

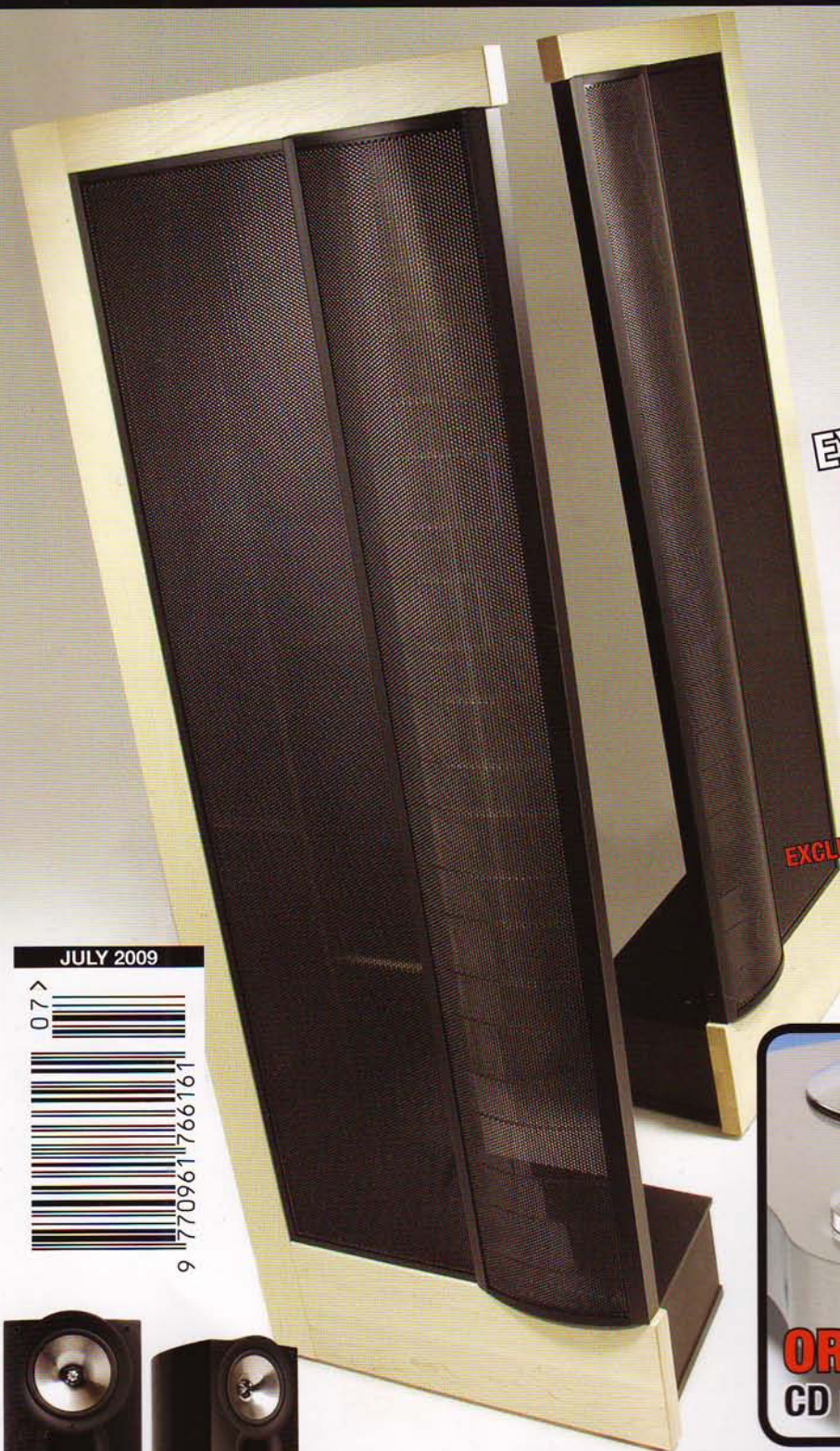
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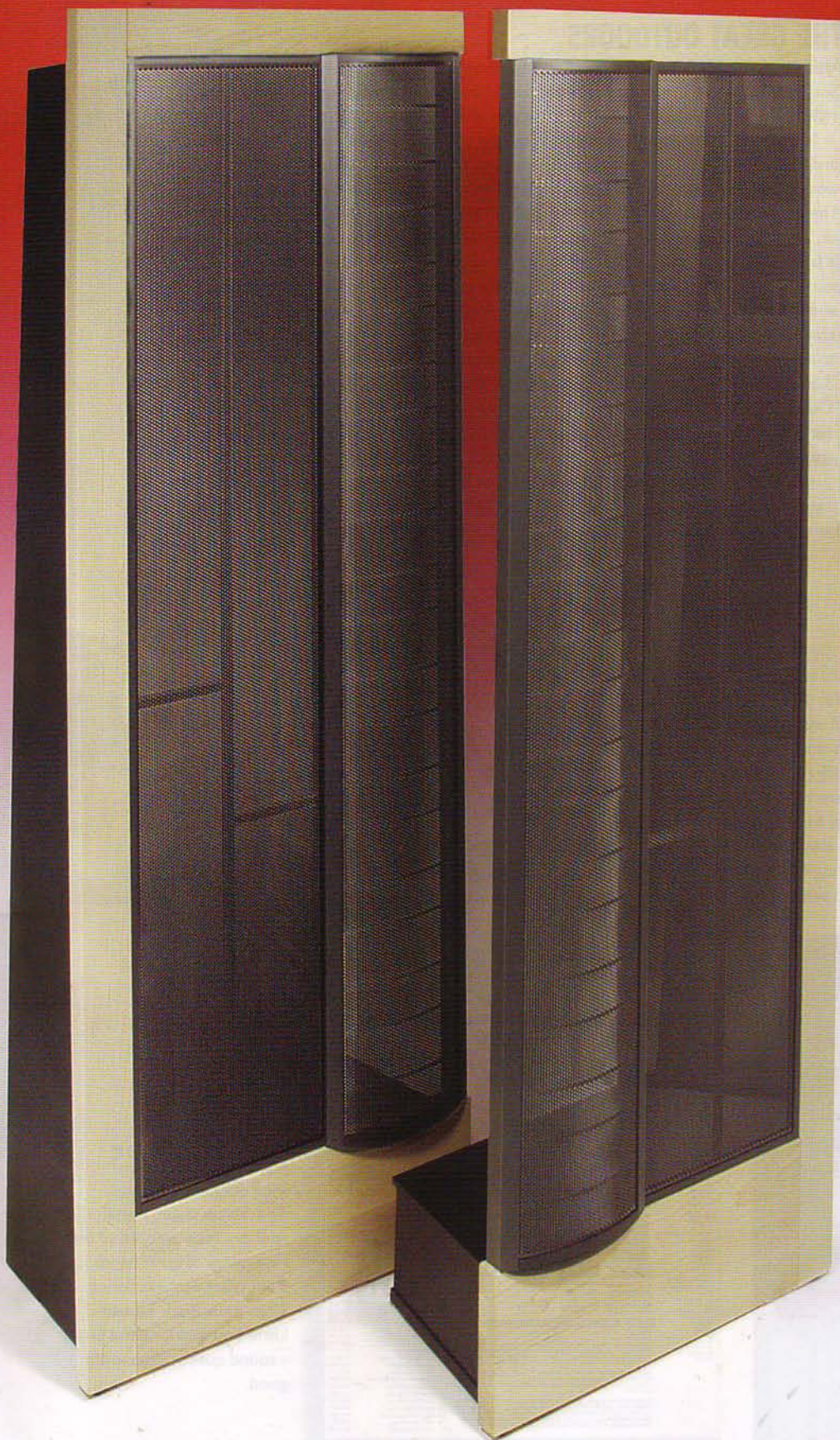
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13 PAGES OF LETTERS - THE BEST WINS A PAIR OF KEF iQ30 LOUDSPEAKERS!



Film Star

Martin Logan's new CLX Linear electrostatic loudspeaker is a flight of fancy for the few. Noel Keywood joins the jet set..

"We solemnly agreed to change into black and meet in

due course in the workhouse" said Gilbert Briggs, founder of Wharfedale, after hearing the first demonstration of a full range electrostatic loudspeaker in 1955. Quad's first electrostatic sounded so good it seemed to spell the end of the conventional box loudspeakers, which Wharfedale were making in large quantities at the time. It didn't turn out like that of course, for reasons that Gilbert later lists, but since then a small group of dedicated manufacturers around the world have continued doggedly onward developing this esoteric way of producing sound. Premiere among them is Martin Logan, who launched a new top model one year ago, the £25,000 CLX Anniversary.

But I'm not reviewing it here. Instead I am looking at the newly launched standard production model, the CLX Linear, which you'll be pleased to know is much less expensive - just £15,990! It has all the same working parts and sounds identical to the Anniversary, I am told, only the price and level of finish are different.

If £16k, less 10p, seems like a lot of money to spend on something that uses Clingfilm instead of loudspeaker cones to move air - it is! The CLX's best known rival is Quad's 2905, priced at a slightly more accessible £7,990 and the little known Kingsound Prince II from Hong Kong, fit for paupers at a devastatingly low price of £2,995 and reviewed by me in our April 09 issue. The Prince II and the Quads give amazing sound so the big CLXs should, in a sane world, give proportionately more. But as I ruefully watch open Bentleys drive this way and that directly the sun comes out I realise that for some, £16k is a mere bagatelle and proportionality doesn't come into it. For some, only the best is good enough and they can afford it, in which case the CLX Linear nicely partners the Bentley. The rest of us can at least dream - or perhaps sneak a visit into a showroom to hear what an ultimate electrostatic sounds like, or hope that their importers, Absolute Sounds, will have them on demo at the Audio 09 Show in September (see www.chestergroup.org). If so, it could even be me that demonstrates them to you, because I'm slated to run demos

at that Show and need a pair of electrostatics! I am adept at hustling manufacturers for a good cause, so we'll see...

Having just returned from an after-6pm session in our listening room rounded off by the stridently forceful yet insinuating voice of Ariel Ramirez singing 'Missa Criolla', backed by a heavenly choir stretched slightly above me in a wide arc across the room, with a power and delicacy that was both awesome and beautiful at the same time, I'm reminded that big electrostatics border on a religious experience. If you want a choir of angels singing with heavenly purity from wall to wall across the end of your lounge then there's no better way to achieve it than this. Vocalists sing slightly from above - I preferred to sit just below centre - and are perhaps slightly larger than life image wise, making their presence imposing. The CLXs look big and the sound stage they throw is every bit in keeping with their physical size.

But you will need a big room, because the CLXs stand 176 cms high and are 66 cms wide so they have a looming presence. They fire as much sound backwards as forwards - there is no cabinet - and the rear sound needs to be 'lost' to some reasonable degree if midrange and high frequency muddle is not to set in. We ran them 6ft forward of a rear wall and had 22ft to play with down our 28ft room. Behind them, against the wall, were placed absorptive panels to soak up higher frequency rear radiation. This turned out to be fine tuning however. The CLXs drive a room over a large area and are reasonably uncritical about their environment, I found. Like the Prince IIs they dominate it acoustically and sound balance did not change dramatically down the length of the room - there were no low frequency

"the sound stage they throw is every bit in keeping with their physical size..."

pressure nodes. Even off-axis the sound balance held up, although being a directional dipole treble does fall away. However, so much musical energy is being pumped into the room and bouncing off the walls that the diffuse field is strong and I could walk around and still appreciate music. Because of their sheer size though a room at least 20ft long is needed and 30ft or more would be ideal. Being relatively wide they don't blend in visually and need to be 8ft

or so apart. At 56kgs apiece they are weighty too, and can be tilted forward or backward by adjustable spikes.

The CLXs have a tall, narrow treble panel for smooth lateral dispersion, flanked by large, flat bass panels. Total area is increased by a single side baffle, to smooth and deepen bass. This is an issue with any open panel loudspeaker - the bigger the panel area the deeper the bass.

The CLX comes in handed pairs, the treble panel on the inside edge as usual, for a smooth response untainted by reflections off the bass panels. They need mains power, to generate a static charge on the moving film, which carries a special resistive coating.

So why is the CLX so costly? One significant benefit of Martin Logan panels is their transparency to sound produced by the Mylar film diaphragm, that must disperse through the perforated stator panels. The company also use a curved cross section and strengthening ribs for mechanical strength, and a special coating to prevent high voltage arcing and make them safe. As a result the treble panel is acoustically very transparent, as well as visually transparent of course. This is a lot different from Quads, that have an array of protective covers that obstruct the flow of sound from their film diaphragm. I removed both the outer sock and protective metal grilles of Quad ESL-63s I once used and this improved resolution of fine detail significantly, so it is an issue with electrostatics. The bit you need to hear is buried deep inside, like the filling of a sandwich, and if its properties of low mass and minimal colouration are to be appreciated then the acoustically transparent perforated panels of Martin Logans are likely the best way of doing so.

The vertical high frequency panels work from 350Hz all the way up to 20kHz. Below 350Hz Martin Logan use double layer bass panels to develop sufficient bass drive, comprising two driven films sandwiched by three stators. They are split into sections of differing sizes to avoid a single main resonance, Martin Logan tell me.

Electrostatics are known for bass that 'drifts' from the loudspeaker, bass that lacks slam. With the CLX



Treble panel is curved to smooth frequency response and improve dispersion.

Martin Logan have eliminated this by increasing motor power, to overcome air load damping (which is considerable), and they have extended front-to-rear path length by the use of that single side baffle. So the CLX has been designed to deliver bass slam, yet it draws almost no bass current (or power) from an amplifier to do this, due to high impedance below 100Hz. This is especially complementary to valve amps, minimising bass distortion.

In their handbook, which you can download (go to www.us.martinlogan.com/literature/manuals_current.html), Martin Logan suggest the CLX is kept away from side walls, but Peter Walker of Quad liked to use side walls to increase panel area and, therefore bass, pushing Quads up against them. It strikes me this positioning will suit a long narrow room - then the wide walls are best damped using curtains or such like, Martin Logan suggest. Our measurements show the CLXs go very low, down to 40Hz (-6dB), which is lower than most box loudspeakers, and their dipole radiation pattern little excited our listening room's main mode at 24Hz, something I also noticed in use. Wherever I listened in the room, even against a wall (which is a high pressure point) there was no bass boom, or 'room boom'. So the CLX has strong



bass that runs deep, but it does not excite room boom and this helps keep things lean and clean. This is a positive feature of dipole radiation and contributes to bass quality, but you won't find it discussed anywhere because how a dipole works in a room is little understood - and probably not understandable either without the aid of computer modelling.

One of the many drawbacks of

"If you want a choir of angels singing with heavenly purity from wall to wall, there's no better way to achieve it than this..."

electrostatics that Gilbert Briggs went on to list was limited power handling. This is another area where Martin Logan's electrostatic panels excel. Quoted power handling is a massive 225 Watts, but this is peak power. The suggestion here is that amplifiers up to 200 Watts or so per channel be used. However, our measurements showed the CLX has a reasonably normal sensitivity of 84dB Sound Pressure Level from one Watt (2.8V) input so they

will work from low powers, unlike the

Prince IIs, and in use our Icon Audio MB845 valve power amplifiers never swung more than 20V peak (50 Watts peak) across them - playing Darkness at shattering volume! So the big CLXs don't demand big power, giving plenty of leeway in amplifier choice. As always I recommend a valve amplifier; the transparency of an electrostatic like the CLX does transistor amplifiers no favours at all (I tried one and it sounded like a cat being strangled).

Worse, anyone aware of an electrostatic foible that Gilbert never did

mention may have spotted in our tests that the CLX falls to 1.5 Ohms load at 20kHz and some transistors may blow if faced with delivering a strong signal into this, whilst valves are unaffected.

SOUND QUALITY

I'll talk about bass quality first because that is where the CLX really does deliver and where it justifies its

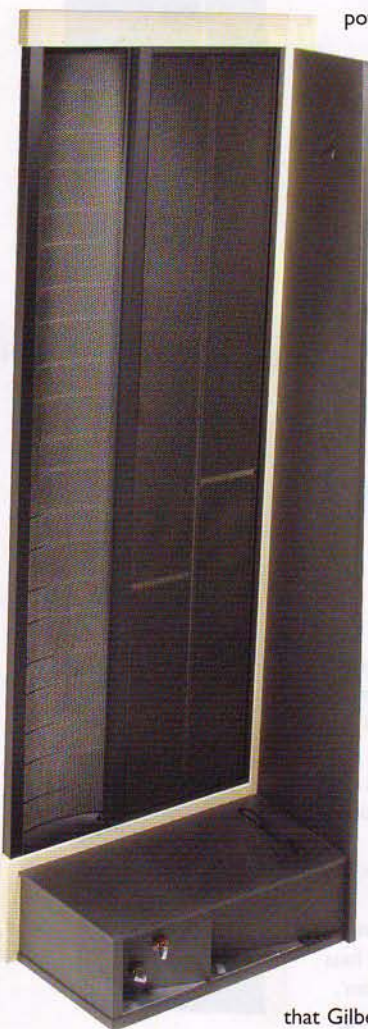
price. In the past I have had glimpses of awesome bass quality from electrostatics, mainly from a friend's pair of Quad ESL-57s positioned at right angles to side walls in a long, narrow room. Improbably, he played reggae through them and I'd never quite heard bass like it, because there was no box boom nor the waffle that comes from overhang; it was clean, tuneful and tight mechanically, and beautifully expressive artistically. Well, now I have - and better, for not only do the big CLXs deliver clean, tuneful bass, they also have unlimited bass power it seems, more than my ears could tolerate anyway. I mentioned earlier the air load on a big panel damps it well, preventing overhang - and it is this last property that struck me most about the CLXs. Take a big drum roll like that at the start of Steve Earle's 'Copperhead Road', a favourite tester of mine, and the drum has wonderful resonant power but there's slightly less characterful richness because of the complete absence of box whoomp - then the sound stops suddenly and cleanly. This gives an unusually clear sense of rhythmic pace with perfectly explicit timing. The CLX gets it all very right at low frequencies in a way that few others can approach. The absence of room boom I mentioned earlier eliminates subsonic waffle, so the emphasised walking bass lines that are a feature of Angelique Kidjo albums strode along cleanly, with a lovely sense of pristine power and nothing following in their wake, the background phantom of decaying room resonances. I can't say how this compares with Quad 2905s, which have bass panels, because it is some time since I have heard them, but the Prince IIs were less even in their bass. Also, where the Prince IIs had a slightly dry balance due to their low

midrange suckout the CLXs sound tonally even and perfectly natural.

Whilst the way bass notes stop is something that had me spellbound, because electrostatic bass is a chimera of perfection that the CLX makes a tangible reality, at the same time there are other sides to this. Firstly, not every recording has a bass line captured in perfect fidelity and the CLXs do make this rudely obvious at times. So spinning 'Cherry Oh Baby' had the bass line sounding obviously soft and undistinguished, but that's what you might expect from old 1970s recording made in a Jamaican reggae studio. Spin the UK UB40 version from 1984 and the differences are obvious. Bass apart though, early reggae stood up very well through the CLXs, the simple studio mixes making for an uncluttered and natural sound stage on which individual musicians and backing singers were clear in both outline and contribution. But then, early Elvis recordings made on quality Westrex equipment shame the middle of much of today's over-mixed studio output. The CLXs surprised me at times by taking what you might expect to be grungy early seventies recordings from a decrepit Kingston studio and showing that in truth their simplicity is a strength that allows the atmosphere and musicianship to shine through.

Whilst on the subject, I did notice that the rumblingly low content of Robbie Shakespeare's bass line on 'Make 'em Move' was lighter than I am used to from big ported loudspeakers; the very lowest frequencies are there but have a little less power than from a box. However, there's a trade off here: cabinets with ports will shake a large room subsonically, but that same energy blurs bass lines too. The CLXs are surgically clean and correct in what they do, but partly because they don't emphasise ultra lows.

The stunning clarity of the CLX had most impact with solo artists singing centre stage, because they construct a large but sharply outlined image, with celestial positioning above the listening axis. So Toni Braxton sang down at me, plucked guitar strings in the opening of Spanish Guitar coming at me with lacerative speed. With the resonant decay of each string tailing away into a believable acoustic ambience, and Braxton's every draw of breath, movement of lips and smallest intonation painted larger than life before me I couldn't help but sit there stunned. Listening later, Editor David Price said, "well, there's no criticism to be made of that", and





The base houses a power supply. It has single-wire inputs that accept 4mm plugs, and it has two light switches.

that understatement sums up the CLX in basic outline: an electrostatic so well crafted it is an 'other world' experience. But still, let's get a bit more into it...

Those guitar strings had just a smidgen of enhancement, a sheen that I found I could adjust down slightly by toeing the CLXs a few degrees in or out. The cause is visible in our frequency response plot: there is a small amount of high frequency lift above 8kHz, just enough to shed a little extra light on higher frequencies. This brings added bite to plectrum against guitar strings on Jackie Leven's 'Desolation Blues', much as it did to Toni Braxton's 'Spanish Guitar' - and also helps etch stereo images more strongly. Especially where there's a wide stage spread of individual percussion instruments, as at the start of Sade's 'Diamond Life', where the CLXs bringing more substance to each than most loudspeakers. Their balance was also less dry than the Prince IIs, giving Jackie Leven's deep Celtic drawl a firm sense of body.

The contribution of backing singers and instruments is picked out with forensic precision, helping me spot a little embellishment from one singer whispering a small Spanish phrase behind Toni Braxton, one that it is probably best I don't understand! I was constantly aware of a wealth of fine background detail through the CLXs, and this made obvious the amount of activity in many performances, behind the foreground vocals and main instruments, the funny twiddling of drum sticks that seems to be going on behind the Zuton's 'Valerie' for example.

The smooth, punchy bass of the CLX brought both acoustic power and visceral impact to the many bodhrans used by the Chieftains at the start of 'The Fokie', their assault pressing me back in the settee. This is where the CLX matches conventional loudspeakers in sheer power, but surpasses them in control and clarity. Sinéad O'Connor's sparse, plaintive delivery, projected forcefully from centre stage made me hold my breath, the tremolo in

her voice clearly underlining the message of personal loss in the lyrics. Performances like this are simply breathtaking from the CLX, arguably unmatched by any other loudspeaker currently available.

The CLX's abilities transfer over to classical music without limitation. They make obvious that orchestral violin sections comprise many individual violins working together, rather than presenting a simulacrum of a group of instruments that is so common. Their physical presence wasn't distorted by the crossover phase anomalies that afflict conventional loudspeakers either. This fact alone brought a sense of natural embodiment to Nigel Kennedy's violin and made strings sound smooth and vibrant, as well as finely differentiated.

Tubas huffed and puffed fruitily in Korsakov's 'Scheherazade', brass sounding lovely and brassy, without the steely patina common from today's metal cones. The full sweep and scale of an orchestra was better conveyed by the vast canvas of sound

these loudspeakers project than the narrower letterbox sound stage of cones. With kettle drums having plenty of resonant power and choirs massive scale, I can't think of any way in which the CLXs could be found wanting with classical music.

Bearing in mind that electrostatic loudspeakers are a difficult technology to master, what Martin Logan have achieved with the CLX is impressive; they are a near perfect exponent of the art. Technically and subjectively their tonal balance is convincing, sound from the mylar film is unobstructed by the stators for unrivalled insight, detail retrieval and clarity, bass power is plentiful and maximum volume very high. They don't demand high power inputs too; I used 24 Watts (rms) maximum to go extremely loud in a large room. Gilbert Briggs would have been shocked to hear them, but he still would have listed the need for a large room to enjoy them and a pocket that isn't a lot smaller. So fetch the Bentley please James, it is time to visit the bank manager!

VERDICT

A meticulously crafted electrostatic that's free from traditional limitations, this is one of the very best loudspeakers money can buy.

MARTIN LOGAN

CLX LINEAR £15,990

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FOR

- sparkingly clear
- finely detailed
- powerful bass

AGAINST

- imposing physical size means large rooms only!
- price

MEASURED PERFORMANCE

The vertical high frequency panel of the CLX is a little directional, but less so than the budget Martin Logan models; moving the measuring microphone laterally in front of the CLX altered the basic high to low energy balance, rather than upsetting frequency response. This means midrange and treble remains as smooth and extended as our stepped sine wave analysis shows, moving up or down in prominence, as listening position changes, relative to bass and midrange frequencies below 1kHz. So whilst the CLX is listening position critical, it isn't too demanding in this respect. It also drove our 28ft square measuring room well, much like the Kingsound Prince II tested in our April 09 issue, giving a consistent sound over a wide frontal area.

Frequency response of the CLX is flat from 700Hz all the way up to 20kHz, so it will sound even in its midband and upper midband/treble delivery. Below 700Hz output is on average 3dB up, right down to 55Hz no less. With a monopole this would give a fulsome balance, but with a dipole it gives a natural balance, likely because the solid radiation angle and associated acoustic power is less. A low frequency peak at 60Hz (third octave analysis, not shown here) suggests there will be no lack of punchy bass. This looks like a carefully tailored euphonic

balance that will be easy on the ear.

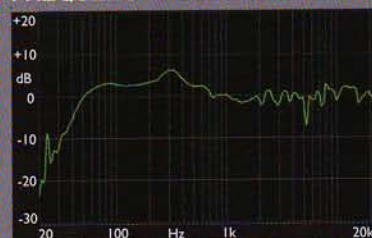
Electrostatics are usually insensitive but the CLX isn't much different from conventional loudspeakers in this area, producing 84dB sound pressure level from one nominal Watt of input (2.84V). This is far better than the 11dB less sensitive (73dB) Kingsound Prince IIs for example. The CLX is a similar amplifier load however, comprising a huge low frequency peak, our analysis shows, reaching a maximum of 125 Ohms at 16Hz, falling to 11 Ohms DCR at 0Hz and 1.5 Ohms at 20kHz. Above 100Hz impedance falls below 15 Ohms and the overall figure measured a normal 5.5 Ohms. The CLX is reactive at low frequencies only, which should not be a problem to amplifiers. Above 300Hz it is largely resistive, making it an easy amplifier load, except for the 1.5 Ohm minimum at 20kHz which could conceivably be too demanding for some solid-state amplifiers. Again, valve amplifiers cope best.

The loudspeaker's spectral decay over 200ms showed there is remarkably little colouration, a strength of the electrostatic, and decay is fast and even across the frequency spectrum, with a small amount of overhang at 60Hz as expected. Distortion

levels were a little above conventional loudspeakers and varied across the bass panel area below 100Hz, falling from 3% at 40Hz down to 1% or so at 100Hz, then around 0.3% up to 1kHz, falling to 0.1% to 6kHz.

The CLX delivers a smooth yet extended sound into the room, free from serious frequency response anomalies. The balance emphasises lows a little, for warmth and body, and low bass output is strong and deep. Its basic accuracy and smoothness of output is excellent for such a big panel, it drives the room evenly and colouration is extremely low, so this is a quality design. NK

FREQUENCY RESPONSE



IMPEDANCE

