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# MANUFACTURING

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## TECHNOLOGY INSIGHTS



POWER  
ELECTRONICS  
EDITION



Steve Fox,  
VP of Business Development  
& Program Management

# MAROTTA CONTROLS

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# DELIVERING SUPERIOR HIGH-PERFORMANCE POWER SYSTEMS



\$15



“  
 The ability to design,  
 develop, test, qualify  
 and manufacture  
 on-site enables  
 Marotta to afford its  
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# MAROTTA CONTROLS DELIVERING SUPERIOR HIGH-PERFORMANCE POWER SYSTEMS

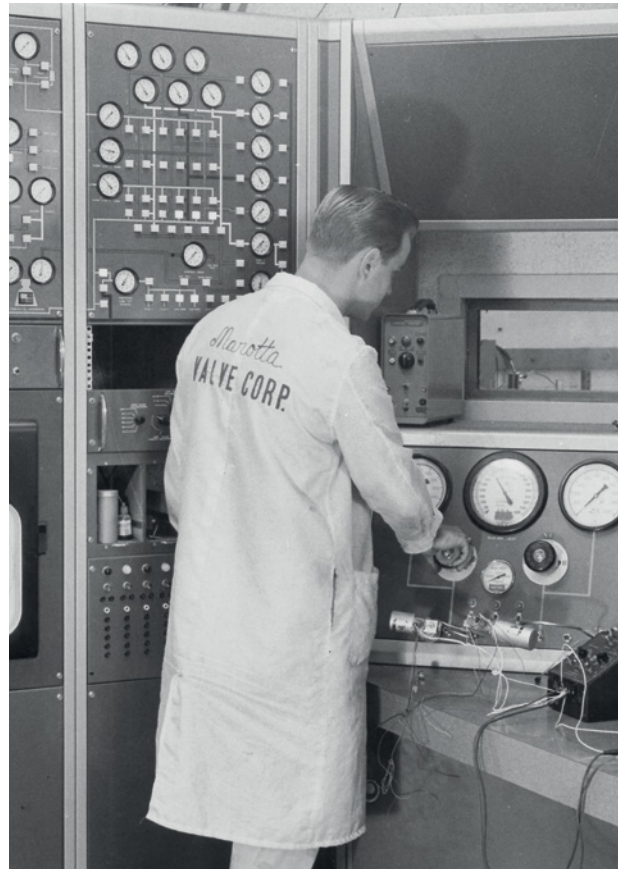
BY LAURA DAVIS

## ‘CHANGE’ and ‘GROWTH’

While ‘change’ is a six-letter word that can indicate either good or bad outcomes, ‘growth’ always signifies positivity and success. But even with its vastly different meanings, the words change and growth have always had an intertwined relationship when used in conjunction with business.

Over the past decades, as market-leading companies experienced stagnation, inventive leaders were driven to explore the positive interconnection between business growth and business change for coming up with ‘out of the box’ solutions. This reinvention of business has become a mainstay with prime examples like Microsoft, Apple, and Amazon paving the way for organizations to realize the significance of transforming their operations and effectively penetrating additional markets. In the

power electronics industry, a notable name of effective business reinvention is New Jersey-based Marotta Controls. Keeping up with the increasingly difficult operating requirements for power electronics, the company successfully transformed itself from a niche valve manufacturing company to a controls systems solutions provider. According to Steve Fox, VP of business development and program management at Marotta Controls, “While it is critical for businesses to reinvent themselves, enterprises must also retain the core values that define their success.” True to his claims, the business makeover of Marotta is built upon its status as an engineering job shop with extensive manufacturing capabilities that develops innovative solutions for their customers’ hard-to-solve technical challenges.



### The Beginning of a Legacy

Marotta's journey began as a small, privately-held valve manufacturer in 1943 supporting the U.S. during World War II. Following its success in the 1940s and 1950s, Marotta grew to become a leading supplier of pressure and flow controls and was selected to support some of the most significant achievements in aviation history including breaking the sound barrier on the Bell X-1 and landing the first man on the moon. With the turn of the century, the company articulated a new approach to its operations. Realizing a growing trend from mechanical components to electro-mechanical systems, Marotta began investing in the development of electronic motor controls and power conversion technologies to complement the company's core mechanical controls. By creating a new 'systems' culture to diversify its portfolio, Marotta gained traction in expanding its footprint into other markets. "Innovative engineering solutions have always been the DNA of Marotta Controls," Fox highlights, "Over the last 20 years we have been able to leverage our technical strengths and manufacturing capabilities to transform ourselves as the go-to-supplier for power electronics as well as control actuation systems."

The company has grown five-fold in the past 10 years with over 350 employees. Close to 30 percent are engineers hailing from various backgrounds (mechanical, electrical and software) that bring extensive industry experience and serve as subject matter

experts in their technical fields. "We develop and nurture a culture of excellence, commitment, work ethic, and high moral standards in engineering through persistent recruiting efforts and dynamic internship programs," states Fox.

### Leveraging Heritage to Provide Proven Solutions

The list of Marotta's high-profile customers includes leading defense contractors across the aerospace, marine, space and weapons markets. For the U.S. Navy, Marotta develops high-pressure valve manifolds that are essential for surface ship and submarines' safety. In the space sector, the company has been one of the largest suppliers of mission-critical flow controls for all launch vehicles of both NASA programs and today's next-generation of reusable, commercial platforms. In recent years, Marotta has grown its customer base in the aerospace and weapons markets providing high-efficiency power electronics and actuation systems for next-generation aircrafts and emerging hypersonic missile programs.

With a deep history of over seven decades in business and an established reputation as a premier supplier, Marotta has been able to develop several long-standing partnerships in each industry, some of which have lasted over 60 years. "Our 77 years of industrial heritage allows us to bring an extensive technical knowledge base, a key strategic advantage. We place a great emphasis on thoroughly understanding the desired performance requirements and product specifications when designing a new system solution," states Fox, "We partner with our customers from the beginning, providing insights to ensure that we are not only developing the right solution but the best, most efficient and effective solution for their mission-critical systems."

“**Our 77 years of industry heritage allows us to bring an extensive technical knowledge base, a key strategic advantage**”

In addition to its engineering expertise, Marotta is able to design, develop, test, qualify and manufacture on-site, in one location, to afford its customers a one-stop-shop supplier. Furthermore, in certain cases, production engineers are able to develop customized test equipment to meet the specific program requirements. "By designing and building our own test equipment we are able to drive down testing and qualification time by eliminating the need to ship units out of the building to third parties. This allows us to protect a program's schedule as well as reduce overall development costs," states Fox.



### Carving a Niche in a Competitive Market


Highlighting Marotta's customer partnership methodology is its success story with one of the largest defense contractors in the world. In 2011, when the aerospace and defense giant was developing a new power supply for a missile launcher, they were met with thermal challenges during the development of a 115V 3-phase AC to 28 VDC power supply. When Marotta was informed about the challenges that the prospective client was facing with their power supply device, Marotta seized the opportunity and funded an in-house development effort. "We built a system at our own cost to demonstrate our commitment to the program as well as our design and manufacturing capability which led to the start of one of our most valued customer partnerships" adds Fox.

The development of this power supply represented a significant milestone in Marotta's history as the opportunity opened the door to enter into the growing power electronics market. Since 2011, Marotta has been awarded over 15 contracts to develop power conversion solutions including power supplies for high-volume missile programs, electronic controls for next-generation aircraft and high-performance power distribution units for hypersonic vehicles. As Marotta rapidly acquired new business in power conversion systems its engineering team began to develop technology internally to eliminate third-party component suppliers. In 2016, chief electronic engineer, Joseph Youssef, spent the better part of a year on his own time to develop an

AC-DC, active power factor correction converter. His innovative circuit solution proved much more effective and efficient than other available conversion methods and launched a new Marotta product line known as 1-STEP AC-DC Power Conversion.

Youssef designed 1-STEP as a high-power density system in a simplified package to meet and exceed the demand for improved size, weight, power and cost (SWaP-C). To date, Marotta has developed 4 variants of 1-STEP, the most recent version, the PS3500, rated at 3,500W efficiently converts AV input power to regulated 28 VDC. With the scalability and modularity of the 1-STEP series product line, Marotta expects to increase its footprint in the next-gen military and commercial aerospace markets with this innovative circuit topology.

### The Promise of a Bright Future

Even after developing a significant depth and breadth of manufacturing capability today, Marotta always traces back to its roots of being an engineering firm that develops superior control system solutions. Even as a small, privately-held company, Marotta has continued to punch above its weight and win market-leading customers. The legacy and extensive experience enable Marotta to always remain a step ahead of its contemporaries with respect to delivering high quality and robust systems. Fox attributes this success to the company's unique ability to leverage its heritage to continuously evolve products that have been proven and qualified. 



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## Top 10 Power Electronics Solution Providers - 2020

**T**he increasing consumption of consumer electronics and automobiles devices like laptops, tablets, smartphones, and household electronics is playing an instrumental role in the high growth of the power electronics market. From introducing electric vehicles to the advent of clinically invasive products in the medical sector, power electronics is adding new dimensions to every industry. This rapid growth is also fueled by advanced technology and the need for stable power supply. Enterprises today are revamping their systems and replacing traditional bipolar power transistors with digitally controlled microcontrollers and signal processors such as mixed-signal smart power ICs, MOSFETs, and IGBTs. Power electronics has even emerged as the foundation of new mobile power systems technologies such as variable frequency AC distribution for electric aircraft, and medium voltage DC grids for electric ships.

Organizations are resorting to advanced power electronic devices to enhance power efficiency, lower costs, and optimize power density. Also, operating in switching mode, the power electronic devices drive the efficiency of the power electronics apparatus by 98 percent. Unlike traditional warship electrical systems, today's and future's warship electrical systems are also driven by power electronics. Companies are also looking for wide band-gap power semiconductor devices comprising silicon carbide and gallium nitride to increase efficiency, minimize chances of system failure, reduce operational costs, and improve the power conversion efficiency.

With power electronics becoming an indispensable part of most organizations today, determining the right solution provider to excel in this revolution plays a crucial role. In the latest edition of Manufacturing Technology Insights, we bring to you "Top 10 Power Electronics Solution Providers - 2020."



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**Company:**  
Marotta Controls

**Description:**  
Provides innovative solutions to control power, pressure & position for critical applications in the aerospace, marine, space and weapons market

**Key Person:**  
Steve Fox,  
VP of Business Development  
& Program Management

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