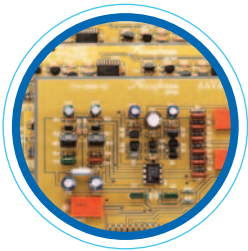




Accuphase Laboratory Inc.

Innovative audio equipment manufacturer Accuphase Laboratories uses Altium Designer to create high-performance audio equipment.



"Altium Designer provides many features for the design of state-of-the-art hi-fi audio apparatus and has evolved with its ongoing development to offer us a state-of-the-art design environment. Our service department also uses Altium Designer to create manuals, since they can save time by using the schematics and PCB data directly from the designers, which is great!"

Mark M. Suzuki,

Director, Engineering Dept,
Accuphase Laboratory Inc.

The Need

Accuphase Laboratories of Yokohama, Japan is a respected Japanese manufacturer of state-of-the-art audio products that are hand-built using innovative electronics and precise construction techniques. The company regards the quality of the printed circuit boards used in their audio products to have a direct link to the unit's sonic quality, and therefore places a high emphasis on the design layout and electrical properties of their boards.

In order to maintain the quality and consistency of their circuit board production and reduce research and development time cycles, Accuphase needed to complete all phases of their board-level design in-house while maintaining the highest possible quality. Altium Designer was the ideal solution.

The Challenge

The demands of a specialized industry such as high-end audio equipment are not unlike those of the limited-production luxury car market, where the product development strategy is directed towards innovative, high-quality design that is not compromised by a dominant need to produce a low-cost product. Production volumes are low, research and development is a primary focus, and design quality is not compromised. For Accuphase, these constraints place high demands on both their design engineers and the electronic product development software they use.

While Accuphase does not release a regular stream of new products as typified by mainstream consumer electronics companies, it does however respond to customer needs by bringing new and innovative products to market as quickly as possible. In line with the company's commitment to create advanced, sonically-satisfying audio products, Accuphase engages in an extremely iterative design approach based on sequential circuit refinement in response to both subjective and objective performance testing. As a result, many prototypes are built, tested and auditioned through the development process, which in turn creates short, critical PCB design cycles for the Accuphase engineers.

The Solution

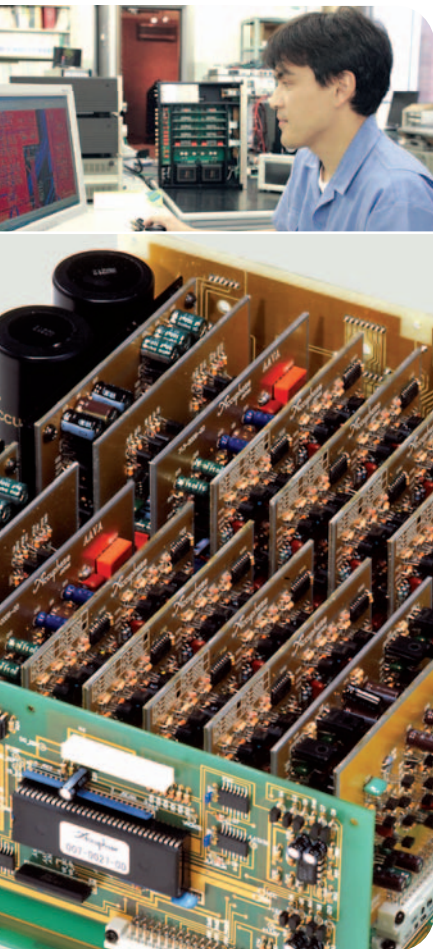
To meet their requirements of a precise, highly-productive PCB development system, Accuphase selected Altium Designer for their board-level design engineers. Altium Designer's highly-integrated and intuitive design environment allows the Accuphase engineers to produce high-quality board designs within short deadlines while maintaining close control of the entire process from conception through to completion.

Unlike most design solutions based on a collection, partially-integrated or linked design tools, Altium Designer offers seamless integration through the various design stages in a single, efficient application, allowing Accuphase to tightly manage their PCB design and production process while maintaining the high-quality results expected of their products.

The Results

Using Altium Designer, Accuphase creates highly-optimized audio modules such as their innovative Accuphase Analog Vari-gain Amplifier (AA), a 16-bit digitally-controlled volume control stage that uses multiple voltage-to-current converters to achieve an excellent signal-to-noise ratio and distortion performance while precisely controlling channel balance levels. Along with Altium Designer's efficiency and control, Accuphase also appreciates the software's powerful simulation and multi-channel capabilities, which further refine the process of creating their high-end audio products.

In line with the Accuphase philosophy of creating the best possible audio technology without concession, the company has not compromised its choice of electronic product development software. According to Accuphase, their mission to provide state-of-the-art audio products such as their flagship C-2800 stereo preamplifier would not be accomplished without the powerful features and productive environment provided by Altium Designer.



Product Information

The Accuphase C-2800 Precision Stereo Preamp features a unique dual-mono design where the unit's left and right channels are physically and electrically isolated. Each channel's power supply, amplifiers for line input, balanced output and AVA stage are entirely separate from those of the other channel to prevent unwanted crosstalk and interaction both on the electrical and physical plane. The result is an utterly stable stereo image and impeccable playback quality.

Along with specialized construction techniques, each and every part used in the C-2800 preamplifier has been selected on the basis of sonic performance during the exhaustive research and development stage. Logic relay control is used for signal source switching to implement signal paths that are as short as possible, and components are assembled on high-quality Teflon (glass fluorocarbon resin) motherboards that feature a low dielectric constant and minimum loss. The overall result is a flagship product that represents the best that Accuphase has to offer.

Customer Information

Accuphase has been designing and building high-quality audio products since 1972 when a skilled group of audio experts and engineers came together to conceive the successful Accuphase line of audio equipment. The name Accuphase is a combination of the word 'accurate' and the parameter the company considers the most important factor in audio technology - 'phase'.

Supporting the company's commitment to a continuous pursuit of quality, Accuphase products are hand-built to an exacting standard using carefully selected components. By avoiding the compromises of mass production, engaging in extensive development programs and resisting the whims of market fashion, Accuphase is able to deliver true high-fidelity sound reproduction products through a limited number of specialized stores.

For more information visit www.accuphase.com

Altium's technology
implemented in the
high-end audio
equipment industry

About Altium

Altium is a global developer and supplier of electronic product development software for the Microsoft Windows environment. Founded in 1985, Altium released the world's first Microsoft Windows-based printed circuit board design tool in 1991, and continues to provide advanced, easy-to-use and affordable design systems to electronics engineers, designers and developers worldwide.

Altium Designer is a single, unified application that provides all the technologies and capabilities necessary for complete electronic product development. Altium Designer integrates board- and FPGA-level system design, embedded software development and PCB layout, editing and manufacturing.

For more information, visit www.altium.com

