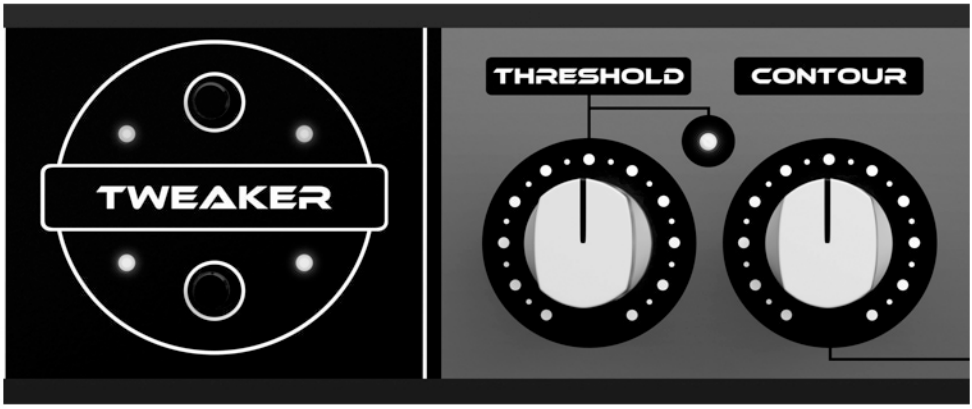
KUSH

TWEAKER

SIDECHAIN SHAPING COMPRESSOR



OPERATOR'S MANUAL

ubk

PART ONE:
COMPRESSION PHILOSOPHY

AKA *Why the Tweaker?*

Why can't a pair of Distressors glue a mix exactly like an api 2500? Why can't the 2500 level a vocal exactly like a Urei LA2a? Why can't the LA2a crush a drum loop exactly like a Valley People Dynamite? Why can't the Dynamite growl and distort without compressing, like an 1176?

Better yet, why can't one single compressor mimic *all* of those wildly differing compressors doing their compression tricks, and do so with such precision that even a veteran recording engineer would have difficulty telling the results apart in a blind a/b test?

Behold UBK's shamelessly self-serving claim #327: the Tweaker can replicate, with extraordinary authenticity, all of the above compressors doing the things they do best; it can also do a lot of things none of them can.

Conventional wisdom generally holds that a VCA compressor without transformers has one 'style' of grab (popular descriptors are snappy, punchy), while an opto with tubes and transformers has quite another style of grab (musical, silky); more importantly, conventional wisdom also holds that ne'er the twain shall meet.

On the flipside, almost every guy I know who not only designs compressors but also *understands compression* (trust me, that second camp is a lot smaller than the first) will acknowledge that the largest factor *by far* in determining how a compressor responds to, grabs, and releases a signal is not the vca/fet/vari-mu gain reduction topology, nor is it the transformer-transformerless-ic-based-discrete inputs and outputs. What makes the biggest impact on how a compressor behaves is the part that's least talked about and least understood by non-designers: the detector.

The detector is the part of the compressor which 'hears' the signal to be compressed; if you change how the compressor hears, you change how the compressor responds.

Armed with that understanding, my mind slowly began to form the question whose answer is at the heart of the Tweaker: what if a compressor offered so much control over its detector that it could, with a little patience and exploration, be made to replicate the *behavior*, if not precisely the tone, of scores of compressors doing innumerable styles and degrees of compression? Better yet, what if it could do so using existing, affordable, and (in many cases) outmoded analog technology that had been abandoned by modern designers in the often dogmatic pursuit of lower noise, lower distortion, and wider bandwidth?

So I set about creating the 'detector of my dreams', and in the process also made the 'VCA of my dreams'. Most modern VCA compressors use the same all-in-one detector and vca chips made by the same manufacturer, Tweaker's detector and VCA were custom designed from the ground up. Having those key parts of the circuit built from scratch using allowed me to spend countless hours with the Tweaker sitting side by side with the coolest compressors on the planet, massaging the circuit until I could get my baby to smooth a vocal like an LA-2a *and* suck a drum loop inside out like a Distressor. And I wasn't looking for 'pretty close', I was looking for 'so close most engineers would be shocked to know they were done by completely different compressors.'

Tweaker is an entirely new animal, and the controls that let you cop the best tricks from other smashboxes also let you go way beyond... and I do mean *way* beyond. While it's a bit cliché, it's also true: some tools are only limited by your imagination. Tweaker is one such tool.

So fire it up, dig in, and enjoy.

- Gregory Scott | ubk

PART TWO: TWEAKER SPECS

AKA *Just the Facts*

- Mono Compressor, Stereo Linkable via TRS-TRS
- Balanced Input & Output via XLR & TRS
- Sidechain Shaper® with Extensive Detector-Path Filtering
- Additional External Sidechain Insert via XLR
- Tri-Metering® for Simultaneous Input, Output, & Gain Reduction Monitoring
- Freq Response 10Hz-22kHz +/- 1dB
- THD = 003% - 10% (translation: a little or a lot)
- Bespoke, Discrete-Transistor VCA
- Bespoke RMS Detector
- Mix Control for Parallel Compression

PART THREE – FRONT PANEL LAYOUT

AKA *Why Does it Look Like This?*

In addition to being freakin' gorgeous, Tweaker's extensive front panel controls are purposefully divided into 3 sections, each of which corresponds with the 3 critical signal paths inside the compressor:

I. **Audio Path**: in the left-most group of controls you'll find **Drive, Mix,** and **Output** knobs, which let you adjust the various levels of audio passing through the Tweaker.

2. **Sidechain Path**: the middle group of controls contains the **Threshold** and **Contour** knobs, plus the **Sidechain Shaper** switch. This powerful trio lets you tell the Tweaker *when, where,* and *why* to compress, respectively.

3. **Detector Path:** the right-most group of controls contains the **Attack**, **Release**, and **Curve** knobs. Collectively, this is where you tell the Tweaker *how* to compress.

Part Four - Tweaker In Depth

AKA *What Do All These Knobs Do?*

Drive

Truth: Drive dictates the amount of gain pushed out of the VCA. Less drive = less distortion, more drive = more distortion. Because of the signal flow, this distortion is mitigated during the attack phase of compression, resulting in clearer, less distorted transients.

Hype: With most compressors, we're given one choice: turn the amount of compression up or down. If we're really lucky, we're able to adjust the amount of distortion and compression simultaneously via an Input level control. In the first scenario, distortion is what it is, and compression is the goal. With the second choice, more distortion = more compression, and vice versa, and that's that.

Because I'm equal parts 'unapologetic snob' and 'restless artist', there are many times when I find those two rigid choices overly restrictive and a good deal less than inspiring. Thus, from the depths of my neurotic studio meanderings was born the Tweaker's inimitable Drive knob. Drive is designed to give you complete control over the amount of saturation and/or distortion you get, and to do so

regardless of the amount of compression being applied with the Threshold control.

Conceptually, this is a small step forward for compressor technology – what the design world calls a 'soft innovation'. In practice, I believe Drive's implementation places this box in another universe entirely when it comes to shaping the energy and impact of sound.

When turned fully counter-clockwise, Drive significantly attenuates the input signal, thus increasing available headroom inside the circuit and reducing overall distortion. You can definitely get some filth out of this box, but you don't have to; at its cleanest, the Tweaker runs at .003% THD, making it one of the cleanest compressors around.

Here's a simple chart that will either clarify or confuse the issue for you:

	Low Threshold	**High Threshold**
Less Drive	Clean Compression	Little to No Processing
More Drive	Dirty Compression	Sat / Distortion Little to No Comp

Turning the Drive knob clockwise slowly increases the levels of --- and therefore the distortion produced by --- the amps that are fed by the discrete transistors in the VCA. Generating the dirt inside the VCA is a very different approach from most other boxes, which distort either the input or the output stages. For starters, this VCA uses shamefully outdated technology, and I like the grind it produces – it's a very dry 70's kind of grunge.

But beyond that, I made the circuit this way in order to solve what is, for me, a constant problem I have in the studio: distortion sounds cool, but kills transients. Compressing a distorted signal results in lots of flavor and zero punch.

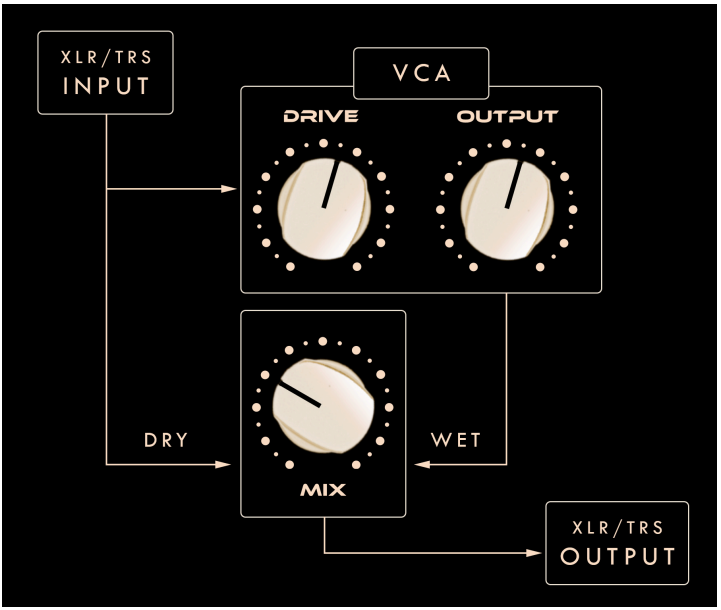
Think for a second about what a VCA does: during compression, the VCA is lowering the signal level by an amount reflected in the Gain Reduction meter, then restoring it. Here's the trick: if a VCA is overloaded and distorting, and then for a split second is asked to do, say, 8dB of reduction on your drum buss, for that split second the level produced by the VCA is reduced by 8dB… which reduces the distortion it generates. So the Tweaker's distortion is 'cleaned up' in direct proportion to the amount of compression being applied, which means you can grunge up your drums but still have the transient punch come thru; or, add some grit to a vocal, but not have the loudest parts degrade into unintelligible fuzz.

MIX & OUTPUT

Truth: Mix blends the unaffected Input signal with the post-VCA compressed signal. The range is 100% dry to 100% wet. Output controls the level of the VCA's output, prior to the Mix control. Output can attenuate or boost the signal by +/- 20dB.

Hype: Tweaker's Mix & Output controls were designed to work together to give you simultaneous control over both the relative and absolute levels of your Wet and Dry signals. This amount of control comes at a slight cost, namely: it is a slightly complex scheme that takes a few minutes to get your head around how it all works. But once you do, you again find that you have more control than more conventional parallel compression designs.

Even the simplest signal flows can be confusing, so let's take a closer look to make sure you get the most out of the Tweaker's unorthodox approach to parallel compression.



On the Mix control, counterclockwise is your Dry signal, at unity gain, straight off the Inputs, untouched by any further circuitry. Clockwise is the signal post-VCA, and therefore post-saturation/distortion/compression.

Output controls the output of the VCA, and therefore the level of Wet being fed to the Mix knob. It's job is to restore level that's been lost due to compression, so that you can achieve a good balance with the Mix control. If it were otherwise, you would always have the Mix control heavy clockwise as the compressed Wet signal would be significantly quieter than the Dry signal and there'd be no way to compensate for that.

NOTE: It is critically important to understand that the Output control does not adjust the overall output level of the compressor. If you find that you want more overall output from the Tweaker but do not wish to change your Wet/Dry relationship, turn the Output control

up and turn the Mix control down by the same amount. This will increase the level of Output from the VCA and increase the amount of Dry signal that's mixed with it. Conversely, if you want less overall level coming out of the Tweaker and wish to preserve the Wet/Dry balance, turn the Output down and turn the Mix knob up.

What could be simpler? Wait, don't answer that!

THRESHOLD

Truth: This controls sets the level at which compression will begin. If you want more compression, turn this knob clockwise. If you want less, turn it counterclockwise.

Hype: At last, a truly simple, straightforward control!

OVER-THRESHOLD LED

Truth: This LED illuminates when the incoming signal crosses the Threshold, and it stays illuminated until the signal drops below Threshold.

Hype: This amazing little light lets you know the instant your signal crosses the threshold, enabling you to see where compression actually begins, long before it accumulates to 1dB (the bottom-most LED on the Gain Reduction meter). The Threshold LED also shows you precisely where your signal drops back below threshold, but the best part is that it does these things independent of the attack and release controls.

Being able to see when a signal crosses Threshold before Gain Reduction accumulates, and being able to see when it's dropped below threshold even though compression is still occurring (because the VCA is still releasing)… this is another one of those deceptively simple things the Tweaker does that can end up taking on a life of its own in your workflow, if you know how to leverage its capabilities.

For starters, in the case of low-ratio/high-threshold compression – often found in mix bus and mastering applications – you will find this LED is capable of teaching you to hear incredibly light and transparent forms of compression that you might otherwise miss if you were looking to the Gain Reduction meter to cue your ears to the compression.

Conversely, if you have high ratio limiting coupled with a high threshold, the Threshold LED can train your ear to hear the subtle shaving of transients that occur with tiny amounts of limiting which still fall short of 1dB.

When you want to go beyond subtle transient reshaping and into heavy-handed density control and groove management, the Threshold LED is a formidable ally in the shaping of not only your levels but also the movement of the sound. It can help you to set the Threshold at a point where the transients are musically dipping below, and then knocking back up against, the knee of the compressor. In the process, you can see how how your signal will stay buried in compression regardless of the release.

Getting this LED to dance in time with your groove is often a great starting point for reshaping the movement of a drum bus, percussion track, acoustic guitar track, vocal…

I could go on endlessly about the uses for this light, but I'll end with one last gem: when two Tweakers are linked on stereo instrument and mix busses, the Threshold LED's are still independent, and therefore will show which side of your program is causing both channels to compress, and when they're doing so. This can reveal energetic imbalances in your mix; by no means are imbalances a bad thing, but sometimes they're unintentional and sometimes they signify problems which, if addressed, result in a clearer, tighter, possibly even wider-sounding mix.

CONTOUR®

Truth: Contour is only active when 'Edge Contour' is selected on the Sidechain Shaper.

Hype: Edge Contour is one of the coolest controls any compressor has ever sported; see next section for additional hype.

SIDECHAIN SHAPER®

Truth: Sidechain Shaper offers an array of on-board filters that are automatically inserted into the Sidechain of the Tweaker.

Hype: Of all the extraordinary capabilities the Tweaker exhibits, the Sidechain Shaper is arguably the most powerful and transformative. If I can offer this way of looking at things: the Drive, Threshold, Attack, Release, and Curve controls, both individually and collectively, let you dictate when and how the Tweaker compresses. But the Sidechain Shaper lets you dictate *why* the Tweaker compresses, or perhaps another way of looking at it is that you now have an unprecedented level of built-in control over which parts of the signal the your compressor pays attention to, and which parts it ignores.

In short, with a little studied practice, you can get the Tweaker to hear the way you hear, and to focus on the aspects of the sound you want it to focus on. The impact this has on your ability to sculpt the compression cannot be overstated.

If you've ever patched an eq into the sidechain of a compressor, or keyed a bass track or entire mix to the kick drum, then you understand what the Sidechain Shaper does. Essentially, it has various filters that eq the detector path of the compressor but not the main audio path, so the compressor reacts to your input as if it were completely different than it is. But to do what the Sidechain Shaper's ingenious bank of filters does, you'd need a spare pair of gentle outboard HPF's at 60Hz and 300Hz laying around. You'd also need an eq that has a 600Hz high shelf and 4k low shelf which

move in simultaneous opposition to one another (i.e., one goes up while the other goes down). And finally, you'd need an extra Clariphonic laying around, set to Shimmer, with the Full Frequency Switch in Bypass… and you'd need all of those eq's patched in and ready to go at the flick of a switch.

Since many of those filters don't actually exist in the analog domain, and since an attempt to replicate them with plugins would eat 2 extra i/o on your converters and mandate that you somehow eliminate all latency to and from your DAW, odds are extremely high that there is no way you can do what the Sidechain Shaper does regardless of how exotic or capable your system is, and there's definitely no way you'd have this kind of power effortlessly within reach at all times, all at your fingertips.

60Hz HPF

The 60Hz HPF is nothing new, in fact it's a time honored filter which allows the compressor to ignore subs, thus restoring punch while applying compression on a kick, bass, drum bus, or full mix. Use it anywhere you want the Tweaker to ignore the extreme bottom end when doing what it does.

300Hz HPF

The 300Hz HPF is a very special filter, and is much higher than the HPF's you'll find on other analog boxes. Indeed, its inspiration came from the UBK-1 plugin, which has a variable HPF that sweeps up to 500Hz, but which I consistently found myself setting around 300Hz for things like intimate male vocals, acoustic guitar, fat synths pads and stabs… basically any sound with a lot of body that can easily swamp a compressor.

Anywhere you want the low-mid warmth and fullness to remain relatively unsquozen while controlling the midrange frequencies and up, this filter is the ticket. Try it on full mixes too, where it can allow

you to compress more assertively without causing the mix to choke or feel congested.

TREBLE SMASH

Treble Smash is what you get when you stick a Clariphonic in the Sidechain Insert, set it to Sheen, and bypass the Full Frequency. On one particularly experimental day when I was patching various weird things into the sidechain of an early Tweaker prototype; at some point the Clariphonic at the top of my rack caught my eye, and my world has never been the same since. In that moment it occurred to me that since the Clariphonic has the ability to lift up the top in ways no other eq can do, inserting one into the sidechain of the Tweaker would likewise allow it to press those high frequencies back down in a way no other compressor could.

Not only was my hunch correct, the resulting effect vastly outstripped my expectation. Used subtly, Treble Smash produces an effortless softening and thickening of the top end in a way that is extraordinarily similar to analog tape; there are no transient clicks, no strange pumping, just a gentle, round flavor of density. If you really dig in, you get something more akin to the extremely distinct and recognizable sound we've all come to expect from FM radio; it's at once shiny, present, and smooth.

Treble Smash can rescue brittle acoustic guitars, screechy or honky vocals, brash overheads… anything where the upper mids, presence, and treble bands are attacking the ears, it will subdue them resoundingly. It can also take tambourines, shakers, rimshots, and other overly-fast sounds and turn them into pure liquid, rounding out not only the transients but also the groove itself, spreading the pocket deeper and wider.

It's an effect you've likely never had access to before, so my suggestion is to spend some time getting to know it on all kinds of sources and material. Experimentation is likely to produce big rewards.

EDGE CONTOUR

The Edge Contour is, for me, the control that puts this machine over the top in terms of flexibility and versatility. The concept is straightforward enough: straight up at 12 o'clock, the sidechain is unaffected and the compressor behaves the same as if the Sidechain Shaper were set to 'Flat'. As you turn the knob counterclockwise, Tweaker becomes more and more responsive to low mids and bass, and less responsive to mids and treble. Conversely, as you turn the knob clockwise, Tweaker becomes more responsive to mids and treble, less responsive to low mids and bass.

Tweaker achieves this by chaining a high shelf and a low shelf together, and moving them in opposition to one another; as one shelf goes up, the other goes down. It's a trick that's been used in the tone stacks of guitar amplifiers for more than half a century; I'm glad to be the first to stick it in the sidechain of a compressor, because it's usefulness is nothing short of remarkable.

Lately I've become addicted to reaching for Edge Contour when I want to 'regroove' a drumbeat in extremely specific ways; one of my favorite uses is to take an otherwise flat or 'heavy' beat and pull the hi-hats upwards on the 'and' (as in the eighth notes denoted by one-and-two-and-three-and-four-and). I'll turn the Contour knob heavily to the left to focus the Tweaker on the low end, then define the degree of hat snap by massaging the attack until the beat is pumping upwards with a strong 'chik'. I'll then take that exaggerated counter-rhythm and blend it back in parallel with the Dry signal until it sounds like the drummer was playing a totally different groove altogether. Depending on the time constants and degree of blend, it won't even sound compressed, just tightened and reshaped. A faster Attack and heavier Mix will tighten and regroove in one stroke.

Twisting Edge Contour to the right is a lovely way to move into mid- and high-frequency specific compression in a way that's more subtle and broadband than Treble Smash. You can tailor the amount of

smoothing on the honky part of a vocal in relation to the sibilants, or growl on guitar vs. the hash, or the bite of a VI synth vs. the fizz.

Edge Contour is also killer on a mix, as you can dial with extreme specificity how much low end 'pump' you want the compressor to impart in relation to the mid and high frequency glue. I often like it two or three ticks to the left, getting the Threshold LED to flicker with the transients, then massaging Curve and Release until things are swinging juuust right.

ATTACK

Truth: Attack determines the speed with which Tweaker applies its Gain Reduction, with a range from 20 *micro*seconds to 70 milliseconds.

Hype: Tweaker doesn't reinvent Attack, but it does offer a new experience of the animal by significantly expanding its range outwards in both directions. On the fast side it's absurdly fast – 20 microseconds at its fastest --- but it balances that aggressive capability with a downright leisurely 70 milliseconds at the other extreme.

In practical terms, this means the Tweaker is capable of shaving all the transients flat, or letting all of them thru with a satisfying degree of impact & transparency.

For those used to defaulting to slow-attack / fast-release compression, you may find that the slowest attack is a lot slower than you're used to, and setting it somewhere between noon and 3 o'clock produces more familiar results.

As with all controls on the Tweaker, each click makes a meaningful difference to the sound, so you won't be struggling to hear what this thing is doing as you step thru the options; on the flipside, each increment is close enough to the adjacent steps that you can find pretty much any degree of transient snap you're looking for.

RELEASE

Truth: Release determines the speed with which the Tweaker reverses the Gain Reduction and restores your signal's level. The range is 20us to 500ms in a single stage, or 500-7500ms in two stages.

Hype: Of all the controls on a compressor, it seems to me that Release has traditionally been the least sexy and most underrated of all. If I have my way, the Tweaker is going to change that forever.

To be fair, the fact that Release is generally overlooked is understandable enough; since compression is, in the current world of music production, generally used in very audible ways to create large-scale changes in the texture, density, and energy of sounds, the modern engineer's mind is captivated by thoughts of fast Attacks and high Ratio's.

But once you go beyond thinking of compression as 'dynamics control' and start thinking of it in terms of 'movement', Release quickly steps to the front as the control to keep your eyes (and ears) on. The more time I spend picking the brains of the masters of this craft, and the more time I spend parked between high resolution monitors, the more I've come to understand that nothing offers as much power over the ability to define (and re-define) the sound's groove as the humble Release control.

Armed with that understanding, I wanted Tweaker's release control to offer the operator new inroads into truly new territories. On the first two prototypes, the Release ranged from 100ms to 1500ms, and I kept coming up against the reality that the fast wasn't fast enough, and overall the whole affair wasn't 'interesting' enough, to give me access to all the flavors of movement that spark my creative drive.

'Not fast enough' was a simple matter, I just made it faster by changing the timing capacitor inside the circuit. 'Not interesting enough' was a whole different animal entirely, one which required a more philosophic approach to what I wanted to hear, and why. At some point, for reasons I still cannot explain, I began to fantasize

the wicked grab of the Tweaker's VCA married to the spongy, unfailingly musical release of my (vintage, hot-rodded) LA2a.

The rest, as they say, is history, and the result is available with the press of Tweaker's Fast/Dual switch. Fast is the same as any other compressor with a variable release: it is linear in nature, and behaves much as you would expect. Dual, however, is a very special mode that gives the Tweaker the same 2-stage release found in LA2a's. What that means is that the Tweaker will release the first 50% of gain reduction very quickly, and the second 50% much more slowly. This is how LA2a's are able to be effective at being both fast and transparent when peak limiting; they grab the really loud stuff very fast and let it go very fast, but they 'ride' the more average-level part of the program more casually, and it's that second, slower stage that allows it to remain musical and gentle even when doing a lot of gain reduction.

But where the LA2a's releases are fixed, an inherent byproduct of the photosensitive cell that reads the music's energy, Tweaker's second stage is fully variable and corresponds proportionally to the first stage. So the more you turn the knob clockwise, the slower both stages become. At it's slowest, the Tweaker will take over 7 seconds to fully release its gain reduction. Coupled with the slowest attack, Tweaker may well be capable of applying the slowest compression anywhere.

To be clear, there's a lot more at stake here than artfully squeezing a vocal, bass, guitar, or anything else that LA2a's famously squeeze so well. In practice, you will find the Dual release to be an extraordinary tool for a shockingly tight, 'bone dry' style of compression that no other compressor I've ever used can do with such finesse and flexibility. I'm constantly amazed at how heavily I can lay into a sound when the Dual stage is active, and the result is both uncannily transparent and improbably firm. On drums it's a no brainer, delivering one of the punchiest flavors of smack I've ever heard. But try it on unruly vocals, stabbing synths, basses of all ilk… it really is a whole new world to explore, one which still manages to surprise me in all the best ways.

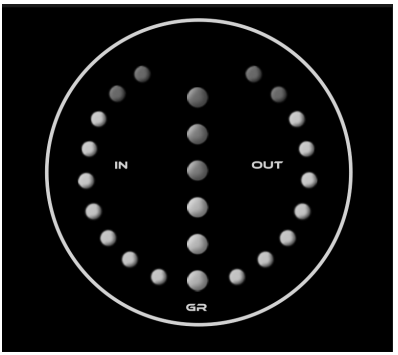
CURVE

Truth: Curve controls both ratio and knee simultaneously. Counterclockwise is 2:1 soft knee, clockwise is 30:1 hard knee.

Hype: Lots of compressors have a control to adjust the ratio of compression. Very few compressors have a control to adjust the knee of the compressor. And to the best of my knowledge, only one compressor on the planet has one control to adjust both the ratio and the knee, simultaneously: yes, that's right, the Tweaker has just such a control, and it's called 'Curve'.

Curve starts off low and gentle, with a relaxed 2:1 ratio that is applied with a soft knee. As you turn it to the right, the ratio gets progressively higher, and the knee gets progressively harder. At full clockwise rotation, Curve control produces an aggressive 30:1 hard knee limiter that grabs with a ferocity that very few other compressors have ever been able to achieve, and certainly not with the degree of control and flexibility that the Tweaker possesses.

PART FIVE - THE TRI-METER®



AKA *So many pretty lights!*

More than any other feature, the Tweaker's Tri-Meter sets it apart, both visually and functionally, from every other analog compressor. As functional as it is beautiful, this meter array allows you to visualize, simultaneously and at-a-glance, the levels of your unprocessed Input signal, the Tweaker's Output, and the amount of Gain Reduction. I'm not aware of any other hardware unit that allows for such easy reference to everything that's going on with the signal.

Several key aspects make Tri-Meter a thoroughly modern tool. First, rather than the traditional/universal 'bar graph', Tweaker's Gain Reduction meter uses a Single Point Array®. That means only one LED is lit at a time, creating a highly visible, singular dot that dances up and down in time with the compression itself.

In practice, you'll find that the Single Point Array makes it incredibly easy to perceive the 'movement' of your gain reduction. In particular, using this meter every single day for months on end has caused my ears to become deeply sensitive to how the compressor's Release time affects the 'swing' of the groove, and also the 'dry' vs. wet' quality of the compression, and (coupled with the attack) the transparency vs. audibility of the entire affect being applied.

Over the years, I've found that the presence of numbers on a Gain Reduction meter somehow discourages people, however subtly, from applying "too much" compression. Since my own artistic bias is to simply listen and go with what feels right, I have --- probably to the great consternation of many --- left dB values off the meter. But for those interested in what each LED actually represents, here's the breakdown:

Moving on to the humble Input and Output meters, even these have received a bit of a philosophical overhaul. In my humble opinion, the traditional design of meters contains a bias against distortion, a bias I don't share. More than that, the levels they report are rooted in a thinking that dates back to the habits and practices of recording to analog tape. I understand why, I'm an avid tape lover myself and have 2 machines that are central to the artistic side of my musical endeavors.

But most engineers today, especially those who began engineering in a DAW, think almost exclusively in the dBFS scale, where 0dB is an absolute ceiling. Beyond that 0dBFS celing there are no more dynamics, only hard-clipped distortion, and below that 0dBFS ceiling you're mostly in the clear. But analog gear is different than digital gear because it can begin to distort long before the hard-clip ceiling is reached.

And so it is that most digital meters don't show red until you're very close to 0dBFS, which makes sense. The only trouble is, most analog meters show red anywhere from 14-20dB *lower* than 0dbFS, because that's where many analog designs begin to run out of headroom and slowly begin distorting.

With all of this in my head, I decided that the Tweaker's Input and Output meters--- much like the Gain Reduction meter --- would not be labeled with any dB value, and in fact do not obviously indicate any specific level at all. To be clear: these meters very much do represent specific levels, but I left the scales off the front panel because I wanted to present several reference options in the manual, depending on your recording rig's a/d calibration level,

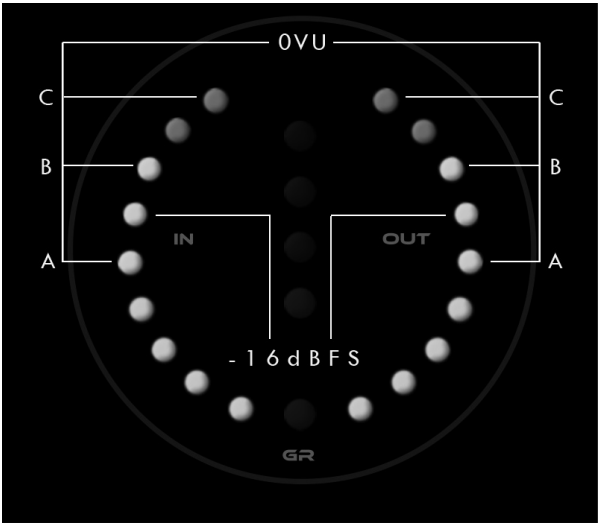
your basic engineering style and predeliction for --- or aversion to --- distortion.

And with that, the image below shows the Tri-Meter calibration, custom-tailored for you. Just figure out which of the following statements is most likely to come out of your mouth and you'll have a good idea of where you generally want to see these meters peaking.

A - *I don't ever want to hear this thing distort, ever.*

B - *A little color never hurt anyone.*

C - *How dirty can it get?*



PART SIX - STEREO LINK

AKA *Syncronizing multiple Tweakers*

Truth: Patching a TRS cable from this jack to the same jack on another Tweaker enables both compressors to respond identically to incoming signals.

Hype: I can hear some of you already: "what, you're gonna tell me you've made the Stereo Linking cooler than other stereo linked compressors?" Well, yes, that's exactly what I'm about to do.

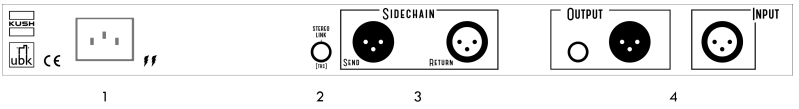
Tweakers use a TRS cable for linking; the 3-conductor connection allows for linking of both the sidechains *and* the rectifiers that feed the detectors. That's way more technical than you probably need, so here's the translation: linked Tweakers will in effect be seeing the exact same signal *and* responding to it exactly the same way. As such, they will track with the same precision and responsiveness previously found only in true stereo compressors, which have one detector and one set of controls for both channels. For those who value precision & stability in their stereo imaging, that's no small thing!

Important: as with any pair of mono compressors, when running two Linked Tweakers, you must set up *both* sets of controls to mirror one another, otherwise the compression will be identical but the output levels may be very different.

One exception to this rule is that you can set the Sidechain Shaper differently for each unit, so if (e.g.) you've got cinematic bass explosions on one side of a film mix, you can set that Tweaker to ignore the subs and let the other unit track the low end. Doing that would get you perfect bass tracking while the cinematic stuff gets ignored by both comps. Clearly I'm a nerd, because super-esoteric techniques like that inspires me, they make me want to crush and bend sounds not just for the art that results, but for the sheer enjoyment of the activity itself.

Part Seven - The Rear Panel

AKA *The Gazintas and Gazoutas*



The connectors, from left to right:

1. **AC Power.** 110-260V, Tweaker doesn't care, just plug it in.

2. **Stereo Link.** Use of a 3-conductor TRS-TRS cable is **mandatory**

3. **Sidechain Insert.** XLR Balanced Send & Return. Active only when the front-panel Sidechain Selector Switch is set to "XLR Insert".

4. **Input & Output**. Balanced TRS & XLR. You can plug unbalanced stuff in without special cables, Tweaker doesn't care. As a general rule, you can use both Output jacks simultaneously without issue; sometimes, things might not cooperate, but odds are you'll be fine.

Part Seven - Credit
Where Credit is Due

AKA *No Man is an Island*

The amount of time, work, and persistence that went into the making of this product cannot be overstated, nor can I exaggerate the gratitude I feel for those geniuses who have generously agreed to put up with my "idiosyncracies" and helped me bring such an exceptional tool to market.

In alphabetical order:

Kevin, my good friend, tone guru, and king of the Kush Tech World. He conjures up most of the electrical guts of these boxes and

makes possible everything that comes after. He is a genius and a gentlemen of the first order.

JP, a friend, a mentor, and the undisputed master of saying 'you guys made a nice little circuit, now excuse me while I make it perform better in every possible way'… without ever actually saying that. JP has dug me & Kevin out of more technical and design holes than I can count, and he has helped Kush go from cobbling together prototypes with 8 million wires to manufacturing properly-designed, tightly spec'd units that sound identical, behave identically, and enjoy an extraordinary level of reliability.

Olga, yet another friend who, aside from being the most sassy and no-nonsense Russian woman I've ever met, is also a deft hand at PCB routing and layout and can whip a chassis or front panel into existence without blinking an eye. Whenever you look at or inside a piece of Kush gear, you are seeing her handiwork everywhere.

Sarah, the woman who makes my days worthwhile. She encourages every idea I have that's worth encouraging, and wisely convinces me to abandon the ones that aren't. She also possesses a wicked mind for business, and it's safe to say Kush is the success it is because of her ceaseless help and razor-sharp instincts. She is also very easy on the eyes, a fact which did not escape my notice when I first approached her one day in a New York City cafe... but that's a story for another day.

KUSH

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