

The Electrostatic comes of age

Geoffrey Horn takes a retrospective look at the Quad ESL

THIS report may at first sight seem to be an escapee from our "Looking Back" columns, or perhaps an attempt to copy the motoring magazines with their reports after 12,000 miles? This latter speculation more nearly parallels the truth, but I have a more distinguished mileage to report on this occasion, for the Quad Electrostatic loudspeaker is 21 years young this year. There can be very few products which have graced our audio pages and been subsequently able to demonstrate such staying power or exercise such an influence on the entire industry.

Anticipating this coming of age, the Audio Editor proposed an updating report, placing this veteran design in the contemporary scene but, as we examined this outstanding British achievement in more detail, it became apparent that something more was called for and so with the reader's indulgence let us begin at the beginning.

Principles evaluated in ancient Greece had led every generation of youngsters to rub fountain pens on their sleeves (or other convenient area) and pick up pieces of paper by electrostatic attraction. Early loudspeaker inventors proposed that larger pieces of paper *inter alia* could form a diaphragm to be more linearly motivated by electrical signals, and certainly there were primitive working examples in the 1920s. A mathematical investigation into the theory of possible methods of achieving linear operation was published in Hunt's book *Electroacoustics* in the early 1950s and led Peter Walker, the then little-known genius behind The Acoustical Manufacturing Co. Ltd., to pursue an idea he had been dabbling with for some time. In 1955, a series of articles by him in *Wireless World*, and a prototype demonstrated at an exhibition in May of that year, let the world know that a new and perhaps unique development was in the offing. Other workers soon became active in the field but Walker's lead was commanding, and although a number of alternative designs appeared and as soon failed, most of those which have since

had any success have been licensed by him.

So it came about that GRAMOPHONE for November 1957 carried in "Technical Talk" a report by the late Percy Wilson on the annual exhibition of the British Sound Recording Association detailing how a lifelong colleague of mine, one Philip Tandy, had won a raffle for the first ever production model Quad Electrostatic loudspeaker. The accompanying photograph is repeated here with (he says rather cruelly) a current one of the same man and the same loudspeaker, and I am handing over the next few paragraphs to Philip for a brief account of his unswerving loyalty to 'Number One'.

Philip Tandy comments

"A major cause of domestic difficulty with the Quad ESL lies in the amount of room it takes up. We have all heard people saying 'I like the sound but my wife would never have it (or a pair) in the room'. No such difficulty arose when I won Quad ESL No. 1. Such was the enthusiasm of myself and colleagues at that time that I am sure my wife would never have had the heart to say, 'I don't like the look of it'. It was soon evident to me that here was no ordinary loudspeaker, for the first time that our long haired cat passed in close proximity, the fur on her back stood out straight, presenting a quite unique sight. There was also, of course, the sound it produced, which was so outstanding as to cause the man who came to read the meter to comment on the excellence of the singing lessons going on in the lounge. It was in fact the morning service on Radio 4 (or was it the Home Service then?) but my wife was afraid to tell him because she thought he wouldn't believe her anyway.

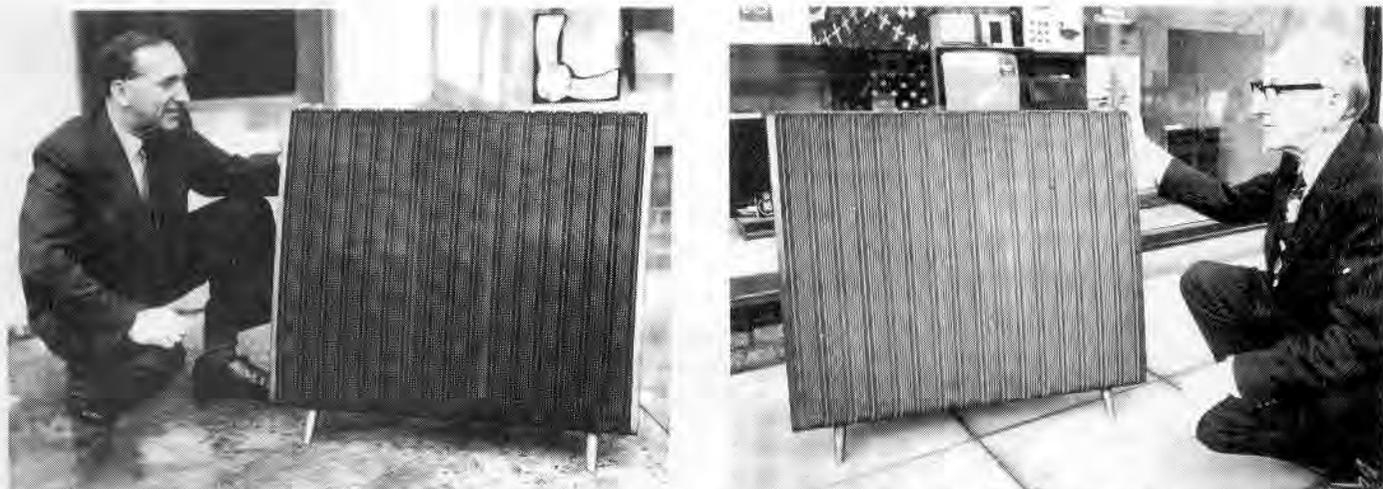
"So many times have I heard the remark that the Quad ESL lacks bass. I have always thought that the bass response was more than adequate for domestic listening and this was confirmed many years ago when my son, then a great enthusiast of the Shadows, introduced a pal who had made an electric bass guitar, but could get

no response from the lowest string. I asked him to bring it along so that I could sort out what was wrong. Sure enough little audible came out of his quite massive loudspeaker but, feeding his home-made instrument into my Quad valve amplifier and out through the Quad ESL produced a wonderfully pure 40Hz note.

"So much for the myths; there remains the magic. ESL No. 1, soon paired by No. 57, has in turn soothed, excited, informed and entertained for over twenty years; a remarkable achievement, and perhaps there can be no better recommendation than the simple fact that I've never contemplated making a change!"

The first review

Moving on to the GRAMOPHONE of May 1958, we find a full report by PW on this remarkable loudspeaker, then priced at £52. As so often with that likewise remarkable man, the writing stands up as well as ever today and it is tempting, but hardly practicable, to repeat it in full. Just a few quotations: "... a little hesitating about the ruthless realism of the speaker. For it has been abundantly clear all along that any fault in the input ... will stand out in all its nakedness in the sound which the speaker will give out. Most of us will regard that as a distinct virtue. But it has its embarrassments ... A little puckish spirit in me suggests that part of the purpose of those articles [in *Wireless World*] was to camouflage the form of design which he [Walker] had chosen for a domestic speaker ... Two of my colleagues [Philip Tandy and Geoffrey Horn] decided to stay up till the small hours and then measure the output in the open air, choosing a night of unusual stillness. It is not known whether any neighbours listened in ... The response to transients was exceptionally good; in fact it was the only speaker amongst those tried that gave a reasonable square wave output when fed with a square wave input. [Of course, although we did not so name it then, the Electrostatic has a linear phase response, a feature much debated and valued in these last



"Age cannot wither . . .": two photographs of Philip Tandy, taken at 21-year intervals, with Quad ESL No. 1 (left) and a brand new one (right)

few years.] . . . I noted in some of my earliest listening tests that the ESL can produce some queer effects when multiple microphones have been used. I myself prefer the single microphone technique although the overall effect is inclined to be a little 'dry'. This, however, gives place to a luscious warmth when stereo is used". [Stereo on disc by happy coincidence has shared these same 21 years.]

Moving forward to 1978, let us now proceed with the original objective, to evaluate the Quad Electrostatic loudspeaker in comparison with today's competitors. First it must be said that it remains the only commonly available full-range electrostatic design. There are and have been others of course; the large screens of KLH, the gas-filled Dayton Wright and, recently at Harrogate, the direct-valve-drive combination by Acoustat, all of them obviously acceptable only in suitably adequate surroundings. Of course, one should not forget the possibility of using combinations of Quads, even up to the 14 deployed by SME's Alastair Robertson-Aikman in his fabulous music room at Steyning, described by John Gilbert in our June 1977 issue. A number of readers use stacked pairs, but for reasons of space, appearance and economy most users will only be contemplating a single pair. Originally these loudspeakers appeared with bronze anodised aluminium grilles. Some years ago, after Braun in Germany gave up licensed manufacture of a Bauhaus styled version, Quad issued a black painted variant and recently, because of problems with colour consistency and fading of the aluminium anodizing, bronze paint has also been available. There have been remarkably few other changes. A small alteration to the crossover protected the treble unit from the greater peak power of transistor amplifiers, and several changes were made in the power supply as improved materials appeared.

At the time of its appearance, one most noticeable aspect of the Quad was its lower than average efficiency. I recall that among a group of 10 different loudspeakers checked in 1959, all except one sounded louder, some quite markedly so. Significantly only that one, the late and still lamented GEC metal cone, hinted at any of the Quad's virtues of flat response right across the mid-range and abnormally low (for then) colouration. Repeating that experiment with a batch of today's loudspeakers almost completely reverses the situation. Quite a number of modern designs have considerably lower sensitivity, taking into account that the majority of them have lower impedances at mid-frequencies and are therefore drawing more power from: what are essentially constant voltage amplifier sources.

The reasons are not hard to find; amplifier watts have become cheaper.

And so loudspeaker designers have been able to use heavier and stiffer materials in construction to cut down on resonance and colouration and to absorb (waste) unwanted parts of the total energy both electrically and acoustically in cabinet frictions. As a result, many good loudspeakers now sound much more like the Quad than their predecessors. One must be fair and point out that there have also been pressures to reduce the size and, by the (so far unshaken) laws of physics, this presupposes either a loss of efficiency or limited bandwidth or both. However recent developments in music seem to be requiring higher sound levels, particularly at the extremes of the frequency range, and we are already beginning to see this swing reverse.

The Quad sound

All in all, and including the acceptance of difficulties in placement, the Quad sound is still a degree or two ahead of the competition. The open 'airy' reproduction of good source material has never been bettered, and the ability to sort out what is going on in complex musical works can still be a revelation. As Philip Tandy discovered, one should realize that the rather lumpy low-frequency behaviour of many cabinet loudspeakers near to their cut-off is not true bass: down to the 40Hz limit, the Quad does a more realistic job than most. A number of well known organists have chosen it for that very reason, asserting that only the Quad permits them to identify the composition of the 16-foot ranks. Quite a few loudspeaker manufacturers lay claim to extended low-frequency response but, in my experience, there are indeed very few capable of clean production as low as 30Hz at any appreciable volume level and I remain unconvinced that I can hear, as opposed to feel, a pure 20Hz, so often quoted as the lower limit of human hearing.

The physical appearance of the Quad has been less objected to as the years have gone by for, as Peter Walker once said, "As a room heater it would have been acclaimed for its style, but everyone expects a loudspeaker to be a box". Because it produces sound over its entire area, the influence of adjacent walls and particularly corners is considerable and room position becomes a matter for experiment. However the format has compensations; because the ear tends to take in a larger sample of the total as the distance increases, there is an apparent superiority of sound distribution in most rooms and conversely one can be quite close to an electrostatic playing loudly without

distress. Another useful gain is in mobility; should the ideal positioning be unacceptable for day to day use, it is the work of a moment to re-position the units when serious listening is intended.

The absolute maximum level of sound remains limited and is very sharply defined by the onset of considerable distortion; unlike moving-coil loudspeakers, where distortion can be found to grow rather more linearly with increasing volume. A pair of Quads in stereo gives adequate volume of classical programme material in all but the largest rooms, and it is mainly those people who relish the impact of modern popular music who feel the need to resort to stacked pairs.

It has been my experience that only a very few owners with established musical taste have willingly forsaken Quads after once becoming accustomed to their virtues. The few which appear second-hand because of domestic difficulties or loss of interest are soon snapped up and represent a microscopic percentage of 21 years' production. Over all that period I have used them extensively both as a reference and for pleasure. I can think of few others which even now would be equally acceptable in either capacity.