

Accuphase

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.

“ 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 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, highlyproductive PCB development system, Accuphase selected Altium Designer for their board-level design engineers. Altium Designer's highlyintegrated and intuitive design environment allows the Accuphase engineers to produce highquality 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 highlyoptimized 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.

CUSTOMER SUCCESS STORY



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 Preamplifier 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.

About Accuphase

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.

ABOUT ALTIUM

Altium Limited (ASX:ALU) creates electronics design software. Altium's unified electronics design environment links all aspects of electronics product design in a single application that is priced as affordable as possible. This enables electronics designers to innovate, harness the latest devices and technologies, manage their projects across broad design 'ecosystems', and create connected, intelligent designs.

Founded in 1985, Altium has offices in San Diego, Sydney, Karlsruhe, Shanghai, Tokyo, Kiev, with value added resellers worldwide. For more information, visit www.altium.com. You can also follow and engage with Altium via [Facebook](#), [Twitter](#) and [YouTube](#).