SHARK

PLUGS

ENGINEERING EDITION / VERSION 1.0

SHARK DIMENSION

Musical stereo depth, width and controlled space

DESIGN INTENT

Make space around the music without weakening its center of gravity.

USER MANUAL / DSP NOTES / WORKFLOWS / MEASUREMENT / TROUBLESHOOTING

DOCUMENT MAP

From first sound to technical verification

This edition is written for producers, mix engineers and mastering engineers who want both an immediate workflow and a clear mental model of what the processor is doing.

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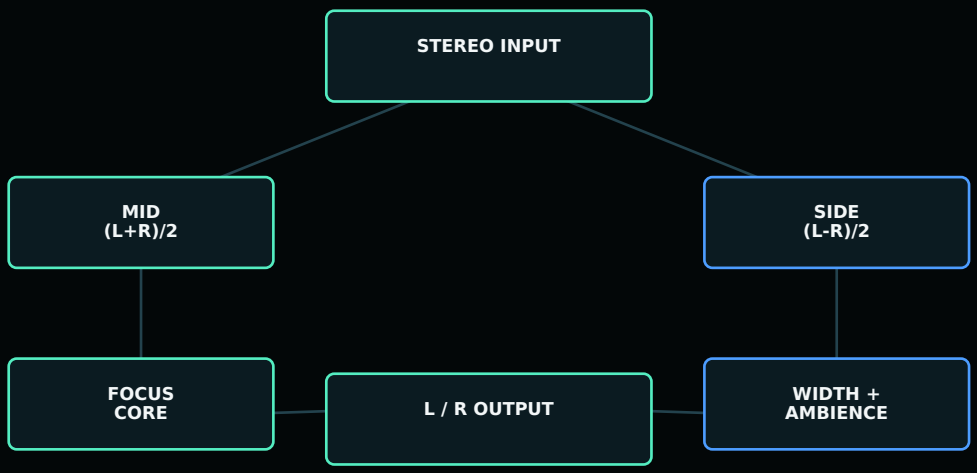
ENGINEERING PRINCIPLE	A widener should be judged at equal loudness, in mono, and at several monitor levels. If the processing only feels impressive when louder, it is not yet a trustworthy setting.

A spatial processor, not a stereo trick

Dimension separates the stable center of a stereo image from its difference information, then creates controlled short-time decorrelation around that center. The musical aim is depth and placement rather than an exaggerated left-right stretch.



WHAT STAYS STABLE

Lead vocal, kick, snare, bass fundamentals and other shared L/R information primarily occupy the Mid path. Focus can reinforce this core in proportion to the spatial amount.

WHAT IS PROTECTED

Low Anchor reduces widening in the low-frequency Side path. Mono Below and Mono Safe provide an additional translation layer when the material becomes correlation-sensitive.

WHAT OPENS

Existing Side information and generated micro-ambience form the outer field. Dimension controls the total contribution; Depth and mode control its apparent distance.

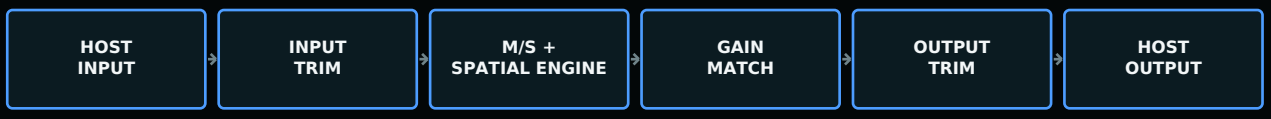
WHAT TO LISTEN FOR

A successful setting creates more room around important elements without moving the vocal backward, softening transients, or turning bass weight unstable.

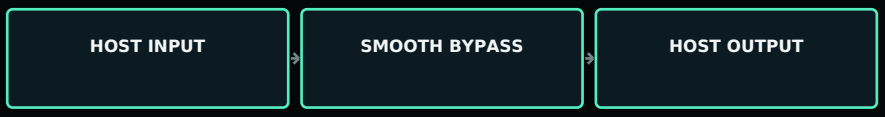
ENGINEER NOTE	The apparent width of a mix is often limited by center authority, not by a shortage of Side level. Raising Focus while opening Dimension can sound larger than simply pushing width harder.

Gain structure before spatial judgment

Dimension treats the operating level, spatial decision and delivery level as separate stages. This makes preset browsing repeatable and allows Gain Match to compare the actual processing rather than a loudness change.



BYPASS PATH



INPUT TRIM -18 TO +6 dB

Set the internal operating level before processing. Zero is at twelve o'clock. Input Trim remains fixed while factory and user presets are browsed.

OUTPUT TRIM

Final manual level after processing and Gain Match. It also stays fixed through preset browsing, so delivery level remains a deliberate decision.

PRACTICAL TARGET

For hot mastering or mix-bus material, begin near -6 dB. The correct value is the one that leaves comfortable headroom and stable meter behavior; it is not a mandatory calibration number.

METER ORDER

Input meters follow Input Trim. Output meters follow spatial processing, Gain Match and Output Trim. Compare the two only after transient peaks have settled.

LEVEL DISCIPLINE	Do not use Output Trim to hide an over-aggressive spatial setting. First correct the spatial balance; then set final delivery level.

Five controls, one interacting field

The controls are intentionally interdependent. Dimension establishes the amount, while Focus, Depth and Low Anchor decide whether that amount feels stable, distant, weighty or diffuse.

CONTROL	PRIMARY ACTION	INTERACTION / FAILURE MODE
DIMENSION	Scales original Side energy plus the generated decorrelated ambience.	Too much can make transients feel detached or reveal phase sensitivity. Re-balance with Focus, Depth and Low Anchor before simply reducing Mix.
FOCUS	Reinforces Mid gently in proportion to Dimension.	Useful when the center loses confidence. Excessive Focus can make the result feel less open even when the outer field remains wide.
DEPTH	Lengthens internal micro-delay timing and increases generated ambience.	Low feels close and tight; high feels farther away. High settings may soften front-edge definition on drums or dense masters.
LOW ANCHOR	Reduces widening in the low-frequency Side path before Mono Safe.	Raise it when bass energy drifts or low-end width masks the kick. Very high values may make the lower image feel intentionally narrow.
MIX	Equal-power dry/wet blend.	Use 100% when Dimension is an insert field processor. Lower values work well for parallel support, but can also hide a poorly balanced wet signal.

CONTROL ORDER	Set Dimension for the desired opening, use Focus to restore center authority, set Depth for front-to-back placement, then protect the low end with Low Anchor. Finish with Mix only after the wet field works on its own.

03 / INTERACTION MAP

How one move changes the next

Think in audible outcomes rather than isolated knob positions. The table below gives corrective directions when a setting is close but not yet trustworthy.

SOURCE	MODE / CORE SETTINGS	ENGINEER CHECK
Center feels smaller	Raise Focus; reduce Depth slightly	Bypass at equal loudness. Vocal and snare should retain authority.
Wide but flat	Raise Depth moderately; try Open	Listen for distance around the source, not only edge energy.
Bass becomes vague	Raise Low Anchor; increase Mono Below	Check kick/bass in mono and on one small speaker.
Transients smear	Reduce Depth; select Studio	Check snare attack and pick definition at low monitor level.
Effect is obvious	Lower Dimension or Mix	The best mastering setting often disappears until bypassed.
Image is still narrow	Check the source Side content; try Deep carefully	A near-mono source needs generated space, not only Side scaling.

FOCUS RELATIONSHIP

The manual model for the restrained Mid reinforcement is:

```
Mwet = M x (1 + Focus x Dimension x 0.05)
```

The expression explains the design intent: Focus does not behave like an independent gain boost. Its effect grows with the Dimension amount, so center reinforcement follows the degree of opening.

ENGINEER NOTE	Do not chase visual symmetry. A centered low end and an asymmetric upper image can be musically correct. Judge translation, not geometry.

Timing defines the character

The three behavior modes establish different micro-time relationships inside the spatial generator. They are not cosmetic labels: each changes apparent distance, density and transient clarity.

SOURCE	MODE / CORE SETTINGS	ENGINEER CHECK
STUDIO	Shortest timing; tight and restrained	Mastering polish, mono sources, drums, acoustic instruments.
OPEN	Balanced timing and width	Default choice for vocals, guitars, synths and full mixes.
DEEP	Longest timing; stronger distance and atmosphere	Returns, pads, backing vocals and deliberate spatial sound design.

MODE SELECTION TEST

1. Start in Open at a moderate Dimension value. 2. Match loudness. 3. Switch Studio and Deep without changing anything else. 4. Listen to front-edge definition, center distance and the length of the generated field. 5. Choose the mode that solves placement before fine-tuning Depth.

WHEN STUDIO WINS

The source already has stereo information and only needs polish; attacks must remain explicit; mastering translation is the priority.

WHEN DEEP WINS

The source needs to move backward or develop a halo; the arrangement has room for longer spatial cues; mono compatibility remains acceptable.

AVOID MODE BIAS	Deep can sound more impressive during a quick solo test. Studio may survive the full arrangement better. Always make the final choice in context.

04 / MONO SAFETY

Protecting the foundation

Low-frequency stereo difference energy can shift bass weight between speakers, collapse unpredictably in mono, or consume headroom without improving perceived size. Dimension provides three related controls: Low Anchor, Mono Below and Mono Safe.

MONO BELOW

Sets the region in which low Side information is progressively centered. The selectable range is 40-300 Hz. Lower settings preserve more stereo low-mid information; higher settings create a firmer mono foundation.

MONO SAFE

Subtracts a low-passed copy of the Side path below the chosen cutoff and reduces generated widening when measured correlation becomes risky.

```
Ssafe = Sraw - LPF(Sraw)
```

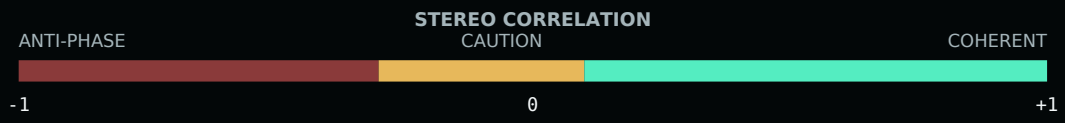
PRACTICAL SETTING METHOD

Begin around the lowest cutoff that stabilizes the bass. Toggle mono and listen to kick impact, bass-note consistency and low-mid thickness. Raise the cutoff only when translation improves; do not center frequencies merely because a rule says they should be mono.

ENGINEER NOTE	Low Anchor is the musical shaping control; Mono Below and Mono Safe are the translation controls. Use them together, but do not assume they are interchangeable.

Reading risk without mixing by meter

Correlation estimates the relationship between left and right. It is a diagnostic, not a target. Wide music may legitimately move toward zero; sustained negative values indicate that mono cancellation is increasingly likely.



+1 / HIGHLY COHERENT

Left and right are closely related. Strong mono compatibility, but not necessarily a wide image.

AROUND 0

Substantial difference or decorrelation. Can be musically wide; verify important content in mono.

BELOW 0

Increasing anti-phase relationship. Brief movement can occur, but sustained negative energy deserves investigation.

METER RESPONSE

Dimension's protection reduces generated widening when relationships become risky rather than allowing uncontrolled anti-phase buildup.

CORRELATION MODEL

```
r = sum(LR) / sqrt(sum(L^2) sum(R^2))
```

The value should be interpreted over time. A single transient crossing is less important than a sustained negative region during musically central material.

LISTENING FIRST	If the meter looks safe but the vocal weakens in mono, the setting is not safe for that mix. Translation always outranks the display.

05 / COMPARISON TOOLS

Make the decision honest

Dimension includes Gain Match, Delta, A/B and smooth Bypass because spatial processing is easy to overvalue when it also changes energy or novelty.

GAIN MATCH

Compares post-Input reference power with processed power, applies bounded correction and smooths the result. Output Trim follows afterward.

```
Target = sqrt(Pinput / Pwet)
```

DELTA

Outputs only the difference created by the processing. Listen for excessive vocal, snare or bass content in Delta; these may indicate that the core is being altered more than intended.

A/B

Stores two complete working states. Use A for the conservative translation-safe version and B for the emotionally larger version; compare in the full arrangement.

BYPASS

Returns to the original host input through a smooth transition. Because Bypass precedes Input and Output Trim, use Gain Match for detailed processed-state comparisons.

THREE-PASS DECISION	Pass 1: choose by emotion. Pass 2: enable Gain Match and choose by balance. Pass 3: check mono and low playback level. Keep the setting only if it survives all three.

DELTA INTERPRETATION

A useful Delta signal often sounds like diffuse edges, upper ambience and controlled Side movement. If Delta contains the identity of the lead vocal or the fundamental weight of the bass, re-check Focus, Low Anchor, Mono Below and the overall Dimension amount.

Subtle size with center authority

Mastering use is usually about a small increase in perceived scale, not a visibly dramatic width change. Work from the loudest or densest section of the song and make every comparison gain-matched.

SOURCE	MODE / CORE SETTINGS	ENGINEER CHECK
Starting point	Studio or Open; Dimension 15-30; Focus 60-80	Low Anchor 80-100; Depth 15-30; Mix 100; GM on.
Dense chorus	Reduce Depth before Dimension	Preserve snare attack and vocal position.
Bass-heavy master	Raise Low Anchor; Mono Below 80-140 Hz	Check limiter gain reduction after Dimension.
Ambient master	Open; Depth 25-45	Keep the center believable at low playback level.

MASTERING SEQUENCE

1. Place Dimension before the final peak-limiting stage unless a deliberate post-limiter effect is required. 2. Set Input Trim for comfortable headroom. 3. Enable Gain Match. 4. Establish low-end safety. 5. Raise Dimension until the change is obvious, then back down. 6. Restore center authority with Focus. 7. Set final Output Trim and re-check downstream limiter behavior.

LIMITER INTERACTION	Widening can change peak structure even when average loudness is matched. Re-check true peak and limiter gain reduction after every meaningful spatial change.

FAILURE SIGN

If the master becomes exciting in headphones but smaller on speakers, the outer field is probably outrunning the center. Reduce Depth or Dimension, then raise Focus modestly.

Placement by source

Use the source role to decide what must remain stable and what can move outward. The following values are directional starting points, not presets that replace listening.

SOURCE	MODE / CORE SETTINGS	ENGINEER CHECK
Lead vocal	Studio/Open; Dim 10-25; Focus 75-95; Depth 10-25	Keep consonants centered; check mono intelligibility.
Backing vocals	Open; Dim 40-65; Focus 35-55; Depth 35-60	Let edges open while the lead remains dominant.
Electric guitar	Open; Dim 25-50; Focus 45-70; Depth 20-45	Watch pick attack and center masking.
Acoustic guitar	Studio; Dim 15-35; Focus 65-85; Depth 10-30	Preserve body and transient realism.
Stereo synth	Open; Dim 25-50; Focus 50-70; Depth 25-55	Use Low Anchor 70-90 for stable fundamentals.
Drum loop	Studio; Dim 10-30; Focus 70-90; Depth 10-25	Protect kick/snare; listen for hi-hat phase motion.

ARRANGEMENT TEST	Solo creates permission for too much width. Set the effect in context, then verify the source still occupies a clear front-to-back layer when the full arrangement returns.

MONO SOURCES

A mono source contains no original Side information, so Dimension's generated ambience becomes the primary spatial contributor. Start conservatively in Studio, keep Focus high, and use Mix below 100% when only a supporting halo is required.

When the spatial field can be heard

On reverb and delay returns, Dimension can shape the environment independently of the dry source. This permits deeper settings because the center identity is already carried elsewhere.

SOURCE	MODE / CORE SETTINGS	ENGINEER CHECK
Reverb return	Open/Deep; Dim 35-60; Focus 25-50; Depth 55-80	Use Mix 100 on an aux; filter the return before or after as needed.
Delay return	Open; Dim 25-55; Focus 35-60; Depth 30-65	Check feedback growth and mono repeat clarity.
Pad atmosphere	Deep; Dim 45-75; Focus 25-50; Depth 60-90	Keep low anchor high if the pad carries fundamentals.
Parallel halo	Studio/Open; Dim 30-60; Mix 20-50	Blend until the source feels larger without sounding effected.

SERIES ORDER

Before reverb: Dimension widens the source feeding the space. After reverb: Dimension shapes the reverb field itself. Before saturation: added Side content may create extra harmonics. After saturation: the field opens around the already-colored signal. None is universally correct; choose the order that preserves the role of the center.

CREATIVE LICENSE	Negative correlation is not automatically forbidden in sound design. It becomes a delivery risk when essential musical information depends on it.

07 / MEASUREMENT

A disciplined verification pass

Measurement is most useful when it answers a listening question. Use it to locate a problem, not to force every mix into the same numeric shape.

CHECK	METHOD	PASS CONDITION
Loudness	Enable Gain Match; compare several musical sections.	Preference remains after the level advantage is removed.
Correlation	Observe sustained regions, not isolated transient dips.	No persistent risky behavior on essential content.
Mono	Sum to mono and compare center, bass and reverberant tails.	Important elements retain identity and level.
Peak structure	Check true peak and downstream limiter reduction.	No unexpected overload or loss of transient control.
Low level	Monitor quietly from speakers.	Center remains readable; width does not replace balance.
Headphones	Check edge sharpness and detached ambience.	Field feels enveloping rather than split or hollow.

MINIMUM MONITOR SET	Stereo speakers, mono sum, headphones and one constrained playback system reveal more than repeatedly checking the same full-range monitor.

Symptoms, causes and corrective moves

Most spatial problems come from too much time displacement, insufficient center support, unstable low Side energy, or comparison at unequal loudness.

SOURCE	MODE / CORE SETTINGS	ENGINEER CHECK
Hollow in mono	Excessive decorrelation or Side dependence	Reduce Depth/Dimension; raise Focus; enable Mono Safe.
Vocal moves backward	Outer field outruns the Mid core	Raise Focus; reduce Depth; try Studio.
Bass shifts sideways	Low Side energy is too active	Raise Low Anchor and Mono Below; verify in mono.
Snare loses punch	Timing is softening the front edge	Reduce Depth; select Studio; lower Dimension.
Preset sounds louder	Gain structure or GM comparison is incomplete	Enable Gain Match; reset Output Trim; re-check Input Trim.
Width disappears	Source is near mono or Focus is too strong	Use generated space carefully; try Open/Deep; reduce Focus modestly.
Effect pumps	Correlation protection or GM is reacting to changing material	Reduce spatial intensity; judge over longer musical passages.
DAW bypass differs	Host bypass and internal bypass may use different transition paths	Use internal Bypass and Gain Match for evaluation; verify host automation.

RESET METHOD	When a setting becomes confusing: return to Open, Dimension 0, Depth low, Focus high, Low Anchor high, Mix 100 and Gain Match on. Rebuild one decision at a time.

Specifications and implementation notes

The values below document the current Dimension v1.0 behavior described by this manual. Host display conventions may vary slightly by format and DAW.

ITEM	REFERENCE
Formats	VST3 and AU; macOS and Windows release targets.
Input Trim	-18 to +6 dB; zero at twelve o'clock; excluded from preset recall.
Output Trim	Final manual gain after Gain Match; excluded from preset recall.
Core controls	Dimension, Focus, Depth, Low Anchor and equal-power Mix.
Modes	Studio, Open and Deep.
Mono Below	40-300 Hz operating range.
Comparison	A/B states, Delta monitoring, smooth internal Bypass and bounded/smoothed Gain Match.
Presets	Thirty factory starting points plus user preset save/import and favorites.
Themes	Emerald, Electric Blue, Crimson Red and Royal Purple; visual only.
DSP topology	Mid/Side separation, high-passed spatial generation, unequal short delay lines, Side scaling, low-frequency Side management and correlation-aware protection.

MID/SIDE RECONSTRUCTION

`M = (L + R) / 2 | S = (L - R) / 2 | L = M + S | R = M - S`

FINAL RULE	The best Dimension setting is not the widest one. It is the setting that creates more room, survives mono, keeps the rhythm intact and still feels right after the novelty is gone.