



## TECHNOLOGY CHARACTERIZATION, ASSESSMENT, AND TEST

Billions of investment dollars have flowed into newly-established space firms over the past five years. Traditional large payload GEO assets are being supplemented and even replaced by distributed and disaggregated constellations of small satellites that can achieve equivalent mission performance at lower costs. These constellations of smaller, shorter-lifespan satellites enable faster technology insertion and more frequent updates to capabilities on orbit. This trend isn't limited to new entrants; even established industry is shelving plans for traditional large, GEO-based satellite systems to explore the options for architectures in LEO and MEO orbits.

Many profitable services can be built on the space-based data and capabilities that exist in this new paradigm. Analytics firms are poised to monetize the valuable insights that orbital asset data can provide and valuable satellite services are growing in areas including remote sensing, communications and weather applications.

In a rapidly changing funding environment, generating positive cash flows quickly can reduce overall business risk, so delivering a novel capability to orbit can be the crucial factor in gaining or maintaining an edge. To stay competitive, companies need to deliver systems to orbit, functioning as anticipated, in as short a timeframe as possible.

### New Models, New Requirements

As the market has grown, risk tolerances have changed as well. With smaller capital investments, operators have more flexibility to explore unconventional options, including the use of commercial-grade parts not intentionally designed for space applications. This increased design tempo leaves less time for expensive and rigorous space qualification processes.

Consequently, this can increase the financial risks to insurers who can be liable for failures early in the operational stage and to investors who make most of their profits later in a satellite's design life. Two of the four major causes for catastrophic loss to space system operators, investors, and insurers are generic defects that cause either system failures or space weather sensitivity across an entire class or classes of satellites. Key to addressing these underlying causes is appropriate testing to avoid the introduction of systemic issues that degrade performance or create operational issues.

### Our labs are technical leaders in:

- › Electric propulsion
- › Composite materials
- › Nondestructive evaluation
- › Space and atmospheric environment
- › Space materials survivability
- › Imaging sensors
- › Advanced microelectronic devices
- › Spacecraft and launch vehicle batteries
- › LIDAR
- › Atomic clock research and development
- › Microthruster testing

Aerospace has almost six decades of experience diagnosing and solving issues with mission-critical national security spacecraft systems. Aerospace does not manufacture products or compete with industry. As the operator of the Federally Funded Research and Development Center for the space enterprise, we operate in the public interest. We can leverage our deep technical knowledge to help companies make original forays in space rather than be hamstrung by old mistakes, to addressing both speed and reliability concerns.

## **Highlighted Service Offerings**

### **COMMERCIAL OFF THE SHELF PARTS TESTING**

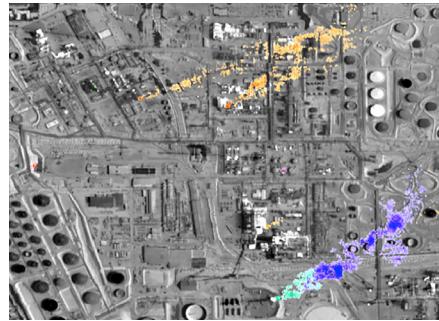
Commercial electronics offer undeniable advantages in performance, cost, and availability over space-grade parts, but how do you assess the potential for automotive-, commercial-, and industrial-grade electronic parts and materials to withstand the rigors of space applications? Through our testing, evaluation and analysis capabilities, we can characterize and assess that parts selected for missions are appropriate for space applications. Our Commercial Electronics Assessment services can help users make appropriate decisions about mission differentiators and their resultant impacts on performance.



Testing of parts for use in space applications can reduce time to market for commercial missions.

### **ENVIRONMENTAL CHEMICAL CHARACTERIZATION**

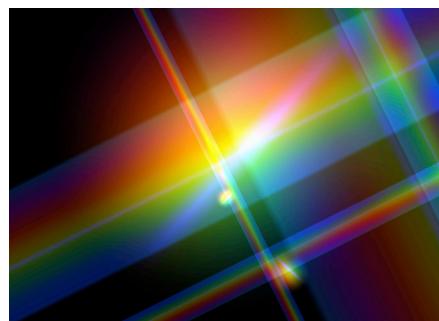
Aerospace has designed, developed and operated hyperspectral sensors with increased sensitivity and discrimination capabilities to identify and image thousands of compounds and targets of interest. Using a disciplined, systems engineering approach, Aerospace works with our customers' requirements to conceptualize and design sensors for specific mission parameters, detecting and characterizing chemical sources and plumes with custom data processing.



Our hyperspectral remote sensing capabilities can be leveraged for various mission needs.

### **SPECTRUM MANAGEMENT**

RF Spectrum is a finite resource; however, the increasing demand both on the ground and in space are generating greater needs for spectrum sharing. While the Our spectrum management services can help identify challenges arising from the evolving spectrum landscape and assess what can be done to meet customers' needs to address the four dimensions of "spectrum sharing etiquette" – time, frequency, place and coding.



The Aerospace Spectrum Center of Excellence can assist in navigating the complexities of the evolving spectrum landscape.

## **Protecting Your Proprietary Information**

For commercial space companies, investors, and insurers, our combination of knowledge, talent, and specialized equipment can help avoid problems early in the space mission workflow, and provide unique solutions not available elsewhere in industry. We take protecting the intellectual property of our industrial base extremely seriously. We have created responsive, simplified contract vehicles designed to pair our resources with your technical needs, without risk to your proprietary information.

## **The Aerospace Corporation**

The Aerospace Corporation is a national non-profit corporation that operates a federally funded research and development center (FFRDC) and has approximately 4,000 employees. The Aerospace FFRDC is aligned to support the most critical programs of the Department of Defense and the nation, and to serve as its customers' innovation partner across the space enterprise. Consistent with the competencies outlined in our sponsoring agreement, Aerospace provides strategic value through independent, intellectually rigorous, relevant, and timely products and services. With three major locations in El Segundo, Calif.; Colorado Springs, Colo.; and Washington, D.C., Aerospace addresses complex problems across the space enterprise and other areas of national significance.