

ISSUES

While the majority of the pro audio world has taken the concept of the line array loudspeaker to its heart, legendary system designer Tony Andrews remains unconvinced. In the first of a new series on the subject, Gary Cooper finds out why

Line array? Nice, but dim.

Tony Andrews is not happy. The founder of Turbosound, designer of both the Floodlight and Flashlight systems and one of the industry's acknowledged 'golden ears', paces the room of Funktion One's workshop overlooking a glorious sweep of the English, Surrey Hills and is into his stride even before I can get my tape machine out of the bag.

What has Mr Andrews so animated is Line Array – or, to be precise, the hegemony it has exerted on the audio industry since L'Acoustics's Christian Heil brought to fruition his take on Olsen's 1940 work showing the theoretical advantages of Line Array designs.

It's not that Mr Andrews's Funktion One business isn't doing well – the walls are covered with pictures of recent installations and when the photo book comes out, it's soon apparent that Funktion One is doing very nicely, thank you – particularly in the Japanese and Far Eastern markets, in the dance world and even in fixed installations, including a major refit of Union Railway Station, Chicago, last November.

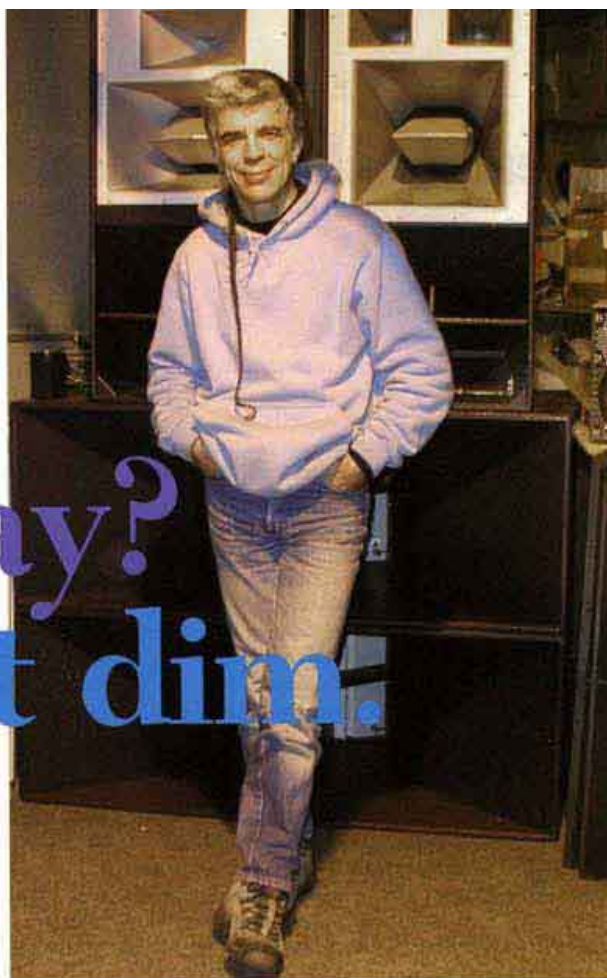
What is upsetting Tony Andrews isn't about money. It's about watching an industry to which he has devoted his working life go off at what he believes to be a distinct tangent.

After a brain-shaking (though supernaturally un-ear-damaging) audition of a Funktion One Resolution system (so that's why they call it a kick drum!), we retire to Tony and Ann Andrews's version of 'living above the shop' – an open-plan living area/recording studio that is every audio guy's dream (and probably every wife's nightmare). It's here that the story unfolds. A story, Mr Andrews believes to be a collective loss of plot of monumental proportions.

Tony Andrews's objection is not, it needs to be established at the outset, to Line Array per se. As he says: "I don't object to Line Array as a method – as a way of doing things, but I have a very strong objection to the almost childlike simplicity the business is showing about it. It's as if people were saying "Right, we've got a solution – let's paint everything pink – and if we paint everything pink, it's all going to be perfect". It is as absurd as that. It's the Emperor's New Clothes."

In the course of the next hour or so, Mr Andrews systematically removes brick after brick in the edifice of advantages claimed for Line Array – so many bricks that it's hard to know which ones to report. But, as he began with the "one-rig-fits-all" argument and moved on to dispute claims about transportability and ease of rigging, so shall I.

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'The fact that there are now three sizes of line arrays in most companies' portfolios tells you all you need to know about their lack of scalability and the fact that one box won't really work on its own – you need a minimum number of them,' Mr Andrews begins. 'Then there's the further fact that Line Arrays have a fixed horizontal dispersion – how often is this right for the room that you're working in?'

'Beyond that, you've got all the reinforcing arguments people use – such as, it's quicker to rig. This is simply not true. We can put a Wembley cluster up in 15 or 20 minutes. People say it's lighter. Again, that's not true, either and it is easily provable. So why are people saying these things when it's so simply demonstrated that they aren't true?'

'When you see that many contradictions – where the received wisdom is so completely contrary to the actuality – you have to conclude that there's some sort of mass psychosis going on and that it has now got to the point where people are saying anything to justify their version of reality. This is really what I object to – seeing all my fellow sound industry people acting like the mental lemmings that 20 or 30 years ago, we were all trying to avoid becoming.'

He is even sceptical about Line Array's greatest claim to superiority over point source – its much-vaunted ability to throw to the back of an arena.

'Yes, Line Arrays will throw – but we have recently been working on new technology that goes beyond this and have an install in a North American football stadium in Wisconsin, where they have no roof, the classic oval shape with just one position for a sound system – above the scoreboard at one end – and they wanted to cover the entire stadium from this one position. The throw involved is over 800 feet and the situation was so challenging that we decided to take a leap to our new 'Hybrid Array' technology. When they commissioned the system they measured

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128dBA at 750ft - at which point they had their instrumentation recalibrated - but it was right. Now that is an absolute fact - it isn't what we are saying, it's what some other people went out and measured. So that's throw dealt with.

'People talk about the efficiency of Line Arrays, but we get 111dB for a Watt, so as a single unit we're more efficient than a whole collection in a Line Array - and I base my statement on the fact that, at best, direct radiators could be 99dB for a Watt at one metre. With maximum coupling, you might get another 6dB, which is 105.

But we have a single device which is 111dB at one Watt one metre. Why would I want to smear up my sound with a collaboration of drivers when I can do that much with one?

So why does Tony Andrews think so many in the industry have come to regard Line Array as the only way to go?

'People seem to need golden calves. What I do remember back in the early 90s was that with point source clusters, if you walked round the system with pink noise running, you would get that "shushing" sound which, it's true, is not that desirable - though I have to say you don't see many punters actually doing that at gigs. Anyway, that's history now because we don't have that problem anymore. When VDOSC appeared, and I know that Christian (Heil) had been working on it for ten or 15 years previously, it did have this very smooth sound - there's a good chunk in the middle where the dispersion could be classed as very even. All of a sudden this was grasped on as being the most important thing in the world and it all started from there.

'People were looking for something else at that time. There were emulations of Flashlight around, none of them were that good, and suddenly there was this new thing and it seemed to satisfy a need.'

Both he and sales and marketing manager David Bruml believe that there was another, vital, element in the game - that making Line Arrays is such a straightforward easily executable concept that given human nature and commercial pressure it is no surprise that there have been a huge number of emulations of Christian Heil's concept. In essence, their argument is that designing innovative systems like Funktion One's Resolution is a careful, painstaking business with much of the effort going into minute design changes of drivers and horns until you get it exactly right. Testimony to this is abundant in the Funktion One test room, which is strewn with the carcasses of dismembered drivers, each having been tested, fiddled with, tested again, modified and then still rejected in favour of something else. Mr Andrews designs his own drivers - and every one is designed to suit its particular waveguide.

'You have to really understand what factors in driver parameters relate to what aspects of the sound and after 30 years I'm pleased to say I'm still learning. But when all you're doing is stringing up a line of eight inch speakers, that's not hard - everybody has got those in the cupboard - all you need is a bit of woodwork.

'Christian's is basically the HF in a stripe down the middle. Either side of it you've got the mid, which happens to be four 7½" speakers, which is exactly



the division of a 15", which you put on the outside, so you go from small wavelengths to large wavelengths progressively towards the edge of the box. Any low frequencies beyond the edge of the box will start to curl round the back, hence, recently, we've started to see speakers squirting out the back of line arrays, to cancel that out. As an approach that's complete anathema to me, because you're using weight, size and energy to correct or cancel something. Surely it's better to get the piece properly directed in the first place?

'It's the same as my dislike of so-called "system processing". Fundamentally it's cheating. Say, for example, you're using it to correct a deficiency like a suck-out. Usually that's a result of an argument between one part of a system and another, resulting in a null. If you put more energy into that null, all you get is a bigger argument. And you're using-up headroom... some of these processors have got 9dB cut and boost - huge and completely out of control. Why are they needed? It's because people aren't doing the job properly in the first place.

'What the human ear seems to want to hear is linear phase and, as it turns out, when we check our systems, that is what we have. It's the result - in fact it's only really possible - when you have an obsessive mania about getting the drivers right. What you want to give people is something that's completely flat and utterly responsive at all frequencies. If you can make the speakers right, then you don't need all that stuff in the middle - it's about signal path integrity.'

For those who would argue that the maths proves him wrong (try Googling Line Array if you want a quick lesson in how much physics you don't understand), Tony Andrews maintains that the maths hasn't yet reached a point where it forms anywhere near a complete model of acoustics.

'I don't rely entirely on maths, because what I realized a long time ago was that no matter how good your maths is, unless it incorporates all the factors that are involved in the listening experience, then it's inevitably going to be off the mark and, as such, could be worse than if you just do it till it sounds right - and it would be fair to say I've spent an awful lot of time learning what sounds right.

'Everyone knows you can have two boxes with identical numbers and yet which sound very different. The reason is that it's incredibly fine-grained and we simply don't have all the parameters mapped out. If we did, then yes, we could use maths entirely on its own and probably get a very nice result. The mistake we are making is to believe what we are measuring is everything that is going on. It's not that anybody is wrong - it's that the picture isn't sufficiently large yet.'

'It's only recently that measurement systems have begun to get anywhere near the way the ear behaves. The human ear really responds to first arrivals and if it didn't we wouldn't have survived the sabre-tooth tiger. Because Line Arrays get their increased efficiency from collaboration, it's important that all the speakers see each other, which means that there are quite large chunks of the frequency band where, at any given distance, ➤

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► what you're hearing is loads of different speakers and they're not all exactly the same distance from you - they can't be. So you've got these micro-delayed arrivals, which the ear will register just as the eye will a picture that's out of focus. Now that's something you can measure and when you do, what you find is a series of peaks like a palisade fence. Even though it is compressed into a millisecond people can hear it. Obviously this is nowhere near as rewarding an experience as a system that delivers nice crisp accurate arrival!

Despite the dominance of Line Array, Tony Andrews still asserts that the intrinsic strengths of the Funktion One point source products have been recognized by companies more concerned with quality of sound and practicality than fashion. 'Those companies who have joined the Funktion One network have seen a very positive increase in their level of business,' he explains. 'They weren't caught up in all this fashion business - they directly relate to the way it sounds, what it does to them. So we put it in front of them, they loved it and they bought it.'

'Back to the Emperor's New Clothes syndrome, there are people out there in live sound who have told us they would love to buy Resolution but they are concerned because the industry has become so entrenched. People ring up and they want a Line Array - they don't care *what* Line Array, which tells you all you need to know.'

'What we have, as an alternative, is a system that delivers sonic excellence, is absolutely scalable for venues from 300 to 30,000. It is



The Funktion One Team (L-R): David Bruml, Ann Andrews and Tony Andrews

This is really what I object to - seeing all my fellow sound industry people acting like the mental lemmings that 20 or 30 years ago, we were all trying to avoid becoming

small, light and rigs faster than anything else, and yes, of course, it is not a line array. That's why I call it Line Array mania and that's why I'm frustrated!

He is, understandably, cynical about the type of sound people who have brought about this situation.

'It's like Linus and his blanket. A guy who isn't really sure what he's doing, surrounds himself with Cape Canaveral so that no f*****r will come near him, because he looks really good surrounded by that Christmas tree of lights. You get enough of that going on and nobody's going to call anybody out in case they get called themselves.'

'Fortunately, not everyone. There are some really good engineers out there, but there's an awful lot of people who were mates of the band, have never been any good at it, but have been there so long that they're still doing it. Individual madness is quite rare,' he grins, 'but communal madness is all too common'.

It would be facile to dismiss Tony Andrews's arguments. And clearly what animus he has is directed at what he believes to be acoustic wrong-headedness, aided and abetted by clever marketing. Is he simply standing his ground while progress washes around him? Maybe. But mankind has suffered collective delusions in the past. Witness the medical profession's dogged refusal to believe gastric ulcers were caused by bacteria rather than 'stress'. Even the most expert of experts can get it wrong. And that is what Mr Andrews thinks has happened in professional audio. •

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