

# The new Quad 2805 Electrostatic Does it beat the old?

AFTER 25 YEARS MARTIN COLLOMS GETS TO GRIPS  
WITH THE NEW QUADS

MARTIN COLLOMS

Self taught electroacoustic engineer Peter Walker, founder of Quad, started his own business in 1936. Although electronics was always at the heart of the operation, he also experimented with many speaker technologies, including ribbons and cone type moving-coil drivers in boxes. But he became fascinated by the electrostatic principle in the early 1950s, as the idea of a near massless diaphragm of inexpensive and repeatable plastic film which could reproduce sound with great accuracy had immense appeal.

Working with D. T. N. Williamson he succeeded in releasing the first Quad *Electrostatic* to the market in 1957. Much admired, it later became known as the *ESL-57* (sometimes *ELS-57*), to distinguish it from subsequent electrostatic models. Many are still in use today, and remain repairable both in Germany and the UK. While the UK model rather resembled a well known electric fire, Braun licensed the speaker for the German market and restyled it in the Bauhaus idiom, to great effect.

Striving for improvement, further research aided by consultant Peter Baxandall led to an entirely new prototype in 1963 which became known as the *ESL-63*, though it didn't enter production for nearly twenty years – my samples date from the mid-1980s. (For those interested, a very detailed chapter on electrostatic speakers by Peter Baxandall is found in the *'Loudspeaker and Headphone Handbook'*, now third edition, edited by John Borwick.)

The 1957 original was a two-way design with a pair of rectangular low frequency panels flanking a narrower central vertical strip 'tweeter'. Due to this top-to-bottom construction, some devotees harnessed two per channel, stacking them vertically in a tall metal frame. Run electrically in parallel they presented a truly cruel amplifier load. HIFICRITIC editor Paul Messenger ran one of these arrays for some years before succumbing to active *Isobariks*, I think in aid of greater rock involvement and a more enveloping sound field. (Actually, it had much to do with the arrival of Bob Marley on the music scene – Ed.)

In recent years Quad introduced some improved versions of the '63 called the *988* and a larger *989* variant. However the latest broadly equivalent *2805* and *2905* designs, priced for the UK at £4,400 and £6,000 a pair, represent a rather more radical upgrade of all aspects of this speaker's engineering. The International Audio Group (IAG), which now owns Quad, has its own



factory in China, and has been acquiring expertise in the production of the electrostatic. Loudspeaker engineer Steve Hewlett is an unsung hero with long experience from many years in the Wharfedale research division. He made the jump to China some years ago, and now directs the engineering at that operation. At a crucial stage, Steve enthusiastically committed himself to the betterment of the electrostatic loudspeaker, and painstakingly ground away at every detail of construction and physical design until satisfied with the overall performance now found in the new *2000*-series.

Our *2805*s stand 1.1m high, including feet, and look physically quite large at 69.5cm wide, though also fairly slim front-to-back at 38.5cm deep. (That's 43.3x27.4x15.2ins). A pedestal base contains the power supplies and electronics. Much heavier than before (I can fairly easily lift a '63 unaided despite its bulk) the *2805* weighs 34.8kg plus a further 8kg of mass loading, comes in very large packing case, and is very definitely a two-man lift.

The *2905* is 1.48m high due to two extra bass panels, increasing the number of panels from 6 to 8, but is otherwise the same width and depth. The weight increases to 41.6 kg plus the loading masses, which are steel

stabilising blocks that bolt under the bases to increase stability.

Input is via three-way heavy duty binding posts, for wire, 4mm plug or spades. Power enters via a 2m IEC 13A cord – longer ones may be required to reach some mains sockets. Top quality floor coupling hardware is provided, well engineered and finished: there's a floor screw option, soft faced feet for hardwood floors, or substantial adjustable locking spikes for carpeted floors.

### Technology

A push-pull approach essentially differentiates Quad's electrostatic design from earlier competing models, which were single-sided, with a diaphragm spaced from a single 'anode' or stator fixed element. Peter Walker adopted a push-pull arrangement for the original 1957 model, with the ultra light moving membrane held and centred between a pair of perforated electrodes, making it capable of a more linear movement and greater output power.

The competition at the time also tended to use a constant voltage for the electrode array, which results in some harmonic distortion, owing to the square law relationship between force and distance for an electric field. Quad chose to avoid this distortion by adopting a constant charge regime, so removing the square law term. In practice, constant charge means ensuring the entire surface of the membrane diaphragm is at a very high finite resistance, and polarising it to the operating voltage via a very high value resistor. The diaphragm acts as a capacitor with a constant charge, the instantaneous

voltage dependent on the drive at the moment of audio signal input. The resistance is so high that if disassembled, you may touch the diaphragm, which is polarised at 5,000 volts, and hardly feel the micro discharge, though I do not advise trying this as high voltages are found on adjacent parts of the assembly.

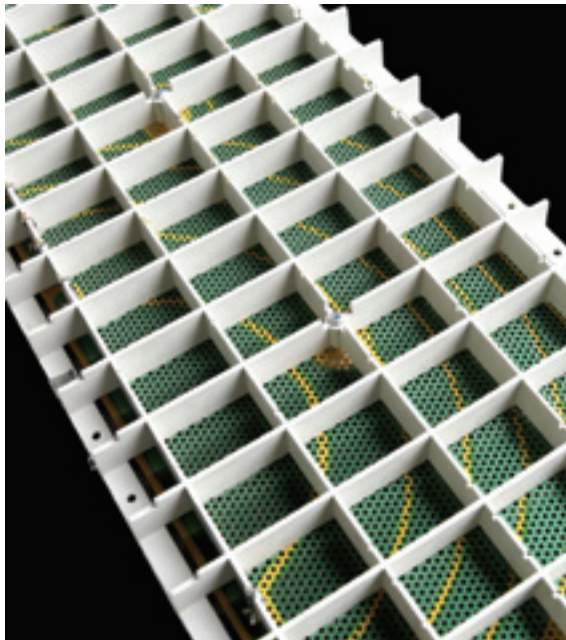
While the acoustic output of the *ESL-57* was symmetrical about the horizontal axis, its vertical off-axis high frequency performance was relatively weak, despite some moderate curvature applied to the diaphragm. This differential affects the smoothness of the power response, and consequently the voiced room acoustic. Peter Walker continued to dream of his ideal, an electrostatic which had to be of substantial size, yet which also closely approached the behaviour of a proverbial point source. This paradigm has perfectly correlated power and frequency responses, sounds correct in all planes and angles, and will drive the listening zone of a room smoothly, with neutral voicing of the reverberant sound. Of course a true point source cannot be attained for an open baffle panel speaker. Open panel speakers are by nature dipole radiators and provide high direct-to-reverberant energy ratios, since their sound output tends to zero at 90 degrees off-axis. This means that floor, side wall and ceiling reflections are dramatically reduced compared with regular box loudspeakers which are nearly omni-directional at low and mid frequencies.

Walker speculated that his ideal speaker would require a large rectangular form, where the diaphragm was driven in such a way that it got acoustically smaller and smaller with increasing frequency. At highest frequencies this meant a relatively small central section was acting as a tweeter with a relatively wide radiation angle. He steered away from an approach using traditional crossover networks, with their inherent acoustic discontinuities, and instead sought a well-blended, multi-stage progression from full-area panel drive in the bass through to that inner core that was almost exclusively radiating the highest frequencies.

Some aspects of this speaker proved most intractable. For example, the concept of a point source provided by an array of concentric active elements was perturbed by the acoustic discontinuity presented by the clamped periphery of the diaphragm. At this boundary the sound output suddenly ceases, resulting in diffraction ripples. The Quad team, helped by electronics guru Peter Baxandall, decided that this relatively minor aberration was unacceptable and conceived a sophisticated solution that modified the complex coefficients present in another part of the drive circuit.

A design with eight concentric rings was adopted (executed as conductive patterns of the printed circuit

A reinforced electrostatic panel showing the active electrode rings



stators), the radii critically adjusted in conjunction with the calculated coefficients of a multi-section, tapped high voltage delay line, to deliver the required progressive and concentric acoustic behaviour, including control of that defining edge diffraction. In addition this delay line is tuned so that the speaker's virtual point source is about 0.4 metres behind the panel. The listener hears a smoothly expanding wave front which is not localised at the plane of the speaker, which aids the impression of image depth.

Incoming audio power is stepped up from the low amplifier voltage to the high voltage positive and negative phases by a pair of top quality, audio grade, C-core transformers. Since the delay line requires some five miles of copper wire, high purity copper is now used, both here and in the 10,000-turn step up transformers, which is believed to improve sonic transparency.

Although such a comparison has limited validity, it's interesting to compare diaphragm masses, given that mass is a reservoir for the energy caused by speaker operation. The typical moving mass of a top class midrange cone driver will be between 6 and 12 grams, whereas the entire Quad diaphragm weighs about 50 milligrams (0.050g). The Mylar polyester film is about one tenth the thickness of a human hair, indicative of very low energy storage potential. Another interesting statistic is the ratio of moving mass to the air-load, for it is the latter which accepts the acoustic power. For a typical midrange driver it is about 10:1 while for the relevant section of the Quad diaphragm it is estimated at 1:100, a relative difference of 1,000 times. Air-load damping is clearly a feature of the electrostatic genre. While it doesn't need to move very far to produce useful bass, the actual radiating area of the 2805 diaphragm is equivalent to about six fifteen inch bass drivers (with open baffle loading of course). (The larger 2905 is equivalent to about two more such drivers.)

The latest 2805 and 2905 models have undergone intensive development to improve subjective performance up to date. Selected components have been upgraded, including output terminals, but the main gains are said to result from improved structural rigidity. The diaphragm is exceedingly light, but a considerable mass of air lies on it, and is kicked about when reproducing sound. To give an idea, a 200mm conventional driver is loaded by about 2 grams of air, whereas the Quad diaphragm is loaded by an air mass of about 50 grams. Try to move that under audio frequency accelerations, and it turns out that structural integrity matters after all, in spite of the low mass of the actual diaphragm. Alastair Robertson-Aikman, founder of SME and longstanding *ESL-63* owner, proved this over many years in his own remarkable system, by making modifications that included a 200lb inertial mass bearing

down on the loudspeaker assembly.

The new model has a substantially more rigid fabricated steel base, replacing the thin plastic shell of the '63. The frame is also massively stronger, built in steel and aluminium and further reinforced by a massive, tension-adjusted diagonal strut at the back. The injection-moulded baffle plates have been revised, superior mounting points providing stronger clamping to the frame. More rigid grilles are fitted and more securely mounted to the frame, providing a larger window area for the sound to pass through. As before, the system is tropicalised, and has extra-light dust blocking covers fitted to both sides of the diaphragm.

To conform to EU regulations, a heavy steel billet clamps to the underside, aiding stability. The speaker is designed to stand directly on the floor, with a simple electrical step network compensating for the acoustic effect of this boundary. Well engineered sets of rubber-faced feet and floor spikes are provided, but the loudspeaker may even be screwed directly to the floor for ultimate stability.

Each of these factors was found to improve clarity and focus, and their cumulative effect is easily audible. A well designed electrostatic speaker ought to have excellent musical timing, and the improved structural quality should make this promise come true in the new Quad.

From the start, the original *ESL-63* was protected from over-drive. Over voltage produces an arc which is also a source of radio frequency (RF) noise. The Quad has an RF sensor to monitor incipient arcing, to avoid progressively damaging the diaphragm and electronics. If detected a mains powered circuit activates a TRIAC-controlled crowbar which shorts the speaker terminals in 0.2 second bursts, warning the user, hopefully not damaging the amplifier, and thus protecting the speaker. Prolonged overload is limited by a Posistor, a self-resetting fuse which progressively reduces the input power and volume until overload is removed. Final diaphragm protection comes in the form of a string of back-to-back Zener diodes, which clip the peak stress voltage at about 7kV. A subtly illuminated logo on the front, based on a set of white LEDs, is powered from this protection supply, and might constitute a source of electrical noise, so a control adjusts brightness and can switch it off completely.

### Sound quality

Moving from a box to a panel type speaker requires a little acclimatisation. Positioning may need to change, and the Quad sounds best when spaced further apart than box designs. That ultra high resistance diaphragm, and the fact that it is inherently a giant capacitor, indicates that some running in will be needed to allow the charge to distribute



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*“These speakers caress the air with their ‘velocity’ characteristic, but nonetheless deliver real loudness in the listening environment.”*

uniformly and the dielectrics to settle down.

The speakers got slightly louder and clearer over the first few hours, and their performance had largely stabilised after about a week of use. My recollections of the *ESL-63* were of its accurate timbre, overall frequency range, and most particularly its transient behaviour in the subtle shadings of colour and texture of small drums and the like. A mildly fluffy bass, somewhat limited dynamic range, and finite boundaries for transparency and image depth were other characteristics, and the high treble could also sound mildly fizzy. Revisiting the ‘63, I found that my recollections were mostly correct. And when comparing old with new, it was clear that performance has been substantially improved in several key areas.

While that intrinsic neutrality has been retained, the new design is substantially more dynamic, clearer, more open, more transparent and, yes, also more expressive. While the original was fine on classical and folk programme, it tended to struggle somewhat with rock material. Leaving aside the bass end for the moment, the new Quad delivered rock and pop with unexpected vitality, speed, upbeat rhythms and high resolution. Complex, layered mixes were unravelled, while tracks featuring top class drummers were revelatory in the speakers’ ability to read both the instruments and the quality of performance.

It’s useful to consider a fundamental technical and philosophical difference between natural acoustic music and rock and electronically supported programme, which has some significance in discussing the low frequency operation of a dipole open panel like the Quad, compared with a box type speaker with piston bass. Natural acoustic music making is generally performed at a moderate distance from the listener and from the recording microphone. Here there is a degree of correspondence between this far field, near plane wave emanation, and the ‘air velocity’ wavefronts produced by the Quad. Conversely rock, and similar electronically supported music, has amplified, piston type box reproducers and sound reinforcement, providing pressure waves at low frequencies.

High sound levels and ‘pressure’ bass combine to produce a learned listening experience with rock music, where sound is felt as well as heard, and there is strong listener envelopment, and larger box type speakers can reproduce this factor very effectively in a good room. Large dipoles like the Quads do not pressure drive the listening room, nor provide high ambient sound power, so enveloping loudness and pressure bass is not really available, and again some acclimatisation is required for a fresh listener.

There’s some correspondence between the two fundamental music categories and the reproduction

provided by these two contrasting types of reproducer, and both are reflected in different aural and body sensations. You hear the velocity wavefront from the Quad, but you won’t feel it much, as it doesn’t couple with the room floor or your body. Conversely the high intrinsic energy – fundamentally pressure bass from a box – shakes the floor, rattles the windows and physically shakes you as well, giving a rather different experience.

At about 3 metres listening distance, the *2805* sounds well integrated, particularly at low and mid frequencies. At times the upper treble focus is not quite as sharp: some breathiness, and other upper frequency artefacts from synthetic instruments can sound mildly disconnected from the main sound. They can play quite loud, but no more. However, they also play tricks on you. For example, good clean loudness at the listening seat seemed fair enough, but this level showed only moderate variation when walking round the room until directly alongside, where the dipole effect was clearly audible as a large drop in volume.

The sound is projected down the room with less than the usual variation, but leave the door open and the sound is still quite loud for those downstairs, as it seems to waft through spaces. These speakers caress the air with their ‘velocity’ characteristic, but nonetheless deliver real loudness in the listening environment. Even at 10 watts peak the sound was pretty loud, and the next 10dB to 100W of peak programme does subjectively amount to a big deal. The Quads ‘throw’ sound well, and are almost as loud at a distance as they are close up.

This unusual behaviour takes some adjustment, as does the bass. Quad bass is not perfectly even, nor massively extended, but it nevertheless excels here, really showing up most moving coil speakers as relatively plodding and mechanical ‘one-note’ reproducers. As Ken Kessler has noted, Quad bass is not visceral; it does not pound your body like powerful ‘pressure’ bass designs can. Rather its ‘velocity’ wall of sound approaches you like a calm wave: a quick percussive ‘bang’ and it’s instantly past. Other large open baffle speakers, such as the Jamo *R909* with its twin 15 inch (380mm) bass drivers, can approach this crisp effect, but are still held back by having less than a quarter the radiating area of the Quad, plus dramatically more moving mass, so such a design cannot help but lack the sheer speed and agility of the Quad.

### **Put that light out!**

Halfway through the listening, we thought we had got the measure of this review *ESL*, and then I got round to turning off the illuminated Quad badges. Operating in an admittedly high resolution reference system, powering down the panel logo had a quite dramatic effect on the



sound quality, removing a certain colouration that I can only liken to the twang of a stretched plastic bag. Some excess grain and grit in the treble, by no means serious but certainly audible, also almost vanished. Clarity, focus, image depth and dynamics were all significantly improved, to the same sort of degree as you might get by changing to a better amplifier.

### Piano on the 2805

The intrinsic quality of the 2805 may be gauged by the number of difficult instruments which it takes in its stride. Piano in particular sounds boxy and wooden with most conventional speakers, and the clarity and power of a grand piano is generally so corrupted as to render the identity of its manufacturer in doubt. Not so with the Quad, which remains very faithful to the inner character of a piano recording, capably differentiating size and make, the finely graded tonal colours, and the inherent dynamic character. While it won't play loud enough to reproduce the full natural level of a piano, it does recreate the effect, especially if set further back from the listener. Left and right hands are in balance, the usual congested ringing heard in upper registers is absent, while the bass notes are 'mean' and nasal, just as they should be, not thickened and over resonant as is so often the case. The 2805 is a must for a professional pianist: you could pay four times the price and not achieve such consistent note playing accuracy and realistic timbre.

The *ESL-63* has long been a yardstick, so readily does it show up resonant stored energy problems in piston/box speakers. This new 2805 dramatically improves the resolution of fine detail and dynamics, and it doesn't have to be played loudly to express its dynamic resolution and natural dynamic range convincingly. Improved clarity makes the inherently low distortion all the more obvious. At natural listening levels, distortion is vanishingly low, as heard in the subtle gradations of timbre shown at different sound levels over a whole range of instruments and voices.

Time and time again, the Quad catches just the right nuance for complex percussion. Wire brush work on side drum comes over as a dry paper scrape rather than a buzz. Flute is well modulated but neither piping nor too 'breathy'. Saxophone is harmonically rich and full bodied but avoids stridency. Bass drums of all kinds sound almost magically percussive, delivering a hard edged 'thwhack', with clear pitch rather than a formless, tuneless soft thud. Small percussion sounds are remarkably well differentiated, in character and image location.

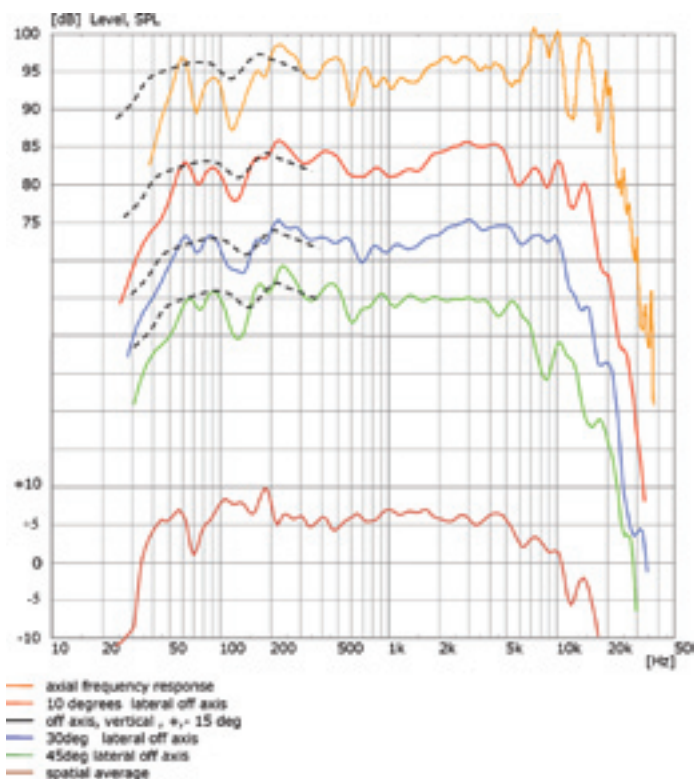
Like contemporary BBC monitor designs, the Quad *ESL-63* attempted to achieve absolute timbral accuracy, and the new 2805 keeps the faith. In a small string combo,

for example, violins are the right size and balance, the cello drives along with a crisp counterpoint, naturally weighted but not boomy. On some compositions the cello can impart a sharply timed almost percussive precision, and this is beautifully captured by the new Quad, which avoids imposing false legato to the cello sound. Singing voices are notably clear and articulate, both solo and choral, while small classic jazz groups such as the MJQ sound exceptionally intimate and involving.

### Lab report

During the review period, relative humidity was quite high, and Quad suggested my below spec sensitivity rating of 83dB/W may have been down to this, as electrostatics do vary a little with humidity. Although the 2805 is sensitive to humidity variations, I still think that the claimed 86 dB/W is a little optimistic.

When Keith Howard measured the companion 2905 for Hi Fi News he reported still lower sensitivity and: "indifferent distortion results... inferior to a B&W 802D". My previous distortion measurement experience with the original *ESL-63* had suggested quite the reverse, so I paid special attention to assessing the linearity of the new version, feeling that the purity and clarity reported by the listeners must be at least partly due to low distortion. Experience with moving coil speakers, where distortion



<b>QUAD 2805</b>	£ 4,400	
<b>Laboratory Frequency Response</b>	55Hz to 22kHz	+/- 4dB see text
<b>Off axis responses</b>	Vertical axis very good	Lateral axis very good
<b>Room spatial average</b>	+/- 2dB 40Hz to 5.5kHz	Excellent
<b>Impedance</b>	3.5ohm minimum at 20Hz	average 7ohms
<b>Amplifier load rating</b>	Not too reactive	Good
<b>Sensitivity, 8 ohm watt at 1m</b>	83 dB/W	Well below average
<b>Bass extension</b>	42 Hz for -6dB	Good plus
<b>Maximum in-room loudness</b>	102dB	Good, see text
<b>Energy storage</b>	Drivers: excellent	Enclosure : excellent
<b>Estimated power handling</b>	150W	Good plus
<b>Compatible amplifier rating</b>	Maximum 100W	Minimum 25 W
<b>Distortion</b>	0.03% typically	Very Good to Excellent
<b>Engineering and build quality</b>		Very Good

is typically 0.2 – 0.4% even at moderate sound levels, has shown that sound quality is clearly improved when the third harmonic is reduced to 0.15% or better.

I measured the 2805 at a number of frequencies, at sound levels from loud conversation (78dB) to near full loudness (98dB), and at equivalent power levels of 0.2W, 2W and 20W. Like the *ESL-63* nearly 30 years ago, results were very good overall, and quite excellent above 100Hz. For example, at 78dB SPL, distortion at 40Hz was a quite moderate 0.6% (typical moving coils are 1-2%); by 55Hz it had improved to a very good 0.25% for both second and third harmonic, and higher harmonics are largely absent. By 100Hz and at this power, distortion had dropped off the graph, at better than 0.03% for all harmonics. In fact, at 100Hz and 88dB, 0.05% second and 0.04% third harmonic was measured, and this had actually improved to 0.03%, 0.03% at 98dB.

The speaker could sustain 98dB SPL at 50Hz, with very creditable 0.18% 2<sup>nd</sup> and 1% 3<sup>rd</sup> harmonic distortion, while 0.03% (-70dB) was quite typical for 2<sup>nd</sup> and 3<sup>rd</sup> harmonics over a variety of levels and frequencies: at 300Hz, 0.02% and 0.012% respectively were recorded. A small rise in distortion was present at higher frequencies; for 5kHz, 88dB I measured 0.03% for both harmonics, while at 98dB I had deteriorated to a still excellent 0.05%! By ear, quite strong, clean output was available in the listening room down to 35Hz. Considering its overall bandwidth, this is one of the most linear speakers ever made.

The quite complex impedance curve looks worse than it really is. My power amplifier ran cool, indicating low average current, and the 2805 loading remains above 5 ohms from 65Hz to 4.5kHz, averaging 8 ohms. There is a harmless rise to 13 ohms at 180Hz, and a fairly innocuous

trough of 3.8 ohms from 6kHz to 10kHz. It fell below 4 ohms at very low frequencies, but the average power in music program is well down by this point. However, a fairly low amplifier output impedance is worthwhile to maintain a flat frequency response. Amplifiers with more than 0.6 ohms output impedance will cause shifts in tonal balance, namely recessed over-sweet treble, and some degree of lower midrange boom and bloom.

Under in-room measurement conditions, with 1/3-octave averaging, a +/-4dB amplitude limit reference response covered a wide 50Hz to 22kHz range. The aurally critical central range fitted within very tight +/-2dB limits from 150Hz to 6.5kHz.

There are some minor imperfections, however. There's a lift of about 2dB around 200Hz, and some bass unevenness below this. On-axis at least, there is also some treble roughness. Without 1/3 octave smoothing the treble from 6kHz - 20kHz requires +4, -6dB limits, reminiscent of the reflections in the throat of a Tannoy Dual Concentric driver. These variations, reflected in the energy/time waterfall, are both real and mildly audible. They are also largely axi-symmetric and for the recommended listening angle, say 10 degrees lateral, the treble is much smoother and rather cleaner sounding, though the significant size of the Quad 'tweeter' element means that on this axis the treble output decays and is -4dB by 15kHz and -15dB by 20kHz. In practice this passes generally unnoticed, as the output remains quite flat to 10kHz. The fine axial frequency response detail shows a mild lower mid plateau balanced by a similar +1.5dB elevated presence region (2 - 5.5kHz), subjectively adding a little extra bite and immediacy. A fair estimate of bass extension is -3dB at 55Hz, -6dB at 42Hz. with a gentle, boom-free roll-off.

Examining the directional response, output was almost perfect at 30 degrees off-axis, in fact a quite exceptional +/-2.5dB 50Hz - 10kHz. By 45 degrees it remains fundamentally the same but now fell off above 6kHz, decaying to -10dB by 12kHz. This off-axis performance essentially replicates the original *ESL-63*.

Driving the room with a stereo pair produced quite an exceptional result for equivalent subjective frequency response at the listening location. The spatially averaged response is an almost unbelievably good +/-2dB 40Hz - 5.5kHz, perfectly decaying at higher frequencies, if mildly 'dull' in terms of reverberant high frequency power. Including room modes, floor reflections and the like, the 2805 achieved an incredibly close tolerance of +/-0.5dB from 250Hz to 4.5kHz, truly state of the art. This result is due to its high inherent accuracy, combined with the ability to complement room boundary issues.

**Conclusions:**

I really enjoyed working with the new 2805. When firing them up, you first have to get over that slightly odd, 'different', first impression. This stems partly from the way this directional dipolar loudspeaker interacts with the room acoustic; partly to the fairly large tweeter 'element', which sounds a bit dull at the highest frequencies in the room; and partly because the inherent sound is not entirely colourless. Specifically, there's slightly nasal squeak on strings, a mild presence excess that adds a hint of extra brilliance, and a hint of low-mid emphasis.

However, this is quickly forgotten as this lightning fast speaker weaves its magic. An orchestra hums with energy, fully committed to the sense of performance, driving forward and taking the listener with it. The 2805 is a huge gain on the *ESL-63* model in audiophile terms. Aware of continuing affection for the original 1957 model, I now understood Ken Kessler's parting conclusion to his October 2006 2905 review in *Hi Fi News*: "time to give up your '57s, fellas."

There are two unexpected benefits with this type of loudspeaker. First, room dependency is much lower than for box speakers and this could make all the difference for difficult room acoustics. Secondly, because of this behaviour, bass room modes are much quieter and therefore there is much less leakage to other rooms and adjoining properties, particularly as the speakers do not thump on the floor.

The lab testing showed reference standards of performance in many areas, not least the astoundingly low distortion at natural sound levels, the well controlled point

source directivity, and excellent room interfacing, resulting in state of the art results for the informative spatial average frequency response test.

Much of the sound quality matches very respected £10,000 to £15,000 designs, and in its areas of particular strength it gives the best £25,000 speakers a run for their money. Appreciating that it will not be to everyone's taste, this speaker is nonetheless very good value and deserves confident recommendation. The qualifications are that it should not and cannot be played too loud, that powerful, rock music style pressure bass is out, but the resolution, focus, image depth, clarity, articulation, timbral accuracy and speed will entertain musically for years to come.

**THE LARGER 2905**

I also sampled the taller 2905 variation at a recent show and found that they could play a bit – maybe 2dB – louder with bass rich material. The general character is very similar to the 2805, but more weighty at low frequencies, which in my view will suit them to larger rooms – particularly the open-plan bass-absorbing constructions often found in the US. The larger baffle area and two extra panels do bring some extra bass depth and power, going about 8Hz deeper than the 2805, to 30Hz. The extra height means that this design makes a substantial physical statement in the listening room, and the stereo image is also positioned a bit higher, indeed to a more usual height.

**REFERENCE COMPONENTS**

**LOUDSPEAKERS:**  
Avalon *Eidolon Diamond*;  
Quad *ESL-63*;  
Audiomaster/BBC *LS3/5a*  
(15 ohm);  
Sonus Faber *Amati Homage*

**POWER AMPLIFIERS:** conrad johnson *350 SA*;  
Krell *FPB700cx*;  
Naim *NAP250*;  
Krell *Evo 402*

**PRE-AMPLIFIERS:**  
conrad johnson *ACT-2*;  
conrad johnson *CT-5*;  
Krell *Evo 202*

**CD PLAYERS:**  
Naim *CDS555*;  
Marantz *CD-7*

**LP REPLAY:**  
Linn *LP12/Naim ARO*;  
Koetsu *RSIII* various head amps

**CABLES:**  
Cardas *Gold Cross*  
and *Gold Reference*;  
Transparent *Reference XL*;  
Kimber *KS* series

**SECOND OPINION: PROFESSIONAL CLASSICAL MUSIC RECORDING ENGINEER TONY FAULKNER GIVES HIS OWN IMPRESSIONS**

My love affair with Quad loudspeakers goes back decades. The first recording sessions I made with Quad *ESL-63s* were Hyperion's Monteverdi (with Emma Kirkby, Ian Partridge, David Thomas and the Parley of Instruments), followed not long after by Hyperion's "Feather on the Breath of God" featuring Gothic Voices and the music of Hildegard von Bingen: an excellent start. Quad monitoring speakers have consistently delivered what I've needed in my work, and also for my listening pleasure, and still do today.

These new Quads are going to broaden their appeal, over and beyond the transparency and integrity I have always valued so highly. They are simply more refined in a number of areas important to audiophile listeners. Build is more solid and linearity improved. They seem

to go a bit louder than the *ESL-63s*, and complain less audibly if overdriven, while the measurements show a linearity which would leave most moving coil system designers very frustrated.

As previously, what the new Quads deliver for me is all the information I need to hear without the necessity to listen at (exhaustingly) high levels. The stereo image definition and depth are very convincing, and classical material always benefits from a lack of the 'fog' created when monopole moving coil speakers couple to the floor or other boundaries in a less than adequate listening room (such as most location recording control-rooms). They are still an individual listening experience, but for me one that I would find it hard to live and work without.