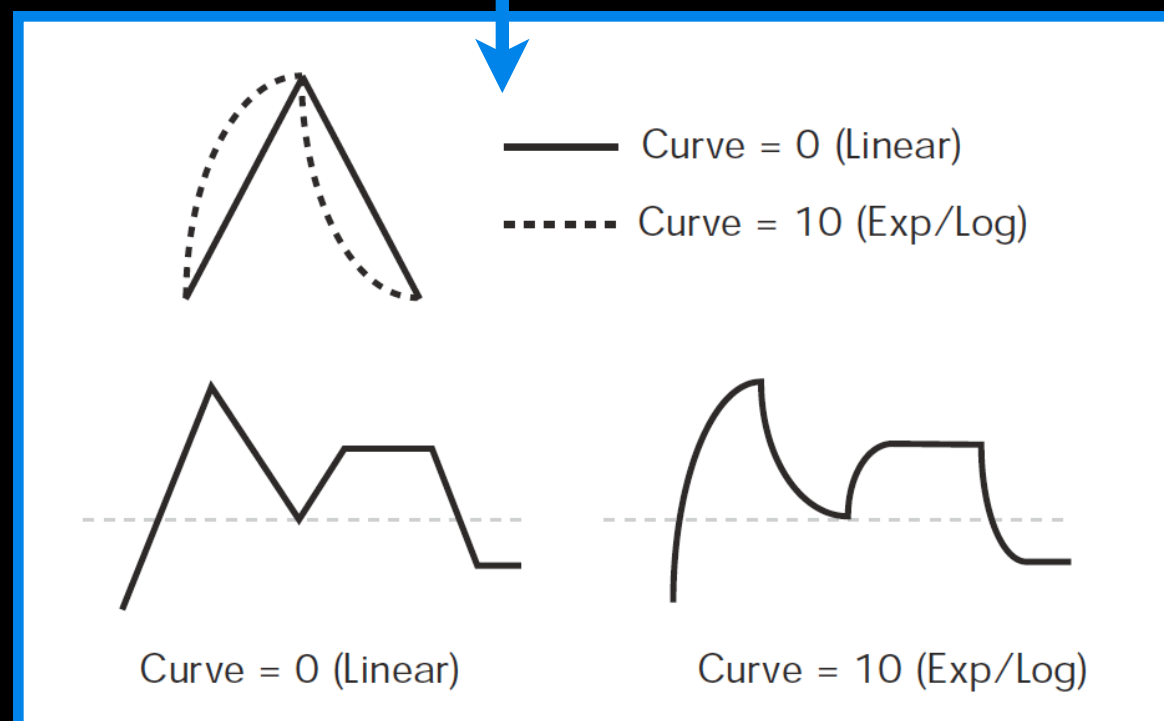
These settings let you use three different AMS sources to control the Time parameters of the EG.

3. The EG

The envelope 'shapes' the cutoff frequency of the filter we connect it to. In our tutorial, we'll connect an envelope to the LPF cutoff.

The figure below shows what the parameters change in the envelope.

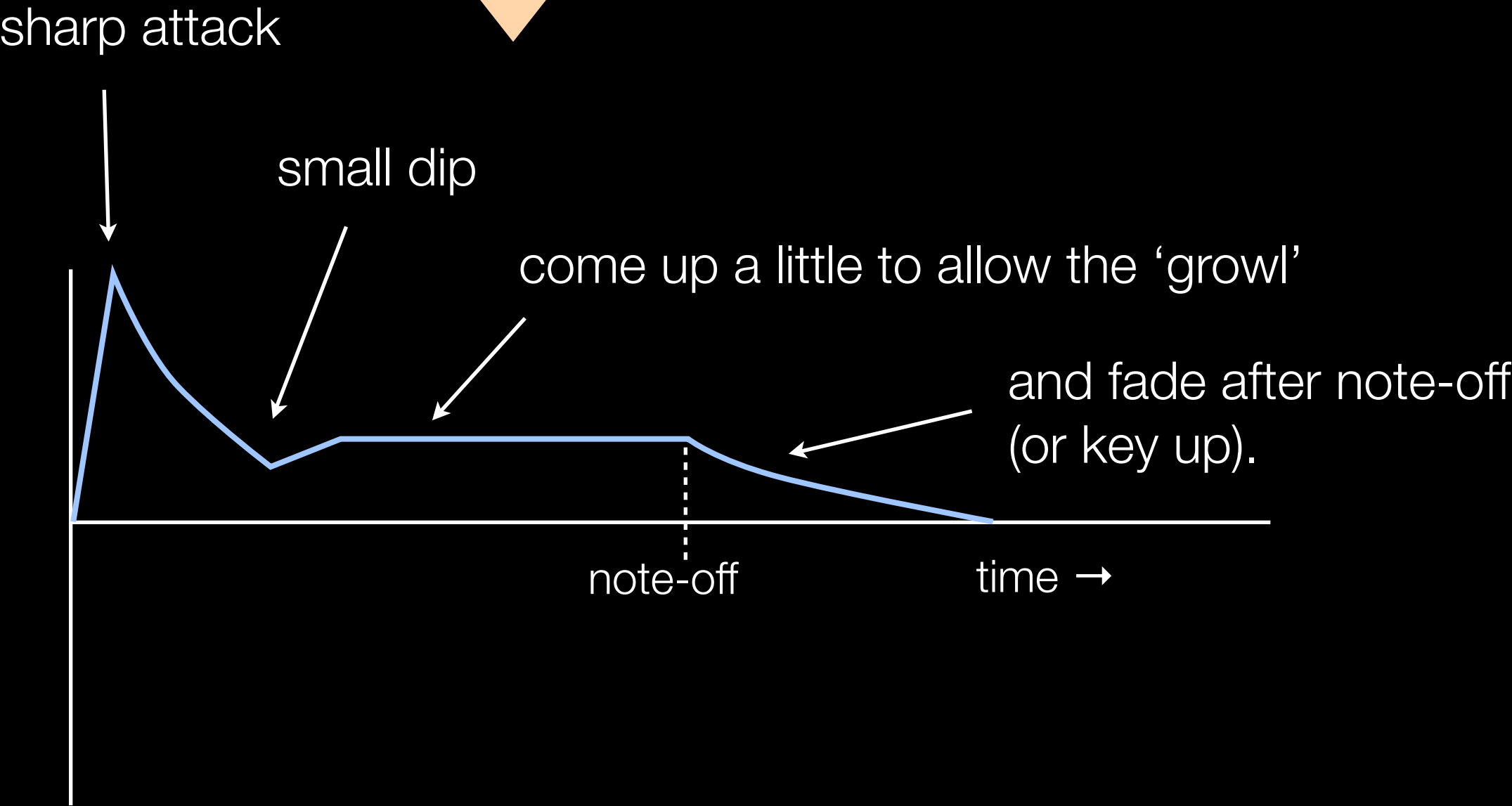
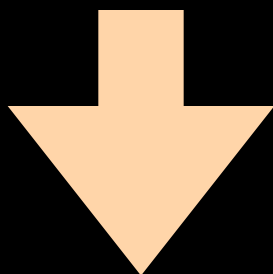
Envelope						
②	Level	Start: +00	Attack: +99	Break: +20	Sustain: +60	Release: +00
	Time	Attack: 00	Decay: 93	Slope: 81	Release: 77	
	Curve	Attack: 0(Lin)	Decay: 6	Slope: 6	Release: 6	



A curve of 3 is a good default setting for upward segments, such as Attack. A curve of 6 or more is good for downward segments, such as Decay and Release.

3. The EG for the LPF

So, what do we want to create?
Well, a sound that starts sharp, after the note-on there should be a small dip, and then a slight growl.
Okay ... I think I know what you mean.
Lets draw it.



Now you have to recreate this envelope for EG3 by using the envelope parameters.

“But, how do I know the correct values?” you might ask.
Simple, by changing the parameter values while playing.

- 4. Select the EXi 1 tab, and then the EG tab.
- 5. Select the EG3 tab, if not selected.
- 6. Now copy the numbers from the example below by selecting the appropriate textfield and typing the number with the keypad and then press enter (or use the value slider).

Envelope

Level	Start:	+00	Attack:	+99	Break:	+32	Sustain:	+35	Release:	+00
Time	Attack:	07	Decay:	50	Slope:	20	Release:	70		
Curve	Attack:	3	Decay:	6	Slope:	0(lin)	Release:	6		

3. The EG for the LPF

Control the cut-off frequency with the EG

Play some notes... no change!
How come? because the EG is not yet connected to the LPF.

7. Select the **Osc & Filter tab**.
8. Select the **CUTOFF FREQUENCY knob** of the LPF.
9. In the Parameter Detail box (bottom right) select **AMS: >**
10. Then from the pop up list, select **EG3**.
11. Now you want to tell the synth how intensive the envelope should influence the cutoff frequency of the LPF.
12. Select the **textfield** right of **Intensity:** and enter **+07.00** (just type 7, or use the value slider).
13. Now play some notes and hear the difference!
14. With the textfield of **Intensity** still selected, move the **value slider** down and while playing move it slowly up (max) to experience the amount of which the EG is influencing the cut-off frequency.
15. For this tutorials leave **Intensity = +7.00**.

Now we will see how the envelope is influencing the cut-off frequency of the LPF.

16. Select the **EG tab**.
17. Select the **EG3 tab**, if not selected.
18. Select under **Envelope** of the **Time** row the textfield of **Attack:**. Currently, this has the value **07**.
19. While playing some notes, move the **value slider** up and down to experience how this influences the cut-off frequency over time. This changes the character of the sound. For higher values it becomes 'softer'.
20. For this tutorial leave it on **07**.
21. Now select of the **Level** row, the **Sustain:** textfield.
22. While playing, move the **value slider** up. You're now increasing the sustain level. You can hear this because the cut-off frequency drops and jumps back to the level you've selected with the value slider. This can be nice for certain effects.
23. For this tutorial, leave **Sustain = +35**.

4. Fattening the Sound

Voice Assign Mode

24. Select the **Common tab**, and then the **Program Basic tab**.
25. In the **Voice Assign Mode** section select the **Unison** so it is switched on.
26. Set **Number of Voices = 3**. This creates a fatter sound.
27. Set **Stereo Spread = 50**.
28. Set **Detune = 012[cents]** and **Thickness = 03**.
29. Select the **EXi 1 tab**.
30. Play some notes to hear the difference.

(see also MS-20EX Tutorial 3 or the PolysixEX Tutorial 6 The Voice Assign Mode for more information)

Detune sets the tuning spread for the Unison voices in cents (1/100 of a semitone).

Thickness controls the character of the detuning for the Unison voices.

For values from 01 to 09, Unison voices will be detuned in an asymmetric way.

This will increase the complexity of the detune, and changing the way in which different pitches beat against one another.

This creates an effect similar to vintage analog synthesizers, in which oscillators were frequently slightly out of tune.

Higher numbers increase the effect.

4. Fattening the Sound

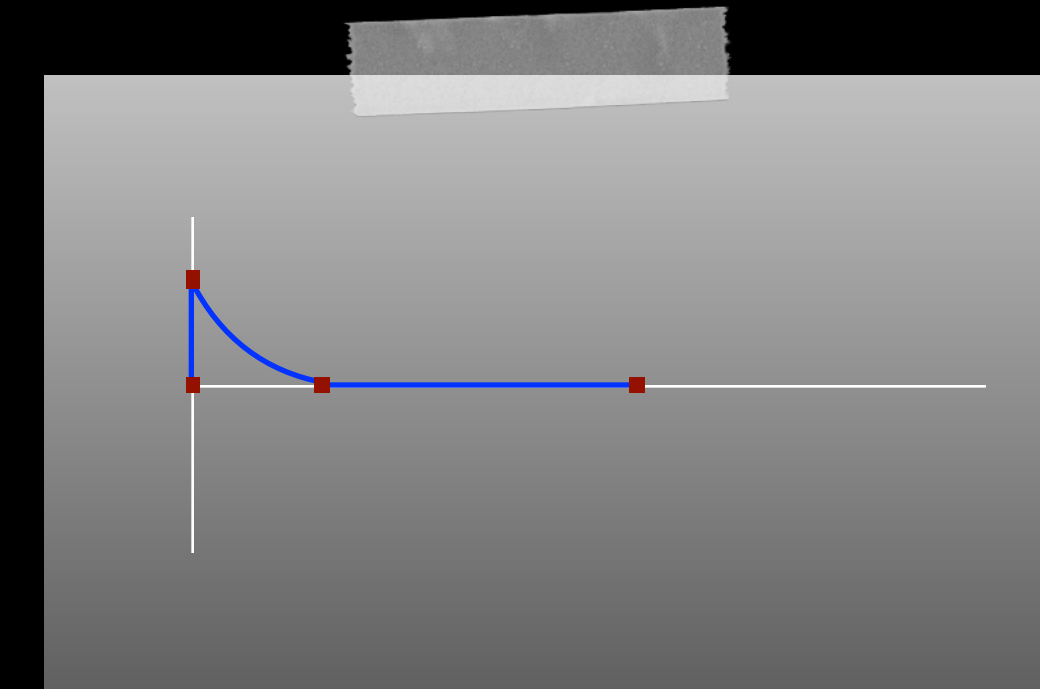
Add some more effect to the **PEAK** of the **LPF**. This will make the sound a little brighter (clean). This is nice for the higher notes. Again, an envelope is used.

31. Select the **EG** tab. And then select **EG4**.

32. Enter the values as given below.

Envelope

Level	Start:	+00	Attack:	+38	Break:	+00	Sustain:	+00	Release:	+00
Time	Attack:	00	Decay:	28	Slope:	00	Release:	00		
Curve	Attack:	3	Decay:	5	Slope:	0	Release:	0		



33. Select the **Osc & Filter tab**. Select the **LPF PEAK** knob. In the Parameter Detail box select **AMS: >**. Select **EG4**

34. Select **Intensity**: underneath and enter **5**.

Experiment: play while you change the value of **Time Decay** to higher values. When finished, reset it to 28 for this tutorial.

5. Experiment: Modulation

Assign EG to Frequency Modulation

Let's try to make the sound even more rough after a short time after key pressed.
To do this you will use a copy of EG3, to get the timing right.

1. Select the **EG tab** and then the **EG3 tab**.
2. Of the **page menu**, select **Copy Envelope**
3. For **To:** select **EG5** and press OK.
4. Select the **EG5 tab**.
5. Change the red values as shown below:

Now you have to assign this EG to the **MG/T.EXT** knob of the **FREQUENCY MODULATION** section under the **Osc & Filter** tab.

6. Select the **MG/T.EXT knob** straight below the VCLF. Select in the Parameter Detail box **AMS: >** and select **EG5**.
7. Select **Intensity:** and enter **10**.
8. Play some notes ... you can hear the envelope working.

Envelope					
Level	Start: +00	Attack: +00	Break: +00	Sustain: +35	Release: +00
Time	Attack: 07	Decay: 50	Slope: 20	Release: 70	
Curve	Attack: 3	Decay: 6	Slope: 0(lin)	Release: 6	

This effect can be nice for sound effects, which you learned in the proces, but not for the sound we want to achieve.

← Timing remains the same.

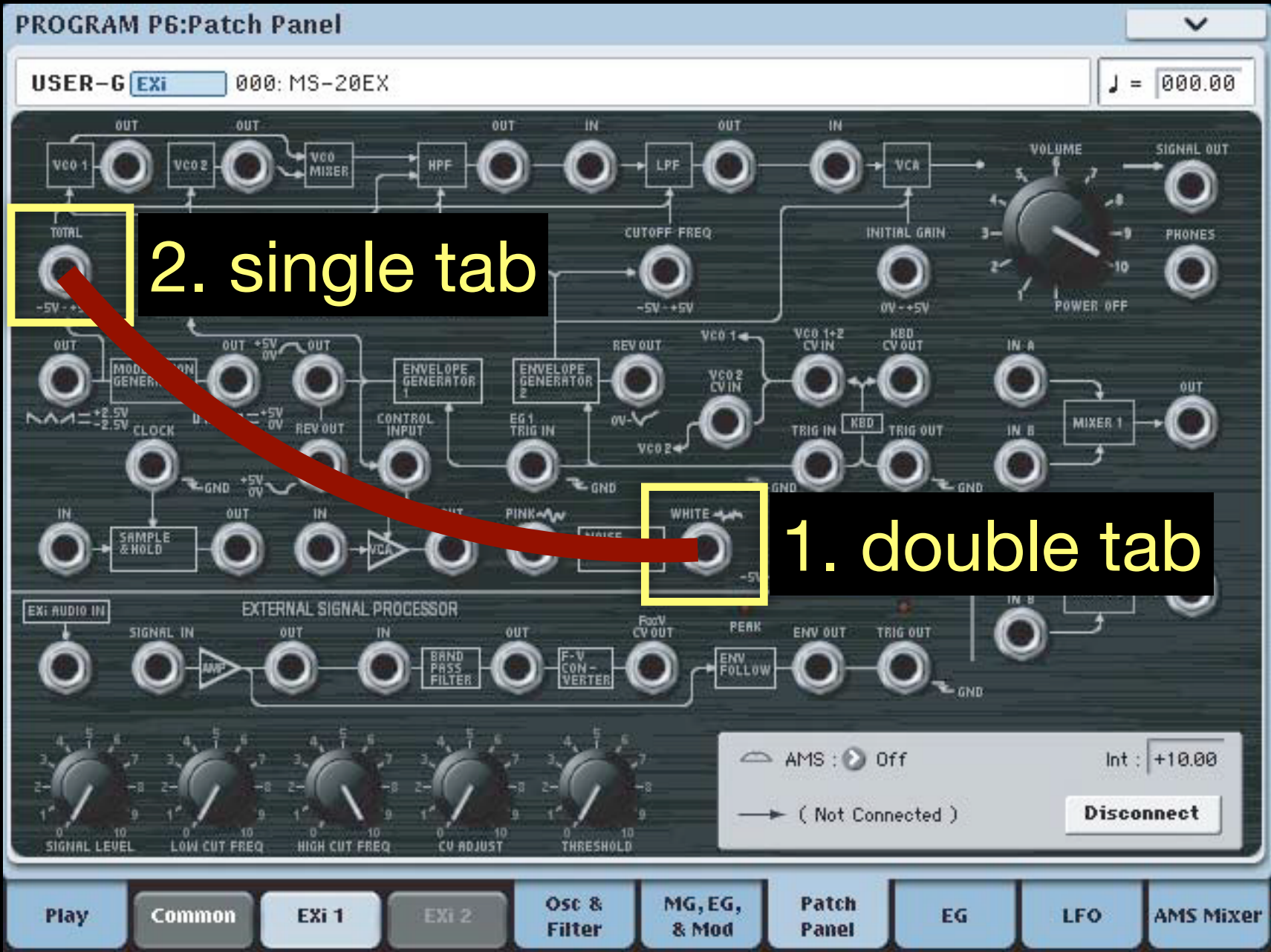
← Curve remains the same.

5. Experiment: Modulation

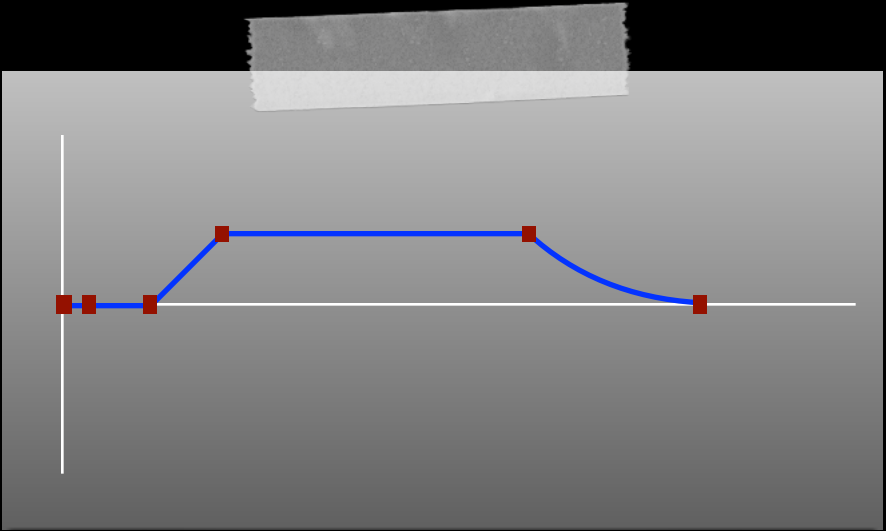
Using White Noise
for Frequency
Modulation

The modulation frequency is not right. Even if you set **FREQUENCY/TIMES = 10** (MG, EG, & Mod tab), it doesn't sound right.
What to do? Use a faster modulation source of chaos - **white noise**.

- 9. Select the **Patch Panel** tab.
- 10. Double tab on the **WHITE** connector and then single tab on the **TOTAL** connector (shown right). You will see a 'cable' on screen.
- 11. Go back to **EG5** and change the Decay in Time to 30 to solve the timing.



Envelope						
Level	Start:	+00	Attack:	+00	Break:	+00
					Sustain:	+35
					Release:	+00
Time	Attack:	07	Decay:	30	Slope:	20
					Release:	70
Curve	Attack:	3	Decay:	6	Slope:	0(lin)
					Release:	6



5. Experiment: Modulation

Using White Noise
for Frequency
Modulation

Now you have to play with the values to get the right 'growl'.

12. Select the **Osc & Filter tab**.
13. With the **MG/T.EXT** knob of the **FREQUENCY MODULATION** section still selected.
14. In the **Parameter Detail box** Select **Intensity**:. Use the value slider to find the right value. Play while moving the slider.
15. For this tutorial we use **1.0**. Otherwise, the higher notes will sound too unstable. For lower notes, you could try higher values like 1.5 or 2.0.

What about using a LFO to produce the 'growl'?
Even setting +99 for **Frequency** is not fast enough.
However, there can be other uses when changing the **AMS:>** of the **MG/T.EXT knob** to for example **LFO1** would make sense.

6. EG on VCO LEVEL

However, if you turn the **VCO 1 LEVEL** up to 10, you'll have more 'growl'. If you turn it to 0, you'll have a brighter sound. We would like a 'clean' start with a 'dirty' growl later. Would it be an idea to use an AMS to control this volume while pressing a key? Yes, it would, so let's try it!

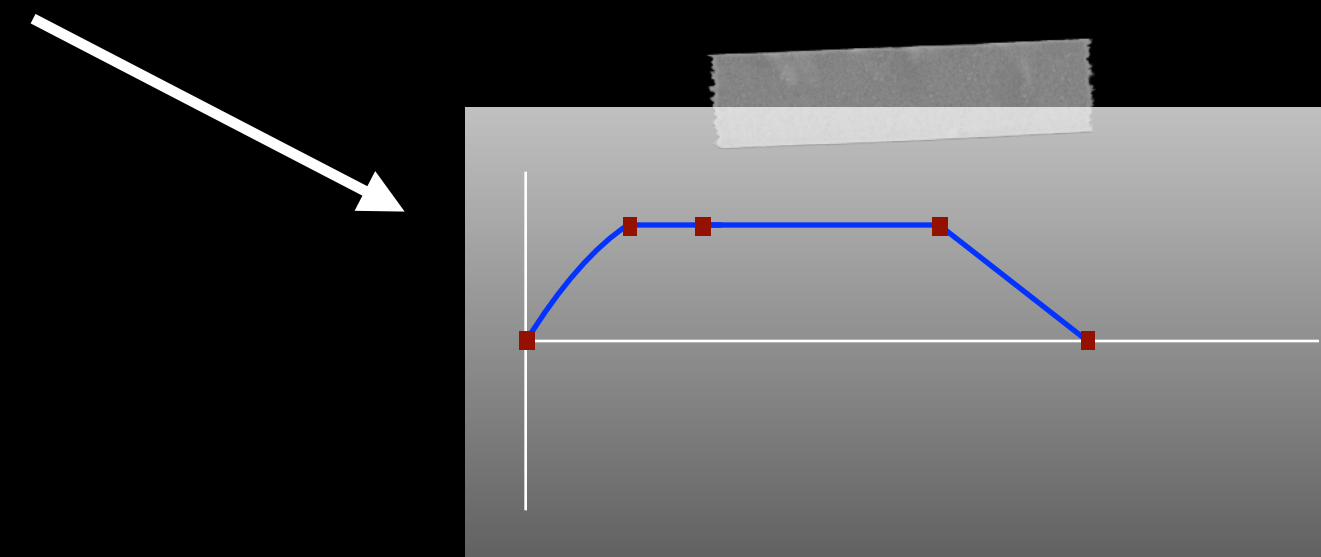
1. Select the **EG tab**. And then select **EG6**.
2. Copy the values as given below.

Envelope										
Level	Start:	+00	Attack:	+00	Break:	+99	Sustain:	+99	Release:	+00
Time	Attack:	00	Decay:	50	Slope:	00	Release:	70		
Curve	Attack:	0	Decay:	6	Slope:	0	Release:	0		

To make this work, you have to assign this **EG** to the correct knob.

3. Select the **Osc & Filter tab**. And then select of the **VCO MIXER** the **VCO 1 LEVEL** knob.
4. Set this level to **0** (volume = 0).
5. In the Parameter Detail box, select **AMS: >** and select **EG6**.
6. Set **Intensity:** to **10**.
7. Play a few notes. That's better.

Changing the VCO 1 Level
in the VCO Mixer

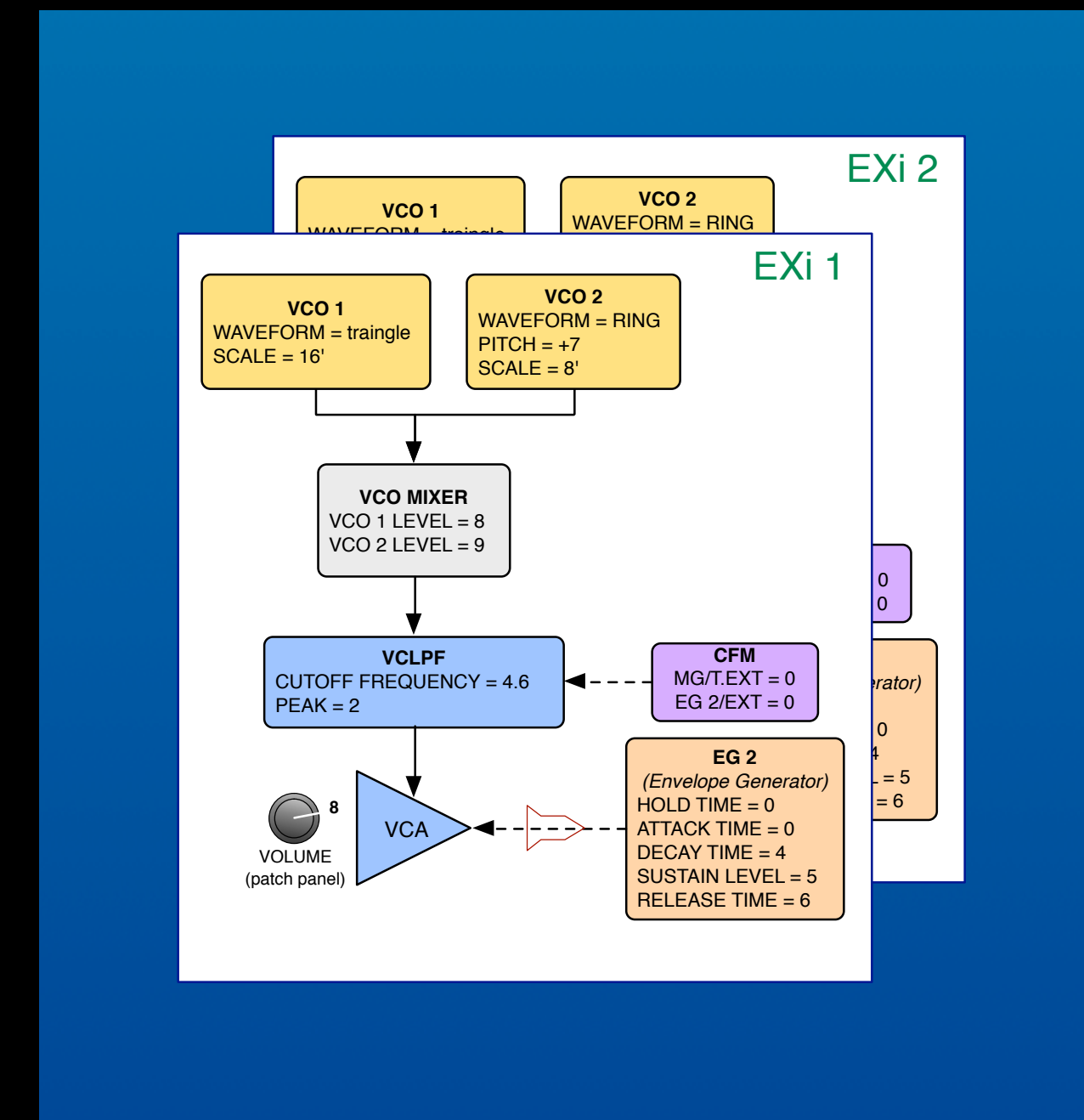


7. More Sound - Copy EXi

Bigger Sound

To make this sound even fatter, you have to copy EXi 1 to EXi 2.

1. Select the **Common tab** and then the **Program Basic tab**. Select of the **page menu** the **Copy EXi Oscillator**.
2. Set **To: EXi2**.
3. Important! Make sure that the **Program: >** contains the **location of this new sound**. Otherwise you will copy another bank's EXi.
4. Press **OK**.
5. In the **Transpose section** (lower right) set the value for **EXi2: -12**. EXi 2 is one octave lower than EXi 1.
6. Select the **EXi 2 tab**. Then the **Patch Panel tab** and set **VOLUME** to **6**. The transposed version is a little softer.



8. Beauty Pass - Kronosification

Adding Kronos Effects

Time to add some effects.

1. Select the **Common** tab, the **IFX** tab, and then the **Insert FX** tab.
2. Insert the effects according to the picture in figure 1.

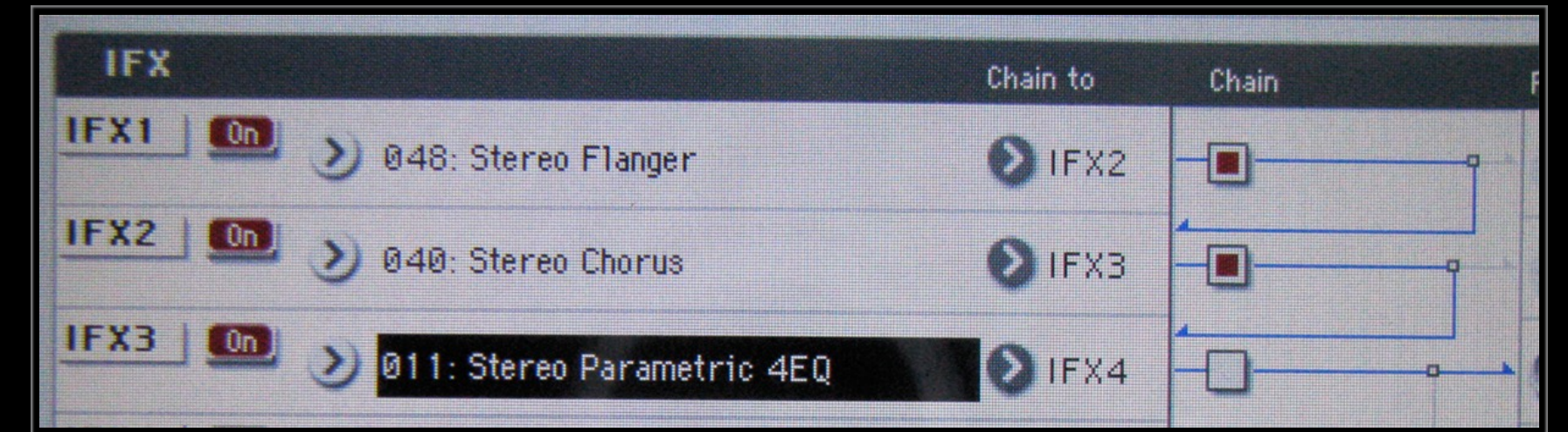


Figure 1.

8. Beauty Pass - Kronosification

Adding Kronos Effects

3. Select the **IFX 1-12** tab and then the **IFX1** tab.
4. Copy the settings according to the picture in figure 2.

The manual writes: *“This effect gives a significant swell and movement of pitch to the sound. It is more effective when applied to a sound with a lot of harmonics.”*

And that’s good, because the ring modulation of **VCO 2** creates a lot of harmonics.

More information on the Stereo Flanger can be found on page 934 of the *Kronos Parameter Guide*.

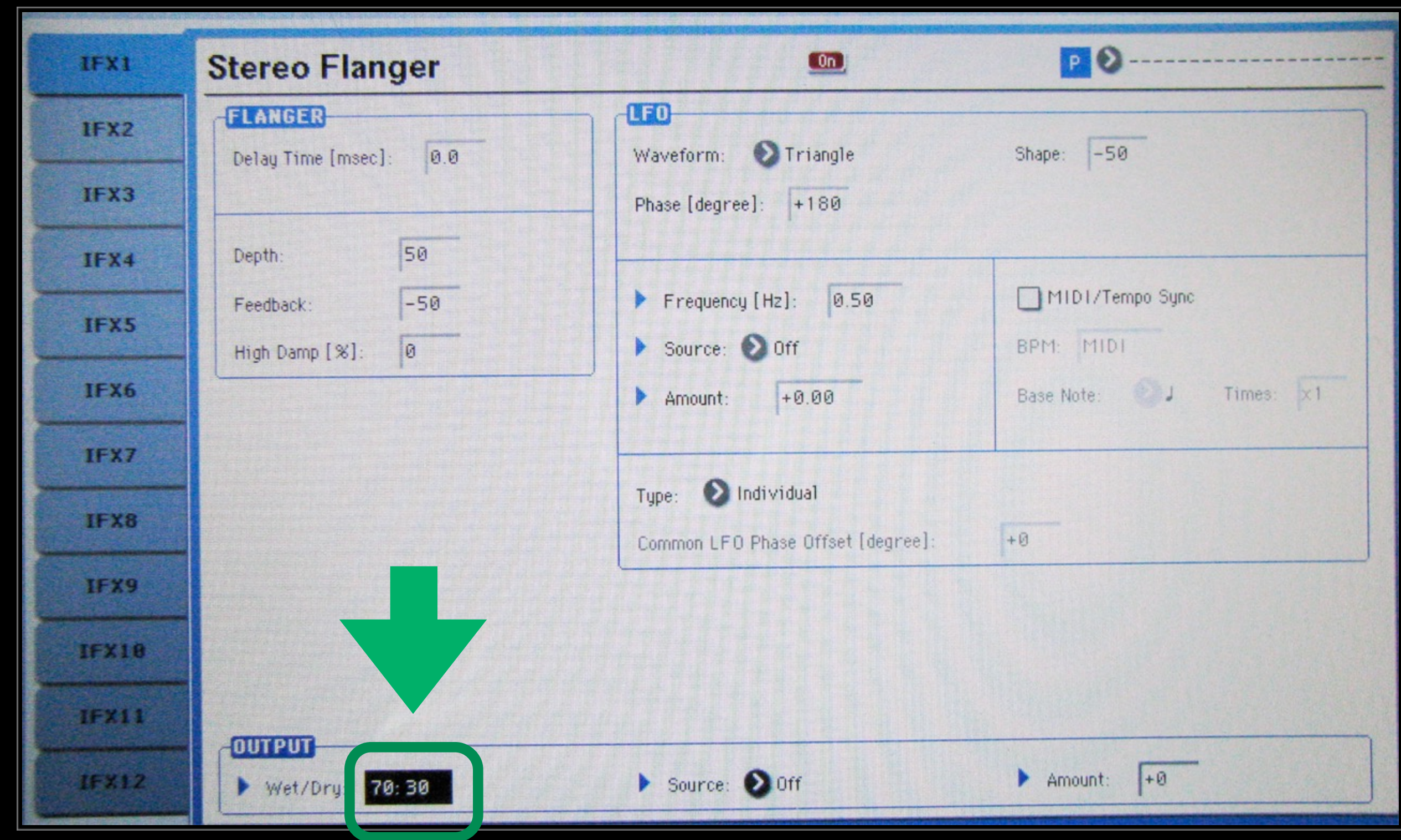


Figure 2.

8. Beauty Pass - Kronosification

Adding Kronos Effects

5. Select the the IFX2 tab.
6. The picture in figure 3 shows the default values, which you'll use.

The manual writes: *"This effect adds thickness and warmth to the sound by modulating the delay time of the input signal. You can add spread to the sound by offsetting the phase of the left and right LFOs from each other."*

This thickness is what you want.

More information on the Stereo Chorus can be found on page 927 of the *Kronos Parameter Guide*.

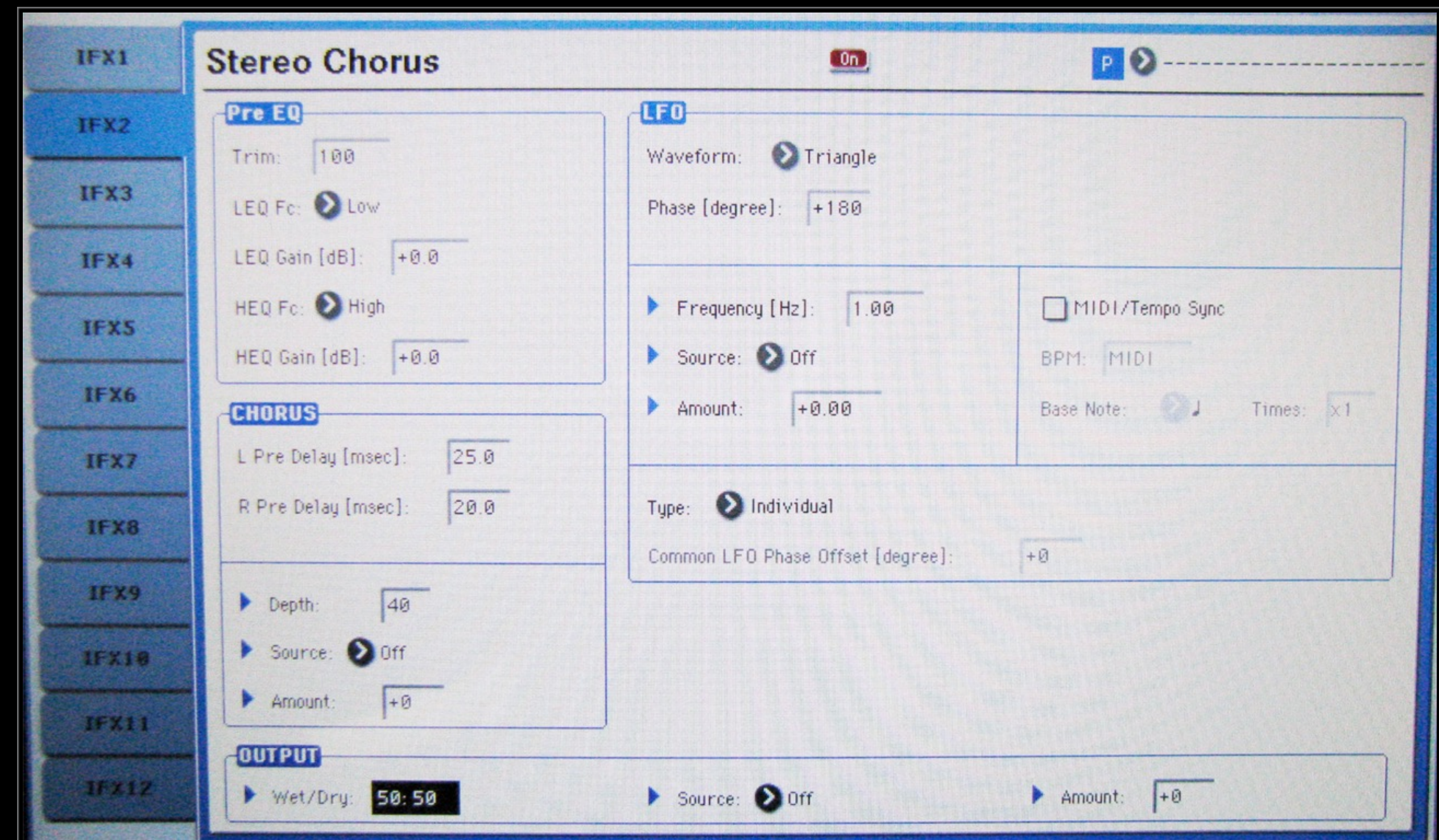


Figure 3.

8. Beauty Pass - Kronosification

Adding Kronos Effects

7. Select the the IFX3 tab.
8. Copy the settings according to the picture in figure 4.

The manual writes: *“This is a stereo 4-band parametric equalizer. Bands 1 and 4 can be set to either peaking or shelving modes, and you can modulate the gain of Band 2 in real-time.”*

This will boost the sound even more. You can try other settings, of course.

More information on the Stereo Parametric 4EQ can be found on page 902 of the *Kronos Parameter Guide*.

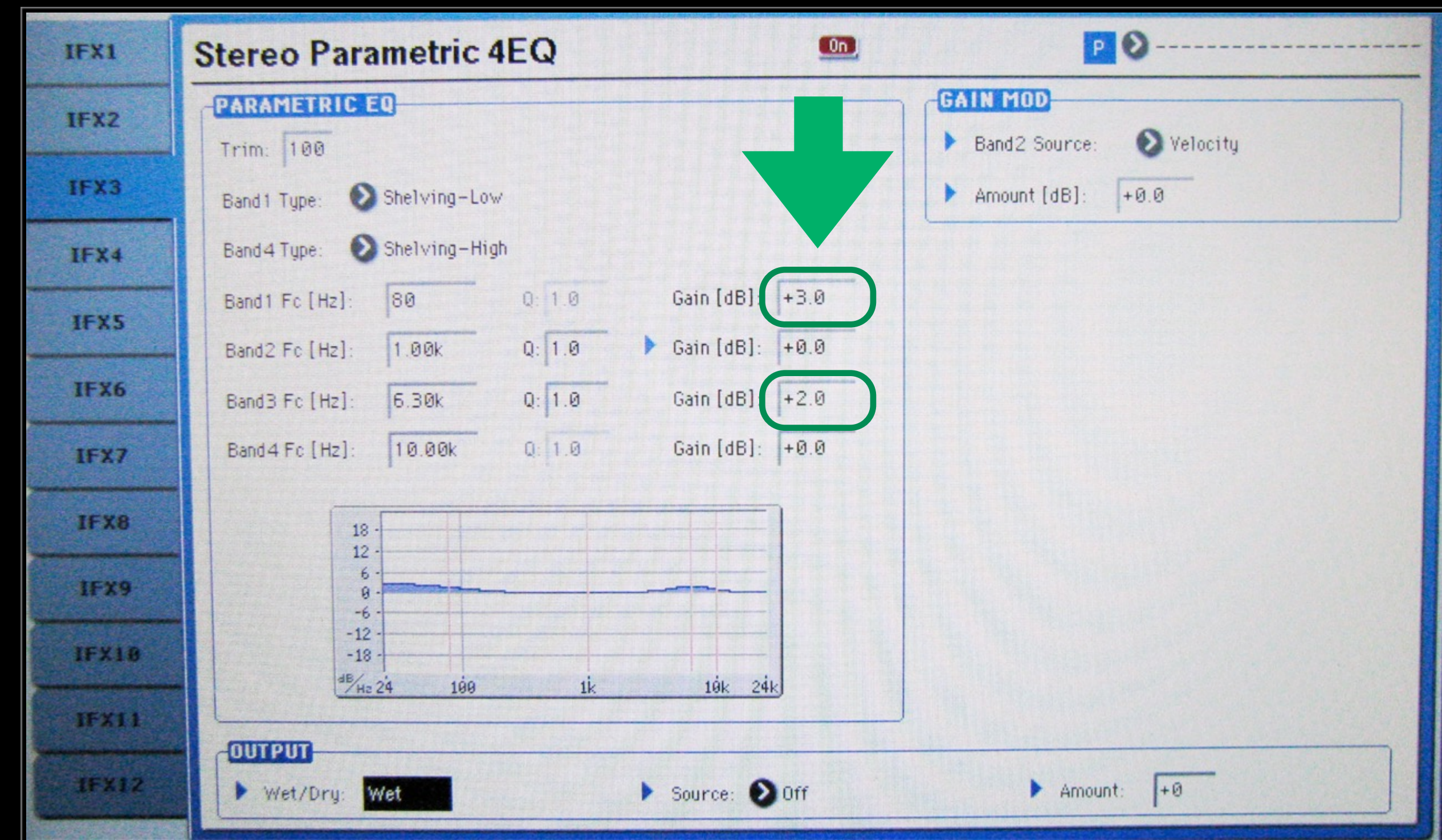


Figure 4.

8. Beauty Pass - Kronosification

Make the effects do their job:

9. Select the **Routing** subtab.

10. In the **Bus Select (IFX/Indiv.Out Assign)** section set **EXi 1&2** to: **IFX1**.

Make sure you'll save all the changes!

11. Select the **Play** tab. Select on the **Main** menu (top right on screen) **Write Program** to save your program. Also see point 3 of this tutorial.

Make Effects
Work

Save Changes!

For more information, please see the *KRONOS Quick Start Guide* at 'Saving your edits' on page 24.

When you switch between programs without saving your changes first, they will be lost.

9. It's not a beast, yet...

Some tweaks

Can we fatten it up? Yes, we can!

1. Select the **Common tab**, and then the **Program Basic tab**.
2. In the **Voice Assign Mode** section select the **Unison** so it is switched on (see also MS-20EX Tutorial 3 or the PolysixEX Tutorial 6 The Voice Assign Mode for more information).
3. Set **Number of Voices = 8**.
4. Set **Detune = 024 [cents]**.
5. Set **Thickness = 05**. This creates an even fatter sound.
6. Select the **EXi 1 tab**.
7. Play some notes to hear the difference. That's more like it!

And a little change to the cutoff frequencies:

1. Select the **EXi 1 tab**.
2. Select the **Osc & Filter tab**.
3. Select the **CUTOFF FREQUENCY** knob of the **VOLTAGE CONTROLLED LOWPASS FILTER** section.
4. Set it to **5.20**.
5. Play some notes to hear the difference. A little more 'growl'.

And some reverb...

1. Select the **Common tab**.
2. Select the **MTX/TFX tab**.
3. Switch **TFX1** or **TFX2 On**.
4. Set the effect to **100: O-verb**.
5. Play some notes to hear the difference. Just a little nicer.

Well, be honest. How cool is this!

See summary of Sound 1 for the settings.

You can always change settings to fit your sonic needs. Experiment!

10. Play Time

Fat Fat Fat

After a lot of programming, it's time to try this sound. Just play the notes below.



Try the high notes as well.

Sounds familiar.

It was *not* the intention to create an exact copy of this familiar sound.

However, with some tweaks you can get close enough and learn something about EGs in the process.

Have fun playing and creating!

Yeah, but ... can you not make it closer to this well known sound?

Okay then, see the next page ;)

11. One more thing...

Copy, clean up, and change OSC

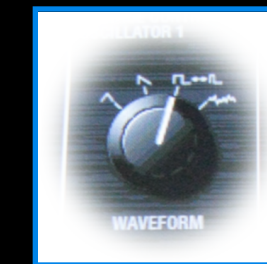
First, copy stuff to a free USER Program

1. Select the **Common tab**, and then the **Program Basic tab**.
2. From the **Program Basic Menu** select **Write Program**.
3. After **Program: >** select your program bank number of the FREE User Program.
4. Press **OK. Are You Sure?** Select **OK**. This copies your sound to this new location, so we can edit it safely.

Removing the unnecessary bits:

1. Of the new program, select the **Common tab**, and then the **Program Basic tab**.
2. Under the **EXi2 Instrument Type** set the **> MS-20EX** to **Off**. We first want to work with one synth.
3. Select the **EXi 1 tab**, and then the **Osc & Filter tab**.
4. Select the **MG/T.EXT button** of the **CUTOFF FREQUENCY MODULATION** of the **VCLF**.
5. In the **Parameter Detail box** (bottom right) select **AMS: >**
6. Set it to **Off**, because we don't need modulation, and we'll need the **EG** later on.

Changing the Oscillators:



1. Set **VCO 1 WAVEFORM = PWM**.
2. For **VCO 1** set **PW = 2**.
3. Set of **PORTAMENTO TIME = 2 ***
4. For **VCO 2** set **SCALE = 4'**.

Note:

For a Kronos 88 you can try **VCO 1 SCALE = 8'** and **VCO 2 SCALE = 2'**.

Changing the **VCLF** (VOLTAGE CONTROLLED LOWPASS FILTER):

1. Set **CUTOFF FREQUENCY = 5.0**.
2. Set **PEAK = 0**.

* On the Elka Glide Speed and Amount is used. In this tutorial this is somehow achieved by using Portamento and Fine Tune.

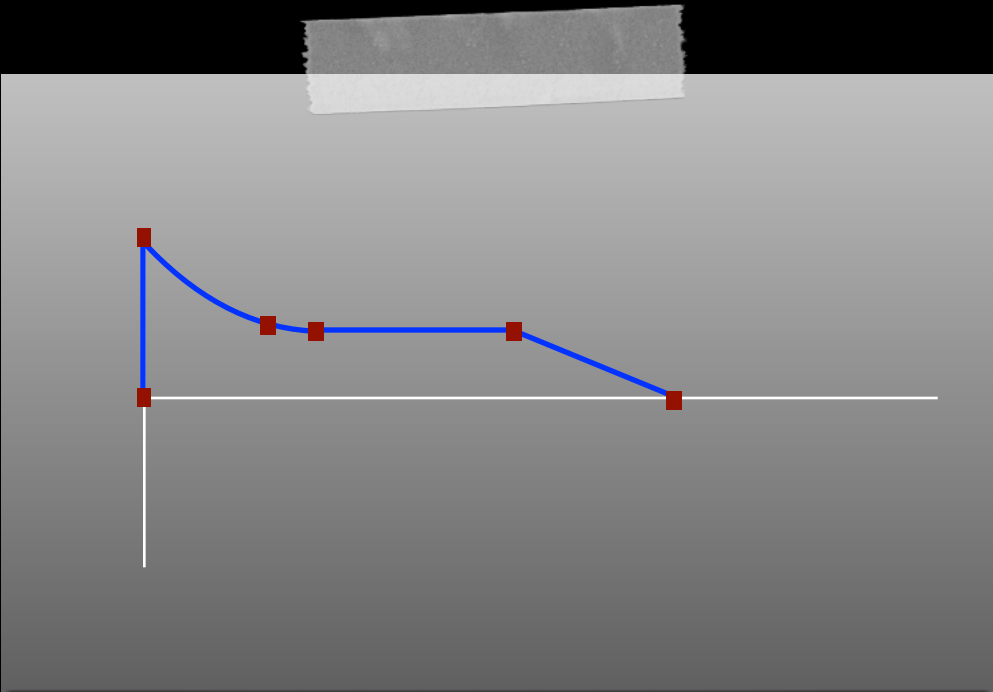
11. One more thing...

Change the EG on Cutoff.

Now, change EG3 (connected to VCLF CUTOFF FREQ) to shape the sound further.

- 1. Select the EG tab and then the EG3 tab.
- 2. Change the values (in red) as shown below:

Envelope					
Level	Start:	+00	Attack:	+99	Break: +45 Sustain: +40 Release: +00
Time	Attack:	00	Decay:	50	Slope: 25 Release: 70
Curve	Attack:	0(lin)	Decay:	6	Slope: 0(lin) Release: 6



The cutoff freq. now follows this shape.

11. One more thing...

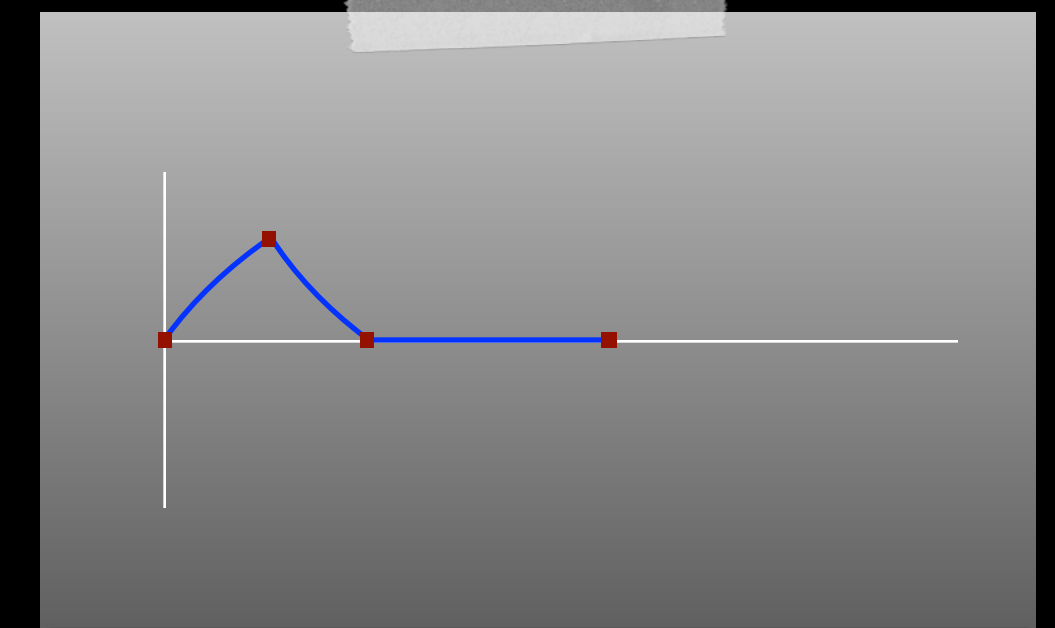
We also need an envelope on PEAK to create a small 'fizzle' (or what it's called):

1. Select the **EG4 tab**.
2. Change the values (in **red**) as shown below:

Envelope						
Level	Start:	+00	Attack:	+70	Break:	+00
					Sustain:	+00
					Release:	+00
Time	Attack:	40	Decay:	30	Slope:	00
					Release:	00
Curve	Attack:	3	Decay:	5	Slope:	0
					Release:	0

Delay the Attack. I.e. the PEAK value slowly increases till a level 70, and then slowly decreases to 0. Giving a 'fizzle'.

3. Select the **Osc & Filter tab**.
4. Select the **VCLF PEAK knob**, and set the **AMS Intensity** to 8.0 (Parameter Detail box) to make it a little nicer.



PEAK now follows this shape.

11. One more thing...

To create a little 'unstable' effect, i.e. to 'simulate' Glide Speed and Amount, we'll put an envelope on FINE TUNE *.

1. Select the **EG tab**, and the **EG5 tab** (we are not using this one at the moment).
2. Change the values (in red) as shown below:

Envelope						
Level	Start:	+00	Attack:	+99	Break:	+00
			Sustain:	00	Release:	+00
Time	Attack:	00	Decay:	20	Slope:	00
			Release:	00		
Curve	Attack:	0	Decay:	6	Slope:	0(lin)
			Release:	0		

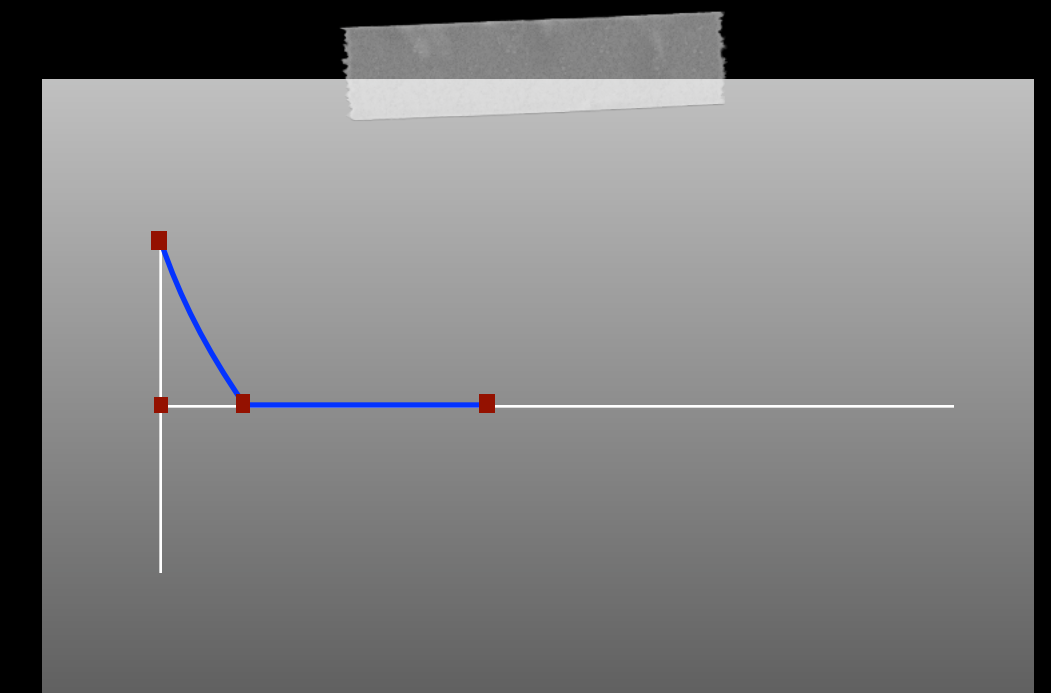
When playing a note, it's directly +1 semitone out of tune and returns quickly to its normal value (in tune). This results a small effect when playing.

* On the Elka Glide Speed and Amount is used. In this tutorial this is somehow achieved by using Portamento and Fine Tune. (see also Slide 23)

By dongfang (Kris Oosting) - July 2013 - March 2015

Change the EG on Fine Tune.

3. Select the **Osc & Filter tab**.
4. Select the **FINE TUNE knob**, and set the **AMS: >** to **EG5** and the **Intensity** to **10.0** (**Parameter Detail box**) to activate the effect.



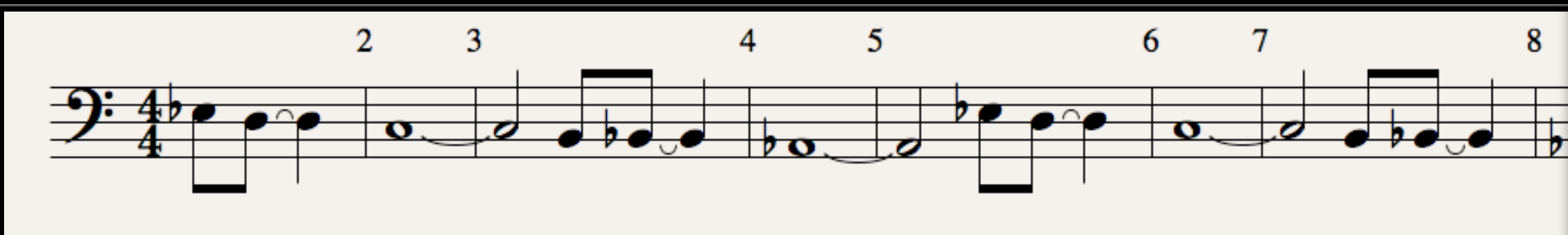
FINE TUNE now follows this shape.

See summary of Sound 2 for the settings.

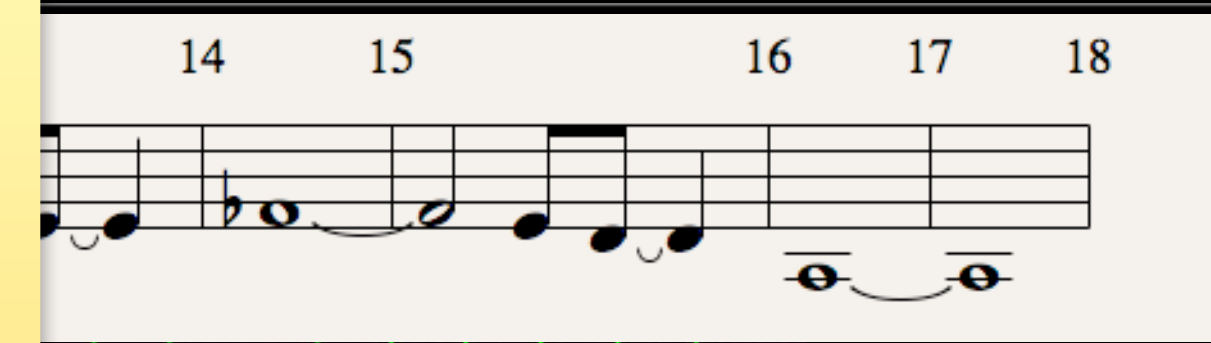
11. One more thing...

More 'laser-esque'

After a lot of programming, it's time to try this sound. Just play the notes below.



Ta Da Daaaah. Hmmmm, interesting enough. Maybe you could try a LFO on PW of OSC1, and look at External Modulation. Next time, try the AL-1 instead. Maybe you can make a tutorial out of it.



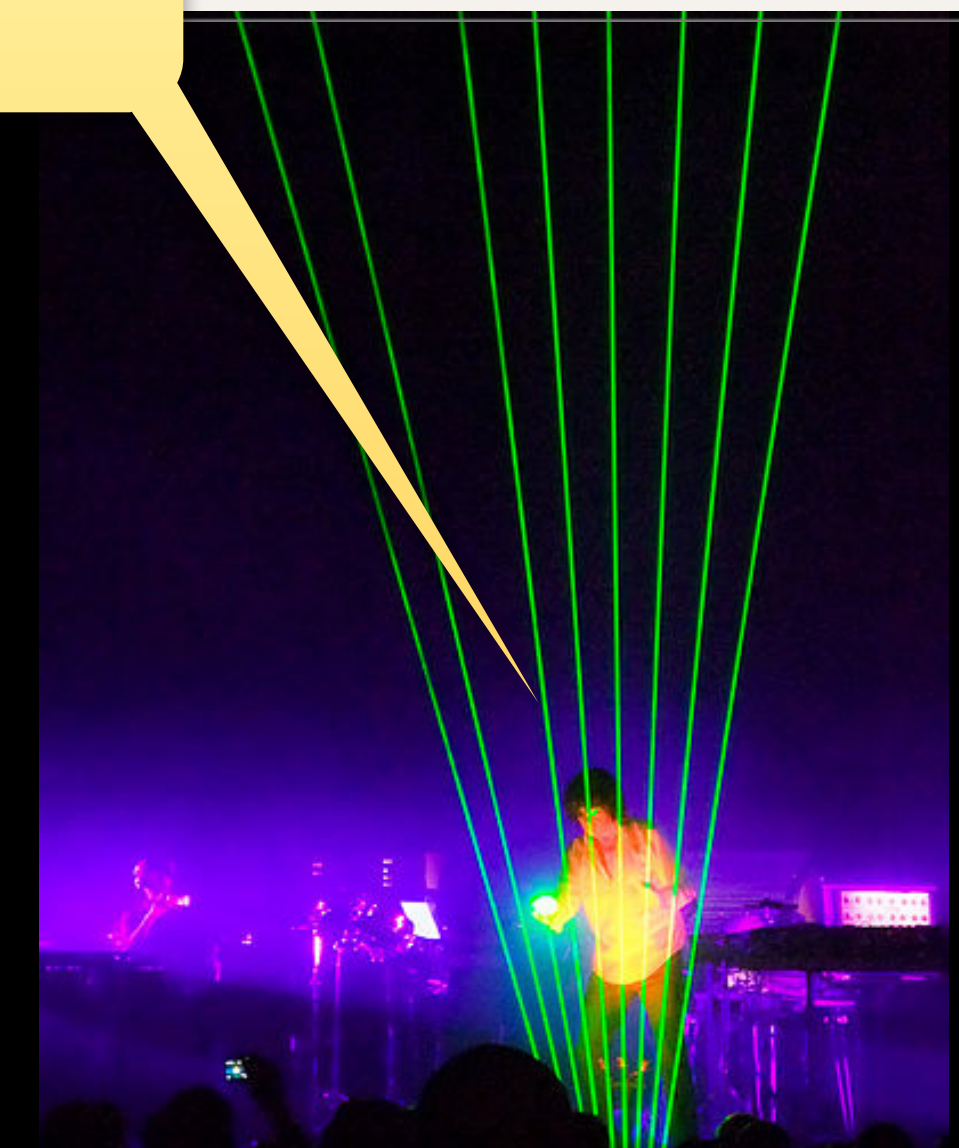
I personally needed to create this whole tutorial to discover these changes after hours of experimentation.

Often, the solution is simple, but it takes time to discover that it is.

I know, I know, it's not an Elka Synthex, it's just one MS-20EX. But, be honest. It's cool anyway!

Experiment, try, change and learn :)

[next page]



Thank you for your advice Mr. Jarre. I will.

11. One more thing...

LFO on VCO 1 its PW

To create a little 'unstable' effect, a LFO will be used on VCO 1's PW.

1. Select the LFO tab, and then the LFO1 tab and set Waveform: > Triangle and Frequency: to 30 (not too fast).
2. Select the Osc & Filter tab, and of VOLTAGE CONTROLLED OSCILLATOR 1 select PW. Set its value to 5.0.
3. In the Parameter Detail box select AMS: > and set it to LFO1. Then the Intensity: to +01.00. LFO1 is now connected to the PW knob.
4. Play some notes to hear the effect. (You can try other values of LFO1 its Frequency to hear the effect.)

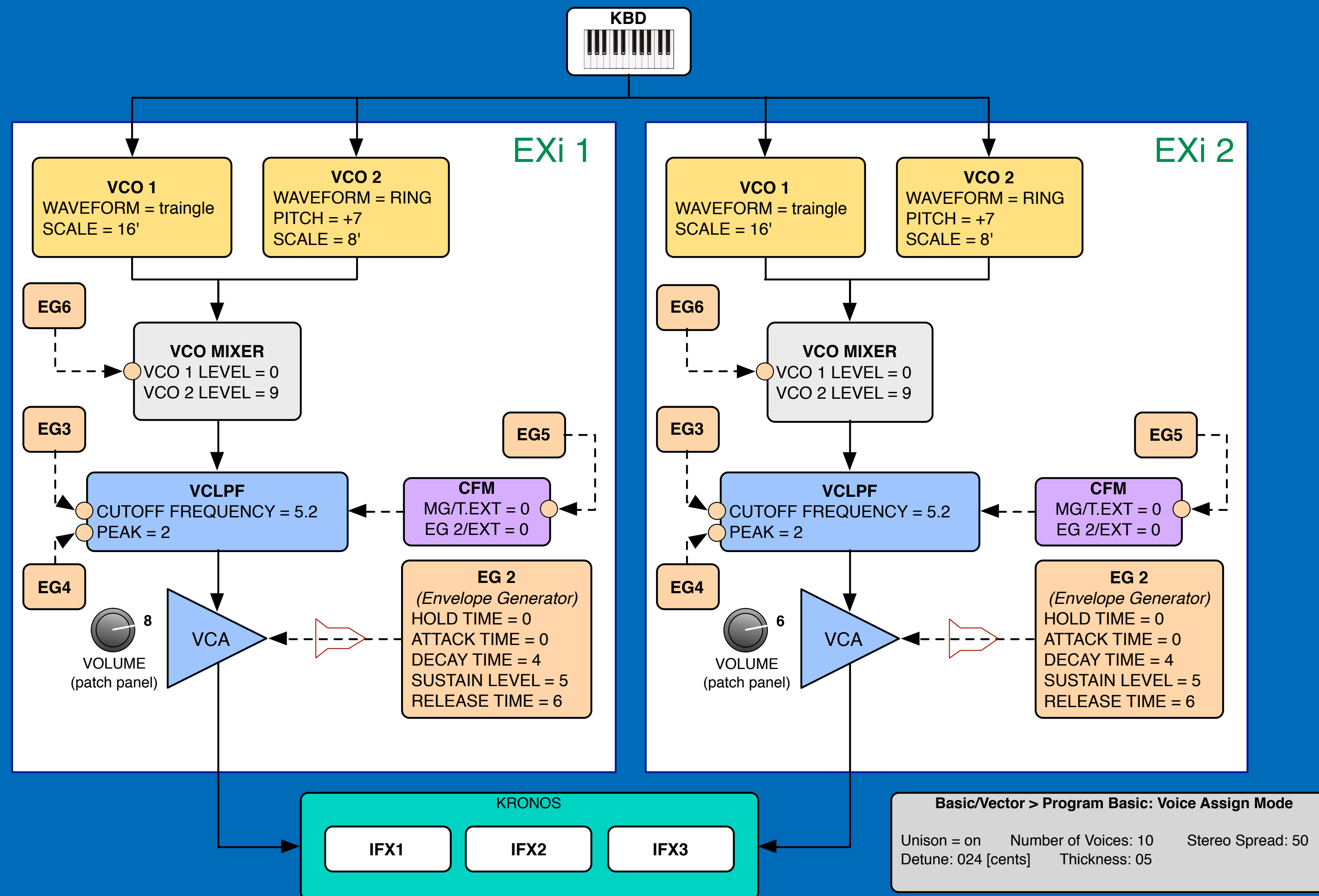
External Modulation

Use External Modulation for the finishing touch.

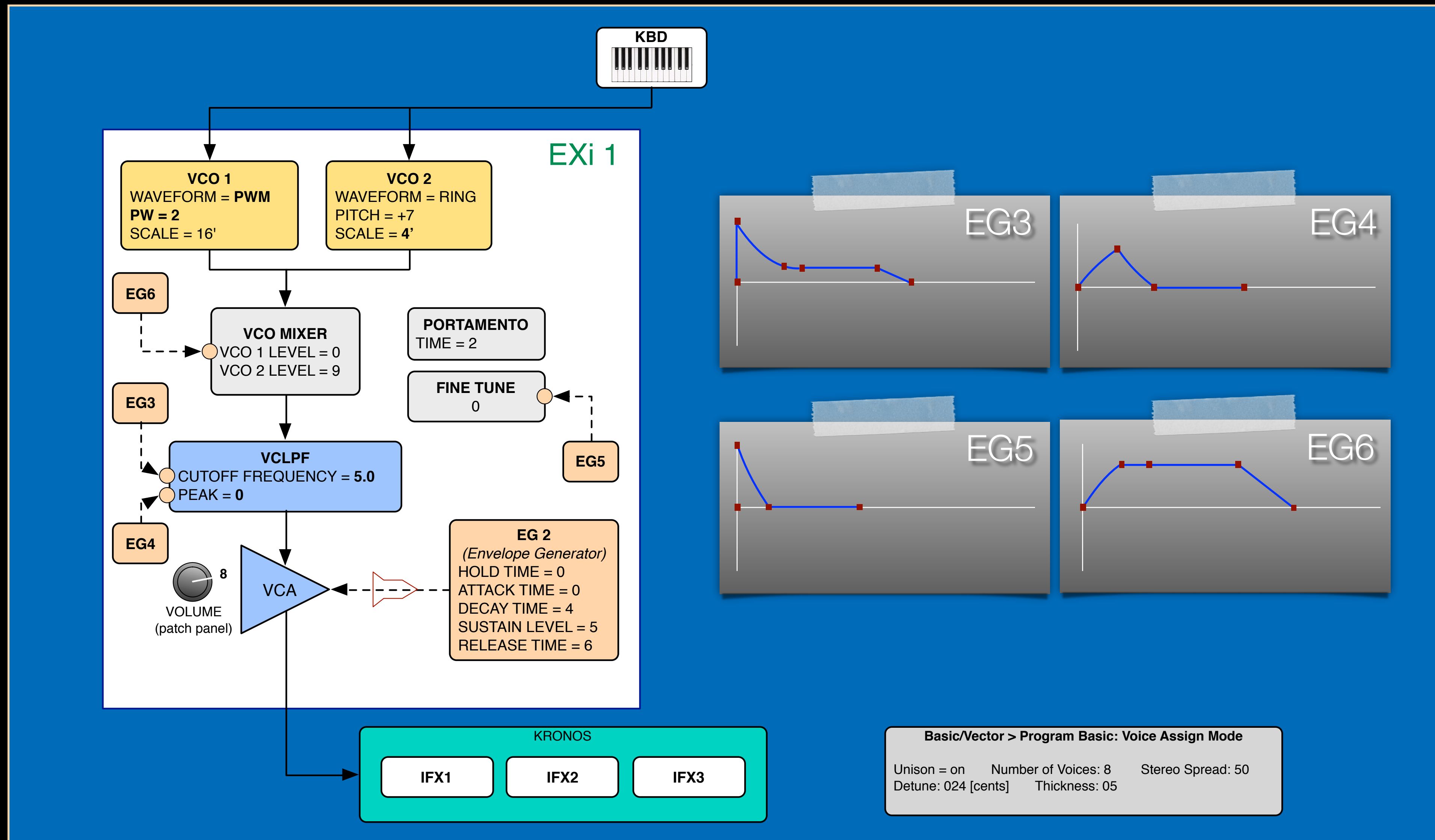
1. Select the MG, EG, & Mod tab, and then of EXTERNAL MODULATION set SRC 1 to > Com KyTrk1 to allow keyboard tracking. This gives you the possibility to influence lower and higher notes with the knobs of this section.
2. Set AMP = 0.
3. Set LPF CUTOFF = +2. Higher notes are a little 'sharper'.
4. Set VCO 1 PULSE WIDTH = +4. Higher notes have more 'sharp fizzles.'
5. Play some notes - *Ta Da Daaah* - to hear the effect.

See summary of Sound 3 for the settings.

12. Summary of Settings - Sound 1



12. Summary of Settings - Sound 2



12. Summary of Settings - Sound 3

