Slim Speakers - Serious Sound

ATI FirePro™ V7750 1GB professional graphics, Dell UltraSharp™ 2711 monitor and NX from Siemens PLM Software enable the speedy development and timely launch of slim profile surround sound speaker system.

A sound reputation

Founded in 1961 by former BBC sound engineer Raymond Cooke, KEF Audio is renowned for the quality of its loudspeaker systems, and has won numerous awards for its range of hi-fi products. The company's success is built on innovative research and design coupled with an intimate understanding of the consumer market.

By 2009 flat wall mounted screens were leading the way in the TV market place, and KEF recognised that it was time to release a slim profile wall mounted home theatre system to complement such televisions. "What had previously been a niche area was expanding rapidly," explains Phil Gidley, Design Engineer. "We knew that we needed to complement our existing home theatre range with a new product designed specifically for this market."

Hi-fi meets home theatre

After nearly a decade of success with the iconic egg shaped 2000 and 3000 series home theatre products, the company's engineers could not afford to risk KEF's reputation for excellence by compromising on sonic performance. They were understandably reluctant to move away from traditional diaphragm loudspeakers and adopt alternatives such as flat panel drivers. The first challenge was therefore to re-package KEF's proven speaker technology into a product that would be a mere 35mm thick. Phil Gidley describes the technical difficulty: "Allowing for the thickness of the rear casing and for movement of the diaphragm at the front, we had a maximum of 27 mm in which to compress all the components which would normally have a depth of 70 to 80mm."

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Phil Gidley, Design Engineer, KEF Audio

"They gave us excellent guidance when we upgraded to NX7. Since then they have really helped us to get the most out of the software by assisting us with specific modelling issues. In this instance they were absolutely right – AMD professional graphics and NX are an ideal combination." *Phil Gidley, Design Engineer, KEF Audio*

The detail design process for the new T Series had to start in January 2010 if the challenging September launch deadline was to be met in time for the peak autumn and pre-Christmas buying season. KEF was well positioned to meet this latest design challenge with maximum efficiency, having recently re-equipped its Design Office with Dell UltraSharp™ 2711 monitors, and new computers incorporating the latest ATI FirePro graphics card. KEF's CAD partner, TEAM Engineering, had suggested a suitable graphics card specification, and recommended the latest ATI FirePro™ V7750 1GB professional graphics for KEF's existing installation of NX7 Product Lifecycle Management software from Siemens PLM Software.

TEAM Engineering is the UK's longest established Siemens PLM Software reseller with over 13 years experience and prides itself on its enduring technical competence. The company's purpose-built Technical Centre in Huntingdon provides comprehensive technical support, certified migration lab, consultancy and training for the complete Siemens PLM suite. TEAM Engineering also carries out NX TM beta testing and provide NX I-deas®

data migration and auditing. According to Phil, the specialists at TEAM Engineering really understand KEF's needs. "They have provided technical support for about 8 years, and when we first transitioned from I-deas to NX three years ago they organised bespoke training. They gave us excellent guidance when we upgraded to NX7. Since then they have really helped us to get the most out of the software by assisting us with specific modelling issues. In this instance they were absolutely right – AMD professional graphics and NX are an ideal combination."

Taking time out of the loop

Phil began using AMD graphics in late 2009 when the T Series was at the industrial design stage. "The critical issues at that phase were to obtain management approval of the Industrial Design, and to confirm the manufacturability of the product, so I created basic CAD models to aid this process. The graphics helped enormously by giving us a stronger sense of the new product. Being able to see various features very clearly certainly took time out of the loop at that early stage."

The design team then began the task of compressing a full size loudspeaker into a tiny space under a tight deadline. "It was an interesting design problem" comments Phil. We created many 3D CAD models before arriving at the final design comprising a lightweight twin layer flat diaphragm that was reinforced to act as a pure piston when driven by a conventional voice coil, thus reducing distortion.

Taking a different approach

Other companies had released slender wall mounted speakers using, for example, a flat piece of material acting as a resonating panel. "By re-developing conventional components and arranging them to fit neatly into each other, rather than stacked from front to back within the speaker, we were able to achieve our target drive unit depth of 27mm without sonic compromise," Phil explains.

Once the drive unit design was complete, real time visualisation became critical during the enclosure development process which involved industrial design and acoustic specialists, design engineers, project management, and our marketing team. "AMD professional graphics enabled me to manipulate and assess multiple models quickly and easily. This was particularly
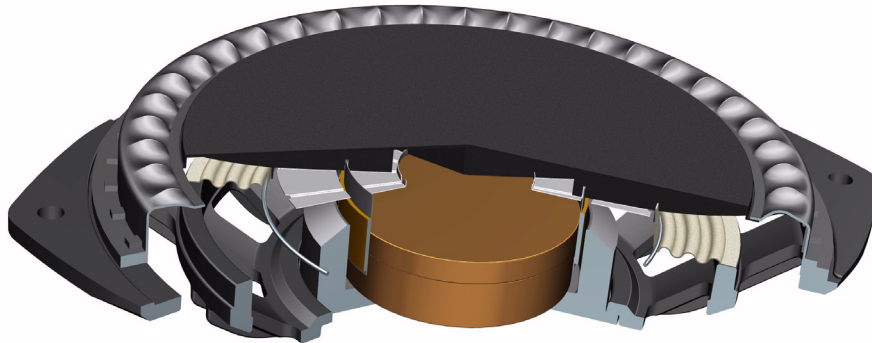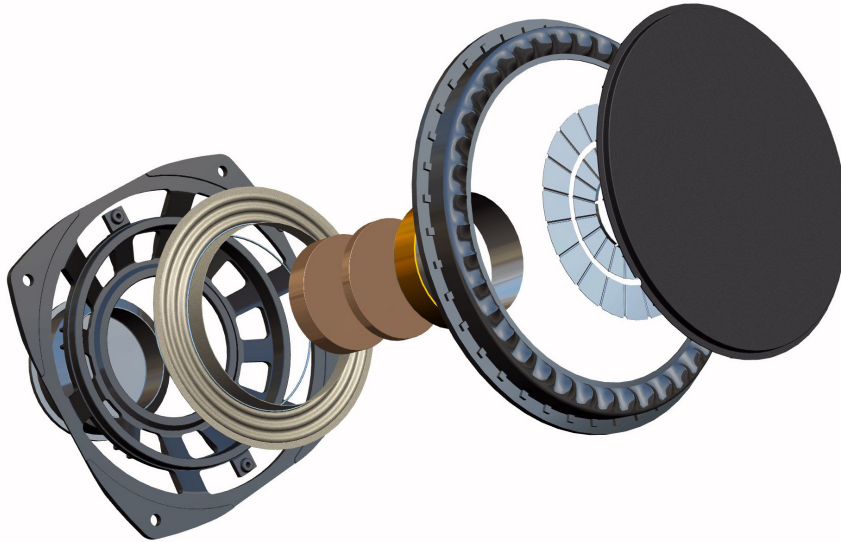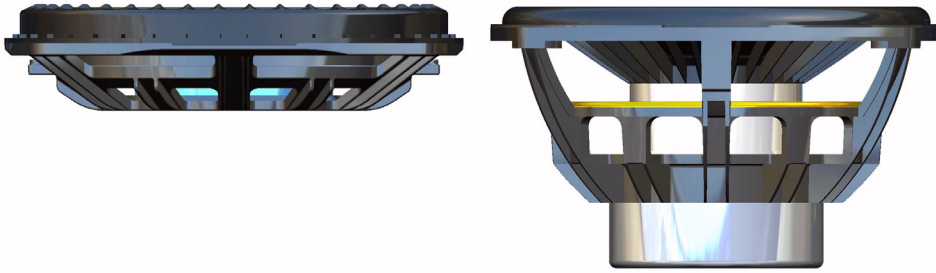
useful during group discussions; the ATI FirePro card was so fast that designs could be rendered, visualised, assessed, modified and re-rendered instantly. As there was never any waiting time we were always able to retain our focus. In addition, NX True Shading provided superb near photo realistic real-time images complete with reflection, shadow and perspective. At the same time the 27-inch Dell UltraSharp™ monitors gave everyone a good view. With an extremely high resolution of 2560 x 1440 pixels there was no need to huddle around, it was easy to relax and participate as we discussed how to make best use of the very limited space available within the product."

Creating a fabulous product

The renderings produced from NX and AMD professional graphics were so good that the marketing department could use them with a minimum of costly and time-consuming retouching. "Previously, a screen grab looked like a CAD model, now it looks like a photograph," comments Phil. "For example, the rendering is so good, even metallic surfaces look really life-like. In some cases people have mistaken a rendering for a photograph."

By April 2010 the design phase was complete, and by late September the products were ready for shipping. The T Series speakers repay handsomely the effort expended at the design stage, combining KEF's renowned sound quality with pleasing curves and a mix of hard and soft feel finishes that offer a satisfying visual and tactile experience. Phil concludes: "We have to work hard and smart in order to maintain our position in the market. Having accurate onscreen visualisation helped us to meet our deadline and create a fabulous product."

Links