Preserving legacies: from classic cars to semiconductor aftermarket

Lansdale Semiconductors' president, R Dale Lillard, explains how an idea for restoring classic cars blossomed into an industrial solution for managing semiconductor obsolescence

I spent my formative years behind my grandfather's garage, where he specialized in rebuilding engines for 1940s and 1950s cars. My playground was a car junkyard, sparking a passion for working on classic cars that has stayed with me throughout my life. Today, I maintain a collection of these timeless vehicles. In my high school and college years, I worked with a distributor of automotive car parts, collaborating with suppliers like NAPA and Advanced Auto Parts. These partnerships were crucial for keeping older cars on the road, especially when original parts were no longer available.

Turning 40 was marked by acquiring a previously restored, red 1965 Mustang convertible as my personal car. This iconic vehicle, synonymous with American automotive history, fueled an intriguing idea—to secure the original Ford Mustang tooling. My vision was to provide the automotive aftermarket with new parts crafted to the exacting standards that defined the original Ford manufacturing.

During the 1980s, the popularity of older Mustangs soared, creating a demand for replacement parts. However, many of these components, sourced from various suppliers, often exhibited marginal quality, particularly those originating from China.

Recognizing the need for high-quality, authentic replacements, my aspiration took shape—to acquire the tooling that birthed the legendary Mustang. By doing so, the goal was clear: to ensure that enthusiasts and restorers could access new parts that mirrored the excellence Ford had embedded in its originals. While I never was able to produce original Mustang parts the idea stayed with me into my career in semiconductor manufacturing.

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Lansdale Semiconductor's president, **R. Dale Lillard**

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manufacturing a germanium transistor line purchased from Motorola and an IC line purchased from Raytheon that were used in early weapon systems like Hawk missiles and S3A submarine chasers. The Defense Logistics Agency (DLA) was grappling with the challenges of OEM obsolescence of ICs. The conventional solution of end-of-life purchases proved unsustainable as they ran out of space and funds to support the growing inventory of obsolete ICs.

Inspired by my experiences with classic cars, I proposed a novel idea to the DLA—the semiconductor aftermarket, modeled after the automotive aftermarket. The concept involved purchasing IC tooling, intellectual property and inventory from the original manufacturer to keep ICs alive. This proposal was accepted, leading to Lansdale's development of manufacturing capabilities and negotiations to acquire product lines from Signetics/Philips and Motorola.

In 1995, the DLA established Mil-PRF-38535 military qualified manufacturing lines (QML), bringing credibility to the semiconductor aftermarket. This ensured that ICs were manufactured and tested according to military specifications, guaranteeing their quality and reliability. Standardized specifications simplified the manufacturing process, making military products more readily available to users. Lansdale, in business for over 60 years, continues to support the military marketplace and some commercial products. The past five years have been particularly successful as end users face increasing challenges in finding inventory for legacy products.

As our military landscape evolves, a significant number of crucial defense systems have stood the test of time, surpassing the half-century mark. The formidable challenge lies in the cost-prohibitive nature of replacing these aged systems, making the availability of spare parts and aftermarket components integral to their continued operation and maintenance.

Many military systems, dating back over 50-years, continue to serve a vital role in national defense. The reliance on aftermarket components has become a linchpin, ensuring the longevity and reliability of these legacy systems. Notably, systems designed in the 1980s and 1990s owe their sustained functionality to the innovative solutions provided by the aftermarket.

However, the aftermarket isn't without its share of challenges. One critical hurdle is the quest for viable wafer processing capabilities tailored to the unique requirements of these aging systems. The closure of wafer fabrication facilities that once produced ICs for 50-year-old

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systems introduces a palpable risk. Yet, the aftermarket has demonstrated resilience by strategically establishing die banks during the operational lifespan of these facilities. These die banks, conceived to anticipate future requirements, play a pivotal role in ensuring a consistent supply of aftermarket parts even after the closure of older fab facilities.

Navigating the intricate world of ICs, the aftermarket perseveres in the assembly and testing of these components. Despite the obsolescence of certain manufacturing processes, the integration of newer equipment has proven to be a crucial bridge between past and present. The compatibility of modern testing and assembly methodologies with older products is a testament to the aftermarket's adaptability, ensuring that the components meet stringent quality standards.

An additional supply risk that the aftermarket confronts pertains to IC packages, particularly those associated with lower volume configurations that are no longer officially supported. The aftermarket relies on excess inventory to mitigate this risk, emphasizing the importance of strategic planning and collaboration within the industry to address potential shortages.

In essence, the aftermarket's role in the defense sector is not merely about sustaining outdated systems but evolving with them. The commitment to innovation, strategic foresight in the form of die banks and adaptability to newer technologies collectively underline the aftermarket's indispensable contribution to the longevity and functionality of our military systems. As we continue to face these challenges head-on, the aftermarket remains a crucial ally in ensuring that our defense capabilities stand the test of time.

My journey from classic cars to the semiconductor aftermarket has been unique. The commitment to preserving and supplying components for aging military systems stands as a testament to Lansdale's dedication. In navigating these challenges our innovative approach involving tooling acquisition has paved the way for sustaining integrated circuits. The establishment of Mil-PRF-38535 qualified manufacturing lines in 1995 has further solidified the industry, ensuring compliance with military specifications. As we continue to address the evolving landscape, the aftermarket faces challenges in finding wafer processing capabilities for older ICs, underscoring the importance of die banks and adapting to newer technologies compatible with vintage products.

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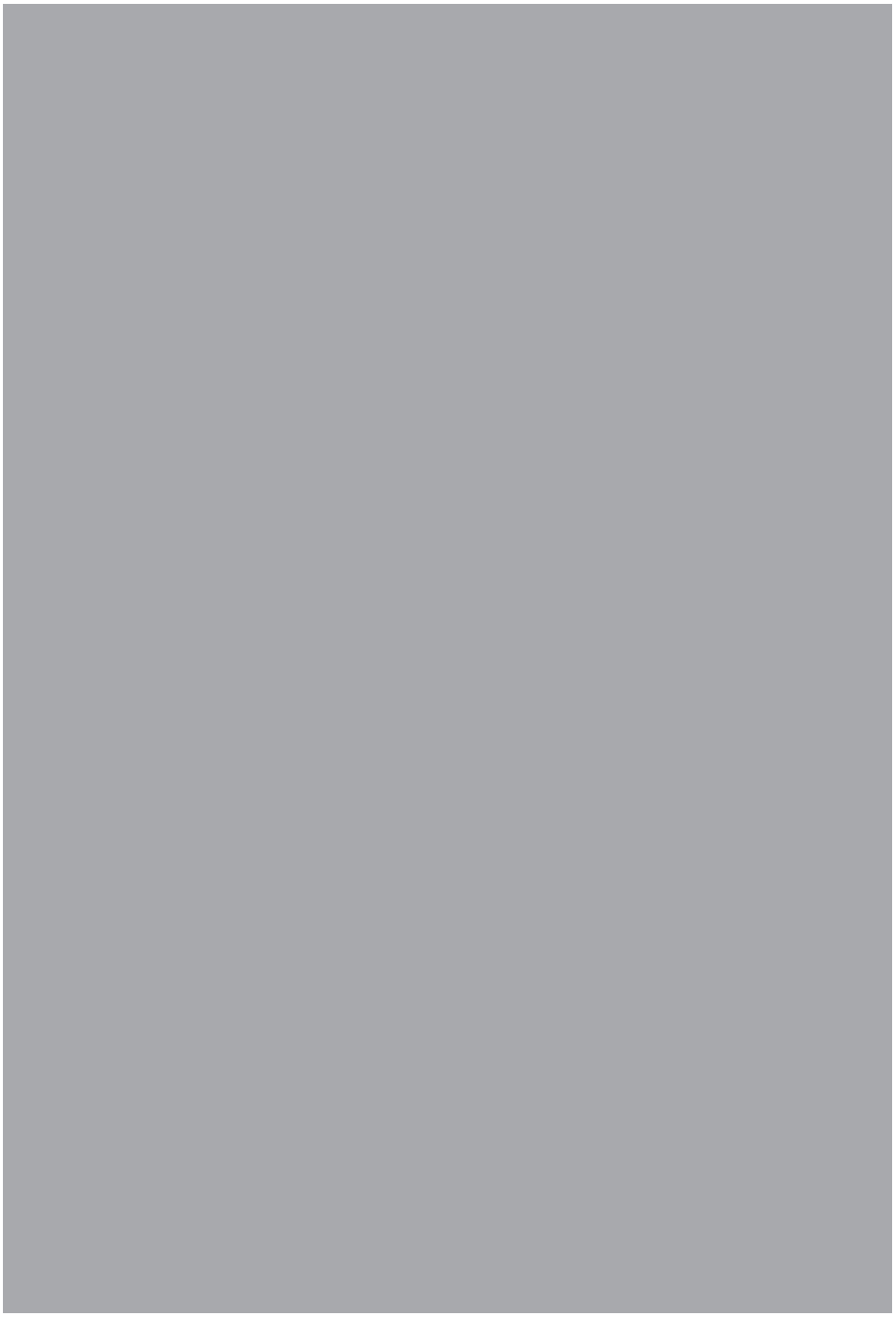

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