

"VEECOMP"

COMPRESSORS

V.1216



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1 INTRODUCTION

The Vee Comp Compressor bundle is a set of three compressors, each working in one of those modes:

- stereo
- dual mono
- mid/side

They are inspired by classic analogue studio gear as well as some premium digital compressors (but they do not try to mimic any other existing plugin). They are designed to add certain "character" and mildly sculpt the dynamics of your tracks in a highly musical fashion. They are not made for ultra-fast, hyper-precise limiting but rather pay homage to older analogue designs which "rode" volumes for smoother, less conspicuous results.

1.1 WHAT IS A COMPRESSOR?

The compressor can be used to control the general level of loudness, decreasing the dynamic range of a recorded track. It can "push up" quieter passages, making articulation nuances more audible, it can tame sudden volume changes (peaks). It is capable of making notes longer by enhancing sustain. When extreme values are dialed in, it imparts its own sonic character. For "better" or "worse": a "character compressor" can "sweeten" or "damage" audio, depending on your intentions.

If you want to know more about compression, visit the Wikipedia page:

https://en.wikipedia.org/wiki/Dynamic_range_compression

1.2 QUICKSTART

1. Put the dlls in the plugin folder of your DAW
2. Load your project
3. Load the desired VeeComp plugin in the track you want to process
4. Flip the power switch or load a preset (when applicable)
5. Replay the track
6. Turn the THRESHOLD knob CW until the VU meter shows the desired gain loss
7. Set up GAIN compensation to make up for the volume loss

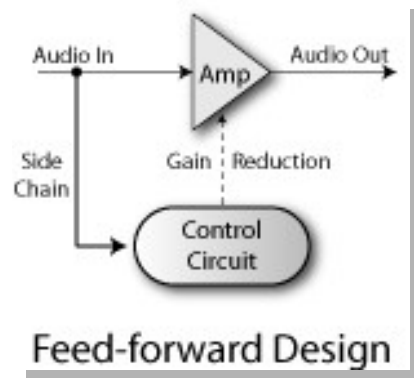
2 THE MANUAL

2.1 COMMON FEATURES

All VeeComps share certain features.

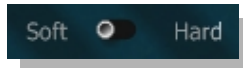
2.1.1 TOPOLOGY

All compressors are the feed-forward type.

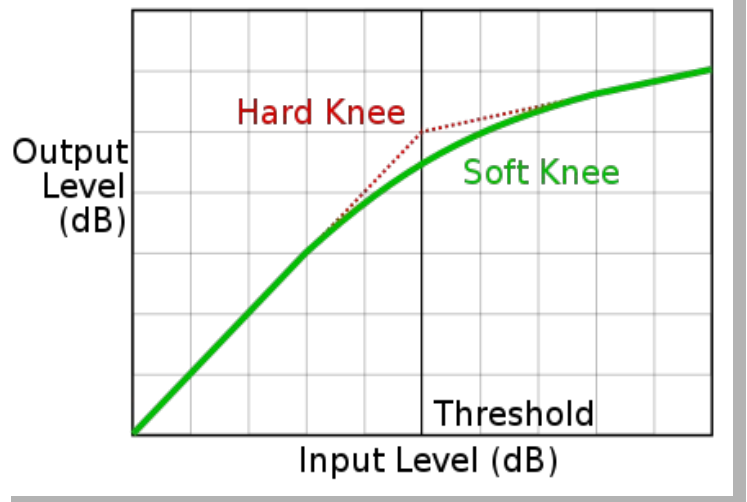


The signal entering a compressor is split, one copy sent to a variable-gain amplifier and the other to a side-chain. The inaudible side-chained signal is measured and the required gain reduction is determined. The GR is then applied to the main signal via a VCA amplifier. This topology is the most often used type in modern compressors. It was chosen for VeeComps because it allows for higher ratios and is more controllable than the self-adjustable feedback version.

2.1.2 TRANSFER CURVE TYPE SELECTOR

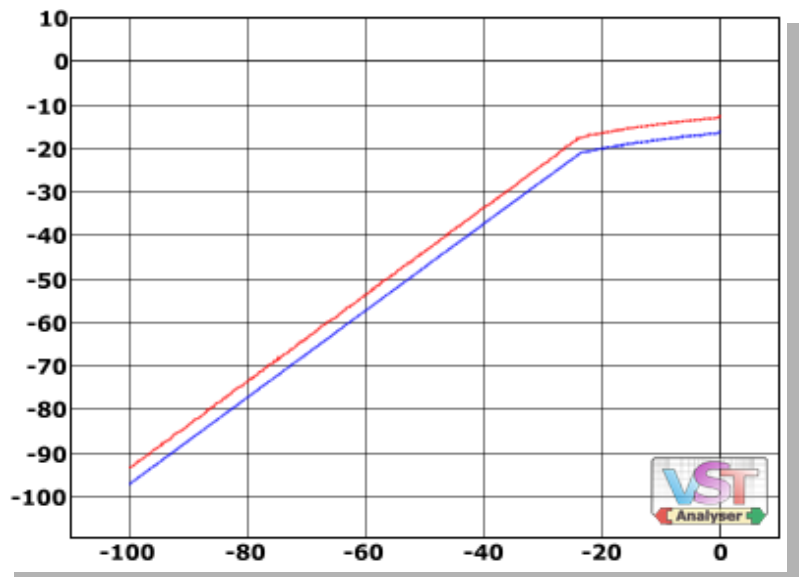


VeeComps can be switched between a soft-knee and a hard-knee transfer curve. **NOTE: the switch does not simply change the curve, it flips between two separate compressor circuits!** Yes, each VeeComp consists of two independent compressors, a hard-knee and a soft-knee.



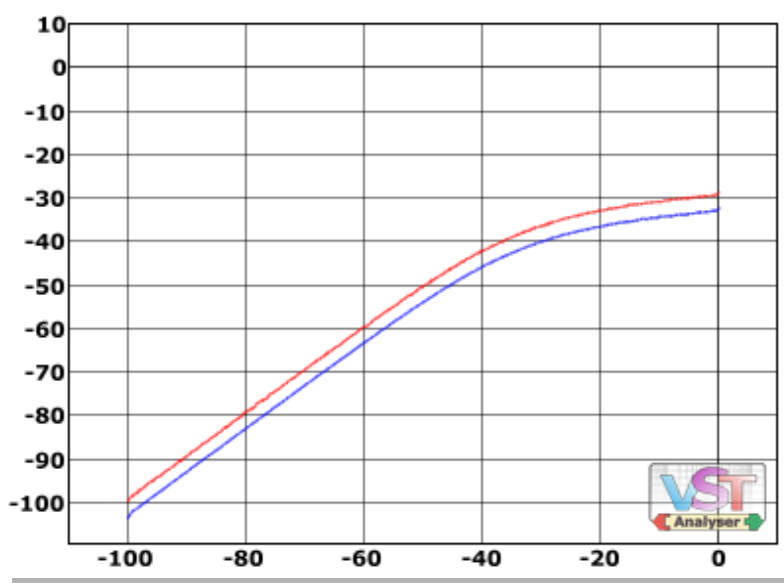
2.1.2.1 HARD-KNEE

This type of transfer curve is typical for FET compressors. If numbers like 11 and 76 came to your mind - you are right, we are talking about this very type of device (although VeeComps are not that fast). The hard-knee transfer curve allows for very fast and very conspicuous action. Transients get their peaks "chopped off" and the signal receives a brand new quality or "color", if you will. The sound can be described as "punchy", "pumping", "heavily treated". **NOTE: Due to a quite long time of attack and release, VeeComps do not introduce aliasing and distortion typical for the ultra-fast hard-knee compressors.**



2.1.2.2 SOFT-KNEE

Unlike the hard-knee compressor, this type of compressor works very smoothly, rather "riding" the volume level than aggressively "limiting" it. If number 160 came to your mind... What is the difference in sound? The gain reduction happens a bit earlier and is much more transparent. The volume changes smoother and there is no significant change in the shape of transients. There is a unique "color" as well but you will find the soft-knee much more universal and suitable for very different sources, including entire stereo mixes.



2.1.3 POWER AMP

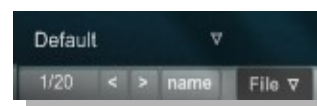
VeeComp and VeeCompDM have a "tube power amp circuit" placed after the Gain control. This "push-pull amplifier" adds odd harmonics, slightly saturating and "fattening" the output signal.

TIP: When you feed the VeeComp with a hot signal, apply zero to no GR and crank up the Gain control - the unit will "break up" and audible tube distortion will be added to the signal

2.1.4 PRESET MANAGER

The preset manager is used in the VeeComp and the VeeCompDM.

Clicking on a preset name brings up the preset list. Clicking on a desired preset will load it. You can also use white arrows to scroll through preloaded presets.



If you wish to rename a preset, just click the "name" label, enter the new name and confirm with Enter.

If you wish to export/import a list of presets to archive them or use on another computer, click the File label to open a sub-menu with options allowing you to do so.

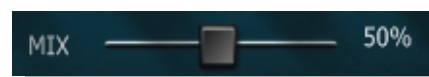
2.1.5 THE CONTROLS



	DESCRIPTION	VALUES
ATTACK	How quickly the compressor reacts when the volume exceeds the threshold	Continuously from 5 to 40 ms
RELEASE	How quickly the compressor reacts after the volume level drops below the threshold	Continuously from 250 ms to 3 seconds
RATIO	The ratio	Continuously from 2:1 to 8:1
THRESHOLD	The threshold	0 to - 40 dBFS
KNEE	The transfer curve control (works only for Soft mode; when in Hard mode the control is inactive)	Continuously from Hard to Soft
GAIN	A make up gain control	0 to 18 dB

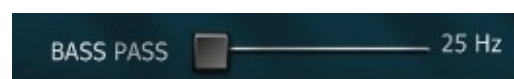
2.1.6 MIX

The mix slider lets you (you guessed it) mix the dry and compressed signals together in various proportions. What for? A common practice, known as a "parallel" or "NY compression", is about blending a heavily compressed (or rather - over-compressed) signal with a clean one. Since brutally compressed notes often sound ugly, squashed, emotionless but at the same time carry enormous amounts of sonic energy, it is good to mix in unprocessed signal to have the track controlled and "lifted" but still maintaining the initial "shape" and emotional aspect.



2.1.7 BASS PASS

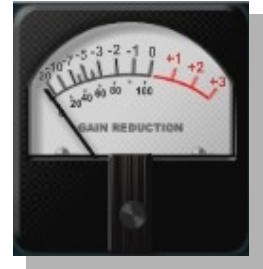
The bass pass slider filters out low end information from the side-chain (it controls an HPF placed on the SC). It does not affect the main signal. What is the purpose of the control? Sometimes huge energy present in the bottom end of the spectrum can overpower other freqs, making the compressor work harder and attenuate higher areas while choking on and distorting the less audible low end. In case you want to control only higher frequencies and/or leave the bass frequencies unaffected, move the slider to the right. The values are set continuously and range from 25 Hz to 250 Hz.



TIP: drums sub group - set the slider to 250 Hz; the compressor will limit only cymbals and leave the kick and (to some extent) snare unaffected

2.1.8 GAIN REDUCTION VU METER

The VU meter shows APPROXIMATE gain reduction. It is not calibrated to deliver precise measurements but serves as a visual indicator of the compression depth and speed at which the compressor works. As it was said before - the VeeComps were not designed to be surgical tools...



2.2 THE CONTROLS IN DETAIL

2.2.1 ATTACK

"Attack" is the time taken for compressor to start compressing after the signal exceeds the threshold. The smaller the time, the faster and more aggressive compressor becomes. The bigger the attack, the more transients are passed through unprocessed.

The VeeComps have the quickest possible attack set at 5 ms, which allows the attack phase of most notes go through so they do not sound "squashed" or distorted. The attack time is less important for Soft mode since the compressor will smoothly attenuate notes as if "predicting" volume changes. The Hard mode will be more affected by the Attack control - use your ears to determine the best value.

TIP: Setting the Attack to maximum value of 40 ms will make the compressor ignore quick and short volume changes and ride the general volume instead. It is useful for program material and sub groups where you "glue" together already processed instruments

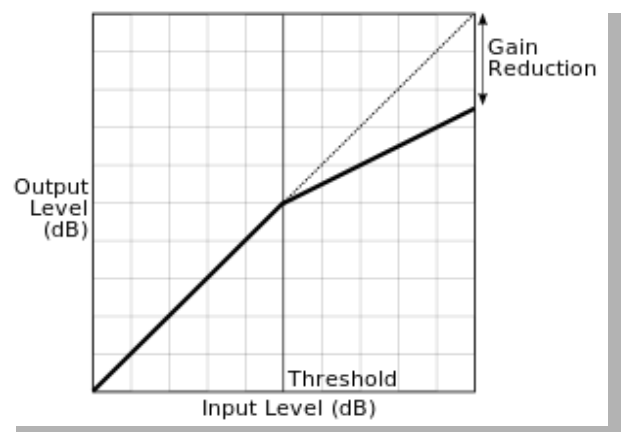
2.2.2 RELEASE

Release is the time taken for the compressor to return to the initial state after the volume level falls down below the threshold. Shorter release times can create a slight distortion but allow to process quickly played notes (the compressor quickly resets itself to grab another note), while longer can make the long notes sustain much longer. You can limit longer sequences without audible pumping (the compressor will "wait" until the passage ends).

2.2.3 THRESHOLD

The threshold is a volume level at which the compressor starts attenuating. Quieter sounds, which are below the threshold, will be ignored. Louder sounds, above the threshold, will be processed.

The Threshold knob sets up the threshold level, going from 0 to -40 dBFS. The more you turn it clock-wise, the more quieter sound will be processed. As a result, this will make the compressor more and more "sensitive" to volume levels and operate more aggressively.



2.2.4 RATIO

The exact amount of gain reduction is determined by the ratio value. For instance, 4:1 means that for every 4 dB exceeding the threshold only 1 dB volume rise will occur. In other words, the signal will be attenuated by 3 dB. 8:1 means that if a signal pierces the threshold by 8 dB, 7 dBs will be knocked off and there will be only 1 dB volume rise.

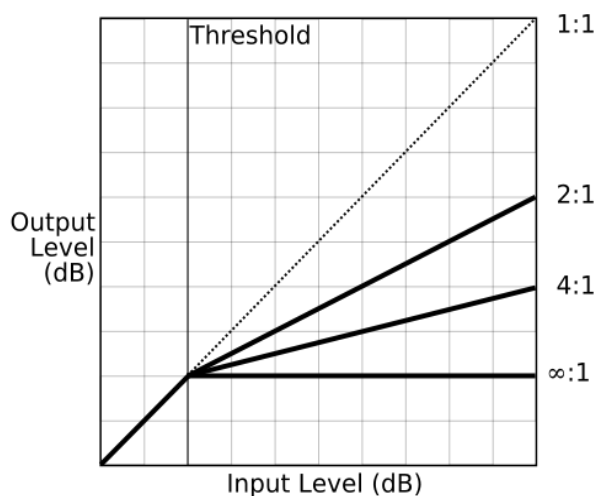
The exact formula to calculate the amount of reduction is $(R-1)/R$ where R is Ratio.

For instance, if input exceeds the threshold by 12 dB and the ratio is 3:1, the gain reduction will equal 8db.

$(3 - 1)/3 = 2/3$. Two thirds of 12 is 8...

Leaving those overly complicated math operations aside, how does the ratio influence the sound? Generally speaking, the higher the ratio, the more "obvious" compression is audible. Extreme values can squash input, sucking energy and realism from performance, while lower ratios allow for more transparent compression. Ratios lower than 4:1 are usually considered "realistic" while higher ratios contribute for more "processed" sound. There are no rights or wrongs, let your ears be the judge.

TIP: it is extremely difficult to "hear" a compressor. Even a true legend of the audio world, Mr. Michael Brauer, admitted that he needed three years to learn how to do it. No surprise there - how to hear a LACK of sound? If you dial in different values and fail to spot any significant difference in sound, do not worry. You will learn to "feel" the movement and vibe created by compressors with time, for now observe your DAW's VU meters and SEE what is happening to volume levels and dynamic ranges of your tracks



2.2.5 GAIN

The control allows you to make up for the gain reduction created by compression. Turn it clockwise to set the desired output volume. You will easily notice that the knob brings up the quiet parts, making the overall sound more "solid" and "juicy".

The effect is enhanced by the "tube power amp" placed at the output. The hotter the signal and the more Gain is dialed in, the stronger the saturation. The power amp circuitry is based on a classic "push-pull" amp design and thus generates odd harmonics.

3 VEE COMP MODELS

3.1 THE VEE COMP



This is a standard stereo model, the most versatile and universal of all VeeComps. It has a certain feature that is quite unique: an ability to **synchronize release times to the tempo of your project**. This is one of the most common tricks used by professional mixing engineers. As mentioned Mr. Brauer claims, the compressor should not be treated as a tool for controlling dynamics only. True masters can use a compressor to create "movement", make a mix "breathe".



Engineers have used compressors for that purpose for years and set release times according with delay charts that translated note values to milliseconds:

Greg Loskom 1/17/99															<u>DELAY TIME CHART</u>			Page 2	
BPM	Fr/Bt	1/4	1/8	1/16	1/32	1/64	•1/4	•1/8	•1/16	1/2T	1/4T	1/8T	1/16T	Bar Tm	Freq	Tick			
80.0	18.00	750.0	375.0	187.5	93.8	46.9	1125.0	562.5	281.3	1000.0	500.0	250.0	125.0	3.000	0.333	1.563			
80.5	17.89	745.3	372.7	186.3	93.2	46.6	1118.0	559.0	279.5	993.8	496.9	248.4	124.2	2.981	0.335	1.553			
81.0	17.78	740.7	370.4	185.2	92.6	46.3	1111.1	555.6	277.8	987.7	493.8	246.9	123.5	2.963	0.338	1.543			
81.5	17.67	736.2	368.1	184.0	92.0	46.0	1104.3	552.1	276.1	981.6	490.8	245.4	122.7	2.945	0.340	1.534			
82.0	17.56	731.7	365.9	182.9	91.5	45.7	1097.6	548.8	274.4	975.6	487.8	243.9	122.0	2.927	0.342	1.524			
82.5	17.45	727.3	363.6	181.8	90.9	45.5	1090.9	545.5	272.7	969.7	484.8	242.4	121.2	2.909	0.344	1.515			
83.0	17.35	722.9	361.4	180.7	90.4	45.2	1084.3	542.2	271.1	963.9	481.9	241.0	120.5	2.892	0.346	1.506			
83.5	17.25	718.6	359.3	179.6	89.8	44.9	1077.8	538.9	269.5	958.1	479.0	239.5	119.8	2.874	0.348	1.497			
84.0	17.14	714.3	357.1	178.6	89.3	44.6	1071.4	535.7	267.9	952.4	476.2	238.1	119.0	2.857	0.350	1.488			
84.5	17.04	710.1	355.0	177.5	88.8	44.4	1065.1	532.5	266.3	946.7	473.4	236.7	118.3	2.840	0.352	1.479			
BPM	Fr/Bt	1/4	1/8	1/16	1/32	1/64	•1/4	•1/8	•1/16	1/2T	1/4T	1/8T	1/16T	Bar Tm	Freq	Tick			
85.0	16.94	705.9	352.9	176.5	88.2	44.1	1058.8	529.4	264.7	941.2	470.6	235.3	117.6	2.824	0.354	1.471			
85.5	16.84	701.8	350.9	175.4	87.7	43.9	1052.6	526.3	263.2	935.7	467.8	233.9	117.0	2.807	0.356	1.462			
86.0	16.74	697.7	348.8	174.4	87.2	43.6	1046.5	523.3	261.6	930.2	465.1	232.6	116.3	2.791	0.358	1.453			
86.5	16.65	693.6	346.8	173.4	86.7	43.4	1040.5	520.2	260.1	924.9	462.4	231.2	115.6	2.775	0.360	1.445			
87.0	16.55	689.7	344.8	172.4	86.2	43.1	1034.5	517.2	258.6	919.5	459.8	229.9	114.9	2.759	0.363	1.437			
87.5	16.46	685.7	342.9	171.4	85.7	42.9	1028.6	514.3	257.1	914.3	457.1	228.6	114.3	2.743	0.365	1.429			
88.0	16.36	681.8	340.9	170.5	85.2	42.6	1022.7	511.4	255.7	909.1	454.5	227.3	113.6	2.727	0.367	1.420			
88.5	16.27	678.0	339.0	169.5	84.7	42.4	1016.9	508.5	254.2	904.0	452.0	226.0	113.0	2.712	0.369	1.412			
89.0	16.18	674.2	337.1	168.5	84.3	42.1	1011.2	505.6	252.8	898.9	449.4	224.7	112.4	2.697	0.371	1.404			
89.5	16.09	670.4	335.2	167.6	83.8	41.9	1005.6	502.8	251.4	893.9	446.9	223.5	111.7	2.682	0.373	1.397			
BPM	Fr/Bt	1/4	1/8	1/16	1/32	1/64	•1/4	•1/8	•1/16	1/2T	1/4T	1/8T	1/16T	Bar Tm	Freq	Tick			
90.0	16.00	666.7	333.3	166.7	83.3	41.7	1000.0	500.0	250.0	888.9	444.4	222.2	111.1	2.667	0.375	1.389			
90.5	15.91	663.0	331.5	165.7	82.9	41.4	994.5	497.2	248.6	884.0	442.0	221.0	110.5	2.652	0.377	1.381			
91.0	15.82	659.3	329.7	164.8	82.4	41.2	989.0	494.5	247.3	879.1	439.6	219.8	109.9	2.637	0.379	1.374			
91.5	15.74	655.7	327.9	163.9	82.0	41.0	983.6	491.8	245.9	874.3	437.2	218.6	109.3	2.623	0.381	1.366			
92.0	15.65	652.2	326.1	163.0	81.5	40.8	978.3	489.1	244.6	869.6	434.8	217.4	108.7	2.609	0.383	1.359			
92.5	15.57	648.6	324.3	162.2	81.1	40.5	973.0	486.5	243.2	864.9	432.4	216.2	108.1	2.595	0.385	1.351			
93.0	15.48	645.2	322.6	161.3	80.6	40.3	967.7	483.9	241.9	860.2	430.1	215.1	107.5	2.581	0.388	1.344			
93.5	15.40	641.7	320.9	160.4	80.2	40.1	962.6	481.3	240.6	855.6	427.8	213.9	107.0	2.567	0.390	1.337			
94.0	15.32	638.3	319.1	159.6	79.8	39.9	957.4	478.7	239.4	851.1	425.5	212.8	106.4	2.553	0.392	1.330			
94.5	15.24	634.9	317.5	158.7	79.4	39.7	952.4	476.2	238.1	846.6	423.3	211.6	105.8	2.540	0.394	1.323			

The method sure works but is rather time consuming and intimidating for beginners. Since you use a DAW and have your BPM punched in, why not make your compressor do the synchronization automatically? We have the technology, you know...

Uhm, I will be frank - I made this feature because I am tired of dialing in the values again and again and again... :)

TIP: the release time will always follow tempo changes of your project, maintaining the correct "note length " value at all times

When you flip the REL switch to the right, the compressor syncs with your DAW and sets up release time so they match note values: 8th, 4th, a half note and a full note.

NOTE: the left knob, labeled as MAN, does not work in this mode.

When you flip the REL switch to the left, the synchronization is disengaged and you can dial in the release time manually.

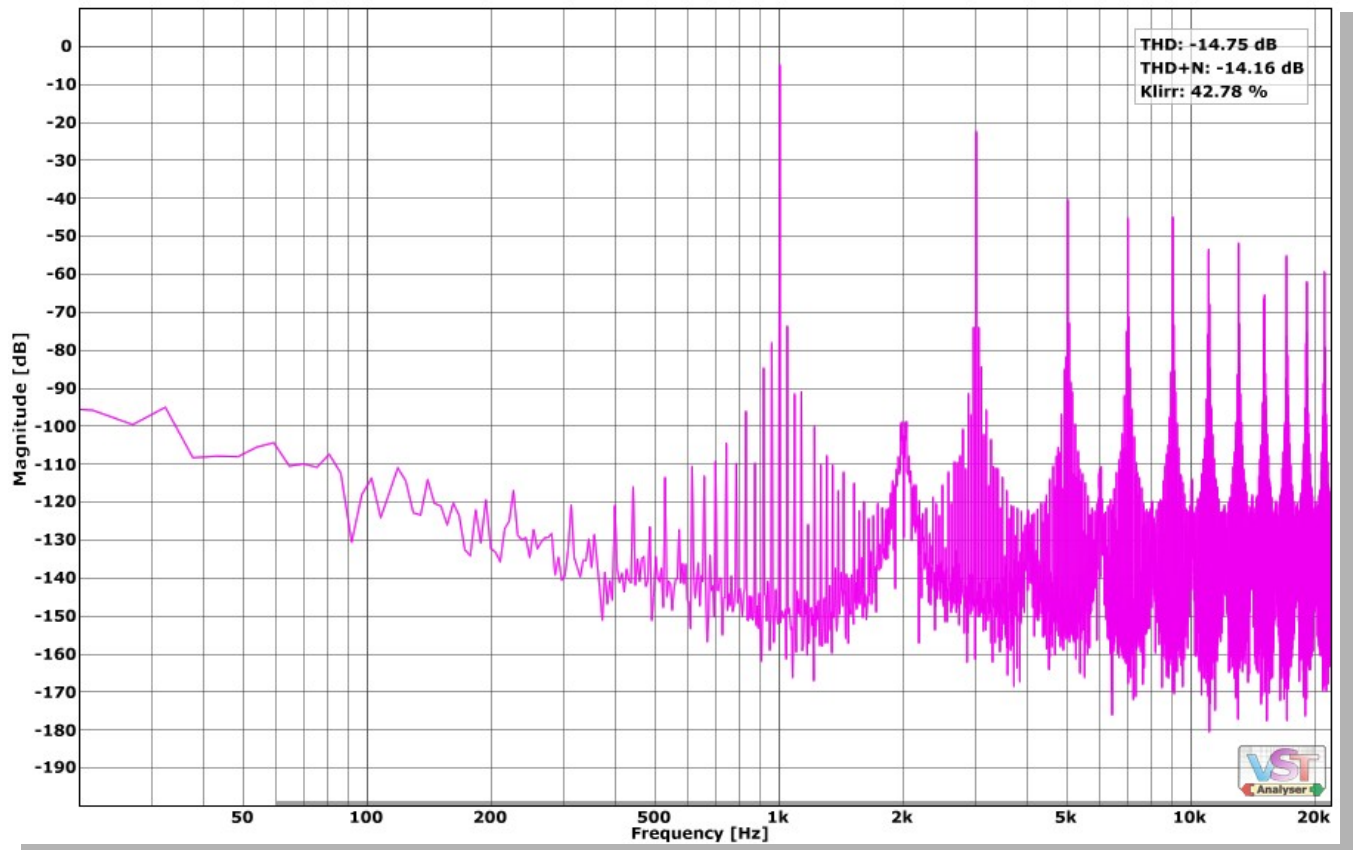
NOTE: the right knob, labeled as SYNC will not work.

TIP: the switch can be automated; this way you can set up two different release time for different sections of your song and flip between them at will

3.1.1 THE COLOR

Upon turning the VeeComp on with a power switch, you will notice a slight boost of the input signal as well as a slight change of sound. The unit is calibrated so the unity gain is maintained; the rise in volume is created by the power amp. To be more precise, your signal gets saturated with tube-like odd harmonics. The exact amount of saturation is dependent on the initial volume level and the frequency content.

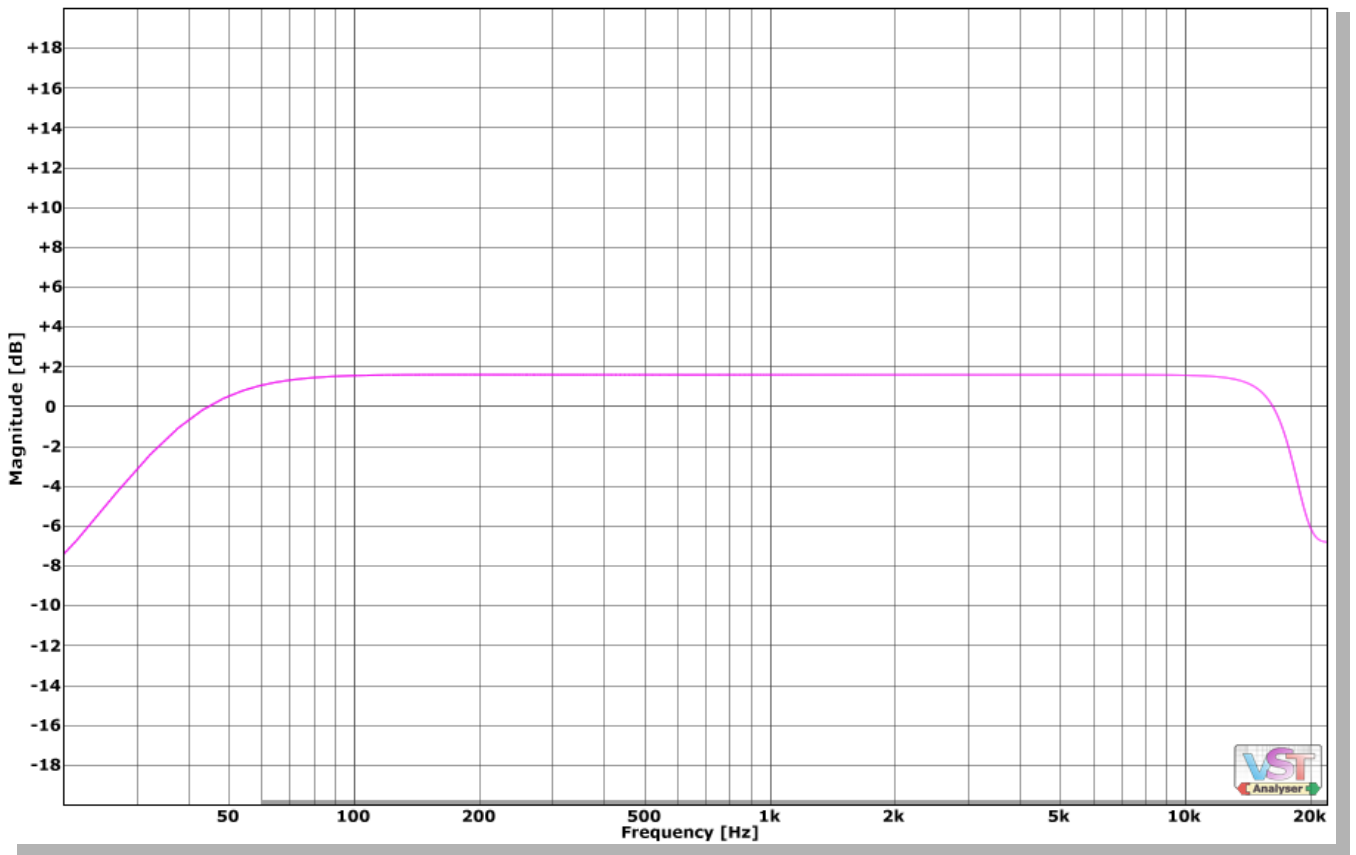
This is the harmonic distortion analysis (all controls, including Gain, are at initial positions):



This is a natural side-effect of the internal circuitry and is absolutely natural. Moreover, in most cases it will make your signal sound "better", "fatter", "more three-dimensional".

TIP: the more you compress the initial signal, the lower volume will be at the output. The more you crank up the Threshold, the "cleaner" the signal will be

The frequency content change is another side-effect of the internal modules.



As you can see, just by putting your signal through the VeeComp, you attenuate the inaudible "air" and sub-sonic "rumble", making the signal slightly cleaner and more focused.

Classic analogue equipment is famous for its ability to make the input signal "somehow better", "pleasantly colored" even when the signal has just been put through and all controls are on idle. The VeeComps try to mimic the effect to some extent.

3.2 THE VEECOMP DUAL MONO



Doubled compressors are encountered in most of real-life studios. Since most classic compressors are monophonic by nature and you often need to process a stereo signal, you can do it by setting up two compressors to deal with the left and the right channel independently. And this is exactly what the VeeCompDM is designed to do.

3.2.1 DUAL MONO OPERATION

This switch flips between the Dual Mono and Stereo modes. The stereo mode turns the lower compressor off (controls can be turned but the unit will remain dead) and the whole work is being done by the upper one. Use it as a standard VeeComp unit.



When you flip the switch to the Dual Mono mode, the incoming signal is split into two independent mono signals.

The top compressor will process the left channel and the bottom compressor will process the right channel. This is useful for "tilting" signals towards one of the sides or controlling the stereo image integrity. Thanks to this mode you do not have to worry that a loud right cymbal hit will attenuate the left hi hat - as it would be in the case of a classic stereo compressor.

TIP: imagine a situation where you have two hard panned guitars. Send them to a bus. Set up the VeeCompDM in the Dual Mono mode. Now you can compress both of the guitars separately, leveling them to the same volume level or unbalancing them according to needs

The "colorization" (saturation and EQ curve) is identical as in the case of the VeeComp.

3.3 THE VEECOMP MID-SIDE



This version operates on a MID/SIDE mode.

3.3.1 ABOUT M/S MATRIX

To put it as simply as possible, the stereo image consists of two elements: the information that is common for both channels (mid) and information that is unique for each channel (side).

The VeeCompMS allows you to process each of those channels independently.

3.3.2 INPUT CONTROLS



Due to the unique nature of the compressor, additional controls have been added.

	OPERATION	VALUES
INPUT MID	Controls the input signal level for the mid channel	Middle is unity gain. CCW - volume is lowered. CW - volume is boosted. The maximum boost is 2x the initial level
INPUT SIDE	Controls the input signal level for the side channel	

3.3.3 WHAT IS THE M/S COMP FOR?

You will easily see that ANY operation on the M/S matrix changes the stereo scene greatly. Even by turning the unit on you will notice certain hard-to-put-your-finger-on "shifts" and the more aggressive compressor's operation, the more mangled and twisted the signal will become.

What can the mode be used for?

Imagine you are processing a stereo vocal track with some "ambience" added. By boosting sides, you increase the "ambience" and "width". By attenuating sides you decrease the "width" and "ambience", making the main body of the voice more prominent.

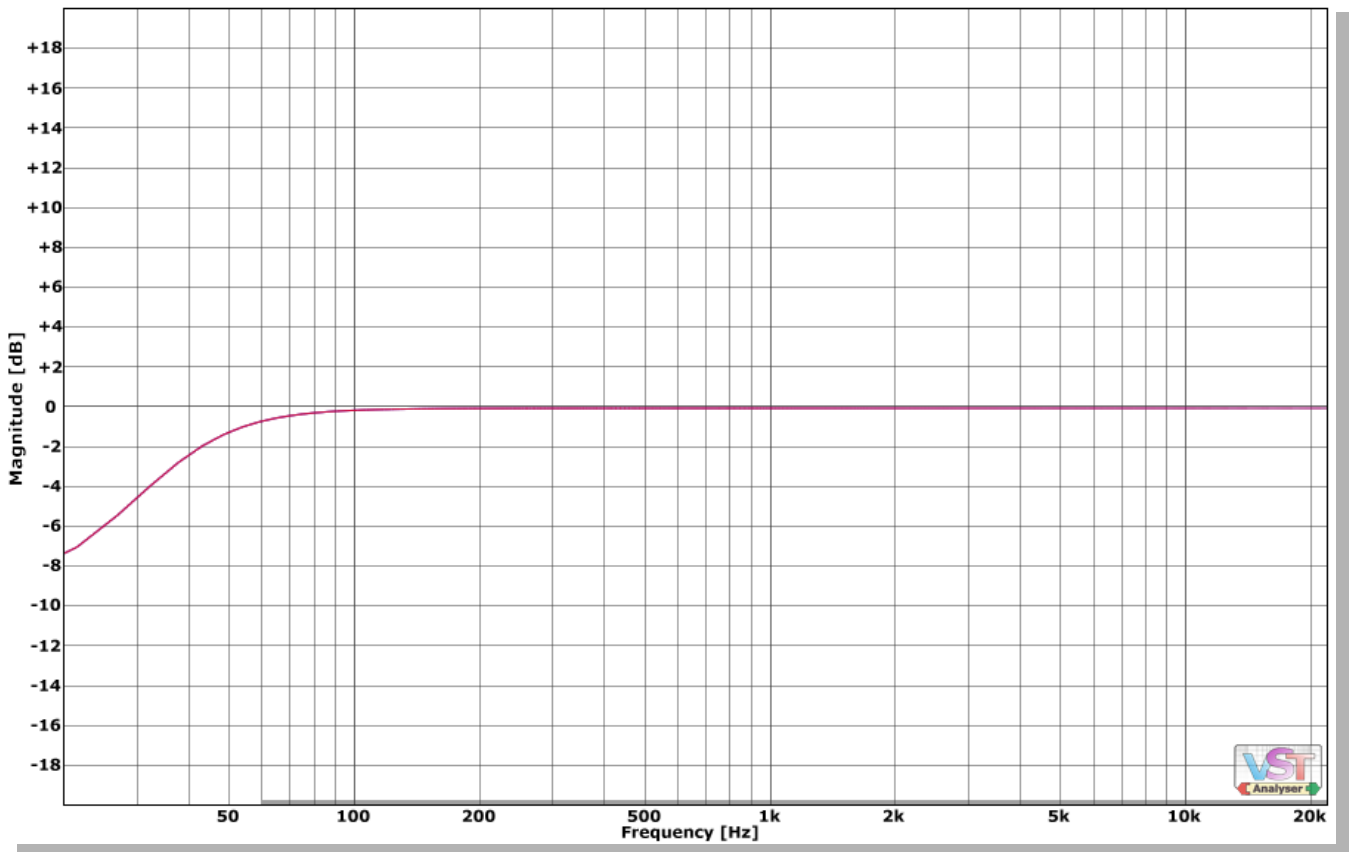
When you work on a sub group, like drums overheads, you can compress the mid (snare, kick, hat) without touching the side information (cymbals), thus increasing the sense of "space" and attenuating unneeded low mid information.

If you have a synth pad spanned between the left and right channels and you do not need it to overpower already crowded center area, you can attenuate/compress the mid slightly to allow the sides flourish.

Uses are limited only by your imagination and particular needs. Just keep in mind that when you work with a tool like that, "less is more"...

3.3.4 THE COLOR

The way the compressor colors an input signal is somewhat different. The "tube power amp" emulation is removed, since distortion in the M/S mode is not a very useful thing. Also, the BASS PASS control makes little sense for SIDE since most of the low end energy is usually placed in the MID anyway. The general EQ curve looks like this:



Additionally there is another filter used on the SIDE channel - everything below 120 Hz is mildly attenuated (it is not reflected in the above picture due to VST Analyzer limitations). This way the sides are scrubbed off sub bass information; the best sonic results are achieved when the powerful bass energy is equally divided between both speakers (i.e. is placed in the MID and removed from SIDE).

TIP: you can completely eliminate mid or side information by turning the corresponding INPUT controls CCW. This way you can listen to opposite channels in solo

4 CREDITS AND THANKS

The Vee Comps reuse code and graphic resources generously shared by **Antress**. If you have not met this brilliant creator yet, visit his page and enjoy tons of great VSTs:

<http://antress.blogspot.com/>

A very special "thank you" goes to Christian-WBudde for his great VST Plugin Analyzer.

<http://www.pcjv.de/>

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Greg Loskom for the delay chart

5 CONTACT

I hope the VeeBoostComp serves you well. Please give me your feedback here:

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Find my other plugins here:

http://vst4free.com/index.php?dev=Viper_ITB

I will be very happy to hear what you do with my tools and how they sound in your songs. :) Have fun!