

# Harbeth - The BBC Heritage and beyond



The Harbeth Monitor 20/2, subject of John Willett's review

After attending the very interesting and informative lecture given by Alan Shaw (MD of Harbeth Acoustics and principal designer) at the Annual General Meeting of the IBS earlier in the year (see the last issue of *Line Up*), I decided to take a closer look at the company and what it is doing. So I journeyed down to Haywards Heath to see the factory, meet Alan Shaw and talk about Harbeth Acoustics.

## Sound Dept to the Past

Harbeth was founded in 1977 By Dudley Harwood, the last Director of the BBC's Loudspeaker Research Department and the 'father' of the BBC's most famous loudspeaker, the LS3/5a. It was Harwood who took over from DEL Shorter who can rightly be credited with being the first to apply scientific methods and specialist test equipment to what was, and still is, a grey area between engineering and art. In addition to the LS3/5a, Harwood was responsible for the LS5/5 (a three way system from which the

Reprinted from Line Up magazine, Dec. 1998/January 1999

**JOHN WILLETT MIBS visits Alan Shaw at Harbeth Acoustics in West Sussex and has a listen to the very first Monitor 20/2 Loudspeakers.**

Harbeth Monitor 40 can loosely be said to have evolved), the LS3/6, LS3/4 and even the forerunner to the commercially made STC 4038 ribbon microphone, the original high quality BBC PGS-1 with adjustable ribbon tension for which DEL Shorter did the research and Harwood the design .

It was that breadth of knowledge that made the BBC's loudspeaker development department the envy of the world. Upon his 'retirement' from the BBC and with the then revolutionary polypropylene cone patent under his belt, he set up in a small way to manufacture a loudspeaker in the BBC tradition - the HL Monitor. He eventually sold the company to Alan Shaw in 1986.

Dudley certainly left the company in good hands. The first thing that impressed me about Alan Shaw is his obvious passion for loudspeakers. He has, from early days, had a consuming interest in sound reproduction in the BBC tradition with the aim always to 'get it right' and it was very clear to me that he is not in the business to 'make a quick buck', but because he believes in what he is doing.

## Philosophy

Time does not stand still. Although the BBC tradition is very much a part of today's Harbeth Acoustics, Alan is not hidebound by out of date working practices and moves forward with technology. As he said, "a monitor loudspeaker should stop the user from making a fool of himself (herself)" and his aim is to make monitors that can be trusted and relied upon. It is no good making expensive and irreversible recording or mix-down decisions based on what a monitor loudspeaker tells you, only to find, perhaps months or years later, that those balance decisions were wrong because of false information presented by the loudspeakers.

This philosophy has lead Harbeth to engineer a consistent sound quality, from the smallest to the largest unit (aiming, of course, to produce a loudspeaker without a characteristic 'sound' of its own). So a recording monitored on location with, for example, a Monitor 20, will have essentially the same character of sound when played back on a Monitor 40, but with the advantage of increased dynamic range and frequency response.



A batch of 'Circle 5' monitors rolling off the Harbeth production line for HHB Communications

### Practice

Harbeth manufacture three distinct series of monitor loudspeakers (excluding, for the moment, the Hi-Fi range). The first group is the BBC designed units, the **LS3/5a** and the **LS5/12a**, which Harbeth manufactures under licence for the BBC. The second group is the Harbeth designed **Mastering Series** comprising the **Monitor 20, 30 and 40**. The third series is the **Xpression!** (now **Circle 5**) family now made exclusively for **HHB** who distribute them worldwide.

The BBC series are built under licence, and are sold world-wide, but the LS3/5a is now finished due to the fact that KEF no longer make the drive units in sufficient quantity for commercial production to continue. The very last batch rolled off the production line in August 1998; a signed limited edition in rosewood veneer. The LS5/12a is in current production and will continue as long as there is a demand.

### The Masters

However, it is the Mastering series I want to concentrate on here, as this range is the true broadcast monitor, very much in the BBC mould, giving an uncoloured sound that can be trusted when making vital decisions during recording and mixing operations.

The design philosophy behind the Mastering series is that this is how the BBC would make a monitor today, were the Loudspeaker Design Department still in operation; using the latest computer design techniques and the latest materials. Every single drive unit is graded for sensitivity, and only units of equal sensitivity are used to make up a pair of loudspeakers.

The crossover components are also individually measured and graded, and the values chosen individually to match the drive units. Every single loudspeaker is measured and certified and the manufacturing tolerances are to a tight 0.5dB. All details are recorded, so that if for some reason a loudspeaker needs repair, Harbeth have all the details on file and can provide a replacement drive unit of identical sensitivity to guarantee the continuing performance of the loudspeaker.

The Monitor 20, 30 and 40 are designed to be almost exactly the same size as the BBC LS3/5a, LS5/9 and LS5/8 allowing them to be used as 'drop in' replacements without any structural alterations to the studios. Considering that the original BBC monitors were the best that design methods and materials available in the 1970s could achieve (remember, the LS3/5a is a 25 year old design!), the new monitors with modern practices and materials are far more accurate and less coloured.

Although the cabinet is a vital part of the loudspeaker design, a fundamental quality limitation is imposed by bass/midrange cone material. Bextrene, Kevlar, polypropylene, etc all have their own characteristic sound. With a Government research grant Harbeth, together with the Science and Engineering Research Council, have developed a new cone material so pure and characteristic-free, that the coloration of conventional cones becomes obvious by comparison, and this 'RADIAL' cone material forms the basis of the Monitor 30 and Monitor 40 loudspeakers. I had hoped to obtain a review pair of the Monitor 30s to report on now. However, Harbeth seem to sell them as fast as they can make them at the moment, so this test will have to wait for another time.

Alan tells me that after having purchased some Monitor 30s, one well known studio has totally rethought its monitor policy, as their current units are now sounding so coloured compared to the clean sound of the Monitor 30 that his clients are insisting on listening on the Monitor 30s in the editing studio rather than on the main studio monitors. He is now replacing the main monitors with Harbeth Monitor 40s.

Although the first units were passive loudspeakers only, both the Monitor 30 and 40 are now available as fully active designs, doing away with the requirement for separate power amplifiers, providing better bass control and allowing the drivers to follow the waveform more accurately. Both versions have overload limiters that only operate under conditions of extreme overdrive, and then with a warning indicator, unlike one very well known manufacturer who sees fit to include a compressor in his active designs (imagine having to do quality monitoring on a loudspeaker that compresses the sound!).

Given that medium sized and large monitors are essential for quality monitoring, it is the smaller units that are the bread and butter of any manufacturer – especially as these are the units commonly used with Digital Audio Workstations (DAWs). It is extremely dangerous for the DAW user to rely on small cheapo computer loudspeakers if he or she is the only quality arbiter before transmission or mastering (as is increasingly the case). Much hair has been torn out when recordings have been presented for transmission with hum and other nasties that have been totally missed due to the inadequacies of the monitors. The cost saving on cheap, plastic DAW 'monitors' disappears when programmes have to be re-worked to remove unacceptable audio problems.

The Monitor 20, at the same size as the LS3/5a, is ideal for this purpose as all its drivers are magnetically shielded and can be used close to computer monitor screens.

The measuring and grading of drive units and components is expensive and time consuming and can make a small loudspeaker very costly. If the quality is there, the money must be worth it – however, if this cost can be reduced without compromising sound quality, it must be a good thing.

Harbeth is now sourcing the drive units for its small monitors from a company that has made a very large investment in drive unit production, by first perfecting the design and then investing in automated manufacturing that will repeatedly produce this design to very high tolerances. The result is a product of very high quality that can be sold for a lower price than if produced by traditional methods. In Harbeth's case the drive units are supplied from the manufacturer with no more than 0.5dB difference between them, obviating the need for individual measurement and grading and also allowing the crossover to be simplified. The result is a large improvement in quality with no increase in price.

### Listening Tests

The result of applying this new thinking to already well received products, is that Harbeth have upgraded the **Monitor 20** to a **Mk.II** version with these new drive units (launched at this year's SBES in Birmingham). I have the very first (pre-production) pair of these for review, and have been putting them through their paces.

Connecting them up in place of my usual monitors I was immediately impressed by the quality of these small loudspeakers. I left the Monitor 20/2 connected for extended listening tests, using both my hi-fi, and NICAM television sound.

The larger Monitor 30 and Monitor 40



Monitor 30



Monitor 40

At one point I was a little puzzled about a boxy-like sound coming from them, until I realised that they were letting me hear the room more clearly than my normal monitors and the boxiness was the acoustic of the room in which the interview broadcast on the television was recorded. Seeking a second informed opinion, I took them over to well known industry figure, Mike Skeet to solicit the benefit of his many years of classical recording experience.

The listening tests were carried out in Mike Skeet's listening room using various recordings made by both Mike and myself, as well as other commercial CDs. As soon as we started listening Mike said, 'I like these, they seem to have the ability to 'see' into the acoustic more than other loudspeakers.'

However, this was a stereo recording with a minimalist microphone technique. Swapping over to another recording that was multi-tracked it was very clear that this was indeed the case – the effects just seemed 'pasted' on. The Monitor 20/2s did everything that a monitor should – speech was natural and realistic, stereo was well located with a good central image, and the brain seemed to compensate for the lack of low bass inherent in small loudspeakers. These are very revealing loudspeakers and should enable you to make the recording/editing decisions required. We then did something that was very unfair really; we compared the Monitor 20/2s to Mike Skeet's ATC SCM20A-Pro active monitors. These are vastly more expensive than the Harbeth Monitor 20/2s and are much larger. Despite this, the Monitor 20/2s held their own and were not disgraced in any way by the comparison. The Monitor 20/2s are accurate and uncoloured units and both Mike and myself were extremely impressed by them.

Good though his monitors are, Alan Shaw is not standing still. A powered version of the Monitor 20/2 was also launched at SBES and a fully active version may follow if the demand is there. I am certainly going to get a powered pair to go with my DAW.

The overriding impression I have taken away from Harbeth is that quality matters, and I would be happy to trust my recordings to their loudspeakers – and when one's reputation is at stake, I think that says it all.

*ajs*

For further information contact:-  
Alan Shaw at  
Harbeth Acoustics Ltd.,  
Unit 1, Bridge Road, Haywards  
Heath, West Sussex, RH16 1UA.  
Tel: 01444 440955,  
Fax: 01444 440688,  
e-mail: [sound@harbeth.com](mailto:sound@harbeth.com),  
web site: <http://www.harbeth.com>.

# NEWS

## **Sennheiser's Jürgen Wahl at Pinewood Studios**

Oct 27th 1998

Sennheiser's well known consultant Malcolm Johnson chose the elegant surroundings of Pinewood Studios for Jürgen Wahl's equally elegant presentation on Microphones, entitled by Sennheiser 'The Universe of Microphones.' Jürgen's total mastery of his subject, together with his core of infectious enthusiasm resulted in an enthralling survey of microphones, their characteristics, design, shortcomings and usage, and produced, for most present, hitherto unrealised thoughts.

Jürgen Wahl is the Principal Applications Engineer for **Sennheiser** and **Neumann** in the USA. He has been involved in music and electronics from an early age and has worked in both areas in the States. This background and his present position has permitted him to research, quantify and qualify many of those aspects of microphone technique which we often apply from experience. Added to this was his sophisticated computer-aided screen presentation which, fed to a pair of **Harbeth Monitor 40s** produced convincing and lateral thought-provoking material.

During the pre-presentation hospitality a short 'file' of very pleasing 'background' music was playing with its accompanying screen representation. At the start of the presentation we were closely quizzed by him on the components of the ensemble! This was followed by the need to identify the mics used to record a Haydn quartet – which turned out to be (shock, horror) a pair of 1930 CMV3s!! Mic positioning, proximity effects, cancellation, and frequency dependent radiation patterns of musical instruments were demonstrated with startling clarity. We had probably a week of seminars concentrated into 2 1/2 hours. It seemed like five minutes!

If you really want to understand more about the Black Art in which we are engaged, move Heaven and Earth to hear Jürgen Wahl!

**Antony Askew ARCM, MIBS – with promptings from Mike Skeet MIBS**

*Mr Wahl is a member of the AES, currently Chair of the Los Angeles chapter, has served as vice-chairman, paper chairman and committee member. He is also a member of the Society of Broadcast Engineers (SBE).*