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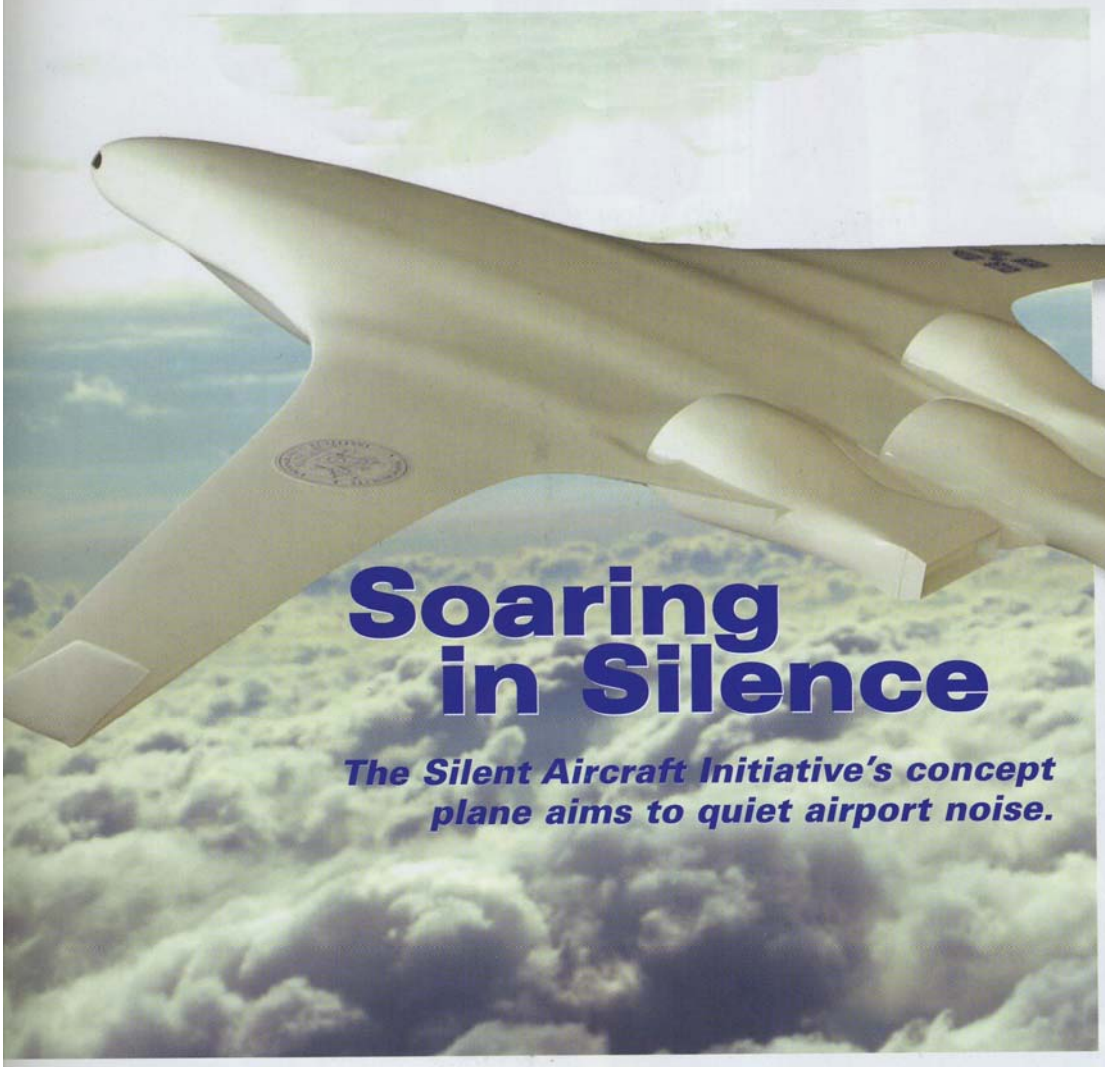
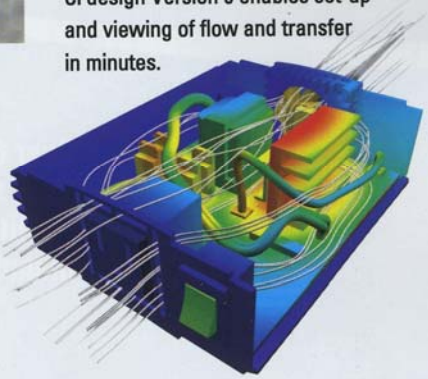


## Soaring in Silence

***The Silent Aircraft Initiative's concept plane aims to quiet airport noise.***

## In This Issue





# The Surge Protector

## It took nearly near two decades, but Rudy Harford has totally eliminated damaging power line energy.

**By Len Vermillion, Editor in Chief**

Rudy Harford describes himself as a lone wolf, at least when it comes to his work. While the term "lone wolf" conjures up images of a cowboy riding horseback through the western desert with a 10-gallon hat on top of his head and a lasso in hand, this lone wolf isn't taming the Wild West, he's taming power surges. His work isn't done under the blazing sun of Dodge City, but under the lights of his laboratory — CAD software at the ready — along the banks of Delaware River in Frenchtown, NJ.

**SNAPSHOT: Rudy Harford**

**Position:** Owner/Chief Engineer

**Company:** ZeroSurge Inc., Frenchtown, NJ

**Accomplishments:** Patents for Series-Mode Suppression, Wide Voltage Range Suppression, and Total Surge Cancellation; holds more than 300 additional worldwide patents and more than 40 additional US patents

**Honors:** Two-time New Jersey Inventor of the Year, 1991 and 2005

**Other:** Active with UL in establishing new standards for surge suppression performance; member of both UL's Industry Advisory Conference and Standard Technical Panel for Safety

Harford has an engaging personality and speaks with a spark in his voice when the conversation turns to power surge suppression. For the past 17 years, he's been a man on mission to wipe out power surges in critical equipment. He doesn't want to simply suppress dangerous surges, he wants to totally eliminate them.

It was in the mid-1980s when Harford, developing integrated circuits for televisions at RCA Corp, began his quest for total surge suppression after developing a DAQ system that would be used in sensitive equipment and needed, as he puts it, a really good surge suppression unit. "I didn't want a surge suppression that eventually failed," he says. "I wanted one that didn't fail."

When he found that the surge suppression technology of the mid-80s was too unpredictable to support demanding applications, his response was a "simple" one. He set out to create his own powerful surge suppression technology. And that's just what this unassuming man from the forestry-laden countryside of New Jersey did.

As it stands today, Harford is the inventor of a new technology called Total Surge Cancellation, which, by its most basic definition, effectively eliminates any surge-related effects to connected equipment. But getting to this point was no easy task. In fact, it was a long process requiring Harford to rack his brain, mull over designs, and upgrade existing technology which he had previously invented.

Before there would be Total Surge Cancellation, there would be ideas for two other patented designs from Harford's work. In 1989, Harford received patents for work forming the basis for "Series-Mode" technology. Series-mode suppression exhibited worst-case surge endurance, with very low let-through voltage. With his patents in hand, Harford started his own company, calling it ZeroSurge Inc.

For many engineers, creating one ground-breaking technology might be reason to sit back, relax, and enjoy the fruits of his labor. But Harford had more ideas, mainly born from conversations he had with military people interested in further protecting their vital equipment.

"It was the same military people I spoke with earlier [in creating Series-Mode]," he says. "It was around 2002 and they asked about wide-voltage products that they were developing for military uses. They needed a technology to protect those as well."

He admits that he was skeptical it could be accomplished. "When I was talking to the military people, they said to me, 'We have a lot of sensitive equipment, we'd like to have no surge.' I laughed at that," he says.

But Harford got to right to work. As the only designer in his new company, he drew up several CAD models of what he would call WVR, or wide voltage range suppression. He says

> "I didn't want a **surge suppression** that **eventually failed**, I wanted one that **didn't fail**."

he expanded the standard voltage range of 120 V for Series-Mode filter technology so it would be able to operate effectively form 85 to 175 Vrms, with 240 V products operating from 85 to 265 Vrms.

And still, Harford was not done. Fast forward a few years and Harford found a way to complete his goal of total surge suppression. His newest filter technology is another addition to Series-Mode technology. He accomplished Total Surge Cancellation by adding additional windings to the input surge inductor and converting it to a transformer. By phasing one of the secondary windings, a canceling voltage is developed in the winding. When the canceling voltage is subtracted from the suppressed voltage, total cancellation results since the residual voltage falls below the normal power line peak voltage.

Having accomplished his goal, he's not laughing at the thought of total cancellation anymore. Instead, he's relishing the chance to provide an important technology for users of sensitive and critical electronic equipment. ■