

# Earthworks SV33

## Cardioid Capacitor Microphone

Earthworks have long been renowned for their top-tier instrument mics, but their latest offering is aimed at capturing vocals.

HUGH ROBJOHN'S

American microphone manufacturers Earthworks Audio are well known for their extensive range of 'wide-bandwidth' microphones, many extending out to 50kHz or so. However, the engineering behind this distinguishing characteristic is not so much about capturing ultrasonic sounds that 'no-one can hear', but is instead to optimise the microphone's impulse response and time-domain behaviour — about which the company's late founder David Blackmer was very passionate indeed (see box).

The company's microphones excel in their time-domain performance, accurate transient responses, tonal neutrality, and well-controlled polar-patterns across the entire frequency range — and these attributes are all embodied in Earthworks' latest development, the SV33, too. However, this new microphone is rather different from everything we've seen previously in the company's portfolio, because it is primarily a studio vocal microphone, and priced to rival the leading European contenders in that market.

Unusually, Earthworks initially sent me an early production model of the SV33 — so keen were they that I should have time to evaluate this new mic in depth ahead of the publication deadline. This first example was finished in every technical respect except that manufacturing delays meant it lacked the mounting hardware and accessories with which it would ship. However, near the end of the review period I received a second mic drawn from the first ready-to-ship batch, allowing me to check out the finished mounting arrangements and accessories, and to confirm the sound quality.

### Vocal Point

Of course, Earthworks have made dedicated stage vocal mics before — Paul White reviewed the SR40V in December 2011, for example — but the SV33 takes a rather different approach as it is intended primarily

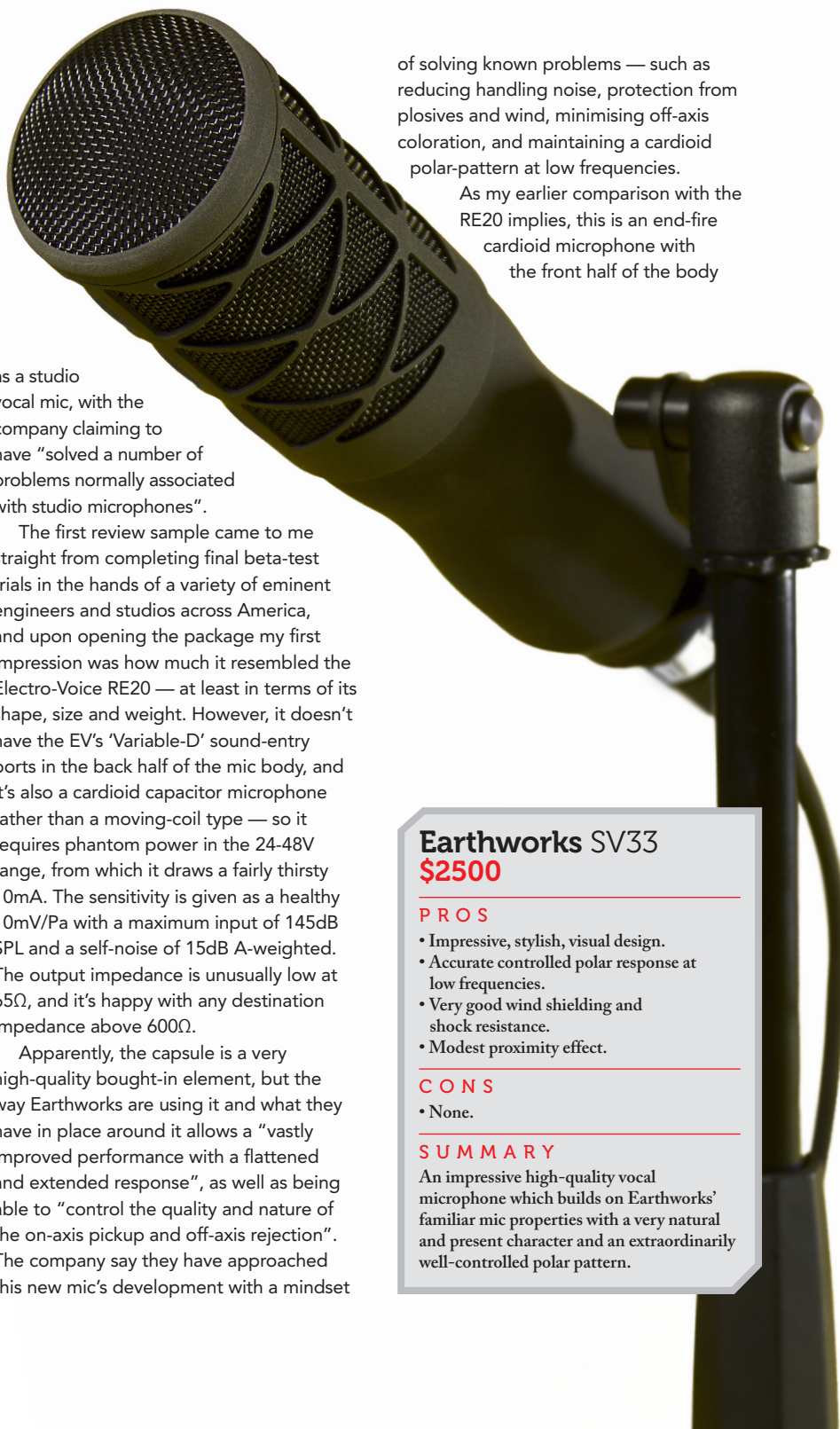
as a studio vocal mic, with the company claiming to have "solved a number of problems normally associated with studio microphones".

The first review sample came to me straight from completing final beta-test trials in the hands of a variety of eminent engineers and studios across America, and upon opening the package my first impression was how much it resembled the Electro-Voice RE20 — at least in terms of its shape, size and weight. However, it doesn't have the EV's 'Variable-D' sound-entry ports in the back half of the mic body, and it's also a cardioid capacitor microphone rather than a moving-coil type — so it requires phantom power in the 24-48V range, from which it draws a fairly thirsty 10mA. The sensitivity is given as a healthy 10mV/Pa with a maximum input of 145dB SPL and a self-noise of 15dB A-weighted. The output impedance is unusually low at 65Ω, and it's happy with any destination impedance above 600Ω.

Apparently, the capsule is a very high-quality bought-in element, but the way Earthworks are using it and what they have in place around it allows a "vastly improved performance with a flattened and extended response", as well as being able to "control the quality and nature of the on-axis pickup and off-axis rejection". The company say they have approached this new mic's development with a mindset

of solving known problems — such as reducing handling noise, protection from plosives and wind, minimising off-axis coloration, and maintaining a cardioid polar-pattern at low frequencies.

As my earlier comparison with the RE20 implies, this is an end-fire cardioid microphone with the front half of the body



### Earthworks SV33

**\$2500**

#### PROS

- Impressive, stylish, visual design.
- Accurate controlled polar response at low frequencies.
- Very good wind shielding and shock resistance.
- Modest proximity effect.

#### CONS

- None.

#### SUMMARY

An impressive high-quality vocal microphone which builds on Earthworks' familiar mic properties with a very natural and present character and an extraordinarily well-controlled polar pattern.

comprising a large-diameter cylindrical grille, and the rear half a solid body machined with a subtly narrowed 'waist'. The review model has a nice dark grey Nextel finish, and the overall dimensions are 210 x 50 mm, with the grille occupying the top 75mm or so. The microphone weighs a chunky 572g with the production mic-stand adaptor, and that makes it a little too heavy to use hand held — although that waist in the body makes it sit very comfortably in the hand!

### How's It Hanging?

The base of the mic features a threaded 'stalk' housing the XLR connector, and this accepts a metal L-shaped bracket that terminates in a pivoting 5/8-inch threaded stand adaptor (the review sample wasn't equipped with a 3/8-inch adaptor for European mic stands). As a result, the stand adaptor ends up roughly a third of the way along the side of the microphone, and off to one side, and while this allows a full range of adjustment, its offset nature means that the centre-of-gravity is also offset to the side. As a result, if the mic is attached to a boom arm it naturally wants to rotate to a position below the arm when

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the boom clamp is released. Of course, a lot of mic mounts suffer similar 'gravitational pulls' and it's really not a problem if the rotation is anticipated, but the weight of the SV33 means the rotation may catch out the unwary! I'm told a threaded plastic sleeve that converts the mounting stalk into a plain tube for use with RE20-style clamp stand adaptors will also be available as an accessory (and I've tested that as one came with the initial review model).

I must admit that I was expecting the microphone to be supplied with some sort of cat's-cradle shockmount, but I am assured that an elastic suspension is generally unnecessary as the capsule has

been mounted internally in such a way as to minimise its susceptibility to mechanical vibration and handling noise. Hands-on testing quickly revealed this to be quite true: the mic is extremely resilient and an isolating shockmount would probably only be required in the most extreme conditions. Having said that, I've learned that Earthworks are actually working with Rycote to develop a bespoke shockmount system for the SV33 microphone, and this should be available early in the new year.

The mic doesn't come with a foam popshield either, and again Earthworks say that the traditional windscreen is unnecessary in most circumstances, too, at least from the point of protection from plosives (though it might still be desirable from a hygiene perspective). By holding the mic up to the light the capsule can be seen clearly as a slim tube extending from the body of the mic but stopping a good 40mm from the top of the grille, and the multi-layered wire mesh surrounding it is extremely effective — far more so than any side-address capacitor mic I can think of — largely because its inner surfaces are a long way from the capsule's diaphragm.

Physics tells us that the further away the windshield, and the larger the volume of 'still air' around the capsule, the more effective the suppression of wind noise artifacts. That is demonstrated very effectively here.

I mentioned the slim capsule behind the grille (and in fact the capsule diaphragm measures only 14mm in diameter, set within the mics' large 50mm diameter grille); this small size is a key element in Earthworks' optimisation of the time-domain performance, and is consistent with many of the company's other studio microphones, of course. The microphone's useful bandwidth is given as 30Hz to 33kHz ( $\pm 2$ dB) measured at five inches (127mm), and that generous bass extension (for a cardioid mic) remains for more distant sources too. Bring the source and mic closer together and the proximity effect boosts the bass, inevitably, but in a well-mannered way that adds scale and warmth, without becoming boomy or uncontrolled. Like all Earthworks mics, the SV33 maintains the heritage of excellent transient clarity, and the company claim the SV33's impulse response is much better than most large-diaphragm mics.

### Play Your Cardioids Right

Another advantage that comes with a small diaphragm is better polar-pattern

### Alternatives

The shape of the SV33 brings to mind alternatives like the **EV RE20** or the **Shure SM7B**, but these are both moving-coil rather than capacitor microphones with all the innate character that this configuration bestows. Price-wise, the SV33 competes against the likes of the **Neumann TLM67**, although as a small-diaphragm capacitor microphone perhaps a more appropriate comparison might be the **Neumann KMS104**.

consistency across a wider frequency range. Most large-diaphragm mics tend to get pretty 'beamy' at high frequencies and tend towards omnidirectional at low frequencies, inherently leading to significant coloration of off-axis sources. However, the SV33 has been designed to maintain a remarkably consistent cardioid polar pattern even at the low end, and this brings the twin benefits of a wide frontal pickup angle (up to around 60 degrees off-axis) without audible timbre changes, and natural-sounding spill from off-axis sources, which are essentially just attenuated, rather than attenuated and coloured!

For me, the most obvious practical aspect of this polar-pattern consistency is the impressive level of low-frequency rejection of off-axis signals, and this is substantially better than most large-diaphragm mics. This characteristic obviously makes a very big difference when recording vocals in the studio along with other performing instruments, but it can also be highly beneficial in vocal booths too, especially where the acoustic treatment is not all it should be to control the low end properly — which is commonly the case in small project studios. »

### In Use

I used the mic to record a singing guitarist friend, mounting it in place of his preferred Shure SM7B dynamic microphone, and we were both immediately impressed with the accurate character it portrayed of his voice, with great detail and a 'right-in-front-of-you' presence. The sound was very natural and life-like, with a level of immediacy that is very attractive and which I have come to associate with Earthworks' products.

The second aspect that quickly became apparent was the greatly reduced low-end spill from a Bose L1 mini line-array, which he uses for foldback. This manifested as a remarkably clean and spill-free vocal track — far better than possible with any large-diaphragm capacitor mic tried previously (and the reason he settled on the SM7B in the first place). When playing an acoustic guitar, the spill from that into the

## History Lesson

David Blackmer was one of the professional audio industry's leading design authorities, and his inventions and inspirations continue to influence the industry to this day.

He founded the dbx company in 1971, initially to market an expander (the dbx 117), which was designed to restore the dynamic range on consumer analogue tape and vinyl releases. Subsequently, the same core VCA system was enhanced to allow compression as well, and that then led on to his famous dbx Type-I analogue noise-reduction system, which rivalled Dolby's more elaborate (and more expensive) professional offerings. In the late 1970s and early '80s there were over 200 vinyl albums processed with dbx Type-II, which (theoretically) provided a dynamic range of up to 120dB! The company went on to build a range of equally successful studio compressors like the dbx 160 VU, and Blackmer's high-quality audio-VCA designs also became virtually ubiquitous in a great many large-format mixing-console automation systems by the mid-1980s.

However, he was also a pioneering researcher into the time-domain acuity of human hearing, arguing passionately in AES papers and conferences about the significance of the ear's ability to resolve timing

information down to 5 microseconds — often against great scepticism.

Blackmer sold dbx at the end of the 1970s and went on to set up Earthworks Audio in 1980, specifically to develop microphones, preamps and reference monitor loudspeakers with accurate time-domain performance. This requirement inherently demands a wide operating bandwidth, and so Blackmer's electronic designs routinely maintained a flat response out to 100kHz or more, while the bandwidth of all his microphone and monitor transducers exceeded 25kHz, with some managing 40kHz or more. Frustratingly, though, many customers missed the point and focussed on the ultrasonic bandwidth of his products, rather than appreciating the underpinning time-domain performance.

In the latter years of his life, David Blackmer developed a new engineering model of the human hearing system that promoted the importance of time-domain resolution, and today his ideas on the subject are widely accepted — no doubt in part because it is now so much easier to build sufficiently precise transducers and electronics with which to test and demonstrate his theories. David Blackmer died in 2002 at the age of 74, but his widow, Heidi, and David's son Daniel now co-own and run the Earthworks company and further David Blackmer's technical concepts.

» vocal mic was also a lot cleaner and more natural sounding than most standard studio mic alternatives.

The SV33 certainly looks the business and feels both solid and tough, but also delivers a very classy and modern sound full of detail and clarity, without being edgy or harsh at all. These qualities arguably justify the price alone, but the tightly controlled polar pattern at low frequencies is also a great bonus, especially if recording vocals with the band! Putting my old and dusty broadcaster's cap on, the SV33's attributes would also make a really great presenter's

mic in a broadcast studio.

Given the mic's very natural sound character, I wondered how it would work on a range of other sources, and tried it on acoustic guitar, electric guitar and bass amps, Leslie speakers (I used it on the top rotor with the back panel removed without any wind-noise issues), a 'cello, and even a silver band bugle! All were handled very nicely indeed, and I have to say this is a very elegant microphone which performs superbly in a wide range of applications far beyond its primary role as a studio vocal mic. It has to be

said that the SC33 is quite expensive, at \$2399 in the US, competing head-on with the likes of the Neumann TLM67 or even stereo pairs of TLM103s or AKG C414 XLSs! Nevertheless, the SV33 expands the boundaries of Earthwork's portfolio in an interesting new direction and this mic is well worth an audition. **///**

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