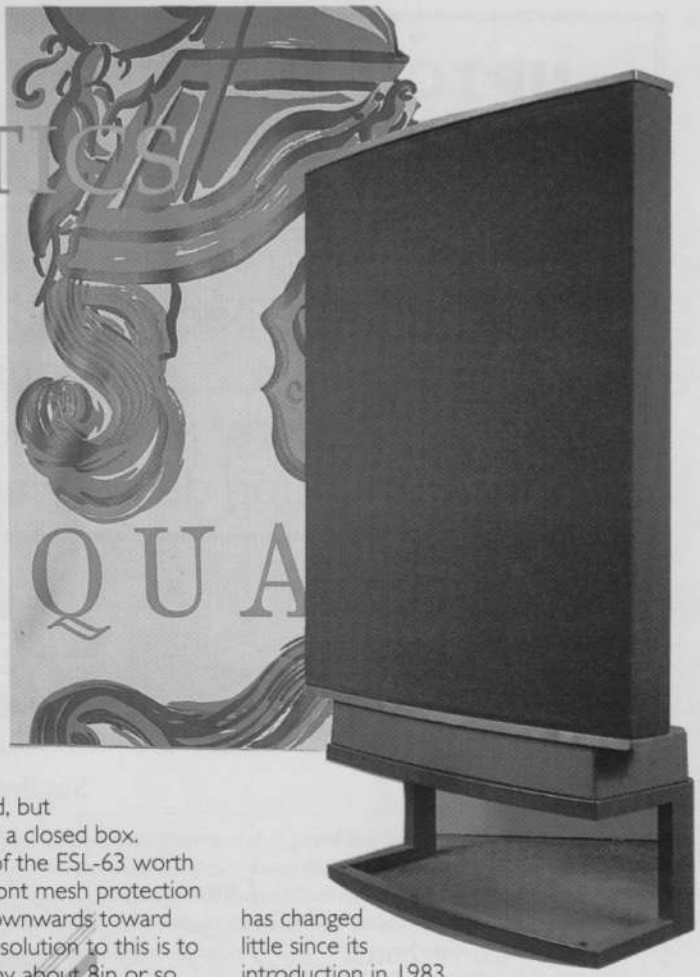
USING ELECTROSTATICS

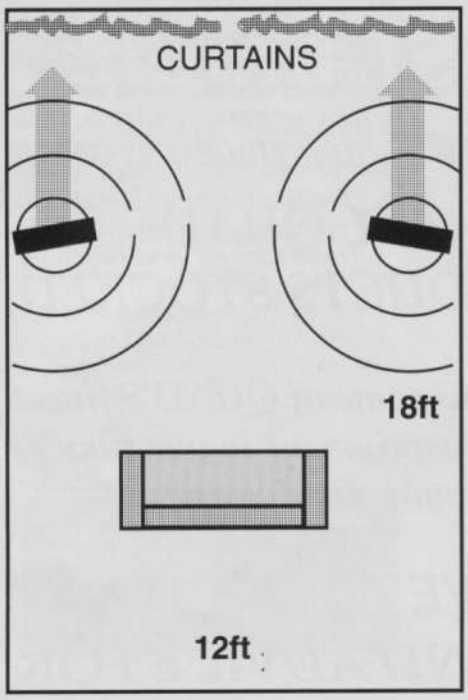
Noel Keywood, who has used Quad ESL-63s in many rooms and systems, explains how to get the best from them.



Quad electrostatic loudspeakers have a reputation for being difficult to use. It isn't entirely undeserved, but most of the problems are easily overcome.

First, let's look at the most obvious difficulty - size. Being a panel 26in wide and 37in high, the speaker is wide. The base isn't very deep, but because the panel radiates from the rear as well as the front, it cannot be stood against an end wall. However, this speaker can be put against side walls and in some rooms this positioning turns out to be fairly convenient.

Rear radiation from the panel is something of a problem, since it is unwanted. Ideally, the '63 needs a fairly large room (18ft x 12ft minimum) to blend in visually and to 'lose' rear output down the length of the room behind the speaker (see diagram). The common rule-of-thumb is to operate the speaker one-third the way up the length. In a room 18ft long, this would put the speaker 6ft or so in front of the end wall.



The Quads need space behind them and, preferably, soft furnishings to help absorb rear radiation. They can be stood against side walls though, which can be convenient.

Heavy curtains and furnishings behind the speaker absorb rear radiation. I hang double-curtains of heavy carpet felt roughly 4in behind the speaker to do this job, but its effectiveness is limited at low frequencies. There are various ingenious ways to absorb the rear sound, but do not consider using a closed box.

Another feature of the ESL-63 worth knowing is that the front mesh protection grille beams sound downwards toward the carpet. The usual solution to this is to raise the speaker up by about 8in or so and tilt it backward, something both Stand and Deliver (not now manufactured) and Quad recommended GFD speaker stands achieve. Doing so will make the electrostatics sound brighter and clearer. Ideally, any stand that lifts the speaker should have a solid front so as to extend the baffle right down to the floor to improve bass. A chipboard, MDF or plywood stand can be made to raise the speaker, tilt it back and support rear sound absorption curtains.

The other big difficulty is price, but ESL-63s can be picked up second-hand. Expect to pay around £750-£1000 a pair. Whilst the original electrostatic would arc when over-driven, perforating the drive film, the ESL-63 has elaborate protection circuits and it is a reasonably safe second-hand purchase. All the same, Quad recommend you check for noise (crackling or popping) when switched on, but not playing music. A slight rustling, especially on damp days, is to be expected. Then play music and ensure they sound OK.

Early models had a crude compressor circuit to prevent music over-driving the speaker, plus a crowbar to short the driving amplifier if things got too bad; later models have a special fuse and crowbar, plus diode protection, which affects the sound less at high volumes. Otherwise, the speaker has changed little since its introduction in 1983.

The most common form of damage to the ESL-63, Quad told us, is burnt out protection circuits, probably because sensitivity is low at 83dB (our measured value) and people tend to over-drive them to get volume. Quad, however, will fit the latest protection circuits to a pair of speakers for around £100, so getting such damage repaired is not too expensive. Anyone experienced can get a renewal kit from Quad and do it themselves. Overseas readers may be interested in this option, since it allows an upgrade of Quads to meet the latest spec.

Amplifier power requirements are specified by Quad as 50watts minimum and 55V peak (190watts into 8ohms) maximum. Quad recommend their 306 (50watts) amplifier for small-ish rooms up to about 18ft long, and their 606 (140watts) for larger rooms. Our view, from long experience, is that amplifiers of 40-80watts are most sensible for the ESL-63s.

What amplifiers work best? Apart from Quad's own, which have suitable protection circuits, high quality solid-state amplifiers from DPA, Sugden, Rose, Michell and John Shearne we find work well. It's wisest to audition an amplifier in conjunction with the speaker before buying. And be very careful of valve amplifiers - some do not like the speaker we have found, possibly because of incipient instability; the EAR834 is a good match we can vouch for though, as is our own 300B amplifier.

The Quad is a difficult load, as our analysis shows. Below 15Hz it drops to

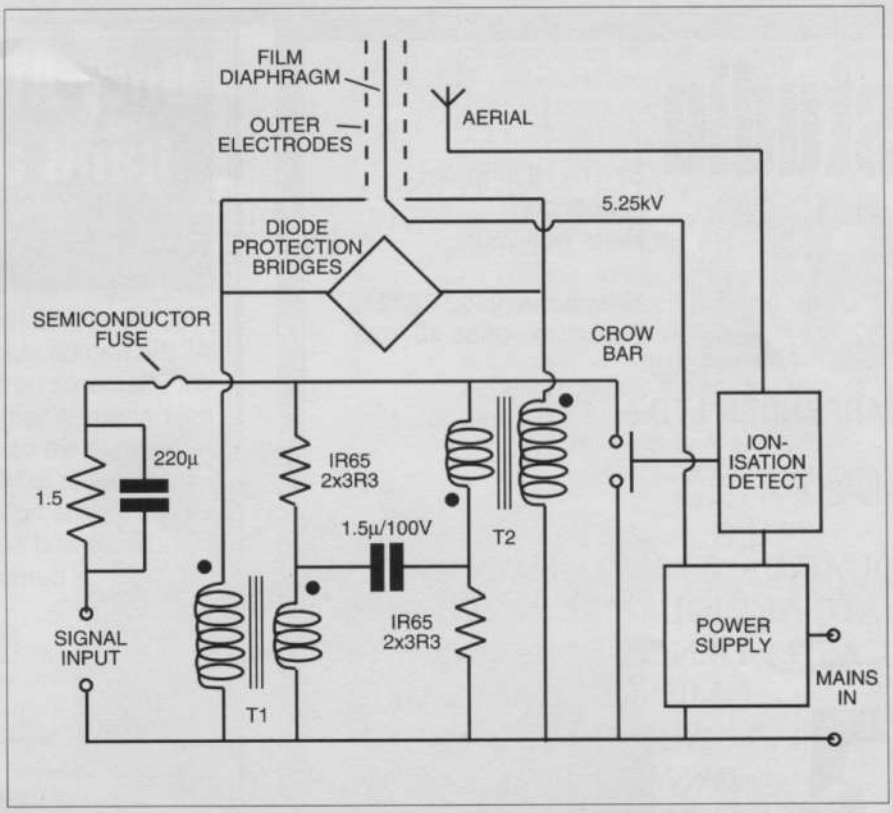
2.7ohms, which will draw power if LP warp signals are fed to it. There's a bass resonance at 60Hz and a treble resonance at 20kHz, both of which produce significant reactive swings. The high frequency resonance presents 1.6µF of capacitance at 20kHz, which may well upset amps of marginal stability. I strongly suspect this is the reason some not-too-clever valve amps have problems, but in truth well designed valve amps can handle this sort of load.

A good cable we'd recommend is Ortofon SPK300 at £7.50/metre. Or you can choose Quad's own simple copper cable, QLSCF2 at £3.50/metre. Don't forget that the speakers need a mains supply too.

Although it is possible in some set-ups to hear Quads delivering powerful bass, which is always quite a surprise, in general they give a somewhat mellifluous sound at low frequencies, lacking deep bass or real punch. Consequently, sub-woofers are a topic very much on the agenda amongst Quad users. I have used Celestion SL6000 subwoofers (expensive, large and heavy, not now manufactured), but their crossover doesn't integrate the Quads in well, since the speakers start to roll-off below 250Hz, but the crossover brings the Celestions in at 100Hz, leaving quite obviously divorced sounding bass. Better alternatives are now available.

A surprisingly effective one is the REL Stadium powered subwoofer. It must be carefully tuned in to match, using its frequency and level controls, to avoid boomy bass, but it can deliver very deep bass and the Quads seemingly go much louder with it. This can only be a psycho-acoustic effect, because the REL does not remove bass from the feed to the speaker, unlike the Celestion and Gradient subwoofers. Quads with a REL put up a good challenge to ordinary loudspeakers in terms of power and dynamics, even if their combined cost does go beyond £2000.

Finally, there is the Gradient SW-63 subwoofer that matches in well and gives excellent results. By removing the need to reproduce deep bass from the Quads, it allows them to go louder. The price is £1650 and they can be auditioned at Quad dealers. We review these separately of page 15 of this supplement ●



Amplifiers must drive two step-up transformers that provide a high voltage push-pull audio signal to the fixed electrodes. On early models a compressor circuit acted in the primary circuit to limit the audio voltage reaching the plates. Current models, after Serial No 29000, possess a network of diode bridges that clip the high voltage audio signal in the secondary circuit. An upgrade kit is available from Quad.

The diagram also shows how the film is polarised to 5.25kV from an internal power supply and that an ionisation sensing aerial causes the crowbar to operate, blowing the semiconductor fuse, if arcing from severe over-drive occurs.

QUAD STANDS

Stand and Deliver - an open frame stand that raises the speaker by around 8in and tilts it backward. Gives a clearer sound, without losing too much bass, but not now in manufacture.

Arcici - Not now available in the U.K. Raises the speaker high, but does not tilt it. Good for stripped down Quads, but gives light bass.

GFD - Tilts the speaker back and possesses castors for ease of movement, but does not raise it. Recommended by Quad.
G.F.Deane, Moorlands Garage, Chorley Old Road, Horwich, Bolton BL6 6BB
Tel: 0204-843382.

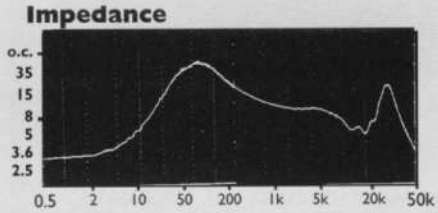
SUBWOOFERS

Gradient SW63 - Sits underneath the Quad, acting as a stand. Needs a separate stereo amplifier for bass drive. See our review on p15. Available from Quad Electroacoustics Ltd, Huntingdon, Cambs PE18 7DB. Tel: 0480-52561 Fax: 0480-413403. Price £1650/pair

Celestion SL-6000 - Not designed for the Quad and does not match perfectly with standard crossover, but has bass of unlimited depth. Discontinued, but may be available second hand.
Celestion International, Ipswich IP3 8JP. Tel: 0473-723131. Price was £1800

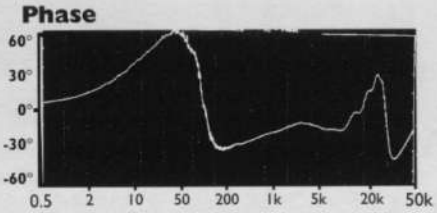
REL Strata £495, Stadium £795, Stentor £1495, Studio £2995. Powered mono subwoofers. We have tested the Stadium, which possesses its own 100watt amplifier and low-pass frequency/level controls for tuning in. Powerful and deep bass; an impressive performance
Harman UK, Unit 2, Rowley Lane, Borehamwood WD6 5PZ. Tel: 081-207-5050.

Impedance



The impedance dips to 2.7ohms below 15Hz and there are two resonances which introduce reactance. At 20kHz the speaker acts as a 1.6µF capacitor, which can upset amplifiers having a limited stability margin.

Phase



Two resonances are revealed by the phase plot above, one at 70Hz and another at 20kHz. The 'speaker is reactive around these frequencies.