QUAD: The Inside Story

Ross Walker

Earlier this year Noel Keywood and Ian Rankin travelled to Huntingdon in Cambridgeshire to visit the headquarters of one of Britain's best-known and most highly regarded hi-fi manufacturers - Quad. Whilst there they toured the plant and discussed the company's philosophy, products, marketing and history with managing director Ross Walker, the son of Peter Walker who founded the company more than fifty years ago.

So let's allow Noel Keywood to tell the story. He began his conversation with Ross Walker with the subject of the selling of Quad equipment to Japan;

"We have made a strong push to sell Quad as a lifestyle product in Japan rather than as an audiophile product"

Do they equate Quad with tweed jackets and Range Rovers?

"No they don't and I suggest they don't either. I believe it is a mistake. What you have got to remember is that the number of people who would buy on that basis is quite small."

Well, who do you think your buyers are then? "They are people who for one reason or another want to listen to music at home rather more seriously than others, whilst not getting involved in the upgrading syndrome."

You sell on the classical music ticket don' you?

"The only reason I tend to emphasise the classical music side of it, or if you like what I call real music, is that firstly nobody else does it guarantees me a large part of the audience at a show, for example, that don't want to hear synthesisers and suchlike. And secondly, by and large we are still concerned with reproduction and it is jolly difficult to convince someone that you are reproducing something properly if he has never heard it in real life. We encourage our distributors to use recordings of instruments that can actually be heard live, down at the local pub or in the Festival hall, where doesn't matter."

Do you make specific recommendations on this topic?

"Yes, we do. We have an annual European distributor's conference here in Huntingdon. This year I said bring along three demonstration records and be prepared to talk about why you think they are good. We have a moderately competitive environment, so the moment some Frog stands up and says "I like zees record because..." everybody else starts shouting and making the usual comments and noises that dealers like to make."

I think we'll cut "Frog" out of the transcript....

"No you can leave it in. Everybody has a go at each other in good humour. They howl in laughter at us Brits and use whatever expressions they like, as others do to them, so the atmosphere is very European yet everybody recognises they are part of a team if you like, Don't take it out of context"

So you try and sell on fidelity.

"Our sole aim in life is accurate and faithful reproduction of the original. We have succeeded when we do our little bit properly. You start with a recording at one end and turn it into sound at the other: that's the job."

Every hi-fi company should by definition claim to do that, even if in practice they don't.
"No, hi-fl and high fidelity are two different things. The one thing that most makers are not doing is making things that reproduce faithfully. They might be making exciting or enjoyable sounds, which is fine, but don't confuse the two.

Let's take one American speaker manufacturer. His brochure, about ten years ago, said :
'of course one of the nice things about reproduced music is that you can do so much more than you can in real life. If you stick a microphone in a piano you can make a piano sound much more exciting than a normal piano.'

Well, perhaps you can, but are you going to stick your head in a piano to listen to it? No ! It is unrealistic. If you want to listen to something more or less as it would have sounded had you been there then we'll have a moderate stab at it . It isn't ever going to be perfect, we are not claiming that."

Why would you say that was the case? Is it because of the electrostatic loudspeakers, which are the only radical Quad items, or would you claim that every piece of Quad equipment is more accurate than what is generally available?

"Basically we design every single product -and we have done over the last fifty-odd years with the intention of getting it as accurate as we know how. There are obvious limitations and in some cases the technology is not available.

"The only reason we make the electrostatic because we see that as one way of getting a I closer to realising our aims and ambitions. Doing rectilinear boxes is quite clearly not going to produce spectacular results because ere are an awful lot of good people doing it. They have been doing it for over fifty years and ok how far we have got. This is not to denigrate the efforts of people who try hard; some o a very good job even if others don't. It is ear that the long term development of the loudspeaker as a reproducing thing requires some sort of change of direction somewhere."

You changed that direction in 1955 then, didn't you ?

"Yes, but it is the industry as a whole that reds to change. Even the electrostatic loudspeaker suffers practical limitations: we can't do cheap and cheerful ones."

You can't do small ones either can you?

"It becomes more difficult - you need a box ! That's the problem."

So, is Quad gaining popularity in the Far East and Japan?

Yes. Most manufacturers are doing good business in the Orient. There is more disposable come there these days."

Do you feel that other nationalities appreciate the Quad image in the same way that the Brits do? For example, the Americans are very big on your history aren't they?

"No. America is a rotten market for us. Whilst it very difficult to find an American journalist, manufacturer or retailer who has never owned Quad loudspeaker, the American general public as a whole is not very receptive to what we are trying to do. They have been brought p to believe in other things, such as big boxes with a lot of drive units with lots of whoomph. Our reputation is very big in the trade in the States. In the old days, with the old electrostatic loudspeaker, my guess is that 50% of what we sold just disappeared within the industry."

How about the Germans? They like a bit of boom and ting but they must be into classical music?

"Funnily enough they are not . What is liked by German reviewers is not what is liked by UK viewers. The magazines have a much higher circulation than those in the UK and they have so much more influence as a result . We don't do terribly well there. Although in the US we have done well recently in review terms, cause the so-called underground magazines are in love with the '63. I hope the love affair lasts. It is difficult to say what the Germans don't like: when the '63 came out one of their mags published a very thorough review of pages long, but they thought it wasn't too good and we were overstating our case. So I flew out and went to visit these people and I said 'Alright, you don't like this. Let's establish some ground rules. Play me your favourite recording on your favourite loudspeaker'.

Well is guy dug out a pair of monsters that were early designed to use up the surplus stock of drivers. They had drivers all over the place. There are lots of loudspeakers like this and you can't make them like that - I'm terribly sorry. The recording was of a solo guitar and to me he first idea is that you try to make the guitar sound guitar-sized. Well, they turned the wick up and out came an image of a guitar that must have been at least 20ft across. I said 'Right, if that's your idea of what we are supposed to be doing, there's nothing to discuss'."

Don't you think you could have said something about it? Couldn't you have then put on your chosen classical recording and explained that? I mean, those giant multiple-unit loudspeakers don't image and are not coherent. That is the total opposite to the Quad.

"It isn't my job to explain it to them. It is no more my job to tell a customer how he ought to listen to music than it is to tell him how to dress or paint his drawing room."

But you did talk earlier about accuracy of reproduction and that is not arbitrary. Accuracy is absolute. You might not want to convince them, but you could explain it to them, or don't you agree?

"It is not our job to tell reviewers how to go about their job. We just explain what we listen for."

Ian Rankin remarks: It is fascinating to come across this attitude in a British manufacturer. I have never come across this 'let everyone else decide' before.! have come across everything from missionary zeal to absolute venom but here is someone not taking the missionary position!

"We feel the role of educator is not one that manufacturers do terribly well in true terms. Propaganda perhaps, but not truth. No; we make it and the dealers can sell it, although we are changing our approach a bit."

But the Quad is a very difficult loudspeaker to demonstrate isn't it?

"Absolutely. You have to have a really good feel for it and unless someone has at least a glimmer of enthusiasm it is uphill work."

Do the Japanese see Quad as an industrial anachronism like the Mini, for example?

"I hope not, that is a very dangerous position to get into. The product is liked as a whole there for a variety of reasons. The Japanese speak in more spiritual and metaphysical terms than us and our message definitely has appeal there, because it is honest and well meant"

Does the presence of Japanese Stax electrostatics help your case, by increasing exposure and the like?

"Yes, it is always much more difficult if you are the only person doing it. It does help in the States as well, which is one reason why we do have a good following in the 'underground' or purist' press. And there are lots of very good and very serious listeners in the States. The biggest problem there is that it is so large that it's difficult to actually get to your customers.

"The UK is much easier because we do have very good brand recognition here. We have it because we have been flogging away for so long and we do look after our customers very well indeed. By and large we like to feel that every customer gets what he wants: a product that works and give him the sort of reproduction he is looking for. If for some reason he is dissatisfied it may well be he should not have bought it in the first place. Perhaps his friends said that was what he ought to have but in fact it was not what he wanted at all. If that's the case we have to unscramble the situation. It happens very rarely and if push comes to shove we would rather give him his money back. We have to do it, not the retailer. British consumers are on the whole realistic. They don't buy on impulse."

How many dealers have you got in the UK?

"A couple of hundred. We try and pick them for their ability to satisfy customers or we end up clearing up the mess."

Do you want Quad to be lifestyle statement products like, say, B&O? You have talked about this market before.

"Yes, but that is an over-simplification of what our niche could be. By and large I see that as a market where appearance and presence are almost enough. You go into certain households and they have a certain number of material possessions and it is quite clear that they are there because they are making a statement about that person. You walk into the kitchen and it has Neff or Smallbone, yet when dinner is served it is frozen peas again. It is quite clear you could cook that on a gas ring with a saucepan. I would prefer it if people enjoyed our product or otherwise it is a waste of time in my view."

Do you try to appeal to the audiophile market?

"No. The audiophile is on an endless quest He wants change. He is not interested in something that is good enough to remain unchanged."

But if Quad is the best, shouldn't he end up with Quad?

"But he wouldn't be an audiophile; that would be the end of it. How dull it would be."

But in the past your 33 preamp did have a lot of controls on it, didn't it? Tone shaping and suchlike which was quite complex. You appear to be going toward abandoning all that.

"No, not so. The 33 had filters and conventional treble and bass. Filters first appeared on Quad preamps like the Quad 1. You have got to remember that in 1953 recordings varied enormously in their basic equalisation and we had to have those particular facilities then. Now, we try to put on things that are going to be useful to people who have large collections amongst which there will always be plenty that benefit from a bit of filtering there is just no question You want to listen to somebody playing something in 1955 when the microphones or techniques weren't t as good perhaps then if you can modify conditions to get more satisfaction it is a good thing to do "

The conversation then switch products which Quad recently announced : a remote control preamplifier and their first CD player

Has your latest preamplifier (the Quad 66) got filters and suchlike on it ? I was thinking of this remote control system that couldn't possess them.

"No we have simplified things, that's all. The fine tuning that was possible has been eliminated, but its use was time consuming . The 66 has two filters, so you can have no filtering, or medium or heavy filtering. We keep the tonal tilt control which has proved to be useful but we have abandoned bass boost. It was quite useful for small loudspeakers which roll off naturally at low frequencies. It tended not to get used too much so we dropped it. We do keep the bass step control though, which is a hoot remover. If you look at most people's systems you find that their speakers are often far too far into the corners of the room. There are good reasons: you have to live in the room and don't want to keep tripping over the loudspeakers. This produces a sort of ooof on everything

which sounds horrible so we include it, even on remote control. There are remote tone controls and remote volume too."

"From the remote you can control the preamp. the CD player and the radio tuner, which is at the moment in embryo form. Tuners are difficult to do. You either buy in a proprietary front end and they are not all as good as one might like, or you do it in-house which is very expensive. The FM4 does actually work well: it is a very good tuner. Radio listening is very good value in this country and most people have at least one station they like. And whatever you might say about the BBC, their engineering standards are extremely high. They do try hard to do a good job and we are in great danger of losing that The consequences of some of these government decisions is that in ten years' time our radio will be as crappy as everyone else's."

Do you mean programme content?

"No - engineering. Content is arguable any way. As Rupert Murdoch did, you can actually stand up and say that American TV is better than British TV"

But although he is prepared to say that, nobody believes him.

"Perhaps, but still he said it and it is ominous. "

"The remote control can go on the wall if you want and you can even have two of them. The equipment sits in standby mode and when you come home in the evening you decide you want to listen to radio so you simply hit the radio button and the sound fades up to the level you last set. Each step of the volume control is 2dB. There is also a balance control so you can swing the image to suit the listening position and there is the tilt control, filters and bass cuts. There are balanced inputs giving good common-mode rejection built into the video inputs to reject hum, since this often occurs when you connect up video equipment. There are two Aux inputs."

What about your CD player?

"It is all part of the system, operating under remote control. It matches the system in every respect and it is not covered in buttons."

Is it engineered by yourselves using Philips chips?

"Actually, Philips produced the boards for us too! They have a very good, comprehensive design service but we fully specify the components and overall quality. After all, ones are ones and noughts are noughts. You can't have good ones and bad ones."

But you can have ones that jitter and ones that don't, and there must be a clean transition period.

"Yes, but you can sort that out"

Only if there is a perceived need to do so. Engineers have yet to understand with digital that it isn't inherently perfect and that distortion is an inherent part of

the system, which was never the case with analogue, even if in practice matters are not so clear cut. Inevitably, until we get digital ears, we have to suffer distortion from the conversion system because of quantisation. Dither is the only thing that apparently linearises the process adequately.

"Yes - it results in zero distortion."

So did Philips tell you CD has no distortion? They have only just managed to upgrade their convertor chip to N2 status to make it linear. It was the most non-linear convertor going. They got so sick of us printing pictures showing 200% distortion, that they had to improve the chip, I was told.

"Our job is simply, as we see it, on this sort of thing, to make sure we pick the right bits. Choosing the right D/A is no different from picking the right transistor for an amplifier, say. We did check on all this. It is worthwhile looking at their OEM plant. "

"For example, we specified the best S1 convertor grade and we check each one again here. If it is okay then we put our own label on it to show it has been through this process. We think it is important to have them - and check them."

What tests do you use when checking them?

"Linearity and monotonicity. We have kept the CD functions simple and straightforward. There is a time and track display, search, pause and stop, the usual programming memory and that's it. What we have tried to do here is produce a remote control that anyone can use without looking at the instruction book."

So, for whose interest is the pretty blue label on the DAC convertor? Buyers aren't likely to open it up are they?

"It's for you and people in the trade like you!"

Oh. Let's change the subject. Why are those two CD transports we can see over there popping in and out doing a little mechanical ballet?

"We are testing them to see whether, over years of use, they might go squeaky. It's little things like that that make the difference. There is nothing more frustrating for the customer than being confronted by a drawer that has locked closed or something like that. In fact we sometimes pack them up in boxes and play football with them - literally."

You should just send them to reviewers. You know they'll go wrong then.

"That really is what pre-production is all about, sorting out all those problems. We have to send them out, to selected individuals.

I notice that there's a cast rear panel as well as a cast front panel on the CD player.

"It is styled in house. The style has to match the 66, but we have keep in mind 34 and 44 owners who want a CD player too. The CD player has to fit in with them all. The CD player can be used with any other product, it is not controlled from the preamp. The single remote control handset in fact has two transmitters in it to allow this, one for the CD player and one for the preamp."
"We have various power amplifiers the preamp can work with: 606's, 306's, 405's, the 500 Series."

I thought the 405 had been replaced by the 306 and 606.

"Well, yes, but we sell quite a number of 405s into the professional market, for those who don't necessarily want more power. Often, people like Our Price use entirely Quad because they know they will work, can be serviced easily, quickly and cheaply and they are not overly expensive in the first place. Also, they don't want sixteen different models, neither do studio's, so they all tend to use Quad as a reliable, long term standard."

Ah, yes. So what's the 520F?

"It is our standard studio power amplifier. Two channel - about a 100W into eight ohms and a couple of hundred into four. It has very similar circuit topology to our other power amps, but not a soggy power supply. On our domestic stuff we put soft power supplies in these days because if you get it right you don't need such a big power transformer. I mean, provided on big organ chords you get it right and it doesn't sag before the organist has got his fist off the keyboards, you are alright You can't do it just for milliseconds as some people do - it has to last longer than that. On studio amps they are not necessarily going to be playing music, so you need a stiff supply."

What does the F stand for?

"We had an earlier version with optional plug-in transformers (balanced input). This one uses a nice little Quad circuit that looks like a perfect transformer and it just plugs in if you want balanced inputs."

"We make nine basic models at the moment: two preamps, three power amps, a couple of pro units, a tuner and a speaker, but we actually have three hundred different versions for various countries and so forth. Instruction books have to be in the right language, safety standards must meet national or local requirements and suchlike - are all different."

Obviously you are doing quite well in the professional side of the business; you've got a lot of equipment going through there.

"Yes, well we started in the pro business. Acoustical Manufacturing was a PA (public address) company back in 1936. Quad IIs (valve power amps) were used by broadcasting studios all around the world. Something like 30% of our business in the UK is pro, much with 405s. If we focus on it we can do better, which is why we brought in Allan Mornington West to represent our pro side."

What is the Pro 63? An awful lot of people ask me about this.

"We make black-grilled versions of the 63 for professional use. You get a carrying handle, rubber kick strips and a steel grille that doesn't deform if you kick it.

Tell us some more about the basic ELS 63.

"Well, the bit of the speaker that moves is made from Mylar, which is 3.5 microns thick
The hair on your head is 35 microns"

Which one?

"We stretch it up to the required tension and stick it in the oven. In its cold form, if you stretch it, it will creep. But by putting it in the oven under tension all the molecules will line up to the most stable position so the tension won't change. This is quite important because otherwise the resonance of the speaker would change and it is carefully designed to a particular value. If it was too slack it would hit the plates, too tight the resonance would be too high. Secret ingredient X is used as a damping layer on the Mylar and then we bond the frame to the electrode structure."
"So you stretch it, stabilise it then bond it to one side of the electrodes. It is a push pull device with two stators and one moving diaphragm in between."

So the concentric rings are the ones you energise on the stator?

"Yes - and the electrodes are held off plus and minus 2mm. That's the gap - of pure air."

How about factory air contamination during manufacture?

"What with, ham sandwiches? No, flying particles.

"Since it is going to operate in a domestic environment - it is not hermetically sealed - we put a dust cover on the outside, mainly to keep the cat's hairs out."

I have never seen inside my pair.

"How could you resist the temptation?"

Easy, 20,000 volts put me off!

"There is a concentric ring structure and each is of equal capacitance. Then there are inductors, so making a transmission line resistively terminated."

Is it PCC-OCC wire?

"No! And there are twelve kilometres of it in that loudspeaker."

Have you any done any listening tests on pure copper wire drawn by the Ohno Continuous Casting process?

"Have we ever done listening tests on wire? No, indeed we haven't! "
"The drive panels on the 63-both versions - are actually decoupled from the frame. If you tighten it all up (as some people have) you get a big peak in response at resonance around 90Hz and a whoomph in the sound."
"We check the tension by measuring resonance; we measure capacity which tells us that the plates are the right distance apart, and basically we check that the internal resistance is correct As you know the surface resistance on the diaphragm is very high to stop the charge wandering around. Otherwise all the electrons rush to the point of highest field which is changing all the time as the diaphragm vibrates. We run it up at 10 to the eleven ohms per square cm resistance."

The tour of the factory halted for a moment in the area used for testing the completed Electrostatic speakers: I see Quad's unique tests here don't I?

"Yes, We have a reference loudspeaker and a production speaker facing each other and each is fed with a square wave out of phase. You can see that the signals cancel, showing the unit under test is identical to the reference. We get them to within better than 0.5 dB without any selection, that's why we can do this. The tolerancing on ordinary loudspeakers varies far more than this and even with lengthy and expensive computer matching they can't get them better than this. Matching only gets a pair identical too. It doesn't mean to say one pair is like another, which it isn't. With the '63 number ten thousand and number twenty thousand would still cancel. We can actually send out a loudspeaker without any of the usual measurements because of the inherent stability of the electrostatic."

Is the Mylar stable? I mean, it is made for wrapping sandwiches isn't it? Does it change thickness for example?

"In theory yes. Obviously, you have to check each batch and we have picked up some faulty ones. We get a precision film of course, which would make sandwiches uneconomic!"

Can the speaker kill you?

"Yes, easily if you put your fingers on the transformer which has 10,000 volts on it. It is the audio that kills, not the charge on the plates. You must never have a 63 open whilst it is working."

Let's talk about your new CD player now: does it use a Philips transport?

"Oh yes. It is the best one, the CD-M4, and it works very well. We think it is better than the CD-M MkII which is made for the audiophile market. With the CD-M4, with perfect discs
that have not been damaged we never see the error concealment flag raised. What more do you want?"

Is this under test or do you have an error light?

"No, we don't put one on the player. The last thing the customer wants is to be sitting there waiting for the errors to come up."

As we were still on the factory floor I felt prompted to ask Ross more about Quad's quality control and test procedures.

"We use batch checks on components coming into the factory, to check components are what they say they are. That is whilst we are happy with our supplier of course. If things start to go awry then we might start to up the input testing because obviously we don't want to make useless boards. When a board is complete all the components on it are tested - 100% testing in other words - by GenRad computer-driven board analysis. Probes measure levels at all parts on the boards, as well as component values."

Do you burn-in at all?

"On new models we do. Once burn-ins yield zero results we don't need to do them any more. We don't bench run every amp for a long period, but we do 100% test and ensure everything is perfect before despatch."
"We do meet the customer service department every week and discuss faults on products that have come back. If it is something that we can learn from, such as a batch of resistors going wrong, then we can prepare."

On the history of Quad, you basically started in 1936 with public address equipment, didn't you?

"Yes, it started with power amps. My old man (Peter Walker) had been working for Trix, I believe, and then EMI and really he wasn't very good at being an employee. He thought 'I can do this too' so he set up his own little business. He nipped down Lisle Street (in London's Chinatown), bought the bits, got a circuit out of Wireless World and built an amplifier. He sold it, got some more bits and so on. In those days the market was mainly PA, nightclubs, race tracks, anywhere where you wanted to shout at large numbers of people. He met Voight early on and that spurred him on. He left school early on, at sixteen. All his theory was learnt from textbooks. The hi-fi side didn't start to take off until the very late forties. There was the corner ribbon loudspeaker, with a ribbon tweeter and a horn loaded bass unit that was quite spectacular in its day. It was a lot better than anything else around. Then there was a little amp with the preamp built in and then into the Quad 1. The electrostatic came about because of materials and work that was being done in the States. Hunt's book on electroacoustics was very good.

"There was a lot of struggle to make the electrostatic work. It was a principle that had been around for a long time and was well known. The attractions were obvious if you could sort out the problems. When the electrostatic loudspeaker came out it was obvious to everyone in the industry that this loudspeaker had enormous potential. But, it was big, expensive and slightly impractical. People don't really want things that big in their living rooms. If they are wealthy they want to hide the hi-fl, and a large proportion of those people who might be potential customers for us won't buy them because of this."

You have always used those beautiful cast front panels and now back panels that allow Quad freedom of style coupled with superb strength. Now others in Britain are finally copying you. How could you afford the tooling when others couldn't?

"Simple. We sell a lot of amplifiers. In ten years we did 100,000 405s. It cost us £150,000 for the CD player and tuner."

Why did you cast the back panel?

"It produces a nice finish and it is the best way of doing it if you can. You have to have the financial resources to do it We don't see a penny back until the product goes out, which can be a long time. We are also perfectly confident of selling 50,000 to 100,000 of any model over its life span.

How about the 63, with all its mouldings extrusions, injection mouldings and suchlike?

"That's much lower. We have only done about 30,000 63s since its introduction."

Which is the biggest market?

"The UK, which is bigger than the States or Japan for us. If you take the FBA (Federation of British Audio) statistics, for the UK on preamps and amps, we make and sell considerably more than the rest put together.

"On export, on power amps, we have got about 70%. You have just been around what we believe is the biggest power amp manufacturing plant in Europe, at least for hi-fi."

Hifi Review December 1989