

## Chapter 1

### Rules are for Intersections

When KuSh Audio unveiled the UBK Fatso back in January of 2009, I came up with a short list that reflected my thoughts process while I was developing the compressor presets. I'm restating that list here because it still captures my intentions perfectly, and my hope is it will encourage you to think about your ideas of what compression is and what it should and shouldn't be used for. In short, I want you to explore and experiment, to use the UBK Fatso to treat your sounds in ways you might not otherwise think were wise or advisable. tt

1. I wanted to create a collection of fixed-setting compressors that, with the turn of a single knob, could shape and tame any sound you throw at it, and be especially adept with those that are the easiest to screw up: vocals, drums, bass, acoustic and electric guitars, and pianos.
2. I wanted these preset comps to offer up several distinctly different 'flavors' of compression, each of which has a 'grab' and 'motion' that is totally unlike the others, in order to give the modern engineer maximum flexibility in terms of style, attitude, punch, and squeeze.
3. I wanted to make these compressors incredibly smooth and easygoing at moderate settings, but able to go to extremes (and beyond) to create sounds that are surprising, inspiring, and drenched in vibe. No matter how much you dig in, the results should be musical; it might be too much compression for you, but it will never be *bad* compression.

Despite it's incredibly simple interface, the guts of the UBK Fatso actually contain one of the most complex circuits I've ever seen in a piece of high end gear, and massive props go to Dave Derr for his ingenuity and creative approach to circuit design. Essentially, the UBK Fatso is a 4-Stage serial processor; when you run a sound through it, each Stage works its magic before passing it along to the next. This means that the effect of each Stage depends on what happened to the signal in the previous Stages. If you understand what each one does to the sound, you'll have an easier time controlling the cumulative effect of all four and shaping it to your hearts content.

The 4 Stages of the UBK Fatso are as follows:

- 1 – The Compressor**
- 2 – The Harmonic Distortion Generator**
- 3 – The Warmth Circuit**
- 4 – The Transformer Emulator**

The UBK Fatso is **identical** to the classic ELI Fatso in all regards, with the exception of Stage 1, the Compressor. I replaced Dave's Buss, GP, and Tracking compressor with Splat, Smooth, and Glue. The Spank compressor is the same on both units, and all the other Stages are the same as well.

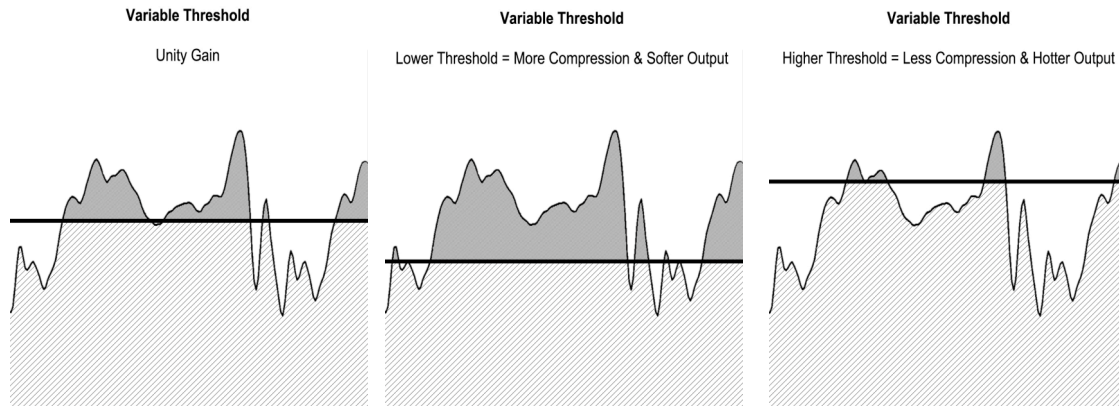
Now that you've got a picture of the overall signal flow inside the UBK Fatso, let's take a look at each Stage in depth and get a glimpse of exactly what it's doing to your signal... and why.

## Chapter 2 All the World is a Stage

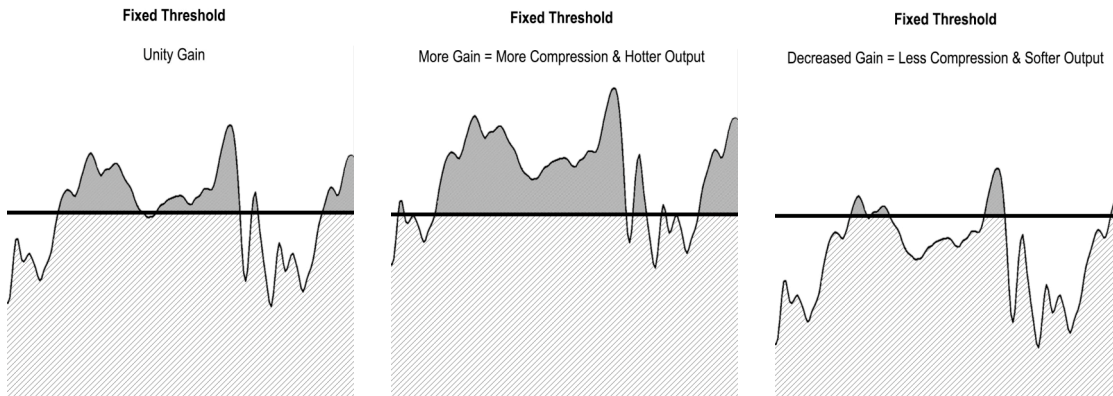
### Stage 1 – The Compressor

The first thing your input signal encounters inside the UBK Fatso is the input knob, which controls the gain, or 'drive', feeding the compressor section. In most compressors on the market, the threshold is variable and has its own control, which you raise or lower to control the amount of gain reduction. Setting a higher threshold means less signal crosses it, resulting in less compression; conversely, the lower you set the threshold, the more your signal crosses it, causing the compressor to dig in and squeeze your signal harder.

In the images below, the thick black line represents the threshold. The dark gray section of the waveform represents that part of your sound which triggers the compressor into doing its thing. (Note that this is not identical to the section of the waveform that actually gets compressed; if your curious as to why, [check the appendix](#) at the end of this manual.) As the threshold is lowered, you can see how this results in more of your signal being compressed.



The UBK Fatso, as you've no doubt noticed, has no threshold control, it simply has an input and output control. In this respect it shares the same design as the more classic vintage pieces out there such as the 1176, LA-2a, and Sta-Level; like them, the UBK Fatso has a fixed threshold, and you control the amount of gain reduction by raising or lowering the gain of the signal being fed to it. A lower input level means less signal crosses the fixed threshold, which equals less compression; as you increase the gain to the detector you increase the amount of signal crossing the fixed threshold, resulting in more squeeze.



So if both methods achieve the same end result, why would a designer choose one over the other? There are a couple of reasons why, but in the case of the UBK Fatso one factor is critical: as noted in the diagrams above, the variable threshold and the fixed threshold approaches result in a different overall signal level *after* the compression occurs.

If this seems a little tricky, bear with me; it's only confusing until you get it.

If you look at those images again, you'll notice that with the variable threshold approach, you apply more and more compression to a signal whose incoming level is fixed. As you lower the threshold across this signal, the quiet stuff stays where it is, and the loud stuff gets knocked down. The result? A signal that gets quieter the more you compress it, and louder the less you compress it.

But in the fixed threshold approach, the way you achieve more compression is by raising the level of the incoming signal, more of which then crosses the fixed threshold. The result is a signal that gets louder even as it gets more compressed. You can see this very easily on the UBK Fatso: just crank up the input knob, and watch that gain reduction meter light up more and more while the output gets louder and louder. The converse is also true: in order to reduce the amount of compression, you have to ease off on the input level, which results in a quieter signal.

*With the classic Fatso the threshold was extremely consistent from preset to preset, which meant that as you switched through them you would get a fairly identical amount of gain reduction. The UBK Fatso, however, is very much its own beast in this regard; the presets all have very different thresholds from one to the next, which means that you have to explore each one on its own terms. Check out the Tips & Tricks section for more ideas about what this means!*

<b>Threshold</b>	<b>Compression</b>	<b>Output Level</b>
Variable	Less	More
Variable	More	Less
Fixed	Less	Less
Fixed	More	More

Okay, sooo... what does it matter whether the signal is louder or quieter after compression is applied? The answer lays in the next section of this manual, which I have ingeniously titled:

## **Stage 2 – The Harmonic Distortion and Saturation Generator**

If you've ever used a guitar amp, or a fuzz pedal, or even a distortion plug-in --- in other words, if you've been playing with sound for more than a week --- you very likely understand how a distortion circuit reacts to signal level. The general rule is this: the hotter the signal you feed a distortion generator, the more distortion it generates in response.

Are you connecting the dots yet with Stage 1 yet? Don't worry if you aren't, connecting dots is my job so just pay attention and revisit the material as many times as you need; at some point, it'll click.

The primary purpose of the classic Fatso was to emulate the pleasing distortions and transient softening effects that you get when you push a signal harder and harder into analog tape; the original Fatso design didn't even have a Compressor Stage in it, it only had the other 3 Stages! Now imagine you've got this tape emulation circuit set up so that, like the venerable Studers and Ampexes of yore, the more level you give the device, the more it fattens the sound, rounds out the spiky transients, adds musical harmonics across the entire spectrum, and saturates and sweetens the high frequencies. Lovely! What could go wrong?

Now imagine you decide that your device would in fact benefit from having a compressor included, and the compressor needs to come first in the chain of processes. Well, if you put a variable threshold compressor in there, then (as you'll recall from the previous section) the more you compress, the quieter the resulting signal. The quieter the resulting signal --- you guessed it --- the less distortion you get when you pass it along to Stage 2. This would have defeated the entire purpose of the unit, which was 'more juice = more saturation and distortion and warmth'.

Thus, a fixed setting compressor was the logical choice, because you get more level as you lay into the compressor. More input = more compression **and** more distortion. This is how it is with analog tape; mission accomplished.

So what kinds of harmonic distortion are we talking about here? Primarily we're talking about the coveted second and third order harmonics, or the octave and the fifth, which means the UBK Fatso essentially enhances and adds subtle notes and sparkling overtones to your sounds in a way that is both musical and pleasing.

On top of this, Stage 2 has a wonderful soft clipper and saturation circuit. It is lightning fast and tends to act only on the very tips of the peaks of your transients, which makes it a wonderful way to apply a little more level control to your signal without having it sound more compressed. It took me about a year with the Fatso before I was able to really hear the effect of this clipper independent from what the Stage 1 Compressor was doing, so if you can't detect it be patient with yourself. The good news is that you can start training your brain to hear it, by using the UBK Fatso on your tracks without engaging any presets in Stage 1 (see the [Tips and Tricks](#) section for more thoughts on that).

So now you understand something critical about the UBK Fatso, and why it behaves similarly to analog tape: the harder you drive the input, the more you compress your signal **and** the more harmonic distortion, soft clipping, and saturation you get. The cumulative effect of all this transient shaping is that even when no compressor preset is engaged the UBK Fatso can have a radical effect on the punch and focus of your transients; if you add into this mix the compression of Stage 1, the result can be dramatically softer and rounder than the original signal. This may be what you want, or it may not. But as usual I have good news for you: you can use the Insert point on the rear of the UBK Fatso to change how the relationship between the threshold in Stage 1 and the distortion generators in Stage 2. In other words, once you understand how the sidechain works, you can set the UBK Fatso up to do more compression with less distortion, or you can set it up to do less compression with more distortion. When you're ready to go deeper with the UBK, see the [Sidechain Magic](#) section of this manual.

When you drive the input to the point where the Comfy light starts flashing, you've begun to hit the clipper, and your Total Harmonic Distortion levels (THD) are running about 1%. When you see the Roast light you're really working this Stage hard, THD can get as high as 5% or more.

### Stage 3 – The Warmth Circuit

Once the UBK Fatso is done adding harmonics and beef to your sound in Stage 2, it passes things along to the Warmth Circuit. Warmth is a wickedly fast limiter, which means it's a compressor with a fast attack, fast release, and high ratio. Warmth is so fast that it usually gets in and out with an absolute minimum of artifacts, even when it's doing a respectable amount of limiting. Furthermore, it only compresses the highest frequencies in your signal, leaving the midrange, lower midrange, and bass frequencies completely untouched.

On top of all that, Warmth has a "dynamic corner frequency"; what this means is that when you're only kissing the gain reduction meter, it's grabbing everything from roughly 2-4k and up. But as you dig in with the Warmth's threshold control, the corner frequency shifts so that at the most extreme setting it's grabbing something closer to 10-12k and up. The idea was that, as you do more and more limiting of the high frequencies, you affect a narrower range of them; otherwise, as soon as you started getting some good reduction going, you'd completely kill the life and air in the sound.

The net effect of this ingenious circuit is that it can do anything from subtly and gently taking the edge off of overly bright and edgy material, to powerfully reshaping and smoothing out harsh or brittle sounds that feel like icepicks in the ear, to completely crushing a source into a dark and creamy soup of analog fatness. As with the compressors, I encourage you to explore the extremes of the circuit to see what creative effects you can generate.

The Warmth Circuit, unlike it's cousin in Stage 1, is a variable threshold compressor. There is one button that selects from 7 discrete threshold settings; each time you tap that button, the threshold is lowered. Lower threshold = more compression --- or, in this case, more high frequency limiting, assuming you have enough signal to cross that threshold.

Sounds simple right? It is, but there's a big caveat, so *pay attention*.

Remember that once you've got a signal that crosses the threshold, any increase to the level of that signal will result in more compression (because more signal will cross the threshold). The ramifications of this become clear when you've dialed in your Warmth, you've got it dancing just right, and then you decide to either change the Stage 1 Compressor preset, or you turn the Input knob up or down. Now the amount of gain reduction in the Warmth Circuit is going to change, maybe a little, maybe a lot.

So the moral of the story is this: get your Input/Compression levels dialed in first and foremost (and if you're using the sidechain to shape distortion levels do that as well) **before** you begin to set up the Warmth control, because any subsequent changes you make with the Input knob or Sidechain will also change the amount of HF limiting the Warmth performs.

## Chapter 4

### Leave the Gun, Take the Compressor

Now we get to the fun part: the different ways that the UBK Fatso grabs, pushes, pulls, and otherwise bends sound. If you've read my product brochure, the following will be familiar to you; but if you're anything like me, you'll enjoy reading it yet again, because I'm so fascinated by sound that I can't pass up any opportunity to read another angle on it. Frank Zappa is often quoted as saying that 'talking about music is like dancing about architecture'; if that's the case, than I'd probably enjoy a good soft-shoe about Frank Llyoyd Wright because I can talk about music and sound longer than is probably heathy.

With that in mind, I give you my best attempts to describe the energy and attitude of the UBK Fatso presets.

**Splat** - this is my take on the comps built into my favorite 3-lettered vintage console, and it is by far the most unusual compressor of the bunch. It has a very distinct knee/ attack relationship which creates a wonderful 'pop' on the front of transient rich sources like drums, and the more you dig in the more that pop creates the 'splat' character. The medium release has a swimmy kinda motion which makes for a very vintage grab. At modest settings, it stiffens and reigns in drums, focuses a vocal, and enhances the vibe of the original sound while making it easier to manage. But when you dig in, wonderful things begin to happen. Drums develop thwack and hit you in the chest. Vocals get utterly creamy with a pleasing, old school hair. Loops come alive and breathe organically. Electric guitars get thicker, deeper, and stay pinned where you want them. But don't be afraid of those meters: push it farther, past that red light.

**Smooth** - this is as close to brickwall limiting as analog gets, the attack time is ~70 micro- seconds (!) and the release is ultrafast. It was designed for tracking, but it does have its uses at mixtime too, so (as always) experiment. My intent here was to craft a tracking style limiter that would allow the engineer to shave 3-7db off the peaks of instruments without sounding like much of anything happened, yet things are somehow sweeter, they behave better. When you print elements thru this preset, you'll find your mixes come together easier and faster, with less eq and compression. Things just 'fit', the way they did when we tracked to tape.

But again, what happens if you start to abuse this preset in the mix? 'Fast and smooth' begets and 'fast and aggressive'. This preset more than any other can add sheen to a sound

**Glue** -if I could only have one compressor for the rest of my life, this might well be it. The bottom end on this preset has to be heard to be believed. It is simply unreal

how easily this preset will lock the bass in place, punch it up, let all the notes ring clear as a bell, and make it loud while getting it out of the way. Engage the transformer to make the low end sing, even on iPod docks. If gluing the bass were the only thing the UBK Fatso did, it would still be worth the price. But Glue is every bit as versatile and surprising as the rest of this box, especially when pushed. It's an extraordinary drum compressor, imparting a distinct smack even as it makes the room explode. It's lovely on acoustic guitars, Rhodes, sitar... whatever.

But best of all, Glue is an incredible compressor for the 2-buss, hence its name. If you have any experience at all with mix compression, you know how tricky it can be to get the time constants right. Now imagine you had to pick one attack, one release, one ratio, and those choices had to work on the majority of mixes you slap the compressor on. That was what I was up against, and that's why this preset took the longest to develop *by a longshot*.

Hip hop, rock, folk, dance... I tested them all extensively with Glue, and believe I have created one of the rarest birds in the world of high end compression: a fixed setting compressor that can pull together almost any mix regardless of style, tempo, or energy levels. And depending on what you want to hear, it can sound as good at 7db of reduction as it can at 2db, so (as always) don't be afraid to push it, see what happens.

**Spank** – What can I say about Spank that hasn't already been said? It was Dave Derr's attempt to emulate the infamous talkback compressor built into the monitoring section on SSL consoles. If you've ever heard a Phil Collins song, you know the sound of this compressor on drums.

Spank is the one compressor I didn't modify, and that's because I *couldn't*. Spank lives deep in the heart of the Fatso's circuitry and it's workings are a mystery even to me. But that's just as well, because Spank is perhaps my all time favorite electric guitar compressor. Something about the way it grabs the strums, it has a way of bringing out the articulation no matter how hard you crush it.

But the real beauty of Spank is the way it combines with my presets to create an entirely new and unique set of compressors that were not purpose-built, but which nonetheless can be just as useful and exciting as the ones that were. More on that in the next section...

## Chapter 4

### Tips, Tricks, and General Mayhem

Below are my thoughts and tips on what is a decidedly different tool than the stock Fatso. Unlike Dave Derr, who was obsessed with getting all the compressors to react similarly to equivalent input levels, I essentially 'bent' the circuits to my liking in order to push the capabilities of the box to its limits, because that's (imo) where the fun and brilliance of the circuit lives. So with the classic Fatso you could step through presets and your levels and gain reduction would remain relatively constant. With the UBK Fatso, each preset is its own animal and needs to be explored on its own terms; some start off with a scream, others with a whisper. You have to be an active participant, because I wanted to encourage people to turn knobs, ignore meters, and see what happens when they experiment fearlessly.

**Using Splat:** There are two big things to be aware of with Splat:

1) To get it to behave the way it does, I had to create a bizarre gain structure inside the circuit. The effect of this is that it begins compressing when the input knob is very low, and it has a quiet output so you have to really juice the output knob to restore equal gain. So on other comps you might be at 6 and 4; on Splat don't be surprised if you end up at 2 and 9, or 10 and 1. If you put it on, for example, a drum buss, and you get to the 15-20db GR zone, it begins to do some kind of bizarre negative compression. Instead of blowing up, the room will start to disappear and drums get very 70's dry, but with an unmistakably modern degree of squeeze. I've never heard any other compressor behave this way, it gives you an unparalleled degree of control over the bigness of the room while preserving the original decay of the drums. Don't be afraid to play with the full swing of the input knob to hear the range of sounds it creates.

2) Because of the strange gain structure of Splat, the Warmth control behaves very differently. Even at maximum, you will likely only get 2-4db of reduction at best unless the material is extremely bright. Essentially, each step is now like a 1/4db high shelf attenuator at 12k, which allows you to super-fine-tune the top end of cymbals or vocals rather than coarsely crush them.

**Using Smooth:**

Because it's so fast, Smooth can kill the transient on anything; sometimes that's what you want, sometimes it's not. Drums are usually a no-go thru this comp unless you go parallel, they tend to lose their life --- although at least one user is reporting great success tracking with ~2db, so again, try it out, experiment. Drum

loops, on the other hand, can sound stunning when crushed this way. Track with it on acoustics, vocals, strings, horns... find the sweet spot you like (for me it's 5-7db on the peaks) and you'd never know any compression happened, it's invisible. Because it was designed for tracking, I made the warmth circuit a little more sensitive, so if you want to get really tapey rather than transparent you have the option.

In a mix, Smooth is an amazing compressor for really unruly signals, such as "out of control" hip hop or screamo vocals, or erratically strummed acoustics – when you want to just pin them down and not have them budge. All the comps do a great job of this, but Smooth generally does it with the least artifacting, and it pulls the sound forward rather than pushing it back. This also makes it perfect as one of two comps in series. Be warned: on some sources, particularly those with long or modulated decays or heavy low end energy, the lightning response of this compressor can make it break up at extremes, because it's literally riding the waveform. It won't sound good, and it won't be subtle. If it happens, just back off a little.

### **Using Glue:**

Glue is so straightforward in what it does, and it's so good at doing it, I don't have many clever things to say about it. This is an incredible bass compressor, and depending on your mix style it does brilliant things on the 2buss. In the mix, it can level the craziest bass parts while retaining a ton of transient punch on the tip of each note. On acoustics and piano, it has a very natural action, neither transparent like Smooth, nor soupy like Splat; it's right up the middle. On drums, it has a hardness, a stiffness, kinda the quintessential Empirical Labs sound. As always, you can't make it sound bad, so keep turning the knob past what you think is wise and see what happens.

### **Combining Splat & Spank:**

Lighting up both the Splat and Spank presets simultaneously results in an absolute gem of a compressor, and the code name for this amazing preset combo is **Squish**. On drum buss, it has a huge low end that lets the kick really smack through, while clamping down super firmly on the snare in an extremely soft, extremely fat, old school way. Magic happens somewhere between the 10-15db mark on reduction

### **Combining Glue & Spank:**

Let's call it **Spue**. To get this one you make all three lights glow; then, you run your

vocals thru it, and you turn that input knob up like there's no tomorrow. What else is there to say but "air"? For modern pop/ or rnb style vocals, where you want them pushed forward with zero movement and a shimmering, focused vibe, this is a great way to go and a dead-easy way to do it. People are laying in anywhere from 7 to 20db and liking it, whatever it takes to make that vocal shine. Don't be shy!

### **Sidechain Magic:**

If you'll recall from Chapter 1, I promised you a way to disentangle the Compressor from the Harmonic Distortion circuit using the sidechain. The 'how' is easy, and straightforward, the 'why' less so:. So, let's start with the 'how', for those who just want to get to it and don't need to understand the mechanics of it:

- 1) insert any kind of gain-modifying device into the sidechain (a cheap pre-amp is great for this job)
- 2) turn up the gain to increase the operating distortion of the UBK Fatso
- 3) turn down the gain to reduce the operating distortion of the UBK Fatso (if you're using a passive attenuator in the Sidechain, this is your only option)

So if you want less distortion per db of gain reduction, attenuate the signal in the sidechain. If you want more distortion per db of gain reduction, boost the signal in the sidechain.

That's the how, now for the why.

The signal in the Sidechain is actually an electrical current whose voltage modifies the threshold of the active Compressor preset. In other words, this insert point allows you to tap into the fixed threshold of the UBK Fatso and make it variable. Once again it is crucial to understand the interactivity of the Stage 1 Compressor and the Stage 2 Distortion circuits.

If you raise the threshold on a preset (by turning up the gain in the sidechain), you will simultaneously

- a) reduce the amount of gain reduction happening in Stage 1, which
- b) increases the level of the signal passing from Stage 1 to Stage 2, which
- c) increases the amount of distortion in Stage 2

And now, because the threshold is higher, you have to drive the Input harder to achieve X level of gain reduction, which means... you guessed it... more distortion as well. Thus, goosing the signal in the sidechain results in more distortion per db of gain reduction.

Conversely, if you lower the threshold on a preset (by lowering the gain in the sidechain), you will simultaneously

- a) increase the amount of gain reduction happening in Stage 1, which
- b) decreases the level of the signal passing from Stage 1 to Stage 2, which
- c) decreases the amount of distortion in Stage 2

With the threshold lower, you can keep the Input level lower to achieve X db's of gain reduction, resulting in less distortion per db of reduction applied.

*<insert clever closing words here>*

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