Guitarist

GUIDE TO

2023 EDITION

OVERDRIVE & DISTORTION SPECIAL!

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Welcome to the

Guitarist Guide To Effects Pedals

Computer musicians have their plug-ins, drummers have their cymbals, singers have their bottles of water, and bassists have their... lead. But of all the musicians, guitarists are truly blessed – not only do we have the most expressive instrument in the world in our hands and towering stacks of amplification behind us, but at our feet, we have rows of beautifully designed, diminutive, yet all-powerful boxes of sonic possibility, ready and waiting to be unleashed with a single well-timed stomp.

From open-mic night performers all the way up to arena-filling rock stars, every guitarist loves and relies on their pedals – and in these pages, we begin by acquainting ourselves with how they evolved, in an article written by renowned author and effects aficionado, Dave Hunter. We name the best effected sounds of all time, and examine all the main types of modern effects, with expert buying advice for all budgets. Next up are how-to guides on building your own pedalboard, placing your effects in the right order, powering them and more. Then we take a closer look at the contrasting pedalboards of a selection of real-life pro guitar players, before we launch into our definitive collection of the ultimate boost, overdrive and distortion pedals.

Finally, we go deeper still into the tone-rich world of overdrive and distortion – the most popular effects on the world's pedalboards – with an expert-led, 12-page guide to getting the best from these workhorses of tone that will help you dial in everything from molten crunch tones to screaming lead sounds with the ease of a practiced professional. Enjoy the issue.

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THE FX EVOLUTION

The search for the perfect sound has taken guitar-kind from the primordial swamps of the first motorised vibrato to the technological skyscrapers of digital 'perfection'. As we stand at the crossroads, with some manufacturers harking back to a glorious past and others pressing ever onward, we chart the unstoppable rise of the stompbox

Words **Dave Hunter**

As much as guitarists prattle on about this glorious enigma we call 'tone', the awful truth is that the naked sound of the electric guitar can be a pale, soulless thing. Electric guitars are just not perfect instruments in themselves; their natural voice needs to be screwed up, messed round, and otherwise corrupted to elicit anything close to a phat and toothsome tone. Even the greatest guitar-straight-to-amp sounds of rock history benefited from sizeable dollops of tube distortion, and that goes for the 'clean' ones too. But don't worry – here in 2015, there are no end of glorious gizmos primed to help us swirl, sweeten or totally detonate that potentially thin reaction between string, wood and magnet.

In the beginning

In the early days of electric guitar, if you wanted to alter the straight sound of the instrument, you had to do it physically. Rickenbacker's Vibrola Spanish electric of the 1930s carried a motor and pulleys to wobble the bridge as desired, while Paul Bigsby's vibrato tailpiece of the 1940s provided much the same effect – albeit ditching the motor and letting the player do the wobbling manually. Another early effect was the seemingly impressive 'echo speaker' jack that some amps of the 1940s and early 50s carried – which was in fact nothing more impressive than an output for an extension speaker, with a long lead, that you were supposed to put in a far-off corner of the stage where it would echo.

By the late 1940s, however, tremolo had arrived as the first commonly available genuine electronic effect for guitarists. Fender amps are probably the most famous for tremolo, but models from Gibson, Danelectro and Premier all carried the effect before Fender's Tremolux arrived in 1955. Around this time, fledgling valve-based effects also sprang up as outboard units. Gibson's GA-V1 Vibrato was one, and other companies followed suit with similar 'add-on sonic effectors', which by the late-50s also included valve-powered spring reverbs.

These echo units, as they were often called, were manufactured by most of the same companies that also offered guitar amps, although Fender was once again strangely late with the new sound. When the Fender Reverb Unit finally arrived in 1962, however, it was a good 'un: it set the standard for that lush, wet 'sproing' that has defined surf guitar ever since, and remains the most revered reverb effect to this day. The sound was a sensation, but some of its early thunder had already been stolen in the mid-50s by a fully-fledged echo. This was a more dramatic delay effect, and another electromechanical design that was even more complicated.

Guitar sensations like Les Paul and Chet Atkins had already been experimenting with tape echo in the studio by the early 1950s, usually by rolling two large reel-to-reel tape recorders together with a long loop of tape between them. But accordion player and amp builder Ray Butts of Cairo, Illinois made the sound far more portable with his EchoSonic amplifier with built-in tape echo. He sold the first 'production' model EchoSonic (less than 70 of these hand-built amps were ever produced) to Chet Atkins in late 1954, and the second to Scotty Moore in May of 1955. From its first recorded use on Elvis Presley's *Mystery Train* through several hits of the 1950s and the early 60s, the slapback echo created by Moore on the EchoSonic set the standards for rock 'n' roll guitar tone.

Carl Perkins, Roy Orbison, and Johnny Cash sideman Luther Perkins also acquired EchoSonics from Butts, but the effect only fulfilled its true potential in the late 1950s when Market Electronics and then Harris-Teller converted a version of Butts's design into a portable outboard unit. The latter product eventually took the Maestro Echoplex name in 1962, and became one of the best-loved and sweetest-sounding tape echo units of all time. (After inquiring about the origin of the circuit, Butts was paid a nominal royalty for the use of his design, but he had never patented the echo effect in his EchoSonic amplifier.) In Europe, makers such as Vox, Meazzi, Binson and Watkins (later WEM) were virtually simultaneously introducing their own tape echoes in the late 1950s and early 60s, and all of these great devices helped to propagate slapback and slightly longer echoes in pop and rock music on both sides of the Atlantic.

The revolution begins

Right about this time, the effects revolution was preparing to break out all across the pubescent face of rock guitar thanks to the wider availability of the transistor, which would help to make many guitar effects far more portable and trouble-free than the cumbersome electromechanical devices that had dominated until the mid-60s. Even so, the evocative echo effect wouldn't be able to abandon its tape loop until the mid-70s, when a more powerful solid-state component turned the effects scene on its head... but we're getting ahead of ourselves.

For the early 60s, the humble transistor was space-age stuff. It sounded as wonderful in a growing number of compact stompboxes as it did woeful in burgeoning lines of amplifiers.

Tape-based echo units from the 50s and 60s fetch high prices today

The fuzz's recorded debut is still contested

Trying to assign the credit for 'first fuzz box on record' makes for a good pub debate: there's a lot of support for Big Jim Sullivan's guitar track recorded with a custom-built Roger Mayer fuzz on PJ Proby's 1964 number one *Hold Me*, while Bernie Watson's solo on Screaming Lord Sutch's much earlier hit of 1960, *Jack The Ripper*, has its fans. But there's little argument over who brought the first commercially available unit to the market. In an effort to reproduce the sound of Grady Martin's 'fuzz' bass solo from Mary Robbins's 1961 hit *Don't Worry* – which had actually resulted from a faulty preamp channel in the Nashville studio where it was recorded – engineer Glen Snotty devised his simple but effective transistorised fuzz circuit. He then passed it on to the Maestro company, who shipped their radical new Fuzz-Tone pedal to guitar shops by the thousands in 1963.

As remarkable as it might seem in hindsight, the effect wasn't envisioned for rock mayhem, but was instead initially marketed to jazzers and session men. Early Maestro ads showed a polite, crew-cut-wearing young gent in suit and tie, wielding a Gibson ES-345 beneath the legend 'guttural, mellow, raucous, tender, raw'. Literature from other makers touted the fuzz's ability to help guitarists sound like a trombone or a sax player. When Keith Richards used a newly acquired Maestro Fuzz-Tone to record *(I Can't Get No) Satisfaction* in 1965, the Fuzz-Tone sounded like nothing heard before, and the effect soared in popularity.

Soon every kid in Britain had to have a fuzz box, and plenty of home-grown manufacturers got their own versions of the pedal ready to feed the demand. Sola Sound's Tone Bender – Jimmy Page's fuzz of choice – was one of the first out of the blocks in 1965 (Sola Sound later became Colorsound, and the pedal was also badged as the Vox Tone Bender), but Dallas-Arbiter's Fuzz Face of 1966 has become the most revered, due in no small part to Jimi Hendrix's use of the pedal.

At this time, all of these units still used the legendary germanium transistors: two AC128s or NKT275s in the Fuzz Face and a pair of Mullard OC75s in the Tone Bender. Germanium transistors are said to produce a softer, rounder, arguably more musical fuzz than the silicon transistors that proliferated toward the end of the decade. They were also less reliable and prone to drift further from spec value than silicon components, which is why when fuzz fans talk of the magical properties of a vintage fuzz pedal they don't mean just any Fuzz Face, Fuzz-Tone or Tone Bender, but a good one. Find a Fuzz Face with two properly matched germanium transistors and it can sound like the voice of God; land one with a pair of drifting or mismatched germanium transistors, and it can sound like the voice of a dog.

Germanium transistors also powered less tone-corrupting treble boosters and plain old boosters (a single Mullard OC44 or an NKT275 gave the fabled Dallas Rangemaster Treble Booster its legendary oomph; that'll be £500 sir, cheers) and cropped up in some early wah-wahs and a variety of other effects. They gradually gave way to more reliable silicon devices by the late 1960s and early 70s. Vintage fanatics might claim silicon yields a harder, edgier fuzz, but no shortage of rockers have loved

them for that very reason. Aurally-gifted tone connoisseur Eric Johnson favours a silicone-transistor Fuzz Face, and it's a safe bet that he sampled more than a few to make his decision.

As for wah-wahs, the magic lies not so much in the transistors as in the small inductor coil each contains – and for most vintage-styled tonehounds there is no other inductor than the Fasel inductor, found in the original Italian-made Vox and Cry Baby Wah-Wahs from the Jen company (in fairness, the silver 'trash can' inductors found in some early Cry Baby wahs have their fans too). The first production wah-wah was developed in 1965 by Vox's American partner, Thomas Organ, as the Clyde McCoy Wah-Wah, named for its imitation of a then-famous trumpeter's muted 'wah' sound. Both the Vox Wah-Wah – played by Hendrix and Clapton – and the Thomas Organ Cry Baby – Jimmy Page and Mick Ronson – grew from the roots of the Clyde McCoy, but each had subtly different characteristics. The Vox is known for its pronounced, rounded, vocal sound, while the Cry Baby is considered a little more fluid.

The octave divider is one of the wilder effects of the sixties. This bizarre, dissonant frequency-doubling device was heard most prominently in the form of Roger Mayer's custom-made Octavia box, famously used by Hendrix on a number of seminal tracks. Mayer never offered the original Octavia as a production model, however, and the effect eventually saw slightly wider use in the early 70s in the form of the Tycobrahe Octavia (a direct copy of Mayer's), Foxx Tone Machine, Fender Blender and – an octave-down effect this time – the MXR Blue Box. Tricky to use well, inherently monophonic, and something of an acquired taste, an octave effect can nevertheless yield some jaw-dropping results when played right.

The Fuzz-Tone wasn't envisioned for rock mayhem, but was initially marketed to jazzers and session men

The final truly classic effect of the 1960s was the Univox Uni-Vibe, made famous by Hendrix, with Robin Trower and Stevie Ray Vaughan in his wake. The Uni-Vibe had been developed for Univox by the Shin-Ei company of Japan to provide an emulation of a rotary speaker effect for portable electric organs. The Beatles, Pink Floyd, Hendrix and others had already dabbled in the sultry, hypnotic swirl of rotating speakers via a Leslie cabinet or, very often – though not so frequently credited – a Fender Vibratone cabinet, but these were the kings of cumbersome electromechanical devices. A Uni-Vibe made the sound truly portable, could be patched in front of a player's amp of choice, and added a dose of its own warmth and shimmer besides.

This totally solid-state effect is actually a four-stage phaser. Each stage contains a light bulb and photo cell coupling at its heart, each tuned slightly differently so that a chorusing effect is produced as the oscillator sweeps the signal across them. The unit's two-speed Chorus/Vibrato switch (fast and slow respectively) mimicked a Leslie's Chorale/Vibrato settings, and also showed a way forward for an extremely popular effect that would come into its own in the 1970s.

Phase one

The simple phasers that emerged in the early- to mid-70s only hinted at the bounty of modulation effects soon to come. An explosion of swirl, twirl and echo would be enabled by the improved capabilities and availability of affordable integrated circuit (IC) technology, but the first phasers were discrete solid-state devices using field effect transistors (FETs). Although they employ forms of circuitry that would be considered archaic today, early classics like the one-knob MXR Phase 90 (1972) or the complex Mu-Tron Bi-Phase and simpler Phasor II (1973 to 74) are still considered some of the nicest-sounding of the breed. It's a Phase 90 that Mick Jones is playing on The Clash's *Lost In The Supermarket* from London Calling, and the same effect on Van Halen's *Ain't Talking About Love*. Upon the arrival of the IC chip (or simply 'opamp'), however – and the larger, more powerful 'bucket brigade' chips of the later seventies – the modulation market really caught fire. Six TL072 dual opamps gave the MXR Phase 100 added dimensions of phasing and more control over them than its earlier siblings (hear its gurgling swirl in Keith Richards's playing on *Shattered*, and all over the Stones' *Some Girls* album).

Electro-Harmonix's Bad Stone carried a number of opamps and provided a deep sound and an impressive range of control, but its simpler Small Stone – with a single Rate knob plus 'Color' switch – proved to be the company's biggest-selling pedal of all time. At one point in the mid-70s, E-H was shipping as many as 8,000 Small Stones each month. Both have become popular with collectors, but a 'small sibling' made a far bigger sonic impact amid the rediscovery of vintage pedals in the early nineties when Nirvana's Kurt Cobain recorded his evocative guitar part for *Come As You Are* through an E-H Small Clone chorus. IC-based chorus pedals like this and others had evolved a long way from the transistor-based phasers with which they shared their sonic roots, and this is the type of device that has ever since defined what we think of as the

One control, many classic phaser sounds

Andy Summers and David Gilmour are fans of the Electric Mistress flanger

'chorus pedal sound'. One of the then-young Boss company's earliest pedals offers the seminal example of analogue chorus: the effect yielded a spacious, multi-dimensional stereo effect that gave many 80s tracks a drive and movement that kicks these simple arrangements to a higher level (though Andy Summers, a guitarist often associated with the chorus effect, in fact used an E-H Electric Mistress flanger on *Message In A Bottle*, one of the hits that defined his sound).

Charge of the 'bucket brigade'

While Boss was gaining the kind of early momentum on the back of the CE-1 that would eventually take it to the top of the ladder for effects sales worldwide, rivals that had been longer in the game were applying bigger, more powerful chips with impressive results. The so-called 'bucket brigade' chip finally let players leave those high-maintenance (if great-sounding) Echoplexes and Copicats back home in the gear cupboard. These new components were named for the way they took a signal at input and handed it along from stage to stage, down a serious of steps that could be tapped at desired points to achieve echo. Utilising this powerful IC's taps differently, and shifting or modulating them, also enabled flanging, deluxe chorus sounds and several other advanced effects.

Electro-Harmonix launched both its divine Memory Man delay and occasionally freakish Electric Mistress Flanger/Filter Matrix in 1976, both thanks to 'bucket brigade' chips, and they became the company's fourth and third biggest sellers respectively. MXR's Analog Delay was generally considered an upmarket alternative, and DOD, Boss, Ibanez and others introduced popular variations on the theme.

After digital technology swept delay off its feet from the mid-80s and beyond, many players looked sentimentally upon the 'smooth, warm' sound of analogue delay in the same way that detractors of the solid-state age shed glowing praise on old tape echo units. There is an undeniable softness and musicality to these analogue delay circuits that certainly makes them ear friendly, to the extent that later designers of digital delays often built in aspects of analogue-like lo-fi reproduction and decay corruption to make their echo effects more appealing. Listen to The Edge's playing on earlier U2 albums in particular, and check out the warmth and musicality in his Memory Man's analogue echo sound.

The somewhat metallic, occasionally dissonant sound of the flanger carried an immense 'wow' factor for any guitarist who sat in his bedroom and fiddled with one for a few minutes but, as much as it delivers a more deluxe, intense modulation sound than the gentler phaser, it also needs to be used subtly to be used well. Classic recorded examples are harder to cite than they are for phasers (the intro to Heart's *Magic Man* is one place to go), and the really seminal flanger recordings were mostly achieved in the 1960s and 70s with tape flanging. This effect was used effectively on songs like The Small Faces' *Itchycoo Park* and The Eagles' *Life In The Fast Lane*. Other effects that joined the fray in the 70s included a broad range of overdrive and distortion offerings, along with the funky fringes of the envelope filter (also Q filter, auto-wah or envelope follower) and the talk box (*Frampton Comes Alive*, anyone?).

Going digital

Opamp-based distortions and overdrives offered more powerful and more tonally versatile versions of extreme or subtle valve-amp break-up than could previously be provided by the basic fuzzes or early so-called distortion pedals such as MXR's transistor and diode-based Distortion+ (more a fuzzy overdrive really). Boss's OD-1 and SD-1, Ibanez's Tube Screamer series, and DOD's Overdrive Preamp 250 all did impressive versions of a tube amp set to the edge of distortion, while the Pro Co Rat, Boss DS-1 and a few others cranked the knob well past it. Both variants have proliferated, with overdrives becoming purportedly more 'realistic and valve-like' (although an Ibanez TS-9 and then TS-10 seemed to be good enough for Stevie Ray Vaughan), and overdrives becoming even dirtier and more extreme. For an example of the latter, you don't even have to listen to an entire track: just dig the famous 'chunka-chunka' lead-in and evil, sustaining first chord in the chorus of Radiohead's *Creep* to hear what an early 90s Marshall ShredMaster can do.

The so-called 'bucket brigade' chip finally let players leave those high-maintenance (if great sounding) Echoplexes and Copicats back home in the gear cupboard

While the powers of the analogue chip rule distortion sounds to this day, the advances in digital technology as applied to music electronics has taken modulation and delay effects to new dimensions. Early units unveiled at the start of the 80s were universally billed as being cleaner and higher-fidelity than the analogue delays that preceded them, although many players troubling to do

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an A/B comparison would have to admit that the digital effect wasn't always sonically preferable. In its primitive, eight-bit form, digital delay could sometimes be cold and harsh-sounding compared to analogue, with a nasty deterioration of the sound in its note decay in particular, but what really wowed players was the delay times it was capable of achieving. Delays of a full second, two seconds, and even up to 16 seconds provided impressive long-echo and looping capabilities, and pedals like the DOD/DigiTech PDS1000 and PDS2000, Boss DD-2 and DSD-2, and Electro-Harmonix 16-Second Digital Delay threatened to obliterate the humble analogue delays. Digital also reined in the chorus and flanging markets through the 1980s and into the 90s, and brought us other wild and wonderful pedals, like the DigiTech Whammy and a varied range of harmonisers and pitchshifters. Sound quality improved consistently, too, as the technology advanced to the 16-bit, 24-bit and 28-bit standards.

However, digital technology began to take the effect out of the realm of the pedal and into that of the multi-effects floorboard or rack unit; plenty of great music has been made with these, certainly, but the processing across a range of different models is sometimes achieved by chips from the same component manufacturers, and these units' sounds can sometimes verge on generic, however powerful they may be. Pedal fans still get most excited about, well, pedals, and this is still where the collectors, reissue and boutique markets thrive.

In the early 1990s, along with a rising interest in older non-master-volume valve amps and lots of simpler, retro-style guitars, many players began dragging dusty stompbox-style effects pedals of the 60s, 70s and early 80s out of closets and from under beds and discovering that these old things actually sounded surprisingly good. A renewed demand for such outdated boxes of tricks sent prices of original examples rising (and of course, when you did lay your hands on one it was often noisy or not functioning properly) so gaggles of young guns with hot soldering irons and crateloads of hobbyist boxes started recreating the things for themselves, and others. In the process they often made them even better than the originals, or quieter and more versatile at least, usually with true-bypass switching to boot. Voila, the now-thriving boutique effects market was born. Today, we have a vast selection of pedals with both quality reproductions of long-lost sounds, and original modern creations sometimes offering modified variations of those sounds.

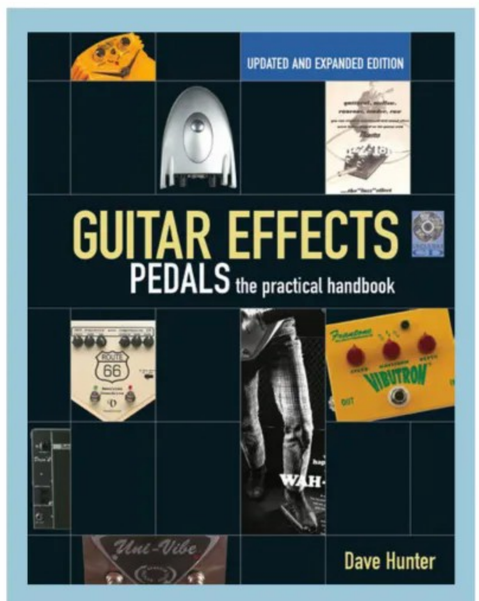
Makers like Fulltone, Voodoo Lab, Jacques, Prescription, Keeley, Analogman and others mostly started off making reproductions of past classics (the roots of Fulltone's '69 Fuzz, Octafuzz and Deja'Vibe are pretty clear from their names, as are those of Analogman's CompRosser, Prescription's Vibe Unit, Jacques' Tube Blower, and Voodoo Lab's Proctavia and Micro Vibe), but they have also ventured into more original territory.

Others such as Lovetone, Frantone and ZVex cop a retro vibe while pursuing a range of unique designs – the latter, in particular, offering some sounds and features that are very much on the fringes of acceptable, more mainstream sonics. The ZVex Seek Wah is like the wayward love child of an auto-wah and a tremolo, while the Fuzz Factory begins with a vintage-style germanium fuzz as a springboard and provides five control knobs for masterly domination of every conceivable parameter within the circuit; twist them the right way, and the thing literally plays itself!

Another adventurous maker, Roger Mayer, has stayed the course from his roots as 'pedal-maker to the stars' in the 1960s to remain a respected high-end manufacturer in 2015. Mayer eschews the term 'boutique', although his pedals rival any of the genre for quality of construction; design-wise, he continues to push the boundaries, both in circuitry and sounds.

Alongside great originators like Mayer, the impressive works of many members of the boutique crowd, consistently good products from the established names, and vintage-style reissues from Ibanez, MXR (under the Dunlop umbrella) and a resurgent Electro-Harmonix, there are new makers arriving almost daily, each bringing fresh sounds to a guitar world you'd have thought was totally toned-out. Global manufacturing has resulted in a plethora of pedals for all budgets – you only need to browse YouTube to be presented with a world of effects options.

Whatever your flavour, three good effects pedals chained together and used with attitude can still provide a near-infinite number of sonic variables. We've never had it so good.



Dave Hunter is author of many guitar titles, including 'Guitar Effects Pedals: The Practical Handbook' (Backbeat Books, £16.95), available from all good bookshops.

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U2

Where The Streets Have No Name

GUITARIST: *The Edge*
EFFECTS USED: *TC Electronic 2290 Dynamic Digital Delay / Korg SDD-3000*
FIND IT ON: *The Joshua Tree (1987)*

"Whether it's a Fuzz-Tone or a wah-wah pedal, if it's really happening, it becomes part of the instrument," The Edge muses. "I don't think about playing through an effect; I think about playing the whole thing."

This integral approach has ensured U2's guitarist has done more than any other modern guitarist to implant the joys of guitar effects into the collective consciousness. This reached its stadium-filling apex on *Where The Streets Have No Name*: those circular delayed intro arpeggios (0:14 to 0:35) through two differently timed delays build into partial powerchords (0:35 to 1:17) then flit between styles until the arpeggiated coda (4:21) – ushering in years of world-dominating mainstream success for the Biggest Band In The World.

Robert Fripp/Peter Gabriel

Water Music 1/Here Comes The Flood

GUITARIST: *Robert Fripp*
EFFECT USED: *His self-designed 'Frippertronics'*
FIND IT ON: *Exposure (1979)*

This reworking of a Gabriel solo track was a notable early instance of Fripp using his own wah/fuzz/delay/tape loop set-up known as Frippertronics. While TC Electronics' digital delays later replaced Fripp's Revox decks, this track remains a pioneering moment in ambient guitar experimentation.

Sweet

Blockbuster

GUITARIST: *Andy Scott*
EFFECT USED: *Shin-Ei Siren/ Hurricane*
FIND IT ON: *The Very Best Of Sweet (2005)*

It featured a main riff nearly identical to David Bowie's *Jean Genie*, released via the same label just weeks earlier, yet Sweet's 1973 track stuck in the mind more. This is partly due to Scott's 'siren' intro riff created on, yes, a Shin-Ei Siren/ Hurricane pedal.

Smashing Pumpkins

Today

GUITARIST: *Billy Corgan*
EFFECT USED: *Electro-Harmonix Big Muff*
FIND IT ON: *Siamese Dream (1993)*

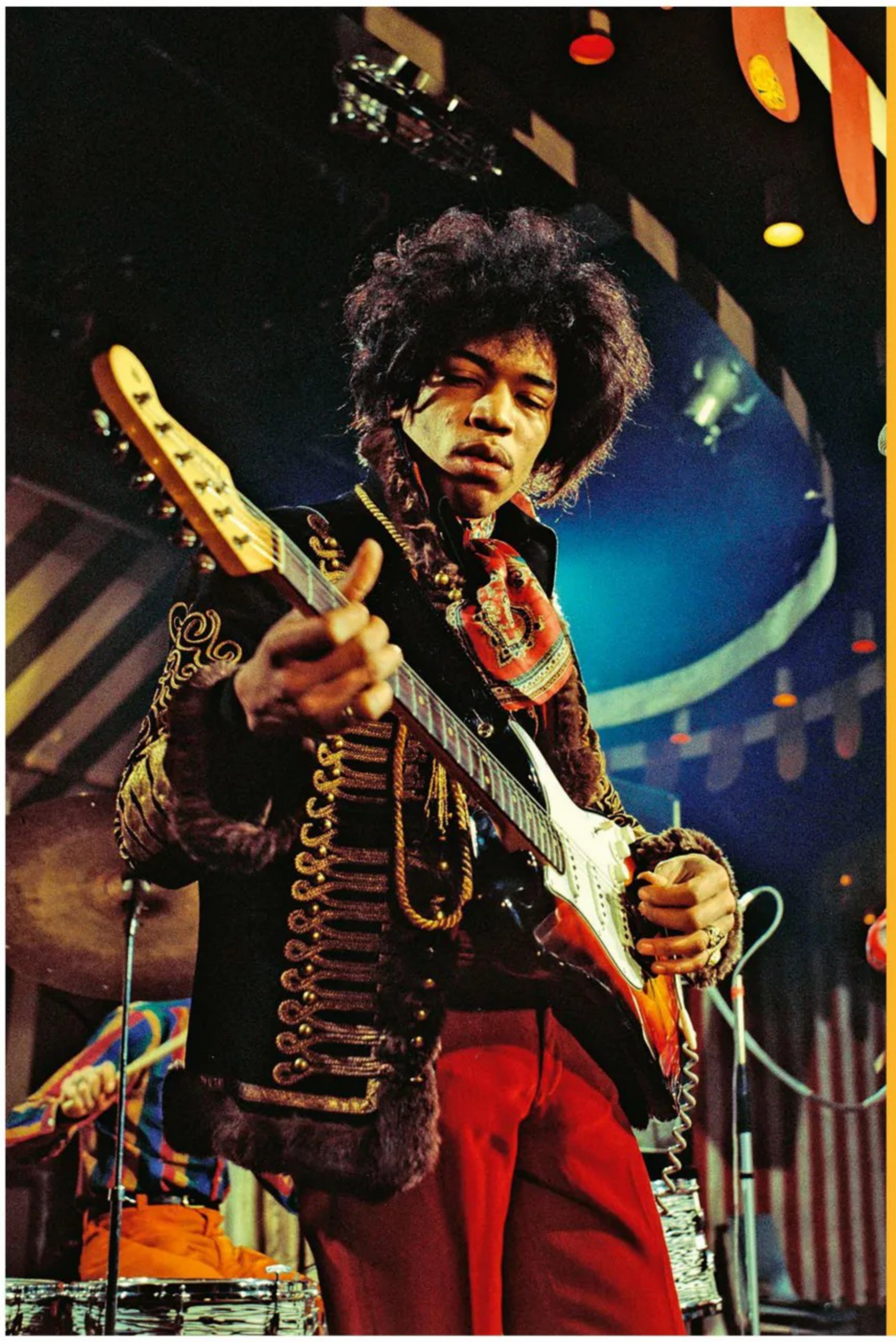
Corgan's JCM800 modified for KT88 valves with a Big Muff plugged into its low-gain input became the signature sound of a still astonishing album. *Today* would become the band's breakthrough hit, and when the angelic intro gives way to a crashing wave of fuzz, millions of teenagers across the globe still throw shapes in unison.

The Beatles

Think For Yourself

BASSIST: *Paul McCartney*
EFFECT USED: *Tone Bender*
FIND IT ON: *Rubber Soul (1965)*

Despite experimenting with a Maestro Fuzz-Tone as early as the 1963 *She Loves You* sessions, *Rubber Soul* saw the first appearance of a fuzzbox on a Beatles recording: a Gary Hurst-designed Tone Bender in combination with Macca's new left-handed Rickenbacker 4001 on Harrison's *Think For Yourself*.



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JIMI HENDRIX EXPERIENCE

Purple Haze

GUITARIST: *Jimi Hendrix*
EFFECTS USED: Dallas-Arbiter Fuzz Face, Roger Mayer Octavia
FIND IT ON: *Purple Haze (1967)*

Hendrix's use of fuzz pedals went back even further. Late US bluesman Mike Bloomfield recalled seeing Jimi using a Maestro Fuzz-Tone (as heard on the Stones' *Satisfaction*) in the summer of 1966, while he adopted a Dallas-Arbiter Fuzz Face from the pedal's launch later that year: hear it sting on *Purple Haze* (straight from the intro) and *Bold As Love* (his soloing tone suddenly gets filthy at 1:51). Then there's the Octavia, purpose-built for Jimi by UK effects legend Roger Mayer. It first appeared on the stinging outro solo of *Purple Haze* and can also be clearly heard on *Little Miss Lover* (from 1:19), *One Rainy Wish* (starting at 2:10), and the Band Of Gypsys' *Who Knows* (from 6:28).

REM

What's The Frequency, Kenneth?

GUITARIST: *Peter Buck*
EFFECT USED: *Tremolo pedal (make unknown)*
FIND IT ON: *Monster (1994)*

REM's follow-up to *Automatic For The People* was laced with distortion and throbbing tremolo. Hear the latter on the opening song (at 0:41), reinventing Peter Buck's signature style in an instant. Nice backwards solo, too...

Muse

Newborn

GUITARIST: *Matt Bellamy*
EFFECT USED: *ZVex Fuzz Factory (built into a custom Hugh Manson electric)*
FIND IT ON: *Origin Of Symmetry (2001)*

The opener to Muse's second album is a statement of grandiose intent and a dramatic fusion of Queen's rock operatics and Radiohead's guitar contortions. Witness the gargantuan riff kicking in at 1:24 with a wall of FF-induced carnage.

Did You Know?
Matt Bellamy's other favoured fuzz is a Foxx Tone Machine, a fuzz wah from the 60s

Van Halen

Atomic Punk

GUITARIST: *Edward Van Halen*
EFFECT USED: *MXR Phase 90*
FIND IT ON: *Van Halen (1978)*

Ed rubs his palm on the strings to produce a sound not unlike the frenetic crashing of waves on to a beach. Always adamant that he tried to get effects from the guitar rather than be reduced to 'tap dancing', even he had to admit defeat in this case.

RADIOHEAD

Paranoid Android

GUITARIST: *Jonny Greenwood*
EFFECTS USED: *Electro-Harmonix Small Stone, Mutronics Mutator*
FIND IT ON: *OK Computer (1997)*

Radiohead's effects scientist Jonny Greenwood writ his ambition large in *Paranoid Android*. Phased E-H Small Clone arpeggios adorn the verses in the song's first movement (0:09) before the climax sees a killswitched solo fed through a Mutronics Mutator rack filter and liberally contorted (5:48).

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STEVIE RAY VAUGHAN AND DOUBLE TROUBLE

Say What!

GUITARIST: *SRV*
EFFECTS USED: *Two wah pedals (likely Vox)*
FIND IT ON: *Soul To Soul (1985)*

Two wah-wahs (one of which belonged to Jimi Hendrix himself, ending up with SRV via brother Jimmie) wired together in line are responsible for this torrential tone cascade from *Soul To Soul*'s opening salvo. Vaughan's trick of rocking the pedals in opposite directions created a scything, dense and unpredictable phasing wall of wah funky enough to have Hendrix's fingers (and toes) twitching in his grave.

PETER FRAMPTON

Show Me The Way

GUITARIST: *Peter Frampton*
EFFECT USED: *Heil Talk Box*
FIND IT ON: *Frampton Comes Alive (1976)*

Frampton first saw a talk box used by 'talking steel guitar' player Pete Drake, while they both played on George Harrison's *All Things Must Pass*. Stevie Wonder, Jeff Beck and Joe Walsh soon adopted one but the effect became Frampton's signature after his then-girlfriend found one in a shop for $150. "It was the best investment I ever made," he says.

Led Zeppelin

Fool In The Rain

GUITARIST: *Jimmy Page*
EFFECT USED: *MXR Blue Box*
FIND IT ON: *In Through The Out Door (1979)*

Page is a master of getting great guitar sounds, but one true 'WTF?' moment arrived courtesy of MXR's oddball Blue Box, which adds fuzz and a note two octaves below the original. It sounds crazy, and but for this solo the pedal would probably have been scrapped long ago.

Pink Floyd

Comfortably Numb

GUITARIST: *David Gilmour*
EFFECTS UNITS: *Electro-Harmonix Big Muff*
FIND IT ON: *The Wall (1979)*

The epitome of soaring solo tone, Gilmour used a 1973 Version 2 'Ram's Head' Big Muff distortion/sustainer to give this track wings, while a Yamaha RA-200 rotating speaker added subtle modulation.

Steve Vai

Ballerina 12/24

EFFECT USED: *Eventide H3000 Harmonizer*
FIND IT ON: *Passion And Warfare (1990)*

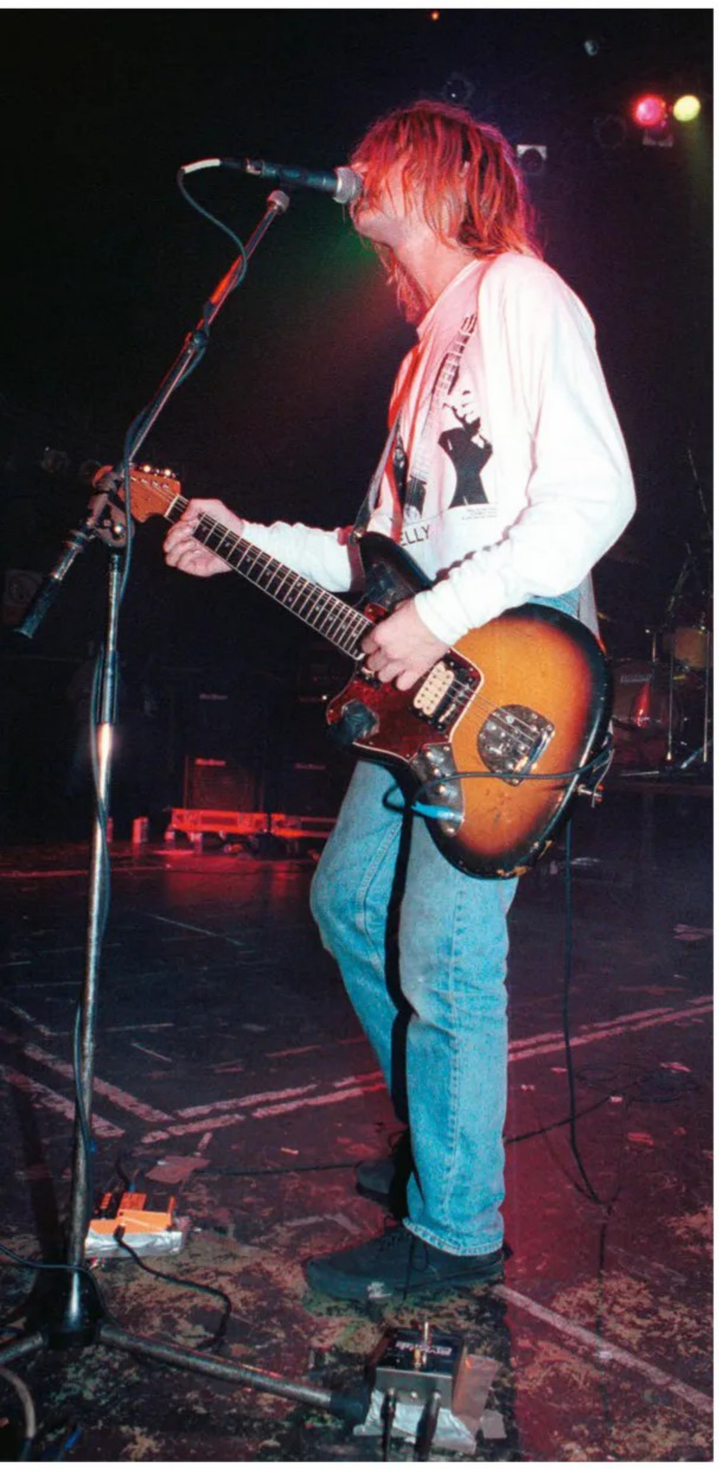
Not one for making do with stock equipment, Vai built a patch from scratch in order to mimic the flow and movement of the titular dancer. Based around pin-sharp, pitch-shifted octaves, Eventide still supplies Vai-constructed upgrades for the unit to the present day.

Robin Trower

Bridge of Sighs

GUITARIST: *Robin Trower*
EFFECTS UNITS: *Univox Uni-Vibe*
FIND IT ON: *Bridge Of Sighs (1974)*

This track's psychedelic churn comes from a Univox Uni-Vibe – sources differ on what drive tones Robin used, but he favoured Dan Armstrong Red Ranger Treble Boost and Fender Blender octave fuzz during the mid-70s.



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NIRVANA

Come As You Are

GUITARIST: *Kurt Cobain*
EFFECT USED: *Electro-Harmonix Small Clone Chorus*
FIND IT ON: *Nevermind (1991)*

Immortalised in a haunting riff that became a 'must-learn' for any fledgling grunge guitar antihero, the Small Clone, with the depth switch hard-wired by Cobain's guitar tech to the 'up' position, provided watery textures to mirror the album's shimmering sleeve art.

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QUEEN

Brighton Rock

GUITARIST: *Brian May*
EFFECT USED: *Echoplex EP-3*
FIND IT ON: *Sheer Heart Attack (1974)*

Unlike May's live solo piece, this example uses just one single repeat rather than two set equidistant to build up harmonies. Queen frontman Freddie Mercury used this latter set-up during vocal sections of *Prophet's Song* on the band's next album, *A Night At The Opera*.

Tool

Wings For Marie Part 1

GUITARIST: *Adam Jones*
EFFECTS USED: *Gig-FX Chopper*
FIND IT ON: *10,000 Days (2006)*

For *10,000 Days*' eerie, spiralling two-part 17-minute centrepiece Jones was influenced by producer Joe Barrei's pedal expertise, and employed the tremolo speed express pedal manipulation of the Chopper, with Gig-FX integrating custom modifications especially for Jones.

Yes

Owner Of A Lonely Heart

GUITARIST: *Trevor Rabin*
EFFECTS UNITS: *MXR Pitch Transposer*
FIND IT ON: *90125 (1983)*

Trevor Rabin's striking solo sound derives from an MXR Pitch Transposer set to a fifth harmony. His guitar was routed to two amps: one for clean signal, the other for effected tone.

Guns N' Roses

Welcome To The Jungle

GUITARIST: *Slash*
EFFECTS USED: *Roland SRV-2000 Stereo Reverb?*
FIND IT ON: *Appetite For Destruction (1987)*

Much of the gear Slash used to record AFD is shrouded in mystery, and the delay used at the very start of Welcome To The Jungle is no exception. Slash can only remember he used a 'common' rackmount studio echo unit, but some claim it's the 'secret delay mode' on an SRV-2000 Stereo Reverb that can be heard cascading through the start of this rock classic.

Alice In Chains

Man In The Box

GUITARIST: *Jerry Cantrell*
EFFECTS USED: *Talk Box*
FIND IT ON: *Facelift (1990)*

Cantrell utilised the Talk Box's head-turning tone to maximum effect when creating the memorable hook that kicks in over the rhythm section groove (0.11), bringing a darker edge to its legacy in rock.

THE WHITE STRIPES

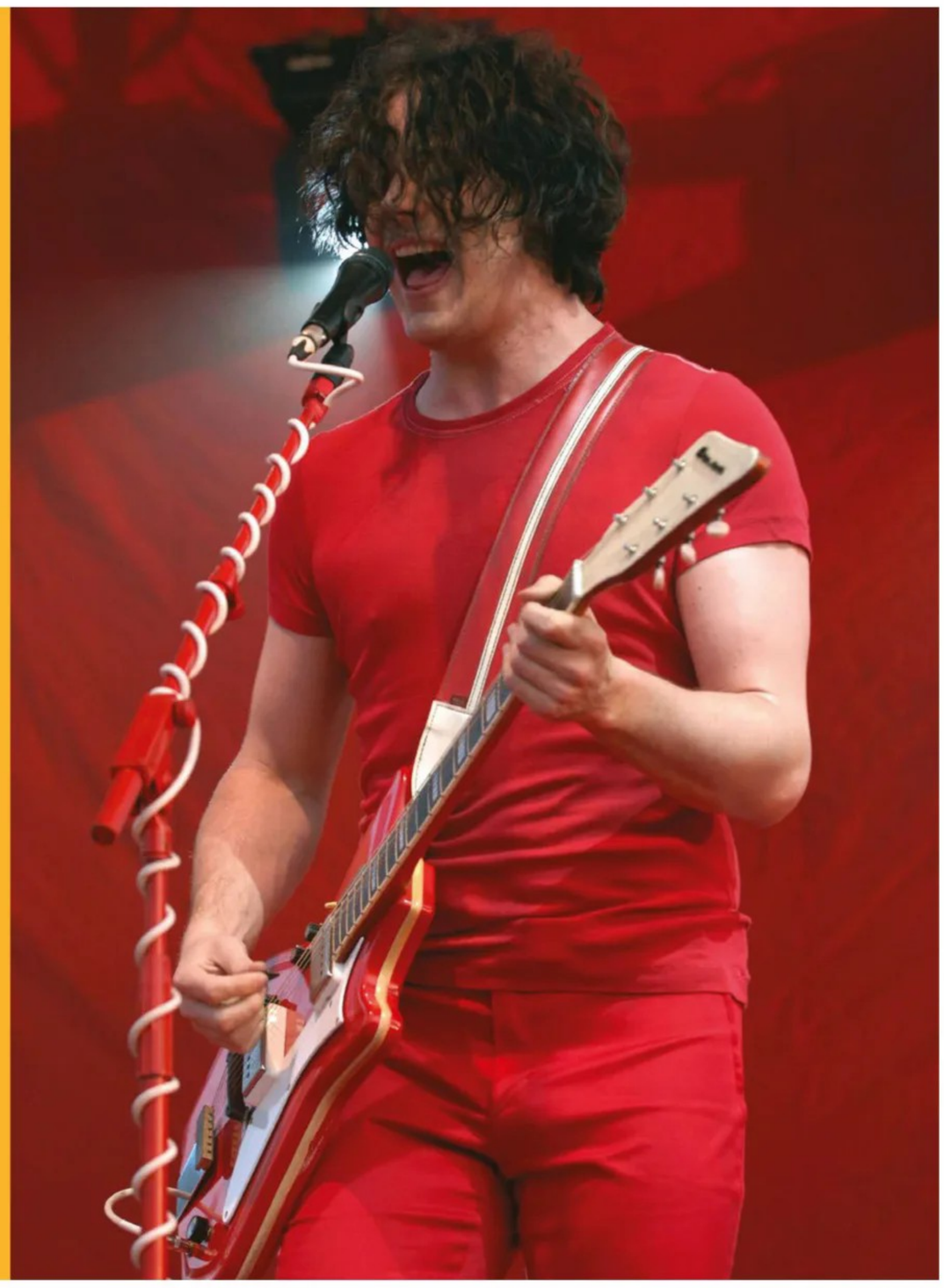
Seven Nation Army

GUITARIST: *Jack White*
EFFECTS USED: *DigiTech Whammy*
FIND IT ON: *Elephant (2003)*

Seven Nation Army's intro might be catchy enough to be sung by beered-up sports fans the world over, but despite appearances to the contrary, it's not actually a bass guitar creating the foot-stomping low-end riffery, but some clever effects wizardry from Jack White. The White Stripes were a strictly guitar and bass two-piece, so in order to replicate the four-string sound, White fed his Kay hollowbody and played slide in open tuning through a DigiTech Whammy pedal set on the sub-octave mode – et voila, instant terrace classic!

Did You Know?

White rates this riff as one of his best: "If I ever got asked to write the next James Bond theme," he says, "that would be the riff for it." He was asked: it wasn't the riff.



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Russian Circles

Carpe

GUITARIST: *Mike Sullivan*
EFFECTS USED: *Akai Head Rush*
FIND IT ON: *Enter (2006)*

The first track on the instrumental alt-rock trio's debut sets Sullivan's agenda; using a tapped part looped to build a crescendo over. The Head Rush has long been his preferred tool, for its responsiveness.

Racer X

Fire Of Rock

GUITARIST: *Paul Gilbert*
EFFECTS UNITS: *Modified A/DA Flanger*
FIND IT ON: *Technical Difficulties (1999)*

Gilbert opens this track with a whammy-style pitch bend. This striking effect was achieved using a mod for the A/DA Flanger's 'Enhance' (regeneration) control that gave extra latitude for adjustment.

Steely Dan

Green Earrings

GUITARIST: *Elliott Randall*
EFFECTS UNITS: *Mu-Tron Bi-Phase, Foxx Tone Machine octave fuzz*
FIND IT ON: *The Royal Scam (1976)*

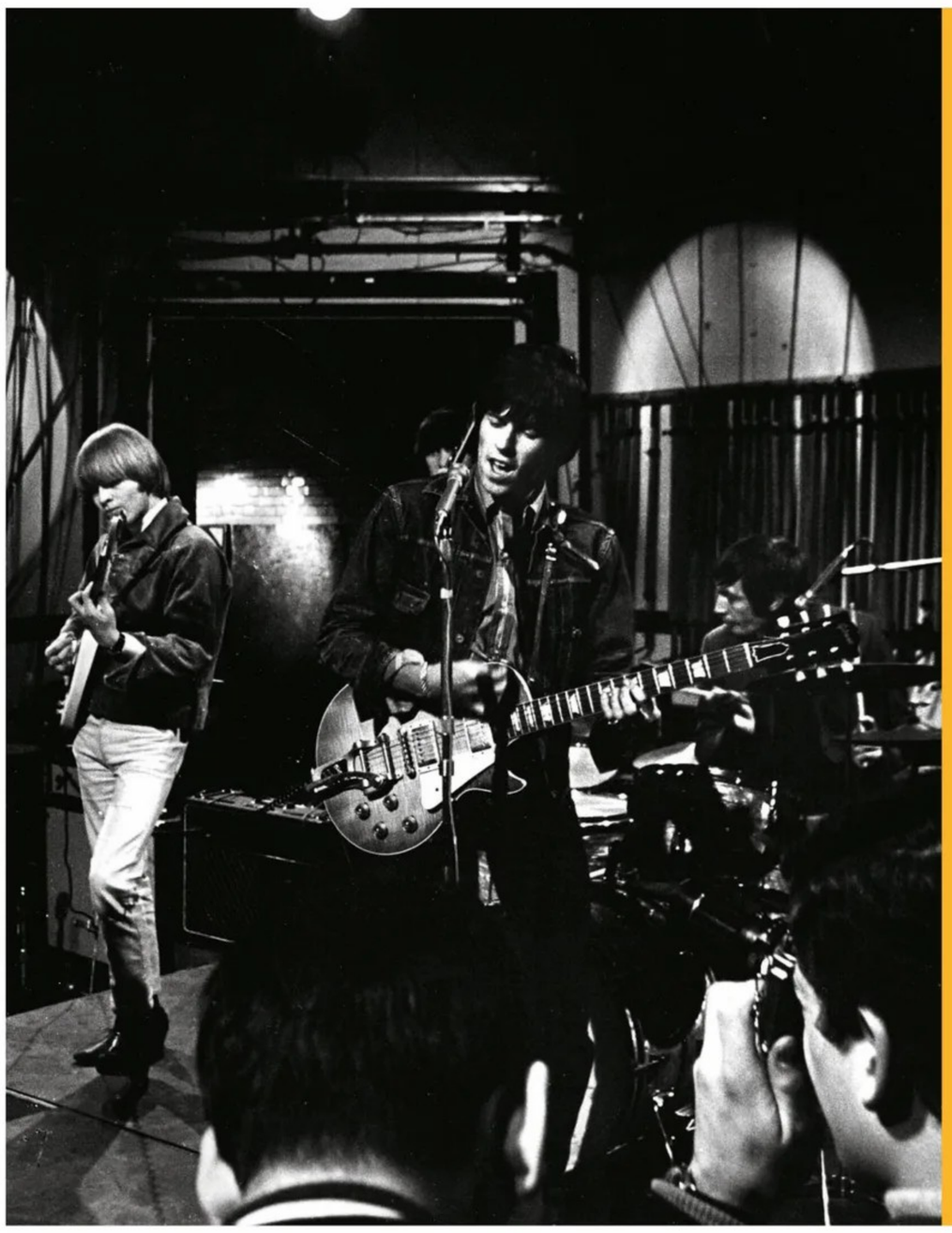
Elliott Randall's swirling tone on this track's barbed second solo was achieved with a Mu-Tron Bi-Phase pedal, with one 'rate' control set to fast, the other to a slow sweep.

Philip Sayce

Blood On Your Hands

GUITARIST: *Philip Sayce*
EFFECTS UNITS: *Arbiter Fuzz Face*
FIND IT ON: *Peace Machine (2009)*

A '67 Fuzz Face, featuring germanium NKT 275 transistors, was used on the track's solo with a touch of wah. Sayce sets both controls almost full for sizzling lead tone.



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THE ROLLING STONES

Satisfaction

GUITARIST: *Keith Richards*
EFFECTS USED: *Maestro Fuzz-Tone FZ-1*
FIND IT ON: *40 Licks (2002)*

One morning in May 1965, at a Florida motel, Keith Richards awoke from a dream and – fuzzyheaded – fumbled around, grabbed a guitar and played an idea running through his head into a nearby tape recorder. "On the tape you can hear me drop the pick," he recalled, "the rest is me snoring." Yet this germ of an idea soon grew into the Stones' biggest hit – and with the addition of an early Fuzz-Tone pedal, a hit that forever changed the way guitarists wanted to sound. Yet Richards wasn't thrilled. "If I'd had my way," he grumbles, "*Satisfaction* would never have been released. The song was as basic as the hills, and I thought the fuzz guitar thing was a bit of a gimmick."

Minus The Bear

Knights

GUITARIST: *Dave Knudson*
EFFECTS USED: *Line 6 DL4*
FIND IT ON: *Planet Of Ice (2008)*

With the aid of a pair of Line 6 DL4s running independently, guitarist Dave Knudson triggers simple repeated guitar loops like he's playing a separate instrument to create the angular, mesmerising intro to this 2008 track.

Mudhoney

Touch Me I'm Sick

GUITARISTS: *Mark Arm, Steve Turner*
EFFECTS USED: *Electro-Harmonix Big Muff Pi, Univox Super-Fuzz*
FIND IT ON: *Superfuzz Bigmuff (1990)*

These fuzz addicts ended up naming a compilation after their two favourite pedals. Turner's Big Muff provides the gnarly abrasion in their defining song's opening riff, before it's joined by Arm's Super-fuzz and its second dose of dirt (0.12).

Black Sabbath

Electric Funeral

GUITARIST: *Tony Iommi*
EFFECTS USED: *Colorsound wah, Rangemaster Treble Booster*
FIND IT ON: *Paranoid*

The Dark Lord's first use of a wah to colour one of his riffs into a darker shade of black came on the band's second album, adding articulation to each note with a Rangemaster modified by his roadies for treble boost.

Blur

Song 2

BASSIST: *Alex James*
EFFECTS USED: *Home-made distortion pedal*
FIND IT ON: *Blur (1997)*

It might be one of the most air-guitar'd songs of all time, but the famous 'woo-hoo!' moment (and all the distorted parts of the song) are actually played by bassist Alex James, double-tracking a clean bass part with a monstrously filthy distorted one to create a headbanging wall of low-end dirt. The fuzz came courtesy of a home-made distortion box that has "since got lost", according to James.

BON JOVI

Livin' On A Prayer

GUITARIST: *Richie Sambora*
EFFECT USED: *Heil Talk Box*
FIND IT ON: *Slippery When Wet (1986)*

Bon Jovi oozed classic rock from every pore, and for *Livin' On A Prayer*, Sambora decided to dredge up the talk box, an effect unheard for a decade. "When I brought it up, everybody in the band started laughing at me like I was a goofy bastard," Sambora recalls.

FOO FIGHTERS

Generator

GUITARIST: *Dave Grohl*
EFFECTS USED: *Heil Talk Box*
FIND IT ON: *There Is Nothing Left To Lose (2000)*

Dave Grohl's not the first guitarist to abandon oral hygiene concerns to bring the Talk Box's vocal sound to a record, but *Generator*'s opening riff is one of the most memorable. Wrapping his gums around a piece of surgical tube, Grohl let Bob Heil's magic box bounce the sound around his mouth – many drunken impersonations followed...

THE POLICE

Walking On The Moon

GUITARIST: *Andy Summers*
EFFECTS USED: *MXR Dyna-Comp, Electro-Harmonix Electric Mistress*
FIND IT ON: *Regatta De Blanc (1979)*

This classic example of Summers' rhythm tone is based around a flanger rather than a chorus and he used the very first version of the Mistress for the recording. The pedal utilises 'bucket brigade' devices, an integrated circuit that formed the core of most pre-digital modulation pedal-based effects.

Green Day

Boulevard Of Broken Dreams

GUITARIST: *Billie Joe Armstrong*
EFFECT USED: *Linn AdrenaLinn*
FIND IT ON: *American Idiot (2004)*

The Linn AdrenaLinn is capable of all kinds of clever sonic mischief, and one provides the sequenced tremolo effect for the intro riff on Green Day's huge hit from their American Idiot album.

ZZ Top

Cheap Sunglasses

GUITARIST: *Billy F Gibbons*
EFFECT USED: *Maestro Ring Modulator*
FIND IT ON: *Deguello (1979)*

Gibbons put a "Fender fake" (used for its whammy bar) through a Ring Modulator into a Marshall Major with a blown valve to produce the metallic tagline on each verse.

Did You Know?
Billy Gibbons once chained together eight Bixonic Expandora distortion units

KT Tunstall

Black Horse And The Cherry Tree

GUITARIST: *KT Tunstall*
EFFECT USED: *Akai E2 Head Rush*
FIND IT ON: *Eye To The Telescope (2004)*

KT Tunstall's performance of Black Horse And The Cherry Tree on Later... With Jools Holland music show was tremendously effective. Building her vocals, acoustic and rhythms through the Akai E2 Head Rush Delay/ Looper, she left the audience speechless, and catapulted herself to stardom.

John Martyn

I'd Rather Be The Devil

GUITARIST: *John Martyn*
EFFECT USED: *Vox Wah, Electro-Harmonix Big Muff, Maestro Echoplex*
FIND IT ON: *Solid Air (1973)*

Acoustic fingerstyle player John Martyn pioneered the use of the Echoplex to create acoustic atmospheres, and this haunted, psychedelic reworking of a Skip James blues uses the tape echo together with Vox wah and Big Muff fuzz to create a rhythmic tour de force.

Did You Know?
For their recent Time Machine Tour, Rush's stage cabs incorporated video displays and CO2 steam jets

RUSH

Spirit Of Radio

GUITARIST ALEX LIFESON
EFFECTS USED: *Electro-Harmonix Electric Mistress*
FIND IT ON: *Permanent Waves (1980)*

Alex Lifeson's rig has grown in proportion to Rush's back catalogue, but his pedalboard was once a fairly a modest affair. And for one of the great flanger moments in rock, he looked to the classic Electric Mistress to provide the key tonal tool for the hammer-on and pull-off fest that is this song's instantly recognisable intro riff.

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THE SHADOWS

Apache

GUITARIST: *Hank Marvin*
EFFECTS UNITS: *Meazzi Tape delay*
FIND IT ON: *Apache (single, 1960)*

The rippling delay sounds on *Apache*, which influenced a generation of young players and created a haunting sound that would define Hank and the Shads forevermore, came from an Italian drum-operated mult-head tape echo unit that Marvin acquired from singer Joe Brown.

The Cult

She Sells Sanctuary

GUITARIST: *Billy Duffy*
EFFECT USED: *Boss pedals including DD-2, DM-2*
FIND IT ON: *Love (1985)*

Then-gothic rockers The Cult struck gold with this stunning guitar intro: guitarist Billy Duffy put his trusty Gretsch White Falcon through every effect he had on his Boss pedalboard, including flanger, delay, chorus and phaser, to produce a timeless riff.

Bloc Party

Octopus

GUITARIST: *Russell Lissack*
EFFECT USED: *Audio Kitchen (custom pedal)*
FIND IT ON: *Four (2012)*

The distinctive and catchy, hi-fi, ray gun-style introductory riff uses two delays at different tempos – and come courtesy of a unit which creator Audio Kitchen is currently sworn to secrecy on, according to the company website.

Cream

Tales Of Brave Ulysses

GUITARIST: *Eric Clapton*
EFFECT USED: *Vox Wah*
FIND IT ON: *Disraeli Gears (1967)*

The day before writing this song, 60s guitar hotshot Eric Clapton had discovered a Vox Wah pedal at Manny's in New York, which featured on this single and Cream's classic *White Room*.

Elvis

Hound Dog

GUITARIST: *Scotty Moore*
EFFECT USED: *Ray Butts EchoSonic amp with tape echo*
FIND IT ON: *Elvis' Golden Records (1957)*

Despite The King having to sing this to a top-hat wearing Bassett hound on national TV as a form of moral penance, this cover lit the Elvis touchpaper. Guitarist Scotty Moore's trademark slapback delay coats the song in tape-echo honey.

Guitarist PRESENTS

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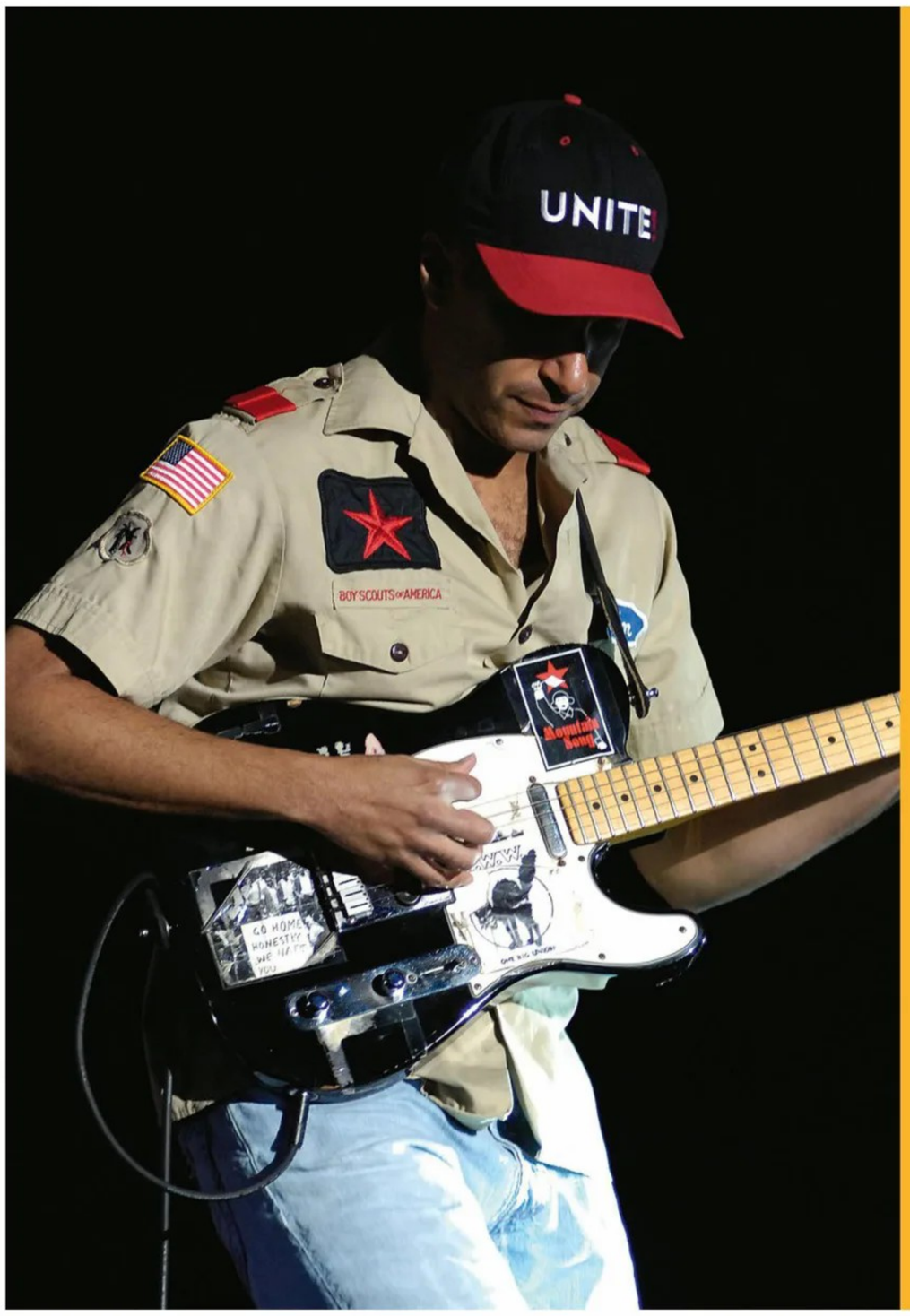

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RAGE AGAINST THE MACHINE

Killing In The Name

GUITARIST: *Tom Morello*
EFFECTS USED: *DigiTech Whammy*
FIND IT ON: *Rage Against The Machine (1992)*

He's a guitarist who has made his reputation with the incredible sounds he can make on a guitar with just his hands, but that certainly doesn't mean Tom Morello has shunned effects in his work with Rage Against The Machine and Audioslave. For the former's vehement calling card, he used a DigiTech Whammy for the solo break (3.52). Setting it two octaves up, Morello pushed the Whammy's expression pedal forward and back, but his technique still remained vital; it's the tremolo picking that gives *Killing In The Name*'s solo its climatic crescendo.

Joe Walsh

Rocky Mountain Way

GUITARIST: *Joe Walsh*
EFFECT USED: *Homemade Talk Box*
FIND IT ON: *The Smoker You Drink, The Player You Get (1973)*

This classic-rock radio staple was among the first to use the talk box effect on electric guitar (3:11). Walsh used a homemade unit but soon collaborated with engineer Bob Heil to make the commercial Talk Box, later to become synonymous with Peter Frampton.

Smashing Pumpkins

Starla

GUITARIST: *Billy Corgan*
EFFECT USED: *Mu-Tron Bi-Phase*
FIND IT ON: *Pisces Iscariot (1994)*

The Mu-Tron Bi-Phase has two 'sweep generator' controls and two phasers, plus a footpedal control; it was used by Smashing Pumpkins for swirl throughout their *Siamese Dream* era, and can be heard at freakier moments on epic guitar jam, *Starla* – a fine example of how to use effects to create drama.

The Smiths

How Soon Is Now?

GUITARIST: *Johnny Marr*
EFFECT USED: *tremolo (Fender Twins), AMS harmoniser*
FIND IT ON: *Hatful Of Hollow (1984)*

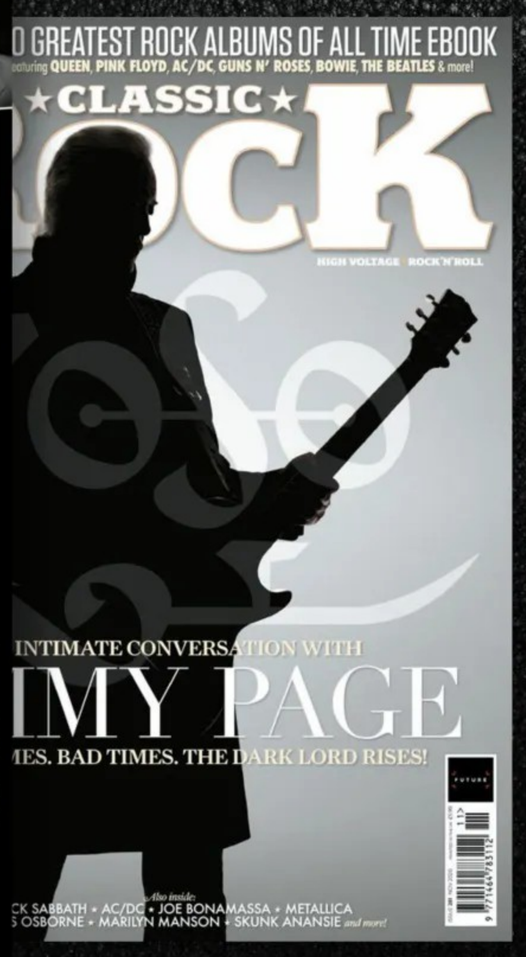
The throbbing, swampy intro riff was played through two pairs of Fender Twins while he and producer John Porter manually adjusted the tremolo rates until they coincided. And then Marr put a harmonised slide wail over the top. "I wanted an intro that was almost as potent as Layla," he says, "when it plays in a club or a pub, everyone knows what it is."

John Mayer

Bigger Than My Body

GUITARIST: *John Mayer*
EFFECT USED: *Linn AdrenaLinn*
FIND IT ON: *Heavier Things (2003)*

The signature intro riff of Mayer's hit came to him when he visited New York guitar shop Rudy's to try out a Rick Turner guitar and Roger Linn's sequencer-style effects box, the AdrenaLinn. "I found this combination of the beat and the arpeggiator: I'd never heard a guitar do that before...", he said. It was his breakthrough hit, and he was on his way to stardom.



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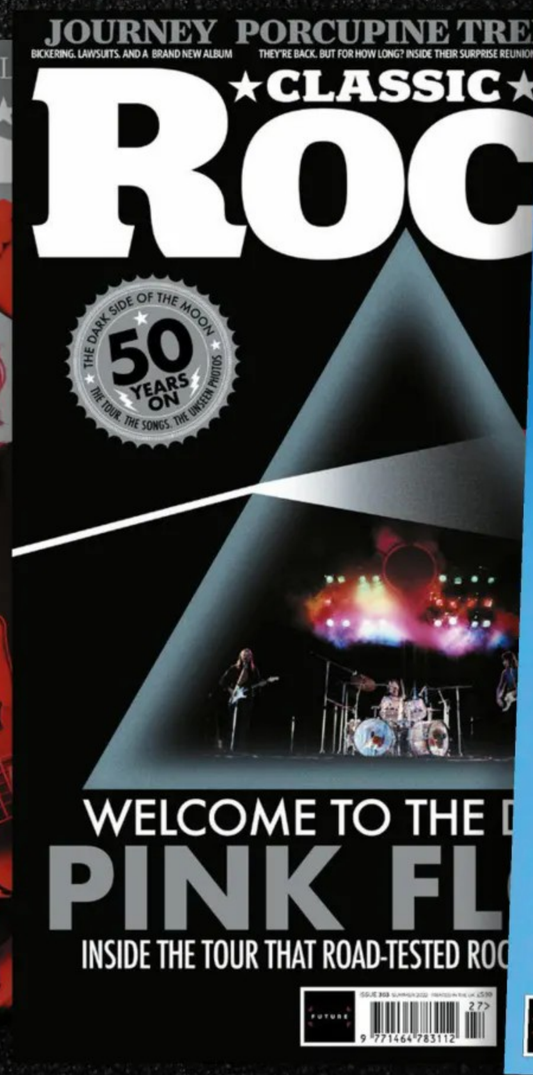

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EFFECTS EXPLAINED

For newcomers to the wonders of effects pedals, the jargon used to describe them, the sometimes obscure differences between them and even the sheer range on offer can be confusing. Here, we examine each of the main types of effects in turn, and explain what they sound like and the basics of how they work – plus, we offer some buying pointers for different budgets. ***Time to get stomping...***

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Overdrive

The singing tone of an amplifier on the edge of breakup... in a box

1 The fabled Ibanez Tube Screamer has a very strong midrange frequency punch. This helps your guitar cut through in a busy band 'mix'. It also works well for solo boosts

2 Overdrive is a versatile sound, and guitarists from pop, country, rock, blues and even jazz backgrounds will have at least one on their board

3 The best overdrive pedals will offer a range of gain levels that range from a clean boost type of sound (very low overdrive, but with a hike in volume), though to a thicker, more driven and harmonically-packed sound

Usage Tip

If you want a heavy overdrive sound, set the 'gain' or 'drive' control high and the 'level' or 'output' lower. For more of a clean boost effect, do the opposite

What it sounds like

Fuzz, distortion and overdrive are three types of gain effects which are easily confused with each other, as they all 'distort' a clean guitar signal in different ways. Overdrive is the mildest of the three types, and as the name suggests, the effect attempts to recreate the effect of a valve amplifier being 'overdriven', creating those warm, slightly crunchy rhythm sounds (think AC/DC) and the singing, sustaining lead tones (think Stevie Ray Vaughan) that our ears have become accustomed to for over half a century of blues and rock guitar.

How it does it

The key factor that distinguishes an overdrive effect from fuzz and distortion has to do with the specific way that it distorts a signal. When a signal becomes distorted, the peaks of its waveform are 'clipped'. Overdrives flatten these peaks more gradually than other types of distortion, and this smooth, 'soft clipping' type of distortion emphasises even-order harmonics, which we hear as smooth and warm break up in the guitar sound.

Overdrive is among the most popular pedals, with countless models available from a plethora of manufacturers. The resultant tones can vary wildly depending on their component choices and indeed the other gear they're paired with with. Consider blues legend, Stevie Ray Vaughan and his use of the Ibanez Tube Screamer. Now bring to mind Edward Van Halen and the Boss SD-1 used as part of his fabled 'brown' sound rig. It's great fun to experiment with many different types.

BEST OF BREED

BUDGET

EHX SOUL FOOD

www.ehx.com

MID-PRICE

FULLTONE OBSESSIVE COMPULSIVE DRIVE

www.fulltone.com

BOUTIQUE

FREE THE TONE SOV-2

www.freethetone.com

Distortion

The snarling, aggressive bite that gives rock and metal its edge

Usage Tip

As with all overdrive, distortion and fuzz boxes, try using your guitar's volume control to regulate the amount of distortion and volume. This can be very effective for moving between rhythm and solo sounds

1 At low volumes, you may find you need high levels of distortion to get plenty of sustain. As you turn up to gig levels, you may find it beneficial to back off on the distortion a bit, to retain clarity and cut in your sound

2 What's the difference between overdrive and distortion? In technical terms, they're the same thing. Soncially, overdrive sounds 'softer' and 'rounder', while distortion sounds 'harder' with more edge and aggression

3 Some techniques are greatly facilitated by distortion, including pinch harmonics, right-hand damping, two-handed tapping and legato lead playing

What it sounds like

Evil, loud and edgy! Distortion – in all its menacing, jagged glory – is the sound of a guitar signal possessed. The first distortion boxes were the fuzzes that arrived in the 1960s; they were uncomplicated and unforgiving beasts. Since then, we've come to think of distortion in a more modern sense thanks to more refined sounds and circuits that have been developed since those tonal pioneering days. Distortion underpins everything from The Rolling Stones, to Jimi Hendrix, to Nirvana, to the heaviest of modern metal.

How it does it

Unlike overdrive – which derives its smoothness from even-order harmonics and softer, more gradual clipping of waveforms – distortion is extreme. It is a harder, more jagged waveform clipping, emphasising the jagged peaks and odd-order harmonics to create a sound that entirely changes the guitar's character, replacing it with the pedal's own.

While distortion pedals have played their part in some of the heaviest sounds ever created, including the earth-shaking riffery of Metallica and the like, pedals like Marshall's ShredMaster and ProCo's Rat have served the differing sonic requirements of indie noiseniks such as Radiohead, My Bloody Valentine and Sonic Youth, not to mention Jeff Beck and David Gilmour's filthier moments. The workmanlike Boss DS-1 and DS-2 have proved their worth among the pros, serving up the gain and sustain for virtuoso instrumentalists Steve Vai and Joe Satriani.

BEST OF BREED

BUDGET

BOSS DS-1

www.bossus.com

MID-PRICE

MESA/BOOGIE THROTTLE BOX

www.mesaboogie.com

BOUTIQUE

PROVIDENCE SDT-2 STAMPEDE DT

www.providence-ltd.com

Fuzz

The 1960s effect that launched a thousand riffs is still going strong

Usage Tip

Blues-rock star Philip Sayce tells us how to set up the perfect fuzz sound: "With the Fuzz Face, I would put both knobs on full, and even if you weren't playing, it'd be like that ocean sort of sound! So then I'd just roll both back until that hiss goes away, and there it is"

1 Although primitive fuzz circuits produced an inflexible wall of sound, fuzz quickly developed into a highly playable and dynamic effect enhanced by the interaction of the guitar's volume control and pick attack

2 The germanium transistors used in vintage-sounding fuzz pedals are sensitive to environmental factors, and variables such as their gain and frequency response can drastically alter the character of the distortion they create. No two fuzzes are the same!

3 Where you place your fuzz in the signal chain has a significant bearing on overall tone, so experiment with different orders

What it sounds like

Among the first transistorised guitar effects, the fuzz has a disarmingly simple circuit – but it's actually a paradoxical changeling that can travel beyond filthy, yet can still be rounded and warm; is generally woolly and thick, yet can also be spiky and angular. However you describe its sound, though, stomp on one and it remains devastatingly effective. Its structure (and integrity) has remained fundamentally unchanged since the moment Keith Richards stepped on his Maestro Fuzz-Tone to mimic the horn part he had in mind for *(I Can't Get No) Satisfaction* in May 1965.

How it does it

The fuzz torch passed quickly to Jimi Hendrix, whose experiments with Dallas-Arbiter Fuzz Faces modified by Roger Mayer literally set the tone for what was to come. The key component of a fuzz pedal's character is the type of transistors it uses – Hendrix used fuzz pedals with two key types, germanium and silicon, to produce softer and woollier, and harsher yet clearer tones respectively. Modern fuzz units range from meticulously accurate vintage reproductions, to supercharged boutique creations like the Z Vex Fuzz Factory, which expands on the classic tonal palette by using internal feedback loops, and enabling the user to vary component bias and voltage to sculpt the sound. Every guitarist should own at least one fuzz pedal!

BEST OF BREED

BUDGET

ELECTRO-HARMONIX LITTLE BIG MUFF PI

www.ehx.com

MID-PRICE

DUNLOP FFM-1 JIMI HENDRIX FUZZ FACE MINI

www.jimdunlop.com

BOUTIQUE

ZVEX FUZZ FACTORY

www.zvex.com

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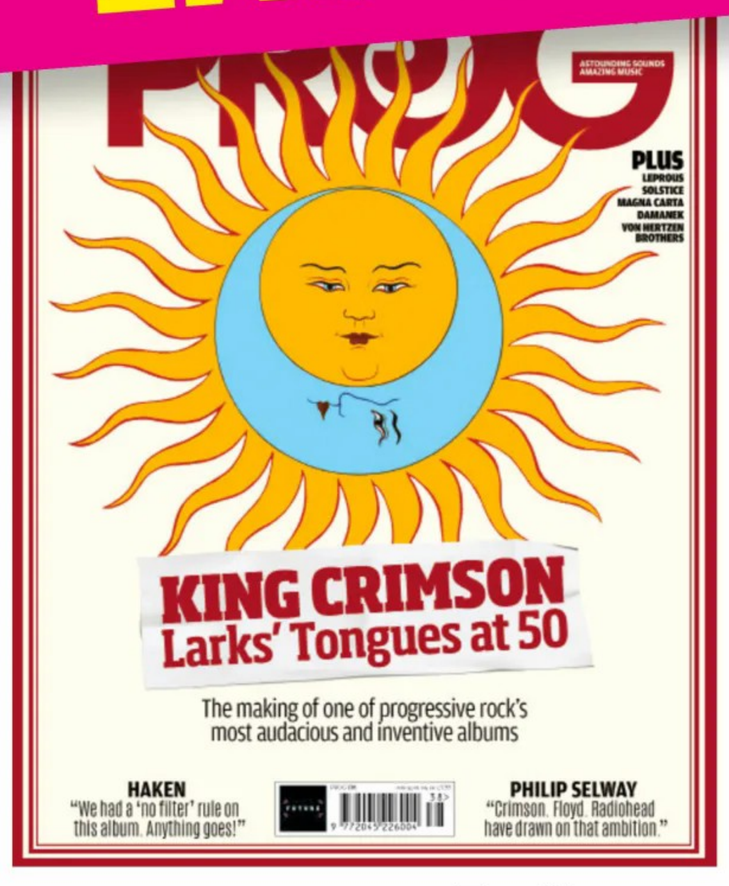

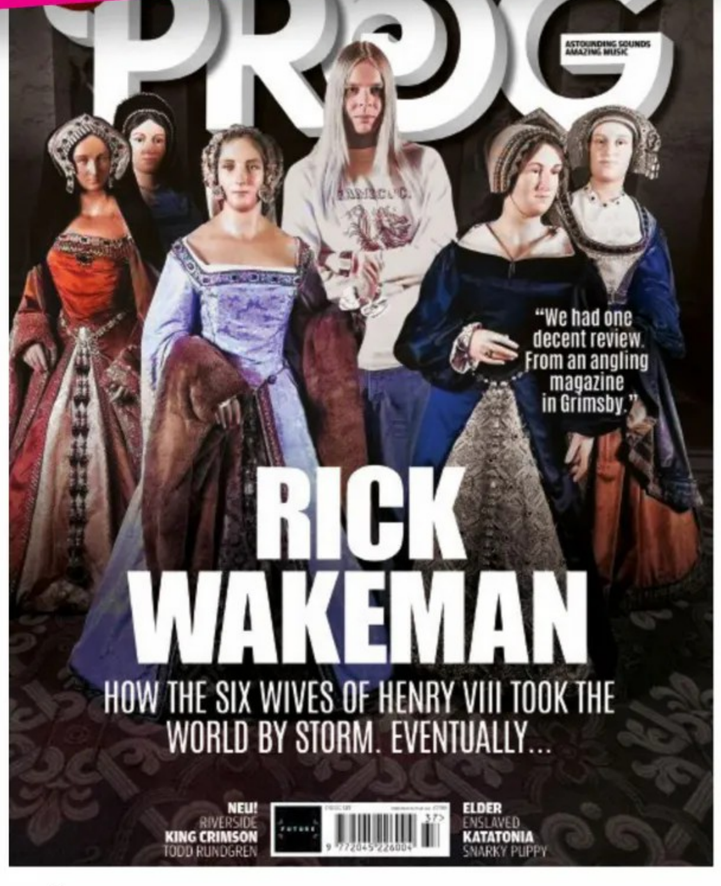

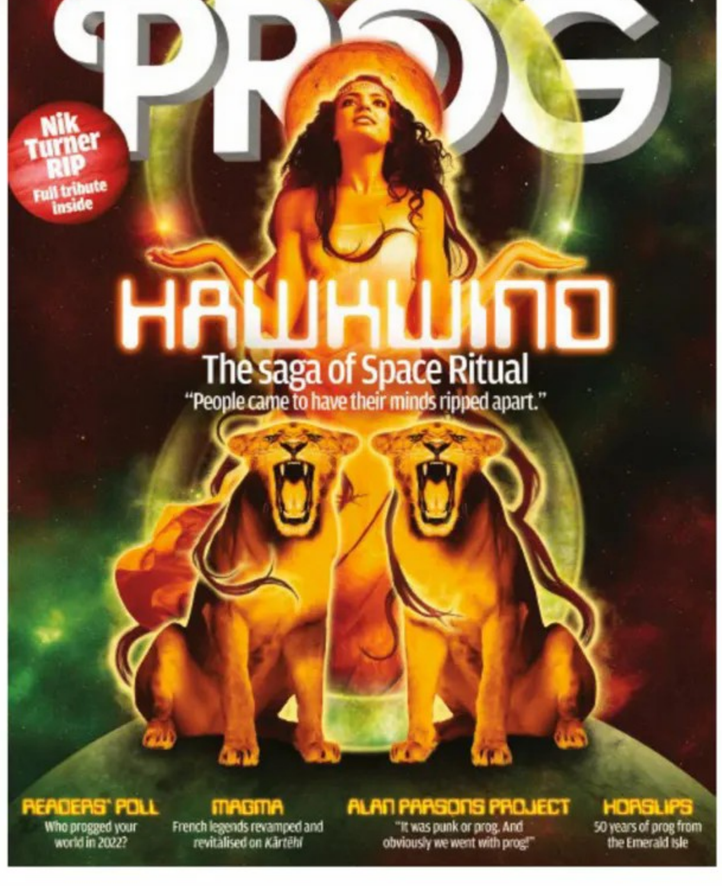

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Boost

Louder is obviously better – but it's not as straightforward as it seems

1 Boost is often placed first in a signal chain, to increase the unadulterated guitar signal at source rather than magnifying aspects of the signal further down the line. However...

2 ...in recent years, more and more players are taking to using a buffered boost as the last pedal in a chain of different effects, to restore a good, strong signal at the optimum impedance before it hits the amp

3 Some boosts are engineered to alter specific frequencies, such as the fabled treble booster, used to such great effect by the likes of Brian May and Rory Gallagher

Usage Tip

Try a booster if you just want a little bit 'more' of your current sound, without going as far as an overdrive or distortion pedal. They're great for a slight hike in volume, or for pushing your amp into drive

What it sounds like

Unlike overdrive, distortion and fuzz, boost pedals are most often marketed on their 'transparency' or 'neutrality' of sound. That means they amplify your signal, but have little or no effect on the fundamental sound or EQ of your core tone. The perceived effect is a 'thickening' of your guitar's tone right across the frequency spectrum. You will also notice enhanced playing 'feel' and dynamics under your fingers, even if this is harder to detect with some circuits (and guitar and amp combinations) than with others. A boost is also an effective way to push an on-the-edge-of-drive valve amp into thicker, natural-sounding overdrive. Some dual-function overdrive pedals build this function into the unit as a bonus feature. The late, great Stevie Ray Vaughan once opined that he wished there was just one button that said 'more'. A booster is about as close to that as you can get in a pedal.

How it does it

A simple booster increases level of the signal strength hitting your amp. It doesn't clip it into distortion and it doesn't alter the EQ. That said, some booster pedals do offer other functions such as bass and treble attenuation, for example, while others only boost certain frequencies – the treble booster is a good example. As always with effects pedals, what starts out as a simple concept, ends up in a plethora of options! Try a few out and see which works best for you.

BEST OF BREED

BUDGET

MOOER AUDIO FLEX BOOST

www.mooeraudio.com

MID-PRICE

XOTIC EP BOOSTER

www.xotic.us

BOUTIQUE

FREE THE TONE FB-2 FINAL BOOSTER

www.freethetone.com

Compression

Compression is the great leveller – quite literally!

Usage Tip

For the most compressed sound, set the sensitivity (compression) knob high and the output low. For a clean boost, do the opposite

1 Compressor pedals affect the volume of your signal in a dynamic way: they respond to the incoming signal strength attack and compensate either up or down. As a result, they can alter the feel and response of the playing experience significantly

2 Compression isn't just for guitars: it's used extensively in many aspects of recording other instruments and vocals, not to mention while mixing and mastering

3 Many compressor pedals have only a few controls. The most common are 'threshold' (the point at which the compression effect comes into play); 'ratio' (how aggressively it affects the signal); and 'level' (the overall output volume)

What it sounds like

Guitarists use compression pedals ingeniously and creatively – whether it's to provide the long sustain for soaring, expressive lead notes, to increase the percussive punch and attack that's come to characterise funky rhythm, or to even out the dynamics of country chicken pickin' and fingerpicked chord-melody styles, these unassuming and deceptively simple boxes have been used in the true spirit of 'effects' pedals; to add character to a guitar part, and create an impact.

How it does it

Compression was originally a studio effect designed to dynamically cut the wayward level peaks, and boost the level troughs of a recorded part. Compressor pedals may be simplified versions, with fewer distinct controls and simpler components than their studio components, but their principal function remains the same. There's no shortage of variations on the theme, however, and while they may seem superficially similar when viewed on a workbench, certain vintage compressors (the MXR Dyna Comp, the Ross Compressor, the Orange Squeezer) have endured on pedalboards, been perpetually cloned, and have assumed almost mythical properties in the minds of guitarists over the years.

BEST OF BREED

● BUDGET

BEHRINGER DC9

www.behringer.com

● MID-PRICE

MXR DYNA COMP

www.jimdunlop.com

● BOUTIQUE

KEELEY COMPRESSOR

www.robertkeeley.com

Wah

This expressive filter effect is why pedals are called pedals

Usage Tip

It's tempting to rock your wah in time to the song's tempo, but intriguing effects can be created by rocking in counter-rhythm, or simply by leaving the wah in one position

1 The classic wah design uses a mechanical pot in conjunction with the pedal. Others use optical circuits with fewer moving parts

2 Some wah pedals add extra fuzz or distortion to the circuit, and signature models are 'tuned' to star players' preferences

3 Use your wah with care – it may be the best-selling pedal of all time, but it's also the victim of overuse and can sound somewhat clichéd if it's used all the time

What it sounds like

Ask any non-guitar player to imitate a guitar, and the chances are they'll make a sound not dissimilar to that of a wah-wah pedal. It's understandable – not only does the wah-wah's sound loosely resemble the human voice, but ever since Eric Clapton embroidered the descending riff of Cream's *Tales Of Brave Ulysses* with one in 1967, the effect has become synonymous with electric guitar itself. Whether it's the theme from *Shaft*, the intro to Jimi's *Voodoo Child (Slight Return)*, or the heavier approaches of Michael Schenker or Kirk Hammett, the wah's ululating sweep makes an instant and powerful connection. Throw in the wah's ability to create percussive emphasis and rhythmic variety, and you have a pedal that's a go-to choice for many a guitarist.

How it does it

The wah is a band-pass filter which creates a frequency peak which moves up and down the frequency spectrum in response to the position of the rocker pedal. When this frequency peak corresponds to the frequencies of the signal being passed into the wah – the signal from your playing – the characteristic wah sound is the result. Different wah pedals have different 'voicings' or resonant responses, and some vintage models are favoured for the perceived uniqueness of voice their components bestow.

BEST OF BREED

BUDGET

VOX V845

www.voxamps.com

MID-PRICE

DUNLOP CGB95F CRY BABY CLASSIC

www.jimdunlop.com

BOUTIQUE

FULLTONE CLYDE DELUXE WAH

www.fulltone.com

EQ

Bass, middle, treble and everything in between

Usage Tip

Experiment with using your EQ pedal before and after characterful effects (drives, for example) in your signal chain, to reduce, emphasise and sculpt particular frequencies

1 The 'scooped' EQ beloved of thrash and hard-rock guitarists, but often difficult to translate to live performance, is easily visualised with an EQ pedal – see left!

2 Your amp may have all the tone controls you feel you need, but you can't access a radically altered setting at the stomp of a switch: the EQ pedal can

What it sounds like

EQs can sound radically different depending on how they're set, so perhaps it's better to discuss what you might want to use them for. First, how about an overall level and midrange boost for solos? Alternatively, you could use your EQ pedal to even out discrepancies in tones when switching guitars; adding thump and low end to your Strat when switching from a Les Paul, for example. Feedback – either a friend or a foe in our world – can be conjured or calmed using your EQ pedal. It can also be used to create a strongly constrasting effect: setting your EQ pedal to a very mid-scooped (metal), or a pseudo through-the-telephone sound (hi mids, low bass and treble), can add a dash of sonic variety. EQ changes effectively place your guitar in a different area of the overall band mix; out of the way of the vocals or other guitars, for example.

How it does it

The graphic equaliser enables you to select certain frequency groups and either boost or cut them. We're all familiar with slider-based graphic EQ interfaces from older generation hi-fis and the like, and many EQ pedals adopt this format, rather than the rotary controls that are standard fare on our guitar amps. Each of the (most commonly) six or 10 sliders corresponds to a band of the frequencies selected to best suit the key frequency hotspots for electric guitars.

BEST OF BREED

BUDGET

BEHRINGER EQ700

www.behringer.com

MID-PRICE

BOSS GE-7 EQUALIZER

www.bossus.com

HIGHER END

MXR KFK1 10 BAND EQUALIZER

www.jimdunlop.com

Talk Box

Tube in the mouth, pedal on the floor. We should talk...

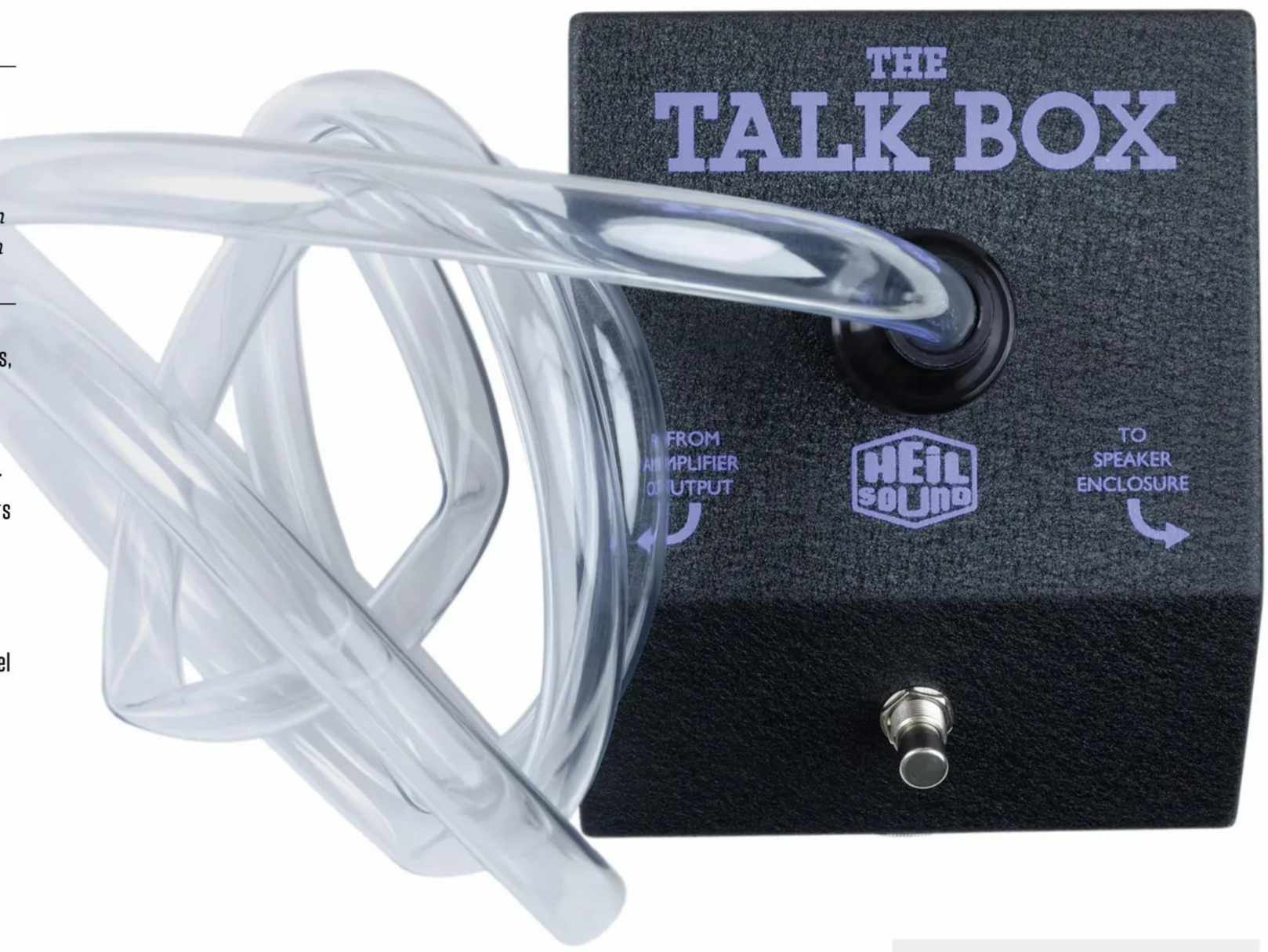
Usage Tip

Talk Box effects work best on melodies with sustained notes, so when you first get one, familiarise yourself with the effect by methodically working up and down scales, filtering each held note with vowels as you go

1 It may look like a primitive dental apparatus, but the Talk Box is an ingenious piece of bio-engineering for guitar

2 The sound doesn't come out of your guitar amp. Instead, it goes into the Talk Box, gets pushed up the tube and then fed down your vocal microphone into the PA

3 The Talk Box was one of the first guitar-specific effects of its kind, but steel player Alvino Rey had combined his guitar sound with his wife's voice using a throat microphone back in 1939, on the song *Singing Guitar*



What it sounds like

Joe Walsh's *Rocky Mountain Way*, 1973. Peter Frampton's *Show Me The Way*, 1975. Bon Jovi's *Livin' On A Prayer*, 1986. The uninitiated might assume those sounds are from some kind of wah-wah, but the blend of guitar tone with human vowel sounds (via the tube in the mouth!) moves it one human interaction further. Walsh is said to have created his with a homemade unit, before working with engineer Bob Heil on one of the first commercial versions, the Heil Talk Box. Since then, many players have used the Talk Box to great effect, imbuing their solos and hooks with an eerie human vocal realism.

How it does it

The original (Heil) Talk Box design actually plugs into the speaker output of your amp. Notes played then come back up the tube and into your mouth, where you physically shape the sounds, just as you do with normal speech. Except in this case, you move your mouth, but you don't make any sound. The guitar sound then comes back out of your mouth and goes down your mic to the PA system. More modern designs, such as the MXR Talk Box, have a built-in amplifier and speaker. This means they can sit in line with your effects pedals like any other: no need to plug them into the speaker output of your amp.

BEST OF BREED

● MID-PRICE 1

HEIL HT-1 TALKBOX

www.jimdunlop.com

● MID-PRICE 2

MXR TALK BOX

www.jimdunlop.com

● BOUTIQUE

FRAMPTONE TALK BOX

www.framptone.com

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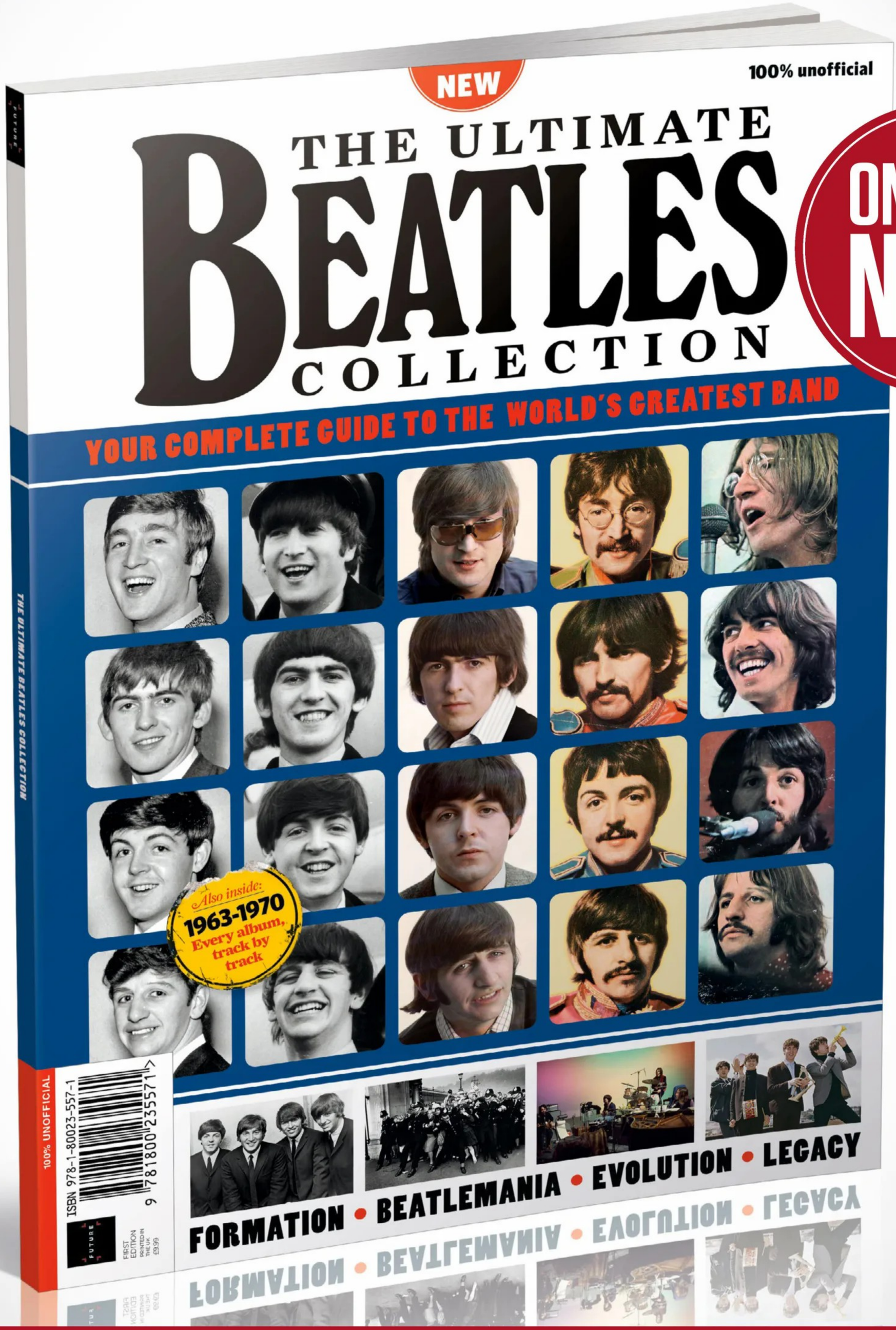

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Chorus

The smooth shimmer effect that adds width to your tone

1 The 'depth' controls the amount of 'sweep' in the pedal's waveform, resulting in the perceived intensity of the chorus effect: how 'deep' the chorus goes

2 The 'rate' controls how fast the waveform repeats, resulting in the perceived speed and pitch variation of the effect

3 Analogue choruses are considered 'warmer' than their digital counterparts; but digital chorus units typically offer much more control, and additional parameters

Usage Tip

For subtle effects, set the depth medium/high and the speed (rate) to minimum. For more sea-sickness, increase both rate and depth. Woah...

What it sounds like

Chorus is related in sound to flanger and phaser, in that it relies on phase cancellation to create a characteristic swirling sound. It differs in sound from those effects, however, because rather than create a sweeping frequency change over time, it simulates the narrower variations in pitch and timbre that typically happen when a group of similar instruments or vocalists perform the same part in unison. The resulting shimmering, sometimes warbling fluctuation can be heard on songs such as Guns N' Roses' *Paradise City* and Nirvana's *Come As You Are*, and can range from a dreamlike ambience to a rapid wobble. 12-string guitar can also be broadly simulated using chorus. It was used heavily in the 1980s, so can sound dated if you're not careful.

How it does it

Though analogue and digital choruses work differently, broadly speaking, a chorus pedal takes an incoming guitar signal, divides it into two halves designated 'dry' and 'wet', and treats the wet half with a series of targeted delays and pitch modulations, before blending this 'wet' signal back in with the dry signal. The rate and depth knobs typical of most chorus pedals enable you to control how much modulation there is on the pitch and delay time of the effect, changing the subtleties of its character. There are many variations on chorus, with units offering different filter parameters and stereo output.

BEST OF BREED

BUDGET

ELECTRO-HARMONIX NANO CLONE

www.ehx.com

MID-PRICE

BOSS CE-5 CHORUS ENSEMBLE

www.bossus.com

BOUTIQUE

STRYMON OLA CHORUS/VIBRATO

www.strymon.net

Phaser

A psychedelic bath of trippy modulation

Usage Tip

The faster you set the rate control of your phaser, the more the effect will change from cycling swirl to flutter. Try extremes of both, throughout various depth settings, to unearth some classic 70s sounds

1 Phasers vary in complexity; classic Phaser pedals such as the MXR Phase 90 have only one control, for speed, where others add controls such as resonance to alter the character of the effect's frequency peaks

2 Phasers can be used for rhythm as well as single-note arpeggios and lead playing, and have proved a popular effect with funk players, as well as heavy rockers

What it sounds like

The earliest phaser effect, the Uni-Vibe, was developed to create a sound akin to the Doppler-esque movement of a rotary speaker. Phasing sounds like a swirling, psychedelic sweep, with a detectable cycle between different frequencies (warm and bassy, trebly and hollow, for example). It was a popular 70s pedal board addition, bringing texture and movement to both rhythm and lead parts. Brian May's playing on *Sheer Heart Attack* and Edward Van Halen's *Eruption* both typify the effect.

How it does it

A phaser splits a signal into two: one half remains unaltered, while the other half of the signal oscillates around the entire frequency range, sending the two halves out-of-phase with each other. This creates peaks and troughs at points in the cycle, and the waveforms cancel each other out to varying degrees during the process. Users control the parameters of the oscillation, and therefore vary the number of peaks and troughs in the overall cycle, using a speed control. The overall effect is a sweeping, variable swoosh that's more pronounced than a chorus.

BEST OF BREED

BUDGET

BELCAT PHS-505 PHASER

www.belcat.com

MID-PRICE

MXR '74 VINTAGE PHASE 90

www.jimdunlop.com

BOUTIQUE

PIGTRONIX ENVELOPE PHASER

www.pigtronix.com

Flanger

Is your sound ready to take off to jet-like altitude?

1 'Resonance', 'regen' or 'feedback' settings control the amount of signal that's returned to the circuit and reprocessed, enhancing the frequency peaks and troughs and resulting in a more intense sound

2 Flanger is incredibly versatile, and can range from cold, metallic, slow sweeps to wobbling harmonics and whooshing jet-engine sounds

3 Rock titans Edward Van Halen and Paul Gilbert are just two players who have used flangers to superb effect. They both have signature pedals as a result

Usage Tip

Try setting the speed of flanger so that the complete modulation starts and finishes either every two or four beats of your song

What it sounds like

Anything from a jet taking off at one extreme, to a slower, 'wobblier' version of the phaser that's thicker and more machine-like at the other. Though it's often associated with rock and metal players from Van Halen to Metallica, one of the best examples of the flanger effect ever committed to record is The Cure's *A Forest*, which according to its producer, Mike Hedges, features up to seven units at once!

How it does it

The flanging effect was popularised when studio producers took two reel-to-reel tape machines and played an identical vocal part, but ran a finger along the flange of one of them to vary its speed. Flanger pedals operate along roughly the same lines as phasers: the difference being that a flanger offers more control over the timing of the peaks and troughs in the relationship between the two halves of its signal: the 'notches' (peaks) in a phaser's signal are non-linear, ie unevenly spaced; a flanger's are linear, and sweep up and down the frequency spectrum in related harmonic series, resulting in a denser, more harmonically rich effect. Regeneration controls common to flangers also allow you to feed back part of the output signal, creating chunky, metallic overtones.

BEST OF BREED

BUDGET

MOOER ELECLADY ANALOG FLANGER

www.mooeraudio.com

MID-PRICE

IBANEZ AF2 PAUL GILBERT AIRPLANE FLANGER

www.ibanez.com

BOUTIQUE

HARTMAN ANALOG FLANGER

www.hartmanpedals.com

Vibrato

How about some wobbling fluctuations in pitch?

Usage Tip

Setting vibrato to slow speeds can produce some ethereal, dreamlike sounds, especially when used over sustaining arpeggio notes or ringing chords. Faster speeds have a more obvious wobbling effect

1 Depth and speed are typical controls on a vibrato pedal. Depth controls the extent of the pitch modulation, while speed determines how fast that modulation occurs

2 Two-in-one pedals such as Carl Martin TremO'vibe continued the tradition of associating the vibrato and tremolo effects in guitarists' minds

3 Some analogue delays include an option for pitch modulation in the repeats of the notes you play. Not strictly vibrato, but it still helps to create that vintage, ethereal texture

What it sounds like

Vibrato was first introduced in early guitar amplifiers from Magnatone, Gibson, Fender and Vox. What it *doesn't* sound like is tremolo. Let's say it here: vibrato is modulation in pitch, while tremolo is modulation in volume. The reason for the confusion is down to historical mislabelling: Fender's Synchronized Tremolo fitted to the Stratocaster, for example, is in fact a vibrato unit. There was more confusion with various amps, but that's another story. Confused? Think of the vocalist's vibrato, or what you do with your fretting hand when you use vibrato on notes. You'll never be confused again – vibrato is about pitch, not volume. Famous users are as diverse as Blur's Graham Coxon, through to blues legend Robert Cray.

How it does it

Similar to chorus but without the delay element, vibrato takes your guitar note and modulates its pitch up and down at a consistent rate, that you can set on the pedal. The other key difference is that where chorus mixes the modulated signal with the dry signal, vibrato is usually 100 per cent wet: the entire signal is effected, not just part of it.

BEST OF BREED

● MID-PRICE 1

ELECTRO HARMONIX THE WORM

www.ehx.com

● MID-PRICE 2

TC ELECTRONIC SHAKER VIBRATO

www.tcelectronic.com

● BOUTIQUE

DIAMOND VIBRATO

www.diamondpedals.com

Tremolo

Throbbing or choppy, this is about volume ups and downs

1 Depth and rate are the typical controls for a tremolo effect; 'depth' for the amount of volume cut, and 'rate' for the speed at which it happens. Some tremolos also have a 'wave' control which makes the volume ups and downs smooth or sharp; from gentle ups and downs, through to sudden on/offs

2 Blues-rock titan Joe Bonamassa often has a faint tremolo effect running on one of his live amps all the time. Weird but true!

Usage Tip

Try setting your tremolo pulses in time with the music. This can be particularly effective with on/off staccato sounds

What it sounds like

Tremolo is the classic, oft-heard effect of a guitar sound's volume cutting in and out at a variety of speeds. It's exemplified by surf guitar sounds and more recently revived by The Smiths' *How Soon Is Now?*, Radiohead's *Planet Telex*, REM's *What's The Frequency, Kenneth?* and countless others. Volume up and down, in time: it's as simple as that.

How it does it

Tremolo has been around since the 50s and was popularised by players like Dick Dale as part of the US surf music craze. The most superficially straightforward of all the modulation sounds, it alters only the volume of a signal, switching it on or off, or moving it up and down, according to user preferences for speed, depth and waveform: eg how quickly, how much and how smoothly the volume goes from minimum to maximum levels in the tremolo's cycle. Some pedals, such as the Boss TR-2, have a Wave control: sine wave settings produce a smooth rise and fall, and square waves produce a harsher, choppier character. Modern units add stereo functionality, and enable you to control the 'rhythm' of the unit's pulse or lock it to tempo.

BEST OF BREED

BUDGET

BELCAT TRM-507 TREMOLO

www.belcat.com

MID-PRICE

ELECTRO-HARMONIX SUPER PULSAR

www.ehx.com

BOUTIQUE

EMPRESS TREMOLO

www.empresseffects.com

Rotary Speaker

The rotating-speaker organ effect that was hijacked by guitarists

Usage Tip

Add a foot-operated expression pedal if your pedal accepts one. This will enable you to vary the speed of the rotary speaker simulation, in order to emphasise certain notes and passages in your playing

1 Modern rotary speaker simulators in pedal form have their work cut out, but there are some exceptionally well-engineered stabs at it, including the Strymon Lex, Boss RT-20, the Hughes & Kettner Tube Rotosphere and the Fulltone Mini-Deja Vibe, among others

2 Genuine rotary speaker cabinets are bulky, expensive and hard to maintain, so the pedal route is the way to go for most players

3 Most good rotary speaker simulator pedals have some ability for external control of the speed. This was a feature on old Leslie cabinets, for example: fast and slow rotation

What it sounds like

The Leslie speaker cabinet is a cumbersome beast that's as literally physical as effects get. Designed for use with the organ and closely associated with the Hammond sound, the sonic possibilities of the Doppler effect created by the spinning parts which sit behind the cabinet's two speakers were quickly seized upon by guitar players. The Beach Boys, The Beatles, The Byrds, and later David Gilmour, Stevie Ray Vaughan and others all stuck their guitars through the rotating speakers of a Leslie, or Fender's Vibratone, a guitar-specific variant on the Leslie 16 introduced in 1967. There are many examples of its sound, but the definitive recorded example has to be Stevie Ray Vaughan's 1984 song, *Cold Shot*, which positively swims in throbbing Vibratone pulse.

How it does it

The classic Leslie had a rotating horn arrangement on its treble speaker, and a rotating drum around its bass speaker. The physical movement of the two caused the complex sound modulation. Fender's Vibratone, meanwhile, had a single 10-inch guitar speaker with a 15-inch rotating Styrofoam cylinder around it. Speeds were variable: off, slow or fast. Pedals simulate all of this in the analogue or digital signal-processing domains.

BEST OF BREED

MID-PRICE

HARDWIRE TR-7 TREMOLO & ROTARY

www.hardwirepedals.com

BOUTIQUE 1

STRYMON LEX

www.strymon.net

BOUTIQUE 2

HUGHES & KETTNER TUBE ROTOSPHERE MKII

www.hughes-and-kettner.com

UniVibe

The king of vintage modulation pedals, as used by Jimi

1 Later Uni-Vibe-alikes added a stereo output, to spread the effect across a mix or stage

2 Chorus is the beloved thick, rotating-speaker-esque setting, and Vibrato produces quavering pitch variation

3 The speed of the Uni-Vibe effect was controllable via a footswitch

Usage Tip

The 'best' place for this is after your overdrive effects in terms of signal path, but do try it before as well to hear the difference

What it sounds like

Machine Gun by Band Of Gypsys is Jimi using the Uni-Vibe to the max. He builds an astonishing wartime soundscape with his guitar, and the rotating modulation of the Uni-Vibe adds a surreal, ghostly dimension – especially when combined with the squelch of fuzz, the howl of feedback, and the frequency emphasis of his wah. Other guitarists who have used the Uni-Vibe's singular take on the rotating Doppler effect include David Gilmour, whose use of it on *Breathe*'s chords and arpeggios was a defining moment in prog rock.

How it does it

Japanese company Shin-ei developed the Uni-Vibe in the 1960s to emulate the Leslie speaker cabinet, and while in construction it is technically classed as a phase shifter, it goes about its business in an unusual way. Inside the transistorised circuit are four bulbs/photo cells which pulse in conjunction with a low frequency oscillator to create the phase-shifting effect: these filters are staggered, rather than aligned as in a normal phaser, and this creates the idiosyncratic character of the Uni-Vibe's modulation. The Uni-Vibe has been cloned and reworked by countless manufacturers, and the Uni-Vibe name is now owned by Dunlop, which makes various updated versions. Finding a unit that uses real photocells is becoming increasingly difficult following recent RoHS legislation.

BEST OF BREED

MID PRICE

VOODOO LAB MICRO VIBE

www.voodoolab.com

BOUTIQUE 1

FULLTONE MINI DEJAVIBE

www.fulltone.com

BOUTIQUE 2

EFFECTRODE TUBE-VIBE

www.effectrode.com

Reverb

This quintessential guitar effect adds warmth, space, character and class

Usage Tip

You don't need to keep your reverb pedal on continuously, on the same setting, for a whole gig, or even song. Think of ways to drop it in and out and vary it – use it as an effect rather than a component part of your sound

1 Many reverb pedals attempt to simulate the classic spring reverb sounds of vintage gear

2 Digital modelling technology has provided a further option for ambience aficionados. TC Electronic's Hall Of Fame offers 10 different reverb types in one stompbox

3 Many amplifiers – particularly diminutive, lunchbox-style heads – come without built-in reverb, meaning a reverb effect is your next port of call

What it sounds like

Guitar reverb is a surprisingly varied effect, but then that's because reverb is meant to simulate the reverberations and reflections of sounds as they bounce off surfaces and decay as they're absorbed. This 'sense of space' is what we perceive reverb contributes to a guitar sound, and types of reverb are often named after the spaces they emulate (cathedral, hall, room etc). Although it's used on practically every recorded sound you hear, reverb's heyday as a guitar effect was the surf guitar craze of the 60s – when guitarists such as Dick Dale would use lashings of it (along with the steady amplitude waves of tremolo) to conjure up images of the crashing of waves. Blackface Fender guitar amps just aren't right without it!

How it does it

Early reverb sounds were created by placing microphones in physical spaces (such as echo chambers, oil drums, and on metal plates with pickups attached to capture vibrations). Later, the spring-reverb chamber we know and love became a standard feature on many amps: literally a number of long, thin springs along which your signal passes, in a small metal tank. The advent of the 'bucket-brigade' chip that prompted a revolution in compact analogue effects made it possible to create the reverb pedal, and add controllability for tone, character and even modulation to its basic signal. Now digital signal processing (DSP) makes almost anything possible: teeny tiny pedals can kick out massive, expansive reverbs!

BEST OF BREED

BUDGET

MOOER SHIM VERB

www.mooeraudio.com

MID-PRICE

TC ELECTRONIC HALL OF FAME REVERB

www.tcelectronic.com

BOUTIQUE

EVENTIDE SPACE

www.eventide.com

Octave

Jimi liked his up, others like them down. Why not have both?

1 Octave above is the *Purple Haze* sound, but modern units (and some vintage ones, such as the MXR Blue Box) offer bassist-in-a-box, multiple octave-down settings too

2 Drive and Tone are typical additional controls on an Octave pedal

3 It may be associated with fuzzy lead sounds, but clean octave sounds can also yield intriguing atmospheres – particularly on bluesy or funky single-note runs

Usage Tip

If your octave pedal is not polyphonic (many aren't, especially vintage ones) you'll only be able to play single notes. If you try chords, it'll turn into a great big horrible mush

What it sounds like

Jimi Hendrix's solo in *Purple Haze*, played with a driver in front of Roger Mayer's early Octavia effect, is still one of the most arresting effects moments in the whole of music. The addition of notes generated an octave above the lead line creates a rich, warm, otherworldly tone that perfectly suits the song's psychedelic theme. Though used sparingly by today's guitarists, Jack White's riffs on *Blue Orchid* and *Seven Nation Army* prove that the octave effect can still elevate a sound beyond its original remit, and take simple riffs to a much higher plane.

How it does it

The Octavia's octave effect was achieved through what Mayer describes as "electronic mirror-imaging techniques, which respond to the feedforward inputs of the player." This doubling effect created the impression of a second note, and the effect could be varied depending on the player's pick attack. Modern variants on the effect add control over fuzz, and introduce various types of modulation control, including ring modulation, into the effect. Boss's OC-3 Super Octave, among others, adds polyphonic octave capabilities so you can get octave effects on chords too.

BEST OF BREED

BUDGET

JOYO JF12 VOODOO OCTAVE

www.joyoaudio.com

MID-PRICE

T-REX OCTAVIUS

www.t-rex-effects.com

BOUTIQUE

ROGER MAYER OCTAVIA

www.roger-mayer.co.uk

Ring Modulation

Because sometimes you just have to sound like a robot

Usage Tip

Using low settings of the blend knob can enable more subtle modulations, unless all out metamorphosis is what you're after – in which case, turn it up and experiment away

1 Higher pitches of the carrier wave create resonant, hollow sounds; lower settings tend towards industrial glitch and stutter

2 The ring modulator is a difficult beast to harness, but has almost unlimited potential to transform your sound, particular with an expression pedal

What it sounds like

The ring modulator is a denizen of the synthesiser realm, and when applied to the guitar signal, is an often extreme effect that ranges from musically intriguing to downright debased. When used in conjunction with fuzz, as in Black Sabbath's *Paranoid* solo, ring modulation can further mangle and contort the inherent stability of your tone. Ring modulators also create synth-like bell tones, percussive effects, and the metallic clangs familiar from futuristic sci-fi special effects.

How it does it

Ring modulators splice your signal with an oscillator signal, called a 'carrier wave', and the resulting multiplication creates enhanced and cancelled frequencies. Varying the pitch of the carrier wave results in very distinct types of ring modulation, and many ring mods enable you to select the carrier-wave type (sine, triangle, square and so on) with a corresponding change in harmonic interactions, and therefore overall character of the output. The blend control present on most units enables you to emphasise more or less of the original signal source. Variations on the ring modulator pedal add control over which part of the frequency range the effect operates on, random settings, expression pedal control, and even a step-sequencer.

BEST OF BREED

MID-PRICE

WAY HUGE RINGWORM

www.jimdunlop.com

BOUTIQUE 1

ZVEX RING TONE

www.zvex.com

BOUTIQUE 2

MOOG MOOGERFOOGER RING MODULATOR

www.moogmusic.com

Pitch Shifter

Shift and glide a note impossibly high or low, or create harmony parts

1 Not all pitch shifters have expression pedals built in. Whether integral or add-odd, they're extremely useful as they enable you to bend or shift notes as you play them

2 Some harmonisers can automatically decode and follow the musical key in which you're playing, and provide sympathetic harmonies on-the-fly

Usage Tip

Combine pitch-shifting pedals with delay and tremolo for eerily uncharacteristic guitar sounds; or pitch-shift chords to add unexpected glissando to rhythm parts

What it sounds like

At one end, pitch shifting can be as simple as using a device to create note harmonies as you play, or indeed transposing your guitar or bass to another key entirely. At the other end, it's the otherworldly noise of bending and squealing, demonstrated no better than by Rage Against The Machine's Tom Morello in the solo to *Killing In The Name*. Names such as Eventide and DigiTech (Whammy) dominate the genre. The latter – used by Morello – was a revelation, as it offered guitarists a new and cost-effective way to glide notes within a given range using a pedal control. David Gilmour's stratospheric Strat on *Marooned* is another example of its use. Octave pedals are pitch shifters too, as are the kind of complex harmoniser units used perhaps most notably by Steve Vai – listen to *Ballerina 12/24* from *Passion And Warfare*.

How it does it

Pitchshifting has come a very long way since the days of The Beatles' tape experimentation. Digital processors and algorithms in the latest pitch-shifting products are phenomenally powerful and fit into smaller and smaller pedal housings. The fifth-generation Whammy, for example, has 10 Whammy settings and nine harmony settings, and enables you to instantly shift all six strings to a different drop or capo tuning. Eventide's PitchFactor, meanwhile, offers a raft of different and often unique takes on pitch-shifting effects, including arpeggiators, diatonic harmonising, and pitch-and-delay effects.

BEST OF BREED

MID-PRICE

DIGITECH WHAMMY 5TH GENERATION

www.digitech.com

BOUTIQUE

EVENTIDE PITCH FACTOR

www.eventide.com

Tape Echo

The lustre of slowly decaying repeats, the analogue warmth...

Usage Tip

A lot of people would say 'don't' when it comes to using real tape machines. These days, they're often confined to studios because of their rather fragile – and therefore expensive-to-maintain – nature

1 The Echoplex had an Echo Sustain Control which enabled repeats to play back on themselves in a feedback loop

2 Artists such as John Martyn, David Gilmour, Andy Summers and Brian May pushed the possibilities of tape echoes to their limits

3 The multiple 'heads' you can see on this Copicat enable you to have multiple delays running at once: instant Hank Marvin!

What it sounds like

Nowadays, it's hard to imagine guitar, or indeed music in general, without some control over repeating notes. Delay is ubiquitous: as players, we've become so spoilt for choice that it's easy to forget delay was once a hard-won effect, albeit with mindblowing musical potential. Despite its primitive origins, the sound of tape echo effects is still seductive to guitar players. That's probably because they're intertwined in the DNA of recorded music: as soon as the earliest units came out, they were used by the likes of Scotty Moore (the Echo-Sonic amp, with built-in tape delay, on Elvis's *Mystery Train*). Each successive evolution was championed by popular guitarists of the day, and the lush wow and flutter and progressively warping, degrading repeats of Echoplexes, Echomatics, Echorecs, Copycats and Space Echos made their way onto countless records, in a diverse range of genres. Tape usually sounds warm, fat and like time past. At the time of writing, Fulltone and T-Rex are the only companies making a genuine tape echo unit, new.

How it does it

Studio experimentation with echo and delay in the 50s led to a demand for tape-based mechanisms for creating echo effects, including the 'slapback' delay beloved of rock 'n' roll and rockabilly artists. Tape echo units work by recording audio to a loop of magnetic tape, which then passes over several playback heads before being erased. Adjusting the distance between heads adjusts echo (delay) times.

BEST OF BREED

BOUTIQUE

FULLTONE TUBE TAPE-ECHO

www.fulltone.com

Delay

Analogue and digital delays will keep you coming back, time and again

1 A delay pedal's basic controls are level (volume), delay (time) and repeat (number of repeats), or many a variation thereof

2 Some units offer the ability to progressively modulate the tone of the repeats, creating fluid, changing delay tails

3 Increasingly, modern delay pedals come with a looper function, enabling you to build up repeating layered phrases during live performance, and save the ones you like

Usage Tip

You owe it to yourself to set up two amplifiers (borrow a friend's) and experiment with the stereo settings on inexpensive modern delay units such as the DL-4, the Flashback or Vox DelayLab. Limitless fun and experimentation awaits...

What it sounds like

Play a note – the pedal records it, then repeats it either once or multiple times at a predetermined time spacing. From the tape units of old, through analogue BBD (bucket-brigade device) chips and on to ever-more sophisticated DSP (digital signal processing) technology, delay is used in everything from early rock 'n' roll to the very most modern rock and pop. Some modern stompboxes attempt to provide the warmth and majesty of analogue and tape delays alongside the crisp and pristine clarity of versatile digital delays, with a range of lo-fi emulations, modulated sounds, and special effects such as ping-pong and reverse, in between. In short, guitarists have never had such advanced time machines at their disposal.

How it does it

Analogue delays appeared in the 70s in stompbox form, using the aforementioned BBD chips. Classics of the time included the Boss DM-2 and the Electro-Harmonix Memory Man, both lauded today for the warmth of their repeats. Come the 1980s, digital delays migrated from expensive rack systems to pedalboards, and their analogue-to-digital signal processing enabled much longer delay times, crisper repeats and greater possibilities for manipulation. By 2000, when Line 6 released its truly classic DL4, the ante had been well and truly upped: today, a wealth of delays compete for our guitar leads, from the futureproof, upgradable TC Electronic Flashback to the truly pro-engineered Strymon TimeLine and countless boutique Pandora's boxes.

BEST OF BREED

BUDGET

JOYO JF33 ANALOG DELAY

www.joyoaudio.com

MID-PRICE 1

BOSS DD-3

bossus.com

MID-PRICE 2

TC ELECTRONIC FLASHBACK

www.tcelectronic.com

BOUTIQUE

STRYMON TIMELINE

www.strymon.net

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PERFECT PEDALBOARD

→ 52 INPUT

Here's what you need to consider to get your pedals to play nicely together on your 'board. Plus, FX-pert Daniel Steinhardt explains the ins and outs of five high-performance pedal layouts

The order in which you place your effects pedals can have a big effect on your overall tone. This is because different pedals react differently depending on what's coming into them, whether that's your pure guitar signal or the effected signal from other pedals. While your pedals' physical position on the floor has practical considerations for you as a player, it's their position within the signal chain that is all to do with sound. The big question: which way is 'right'? Alas, when it comes to pedal order, no one way is universally 'right' or 'best'. Instead, it's more helpful to start with some basic, standard approaches that can act as a springboard to finding your own ideal setup. Let's refresh our memories about basic pedal types, in the context of signal chain order.

Volume / dynamic effects

These are volume pedals, tremolo, compressor; they take your signal and affect its level. They tend to come first in your signal chain because you generally want those dynamics to happen before more involved or extreme signal changes. Some players put their volume pedal last in line for a kind of 'master volume' control on the floor; indeed, there are different kinds of volume pedals with different impedances to better suit being either first or later in line.

EQ & filter effects

Most commonly, this would be a wah-wah pedal. They tend to be first in line for many players (second if they're also using a volume pedal). As an experiment, try putting an overdrive and a wah-wah on the floor. Start with the overdrive first in line, then swap them around and compare sounds. What you'll notice is the wah tends to sound much more pronounced when it comes after the overdrive. Some players really like it that way; most tend to prefer the wah before the drive.

Drive & distortion effects

The range of drives and distortions out there is endless. 'Standard' practice is that they come after volume and EQ effects, but before modulations and reverbs/delay. There are exceptions – vintage-style fuzz pedals can really struggle after wah-wahs, for example, but by and large, start by trying your drives and distortions after wah wah. One extra tip that many players find useful is that if you're using more than one drive or distortion, put the most distorted pedals first, and the least-distorted pedals last. This means the lower-gain sounds effectively 'boost' the heavy distortions, whereas if you put them the other way around, you just end up with an over-gained, indistinct mess. Again, try it.

Modulation effects

These are your choruses, vibratos, phasers, flangers and so on. This is where the strongest disagreement occurs between players, in that some prefer their modulations before drive and distortion, and others the other way around. As a very general rule, more extreme, vintage-type modulations work better before drive and distortion; more clarity, less mushy weirdness and so on. More modern pedals – especially anything with a buffer or digital circuits – generally works better after drive and distortion.

Reverbs & delays

There are two common placements for reverbs and delays. If you're using them in-line with other pedals, put them very last in line: the thinking being, you want to echo and reverberate the sound of everything that's come before. The other approach is to use these pedals in your amplifier's effects loop, if it has one. Most amps' effects loops sit between the pre- and power-amp sections. Patching your reverbs and delays in there keeps them clearer and cleaner sounding, instead of getting lost in a melée of noise.

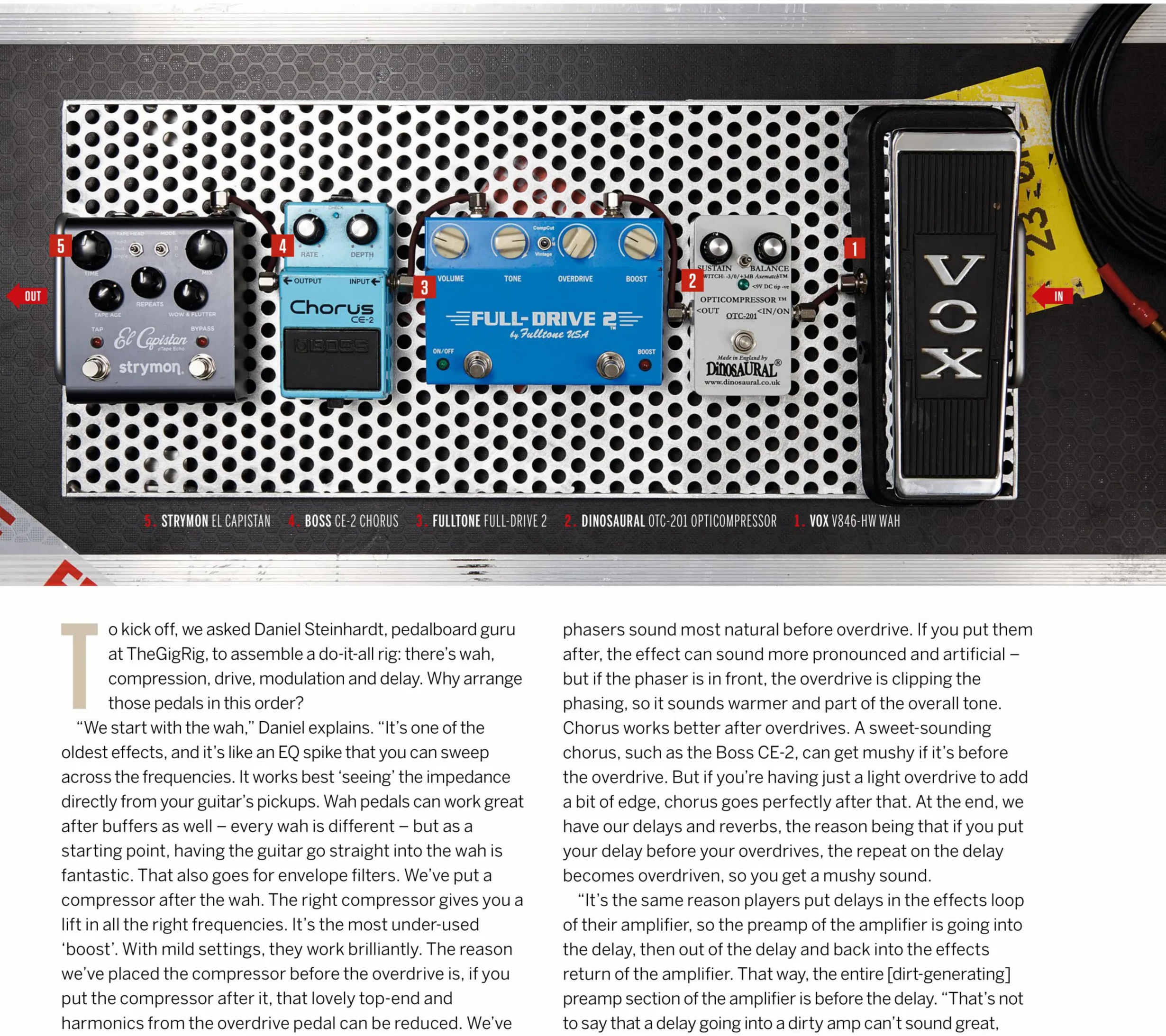
Wet/dry rigs

You'll often hear the terms 'wet' and 'dry' used when discussing effects. Wet simply means 'effected', while dry means 'unaffected'. Wet/dry rigs came to prominence predominantly in the 1980s along with stereo rack systems. The essence was that you'd have the middle, centre speaker/amp just putting out your dry signal (usually including wah and distortion), while a separate left and right, stereo rig would handle your delay and reverb effects and perhaps your modulations too. It doesn't have to be fully stereo – you can also achieve great sounds by having a simple wet/dry two-amp set up.

Most players tend to think of drives and distortions as part of their core tone, so leave them in the 'dry' rig. Nothing is set in stone – and experimentation is definitely key to finding the order that suits you best. At the very worst, it's a whole load of fun finding out!

STANDARD LAYOUT

Our first pedalboard layout is a good place to start if you're after a general-purpose 'board with a bit of everything – from wah to delay – while flattering the tone of each pedal



5. **STRYMON** EL CAPISTAN 4. **BOSS** CE-2 CHORUS 3. **FULLTONE** FULL-DRIVE 2 2. **DINOSAURAL** OTC-201 OPTICOMPRESSOR 1. **VOX** V846-HW WAH

To kick off, we asked Daniel Steinhardt, pedalboard guru at TheGigRig, to assemble a do-it-all rig: there's wah, compression, drive, modulation and delay. Why arrange those pedals in this order?

"We start with the wah," Daniel explains. "It's one of the oldest effects, and it's like an EQ spike that you can sweep across the frequencies. It works best 'seeing' the impedance directly from your guitar's pickups. Wah pedals can work great after buffers as well – every wah is different – but as a starting point, having the guitar go straight into the wah is fantastic. That also goes for envelope filters. We've put a compressor after the wah. The right compressor gives you a lift in all the right frequencies. It's the most under-used 'boost'. With mild settings, they work brilliantly. The reason we've placed the compressor before the overdrive is, if you put the compressor after it, that lovely top-end and harmonics from the overdrive pedal can be reduced. We've placed the chorus after the drive – but not all modulation pedals go best after overdrives. There are no 'rules', but phasers sound most natural before overdrive. If you put them after, the effect can sound more pronounced and artificial – but if the phaser is in front, the overdrive is clipping the phasing, so it sounds warmer and part of the overall tone. Chorus works better after overdrives. A sweet-sounding chorus, such as the Boss CE-2, can get mushy if it's before the overdrive. But if you're having just a light overdrive to add a bit of edge, chorus goes perfectly after that. At the end, we have our delays and reverbs, the reason being that if you put your delay before your overdrives, the repeat on the delay becomes overdriven, so you get a mushy sound.

"It's the same reason players put delays in the effects loop of their amplifier, so the preamp of the amplifier is going into the delay, then out of the delay and back into the effects return of the amplifier. That way, the entire [dirt-generating] preamp section of the amplifier is before the delay. "That's not to say that a delay going into a dirty amp can't sound great, though: Steven Wilson doesn't use an effects loop and just goes straight into the front of the amp – and he sounds amazing."

DRIVING DRIVES: HIGH OR LOW GAIN FIRST?

So what's the best order to arrange your overdrive pedals in?

Do high-gain pedals come first – or should it be the other way round? Many opt for the more traditional highest-gain-first approach, but Daniel Steinhardt argues that the opposite way around yields great results.

"I keep coming back to this: lower-gain pedals first, cascading up to the higher-gain pedals. Why? Well, if you take a really high-gain overdrive pedal and put a low-gain overdrive after it, you've got a huge amount of gain and nastiness with the first pedal, but that gets tamed down by the natural compression in the low-gain pedal. However, if I swap that around and take the clipping and warmness from the low-gain overdrive pedal and push it into the high-gain pedal, it embellishes the harmonics and the compression that I've already got going with the low-gain pedal."

MULTI-OVERDRIVE LAYOUT

What's the best way to arrange your pedals if you want more than one overdrive? We find out how to stack gain without the pain...

In this scenario, I'm going to put a treble booster before everything," Daniel explains. "It's a very interesting pedal – really, it should be called an upper-mid-frequency booster. People hear the term treble booster and instantly think 'it's not for me'. In actual fact, especially for solo sounds when you want to cut through the mix, they can be absolutely fantastic.

"Next, we've got a compressor, because a treble booster into a compressor is a very interesting sound. Some people like it the other way round. Alternatively, using the compressor on its own as a form of boost into the drive pedals that follow will give you more sustain, clarity and clout.

"Next, there's a low-gain overdrive, which is the Lazy J Cruiser – a very dynamic, low-gain overdrive pedal. After that, we've got an original Lovepedal Eternity. That's a medium-gain drive, with a mid-humped sound. Overdrives have different frequency shapes – the Tube Screamer, for example, has got a mid hump. So when you kick that on with Fender-style American amps, which tend to have a slight mid-scoop, it brings those mid-frequencies up. But if you stick a mid-hump pedal on an amp that already has a big mid hump in it, it can get a bit gnarly.

"Last, there's an old 70s Big Muff. It's a distortion/fuzz tone, but it is still very dynamic, any one of these pedals into it will sound great. The way we've set this board up allows us to stack overdrive pedals in a flexible way," Daniel explains. "If I go from the low-gain Cruiser overdrive into the medium-gain Eternity, I get a really fat hybrid between distortion and overdrive. And if I go from the Eternity into the Big Muff, the resulting tone is fatter again. You might not always want that, though, which is why you've got the treble booster before all of those: it shelves those bottom-end frequencies to allow you to get an aggressive focus for solos. Stacking drive pedals in this way is a wonderful way to find unique tones."

5. **ELECTRO-HARMONIX** BIG MUFF 4. **LOVEPEDAL** ETERNITY 3. **LAZY J** CRUISER 2. **DINOSAURAL** OTC-201 OPTICOMPRESSOR 1. **PLOSIVE** MAY TREBLE BOOSTER

FUZZ-FIRST LAYOUT

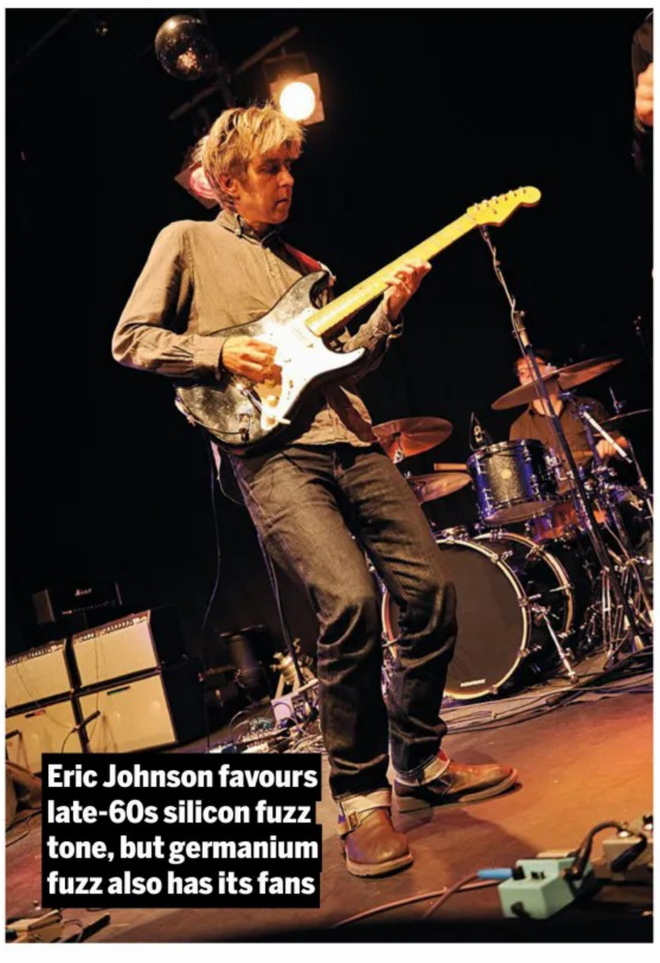
Make no mistake, fuzz is the problem-child of the pedalboard. We explain how to design your 'board to avoid provoking tantrums from this powerful but temperamental effect...

If you use fuzz pedals in your rig, especially germanium-transistor models, pedalboard placement is critical. Here, Daniel Steinhardt of TheGigRig assembles an effective, fuzz-heavy 'board that won't sacrifice tone to impedance issues.

"The most important thing to be aware of with fuzzes is impedance," Daniel explains. "There are two main sorts of fuzzes: we have silicon-transistor fuzzes and we have germanium-transistor fuzzes. The earliest fuzz pedals were built around germanium transistors, such as the NKT275 Fuzz Face that was a big part of Hendrix's sound. They can sound amazing but they have issues. Firstly, they're very sensitive to changes in temperature. There's at least one studio I know of in New York that keeps their Fuzz Faces in a fridge! But the biggest thing that germanium fuzz pedals are sensitive to is impedance changes.

"So, here, we're using a germanium treble booster to boost into a germanium fuzz. The booster's output impedance is high enough to work well into the germanium fuzz but low enough so that it'll still work well with other pedals on the 'board.

"Swapping these two around can also work well but this is my preferred order. It's okay to have a true-bypass wah in front of both in this case, too, but what I'd avoid on this 'board is having any pedal containing an 'always-on' buffer going into the germanium fuzz. The input impedance of the germanium fuzz is too low to work well with buffers before it: if you do that, the tone becomes very brash. Not all germanium transistor fuzzes have that problem – some do have a higher input impedance. But as a general rule, they will not work as well with buffers before them as a silicon-transistor fuzz will: silicon-transistor fuzz effects, like the Pro Co RAT on this board, usually play nicer with other pedals – but they have a very different character, tonally, to the germanium fuzz, so you might still want both on your 'board. But if you want to use a germanium fuzz as well, you need to make sure that it is right at the front of the 'board where it can 'see' the guitar's output impedance directly."


Eric Johnson favours late-60s silicon fuzz tone, but germanium fuzz also has its fans

MULTI-DELAY LAYOUT

From slapback echo to floaty soundscapes, if it's atmosphere you're after, you'll want a delay pedal on your 'board. Here, we examine how to use various delay effects together

Tape delay was one of the first effects, and in some ways they still haven't improved on that sound," reflects Daniel Steinhardt of TheGigRig. "Tape delay is an instrument in its own right when you find a good one. The issue is, they're very tricky to maintain on the road. Even Eric Johnson stopped using tape delays and started using Memory Mans for that reason.

"The Hiwatt Custom Tape Echo we've put on the 'board here is the closest I've come to a road-worthy tape echo. But if you're going to put any tape delay on your pedalboard, you need to be aware they don't travel well, and you need to have a bit of tech savvy to keep them running. Before that, we have a couple of other delays. First is an original Ibanez AD-80 vintage analogue delay. It's an 18-volt delay and it's gorgeous: lots of headroom, very warm and not as bright as the more modern delays; you can have quite a lot of effect in the mix, but it always sounds musical and right. But you won't get that modern, hi-fi digital delay sound – the repeats always sound progressively darker.

"After that, we have an Analog Man ARDX20. I use it 90 per cent of the time and it's my meat-and-potatoes analogue delay: with the added AMAZE0 unit, it's like a really great-sounding Memory Man with tap tempo. It has two separate delay settings, so you can have a slapback delay and a long delay in one box, which is handy, plus it's really low-noise.

"If you need to play a note that won't darken and degrade with each repeat, then you're looking at a digital delay. So, last in line, we have the Eventide H9, which is a modern digital delay that does everything. For me, digital delays don't have the character that the old analogue delays have – but you can do so much with programmable pedals like this. You can choose from different delay engines – from ping-pong delays to deep reverb delays – and also do things like modulate and even harmonise the output.

"The more powerful units are also good for approximating lots of different delay sounds in one box. For example, on tour, you might need to try to conveniently replicate the sounds of an album on which many dozens of delay pedals were used. So, Steve Vai's new touring board will have two Eventide H9s on it, and a lot of the sounds that he gets in the studio will be attainable, in a small package."

4. EVENTIDE H9 HARMONIZER **3. HIWATT** CUSTOM TAPE ECHO **2. ANALOG MAN** ARDX20 **1. IBANEZ** AD-80 ANALOG DELAY

5. **LAZY J** CRUISER 4. **MXR** PHASE 90 3. **ELECTRO-HARMONIX** SMALL STONE PHASE SHIFTER 2. **SWEET SOUND** MOJO VIBE 1. GERMANIUM FUZZ

MODULATION-RICH LAYOUT

Atmospheric and swirling, phasers and other modulation pedals can lend your tone movement, warmth and colour – plus a dash of psychedelic magic

On this 'board, we've got many different kinds of classic modulation effects: from MXR phasers to Uni-Vibe-style effects, plus some fuzz and drive pedals to show how you can integrate those as well. Once again, careful pedal placement is paramount if you want optimal tone.

"Generally, phasers and phaser-based effects, including Uni-Vibes, sound better when they're placed before any other pedals on your 'board," Daniel Steinhardt, of TheGigRig, explains. "They sound more organic and 'part of your tone' that way. But again, we have a complicating factor here, in the form of a germanium fuzz that must go right at the front, because of the impedance issues we discussed before. Because the vibes and phasers have to go after the fuzz, they are going to sound a bit more pronounced and artificial when used with the fuzz than if they were placed at the front of the 'board. So, if that's not your thing, you could experiment with having a pedal similar to the Mojo Vibe in front of the fuzz. This [Mojo Vibe] is a true-bypass pedal, so when it's switched off, the germanium fuzz will still be 'seeing' the impedance directly from your pickups, which helps it to operate correctly. But you certainly don't want any kind of buffered pedal in front of it.

"From model to model, phasers can sound quite different – generally sounding deeper and richer the more stages they have: for example, a two-stage phaser, such as an MXR Phase 45, will sound subtler than a four-stage [EHX] Small Stone phaser, and so on. Finally, phasers and Uni-Vibes tend to integrate better with the sound of overdrive if they're placed before conventional gains, which is why the Cruiser is last here."

BUFFERED PEDALS VS TRUE-BYPASS

So, which is better for your tone?

A buffer is a 1:1 amplifier stage. It helps preserve your signal through the cables of your rig, preventing loss of treble frequencies due to capacitance. Even true-bypass pedals use buffering components when they're on, as they need them to generate their tone.

What we term 'buffered pedals', however, continue to add buffering to your signal even when the effect is off, as opposed to true-bypass pedals, which simply direct your signal across a short length of wire from input to output, with no intervening circuitry, when the pedal is off. "If I'm not putting the pedals in individual loops on a switcher, I don't use more than two buffered pedals on a 'board," argues Daniel Steinhardt. "The problem of pedals with buffers is what happens to the signal when that pedal is bypassed. One is generally fine, but more than two can start to eat away at the tone. But if you've got loads of true-bypass pedals on your 'board and no buffers at all, you can lose high-end due to capacitance, so up to two buffers – or pedals that are buffered when bypassed – can be beneficial."

PRACTICALITIES

Five things you need to know about fixing, taping and tying. Or, in other words, how to fasten your pedals to the 'board effectively...

1. Cable ties are your friend

They cost about 8p for 15 million from ScrewFix or similar, but the humble cable tie is invaluable. Use 'em, snip 'em off, use more: no mess, no fuss. Take care on the sharp edges when you cut them to length, and make sure you haven't tightened them where they can stress a knob or flange... ahem...

2. Non-slip rubber is not just for the bedroom

If you do go the cabletie route, you might find your pedals still wobble about a bit, if they're slippery on the bottom and/or don't have rubber feet. A little bit of rubberised anti-slip mat – available from Maplin, Homebase and the like – cut to size between pedal and 'board will work wonders.

3. Gaffer tape leaves horrible sticky crap everywhere

So use it with caution. It might be brilliant for well, everything, ever, but think twice about covering your pedalboard with it. Gaffer tape + beer = stickymageddon – you have been warned.

4. Velcro is for wimps

If you've not come across 3M Dual Lock yet, you're in for a VERY exciting weekend. Velcro works brilliantly for the first two or three on-and-offs, but soon wears and becomes less effective as time goes on. The more robust Dual Lock or similar – you'll see it advertised as 'Pedalboard Tape' – lasts much, much longer and is super strong to boot. The only downside with using either it or Velcro is that it can make a mess on, or peel off, labels from the back of your pedals. Beware of Velcro-style fastenings that have weak backing adhesive: these may actually come unstuck from the bottom of the pedal more readily than the Velcro itself will pull apart once fastened.

A pedal-packed 'board is useless if there's no room for patch cables

5. Gimme some room, jack

When planning your pedalboard and getting ready to attach things, make sure you've left enough room to plug and unplug your patch cables. You might need to swap a pedal out, change a lead, or – following the advice of guitar systems guru Pete Cornish – clean your connections to 'free the tone' once in a while. Same goes for power leads.

TOP FIVE PEDALBOARDS

Our pick of the pre-made 'boards to mount your prized pedals upon. Other sizes are available...

Stagg UPC-535 £29.99
Excellent value-for-money option, comprising rudimentary ABS plastic case with metal trim and lid-cum-'board. The hinges, clasps and the like are not a patch on more expensive ones, though.
BOARD SPACE: 53x32cm

T-Rex ToneTrunk 42 £129
High-quality, metal-frame 'board with oval cut-outs instead of straight bars like the PedalTrain range. Comes with Velcro and soft carry bag.
BOARD SPACE: 42x32cm

Diago Showman £119
Plywood construction case and lid-cum-'board with quality catches, hinges and corners. Nice 'polyweave' covering, too. Again, the Velcro's included.
BOARD SPACE: 75x35cm

Gator G-Tour Small £149
Tour-grade flightcase and 'board in one, with shock-absorbing foam interior. Take it on the road with confidence. Comes with 3M Dual Lock, too: pro!
BOARD SPACE: 43x28cm

PedalTrain Grande £375
Need gigantic? This wheeled, flightcase'd beast sits at the top of the industry-standard range, and also benefits from lots of useful and practical accessories.
BOARD SPACE: 106x40cm

FROM GUITAR TO PEDALBOARD

Think just any old cable will do? Think again, because the way your cables interact with your pedalboard forms a crucial part of your sound

There are two basic types of cables: patch cables and signal cables. Patch cables are short, and designed to link your pedals together, while signal cables connect your guitar to your pedalboard, or the 'board to the amp. Not all cables will sound the same, however, and with a wealth of high-quality options to choose from it pays to tailor your cabling to your exact needs.

From guitar to pedalboard

"The cable running from the instrument to the pedalboard is the most important," Daniel Steinhardt of TheGigRig argues. "In analogue terms, there is so much information going down that cable, and if you lose anything [tone-wise] at that point, before the signal even reaches your effects or your amp, there's no getting it back. So your instrument cable needs to be able to handle all the frequencies, and normally it should be fairly low capacitance, too.

"Be aware, though, that just because a cable is 'low capacitance' doesn't mean it's guaranteed to sound great for your setup. There are exceptions: for example, Brian May famously used a long curly cable that was high-capacitance, and which would normally be very dull-sounding. But if you think about the kind of guitar Brian was playing, and the sort of amp he was playing, if he had used a really bright-sounding cable it probably would have sounded quite harsh.

"So that curly cable is actually a big part of his sound, helping to control the level of top-end from the guitar. But if you have a warmer-sounding guitar, a brighter cable might work better. So it's really important to try a bunch out and see which one's right for you."

From pedal to pedal

"The more pedals there are on your 'board, the more important the quality of the patch cables is. If you've spent a lot of money on your pedals and other cables, don't try and save a bit of money buying rubbish patch leads, because it's just not worth it. If a patch lead goes down in a gig it can be a nightmare to troubleshoot. Also, if you have a bunch of true-bypass pedals and you don't have a buffer on the board, that's when the quality of the patch cable is über-important.

"Each extra cable that you add between the instrument and the amp adds a bit of capacitance load to your signal, which can sap your top-end. So to minimise the impact of that – especially if you're using all true-bypass pedals – you should invest in the best-sounding patch cables that you can get. There's a lot of really good ones out there: soldered cables are the norm, but there are also great solderless designs: I've found the current Evidence Audio ones unbeatable, but there's other great solderless alternatives out there.

The more pedals there are on your 'board, the more important the quality of your patch cables is

"If you have a buffer on your 'board, however, you'll be less affected by capacitance issues. Imagine your guitar's signal flowing in your cables is like the water flowing in a garden hose. Every bit of extra load on your signal reduces the pressure in the hose. Well, a buffer acts like a pump that increases the pressure in the hose and pushes that signal through any resistance. I find that placing a buffer after your overdrive pedals works best."

From pedalboard to amplifier

"You might choose to use a very specific type of signal cable for this application, depending if the 'board is all true-bypass or has a well-placed, always-on buffer. For example, I use an Evidence Audio Lyric HG cable in this role. That cable is quite dark, but I use it directly after a buffer that restores top-end to my signal, and so that actually balances things out. But, again, you should try a few to get an idea of what best suits your needs."

→ 60 INPUT

ONE FOR ALL

Let's hear it for the unlikely return of multi-effects to the pedalboards of the nation, with gig-simplifying combinations of classic tones

T-Rex SoulMate £540

When this arrived, we all wondered why it had taken so long. So, in one 'board you get an overdrive, distortion, delay, reverb, boost and tuner, derived from some of T-Rex's top pedals. It's all analogue, and includes an effects loop insert after distortion/before delay to add more pedals. You can use it as five separate pedals, or choose to program 10 preset sounds.

Carl Martin Quattro £499

Another all-analogue, multi-pedals-in-one approach, this combines a compressor, two overdrive modes, chorus and an echo (delay) unit with tap tempo. You get the option of a loop insert between the drive and the chorus sections for adding more pedals, and with no presets mode, it's always WYSIWYG on the top panel. There are plenty of classic tones available here, for sure.

EHX Tone Tattoo £189

There are three pedals in one here: EHX's Metal Muff distortion, Neo Clone chorus and Memory Toy analogue delay. They all work independently and are wired in series in the order above. The Metal Muff is much more versatile than its name implies, so this would be a good choice for pretty much any rock, pop or heavy blues player looking for these effects in one box.

Strymon Flint £279

Now a staple of so many pro 'boards, Strymon combines the best in analogue and digital signal processing, not least here with vintage-flavoured reverb and tremolo in one box. Drawing on models of six classic 'verbs and tremolos, the Flint lets you mix them in any combination and manipulate all key parameters. You can route the effects in either order for awesome ambience.

Pigtronix Disnortion £149

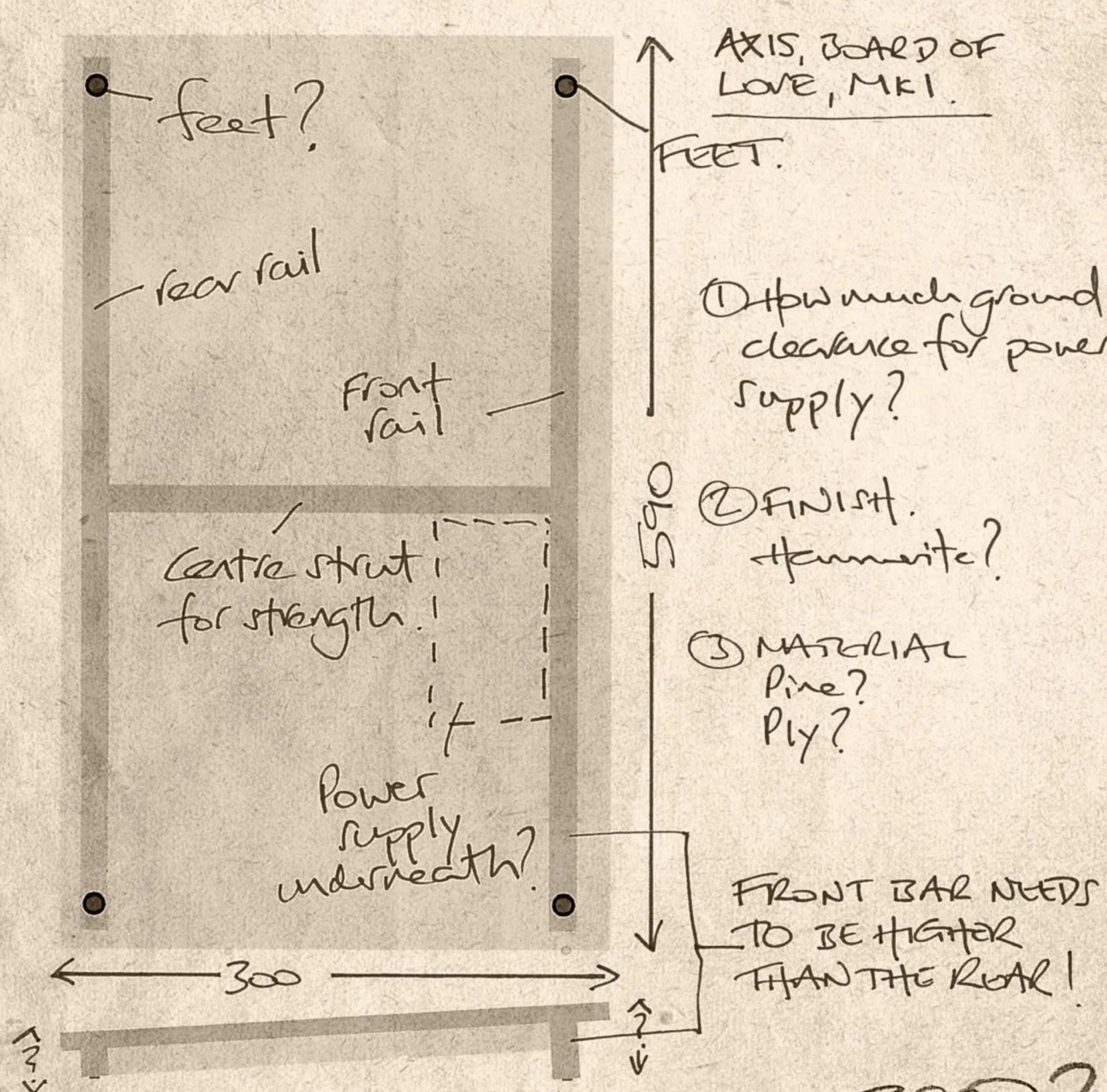
This Disnortion pedal crams overdrive, fuzz and octave-up all into one unit, and each effect is selectable independently. The octaver is the first in the chain, wired in series, while the diode-clipped fuzz and overdrive are in parallel so they don't cascade into one another. The fuzz has a number of really useful EQ curves to make it sit how you like with the overdrive. Sambora and Jimi? Oh yes!

Line 6 M9 £339

We're veering into digital multi-effects here, but the M9's pedal-type layout and stompbox inspiration warrant its inclusion. So, you have a dizzying array of classic stompboxes, simulated digitally in programmable format. What you lose in analogue sound/circuit integrity, you make up for in massive flexibility, versatility and programmability. With a looper and tuner included, there's a lot in here.

SHOPPING LIST

- Main board
- Front rail
- Rear rail
- Strength rail
- screws
- glue
- feet.
- primer
- paint.



HOW TO DESIGN & BUILD YOUR OWN PEDALBOARD

Fancy building your own, custom-designed pedalboard?
We walk you through the basic steps

Before we start any of this, it's worth saying that buying a purpose-made 'board will be quicker, far more convenient and potentially less expensive than the DIY method. That said, there's a good feeling of achievement involved in making something from scratch, so here goes...

First, decide what pedals you want on your 'board – it might be something completely custom and specific, or you may want something with more versatility to enable pedal changes over time.

Get your pedals and lay them out on a surface, including all the interconnecting signal and power cables. Arrange them as you'd want them to be on your pedalboard, making sure the switch positions, pedal orientations and so on make practical sense when you're playing. Take care when placing pedals very close together – can you get the jacks in and out? Do you need to? Will there be room to upgrade any of your existing pedals?

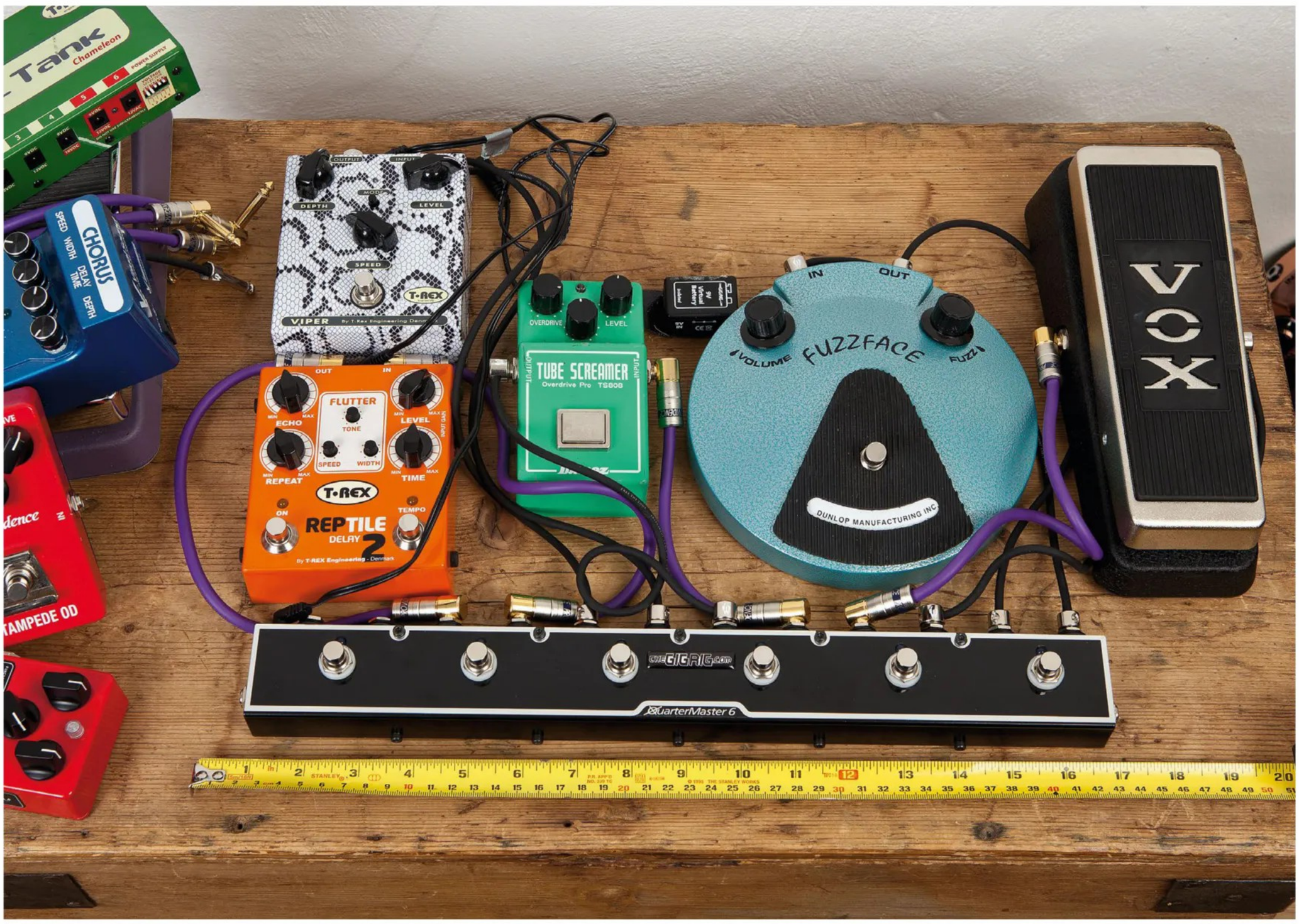
When you're happy, take a quick photograph or three to remind you how it's all arranged, and measure the extent of your sprawl. Where is your power supply going?

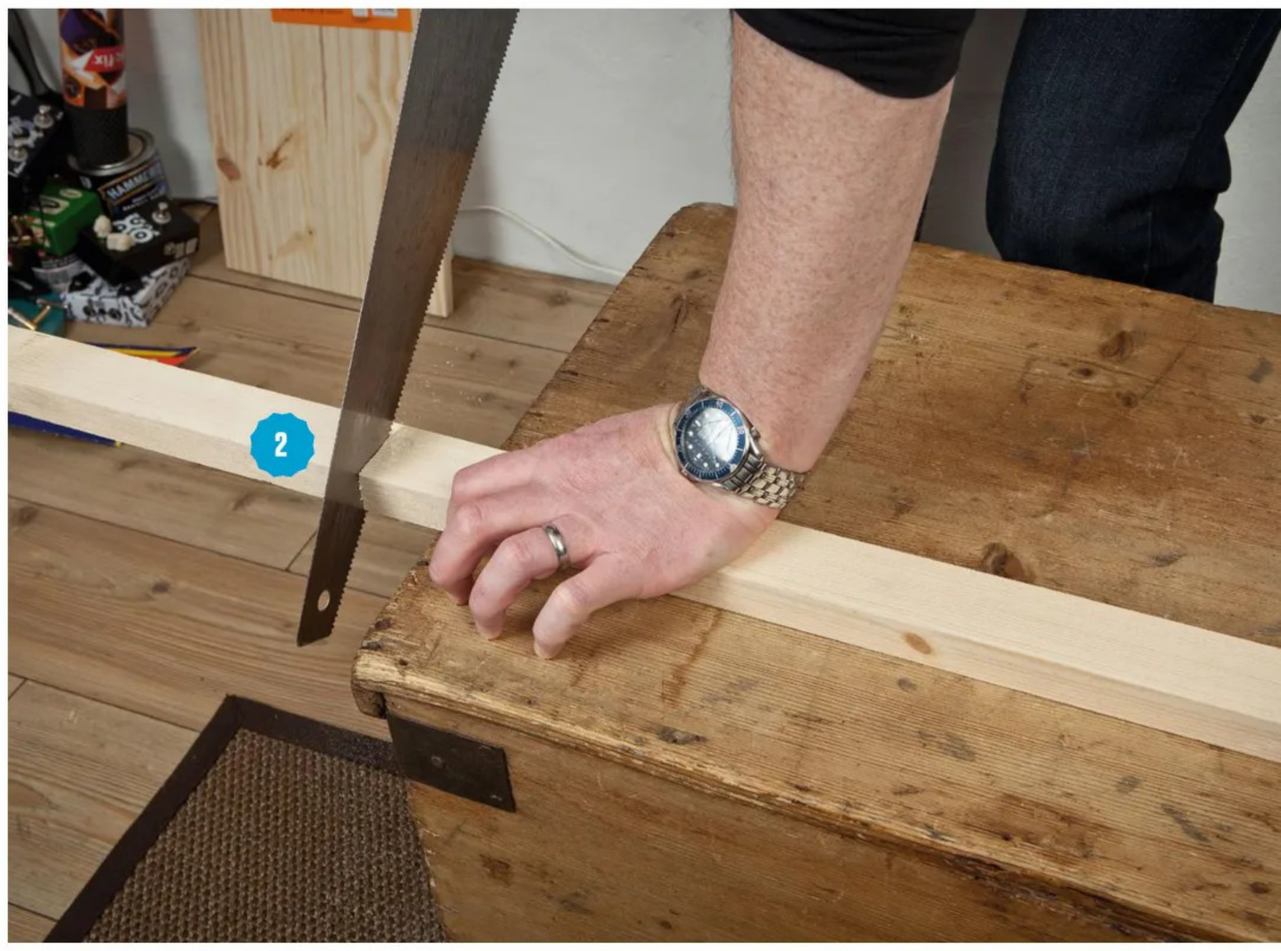
You now know how big the 'board surface needs to be. Write the measurements down! Now it's time to design the 'board itself in terms of materials, shape and structure. If doesn't have to be wooden and rectangular, but that is probably the most practical/easy solution, especially if this is your first attempt (and you're not a welder).

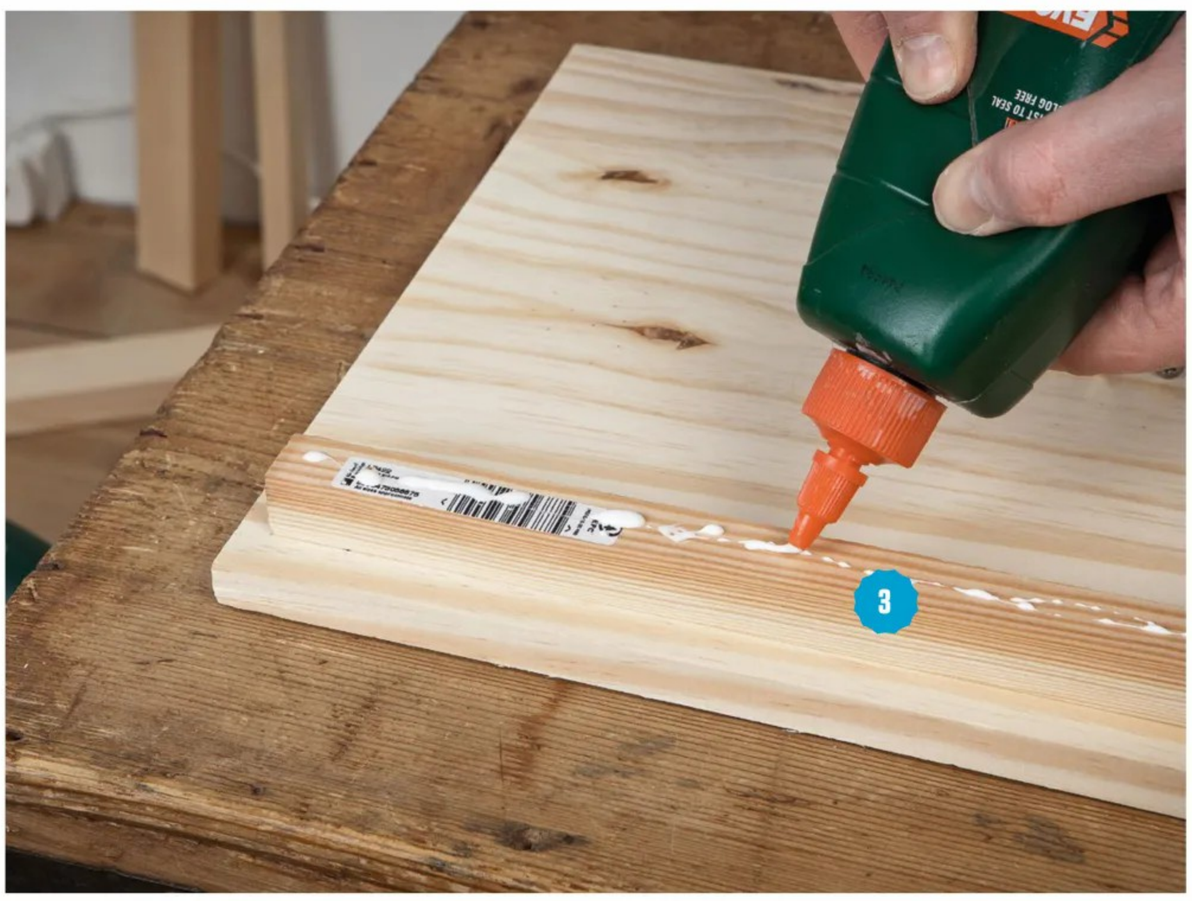
PRE-PLANNING TIPS

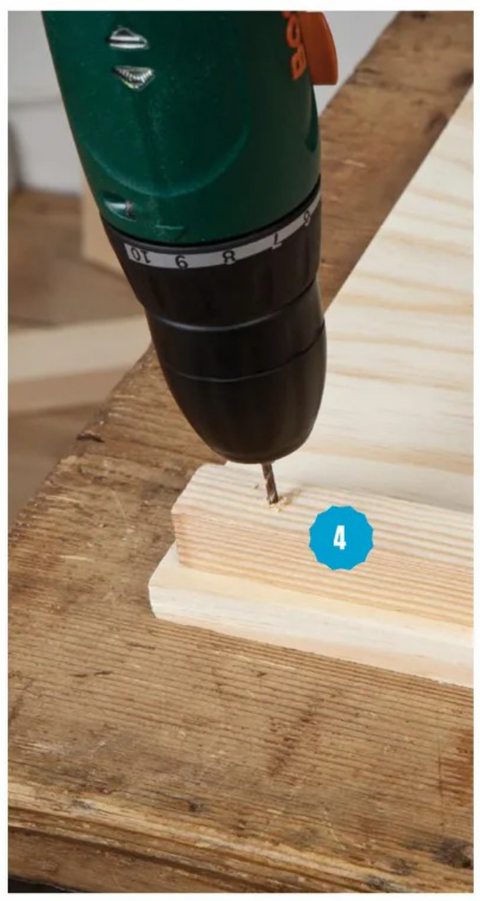
Consider this before you design your 'board

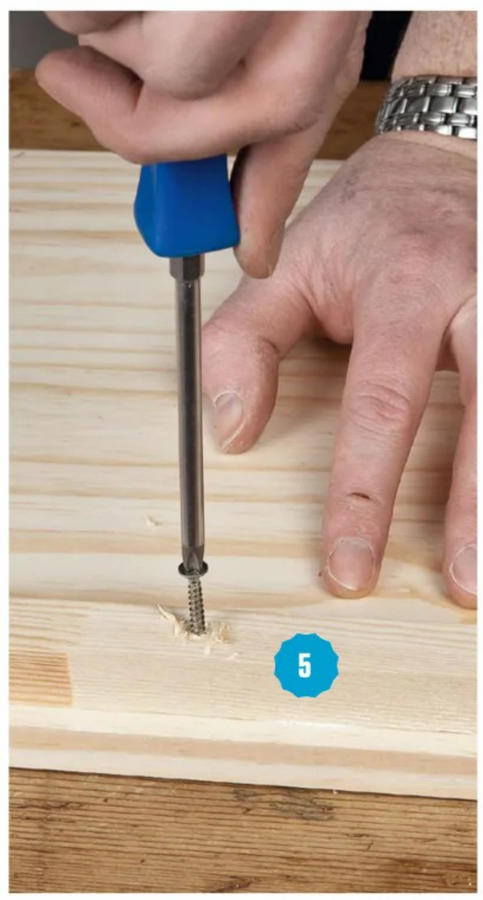
- Are you planning on putting something under the 'board, such as your power supply? If so, you need a way of creating space underneath, high enough to keep whatever is under there off the floor.
- If you don't want to put anything underneath, it's still a good idea to have some feet on the bottom of your 'board to help stop it from slipping around the floor, and also so you can get your fingers underneath when you go to pick it up. It's helpful to have the 'board angled up at you slightly. Higher at the back, lower at the front.
- How are you going to transport it? If you have a bag or case in mind, in might influence the dimensions of the 'board right from the outset.











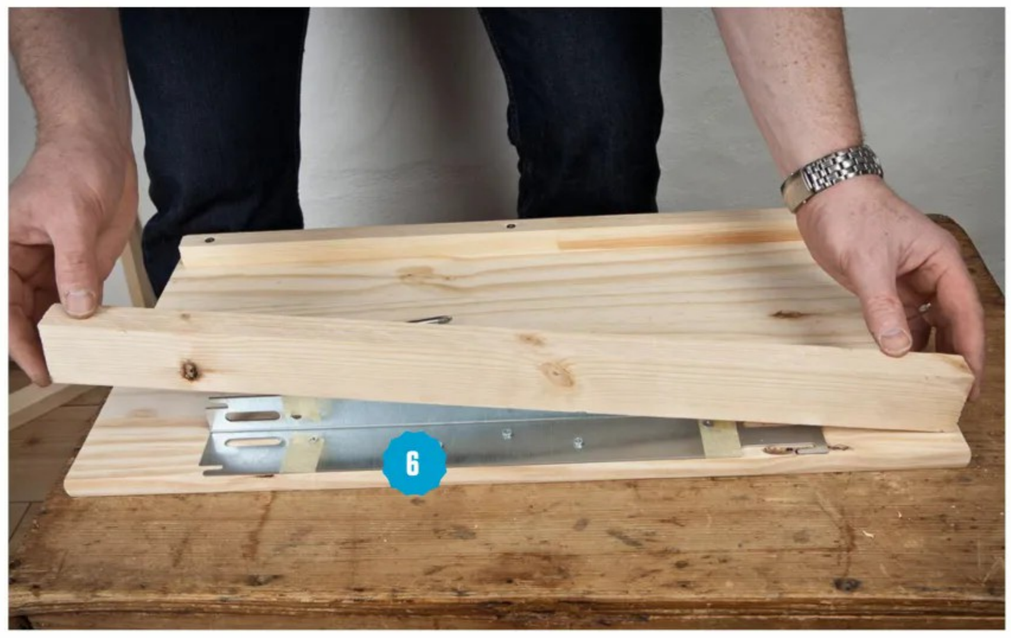
Plywood can be very expensive, so it's worth checking out the ready-made shelving in stores such as B&Q. We're using a pine shelf kit **(1)** for £6.48... they come in almost perfect dimensions, and the edges are already finished, too!

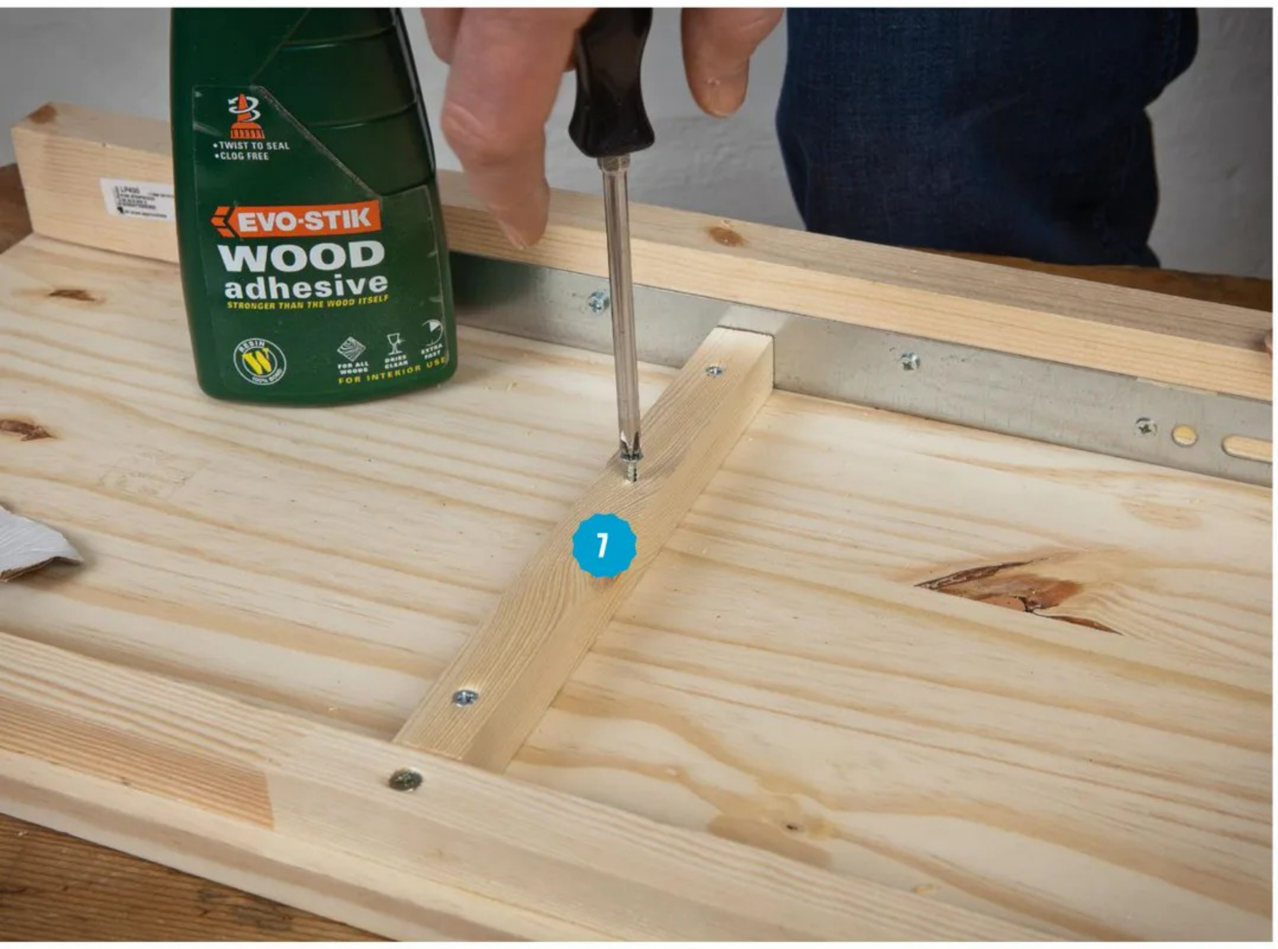
2) Cut the front, underside raising rail to length.

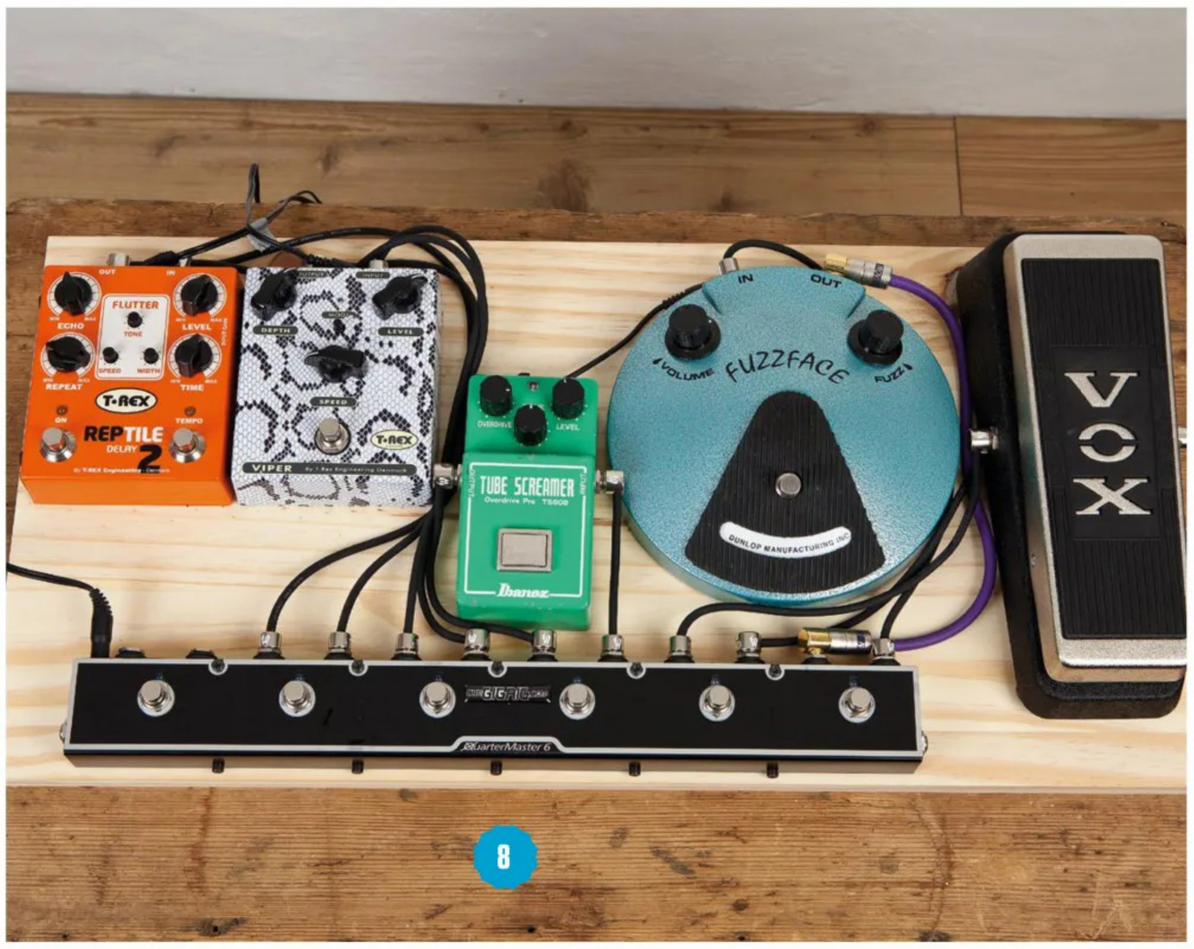
Make sure each surface is clean, dry and free of dust, then glue and screw it in place **(3)**. It's a good idea to drill guide holes **(4)** before you screw anything to help prevent the wood from splitting **(5)**.

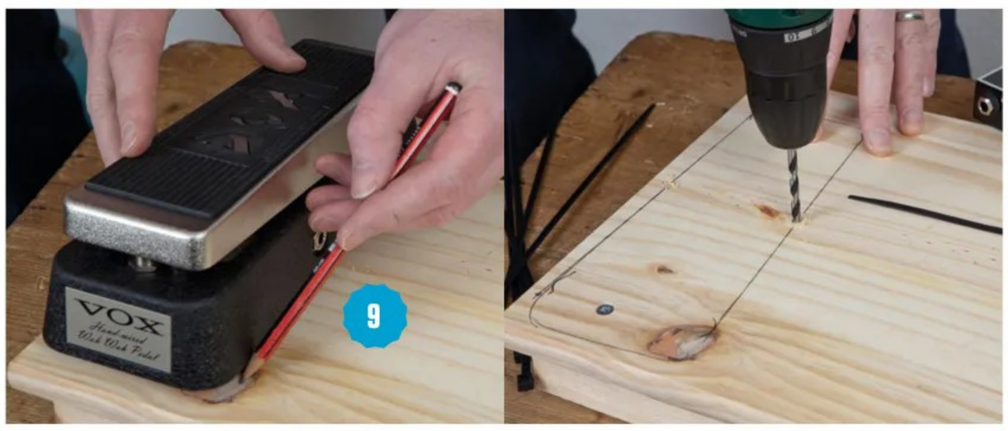
Repeat the process for the rear raising rail. We stumbled across these radiator-hanging brackets **(6)**, and liked the strength they add to the design: less so the weight.

Now, pine isn't very strong in the direction of the grain. There's a chance the whole thing could snap with a hefty step, so we've chosen to add this strengthening strut **(7)**, using the leftover wood from the front rail, across the grain. Using your original design/photograph, place all your pedals on the 'board **(8)**









including all your connecting leads, power leads and so on.

If you're using Velcro, you can skip forward to applying whatever finish you've chosen (step 13). We're going to use cable ties, however, so that means drilling holes in the appropriate places. So, draw around your pedals in pencil **(9)**. This isn't so smart if you're constantly pulling different pedals on and off.

One by one, decide the best location for your pedal-securing cable ties and drill the appropriate holes **(9)**. You could of course do this after you've finished the 'board, but we're going to do it now **(10)**.

Now, if you're putting your power supply underneath, you need to think about how that will be fixed on: we're using 3M Dual Lock. Also, the wires for each pedal need to get from the

WHAT MATERIALS?

Thoughts on weight, strength and ease of use...

MDF / particleboard

Upsides: Solid, sturdy, easy to cut and work. Not as expensive as plywood

Downsides: Very heavy; looks awful when it chips / gets worn at the edges; not a good material for screwing anything into

Plywood

Upsides: Stronger and lighter than MDF (assuming same thickness), easy to cut and work, holds the screws strongly

Downsides: Expensive; can be too flexible – 12mm thickness as a minimum

Solid softwoods (eg pine shelving)

Upsides: Lighter than ply or MDF; cheap; easily accessible in almost pedalboard-ready sizes

Downsides: Not as strong as ply; can easily split along the grain

Solid hardwoods (eg mahogany)

Upsides: Looks lovely, easy to cut and work

Downsides: Expensive; not as strong as ply; it's harder to find

Metal (eg steel / aluminium)

Upsides: Super strong; can be very light if design is right; looks great when well finished

Downsides: Hard to work / weld; potentially expensive

OUR SHOPPING LIST

(And what we ended up buying...)

Main board for the top surface
(B&Q Value Pine Shelf Kit, £6.48)

Bits for raising the board off the ground
(B&Q pine stripwood, £3.24, B&Q pine stripwood, £1.99, B&Q radiator bracket, £4.98)

Feet
(B&Q Appliance Feet, £3.98)

Finish / paint
(Wood primer paint, £5.98, Copper Hammerite 1 litre, £17.98)

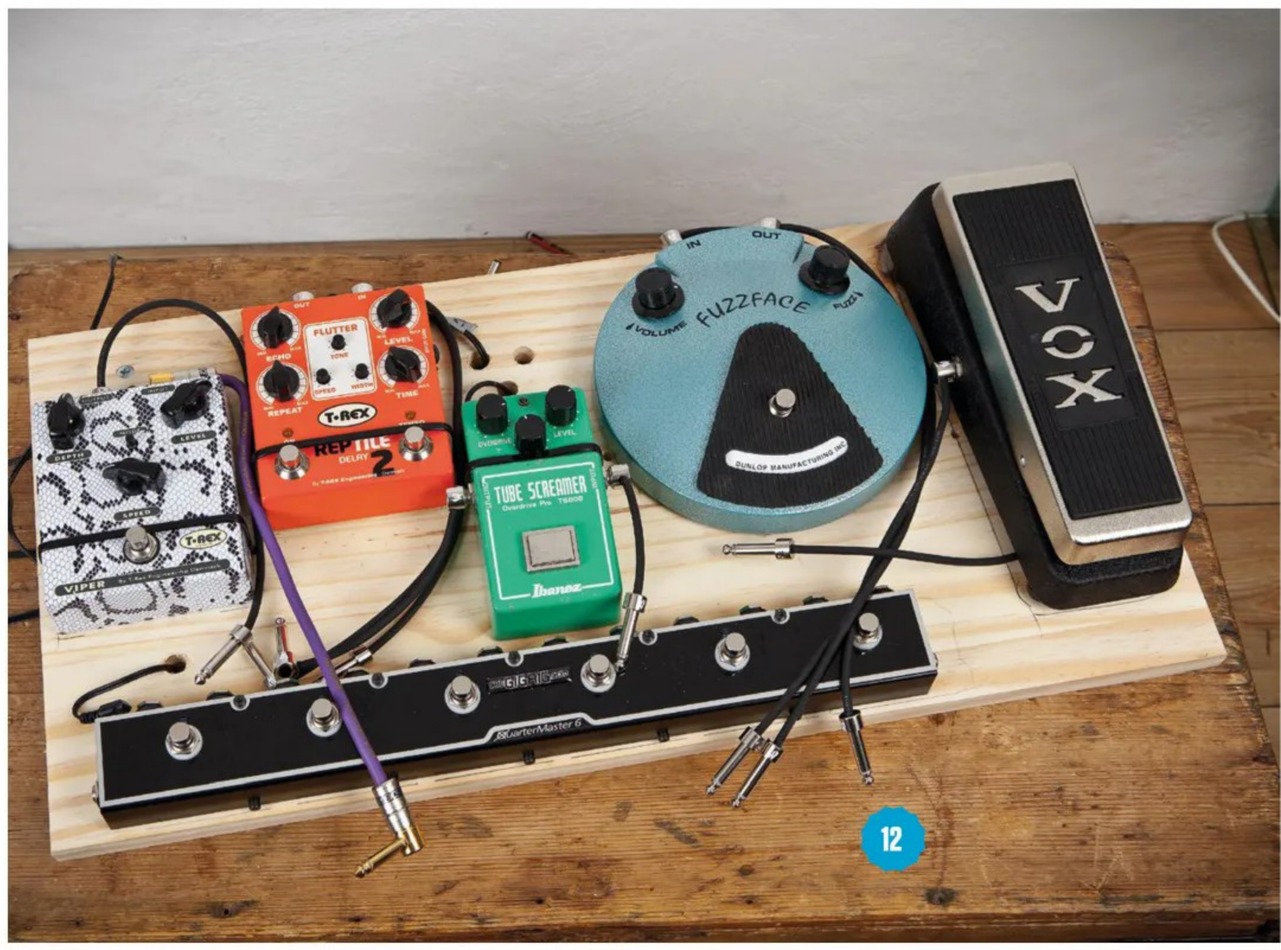
Non-slip material
(B&Q Non-Slip Mat, £4.98)

Grand total: £49.61

Tools we'll need

- ☑ Saw
- ☑ Electric drill
- ☑ Paintbrush
- ☑ Various screws
- ☑ Screwdriver
- ☑ Cable ties
- ☑ Wood glue

11



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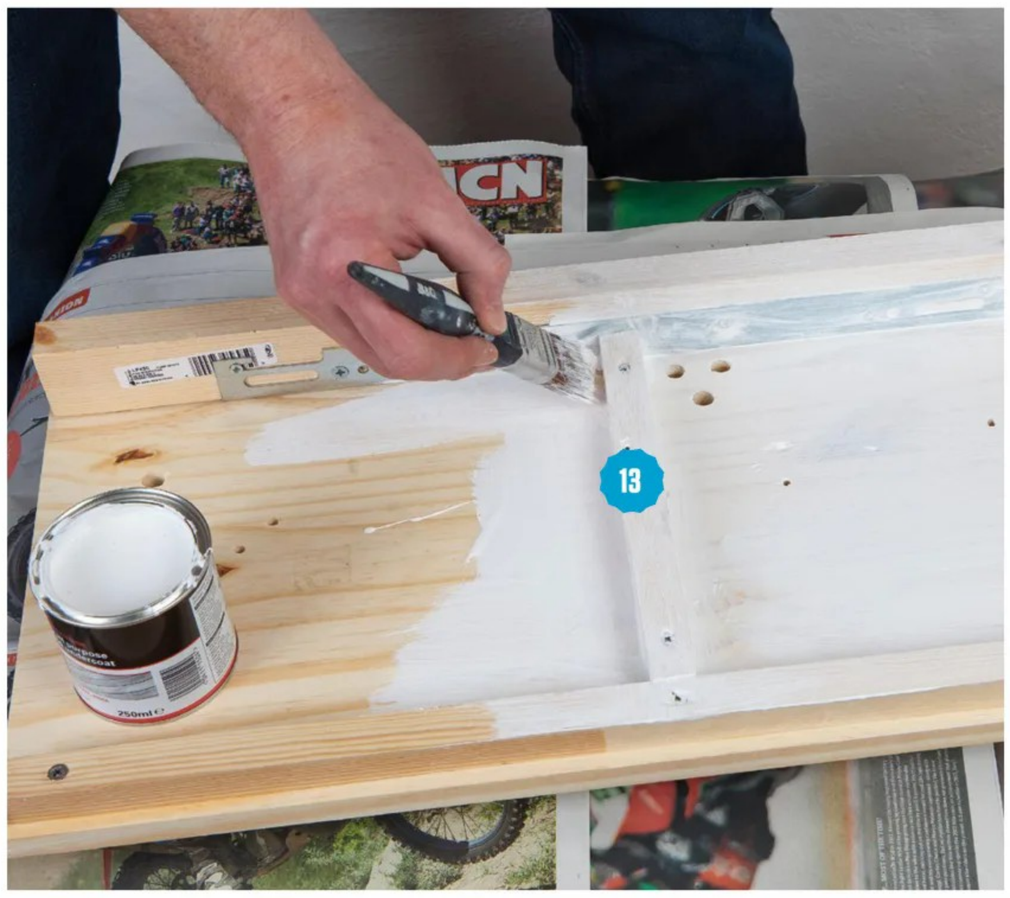
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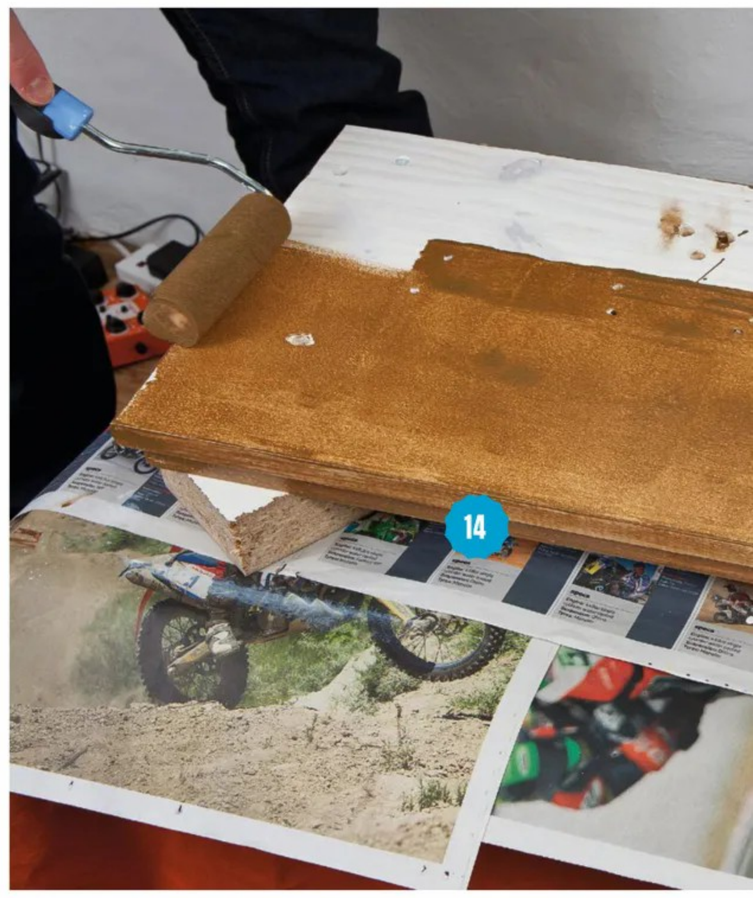
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underneath to the top. More holes... **(11)**

When you've positioned each pedal and drilled all your holes, put it all together and make sure everything is where it should be. No need to cable tie at this point, but do make sure the cable ties will at least pass through the holes okay **(12)**. If you've missed something, fix it!

Once you're confident that everything is fixed and all the necessary holes are drilled, you can go ahead and start your finishing process. The easy option is to just paint or spray it black. However, we're going for something a little different...

Prime the wood **(13)** with an appropriate primer, and leave to dry according to the manufacturer's guidelines.
When the primer is dry, apply your top coat(s) as per the paint's instruction. We've gone for hammer-finish metallic copper

15

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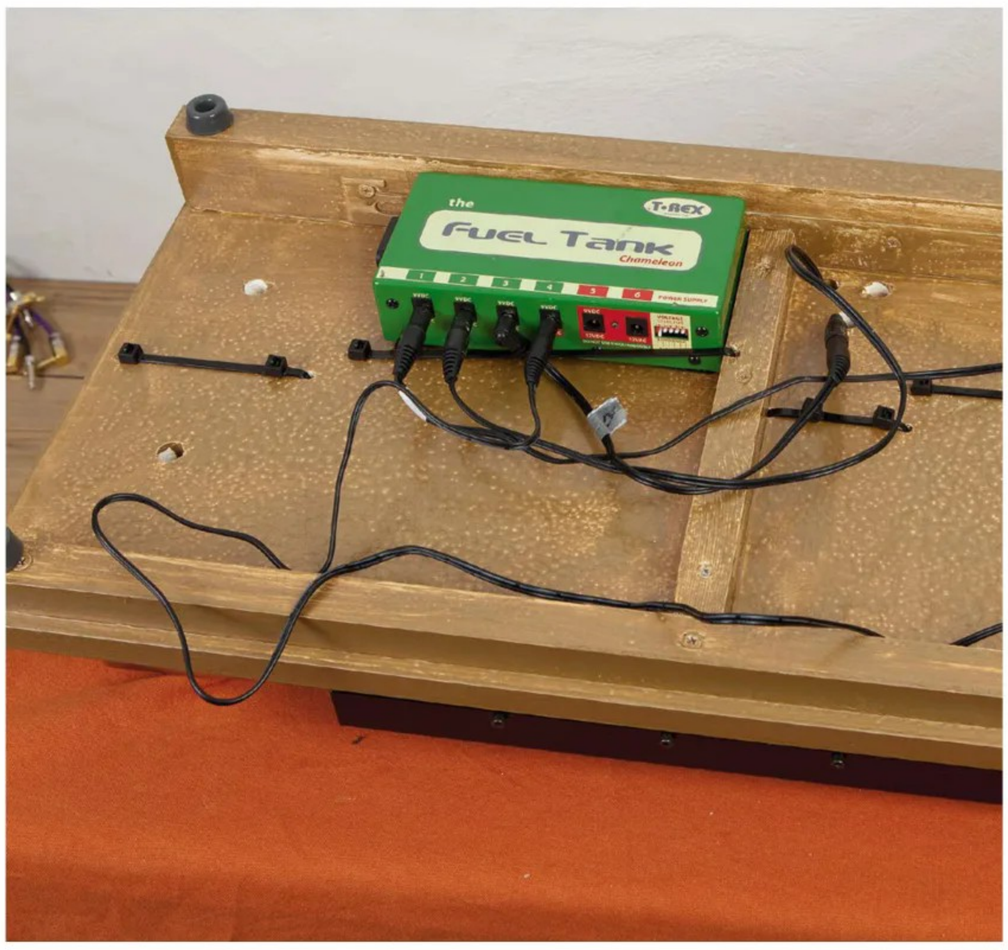
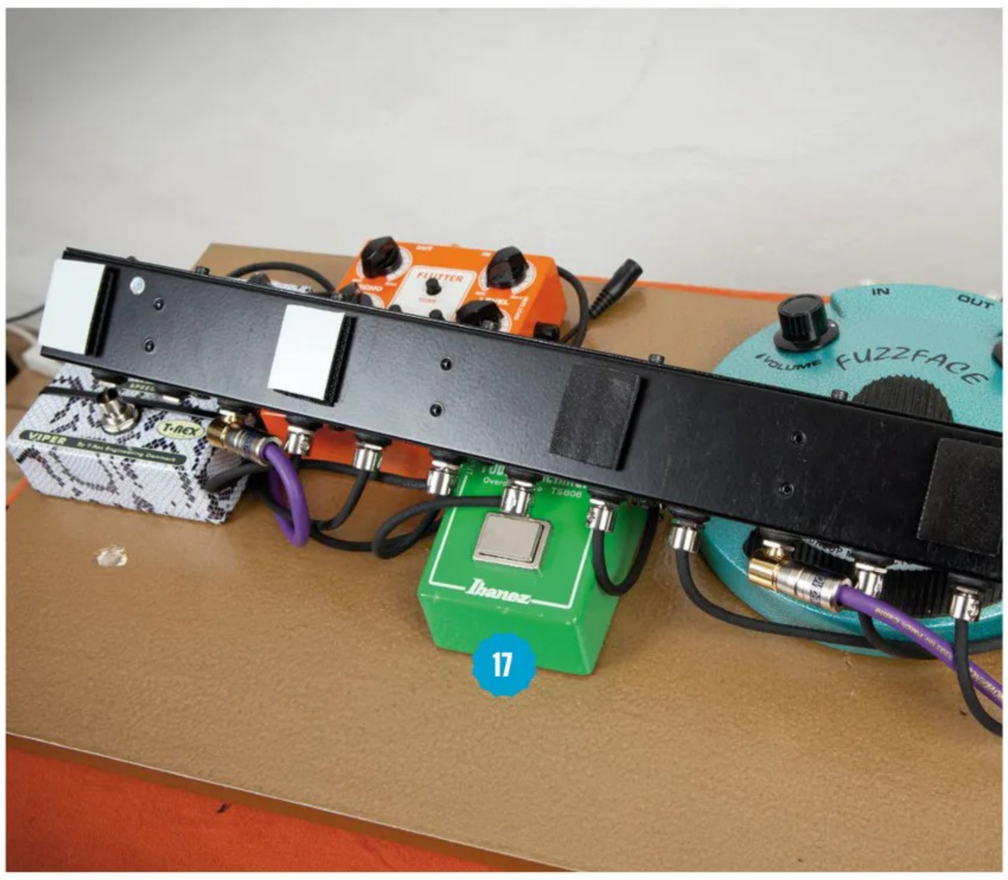




FIXING YOUR PEDALS TO THE 'BOARD

Your main options explained

Velcro

The go-to solution for most 'boards. Upsides are that it maximises versatility because you can coat the 'board with say, the female strips, then stick the male side to your pedals. That means you can add and remove pedals at will. The main downside is that the more you pull pedals on and off, the more the Velcro loses its stick. Also, a lot of people don't like sticking things to the bottom of their pedals because it can pull decals/stickers off when you remove it.

3M Hook & Eye (eg, Dual Lock or similar)

The next step up from 'normal' Velcro. Much stronger and more reliable. Far better in every respect, in fact. There are a few variants available – we really like the Power-Grip brand stuff.

Cable ties

Cable ties are second only to Gaffer tape in their universal usefulness. From mending a fence to reattaching severed limbs, there's almost nothing they can't do. For pedalboards, the upsides are that they're immensely strong and trustworthy, and you don't have to stick anything to your pedals. Downsides are that they can foul pedal controls if you're not careful; you need to drill through the 'board in exactly the right places; and it's a pain in the butt taking pedals on and off.

If you go the cable-tie route, you will also need something non-slip between pedal and 'board. Either good rubber feet, or something else rubbery.

Hammerite **(14)**. We probably could have got away without the primer when using Hammerite, but hey...

When the paint is dry, build up your 'board. For the pedals that don't have good rubber feet, we're cutting little rubber non-slip mats **(15)** to sit between the pedal base and the top of the pedalboard.

When the cable ties are tightened **(16)**, it will all be super snug and the pedals won't move around: this may seem like overkill, but in the heat of battle on stage, it can make all the difference.

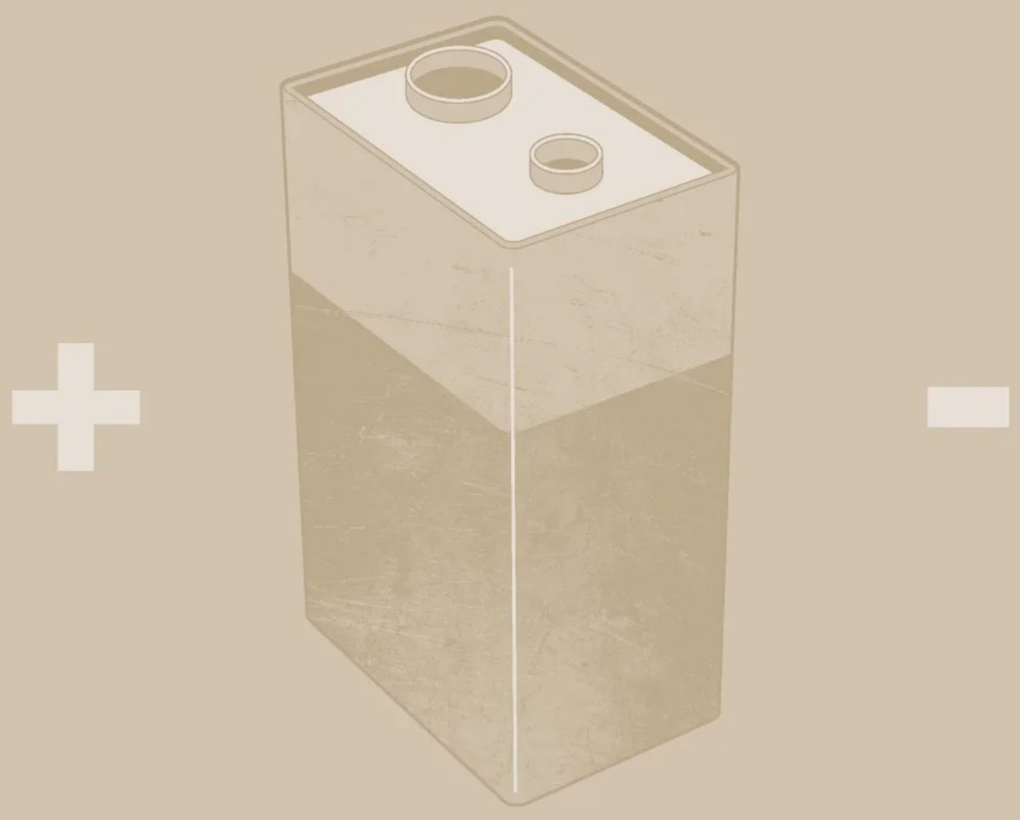
This pedalboard also includes a separate switching device (TheGigRig QuarterMaster 6). We're attaching that with 3M Dual Lock, not cable ties **(17)**.

Done? Superb! Now play...

POWER TO THE PEDALS!

BATTERIES, ADAPTORS, SUPPLIES & MORE

Simple square nine-volter, or plug into the National Grid? Those pedals need some power...



For many players who use just two or three simple pedals and have no convoluted pedalboard to deal with, batteries work just fine. Yes, they're expensive, but there's no brain work involved in extra cables, how to connect them, power requirements and so on.

Add one or two power-hungry pedals to your collection or fix anything down to your 'board, however, and you'll soon find yourself searching for a reliable mains adaptor or power supply to deliver those pedals the juice they need. Here's what you need to know...

Number of outputs

How many outputs do you need in total?

It's worth bearing in mind that not every pedal may need its own output, because it's possible to 'daisy chain' multiple pedals off a single power outlet, as long as the voltage, polarity and current-draw requirements are satisfied.

Voltage

How many volts does the pedal(s) require?

Most pedals need nine volts, some require 12, others 18. Also look for the word 'regulated'. This means that the power supply is 'stabilised' for varying current draws. Unregulated power supplies aren't ideal for guitar effects. It's also worth saying that one nine-volt supply can drive as many nine-volt pedals as you like, depending on the total current draw. So...

Current

What is the current draw in milliamps?

A normal overdrive pedal might be as little as 9mA, where a feature-packed digital delay or modulation effect may need up to 150mA or more.

If you're using more than one pedal, add up the total current draw of all your pedals, and make sure your chosen supply can put that out as a total. Also be sure to check the maximum current for each separate outlet on the supply. For example, the supply might be capable of delivering 1000mA in total, but only 200mA maximum per outlet. That would be fine for the majority of 'normal' pedals, but if you're daisy-chaining multiple pedals off a single outlet, you need to be sure you're not asking for more than it can deliver.

Connection type

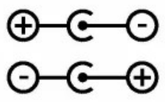
What type of plugs/pins are required?

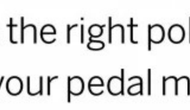
You'll need to make sure that whatever plugs/leads come with the power supply will fit into the sockets on your pedals. Common types are the Boss-style 'barrel' plug (though they're not all the same size!) and a mini jack plug. Some pedals have their own bespoke plugs, so do check.

Polarity

Centre-negative or centre-positive?

Most pedals require a centre-negative supply. This will either be stated in words in the manual, or illustrated with a diagram on the pedal itself.

This is centre negative: 

This is centre-positive: 

It's important you use the right polarity (and voltage) adaptor and leads, otherwise your pedal may be damaged.

Isolated outputs?

Cutting out the noise

One key feature of high-quality pedal power supplies is that they will often have 'isolated' outputs. This means that each individual power outlet will be electrically isolated from the others, which helps solve problems in terms of extraneous noise and interference that can occur in lesser supplies.

Size and design

Will it fit on your 'board?

This might seem overly simplistic after the technical considerations that we've considered so far. Nevertheless, it's important: will it fit? Less obvious concerns are the position and orientation of the supply's connections. Can you plug everything in and out when it's in position?

Power supplies: closing thoughts

If you take into account all of the considerations here, choosing a power supply for your pedals becomes a much less onerous task than just hitting it cold. The quid pro quo for being knowledge-rich is that you may well end up slightly cash-poor! The depressing truth is that if you have mixed voltages, high current pedals and/or different polarity requirements – and you want isolated outputs – the right power supply almost certainly won't be cheap. It's all too easy to be tempted to skimp on this critically important part of your rig, but tread ye with caution down the path of cheap and nasty: buy cheap, buy twice. If you're anything like us, it's also likely that you'll be expanding your pedalboard over time, not reducing it, so a dedicated, do-it-all power supply is a sound investment.

Over to you...

THREE GOOD POWER SUPPLIES

T-Rex Fuel Tank Chameleon

Max current output: 1500mA
Max simultaneous outlets: 5
Current per outlet: 300mA
Voltage provision: 9v DC, 12v DC, 18v DC, 12v AC
Isolated outputs: Yes
Extras: Conversion leads for voltage doubling, polarity changes, Line 6 pedals and more included

MXR DC Brick

Max current output: 2000mA
Max simultaneous outlets: 10
Current per outlet: Up to 1200mA total from 9V outlets. Up to 800 max from 18v outlets
Voltage provision: 9v DC, 18v DC
Isolated outputs: No
Extras: Limited selection of conversion leads

Voodoo Lab Pedal Power 2 Plus

Max current output: Info n/a
Max simultaneous outlets: 8
Current per outlet: 9/12v x 4 100mA; 9v x 2 250mA; 9v x 2 100mA
Voltage provision: 9v DC, 12v DC, 18v DC, 12v AC
Isolated outputs: Yes
Extras: Conversion leads for voltage doubling, polarity changes, Line 6 pedals and more included. Includes battery 'sag' voltage feature

REAL-LIFE BOARDS

Join us onstage as we check out real-life pro pedalboards belonging to gigging guitarists: they reveal the thinking behind their pedal choices, and their boards' inner workings

Shot: December 2012
Guitars: PRS Goldtop McCarty, PRS Custom 24
Amps: Fender Twin, Mesa/Boogie Lone Star

Dave Knudson
Minus The Bear

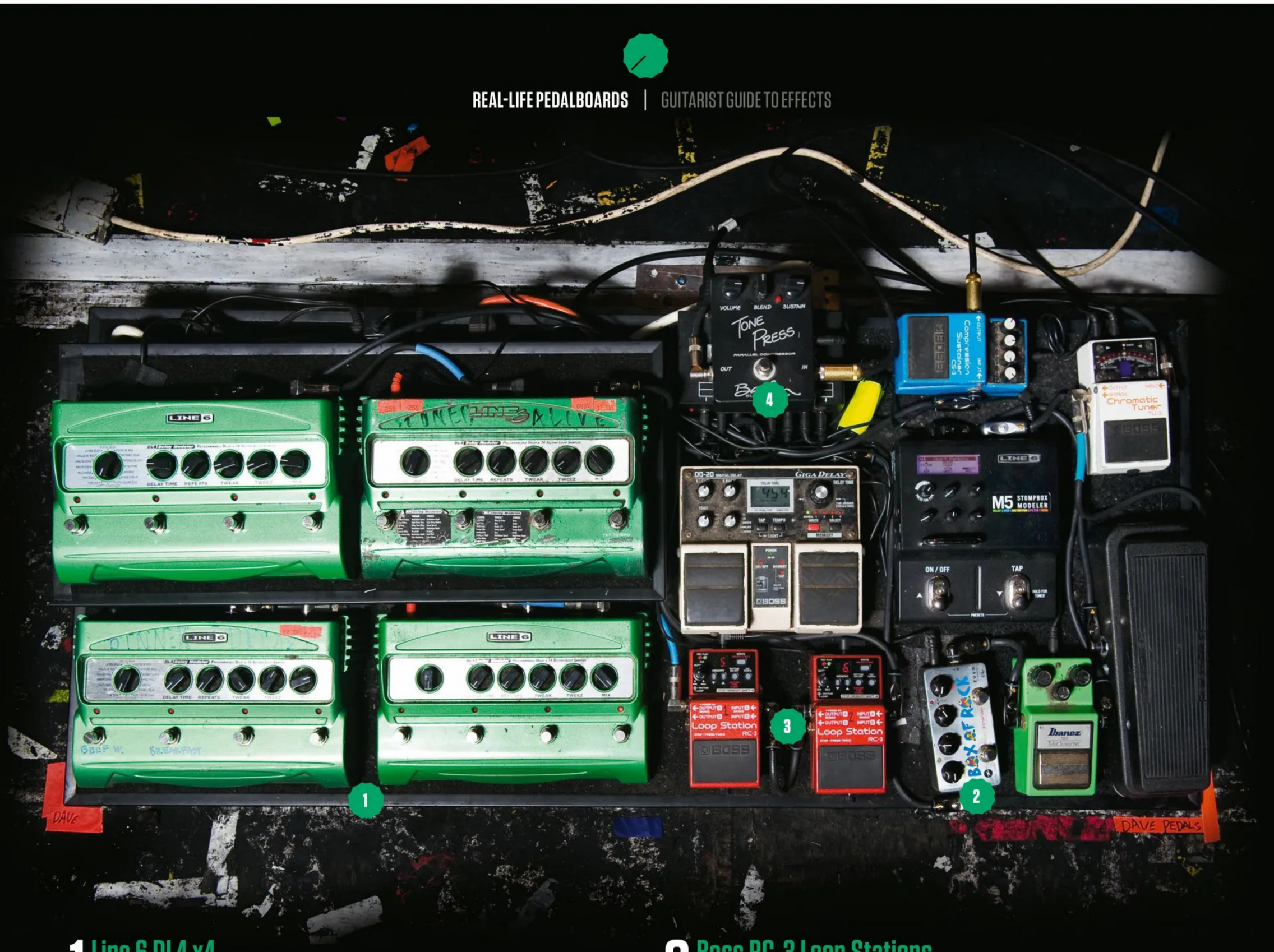
Minus The Bear guitarist Dave Knudson shows us how he recreates his mind-bending tapped and looped studio parts onstage using one serious pedalboard. Here, he explains how he's refined it over time...

Seattle's experimental indie quintet Minus The Bear are an ambitious lot, even by the usual standards of the US alternative scene. Their sophisticated sound combines unusual time signatures with complex and densely textured soundscapes. Guitarist Dave Knudson builds fearsome loops using up to four DL-4 pedals and two RC-3 Loop Stations, supporting the catchy, poppy hooks that have become the band's trademark over a decade together.

minusthebear.com

Hear It Here

Minus The Bear *Infinity Overhead* (2012)



1 Line 6 DL4 x4

It's hard to ignore the bank of Line 6's most famous delay modeller sitting on Dave's 'board. He uses all four of his DL4s to record, manipulate and trigger the legion of complicated guitar loops that can be found in almost every Minus The Bear song. "If the song allows you to, I prefer to record the loops while the song is playing. Most of the loops I record are either at normal speed or double-time, so most of the time [I record them in] half-speed so that when I take the [loop] speed up it goes into double-time or whatever. The DL4s work especially well for re-triggering the beginning of the sample – y'know, the really jittery, stuttery, one-shot stuff. That feature has made the DL4 a staple of my rig. Because of the way the songs are written, that stuff is kind of a necessity now."

2 ZVex Box Of Rock

Despite being primarily known for clean tapping in the early days of the band, when Dave brings the filth, which he does more than ever on 2012 album *Infinity Overhead*, he turns to a little multi-knobbed box from boutique effects maker ZVex. "I mainly use the boost section of the pedal. I just love the way it brings out some of the chimey-ness and the upper-harmonic tonalities, especially in combination with a nice tube amp, like a [Fender] Twin, which I obviously use on a lot of stuff. It just makes any amp sound better, and adds a whole bunch of extra character. Plus, when you have a pedalboard chain as long as mine is, I'm sure there's some audio deterioration along the way, so it's good to sometimes sparkle up the sound if it gets a little dull."

3 Boss RC-3 Loop Stations

How much looping does one man need? Well, apparently, this much looping: in addition to the four DL4s, Dave has a pair of Boss RC-3s on his 'board, which he uses to trigger pre-recorded loops.

"Some of the samples I can get away with having stored ahead of time – like the sample of *Into The Mirror* – that's one of the ones I play off there, or the crazy sample at the end of *Ice Monster* that's really intense – stuff that would take me a while to recreate live. For those kinds of things, I think that works great."

4 Barber Tone Press

While Dave also has a Boss CS-3 to keep things even on his recorded loops, when it comes to playing his intricate tapping parts live, only this expressive boutique compressor will do. "The Tone Press just levels everything out, especially with the tapping stuff – it can kinda get lost in the mix,especially the low strings, so you just hear the high notescoming through, tapping-wise. It levels all that stuff out, so on songs like *Pachuca Sunrise* or *Absinthe Party At The Fly Honey Warehouse*, where there are a lot of high and low notes competing, this kind of flattens everything and brings it to a nice level."

Kim Thayil
Soundgarden

Grammy Award-winning alternative rockers Soundgarden are kingpins of the famous Seattle scene. After over a decade away, they released their sixth album *King Animal* to widespread acclaim. Lead guitarist Kim Thayil and his guitar tech, Josh Evans, gave us the lowdown on his stadium-sized pedal setup.

Soundgarden formed in 1984, and achieved worldwide fame alongside fellow Seattle alternative bands Pearl Jam, Nirvana and Alice In Chains in the 90s. Their 1994 release *Superunknown* saw them reach the peak of their fame, winning Grammy Awards for their singles *Black Hole Sun* and *Spoonman*. Always developing their sound, the band used tricky time signatures and a variety of open tunings in their hard-hitting, dramatic, dark rock sound.

www.soundgardenworld.com

Hear It Here

Soundgarden *King Animal* (2012)

Shot: January 2013
Guitars: Guild S-100, Guild S-300
Amps: Mesa/Boogie Electra Dyne and Tremoverb combos

1 T-Rex Reptile delay

Kim: "Chris gave it to me. Lately, with this album, I've noticed there's a lot more use of the delay pedal. I became fond of it when writing *By Crooked Steps* and then *Worse Dreams*. So, now I'm using it on some of our older songs live with selected parts of solos like *Slaves & Bulldozers* and *Black Hole Sun*."

2 Ibanez CS9 chorus

Josh: "That's been in Kim's chain for a long time – it's an analogue chorus, really warm and not cheesy-sounding at all. He'll use it on a lot of the older songs."

3 MXR Custom Audio Electronics MC402 Boost/Overdrive

Josh: "This is really great, because it seems to keep the character of each guitar and amp but drive it harder with a little distortion, unlike something like a Big Muff or Tube Screamer that has its own sound."

4 Electro-Harmonix Micro POG

Josh: "This is used for an octave effect."

5 Boss NS-2 Noise Suppressor

Josh: "The signal goes to the wireless and comes back to here. Kim kicks this on and off when he wants to get a lot of feedback. On other songs where he's got a lot of gain and the pickups can get a little microphonic, especially in a couple of the older Guilds, this helps keep that under control."

6 Dunlop Custom Audio Electronics MC404 Wah

Josh: "We use it on the yellow setting, which is a little brighter. Kim likes to use it to get a real kind of screamy sound out of it."

7 Providence PE C-2

Josh: "This is the newest addition. It's a [Voodoo Lab] Ground Control-type rig in a box, but it lives here on the pedalboard, so if we need to tweak any knobs or settings we can do it here."

8 Boss DD-7 Delay

Josh: "This is a new addition – it's set on reverse. Kim uses that on the solo to *Rowing*."

9 Hughes & Kettner Rotosphere MKII

Josh: "That's the one labelled BHS – Kim calls it the *Black Hole Sun* machine. It's that Leslie effect on that song."

Philip Sayce

This Welsh-Canadian blues-rock guitarist is one of the most explosive guitar players ever to torture a Stratocaster – and as his pedalboard proves, he's an uncompromising tonehound to boot.

Philip Sayce's four solo albums, beginning with 2009's *Peace Machine* and progressing to 2012's riotous *Innerevolution*, have progressively confirmed that in him, the proud lineage of high-octane blues that runs from Hendrix through Stevie Ray is alive and kicking a decade into the new millennium. Sayce's songwriting is evolving apace, but never at the expense of a searing tone that begins at a vintage '63 Strat and progresses through a pedal board loaded with classic effects. Sayce's use of fuzz is particularly sophisticated, even though it can at times sound downright primitive – and if you like your blues played with power, amazing tone and intensity, you should investigate further.

philipsayce.com

Hear It Here

Philip Sayce *Steamroller* (2012)

Shot: October 2011
Guitars: 1963 Fender Stratocasters
Amps: Late-60s Fender Super Reverb, Mystic Mother, Fender Vibratone rotating speaker cabinet

1 KR Musical Products Megavibe

"That's made by a guy in San Diego, California. It's based on the 60s Univox Uni-Vibe model, as used by Hendrix. I often combine it with my Echoplex on slow songs."

2 Cesar Diaz Texas Square Face

"That's his germanium Fuzz Face. He built them for Stevie Ray Vaughan. I made it in his basement with him. He had a huge bag of transistors. We went through them all!"

3 Maestro EP-3 Echoplex

"It's a mid-70s model. It sometimes works and sometimes doesn't. They're very sensitive to heat, but when they work there's no other sound like it. The old ones have kind of a spookiness to them."

4 Ibanez TS-808 Tube Screamer

"You have to go through a bunch because they don't all sound the same. A couple of them will sound good; some will sound thinner. Just because I like one doesn't mean you will."

5 Klon Centaur

"They cost a thousand bucks on eBay! I use it for most of my overdrive stuff now, more than the Tube Screamer actually, but I'll occasionally combine the two for some feedback craziness."

6 Chicago Iron Octavia

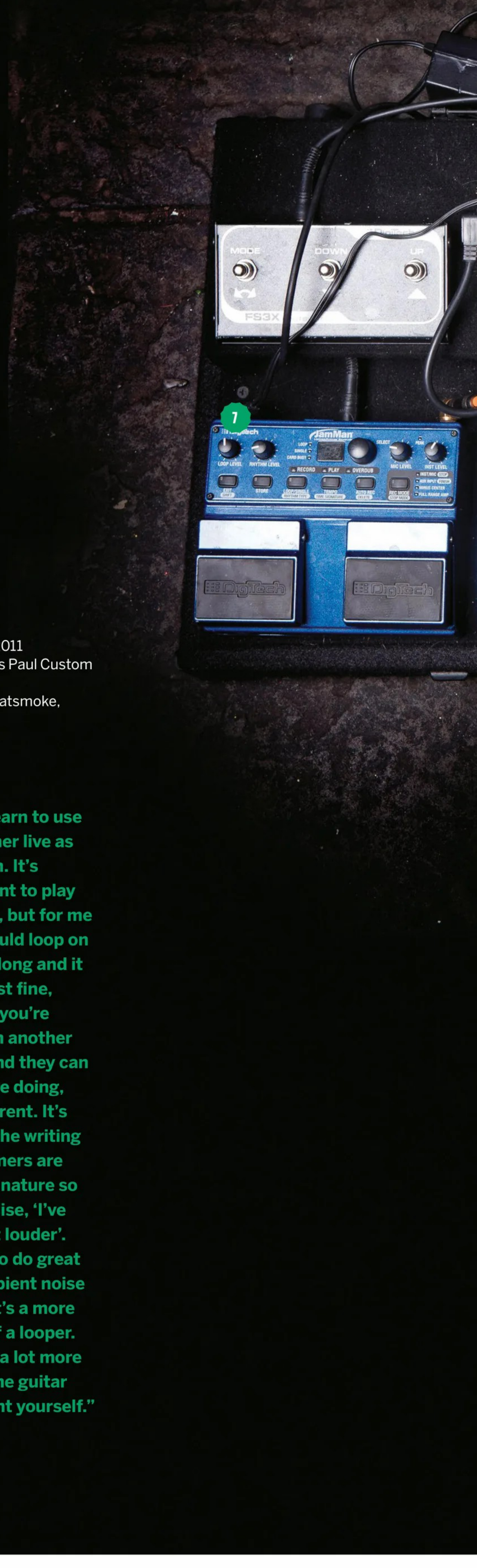
"A fantastic Tycobrahe Octavia remake. I've played original ones and they may have a little bit more spookiness, but this gets 9.9 out of 10. It's the best I've heard."

7 Dallas-Arbiter Fuzz Face

"I actually have a couple of old Fuzz Faces, but I have my BC183L silicon one with me on this tour. That's my favourite of the silicon transistor models. It was made in October '68."

8 Vox 'script' Clyde McCoy wah

"I bought 20 vintage wah pedals. It's like a sickness! I narrowed it down to where I just kept a couple and this is my favourite one. This one's pretty squawky."



Shot: September 2011
Guitars: Cherry Les Paul Custom 1957 Reissue
Amps: Verellen Meatsmoke, Loucks heads

Mike Sullivan
Russian Circles

Guitarist Mike Sullivan creates a colossal post-rock sound with his instrumental trio, Russian Circles, by adding textures and layers using looper pedals and a variety of esoteric effects. Here, he walks us through his tech-savvy pedalboard...

Chicago instrumental trio Russian Circles formed in 2004, and over the course of their four studio albums, *Enter*, *Station*, *Geneva* and *Empros*, they've developed a dynamic sound that contrasts heavy, complex passages with more delicate and quieter movements. Guitarist Mike Sullivan uses loopers and a gamut of pedals, combining them with heavy riffery and rhythmic two-handed tapping to create an ever-changing wall-of-sound live experience.
www.russiancirclesband.com

Hear It Here
Russian Circles *Empros* (2011)

Looper Tip
"My advice is learn to use it with a drummer live as soon as you can. It's always important to play with drummers, but for me it was vital. I could loop on my own all day long and it would sound just fine, but the minute you're interacting with another human being and they can hear what you're doing, things are different. It's the same with the writing process: drummers are awfully loud by nature so it's good to realise, 'I've got to play a lot louder'. But you can also do great things with ambient noise and loopers – it's a more forgiving use of a looper. Looping allows a lot more freedom with the guitar – you can accent yourself."

1 Fulltone OCD

"That's another overdrive. I use several distortion pedals in the studio and if there's too much gain, nobody wins. It becomes a mud-fest and I get dirty looks from my bandmates."

2 Fulltone PlimSoul

"I'm a big fan of the PlimSoul [overdrive], a Fulltone pedal with the ability to cover all kinds of ground. I use that a lot on the new album."

3 MXR Micro Amp

"It's simply used to bump up the guitar signal here and there, mainly for heavier moments."

4 Electro-Harmonix Memory Toy

"I use this for a shorter delay."

5 Electro-Harmonix Holy Grail Reverb

"I use it at various points in the set and adjust it accordingly for different songs."

6 Akai Head Rush E-2 Looper

"With certain loopers, it's difficult to feel exactly where they start and stop recording. There's no down and up motion with this pedal – it's instantly recording and there's no discrepancy for me."

7 DigiTech JamMan Looper

"You can store pre-recorded samples and loops, which is useful if I need more time tuning or an interlude didn't go as I planned. Sometimes I'll use it for set interludes when I have a lot of tuning to do."

8 ZVex Fuzz Factory

"The band is named after an ice-hockey move and [ZVex] has illustrated that on the pedal for me. It's a disgusting-sounding pedal – I don't know if I use it tastefully or not, but I certainly have fun with it."

9 Boss TR-2 Tremolo

"I use that for a segment in the song *Youngblood*."

10 Fender PT-100 Tuner

"I've found the Fender tuner to be more efficient onstage."

11 Electro-Harmonix Deluxe Memory Man

"I've never been a big fan of tap tempo with delays, so I'm on my hands and knees between songs, working out where the delay needs to be. It's important to have the delay match the tempo of the song. It's an easy oversight but very relevant to the overall feel and keeping things rhythmic."

Mike Einziger
Incubus

This alt-rock effects experimentalist has refined his pedal board to cope with a no-holds-barred signature style evolved over two decades of touring and recording.

Californian alt-rock act Incubus may have sold millions of records and enjoyed US chart success with a string of singles, but the band's sound has always been underpinned by the skills and tonal experimentation of guitarist Mike Einziger – despite having mutated from funk-rock beginnings to incorporate various rock styles. Nowadays, darker and more spacious soundscapes are the order of the day, with keyboard sounds supporting the atmospheric guitar work.
www.incubushq.com

Hear It Here
Incubus *The Essential...* (2012)

Shot: November 2012
Guitars: Ernie Ball Music Man Albert Lee HH
Amps: Mesa/Boogie Dual Rectifier, Mesa/Boogie Trem-O-Verb combo

1 Boss PH-2 Super Phasers & MXR EVH90 Phase 90
"The two Super Phasers are set differently: one is set at a higher speed, almost like a rotary effect; and the other is set to a very wide, sweeping, almost flange-like sound. I use these in pretty much every song. The MXR was put in there by one of my old guitar techs, Larry Melero, who was a crazy Van Halen fan. I use it all the time."

2 Boss RV-3 Digital Reverb/Delay & Electro-Harmonix Holy Grail reverb
"During Megalomaniac, I use this Boss reverb and also the Holy Grail reverb sometimes. I use both of them together if I want a real brittle, dark-sounding reverb, like on *Pendulous Threads*. They carry a lot of the higher frequencies through and they become kind of harsh sounding, making it very dark, which I really like."

→ 78 INPUT

3 Electro-Harmonix Micro Pog & BOSS OC-2 Octave

"This POG is great. It gives you an octave above as well as the sub octave. When you play a chord through it, it doesn't get the notes jumbled. It will actually harmonise the whole chord, which is really cool. I've been using it a lot during *Sick Sad Little World*, like when I play a solo in the middle of that song. I also use it during In *The Company Of Wolves* and that's another place I use the Octave a lot. I use [the Octave] during the verse sections of *Privilege*."

4 Boss CS-3 Compression Sustainer

"I use this a lot when I'm playing solos, like on the song *Pistola*. I'll click on this and it makes things go to 11, basically. When 10's not quite enough, that's what I use. I don't have 11 on my amps, so this is the 11 pedal!"

5 Dunlop Cry Baby

"This is one of the first pedals I ever started using. A lot of times, I actually use it set at a midway point so you get this really throaty sound: I do it during the bridge section of *Megalomaniac*, in *Adolescents*, during the bridge section of *Are You In?* and during the guitar solo in *Here In My Room* with a slow phaser and a delay as well."

6 Danelectro Reel Echo

"This is probably my favourite pedal. It is awesome. You know all this dubstep-type stuff that people are trying the delay rate without effecting the pitch, and I haven't ever found another delay that does that. I use it during the *Pistola* solo. There's some weird stuff happening on there – and it's all from this pedal."

7 Electro-Harmonix Deluxe Memory Man

"You can get some really wild things to happen with this pedal just by messing around and changing the feedback and the delay. It can get really out of control, actually, and blow your amp up if you aren't careful! A lot of the time, I'm just really experimenting with this and the [Reel Echo], specifically running them through the wah. It ends up sounding like an analogue synth filter section. The guys in my band tease me a lot of times because sometimes I end up losing control of the thing. I call it 'spilling the paint'!"

PERFECT PAIRINGS

Like the Fuzz Face and wah-wah under the dancing feet of Mr James Marshall Hendrix, or the combination of vintage amp tremolo and reverb, the marriage of certain effects can trigger a creative tidal wave. Here, we've put our heads together with the pros in order to recommend some must-try combinations for your 'board...

BARRIE CADOGAN (Little Barrie, Primal Scream)
Analogue delay with Dr Scientist Reverberator

"This is really useful live, but especially in the studio, or for making rough demos. You know how rehearsal rooms and studios, when sound-proofed, can be super dead-sounding? That sound can be good for some things, but it can also leave your recordings a bit flat and lacking atmosphere. Adding a bit of rockabilly-style shimmer from an analogue delay and then plugging into the Reverberator can really add more character to the sound of even a rough recording.

"However you set them, you create the feeling of a much more 'live' sounding room, or if you set the reverb much higher, a sound closer to a huge hall. You can use any decent analogue delay for this, I'd say. I have a cheap MXR copy that sounds really good. It only cost me £25. It's digital, but sounds more analogue. The cool thing about the Reverberator is it has a level control, so you can drive your amp harder with it by turning it up, if high volume's a problem.

"I really love the sound of the Tom Waits album *Real Gone*, featuring Marc Ribot's brilliant guitar playing. Crank up your valve amp with these two pedals and you can create a bit of that mood. It's such a great sound."

DAVID GILMOUR (PINK FLOYD)
Electro-Harmonix Big Muff with Colorsound Power Boost

Daniel Steinhardt on Gilmour's secret weapons:
"David Gilmour used a Big Muff with a Colorsound Power Boost. Everyone thinks Gilmour used a Big Muff. Well, no, actually, that sound is a Colorsound Power Boost into a Big Muff. It's that combination. But you need a really good Power Boost and a really good Big Muff, and then you can go on for days. But I've got nothing but respect for the guy; he's tried everything and really experimented. So, yeah, stacking overdrive pedals is a wonderful way of finding unique sounds."

→ 80 INPUT

ELLIOTT RANDALL (Steely Dan)
Foxx Tone Machine with Mu-Tron Bi-Phase

"I love to find 'out there' sounds. There are many great echoes, overdrives, wahs, compressors, and so on, and I'm comfortable using most of them to achieve maximum appropriate effect. But since my quest has always been 'the lost chord and the lost sound', I've always loved devices that allow me to bridge the gap between guitar and synthesis.

"Give me a Foxx Tone Machine and a Mu-Tron Bi-Phase. I can move between the most subtle of conventional sounds (gentle phase/chorus/Leslie and slightly overdriven 'rocky') all the way to a very powerful synthesiser. The Bi-Phase comprises two 90 degree phase shifters, which can work independently or in tandem to produce 180 degrees of phase. It can also do delicious stereo panning. There's a choice of two waveforms, individual speeds (clocks) on the phasers. I could go on – it's a major synthesis component.

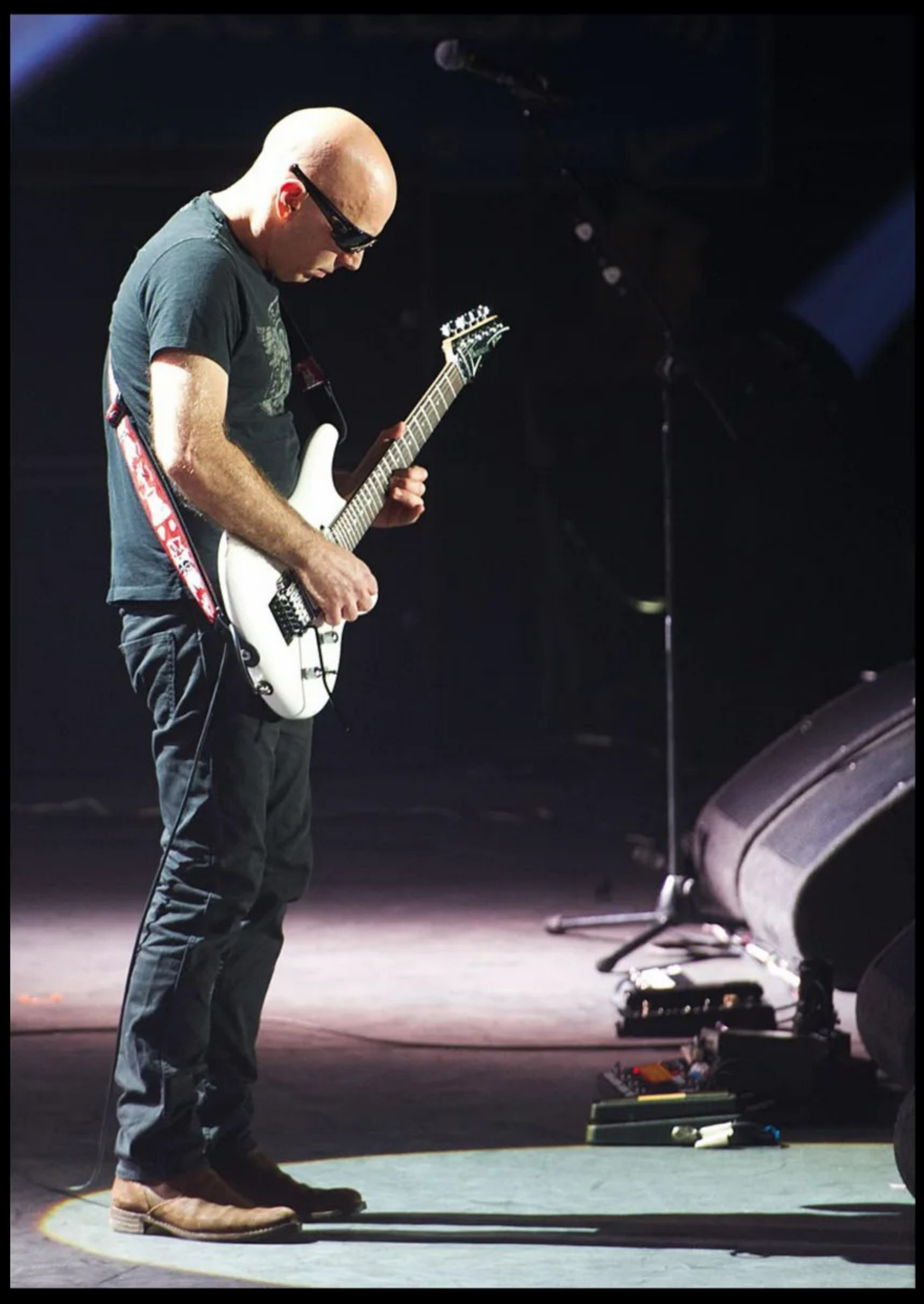
"The Tone Machine goes between being a conventional fuzz tone, and with the flip of a switch, its circuitry produces the octave above; and if that wasn't enough, in this mode it becomes a bona fide ring modulator! The mid 70s rocked in terms of producing original warm analogue boxes."

ACE (Skunk Anansie)
Electro-Harmonix Big Muff with DOD Buzz Box Ibanez ST-9 Super Tube Screamer with Pearl OC-07 Octaver

"My first Perfect Pairing would be the original 1967 Electro-Harmonix Big Muff, coupled with the rare and insane DOD Buzz Box (developed with King Buzzo from The Melvins). This combination produces insane and gnarly fuzz-drive with almost random harmonics and octaves. You can obtain a monster solo or riff tone with a super-original sound! A recording classic, used on *Yes It's F**king Political* on *Stoosh* – on the riff and solo.

"Next up is the old and rare Ibanez Super Tube Screamer from the late 70s to early 80s, coupled with the 80s Pearl Octaver. This is the stuff that super-fat monster riffs are made of. The Tube Screamer can drive the amp tone to fat and hot without losing the character of it, while the octave pedal has two octaves down, as well as one up to blend in for super massiveness.

"I used it on the track *Intellectualise My Blackness*, on the *Paranoid And Sunburnt* LP. I've used it many times in the studio, and it has remained a live classic in my 'board for the last 20 years!"



JOE SATRIANI
Electro-Harmonix POG with Neunaber Wet Reverb

"Right out of the box, EHX's POG is a pedal that screams, 'Write a song with me now!' That's pretty much what I did when I first plugged it in, and the result was *Super Colossal*. Send it into a Marshall, cranked up, or even a small vintage Fender amp, and it makes your guitar sound like Jon Lord's Hammond organ. A nice pairing is a delay or reverb that gives it a space of its own, just a little more depth and ambience. For delay, I'm partial to my own Vox Time Machine pedal, but I will restrain myself from mentioning my signature gear. My favourite digital reverb pedal is the Wet pedal by Neunaber. It's compact in size, but huge sounding. These two pedals together provide me with hours of fun and inspiration. Check them out – you will not be disappointed."

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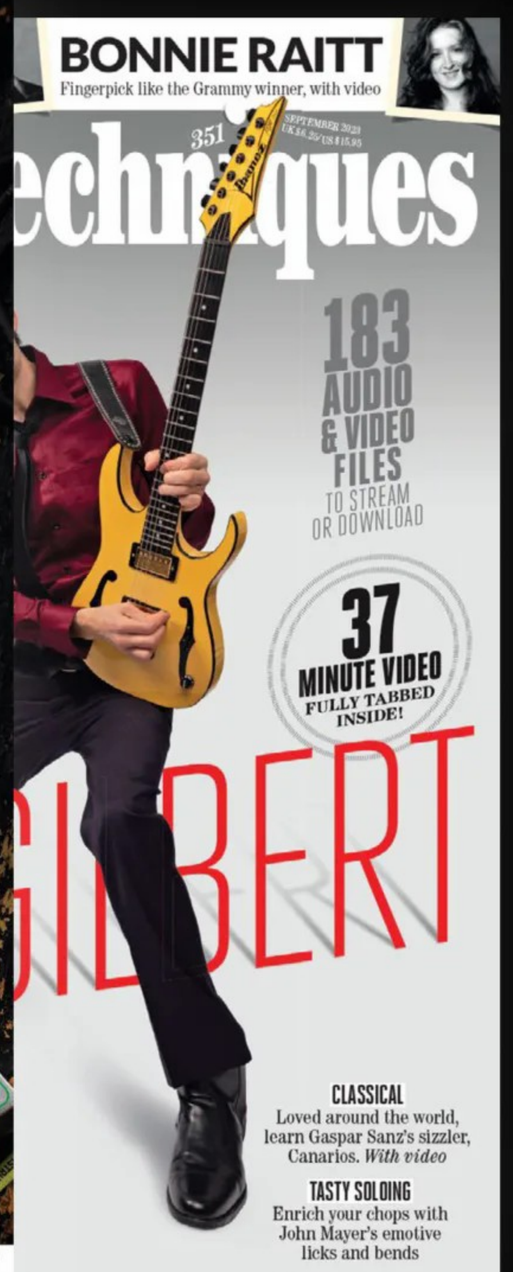

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TONE TIPS | BUYING ADVICE | TECH INSIGHTS

A tone-tweaker's guide to essential boost, overdrive & distortion pedals

ULTIMATE OVERDRIVE

→ 84 INPUT

THE ULTIMATE OVERDRIVES

THE SETUP

A brief word on what this guide is about – and what it isn't – plus a look at how we put the runners and riders of our Ultimate Overdrives guide to the test

We've got a confession to make here. If you're expecting a complete list of the best overdrive pedals you can buy, this isn't it. There are so many excellent and worthy drive pedals out there that it's inevitable some didn't make it onto our list, so please don't feel aggrieved if you don't see your personal favourite here, or the latest greatest thing that's all the rage on the forums. Instead, we've selected 12 epochal overdrive, boost and distortions pedals that either represent a moment when the game changed, or a drive effect at the peak of its engineering evolution.

Don't get us wrong, however: each pedal here is a stone-cold classic and together, they represent an awesome spectrum of dirt-dealing tonal possibilities. But the primary thing we hope you'll take away from this guide is a surer sense of how legendary types of drive effect can be used with the rest of your rig, as well as putting forward a choice list of benchmark effects by which the standard of other pedals can and should be measured.

Let's also say a word about an important class of pedals this guide doesn't cover: fuzzes. We decided these are so important, yet so distinct that they're deserving of their own separate guide. Some famous pedals, notably the Electro-Harmonix Big Muff, straddle genres of pedal and could arguably have found a place in this guide, too. But we decided to leave that particular big-hitting box for a more fuzz-focused guide. So Muff fans, we're sorry and beg your indulgence for the moment. Its time will come.

THE EXPERTS

To aid us in our quest, we've enlisted both Daniel Steinhardt of TheGigRig, and veteran *Guitarist* gear reviewer Mick Taylor. Daniel builds pro-grade pedalboards for everybody from Steve Vai to Ed O'Brien of Radiohead. His company, TheGigRig, creates some of the very best tone-sculpting gear going, including the G2 switching system that we've used here to rapidly A/B the pedals, amps and guitars in this guide. Mick, meanwhile, is a former editor of *Guitarist* and *majordomo* of our Q&A gear-fettling column. He's picked apart the tonal attributes

Make sure you watch the video of Daniel Steinhardt and Mick Taylor that accompanies the features throughout this supplement to hear all this classic gear in action. To access the video, go to **http://bit.ly/guitaristextra**

"Because effects often perform differently with different combinations of guitars and amps, we've brought together a cross-section of classic hardware to test our ultimate drives"

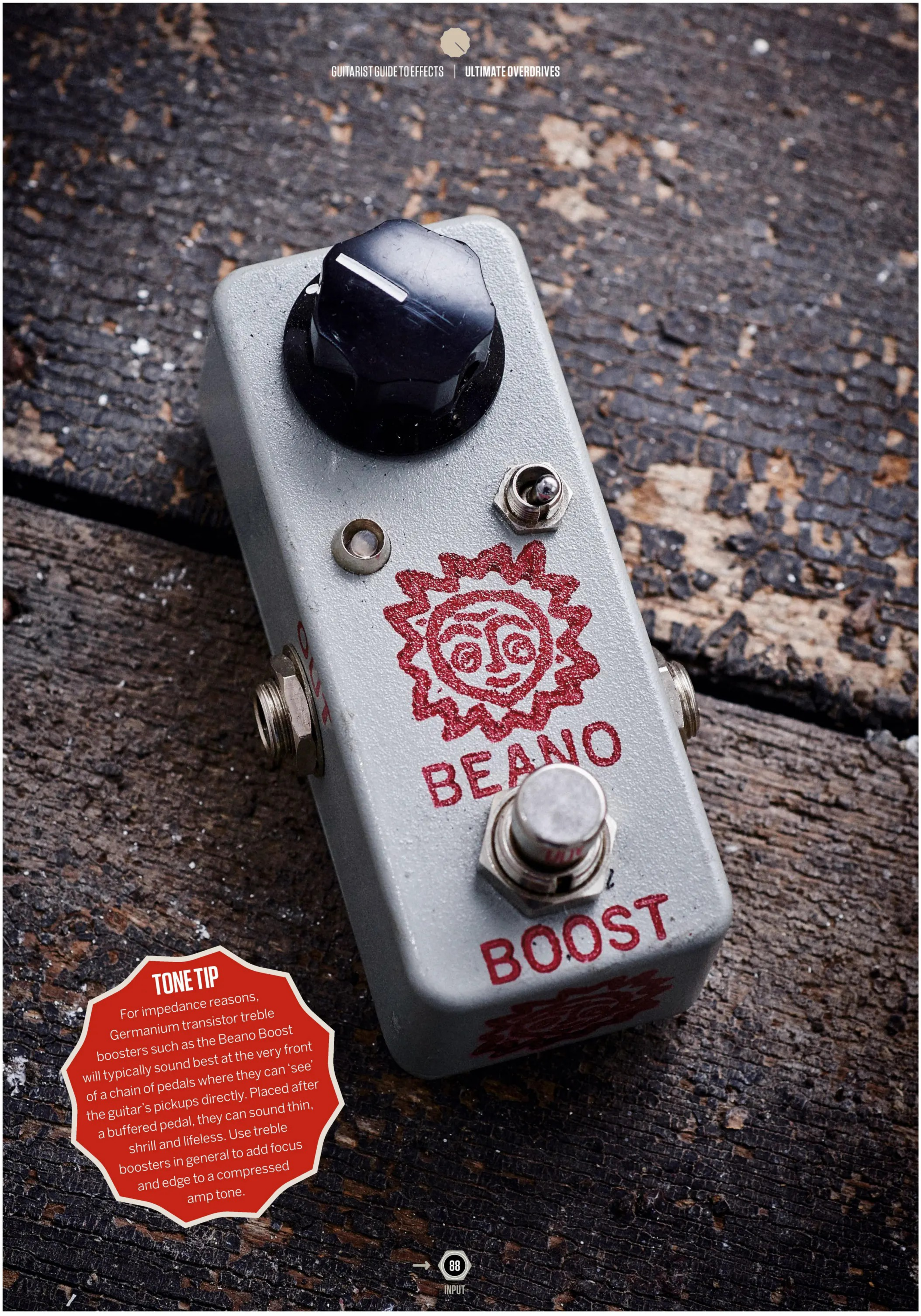
of more classic pedals than he'd care to remember, but still has a powerful thirst for discovering new stompbox sounds to add to his appreciation of the field. Together, Daniel and Mick host *That Pedal Show*, an excellent weekly video blog on how to get the best from your effects. If you haven't seen it yet, check it out on YouTube – it's an education.

THE HARDWARE

Because no effect is an island – often performing radically differently with different combinations of guitars and amps – we've brought together a cross-section of classic hardware to test our ultimate drives through. For amps, we have a carefully fettled Vox AC30 that belongs to a very famous prog-rock guitarist, a Marshall JTM45 and 2x12 cabinet to represent the bridge between British and American amp tone, and finally, the quintessential gig-worthy Fender combo, the 22-watt '65 reissue Deluxe Reverb, here in special-run 'Bordeaux Blues' spec, with Jensen P12Q driver. To bring it all together seamlessly, we're using the excellent TheGigRig G2 switching unit, permitting seamless transitions between effects and the various items of hardware in play today.

The guitars are equally choice, covering a gamut of classic tones: a 2003 Custom Shop 1963 NOS Telecaster in Candy Apple Red with rosewood fingerboard; American Vintage Stratocaster with Seymour Duncan Antiquity pickups; a John Mayer Signature Stratocaster tuned to E♭, a Custom Shop '58 reissue Sunburst Les Paul Standard; and last but not least, a Gibson Memphis 50th Anniversary '63 ES-335 reissue.

So, the amps are on and warmed up, and the guitars are ready for action. Gentlemen, to your drives.



TONE TIP

For impedance reasons, Germanium transistor treble boosters such as the Beano Boost will typically sound best at the very front of a chain of pedals where they can 'see' the guitar's pickups directly. Placed after a buffered pedal, they can sound thin, shrill and lifeless. Use treble boosters in general to add focus and edge to a compressed amp tone.

→ 88 INPUT

ANALOG.MAN BEANO BOOST

Daniel Steinhardt and Mick Taylor discover what treble boosters are really for with this classic Germanium-transistor unit

The first class of drive effects Daniel and Mick have nominated for 'Ultimate' status belong to what might broadly be termed boost effects. That is, they offer an increase in perceived volume when engaged plus a flattering tonal colouration – but don't sound as 'dirty' as higher-gain overdrive pedals.

Among boosts, the Dallas Rangemaster is legend. Beloved of guitarists ranging from Eric Clapton to Rory Gallagher, it remains the quintessential Marshall-baiting, blues-rock booster. Think of Clapton's lead tone on Hideaway on the Bluesbreakers' 'Beano' album and you're getting the idea. Developed by the Arbiter Group in the mid-60s, the Rangemaster utilised a single Germanium transistor to provide the boosting mumbo.

Highly sought-after, original Dallas Rangemasters are nonetheless hard to find and are rather archaic by modern standards of usability. The boxy enclosure, with front-mounted controls and a hard-wired output cable, works better when placed atop an amp than on the floor. Since that's not how most players use effects these days, a number of contemporary makers have manufactured treble boosters that come in a more usable package.

However, as Daniel Steinhardt of TheGigRig observes, the term 'treble booster' is a misnomer that shouldn't put you off trying this useful type of boost effect, which is far more musical and less shrill than the term might suggest, giving bite and focus back to amp tones that have become bloated by high volume or gain settings.

"Yes, treble boosters such as this Beano Boost do boost upper mid and treble frequencies," Daniel Steinhardt explains. "But it works really well in conjunction with an amp that is really compressed, because the frequencies that the treble booster is pushing become a lot more focused and sensitive and can then form an amazing sound."

It was a tough choice, but for our Ultimate Drives line-up, Daniel has plumped for the Beano Boost by well-respected Connecticut effects maker Analog.Man, founded by tone guru Mike Piera, as a leading example of a modern Rangemaster-style treble boost. This micro-enclosure pedal has a small footprint but retains the original's point-to-point wiring rather than PCB construction. A number of varying but period-correct NOS transistors, including Newmarket NKT275s and Mullard OC44s, have been used in this model to date. It can also be switched to emphasise either upper mids or frequencies more in the centre-ground of midrange, also like the original.

SOUNDS

"Let's have a listen to the Beano Boost into the Marshall JTM45," Daniel says, taking up his Tele. "It reminds you of sounds from the 60s and you can hear it's not just treble that it provides. Because all of the bottom-end frequencies of the amp are still there – but the pedal is pushing the upper mid and treble frequencies into overdrive."

"There is a guitar that needs to be played with that," Mick says, referring to the Gibson Custom Shop '58 Les Paul 'Burst reissue that's the kind of guitar Clapton might have used in his pre-Cream Bluesbreaker days. Plugging it into the Beano Boost and the Marshall, a savage but warm saw-blade tone leaps out.

"It's a really honky, dark-sounding tone," Mick observes. For comparison, Daniel tries the same combination with the AC30 with more mid-focused but equally wild results. As an experiment, Daniel and Mick try the Les Paul into the EP Booster first, then the Beano Boost. This time, the tone is much harsher and more metallic. "There's a very good reason that it now sounds awful," Dan says. "The Beano Boost uses a Germanium transistor. And Germanium transistors need to 'see' the inductance and impedance from your pickups. If they 'see' a buffer at the input, they sound awful!"

LIKE THIS? TRY THESE...

KEELEY Java Boost £129

Robert Keeley is one of the finest builders and modders out there and his hand-built modernised take on the Rangemaster is a beauty, offering an original Rangemaster voicing – plus both mid-boost and full-range settings for extra versatility.
www.robertkeeley.com

BSMAmbassador Treble Booster £POA

German maker BSM makes numerous interesting variations on the treble booster theme, but this Germanium transistor model gives a flavour of the Rangemaster, as well as maybe a few other late-60s treble boosts of note. BSM also uses only NOS German components for that extra touch of period authenticity. **www.treblebooster.net**

TONE TIP

At higher levels, you can use a booster like the EP to make your amp's natural voice wider and louder without overly changing the core character of your sound. Watch out when trying that with amps that have lots of bottom end, though – things may get mushy! If you simply want the flattering tonal colouration that a boost pedal can add, however, turn the boost's level control down to near unity gain and leave it on all the time.

XOTIC EFFECTS EP BOOSTER

Dynamic duo Daniel Steinhardt and Mick Taylor explore what a good boost pedal can do for you with this Echoplex-inspired modern classic

In the days before effects pedals were as numerous as they are today, top players would find tonal advantages in unusual places. The Maestro Echoplex EP-3 tape delay unit is best known, of course, for its vintage echo sounds. But as players such as Jimmy Page and Brian May have found, its internal preamp circuitry has a very flattering effect on tone, too. Daniel Steinhardt of TheGigRig explains:

"A lot of guitar players liked the sound of the Echoplex even with the echo turned off. There's something very special about that circuit."

While a few makers, notably including Dunlop, have made good clean-boost effects based on that principle, one pedal that we've seen time and again on the pedalboards of tone-conscious pro players such as David Grissom is the EP Booster by Xotic Effects of Los Angeles, which forms the second of our Ultimate Drive selections. Hand-wired, offering up to +20dB of boost, it's a little more versatile than its compact, single-knob layout might suggest, thanks to internal DIP switches that allow users to tailor gain levels and add 'bright' or 'vintage' emphasis to its sound.

A true-bypass design, its classic role is nonetheless as an 'always-on' booster that colours your tone slightly, while adding a little bit of extra warmth, volume and girth to your amp's natural voice.

SOUNDS

"When you play the EP booster into the AC30 and then the Marshall JTM45, you notice that it's a full-frequency boost," Dan comments, and then demonstrates what that means with his Fender Custom Shop Telecaster. "The AC30 has prominent mids, so the booster pushes those mids up until the amp saturates really nicely. But as soon the booster goes into the Marshall, which has lots of bottom end – because the booster is now also pushing up those lower frequencies – you'll notice it got a bit mushy straight away."

Switching from the Tele to the Strat and performing the same comparison with the booster on through the two amps, Mick and Dan comment on the "bonkers" amount of low end the Strat generates from the JTM45 when the EP Booster is engaged. "That low end is not always useful – but the fact that we've been able to use the booster to produce that amount of bottom end from an amp that produces about 30 watts is a wonderful thing."

But Dan adds that it's sometimes better to take advantage of the flattering tonal colouration that the EP Booster, and other effects like it, can add without cranking the pedal's level control right up – which can overwhelm amps with lots of low end, such as the JTM45.

"For example, if I turn this EP Booster down to unity gain – unity meaning the same volume level as if it wasn't switched on – it does still add something, it does still colour the sound compared to the un-effected sound of the amp. It isn't a completely, clearly clean boost and that's the quality of the Echoplex preamp circuit that a lot of guitarists such as Jimmy Page liked. It's ace!"

Switching over to a Gibson Custom Shop Les Paul and a Gibson Memphis ES-335, to see how the EP Booster works with the fatter sound of humbuckers, Mick and Daniel soon find that it summons an absolutely immense but well-defined voice from the AC30.

"What I love about that sound is that it's so focused – even if you were turned down in the mix [of a live performance or studio recording], you're going to hear every note you play," Daniel adds.

LIKE THIS? TRY THESE...

DUNLOP EP101 Echoplex preamp £107

From renowned US effects makers Dunlop, now celebrating its 50th year in business, the EP101 claims the same Field Effect Transistor circuitry and signal path as the original tape-echo unit had. Build quality is excellent, and the EP101 is also a little cheaper than the Xotic unit and has a wider, more stable footprint on your pedalboard. And it's got that retro logo, too.

www.jimdunlop.com

MXR M133 Micro Amp £86

Not a clone of the Echoplex circuit, the Micro Amp nonetheless deserves a mention here as the quintessential 'always-on' clean boost that wakes up and fattens your amp's tone, or adds up to +26dB of volume for solos if used in the conventional clean-boost role. It's built like a truck, affordable and there's a Custom Shop 'Plus' version that offers EQ controls, too.

www.jimdunlop.com

TONE TIP

With low-gain overdrives, the relationship with the amp you're using is especially critical. Used with a lower-wattage amp, they'll tend to 'push' the amp's preamp and power valves into clipping and so you'll hear an attractive blend of pedal- and amp-generated crunch tones. In that scenario, a classic technique is to turn the pedal's level up but its gain down to yield a punchy-but-warm tone that contains plenty of the amp's own voice. Amps that have more headroom will reveal more of the pedal's intrinsic drive tone – but can project that sound with stunning clarity and force.

→ 92 INPUT

BOSS BD-2 BLUES DRIVER

It's the original 'transparent', low-gain overdrive – Daniel Steinhardt and Mick Taylor crank it up to find out what all the fuss is about

Low-gain overdrives are cousins to clean boosts, but they also form an important category of drive effect in their own right: the fabled 'transparent', low-gain overdrive.

Essentially, these kinds of pedals take the same ingredients that make a clean boost appealing – such as the fact that when they are engaged, you can still hear plenty of the natural tone of your amplifier and guitar – but they add just a little bit more colouration and compression than a straight boost might. For example, where clean boosts can sound a little abrupt and stark sometimes, low-gain drives give you a little more flattering sustain and punch instead, for those warm, bluesy solos.

Given the number of forum-worshipped, boutique low-gain drives around, it may seem unusual that our expert testing pair of Daniel and Mick have opted for the humble Boss Blues Driver as our exemplar of great low-gain drive. But it shouldn't be forgotten that Boss compact pedals formed many of the tonal templates for plenty of boutique effects since the 80s, and the Blues Driver is an undeniable classic.

"For me, it was an important pedal," Daniel says. "When Boss produced this, a lot of blues players – who'd previously been using handmade boutique things – started using these on their 'boards instead, for the reason that it's a transparent overdrive. And what I mean by that, is that it doesn't colour the sound too much."

SOUNDS

"Used with the Les Paul and the AC30, you can hear that all the natural frequencies of the guitar and amp are there, but the Blues Driver just lifts the mids a little," Daniel observes. "It's nothing like the amount of mids a Tube Screamer provides, though, but it was – and is – fantastic for just boosting an amplifier that's working and giving it a little bit more edge. But it's definitely an overdrive pedal, not a clean boost, because a certain amount of that drive tone is being created in the pedal itself. But it's very warm and very natural."

Mick adds that Strat players often get on well with the Blues Driver, because the pedal tends to gently balance out the Strat's toppy sound.

"Because it's got that little bit of mid-hump, it does give you a bit of extra girth. So on the hollow position four on a Strat, turning on the Blues Driver gives you a Robert Cray-style tone, where it has lots of punch but you can still hear the guitar. Switch from the AC30 to the Marshall and you veer into Clapton territory."

"It doesn't colour the sound too much... Used with the Les Paul and the AC30, you can hear that all the natural frequencies of the guitar and amp are there, but the Blues Driver just lifts the mids a little"

"It's interesting that the AC30 is breaking up earlier than the Marshall when the Blues Driver is engaged," Daniel adds. "So we're hearing the overdrive in conjunction with the amplifier, being driven harder, whereas the Marshall is retaining it's clean headroom better than the AC30."

While the vanilla Boss Blues Driver is a great pedal in and of itself, we've picked out this Robert Keeley-modded specimen as the perfect example of what this design can be at the absolute apex of its refinement.

"It doesn't change the sound greatly," Mick observes of the Keeley-modded version. "But the noise floor is improved, among a few other things."

LIKE THIS? TRY THESE...

FREE THE TONE Red Jaspe £239

Designed by ex-Providence engineer Yuki Hayashi, the Red Jasper is a woody, organic low-gain drive with progressive features such as its Holistic Tonal Solution bypass and buffer circuit. The main attraction for us is its sweetly gritty but mellow tone, though. Not cheap.

www.freethetone.com

BOSS BD-2W Waza Craft Special Edition £129

The Japanese pedal giant joins the boutique party with its 'Waza Craft' range of up-spec'd versions of Boss favourites. In the case of this pedal, revamped 'all-analogue discrete amplifier circuitry' and fatter 'custom' voicing modes are the goodies.

https://uk.boss.info

TONE TIP

They say everything in moderation. And though that sounds like a recipe for mediocrity, in the case of pedals such as the King Of Tone overdrive, adding a bit extra without masking your instrument's character is a winning combination. If your current overdrive or distortion pedal sounds a bit generic, try turning down its gain control and raising the level to let the natural sound of your guitar shine through.

ANALOG.MAN KING OF TONE

One of the most talked-about boutique overdrives in the past decade comes under Daniel and Mick's scrutiny

The King Of Tone overdrive started life as an attempt to get away from the ubiquity of the mid-heavy Ibanez Tube Screamer sound and get back to a more detailed, organic style of overdrive that didn't obliterate the sound of the player's guitar, but still provided more sustain, gain and flexibility than a basic boost might. Daniel Steinhardt of TheGigRig explains.

"For me, this is one of the most important pedals of the past 10 years. Analog.Man has fine-tuned the idea of having an overdrive and a boost pedal in one box," he says. "It works with the sound of the guitar and doesn't alter its frequencies too much – but just sounds fantastic."

"In some ways, this is our rule-breaker," Mick chips in. "Because quite often, we say that your choice of amp and guitar is critically important in terms of matching them up with the right pedal. But the King Of Tone will work with pretty much any guitar and amp."

Daniel agrees, adding: "I've had this particular pedal on my 'board for a decade now and I've had lots of guitars. And everything else has moved around, but that works with everything, so it's a real testament to how flexible this thing is."

While it owes a few strands of its DNA to Marshall's Bluesbreaker OD, Ibanez's Tube Screamer and other effects, the King Of Tone overdrive has its own technical and tonal identity. It has seen several revisions and each of its two drive channels has an internal DIP switch that allows the player to alter its clipping characteristics between clean boost, overdrive and distortion modes.

With this in mind, it still weighs in at the lower end of the gain spectrum, generally speaking, and many rightly think of it as sitting at the ideal tonal midpoint between the natural, more transparent feel of a clean boost and the smoother, plumper sustain of a Tube Screamer.

SOUNDS

"We're going to try this pedal with the Strat first, into the AC30," Daniel says. "You can hear there's a little bit of midrange push there but what happens a lot of the time when you push the midrange is that you have to give up a lot of top end and low end frequencies. So, yes, it does push the midrange by a hair, similar to the way the Blues Driver does. But despite that, the top end is so crisp and the attack is so quick. One of the big things with overdrive pedals is what we call the transient response, which is the way the transistors work with the initial attack of the note. And the King Of Tone for me just nails it. It's such an important part of the sound.

"The King Of Tone and the Strat into the Marshall, however, sounds special, too. But if you then swap the Strat for a Tele with the Marshall, it sounds awesome," he adds, playing a little at volume to show off the size, clarity and formidable bite of the tone that this particularly ferocious combination of guitar, amp and pedal yields.

"I'm going to say something contentious," Mick adds. "If you're ever in a big venue listening to a band, that guitar sound is often made by some sort of modelling sound straight into a PA. What you've just played
is the absolute antithesis of that sound. That's the kind of sound that gets you chucked out! [laughs]"

"It's so raw," agrees Dan. "But what I love about it is that you hear the guitar. With some modelling stuff, you end up wondering, 'What are they actually using?' It takes away some of the individual character. But with this setup, all of the harmonic content from the instrument is simply amplified. It's fantastic. The Telecaster actually sounds louder than the Les Paul with this pedal, because it's less compressed, but the King Of Tone sounds good with every guitar we've got here."

LIKE THIS? TRY THESE...

THORPYFX Gunshot Overdrive £184

Military-trained engineer Adrian Thorpe has produced something really special with his Gunshot OD, which enables blending a mid-rich TS-style voice with a more amp-like, mid-scooped 'Calibre' gain stage. A rich variety of drive tones emerges from the interaction between these contrasting gain stages, ranging from nuanced boosts to rip-snorting leads. **http://thorpyfx.com**

FULLTONE Full-Drive2 FD2 MOSFET £119

This affordable dual-channel, boost-to-overdrive pedal has bags of adaptability and offers the choice of either mid-hump 'Vintage' voicing or a 'flat-mids' mode, plus MOSFET or 'normal' clipping modes.. **www.fulltone.com**

PREMIUM DRIVES

Check out this selection of classic and boutique drive stompboxes, for the keen-eared tone connoisseur

FREE THE TONE Gigs Boson GB-1V £222

This high-end, high-ticket overdrive from Yuki Hayashi's Free The Tone stable seeks to fit the 'sounds natural/does everything/has enough gain' ideal. It does so admirably, by offering a range of usable tones from slight fattening to full, singing drive. A must-audition alongside modded Tube Screamers and OCDs.

www.freethetone.com

KEELEY ELECTRONICS Luna Overdrive II £189

The main man for modding classic effects-pedal designs has his own roster of pedals – and the Luna Overdrive earned itself //Guitarist//'s coveted Gold Award. It'll do blues, no problem, but the extra edge, bite and distortion means it can cover more – it's among the best-sounding distorto-drivers we've ever heard.

www.robertkeeley.com

J ROCKETT Archer £149

The best value Klon-alike on the market. It's based on a silver Centaur owned by J Rockett co-boss Chris Van Tassel, and is the result of a collaboration with Klon designer Bill Finnegan. The collaboration faltered but the Archer remained, going on to great success. There's also the gold Archer Ikon model, using up-specced diodes

rockettpedals.com

CROWTHER Hot Cake £149

A pro favourite, this was designed to leave your guitar and amp's character largely unchanged; ladelling on drive (and presence midrange) in the desired quantities. The drive begins as a cleanish boost, goes through medium-fat and on to a squashy, harmonically packed powerhouse. Unique.

www.crowtheraudio.net

SUHR Shiba Drive Reloaded £179

The Shiba Reloaded tweaks the overdrive circuit of Suhr's lauded 2009 original for a more amplifier-like drive with a tighter lower end character, and the small matter of 50 per cent more gain on tap. The result is one of the most naturally playable overdrives around, with a choice of 'smoothness' settings.

www.suhr.com

DURHAM ELECTRONICS Durham Electronics £219

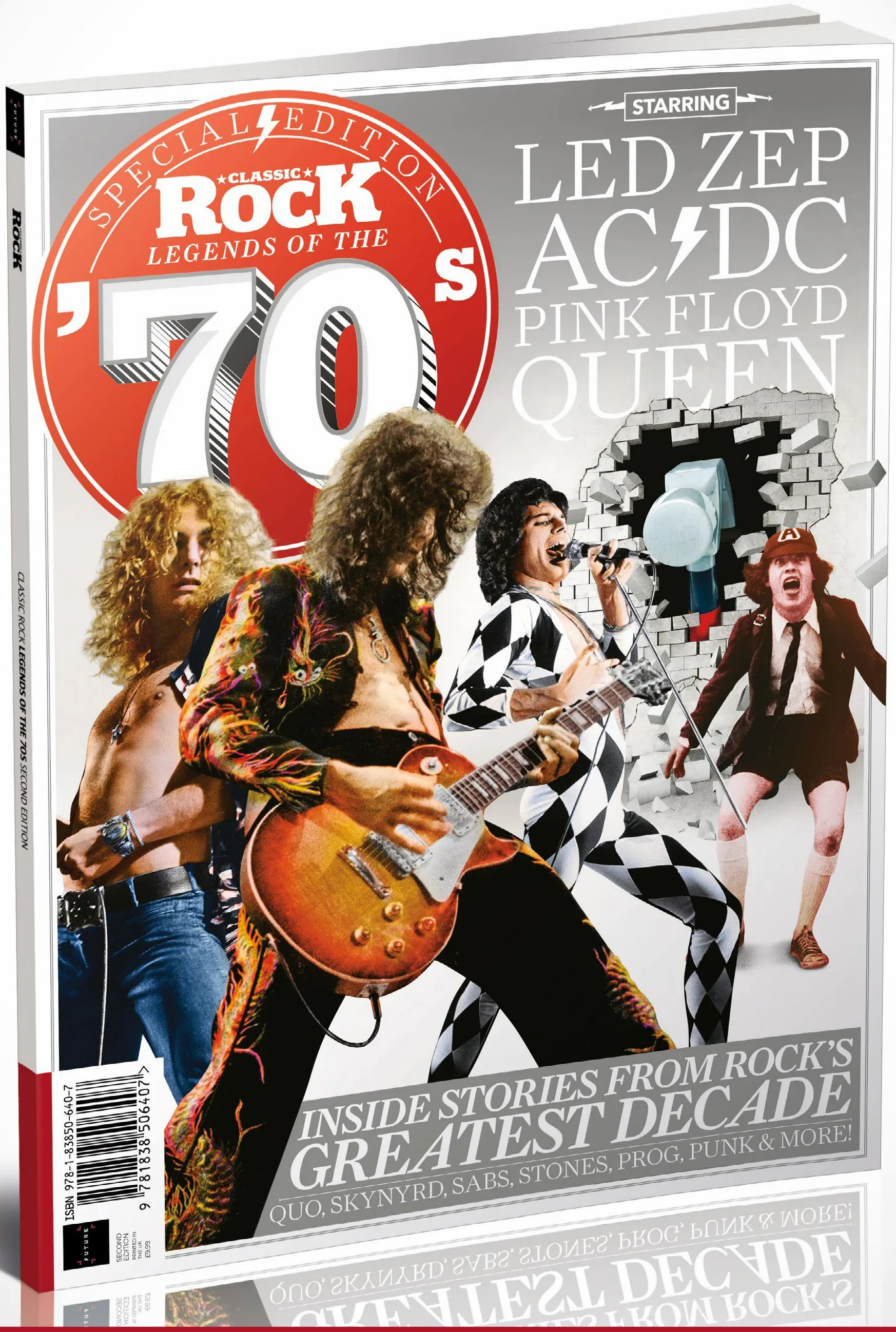
Raunchy! Designed for Charlie Sexton, guitarman for Bowie and Dylan, this racy-sounding clean booster offers blooming bass and plenty of presence, with three compression settings. If you want to preserve the sound of your amplifier's natural drive, then start your quest here; it also comes in compact form.

www.durhamelectronics.com

→ 96 INPUT

THE MIND-BLOWING STORY OF ROCK'S GREATEST DECADE

From Queen and Pink Floyd to Aerosmith and Bowie, uncover the magic and madness of rock's defining decade. Packed with the best features from Classic Rock magazine, this is the ultimate celebration of the Seventies



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TONE TIP

British amps such as Marshall JCM800s or Vox AC30s often have a strong midrange, while the spankier American amps of Fender, with their sparkling highs and glassy bottom end, can benefit from a bit midrange help. Understanding the core tonal balance of your amp is key to selecting the right overdrive pedal to achieve a balanced overall tone. Indeed, if balance is what you want to achieve, of course...

IBANEZ TS808 TUBE SCREAMER

Daniel and Mick reveal how to get the best from the daddy of all mid-frequency boosting overdrives, the Ibanez Tube Screamer

What hasn't been said about this emerald jewel of the pedalboard over the years? Launched around 1980, the original TS808 Tube Screamer had a small, square-ish footswitch, solid black knobs and a slightly narrower enclosure than the more common TS9 that followed in 1981 and a slew of later variants, each of which has – many would argue – a tangibly different tonal character from the original 808.

In terms of electronics, the JRC4558D dual-chip op-amp is famously synonymous with the early TS808's sound, although other op amps were also used freely throughout the TS family of drives, while small differences in the spec of resistor components also do their bit to separate the various versions of the Tube Screamer from one another. No matter the spec, the raison d'etre of all TS tone is the same, however, as Mick and Daniel explain.

"This is my favourite overdrive pedal of all time," Mick confesses, "because Stevie Ray Vaughan used one," he says, laughing. "And of course, he typically played a Fender Stratocaster, into Fender amps. And, basically, the Tube Screamer put back all of the midrange that was naturally missing from that combination."

Anyone tempted to play the TS snobbery card should note, however, that according to effects expert and archivist Dave Hunter, photographic evidence indicates that Stevie Ray Vaughan used TS808, TS9 and the less-fancied TS10 variants over the years, suggesting that he either thought there wasn't much to choose between them or that they were getting progressively better.

SOUNDS

"Fender amplifiers represent the classic American sound," Daniel says, indicating the reissue '65 Fender Deluxe Reverb with a Jensen driver with "sizzling highs" that we have on hand for testing purposes. Mick, meanwhile, has picked up a John Mayer signature Strat from a few years back and begins testing it out.

"Without the Tube Screamer, that's a very 'scooped' sound," says Daniel. "You've got a warm bottom end, and a very crisp top end. But when you hit that with the Tube Screamer you suddenly get the midrange back... and there it is! When you play the Marshall JTM45 on its own, you can hear that it already has lots of midrange present. So if you add the Tube Screamer to it, it sounds awesome, but now the midrange is really pushed [forward in the mix]."

"So that's why the Tube Screamer works so well with those American-voiced amplifiers," Daniel continues. "Where there's naturally a bit of a mid-scoop, the midrange push of the Tube Screamer just evens it out."

Switching to the humbucker-equipped '58 reissue Les Paul alters the balance of things once again, as Daniel demonstrates.

"The Les Paul already has a lot more midrange than a Strat," he says. "Even though this one has low-wind pickups that don't have that crazy mid-push that a lot of Les Pauls do."

Mick is impressed.

"That sounds blooming great!" he says of the commanding, girthy tone that now emerges from the Fender combo with the Les Paul and Tube Screamer.

"We've got it set up as a lot of people like to set Tube Screamers," Mick adds, "With the level high and the overdrive knob low. So it gives you a bit of a boost-y thing."

Daniel agrees, and adds: "With the Tube Screamer, when you start pushing the overdrive control up it can get a little bit unruly, shall we say. As soon as you turn it above noon, you're just compressing the tone more. The sound everyone knows and loves is really achieved with the overdrive knob just shy of 12 o'clock."

LIKE THIS? TRY THESE...

IBANEZ TS808 Tube Screamer reissue £185

With used prices for original units soaring, Ibanez eventually succumbed to the inevitable and reissued the original 808 with JRC4558 chip. Arguably the warmest Tube Screamer in the family, the reissued Ibanez 808 is not cheap, but comes straight from the horse's mouth. **www.ibanez.com**

MAXON OD-9 Pro+ £149

Maxon was the electronics company Ibanez chose to develop its effects in the early 80s. Maxon now offers the OD-9 Pro+, and argues it's an improvement, offering subtler compression and more headroom thanks to the option to run it at a higher internal operating voltage of 18 volts. **www.maxonfx.com**

TONE TIP

We often say that guitarists buy with their eyes, but it's also true that we buy by reputation. The Klon Centaur is worthy of high praise for its performance, and is without question a milestone design. But there are a lot of pedals out there that do a very similar job at a fraction of the price. So let your ears be your guide: learning to be analytical but unprejudiced about effects will help you find great sounds at all price points.

KLON CENTAUR

Daniel Steinhardt and Mick Taylor enter the realm of legend with the fabled Centaur...

It's the most hyped overdrive pedal of all time – so what's so special about this rather plain-looking stompbox that's been cloned and coveted more than any other boutique drive? Although it's often spoken of as the ultimate 'transparent' overdrive, it actually has something of a mid-hump like the Ibanez Tube Screamer, although its classic role is to be used at low-gain settings like a clean boost, to drive your amp's natural voice a little harder.

Designed by Bill Finnegan in 1994, it has several neat features that contribute to its reputation as the all-time heavyweight of low-gain overdrives, including elevated internal voltage that allows for extra headroom and clarity, and a gain control that cleverly adjusts the EQ profile as gain is increased, to consistently ensure the optimum tonal range for the level of dirt being applied.

"When this came out, it was immediately picked up by a lot of well-known artists," Daniel Steinhardt observes. Mick adds that John Mayer, Joe Bonamassa, David Grissom, Warren Haynes and Philip Sayce are just a few of the notable players who have favoured it.

"So, what is it about the Klon?" Daniel asks. "Well, it's really interesting how much of the guitar is still present in its sound. It doesn't sound like a pedal."

SOUNDS

To illustrate the point, Daniel and Mick pair the Klon with the Fender Deluxe Reverb reissue that's on hand. To start off with, they set the Klon up to work as a classic overdrive, with the gain relatively high.

"It's still got that mid-boost thing," Mick observes, as we take in its chunky but extremely well-defined voice through the Fender. Daniel then switches over to the Ibanez TS808 Tube Screamer, the classic mid-boost pedal, to compare the amount of mid push that each pedal generates. "The Klon is clearer sounding," he notes.

Switching to the Klon with the Marshall, Daniel says: "What the Klon does is, it has that quick transient response: it grabs the note very fast so you can hear more of the attack, but is voiced very similarly to the Tube Screamer."

"Everyone says that you can hear more of your guitar with the Klon," Mick reflects. "And I think that's probably true," he continues, switching to the Gibson ES-335 with the Klon, going into the Marshall. The pair compare the Klon and the Tube Screamer with this setup again.

"Can you hear that the Tube Screamer is a bit softer?" Daniel asks. "That is why people love the Klon – it just helps with that attack a little bit. We're using it right now as an overdrive, but the other thing about the Klon is, people use it more commonly as a boost. So let's turn the gain down."

Turning down the Klon's gain yields a tone that is chunkier and edgier than the Marshall's straight clean tone, but still clear and well-defined. But that's not the only useful purpose for a boost-configured Klon. Next, Daniel combines it with a BK Butler Tube Driver, with the Klon first in line and the Tube Driver second, to produce an ultra-punchy, far-carrying lead tone that recalls the sound of David Gilmour.

So, used singly or stacked, the Klon's clarity, natural feel and flattering mid-push make it a more subtle tool than the Tube Screamer. But is it worthy of all the hype?

Well, you'll have to try one yourself to decide. Certainly, its creator would prefer that it's judged on its own merits: frustrated with the 'cult of Klon' that has seen prices for used original Centaurs soar above £1,000, Bill Finnegan produced a cheaper, offshore-built version, the Klon KTR, in 2012, that was actually emblazoned, at his behest, with the words: 'Kindly remember the ridiculous hype that offends so many was not of my making.'

LIKE THIS? TRY THESE...

LOVEPEDAL Kalamazoo £150

The circuitry is different, but boy, can the Kalamazoo sound a lot like a Klon! The kind of drive that boosts and accentuates the sound of your guitar, rather than swamping it, there's bags of clarity and punch on offer here and a useful four-pot control layout.

www.lovepedal.com

ELECTRO-HARMONIX Soul Food £40

If you don't fancy paying over a grand for a real Klon, Electro-Harmonix's Klon Centaur-inspired Soul Food is ludicrous value for money. No, it's not double-take identical, but it does a nice job of providing the kind of flattering, clear boost that made the big K so hyped.

www.ehx.com

TONE TIP

If you've used a well-known drive pedal from a mainstream manufacturer for years and like its basic sound, but find yourself wanting a certain 'something' extra, do some research into boutique pedals that are inspired by the same design. You may well find that others have identified that pedal's weaker points and have designed pedals that offer a tweaked alternative, opening the door to total tonal satisfaction.

LOVEPEDAL ETERNITY DRIVE

A meticulous makeover of the Tube Screamer concept has turned this mid-rich overdrive into a classic, as Daniel Steinhardt and Mick Taylor discover

One of the great things about so-called boutique effects makers is the way that talented independent designers can take a well-known mass-production pedal as a starting point, then refine the concept until they have something that's a classic in its own right. Such is Lovepedal's Eternity Drive.

Designed in Michigan by Sean Michael, it's a medium-gain overdrive with pronounced mids, in the style of the Tube Screamer, but with some added benefits. Daniel Steinhardt of TheGigRig explains:

"This is a very important pedal, one of the first pedals to explode onto the forum scene," Daniel says. "It was one of the first boutique drives that was really embraced and became a staple for a lot of people. This one here is one of the first series, which was handwired by Sean himself.

"The thing about Sean is that he's got an amazing set of ears and he's a killer guitar player," Daniel adds. "So he tweaked and tweaked this until he got it right, then sent it out to a few people and they got back and said, 'This is the pedal I've been searching for my whole life.'"

SOUNDS

"If we listen to the Tube Screamer first into the Fender Deluxe," Daniel continues, "then compare it to the Eternity Drive, you can hear it has a little more harmonic content and a little more bottom end than the TS808."

Picking up the theme, Mick adds that the Eternity Drive has qualities that many players found lacking in a stock Tube Screamer, notably bottom-end grunt. "A lot of people on the forums got them, looking for that sound from Fender amplifiers [in which the overdrive pedal replaces the 'missing mids']. I've been using this with Voxes and a whole bunch of different things and it does have that clear midrange push. But if you're doing a solo, it's just fantastic."

To illustrate the point, Mick takes up his Eb-tuned John Mayer Stratocaster and plays the Eternity through the Marshall JTM45 this time, producing a smooth but punchy drive that is harmonically detailed and sweet as a nut.

"That's killer," comments Daniel. "Very natural compression, harmonic content... all of the things that you want from the Tube Screamer. But with just a little bit more love there, especially in the bottom end. And it stacks really well with other pedals, too."

While there are many versions of the Eternity to date, such as the Roadhouse, E6 and Burst, Daniel recommends the Kanji variant as a good starting point for those new to the series.

"This is a very important pedal, one of the first pedals to explode onto the forum scene. It was one of the first boutique drives that was really embraced and became a staple for a lot of people"

LIKE THIS? TRY THESE...

PROVIDENCE Red Rock OD-1 overdrive £216

Want a bit more bottom end from your TS? Need to fatten up spindly single-coils? Try the Red Rock, from Japanese maker Providence. The company says it's optimised to give extra body to the sound of single coils, but we've found it works great with humbuckers as well. It has elevated internal voltage for extra clarity, while the buffered boost circuit at the input helps you fine-tune the way the pedal interacts with your amp's preamp stage, making it easy to dial in chunky drive with any rig. Smooth and creamy, it'll yield Larry Carlton-style Room 335 tones all day. **www.providence-ltd.com**

EARTHQUAKER DEVICES Palisades £229

It said it would never make one, but having caved in and released a Tube Screamer-inspired pedal in 2014, the quirky Ohio maker has pulled out all the stops with the Palisades, which offers several extra layers of tweakability over a stock TS, including a choice of several different voicings from classic 808-style drive to harmonically rich MOSFET and Schottky diode clipping for a fuzz-like tone. The Palisades also has two channels – a lower-gain channel with a wider range of dirt and a higher-gain channel with a more focused range. Is it the most flexible TS-style pedal ever? Try it and decide yourself. **earthquakerdevices.com**

18+

WHAT IS AVAXHOME?

AVAXHOME-

the biggest Internet portal, providing you various content: brand new books, trending movies, fresh magazines, hot games, recent software, latest music releases.

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B. K. Butler

BUTLER AUDIO TUBE DRIVER

It's the choice of legends from Floyd to ZZ Top, and it gets phenomenal punch from a single valve, as Daniel Steinhardt and Mick Taylor discover

David Gilmour, Eric Johnson, Billy Gibbons. No slouches, tone-wise, and all united in their use of the Butler Audio Tube Driver pedal, which stands alone among our selection here in having a single 12AX7 valve at the heart of its drive tone, a component more commonly found in the preamp of the average valve amp. The pedal is also unusual in having been engineered by BK Butler, who also designs high-end home and car stereos.

"It's a very well-known, very dynamic sounding overdrive pedal that reacts like the preamp of a valve amp," Daniel Steinhardt comments. "But it also has quite a tightly defined, even sharp, voice – which is why it helps with cutting through in solos, and which is why it appeals to players such as Eric Johnson."

SOUNDS

"Into the Marshall with the EQ flat, it sounds quite natural," Daniel observes, as Mick summons a tight, biting but sustaining lead tone from it that's balanced out nicely by the Marshall's ample bottom end. Activating a Klon in front of it adds a bit more compression and thickness, but, thanks to the Tube Driver's hard-edged voice, definition is retained. No matter which way the Tube Driver is used, however, it's clear it has considerably more teeth than most of the other pedals here, with that very valve-like ability to slice through where transistors might squash and soften tone.

The stock four-knob Tube Driver is handmade by BK Butler, who quotes a build time of a few days and signs each unit. Some added flexibility is also possible with his modded version, which features a fifth control for variable bias – and BK Butler says this more complex version has been taken up by many of his best-known clients. The mod costs extra, but it does unlock a greater range of gain from the pedal's single valve. British users should also note that although a 220 to 240-volt version is available for no extra charge, all Tube Drivers are shipped with US plugs fitted, requiring an adaptor to be used.

"It's a very well-known, very dynamic sounding pedal that reacts like the preamp of a valve amp. But it also has quite a tightly defined, even sharp voice – which is why it helps with cutting through in solos"

LIKE THIS? TRY THESE...

VOX Straight Six Overdrive £129

There aren't too many drive pedals that feature real valves inside, partly due to the problems of generating sufficient plate voltage in a stompbox for it to sound good. However, Vox's Tone Garage series is a notable exception. We like the company's dynamic, detailed Straight Six overdrive that houses a single 12AX7 valve and offers a bright voicing switch for cutting, Tube Driver-style lead tones. They can be snapped up for very decent street prices at the moment, too. It'll even work off six AA batteries!

www.voxamps.co.uk

BLACKSTAR HT-Drive £129

Blackstar blazed a trail with a range of valve-driven effects in slightly oversized enclosures, which operate at high internal voltages for maximum valve performance. With cascading gain stages, thanks to utilising both sides of the dual triode 12AX7 valve, the HT-Drive also sports a speaker-emulated output for convenient home studio use.

www.blackstaramps.com

TONE TIP

The Tube Driver is just one example of a drive pedal that works well in combination with other overdrives. So what's the best order to arrange your overdrive pedals in? Daniel argues that: "I've tried it every way and I keep coming back to this: lower-gain pedals first, cascading up to the higher-gain pedals. Why? Well, if you take a really high-gain overdrive pedal and put a low-gain overdrive after it, you've got this huge amount of gain and nastiness with the first pedal, but that gets tamed down by the natural compression in the low-gain pedal. However, if I swap that around and take that little bit of clipping and warmness from the low-gain overdrive pedal and then I push it into the high-gain pedal, it embellishes and enlarges the harmonics and the compression that I've already got going with the low-gain pedal."

TONE TIP

Just as a Tube Screamer helps replace weak mids in US-voiced amps, there's a role for pedals that gently shelve off certain frequencies that your amp might have too much of. Marshall amps, used with closed-back cabinets, have a lot of bottom end – and while that might feel empowering, it's not always useful to have a lot of pillowy bass in your sound. Distortion pedals that trim bass can be useful in making your tone more lean and penetrating – mids are a guitarist's best friend, after all.

PRO CO RAT

Daniel Steinhardt and Mick Taylor enter the dark sewers of high-gain drive tone to confront the infamous RAT and find out how to make it squeal

Bratty, over-the-top, with a narrow sweet spot, the RAT is definitely the wild child of the pedals we've assembled here. Designed by Pro Co's Scott Burnham, the RAT uses a duo of silicon diodes to bring the hurt, making it far less sensitive to placement at the front the signal chain than, say, the germanium diodes of the MXR Distortion+ that inspired it.

Due to quirks in the resistor spec, the RAT has huge amounts of gain on tap, with the LM308N op-amp pushed into clipping itself when the pedal's gain control is dimed. That hasn't stopped subtle, intelligent players such as jazz giant John Scofield from favouring the RAT, which was originally made between 1979 to 1987. Part of its flexibility results from its powerful treble-tweaking EQ that lends it a more treble and mid-voiced character.

"It's a high-gain overdrive bordering on fuzz-y," Daniel Steinhardt explains. "But the pedal's filter control was new at the time. So let's switch between the OCD and the RAT and you'll hear what I mean with the filter control."

"That's why some people equate the RAT with being the 'Tube Screamer' of distortions: it has that really pronounced midrange and shelves off those bottom-end frequencies"

SOUNDS

"Immediately, you'll notice that the bottom end is not as full as the other ones," Daniel comments after a few moments of thrashy, trashy sonic assault through the Marshall JTM45. Switching to the AC30 reveals an even more aggressive, mid-led edge.

"That's why some people equate the RAT with being the 'Tube Screamer' of distortions," he adds. "It has that really pronounced midrange and shelves off those bottom-end frequencies. When you want to be heard and you don't want all that bottom end, the RAT is a great choice."

Mick adds that: "It partners better with a Marshall-type amp than it does with a Fender type amp, right?" Daniel agrees, reflecting once again the value of a balanced pairing of an amp with abundant, possibly overwhelming bottom end with a distortion pedal that cuts through and trims off a little low-end flab from your tone. Although both of our experts are keen to stress, as always, that there are no absolute rules – only preferences and choices.

Despite the relatively short production span of the original RAT, a later, revived production phase in the 90s has led to the current RAT 2 incarnation, with slightly different voicing due in part to the inclusion of an LED indicator to show when the pedal is switched on. The original version had no LED indicator light, like many 70s-era effects, a 'non-feature' that was repeated on the reissue-format 'Vintage RAT' for the sake of authenticity.

LIKE THIS? TRY THESE...

PRO CO DeuceTone RAT £229

Is too much gain never enough for you? Time to try this two-RATS-in-one, twin-channel unit from Pro Co, which has some fairly out-there capabilities, including the option to cascade one RAT into another to create a veritable maelstrom of distortion. Featuring an all-analogue signal path, it'll also let you select between the Vintage and later Turbo RAT voicings, plus two newer guises: the Clean and Dirty RAT. You can chop and change how these voicings are used across the two channels, and the whole glorious mess is contained in a bomb-proof steel enclosure – making this the ultimate rodents' nest. In case all that isn't lurid enough, the graphics glow in the dark!

www.procosound.com

MOOER Black Secret Distortion £42

Though geared more towards slavish imitation rather than sonic innovation, a small army of micro-enclosure Mooer pedals has found its way onto players' pedalboards in recent times. Mooer's closest equivalent to the RAT, the Black Secret, has a crisp trebly edge, riding atop fountains of gushing gain. The pedal's two voicing modes (Vintage and the off-the-wall Turbo) and Filter EQ control leave little doubt as to whose homework Mooer has been peeking at in class. Still, it's small, solidly built for the price point, and cheap as chips.

http://mooeraudio.com

TONE TIP

A lot of people are confused about the difference between overdrive and distortion and how to apply them. "The main difference is harmonic content," says Daniel Steinhardt. "If you look at an overdrive pedal, it produces a lot of even-order harmonics, and consequently sounds very warm and lovely. Distortion pedals, by contrast, give you even-order harmonics, but also some more 'odd-order' harmonics in there as well and it just sounds angrier. The way that the top of the waveform is cut off, or 'clipped', is a lot sharper. "It sounds a lot more aggressive. It's still the same concept, though, but just more and angrier."

→ 108 INPUT

BOSS DS-1 DISTORTION

Daniel Steinhardt and Mick Taylor get nasty with the original distortion pedal to find out why this familiar orange brick is still a benchmark

The orange case of the Boss DS-1 is probably the most recognisable in all pedal-dom, thanks not only to the ubiquity of Boss compact pedals in the 1980s, but also because it was, and is, a favourite of some landmark hard-rock players, such as Steve Vai and Joe Satriani, who you might imagine would turn to more boutique offerings. However, the DS-1's combination of ample bottom end and aggressive mids have made it a classic match with high-gain heads and closed-back cabinets, which together send jagged chunks of sonic masonry flying.

"Imagine – it's 1980 and there's some hair-metal tune on the radio and everywhere, there are guys in their bedrooms saying, 'How do I get that [shred] sound?" Daniel Steinhardt says. "So Boss brought out the DS-1, which is a very angry-sounding distortion pedal."

The DS-1 was launched in 1978, and its characteristic hard-edged clipping is generated by a diode-based gain circuit. The op-amp fitted was originally a Toshiba TA136AP unit but this changed to Rohm, Mitsubishi and New Japan Radio alternatives in later production versions. Although its classic orange styling looks unchanged at first glance, there have been a few small revisions over the years, for example in the placement of the DS-1 model name relative to the word 'Distortion' emblazoned above it.

SOUNDS

Our experts start off with the AC30 and the '58 Les Paul reissue – the mid-rich Vox and Marshall being most suited to handling hard-rock distortion tones among our three test amplifiers. After a few joyful minutes of not-entirely-grown-up riffage, Mick observes: "I've just got to say this: that's the best-sounding DS-1 I have ever heard!" Daniel concurs and adds: "This particular DS-1 belongs to Dave Gregory [formerly guitarist with XTC and now Tin Spirits] and he bought it in the 80s, and used it on most of the XTC stuff with pedals then. It's a corking-sounding distortion pedal."

"Every one I've heard since then sounds thinner," Mick muses, and Dan adds that the newer ones do seem to be voiced subtly differently. "The thing with the DS-1," Daniel says, "Is that it has a lot of bottom end. Imagine again that you're that young kid and you plug this into your little amp at home and it sounds huge. But if you then plug it into something like the Marshall JTM45," he trails off... Loud, malevolent gain tones thick with pinched harmonic squeals follow. "It's a big, fat, angry sound," Daniel concludes and Mick agrees, adding: "If you were playing an 80s hair-metal guitar like an Ibanez or a Jackson or something like that, a lot of that midrange would be scooped out even more, especially if you had some crazy 'idiotbucker' in the bridge position," he jokes.

"It's very aggressive-sounding," Dan comments. "And that is with the distortion actually set quite low, but the level high."

"Imagine – it's 1980 and there's some hair-metal tune on the radio and everywhere, there are guys in their bedrooms saying, 'How do I get that [shred] sound?'"

LIKE THIS? TRY THESE...

BOSS DS-1X £109

If you like the DS-1, you should definitely give this next-generation update a try, as it's a really interesting proposition. The big new feature is its Multi-Dimensional Processing, which translates in real-world terms as a precise, ultra-detailed tone that seems to occupy a wider space in the stereo image. Crisper, hotter and more expansive-sounding than its older brother, trialled back-to-back, it makes the original DS-1 seem flat and lacking in sparkle, though its voice is very modern so it's not one for retro-heads, who may prefer Robert Keeley-modded versions of the original if they're craving more bottom end than stock units.

http://uk.boss.info

FREE THE TONE Heat Blaster £345

A distortion pedal for people who don't like distortion pedals, the Heat Blaster uses a JRC072D op-amp here, in conjunction with red LEDs for the clipping (most pedals use diodes) that grant a little more headroom and less squidgy compression than found in many distortion pedals, cutting down on fizz and maximising texture and character. The useful low and high cut controls will also help you find an ideal balance with your amp. It's the polar opposite of the template set by the DS-1 in some ways, and some will prefer it for that very reason.

www.freethetone.com

GAIN
BASS
MIDDLE
TREBLE
LEVEL
Marshall
The Guv'nor

MARSHALL THE GUV'NOR

Big Jim Marshall left his mark on more than just an iconic series of amps. In its Guv'nor from the 90s, Marshall turned in a very cool distortion pedal

Though they stand in the long shadow of Marshall's towering stacks, the Milton Keynes company's drive effects are by no means poor relations, though many of its pedals took the voicing of its heavy-hitting amps as an inspiration. Many players who took up the guitar in the 1990s will undoubtedly feel a wave of misty-eyed nostalgia, then, as they gaze upon the no-frills black metal enclosure and distinctive wedge shape of the Guv'nor high-gain overdrive, which has made its way to us here thanks to an extraordinarily kind and prompt loaner from one of Daniel Steinhardt's regular customers.

Released along with the low-gain Blues Breaker and middleweight Drive Master in the early 90s, the Guv'nor was almost the hottest of the bunch (the aptly named Shred Master had even more beans) and was, in its way, quite progressive as a piece of 90s pedal design – and has since proven to be a major inspiration to latter-day effects makers.

"There are lots of really great distortion pedals that owe their existence to this thing," Daniel Steinhardt comments.

"I remember reading Guitarist back in the day and seeing ads for that pedal, and just wanting it so bad," Mick adds, speaking for lots of players out there.

SOUNDS

"The Guv'nor was a unique circuit," Daniel resumes. "Back in the day, this was Marshall broadening its horizons, and as well as quite a special circuit, it also has this three-band EQ instead of a single tone control, so the Guv'nor was something you could dial in to suit pretty much any amplifier. So let's have a listen to it with the Les Paul into the Marshall JTM45." Predictably, Marshall into Marshall yields a tidal wave of commanding, bass-heavy drive, although the amp itself is set up to run quite clean.

"That is fat," Mick comments, admiringly. "It's huge, isn't it?" adds Daniel. Running it, next, into the AC30 trades a little low-end mumbo for smooth-but-searing lower mids. But the overall impression here is one of bottomless power and a smooth but well-defined voicing.

"Interestingly enough, the Guv'nor is a little bit softer than some distortions on the attack," Daniel says. "It's not harsh. But it works brilliantly into an amplifier that's quite open. Now, that pedal into an amplifier that's dimed, is a little bit too compressed. But with a lovely big clean sound on the amp, it's fantastic. Because it simulates natural amp compression – it's great. But although this is less aggressive than some of the pedals here, it still has all the high-gain range."

LIKE THIS? TRY THESE...

EMPRESS EFFECTS Heavy £259

Like tweakable distortion? This Empress Effects unit does what it says on the tin, with gusto. It's a dual-channel design with oodles of gain on tap, plus a Guv'nor-like three-band EQ for sculpting the living rock of your high-gain tone. There's also a noise gate to keep unwanted noise to a minimum, while the pedal has a relatively small footprint on your 'board for a twin-channel design.

http://empresseffects.com

WAMPLER Triple Wreck £239

American tones more your kind of thing? Take a look at Wampler's Triple Rec, whose name hints at the hard-edged US metal-amp lineage it was inspired by. Like the Empress Heavy, it has a three-band EQ to give definition to the abundant gain on tap and help you match it with the tone of your amp, vintage and modern voicings, and a boost switch to step up the aggression on demand.

http://wamplerpedals.com

TONE TIP

The fact this pedal works so well with a clean base tone set up on the amp nods to an emerging trend in amp design: towards amps that are designed to provide plenty of headroom and act as a blank canvas for effects. Fender's uprated Mike Landau Hot Rod DeVille ML or Victory's V40 head are good examples – if you're a player that uses a lot of pedals and like the way they gel together with the base tone of warm-but-powerful, open-sounding amps, then consider whether your current amp has enough shunt to work in even partnership with effects such as the Guv'nor. Generally speaking, the lower the output, the more of the amp's own clipping and compression you'll hear when you push it with a drive pedal. If you want to hear the voice of the pedal with extra clarity and projection, however, try an amp that's voiced to support effects, and which has plenty of headroom.

TONE TIP

Drive pedals that are designed to have amp-like performance form perhaps the most interesting and progressive class of drive effects available today. Although it must be said that the idea of making a solid-state effect that's designed to sound like a valve amp, when it's probably going to be plugged into a valve amp anyway, is just a little strange. Wampler (see below), Tech21 and a host of coat-tailing clones have all found useful inspiration for little boxes in bigger ones, however. We'd stick our necks out and say that pedals that copy the bright, rich chime of Vox amps are often the most successful, offering the chance to add pep, lively upper mids and a bit of harmonic detail to duller amps.

FULLTONE OCD OVERDRIVE

Daniel Steinhardt and Mick Taylor get obsessive about what's arguably the most flexible and usable distortion pedal that there's ever been

Los Angeles-based effects maker Mike Fuller is very much a maverick genius of the effects world. When he's not racing vintage Ford Mustang sports cars, he's under the bonnet of a new effects pedal, tweaking, refining, innovating and generally sculpting great sounds. Though it's hard to pick a single 'winner' from among his many successful drive pedals – which are often lateral-thinking evolutions of classic designs – the pedal that you'll see owned (and cloned) the most is his excellent OCD. Somewhere between a hottish overdrive and an all-out distortion, some of the complex, chimey graduation into drive that's found in smaller British amps such as the Vox AC15 also forms part of its crisp but pliant tonal character.

"This is another distortion pedal that the internet blew up about, when it came out," Daniel says. "It's a fantastic-sounding thing. If you imagine when Boss was making the DS-1 they were making it to a price-point; by comparison, what Fulltone did was they simply started making their stuff with the best-quality components they could."

> *"This is another distortion pedal that the internet blew up about, when it came out. It's a fantastic-sounding thing... What Fulltone did was they simply started making their stuff with the best-quality components"*

The OCD, Fuller says, was something he designed for himself that he reckoned would prove popular with other players, and so it has. A front-mounted switch allows users to either select the more transparent, boost-like drive tones of the pedal's Low Peak mode or toppier, louder performance when High Peak mode is selected. The pedal's tone control, meanwhile, rolls off high end without affecting bass frequencies. Its excellent dynamics and detailed articulation also make it one of the most amp-like of drive pedals. "Let's compare the OCD to the DS-1 into the AC30," Daniel proposes. An excellent idea...

SOUNDS

A short but intense period of high-gain play follows, as Mick and Daniel evaluate the OCD's performance. "Again, the OCD is very 'angry' but there's more midrange in there than with the DS-1, it's more even," Daniel argues. Mick, meanwhile, wonders if the OCD has more midrange than the DS-1, or simply less bass. He takes up Daniel's Fender Custom Shop Telecaster to investigate the theory.

"I think a Strat's gonna sound too thin with any of these distortion pedals," he says. "I think we need to go with a DS-1 and the Tele bridge pickup into the Marshall first," he proposes, before launching into some exploratory riffing with that combination. Switching to the OCD directly afterwards for comparison reveals some more points of difference. Daniel notes the OCD is "definitely tighter in the bottom end, and also that midrange is more pronounced".

"Certainly with this guitar [the Tele], it brings more of the aggression that I would associate with a distortion pedal," Mick says. Daniel adds that the tone control range on the OCD is quite broad, "because most of the time, people are playing these with humbuckers. Those are more compressed than single coils, so Fulltone has made sure that there's an amount of tonal range in there so it still sounds nice and edgy used with a humbucker."

LIKE THIS? TRY THESE...

WAMPLER Thirty Something £255

Wampler seems to have a great handle on getting amp-like performance from stompboxes and it's created a number of excellent pedals that take classic amps as their inspiration. The Thirty Something, also produced as the Ace Thirty, is intended to mimic the chiming British gain tones of the Vox AC15 and AC30 combos, with a Headroom switch to toggle between two styles of breakup inspired by those amps. Internal gain trim pots allow you to optimise it for either single-coil pickups or hotter humbuckers, without losing the chimey charm Wampler was shooting for.

http://wamplerpedals.com

TECH21 SansAmp Character series Liverpool V2 £154

Eagles' legend Joe Walsh is a big fan of this SansAmp take on the Vox sound, enthusing in issue 356 of Guitarist that: "The key knob is Character, and when you move that, it'll go from a Vox Beatle sound to the other extreme, where it sounds like a Plexi. This is a secret I shouldn't be telling you, but it's the best pedal I've ever come across," he told us.

www.tech21nyc.com

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INPUT

MAXIMUM OVERDRIVE

From volcanic lead tones to organic, expressive crunch, every guitarist needs a touch of overdrive from time to time. But how do you make sure your drive tone is warm as honey and twice as sweet – not tizzy as a bee imprisoned in a tin? We consulted three acknowledged experts on the subject of great overdriven tone to hear their seasoned advice on dishing the dirt...

Words: Jamie Dickson **Photography:** Neil Godwin

If you want to really get inside the soul of a guitarist, start talking to them about how they like their drive tones. Some players want crystalline projection and clarity, others a swampy mudslide of saturated fuzz. Every player's sweet spot is different when it comes to gain and, to make things more interesting, that perfect lead tone is the sum of several tonal influences – with pedals, amp and the player themselves at the heart of the equation. Marshalling all those elements to produce the tone you want, every time, no matter the venue or musical task to hand, is a tough job. And, as in all things, knowledge is power. In the following pages, we call on the combined knowledge of three of the wisest heads in the drive tone business (see Meet The Experts box). They give their seasoned tips on how to make your gain tones more nuanced and expressive than ever – and dodge some common pitfalls that can spoil the gig. G

MEET THE EXPERTS

Daniel Steinhardt

The founder of TheGigRig has built pro-spec pedalboards for everyone from Steve Vai to Ed O'Brien of Radiohead. He's also the hugely popular co-host of That Pedal Show, along with former Guitarist Editor Mick Taylor. He's forgotten more about getting great gain tones than most of us will ever know and his advice always has a focus on gig-ready practicality.

Brian Wampler

He's the founder of the eponymous Wampler effects company, responsible for some of the finest overdrive tones going. From his soaring Ecstasy overdrive to the Vox-inspired ThirtySomething pedal, Brian has a superb ear for great lead tones and a no-nonsense approach to debunking myths and wiping away snake-oil from the subject of getting great lead sounds happening.

Adrian Thorpe

A rising star of the British effects scene, Adrian's exacting approach to pedal design comes from his years in the Army as an explosives expert. He shares his rigorous, logical approach to sculpting superb drive tones with us here – wisdom that has made the overdrives made by his own company, Thorpy FX, some of the most sought-after in the world right now.

Q I can dial in my drive pedals and amp to sound perfect together at home. But at rehearsals or gigs it all sounds wrong again. What's going on?

A "You need to EQ your amp and your rig to that particular environment," Adrian Thorpe of Thorpy FX explains. "Typically, if you're running louder – usually the case at rehearsals or gigs – you'll need to lower your treble and upper mids as well, just to make sure your tone is not a scythe that cuts through the audience. Treble and mids can get harsh at higher volumes, which is to do with Fletcher-Munson curves and how your ear perceives certain frequencies at certain decibel levels. At higher volumes, your speaker is in its optimum zone as well: it is just pumping out the decibels and working at its most efficient, so it's able to beam sound outwards very effectively.

"So if you're running an amplifier really, really loud, firstly I would suggest you get someone in the band to go and stand where the punters are going to stand while you do a soundcheck. If you don't get your EQ right at proper gig volume, with someone you trust standing where the audience will stand to help you dial it in, all that top end is going to cut the audience's heads off."

"At higher volumes, your speaker is in its optimum zone, pumping out the decibels, working at its most efficient and beaming sound outwards very effectively"

Q Is it important to settle on what type of amp you like first, before building a pedalboard?

A "Absolutely," says Daniel Steinhardt, "because that's the one thing that's likely to be a constant in your rig – even the guitar is likely to change more often than the amp. So, first, you need to find an amplifier with a clean sound that you connect with – and I mean at proper volume levels. Once you have that, then you sculpt the pedals. Although it changes all the time, the four main gain pedals that I've got on my board are a Keeley Java Boost, an Analog Man Red Dot Sunface, a D&M Drive and a Kingsley Page. And that's because I'm using a 60-watt Hamstead 1x12 combo and those combined together sound amazing. If I go to the AC30, though, I'll opt for the King of Tone, the Crowther Hot Cake and the Plosive Treble Booster. That's because I've spent enough time messing about with different amps and pedals to narrow down what works best, to my ear, with each of those amps.

"But in general if you choose the pedals first and then try to work out what kind of amp you really want, you're going to waste time. First find the style of amp that you love and then you will find pedals that sound fantastic with it. If you really get the basic combination of guitar and amp right first, it's going save you years of heartache and guesswork."

→ 116 INPUT

Q People talk about 'clipping' a lot in relation to drive pedals – what is it?

A "It means the signal that's coming from your guitar is amplified and then the very top and the bottom of the waveform are chopped [off] so that it sounds like the smoothness has gone and a level of aggression has been applied to it," Adrian Thorpe explains.

"So the signal comes in and it goes into the clipping part of the drive pedal's circuit. That circuit will only allow a certain amount of voltage through. Depending on the type of drive pedal you can have some that sound more open and big than others. Something like a Hermida Audio Zen Drive, for example, uses Schottky diodes. They clip in a 'soft' manner – they don't let a lot of forward voltage through. Whereas something that's more hard clipping might be a pair of LEDs: something like I use in the Gunshot overdrive. It lets more [voltage] through, but when it does clamp down, it clamps down quite hard.

"Effectively, what you're trying to do is replicate within a pedal what's happening within a valve. You're trying to create distortion – and it does that through chopping your signal and making it more like a square wave than a sine wave."

Q People talk about the sound of various versions of the Tube Screamer but I can't really hear any difference. Is it just more cork-sniffing myths?

A While there are some differences between the various types of Tube Screamer, it should also be said that at least some of what people perceive as sounding 'different' when comparing variants of the same pedal can be put down to inconsistencies in common components. Brian Wampler of Wampler effects explains: "Every component has a tolerance [degree to which its actual performance may differ from its published spec], whether it's a capacitor, a diode, a resistor or a potentiometer. A resistor, for example, might influence how much gain a pedal is going to have. But the differences in tolerance from one resistor to the next means that Pedal A may end up with a different amount of gain to Pedal B, even if they are the same model and make of overdrive.

"Now apply that to all the parts that go to make a Tube Screamer, for example. The variability in the performance of its individual parts means you can end up with pedals that sound dramatically different, even though they are supposed to sound the same. At Wampler, we try to get around that by sourcing components that have lower tolerances. So instead of buying potentiometers that have a tolerance of plus-or-minus 20 per cent, because they're cheaper potentiometers, we'll find potentiometers that are as close to one per cent as we can get without having it be a $400 pedal. But to return to the main point, all those changes, all those differences in the performance of components that are supposed to be the same, has a cumulative effect on the final sound of a given pedal."

"A resistor's tolerance means that two pedals may end up with a different amount of gain, even if they are the same model and make"

GETTING THE HUMP

Many classic, mid-rich drives are so well-liked because they make Fender amps sound warmer and richer. Brian Wampler explains why...

"Anything mid-humpy like a Klon or a Tube Screamer derivative is just a perfect match in front of a Blackface style amp because of the EQ of the amp combined with the EQ of the pedal itself," says Brian Wampler, who adds that the rich mids of those drives fill in a slight mid-scoop in the EQ profile of many Fender amps. "It's really effective for warming the sound up. Also, if you crank one of those Blackface amps all the way up, the bottom end gets a little flubby. So those kinds of drives also tighten everything up and you end up with a smoother, tighter distortion sound by using a pedal with a cranked Blackface style amp."

"If you EQ things properly you can punch through with enough volume as long as you don't scoop out the mids"

LESS CAN BE MORE

A lot of players swear by boosts and low-gain drives. Why do they yield such flattering, natural tones? Adrian Thorpe explains...

"A typical low-gain drive doesn't do much clipping. It might smooth off the edges and add a bit of perceived compression because it's lightly clipped. What it will do is add EQ [often mids-focused] and it will add volume. That volume is effectively signal voltage that comes out of the back end of the pedal.

"So a larger signal is hitting the front end of your amp. In fact, it works almost the same way as a higher-output pickup would. A higher-output pickup will drive tubes harder, so when you've got a low-gain pedal with more volume than your guitar alone can produce, you're driving the front end of the amplifier harder."

Q I love high-gain tones but I just can't seem to get a really heavy sound that also has the clarity to cut through a mix. What am I doing wrong?

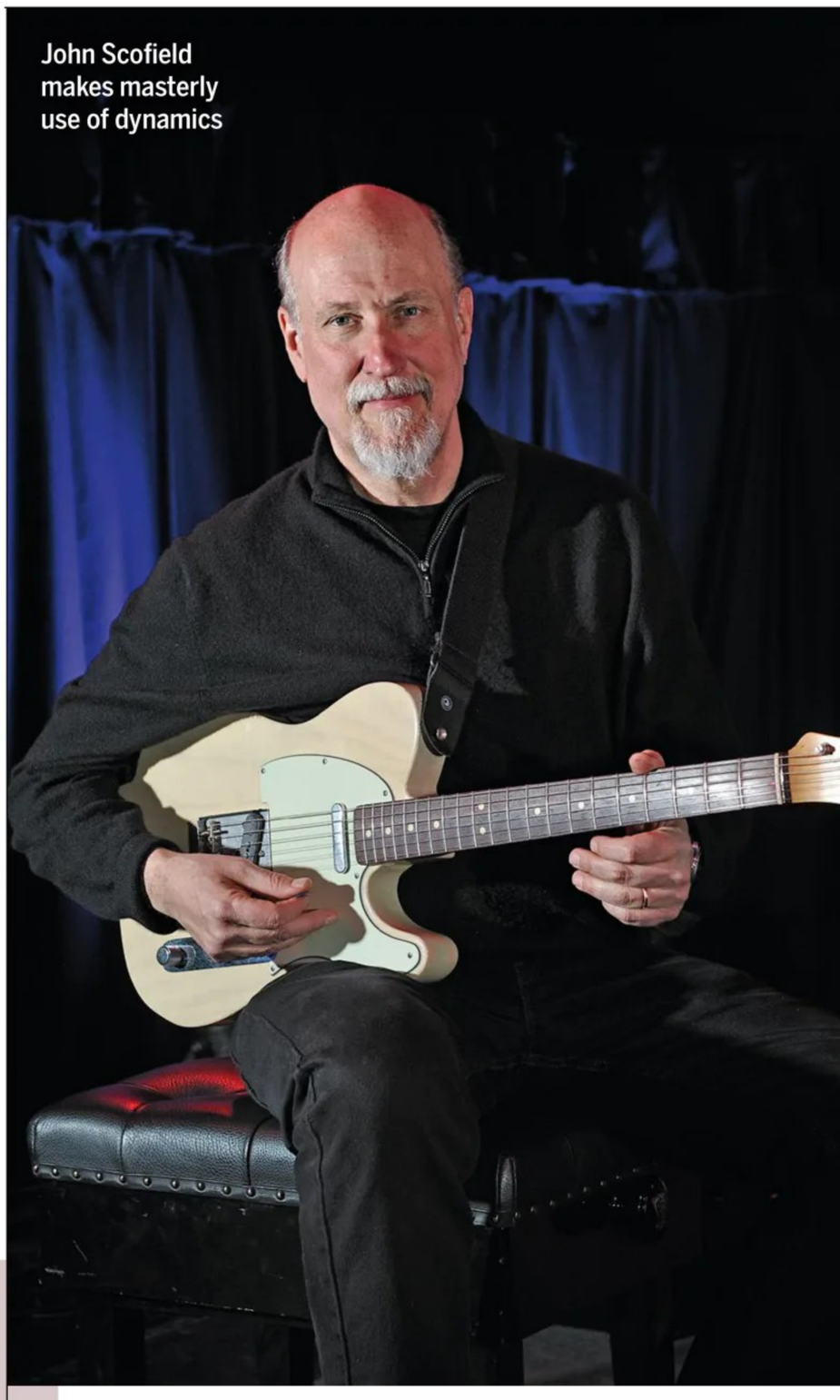
A "The problem is you've only got so much signal," explains Adrian Thorpe. "Within a pedal or a series of pedals you can raise the volume artificially using op amps and all the rest of it. However, what you end up doing when you make a high-gain sound – either by cascading gain stages or hard clipping – is chopping off the very top and the very bottom of the signal, which is very much what a compressor does. So by doing that you're limiting the signal that's going through and it isn't going to punch through as much.

"One thing you can do is EQ the thing properly. A lot of the time, players looking for a heavy sound just scoop the mids – and then they can't be heard at all. So I think people can suffer problems with high-gain drive sounds because of a combination of the two factors: compression and poor EQ. However, if you EQ things properly you can still punch through with enough volume – as long as you've mids. Don't equate a good metal tone to lack of mids. I actually don't think the two marry up particularly well.

"If you want to be heard but also want to use a drive effect with scooped mids, what I think you should do is maybe lower the gain and run another contrasting pedal that's got prominent mids, which fills it back in. That's why a lot of heavy players use two or more amps that are EQ'd very, very differently. One amp will be scooped quite heavily and tuned for bass and treble. The other one will be tuned for mids. Together they sound huge."

Fredrik Åkesson of Opeth's metal tones have plenty of juicy mids

Photo by Joby Sessions/Total Guitar Magazine via Getty Images



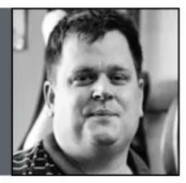
John Scofield makes masterly use of dynamics

Q A lot of the players with great lead tone play loud – why?

A "All of my favourite guitar players are loud," Daniel Steinhardt says. "A lot of people misunderstand what volume gives you. Perhaps I should really say my favourite guitar players are dynamic. If you listen to a sax player in a room by themselves and they give it some welly, that thing is loud. But that sax player can also dial it down and use dynamics – contrasts between loud and quiet playing – to play really softly too. As guitar players, we're so used to just giving it everything all the time. But listen to Mike Landau or John Scofield – they're some of the most dynamic players you'll ever hear. And with plenty of volume on tap, you can get that full range of dynamics: you can pick harder and it'll go wild or you can pick softly and it comes down to a whisper. So that's really what volume affords you. Having volume doesn't mean you're going to be loud all the time – but it gives you dynamic range."

ORDER, ORDER!

Stacking overdrive pedals – running one into another to blend their sonic characteristics – can yield fantastic-sounding results. But which order should they go in? Adrian Thorpe of Thorpy FX and Brian Wampler of Wampler reveal their stacking secrets



Adrian Thorpe

"IT USED TO be that I would stack low-gain pedals into high-gain pedals. But over time I've come to feel that it actually sounds better if you have a lower-gain or a less-clipped pedal coming after a higher-gain pedal. If you've got a higher-gain pedal that's quite compressed in nature, what you would want is to run it into a second drive pedal that's relatively uncompressed. You can then use [the second pedal] to tweak the EQ and add volume without changing the character [of the first pedal]. It's like blending amplifiers to a degree, although it's a little bit different because you're in series rather than parallel. But I'd definitely prefer a higher gain pedal and then a lower gain pedal.

"A second point is that stacking only really works, in my view, if you're using medium- or low-gain pedals. I'm not sure it would really make sense with a really heavy, gain-y pedal like the BE-OD by Friedman: it doesn't really need to be stacked into another drive: it's got enough cascading gain stages within it anyway. If you were to then have a high-gain pedal after that you'd just end up with mush. If you really want to run another pedal after that your best bet is probably an EQ – something that's got high headroom that mainly allows you to adjust the overall EQ.

"In fact, some people use a drive pedal as an EQ, effectively – even though they may not know that's what they are doing. Take the Klon, for example. Most people run a Klon with the gain set very low and the level high – in which case it doesn't matter what 'magic diodes' have gone in it because they're not even tickling them. What they're actually getting with the pedal set up like that is a mid-boost.

"The reason that can sound very flattering is that typical Blackface Fender amps have quite scooped mids. So when you put a lovely, mid-focused drive signal into one of course it's going to sound nice – because you've got your amp back to where it really ought to be, which is rich in mid-frequencies, in line with your instrument that you're playing."

Brian Wampler

"IT DEPENDS on what sound I want. If I want a sound that's a little more fuzzy and raspier then I'm going to take a distortion pedal of some sort that is bass-heavy and probably stack that with another distortion pedal. In that scenario you'd want to run the gain settings on each pedal quite low. Because we're basically using the separate gain stages not so much like conventional pedals but more like you would with certain tube amps where you have multiple gain stages, each adding a little bit of flavour along the way.

"As for order, yes it makes a big difference. Our Dual Fusion and Paisley Drive Deluxe pedals are both dual [drive] pedals and when you flip the order on those you get two completely different sounds. If I want a tighter-sounding drive I'll generally run an overdrive in front of a distortion. But there's another good trick you can use, especially with something like a Blackface amp. Let's say you take something like an OCD which doesn't have a whole lot of mid-contour because it's a fairly transparent-ish distortion pedal. So if I want to give it more of a mid-hump, to fit better with a Blackface style amp which has quite scooped mids, I'll run that OCD into a Tube Screamer type pedal but with the gain down – not all the way but just a little bit up. And that kind of flavours it sort of like an EQ pedal would do.

"So it's fun to stack things that way because each pedal has its own EQ – but the one you put later down the line is really going to influence the overall EQ sound of your distorted tone. It's sort of like when you use an EQ pedal before distortion, you're going to affect whether it's flubby or tight... that sort of thing. But put it after the distortion and you can increase the actual bass content or the actual treble content after it's already been distorted. It's just two totally different sounds."

"First find the style of amp that you love and then you will find pedals that sound fantastic with it"

Q I've tried using overdrive pedals that my favourite players swear by – but none really suited me. Am I missing something?

A "I've probably tried them all," Adrian Thorpe says. "And I don't think there's any one that I couldn't live without, because a lot of pedals effectively do the same thing. We tend to shop with our eyes and our hearts rather than our ears. I get it, it's very difficult for guitarists to try every bit of gear that's out there. So the first thing people do is look on forums or in mags, look on Facebook and look at what their favourite players use. But you almost need to treat it like buying a pair of shoes. I know that sounds so boring, but they've really got to fit you. If they don't fit you, you're in agony. Whether it's your ears that are in agony or the punters who come to listen to you are in agony, one way or the other you're suffering. That's the dullest analogy I can probably think of, but it's true: treat your pedals like a pair of shoes and make sure they fit you."

Q Some drive pedals have actual valves in them as opposed to just transistors. What are the pros and cons of that?

A "The most important one is the output impedance of the pedal," says Daniel Steinhardt. "Often, with a valve-powered preamp-style pedal, the output impedance is quite high. So it doesn't drive [the signal through] long lengths of cable very well. So what can happen is that you set your valve overdrive pedal up so it sounds really nice on its own, and then you switch on a delay pedal further down the signal chain (delay pedals typically have a really low output impedance, which restores a lot of 'zing' and brightness to the signal) and all of a sudden that wonderful warm, chewy drive sound becomes really hard and brittle sounding. An easy solve for that is putting a buffer directly after your valve-powered drive pedal. And you leave that buffer on all the time and then you just dial in the sound of the drive pedal to suit. Then when the delay comes on it won't suddenly make the sound much brighter."

Q Tell us a 'secret weapon' overdrive trick that you can use to unlock great lead sounds

A "One really great trick is to use an overdrive pedal to turn *down* the volume of your amp," says Daniel Steinhardt. "What generally happens with an amplifier is if you turn it down at the input, you lose gain, right? So if you set the amp loud but then use something like a really nice-sounding OD-1 or something in front of it you can turn the level down on the *pedal* but have the gain up so that you decrease the level going to the amplifier but compensate for that with a bit of gain from the pedal. And then when you turn the pedal off the natural, full volume of the amp becomes a solo boost that really cuts through."

A sorted pedalboard can be used incredibly flexibly – drive pedals can even be used to reduce volume

PEDALBOARD BOARD GAMES

YOUR PEDALBOARD PROBLEMS SOLVED

THE BACKGROUND

JAMES GRAY, GUITARIST READER:

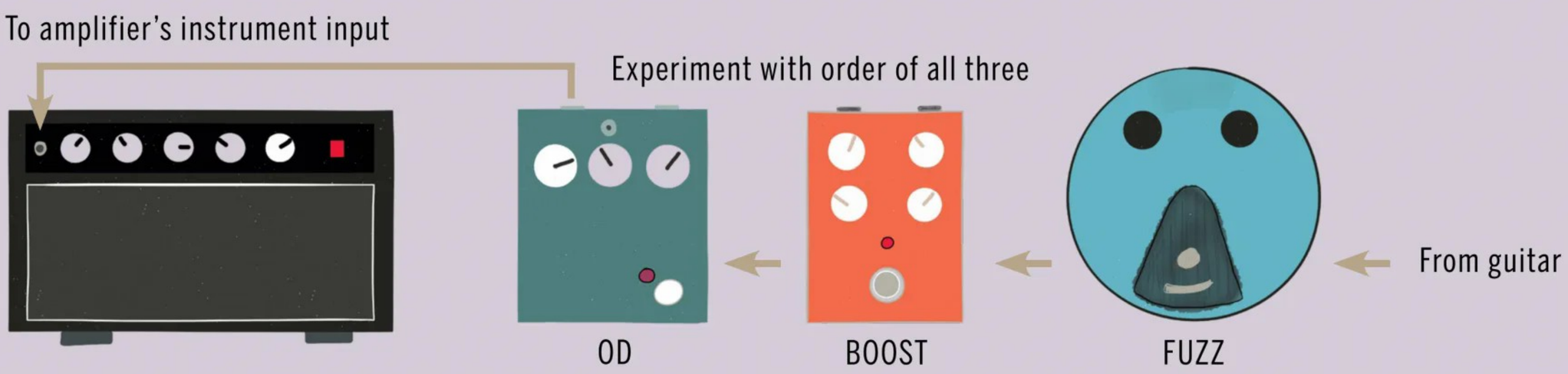
"I'm having a trouble choosing overdrive pedals because of the way they react so differently with different amps. I might watch one demo where a pedal sounds really, really distorted and another where it sounds much cleaner, even though the settings and the guitar are very similar. All I want is a wide range of gain available from the 'board, from just breaking up to a heavy gain yet clear tone. I have two amps – an Orange TH30 and a Marshall DSL40C – though I don't use them both at the same time."

THE QUESTIONS

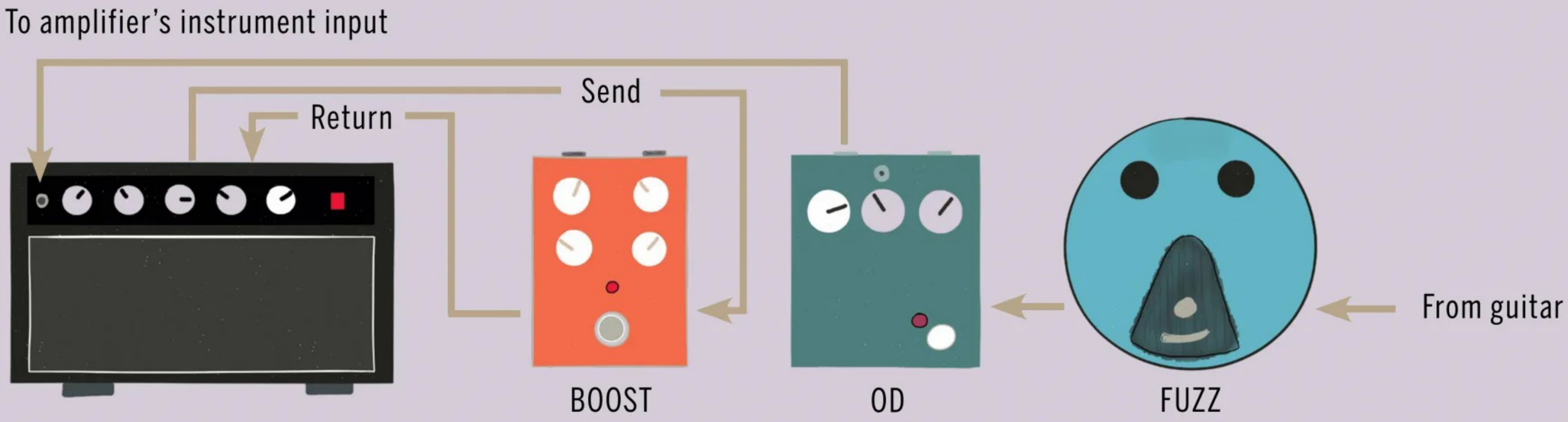
1. **ARE THERE ANY RULES – OR JUST SOME GUIDANCE – ABOUT WHAT KIND OF PEDALS WORK WITH DIFFERENT AMPS?**

2. **IF I HAD A BOOST, OVERDRIVE AND FUZZ, HOW WOULD YOU ORDER THEM INTO MY AMP(S)?**

BOOST, OD & FUZZ: CLEAN AMP



BOOST, OD & FUZZ: DRIVEN AMP



THE ANSWERS

This is the fundamental of all electric guitar sounds, James: gain structure. And you're right, different pedals sound *radically* different with different amps. But don't despair...

01 Gain, compression and EQ: a Tube Screamer works so well with a blackface Fender because it offers the amp a bit of compression, a kick in mids and enough gain and level to take all that sparkly clean stuff into nice overdrive. By contrast, both your amps have a lot of available gain, quite a bit of compression in the front-end and a totally different EQ character.

We'd be looking at a full-range boost that can boost clean sounds, and/or drive the amp's OD into sweeter drive and compression without overly colouring the sound. Having some bass attenuation will help with clarity. Fuzz-wise, the world is your oyster. Marshall and Orange amps tend to like fuzz because you can have the front-end of the amp breaking up slightly. Fuzz Face, Big Muff, Tone Bender, Power Driver... all sounds that you should experiment with. As for ODs, there are just so many. Avoid a big mid hump, we'd say, and go for something with plenty of sizzle if you're playing in a rock style. You may not even need an OD with the right boost and fuzz combination.

02 If it's a germanium fuzz, run that first. Then you can use the boost to boost it louder. If the fuzz plays nicely after the boost, try that, too, for some wild compression and gain. As for boost and OD, running boost first will push the OD into much heavier saturation; running it after will give you a level lift after the OD... but only if your amp is set relatively clean. If the amp is set dirty, you'll just get more gain and compression. In that case, try the boost in the loop. Good luck! G

EMAIL US YOUR QUESTIONS: **GUITARIST@FUTURENET.COM**

Q Some amps are billed as 'pedal friendly'? What does that mean?

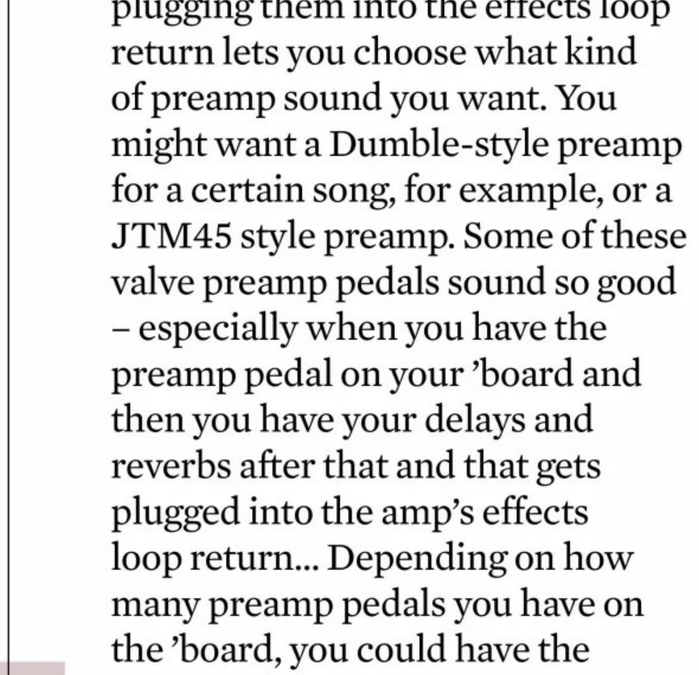
A "Amps of that kind are typically low-gain pedal platforms that are optimised to allow you to get most of your drive from your pedals instead of from the amp," explains Adrian Thorpe. "And, in that scenario, the amp almost just acts as a power amp. Because if you're going to get your drive sound from the pedals one answer is to use them with an amplifier that has as flat an EQ as possible. The flatter the EQ of the amp, the more likely it's going to take a wide range of pedals well. The only problem with that is you have maybe a little bit of a lack of character.

"By contrast, if you've got a naturally dark-voiced amp you're going to need to pair it with bright pedals – or at least you're going to have to have the scope within the pedal to adjust the EQ to that level. I'll give you the perfect example: I've got a Mesa Mark V and when I put it on the Mark II setting, it's a very dark amplifier. I've also got a Tone Bender that's just ear-piercingly sharp. So the two together are absolutely incredible. Either on their own are, to me, useless. Some people love extremes but I like a good balanced EQ."

"Depending on how many preamp pedals you have on the 'board, you could have the equivalent of a three-channel amplifier at your feet"

Q I've seen some players plug preamp pedals like the Kingsley Page directly into the return of their amp's effects loop. Why?

A "The way an effects loop works in an amplifier is as a bridge between the preamp stage and the power amp stage," Daniel Steinhardt says. "Generally, the signal will go through your amp's preamp stage, out to delay and reverb effects, and then back in to the power amp stage. But your amp's preamp is designed a certain way and will sound a certain way – which is great, if that's the only sound you want. But if you want a bit more flexibility, having preamp pedals on the 'board and then plugging them into the effects loop return lets you choose what kind of preamp sound you want. You might want a Dumble-style preamp for a certain song, for example, or a JTM45 style preamp. Some of these valve preamp pedals sound so good – especially when you have the preamp pedal on your 'board and then you have your delays and reverbs after that and that gets plugged into the amp's effects loop return... Depending on how many preamp pedals you have on the 'board, you could have the equivalent of a three-channel amplifier at your feet."



Q I've noticed that many overdrives that are supposed to sound 'amp-like' feature JFETs. Why is that?

A "What you've got within a normal amp's valve network is cascading gain," Adrian Thorpe explains. "The first half of the first preamp valve, will clip – in other words create distortion. That then cascades into the next section of the valve – and, again, that clips and distorts. So you end up with a complex sound as a result of this cascading process within a valve amp. Each section of the pre-amp effectively adds its own bit of flavour to the resulting sound.

"There are different ways of replicating that process in a pedal. Some designers use JFETs (Joint Field Effect Transistor) which is what happens in a valve amp, but what they can do is create cascading gain. One JFET passes onto the next JFET, which passes onto another JFET and so on. In fact, at one stage in the evolution of amps, transistors were supposed to replace valves because they use less voltage and have some other advantages. And ultimately you can, with a few tweaks, take a JFET and do a one-for-one replacement for a valve. In reality though, it just doesn't sound quite the same."

LITTLE AND LARGE

How should your strategy for achieving great drive tones change when you switch from using a high-headroom amp to a juicy, low-wattage combo? TheGigRig's tone guru Daniel Steinhardt explains the factors you need to consider

Daniel Steinhardt says pedals should be selected to complement your amp's natural voice

THE FIRST thing to know about pedals is that their tone is amp-dependent. "A pedal only reacts. It's so important to be aware what you are pairing it with," explains Daniel Steinhardt. "Whenever I talk to pedal designers I always ask them what amp they tend to test the pedal through during the design process. Crowther's Hot Cake, for example, is my favourite overdrive pedal to use with a Vox – primarily because Paul Crowther uses AC30s when he designs his pedals. And so, when you listen to Neil Finn use a Hot Cake with his AC30s it sounds extraordinary. But you might find that pedal a little bit warm when you plug it into your Marshall for example – although some guys do and they sound amazing. But it's definitely a part of the overall chain. There is no substitute for trying a pedal as part of the rest of the chain you mean to use. Becuase the other really important part of the chain is the person playing the guitar. Listening to demos and all that stuff will go part way to inform you how a pedal will sound but it's a pale imitation of what you learn by trying the stuff out yourself.

"So, with that in mind, let's address the two scenarios you mentioned: with the really high-headroom amplifiers...there's been a craze called amp-in-a-box [eg drive pedals designed to ape the sound of well-known amps]. But they're just overdrive pedals at the end of the day. They might have a frequency characteristic that is modelled after a Laney Supergroup or something else that's got characteristic frequencies when it's overdriving. But for those characteristics to be heard, that pedal needs to go into an amplifier with lots of headroom.

"But if you take the same pedal and plug it into a Fender Champ or something that you've got turned all the way up, what happens is that all the input of the amplifier is already hitting the rails. And it's got nowhere else to go. So when you put more gain into that, there's no more headroom – it's not going to get louder, it'll just get more compressed. So you're not going to hear those characteristics. However, there are other approaches you can take when your amp is saturated like that. There's a reason metal guys like Tube Screamers so much – they'll have a really saturated amplifier and put a Tube Screamer in front of it and what that does is push the mid frequencies without touching much of anything else – and that gives them a distinct characteristic that they can work with, even with a saturated amp.

"So there are two basic approaches: David Gilmour uses a high-headroom Hi-Watt and he gets his tone from pedals and it's a very good tone. And that's a wonderful way to do it – because we're so spoilt for choice with amazing sounding overdrive pedals that if you can find a high-headroom amplifier that still has character and isn't sterile then you can shape and mould all your gain stages and find specific tones.

"However, if you're going to plug into a small amplifier and crank that up there are still things you can do with drive pedals, but it's a very different approach. You'll be looking at things like treble boosters, for example, and certain sorts of fuzz. Not necessarily fuzz with massive, blown-out bottom end, but effects like octave fuzz and things that give you a characteristic that will still break through all that saturated compression within the amp itself."

Jimi Hendrix drove his amps' power valves into distortion by cranking them way up!

Photo by David Redfern/Redferns/ Getty Images

"Just dialling back on the gain can allow you to hear your guitar's characteristics"

Q I've heard it said that the best drive tones happen when an amp's power valves are distorting, not just the smaller valves in the preamp stage. Is this true?

A "Power valve clipping can add to the depth and complexity of your drive sounds," Adrian Thorpe explains. "But only at the point where you've breached the normal operating range of the valve. In most amplifiers these days the preamp is designed to cascade gain. What you then want is your power amp to take that signal and project it clearly through your speakers. But if you've got power amp distortion, you've now got the same thing that's happened in your pre-amp happening in your power amp as well.

"That means we're back to this complexity thing: you've got preamp distortion and power amp distortion all mixed together and then pumping out of your speaker. That's why people like it. It's a mixture of all the harmonics, it's a mixture of all the different types of signal clipping – and it sounds sweet to our ears. So when people say, 'Is power amp clipping important?' Yes, I reckon so for those classic rock sounds.

"The players of the 60s didn't have a choice – they only had those amps, they didn't have dedicated PAs at the time. They just cranked the amplifier and their power amp was definitely saturating and adding its own thing to the mix. When you put that on record that's the sound we tend to like because they're the classic songs. To get that you have to drive the power amp."

Q What lesson has long experience taught you about gain?

A "One of the biggest ones for me is that just dialling back on the gain a little can make you sound much better," says Daniel Steinhardt. "There are times, for sure, when loads of gain is really appropriate – like with fuzz. But you spend all this money on a good guitar, a good amp... and sometimes, if you use a generous amount of gain, you can't even hear the sound of the guitar itself. So sometimes just dialling back on that a hair lets you hear some of the characteristics of the guitar come through. And you might find when you turn the gain down you have to work a little bit harder – once you've found that beautiful sound, you may have to work harder to get it to come through than if you had endless gain and sustain. But that can actually be a real gift, making you more thoughtful about your note choices, dynamics and all the rest of it."

A FINE PAIR

What amps do our experts like to pair pedals with? Adrian Thorpe tells us all...

"My favourite amplifier at the moment is an Orange Rockerverb Mark III. It's got a lovely clean channel and it's also got a great drive channel. Mid-gain and higher gain pedals will go through the clean channel, so I get the high end clarity – but the pedal will provide most of the overdrive character to the sound. With lower-gain pedals like the Thorpy FX Peacekeeper, I'll often opt to use the amp's drive channel set to a crunch tone – here the pedal is simply adding complexity to what the amp is already producing."

When you isolate the guitar on classic Van Halen recordings it's surprising how low-gain the tones are

Photo by Richard McCaffrey/ Michael Ochs Archive/ Getty Images

THE BACKGROUND

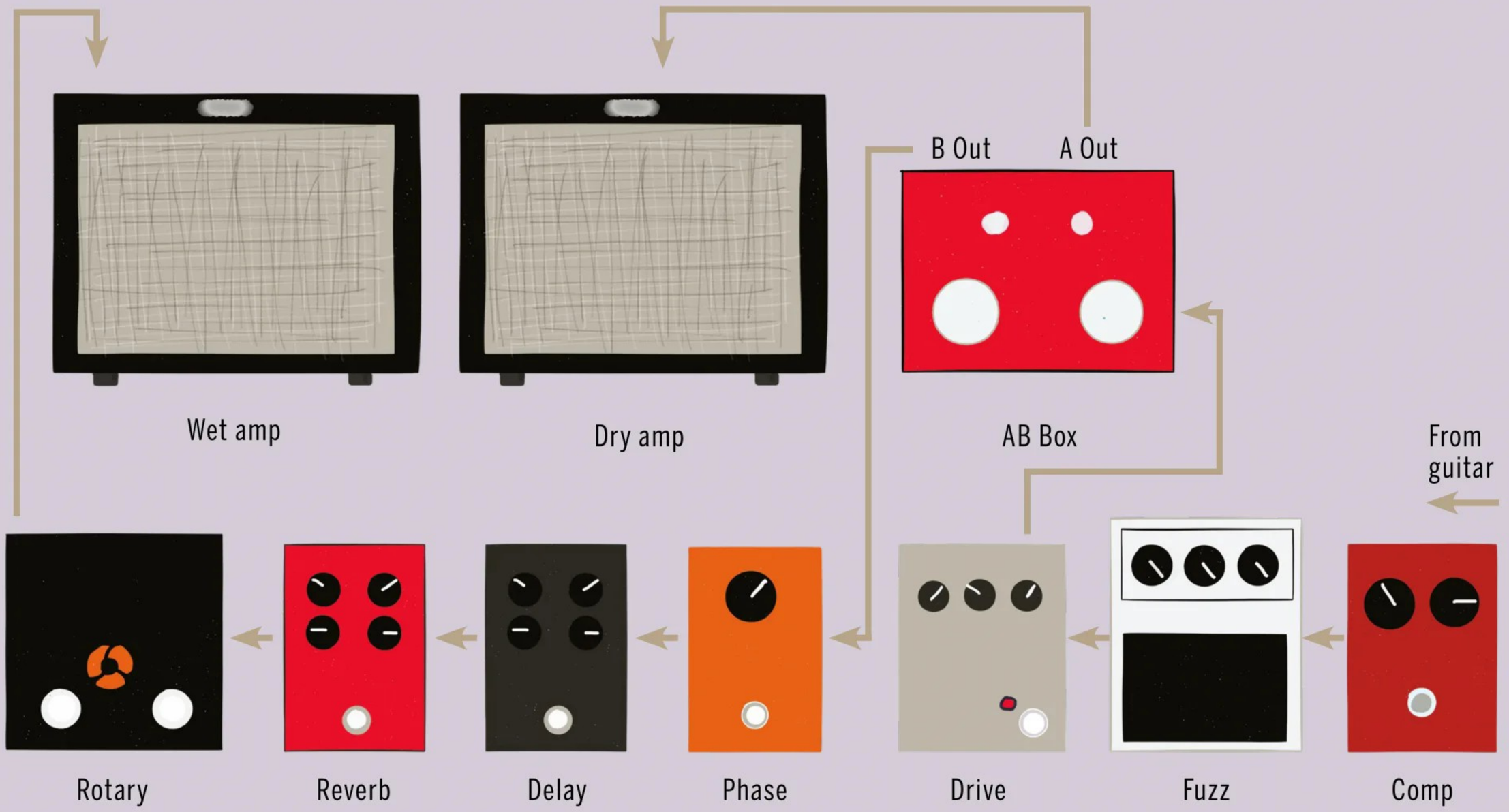
GARETH HENDERSON, GUITARIST READER:

"I really love the sound of a rotary speaker effect, particularly for David Gilmour-type sounds. If I could afford the time and space I'd have a real Leslie cabinet, alas it's not practical or realistic, especially for gigs! To date I've been using the rotary speaker preset in a Boss ME-50, which is about to get 'retired'. My current signal chain is MXR Dyna Comp, EHX Big Muff Pi, Kingsley Page Tube Boost, MXR Phase 90, Boss ME-50, TC Alter Ego 2, TC Hall Of Fame, into a Fender Hot Rod Deluxe. I want to add a Neo Instruments Mini Vent II for the rotary sounds... and maybe even think about wet-dry."

THE QUESTIONS

1. **WHAT IS THE BEST POSITION IN THE SIGNAL CHAIN FOR THE MINI VENT II?**

2. **HOW WOULD I GO ABOUT MAKING THIS WET-DRY WITH AN EXTRA AMP?**



THE ANSWERS

01 We'd probably put the Mini Vent II last in the chain, Gareth, as it's simulating what a speaker cab would do. So in the 'real' world, it would be after everything. That's simple enough. We think you're going to be very happy exiting the ME-50 from that signal chain in favour of the Vent II.

To go wet- dry, you need to decide which of the 'wet' effects you want to split out. So you could do it before the phaser to keep it strictly wet-dry, or you can split the signal at any point after that albeit before the Neo Vent II. Once you've decided where – let's take the before-phaser option as our example in the diagram – you'll need a device to split the signal, correct for phase and make sure one of the outputs is isolated. This could be an AB-Y switcher (Fulltone, Radial, TheGigRig etc) or a Humdinger by TheGigRig, which is purpose-designed for the job with no additional switching. And an extra amp of course...

02 If the ABY/switcher has a buffered output, use that one for the wet effects. If you don't want to go wet-dry, just use all the effects in line with no AB-Y box, and just one amp.

EMAIL US YOUR QUESTIONS: **GUITARIST@FUTURENET.COM**

UNSUNG HEROES

We join Dan Steinhardt of TheGigRig to discover why these four pedals – all uncelebrated gems – deserve a great deal more praise

Professional MKII

By Pigdog Pedals

"So this is an example of a pedal by Pigdog Pedals in London. The amount of work and research and knowledge that's gone into it is astonishing. He doesn't just use the best components available but he's used original transistors from the MKII Tone Bender. All the transistors are matched and then everything is tested by ear. But also, this pedal [which replicates the MKII Tone Bender] works beautifully with buffers. So the guy's a genius.

"The original Tone Bender was a very important pedal in the history of guitar tone. From Clapton to Mick Ronson, and of course Jimmy Page… the Tone Bender had a massive influence on the sound of guitars. But again, it was a really temperamental-sounding pedal. Lots of people have tried to come up with really good Tone Benders. It's not a difficult circuit, and there are lots of good-sounding ones out there, but it is a very sensitive circuit, and I've never heard one sound anything like this Pigdog pedal. That sort of quality can only come from someone who is absolutely obsessed!"

GE-7 Equalizer

By Boss

"The GE-7 by itself is really great, but you can also get them modded – Analog Man does mods for them, for example – just to make them a bit quieter, but they are so handy to have. Why? Well, if you're a touring musician and you don't necessarily know what amp you'll be given on the night, and let's say they've given you an old Marshall, you can just pull out any frequencies that you don't want to hear. Or if you're used to playing Voxes and you've been given a Twin, you need to add a hump in the mid-range. For that, this is wonderful. Or let's say you've got a distortion pedal but you need to tame down the bottom end a little, then you can put the EQ behind the distortion pedal. It's a trick that's been used by a lot of the top guys, because if you've got the EQ pedal in the loop with a distortion pedal, you can shape the sound of the signal that's going into the distortion, so it's great just for tailoring tone. For example, I've got a pedal here, which is a 2CH Dynamic Distortion from Lehan Labs. It's amazing, but the bottom end is just a little bit too big by itself. My sound is very focused, and whenever I stick the Dynamic Distortion on it's just ridiculously trouser-flapping. But if I put the GE-7 before it and then just pull down the bottom end, it's perfect."

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INPUT

Shaftesbury Duo Fuzz

By Rose-Morris/Shin-ei

"Back in the very early 70s, companies such as Shin-ei would make fuzz pedals for whoever wanted to sell fuzz pedals under the name of their own guitar shop or what have you. So in that period, the Rose-Morris shop in Denmark Street commissioned a bunch of fuzz pedals which were known as the Duo-Fuzz. Now, usually they would use whatever components they had to hand to build fuzzes for various customers – but for some reason the Rose-Morris Duo Fuzz was just perfect. It couldn't have been planned that way – and it has a sound unlike any other fuzz pedal. Just perfect.

"Originally, I got this pedal for about £80, and now they're going for £500. The big tell is the enclosure, which is sort of wedge shaped and with the two controls on the side. I was very lucky because I saw that, and recognised the enclosure, but the label had actually fallen off. They are harmonically the most dstinctive-sounding fuzz ever. Really wonderful. Steve Hackett used these and it's all over *The Lamb Lies Down On Broadway*."

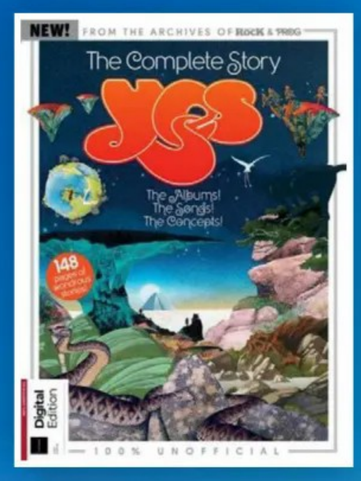
Mu-Tron Phasor II

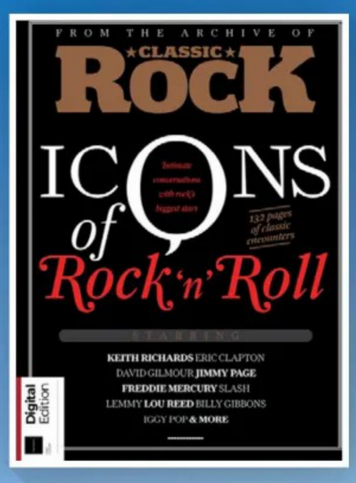
By Musitronics

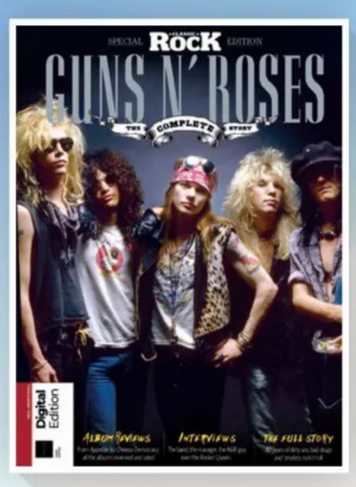
"Everyone knows the Mu-Tron III, which is the envelope filter to have, but the Mu-Tron Phasor II is a wonderful-sounding phaser that has the depth and rate of a normal phaser, but also has this feedback control here which gives it an almost flanger-like quality, feeding some of that signal back in – so it's a unique-sounding phaser. They're very rare but I heard one years ago and started hunting for one, because it was just a sound I had not heard anywhere else. It's from the same 'family' as the Bi-Phase, but the Bi-Phase is a massive big thing, with parts of the same circuit in it. But this is unique because they've included that feedback circuitry. They are 120 volts, so you've got to get the adaptor and all that stuff, but as a thing to have in the studio, they're absolutely remarkable."

Dan Steinhardt of TheGigRig builds to-die-for pedalboards for some of the world's most sonically-demanding guitarists, including Steve Vai and Steven Wilson. He's played, repaired or owned just about every effects unit worthy of the name, from vintage classics to boutique beauties. To find out more about Dan and his work visit *www.thegigrig.com*

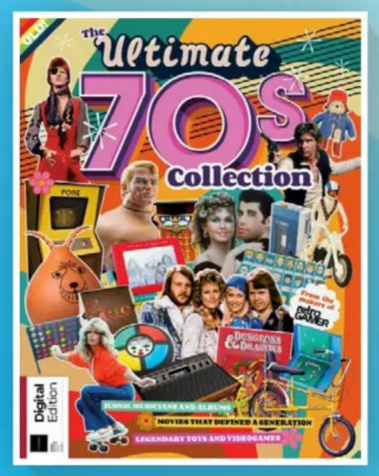
Celebrate the songs and sounds of the greatest decades in music

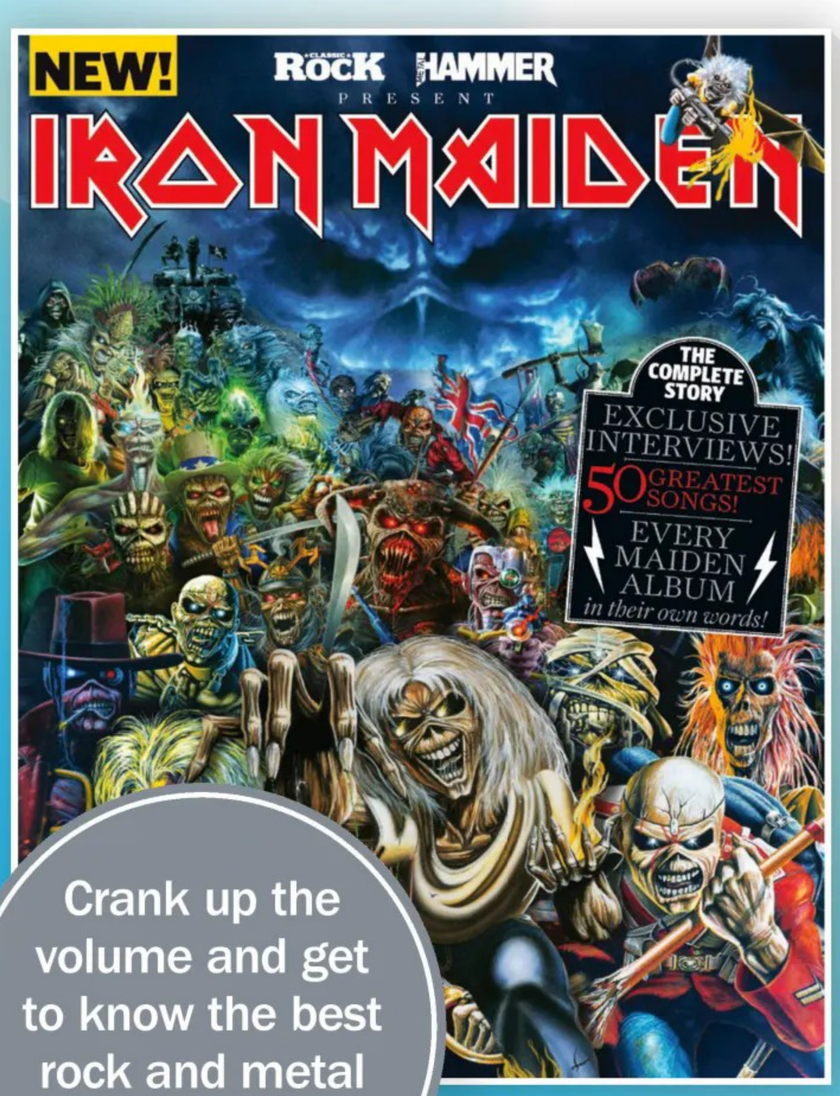


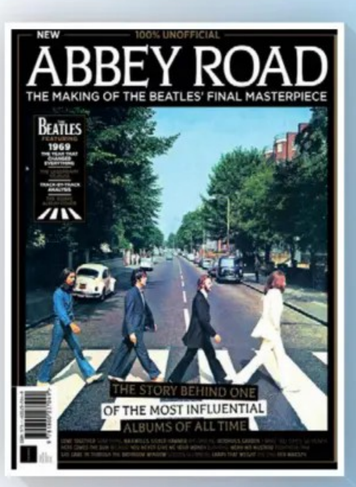


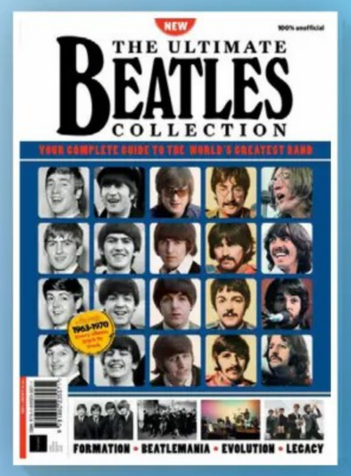


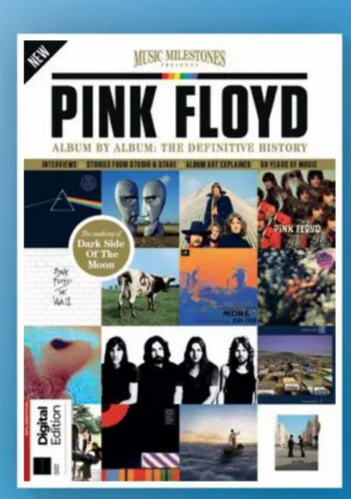
Explore the lives and legacies of some of the world's most iconic artists











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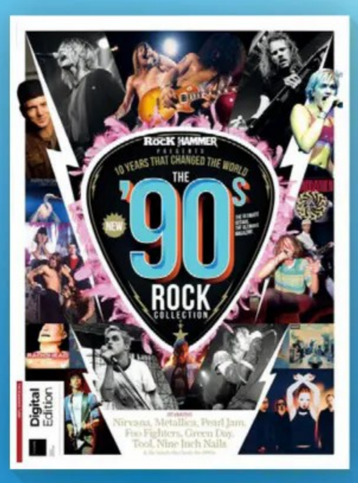

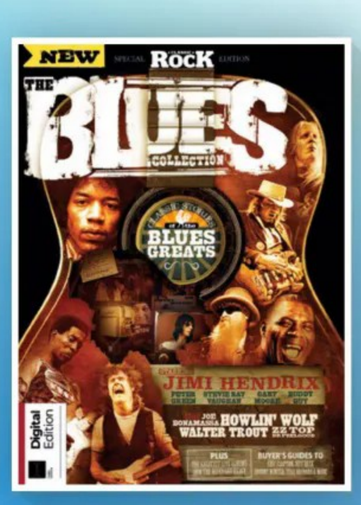

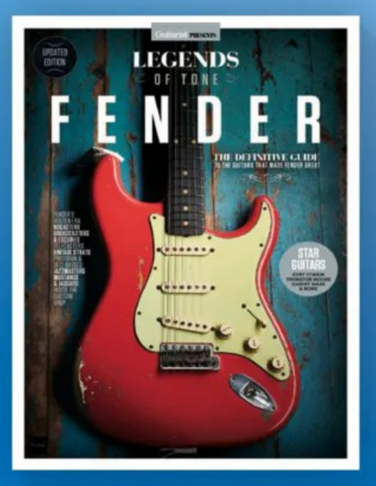

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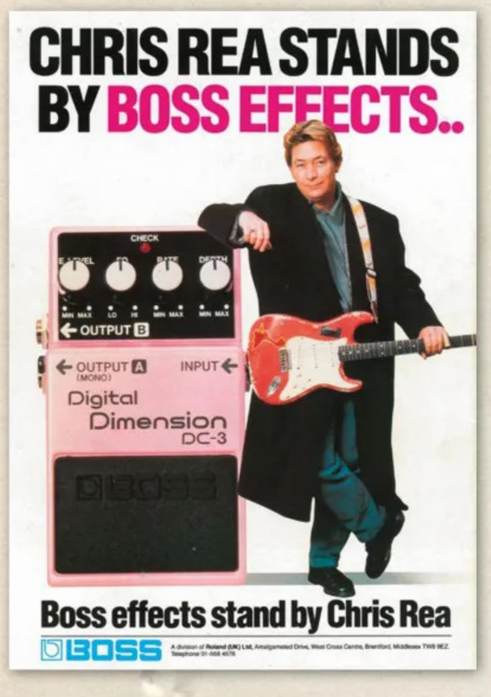
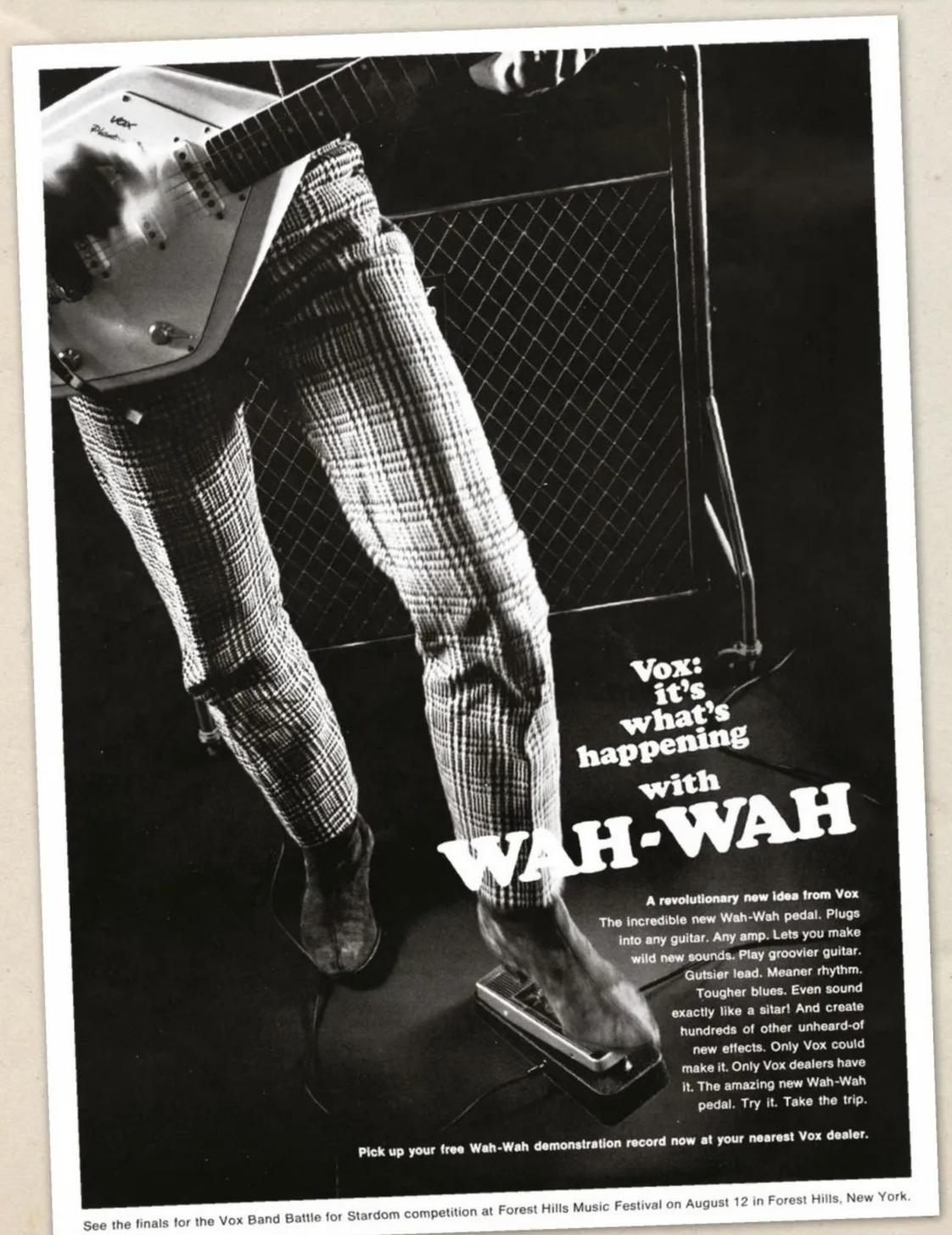
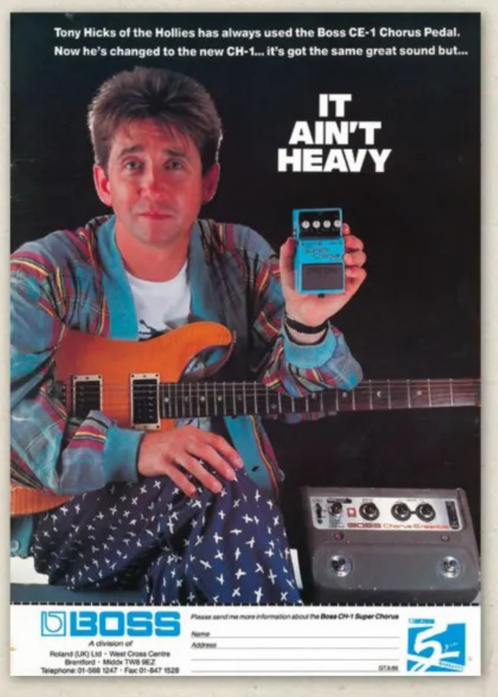


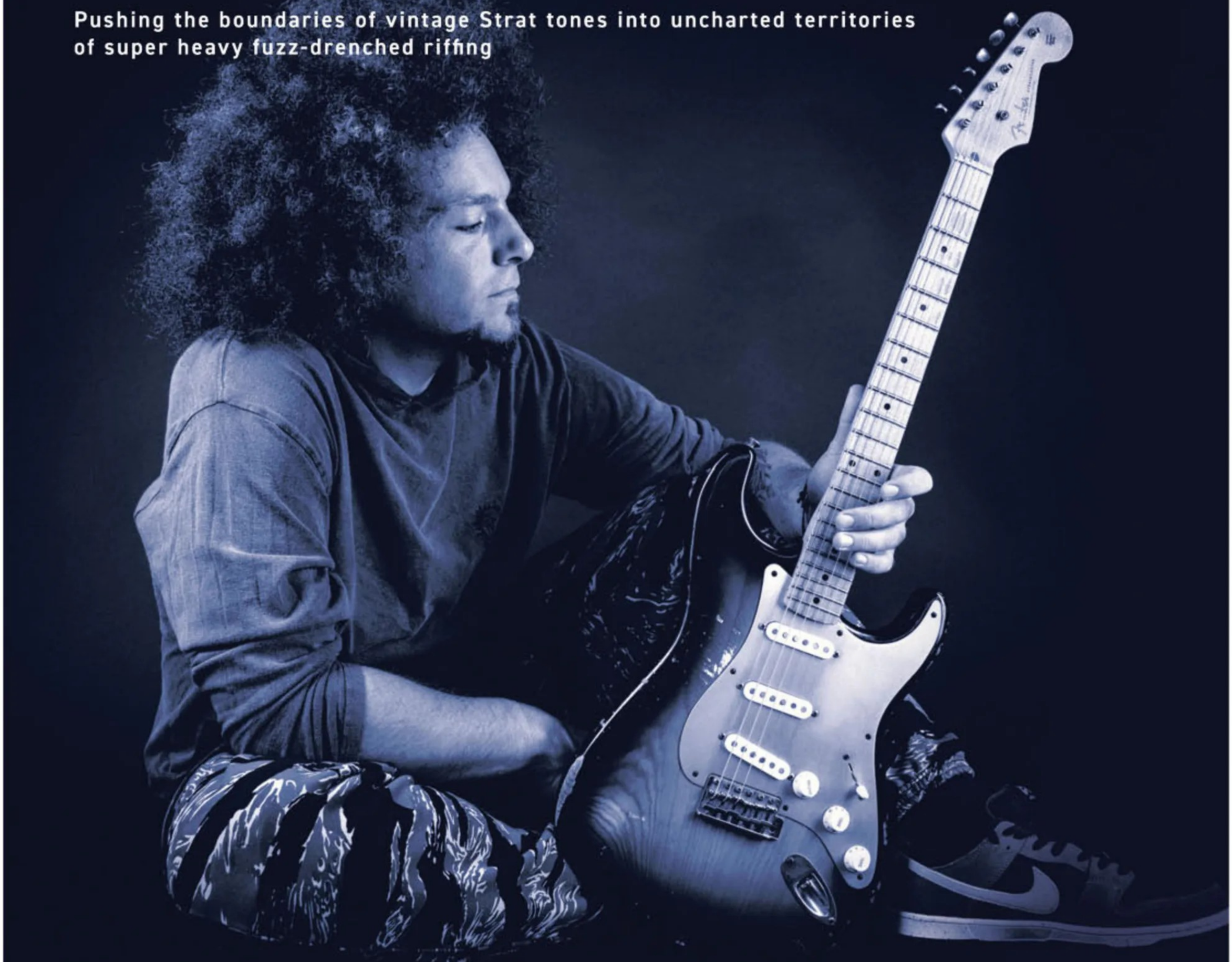




TRIPTYCH

THE POWER OF THREE

Pushing the boundaries of vintage Strat tones into uncharted territories of super heavy fuzz-drenched riffing



"For me, the perfect Strat tone has been an ongoing journey for the last few years, and I'm happy to say that the journey has ended with the Triptych single coils"

RABEA MASSAAD

BEA

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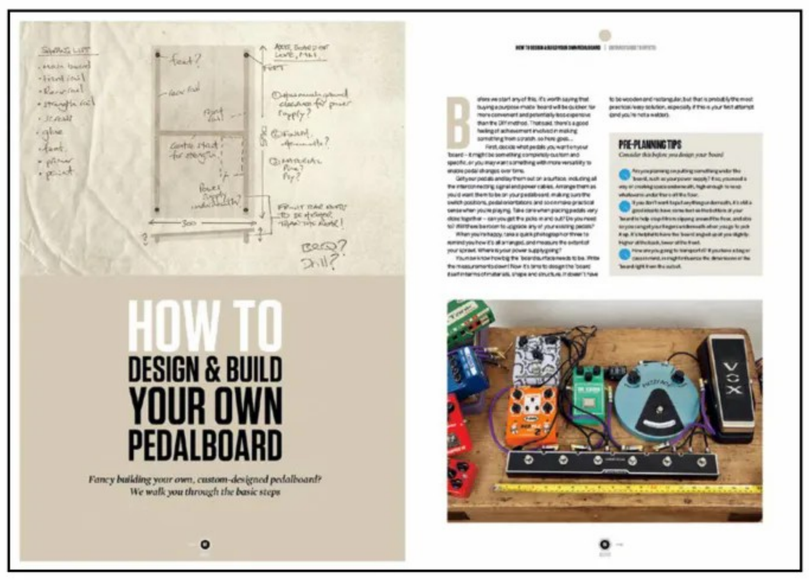
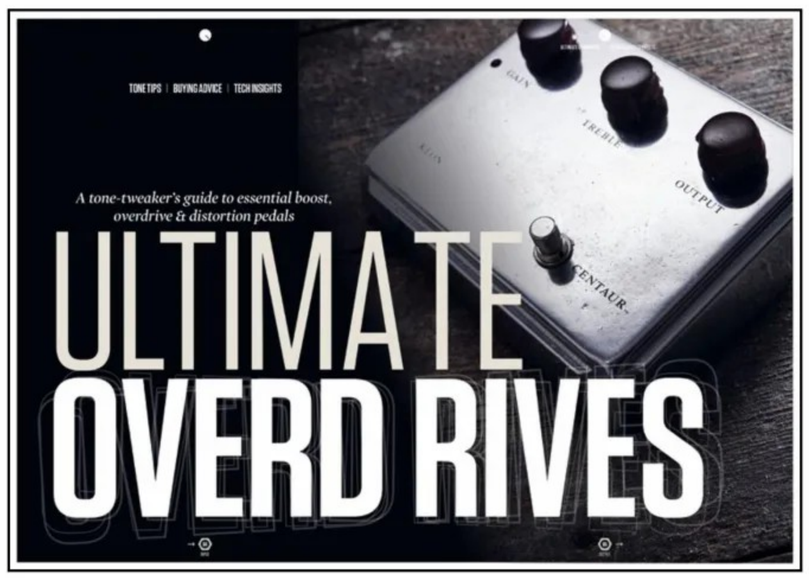
Guitarist Guide To effects PEDALS





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Power your 'board

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