

# Earthworks QTC40 & 521 ZDT

Representing a fabulous dynasty of top drawer mics, Earthworks continues to expand its range and reach. **JON THORNTON** samples a choice pair of omnis and a pair of pres.



Earthworks was set up to develop state-of-the-art loudspeakers to sit on the end of the record/reproduce chain and it was the need for measurement tools that exceeded accepted industry standards that led it to develop its first omnidirectional microphone. And while the loudspeaker did eventually come to fruition, it was the development of its microphones that grew the company.

Philosophy wise, the Earthworks mantra is about absolute realism. Not for them any notion of 'character' in the microphone or any other part of the signal chain — such non-linearity is, in their view, simply an acceptance of inherent shortcomings in conventional approaches to microphone design. Central to the Earthworks quest for transparency are two key ideas. The first is that a microphone's amplitude response should be linear well above the accepted range of human hearing — to 40kHz or more. The second gives primacy to a microphone's accuracy in terms of impulse response even over and above absolute amplitude response, and again across a wider frequency range than the standard 20Hz–20kHz. The argument here is that the human auditory system is complex and sensitive to the interactions of high frequency transients not necessarily resolved as tones.

While you can agree or disagree with this thesis (there's a paper on the Earthworks website that goes into more detail), what it does do is define some of the key design decisions. Omnidirectional, small diaphragm is pretty much the only way to go so it's no surprise that this approach is at the heart of the flagship QTC series. The acronym stands for Quiet Time Coherent — the 'Time Coherent' part we've already discussed, and as for 'Quiet' — well it's a nod to the compromises made in terms of diaphragm size versus noise. I have three earlier Earthworks models in the mic locker — great as a Decca Tree, but their Achilles heel has always been their noise level — so

I was curious to see how the QTC range compared.

There are three microphones in the range, the QTC30, QTC40 and QTC50. The number is broadly indicative of the frequency response — relatively flat up to 30, 40 or 50kHz respectively, and down to sub 10Hz in all cases. A matched pair of QTC40s were supplied for review. Visually they adopt the fairly conventional 'ant eater' form factor, with the capsule positioned at the end of a tapering snout to minimise high-frequency masking in the rear pick-up. Published specs for frequency and transient response are impressive — frequency response is quoted as 4Hz–40kHz +/-1dB, and a graph shows almost complete diaphragm settling within 100 micro seconds. Electrical sensitivity is quite high at 30mV/Pa, and noise a respectable (although not large diaphragm threatening) 22dB (A). This does, on paper at least, make them about 3dB quieter than the standard Earthworks TC range. Despite the 'Q' in the moniker, these still aren't the quietest of microphones and while the paper spec puts them on a par with similar small diaphragm omnis, they sound a bit noisier than my DPA 4006s, although they are an improvement on my old Earthworks TC30s.

Not content with applying the design philosophy just to microphones, Earthworks has also in recent years released a range of mic preamplifiers. Called the ZDT (Zero Distortion Technology) range, they aim to go as close as possible to a 'straight wire with gain'. The original ZDT range is available in single, dual or four channel standalone flavours but also supplied for review were a pair of 500 series ZDT pres, based on the original designs.

I say 'based on' because a key differentiator of the originals was the use of all discrete components with no ICs in the signal path. However, a quick peek inside one of the (surprisingly light) 500 series versions reveals a fair smattering of ICs. Nevertheless, the key specs in terms of frequency response (2Hz–100kHz +/-0.1dB), slew rate (22V/microsecond) and distortion (0.0001%) are identical. Functionality is identical too. You get a stepped gain control (5dB steps from +5 to +60dB), toggle switches for phantom power, polarity reverse and output muting and a single LED to indicate output level approaching maximum (+21dBu). As well as the balanced output on the rear of whichever 500 series chassis it's mounted in, there's also a parallel balanced output on TRS jack located on the front panel. This works in conjunction with a variable output control, which essentially allows the output to be attenuated by up to 20dB.

The pairing of the ZDT pre and the QTC40 is, as you'd expect, a good one giving an overall sound that does really put you right in front of any instrument. An initial walk around a single QTC40 shows a very consistent pick-up, with a very slight softening of the sound off-axis that's only really noticeable when used close to source. What's really noticeable here is the free field response, which is quite startling in terms of resolution and detail. You've got to be a little careful with positioning as a result, especially in smaller or less than ideal recording spaces, as the influence of the room can intrude rather than add to the sound.

A single QTC40 on a 12-string acoustic guitar yields a result that is instantly gratifying — balanced, plenty of weight, not at all harsh and full of that HF harmonic detail that really brings a sound to life — but I did find myself moving the microphone a little closer to source than I usually would with an omni and made judicious use of baffles at the rear of the microphone. And as the choice for a (3m) distant room mic coupled with a close mic on an electric guitar cab, it was the first to be ruled out — in this type of application it really does tell you everything about the room including the good, the bad and the ugly. The airbrushing effect of a decent ribbon is much more to my taste here.

Stick a pair of them on a drum kit, though, and they tell a completely different story. As a kit pair for a minimum mic set-up they really are exceptional. Yes, the issues above are still there to an extent — but put a good kit in a decent sized room, spend a little time tweaking placement and give the kick a little close-miked fill-in and the results are compelling. It's hard to put it into words, but there's an immediacy and vitality to the sound, and such a sense of attack and precision, that really brings this most difficult of instruments to life. Given a good, transparent, quiet preamplifier (the 521 ZDT fits the bill nicely) and a decent recording space, the QTC40 offers something very special. ■



## PROS

Accurate, lifelike and detailed sound; consistent polar pattern; superb transient detail; delivers everything about the space.

## CONS

Not the quietest; care needed in placement in less forgiving environments.

## Contact

**EARTHWORKS, US**  
Web: [www.earthworksaudio.com](http://www.earthworksaudio.com)