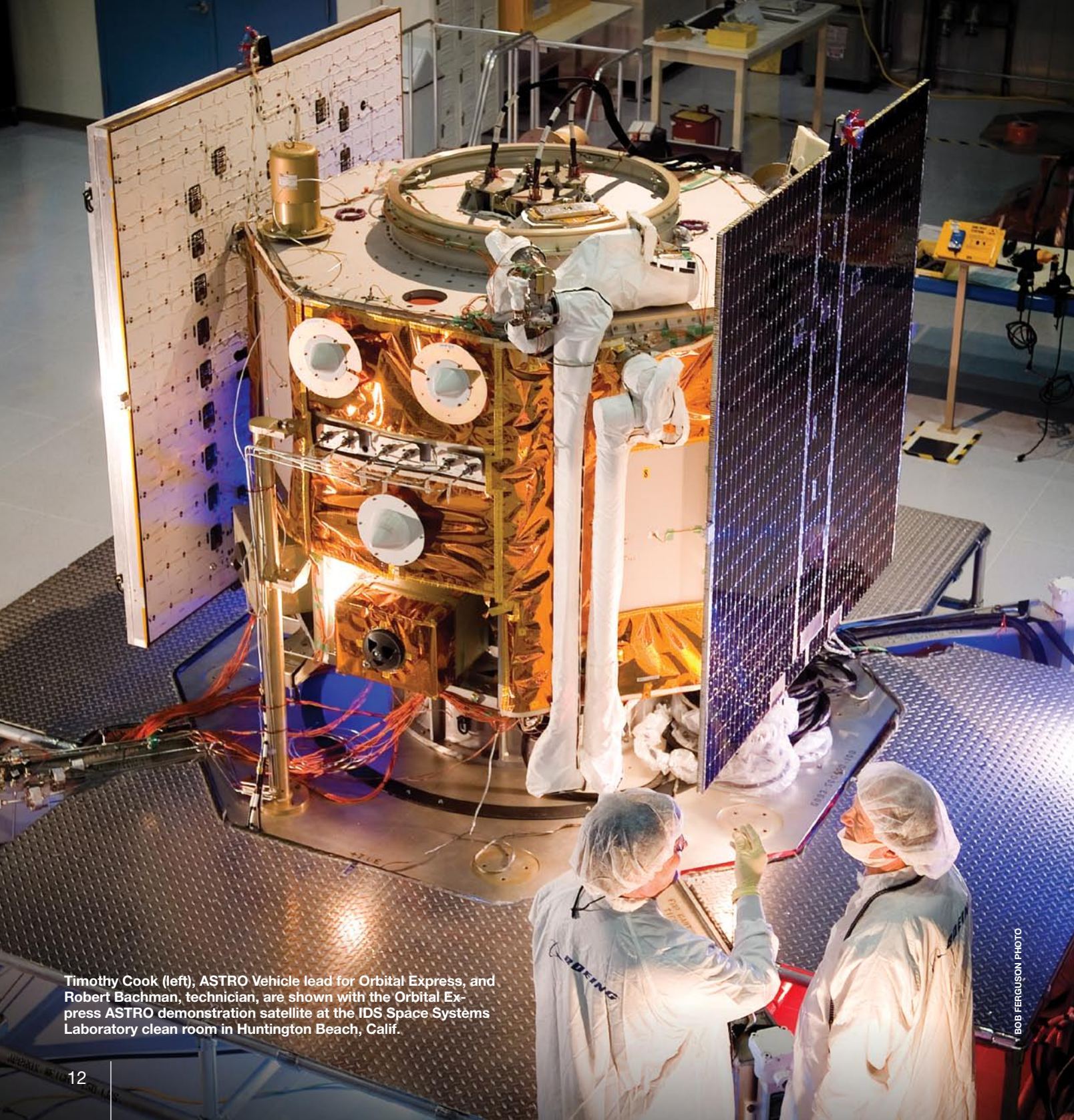


BRIGHT IDEAS!



Timothy Cook (left), ASTRO Vehicle lead for Orbital Express, and Robert Bachman, technician, are shown with the Orbital Express ASTRO demonstration satellite at the IDS Space Systems Laboratory clean room in Huntington Beach, Calif.

BOB FERGUSON PHOTO

IDS' Advanced Systems looks to develop products that are futuristic—yet are in line with budgets and Lean

By MARC SKLAR

Imagine a helicopter that can fly autonomously for long periods of time. A networked system to secure U.S. borders. A satellite that provides a space repair and refueling service. A hypersonic vehicle that can soar through the atmosphere at six times the speed of sound. Or a fighter aircraft that can conduct missions without help from human controllers on the ground.

These are just a few of the many futuristic programs within Advanced Systems, the organization responsible for generating new business opportunities and transitioning technologies for Integrated Defense Systems. Through the work undertaken by the people of Advanced Systems, Boeing is channeling its technical know-how to develop future solutions that will support its defense and other customers while respecting their budgets—and will give Boeing an advantage in the competitive defense market.

As part of this year's IDS reorganization, Advanced Systems absorbed the former IDeAS (Integrated Defense Advanced Systems) organization of Phantom Works that was responsible for creating and capturing new opportunities and transferring them to IDS business units. Advanced Systems remains vitally linked to Phantom Works, which provides advanced technologies to the Boeing enterprise.

Here's a brief look at some of Advanced Systems' top programs.

SBlinet. SBlinet is the technology component of the U.S. Department of Homeland Security's Secure Border Initiative. A Boeing-led team won this contract in September. Boeing's solution, developed by Advanced Systems' Integrated Defense & Security Solutions (IDSS) element, concentrated on using proven, low-risk, off-the-shelf technology to ensure SBlinet will significantly improve the availability of information and tools to Border Patrol agents. This will let them better detect, identify, classify and resolve illegal border crossing incidents. IDSS' ability to rapidly deploy people and best-of-industry capabilities enabled it to provide DHS and Customs and Border Protection with the preferred solution and team.

A160 Hummingbird Unmanned Aerial System. The autonomously flown A160 looks like a helicopter but is unlike any other helicopter on the market. It can reach higher altitudes, hover for longer periods

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It's elemental

There are five elements of the Advanced Systems organization of Integrated Defense Systems. Here's a quick overview of each.

Advanced Logistics Support Systems: ALSS is driving the development, growth and transition of innovative, knowledge-based logistics capabilities for Support Systems. With a central focus on the emerging network-centric logistics marketplace, ALSS is working on deploying total asset visibility, data management/mining, prognostics and legacy systems integration solutions for end-to-end (factory-to-foxhole) logistics.

Advanced Network and Space Systems: AN&SS is developing the next generation of network capabilities and space assets for both defense and commercial uses. This includes the Orbital Express on-orbit satellite servicing system scheduled for launch this fall. Other programs include the WaveRider hypersonic demonstrator, Space Radar and network systems such as Army Airborne Command and Control Systems and wide band on the move.



BOB FERGUSON PHOTO

The A160 Hummingbird is being tested at Victorville, Calif. This unmanned aerial vehicle has the capability of flying at higher altitudes and traveling longer distances than current helicopters.

Advanced Precision Engagement & Mobility Systems: APEMS programs will provide the capabilities needed by the transformational defense forces of the future. Programs include the A160 Hummingbird rotorcraft unmanned vehicle and the X-45N Unmanned Combat Air Systems program that is following up the highly successful Joint-UCAS X-45A demonstrators.

Analysis, Modeling, Simulation and Experimentation: AMSE is responsible for coordinating and integrating the company's diverse worldwide array of modeling, simulation and analysis resources along with related experimentation activities. Its facilities include the Boeing Integration Centers in Anaheim, Calif., and Crystal City, Va., the Virtual Warfare Center in St. Louis and a growing number of BIC-distributed environments located near customer facilities to support mission demonstrations.

Integrated Defense & Security Solutions: IDSS is leading the development of innovative, integrated defense and security solutions—such as SBlinet—designed to meet a wide variety of customer applications.

A focus on growth through technology

Meet George Muellner, leader of Advanced Systems

As president of Advanced Systems, George Muellner heads an organization that develops solutions to support the warfighter. That's no small matter to Muellner, who spent 31 years with the U.S. Air Force.

Since joining Boeing in 1998, Muellner has held various leadership assignments, including serving as vice president—general manager of Air Force Systems immediately before his Advanced Systems role. Muellner spoke to *Boeing Frontiers* about his view of this organization within Integrated Defense Systems—as well as about career advancement.

Q: What's your primary goal as president of Advanced Systems?

A: My role is to lead an organization focused on enabling IDS to grow the business. This includes focusing the enterprise technology investments to obtain maximum value; providing other business units with mature technologies and business opportunities to grow our core businesses; and developing opportunities in adjacent markets such as Homeland Security.

Q: What do you find most exciting about your job?

A: The best part of the job is working with a group of people who are creative, entrepreneurial and focused on the future. We have a tremendous wealth of talent in The Boeing Company. Putting together new concepts for solving customer needs by exploiting that talent is exciting. Every day, someone will hear or read of a customer need and will envision a solution that brings together talent and technology from across the enterprise to solve the problem.

Q: What has driven you in your career?

A: My personal growth has always been driven by challenging opportunities. I have benefited by being able to see new opportunities on the road ahead. I have then tried to prepare myself for the challenge and have been fortunate to have been given the opportunity to prove myself.

Preparation always pays off, since we all want to have the most qualified person taking on a task. This preparation has often required a side step or even a step backwards to insure I had the right skills for a challenge. In the end, success comes from preparation and opportunity coming together.

Q: What do you like to do outside of work?

A: Away from work, I have several distractions that provide some balance. Flying is still an escape for me, and cruising the Sierras in a sailplane provides a new outlook on life. Since I have lived on several sides of the defense acquisition process, I am writing a book on defense acquisition. Also, golf provides the opportunity to experience what happens when inadequate preparation creates insurmountable challenges.

“The best part of the job is working with a group of people who are creative, entrepreneurial and focused on the future.”

—George Muellner, president,
Advanced Systems

RON BOOKOUT PHOTO

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of time, go greater distances and operate much more quietly than current helicopters. And it features a unique optimum-speed rotor technology that enables the Hummingbird to adjust rotor revolutions per minute at different altitudes and cruise speeds.

The Hummingbird is designed to fly 2,500 nautical miles (4,600 kilometers) with endurance in excess of 24 hours and a payload of more than 300 pounds (136 kilograms). The autonomously flown A160 is 35 feet long with a 36-foot rotor diameter (10.7 and 11 meters, respectively). It will fly at an estimated top speed of 140 knots at ceilings up to 30,000 feet, which is about 10,000 feet higher than conventional helicopters can fly today (9,100 and 3,000 meters, respectively). Future missions for the A160 include reconnaissance, surveillance, target acquisition, communications relay and precision resupply.

Orbital Express. Orbital Express is a safe and cost-effective approach to autonomously service satellites in orbit. The system will employ autonomous maneuverable satellites to refuel, reconfigure and repair satellites, extending their lives with a bottom-line benefit for customers.

X-45N Unmanned Combat Air Systems. The X-45N demonstration program is designed to demonstrate in 2011 aircraft carrier suitability of an unmanned air vehicle that can carry out persistent (long-endurance) intelligence, surveillance and reconnaissance missions and has low-observable (hard to detect by radar) characteristics. This U.S. Navy-led program is designed to mature critical technologies prior to a potential System Development and Demonstration phase. The SDD program would be for a system providing persistent, penetrating 24/7 reconnaissance, surveillance and intelligence gathering as well as attack of time-sensitive targets for the Navy.

X-51A Scramjet Engine Demonstrator—WaveRider. The X-51A is intended to prove innovative hydrocarbon-fueled hypersonic propulsion technology. Using jet fuel, it will operate above Mach 6 (six times the speed of sound) and provide the technologies for affordable space access and global strike.

Other Advanced Systems capabilities and programs include providing advanced network-centric logistics systems, an advanced security system for U.S. government compounds outside the United States, and analysis, modeling, simulation and experimentation capabilities.

AFFORDABILITY MATTERS

As exciting as these technologies might be, Advanced Systems' leadership recognizes today's economic climate. Products and systems that promise a bright future for IDS are squarely balanced with the realities of budgets, technologies and Lean requirements.

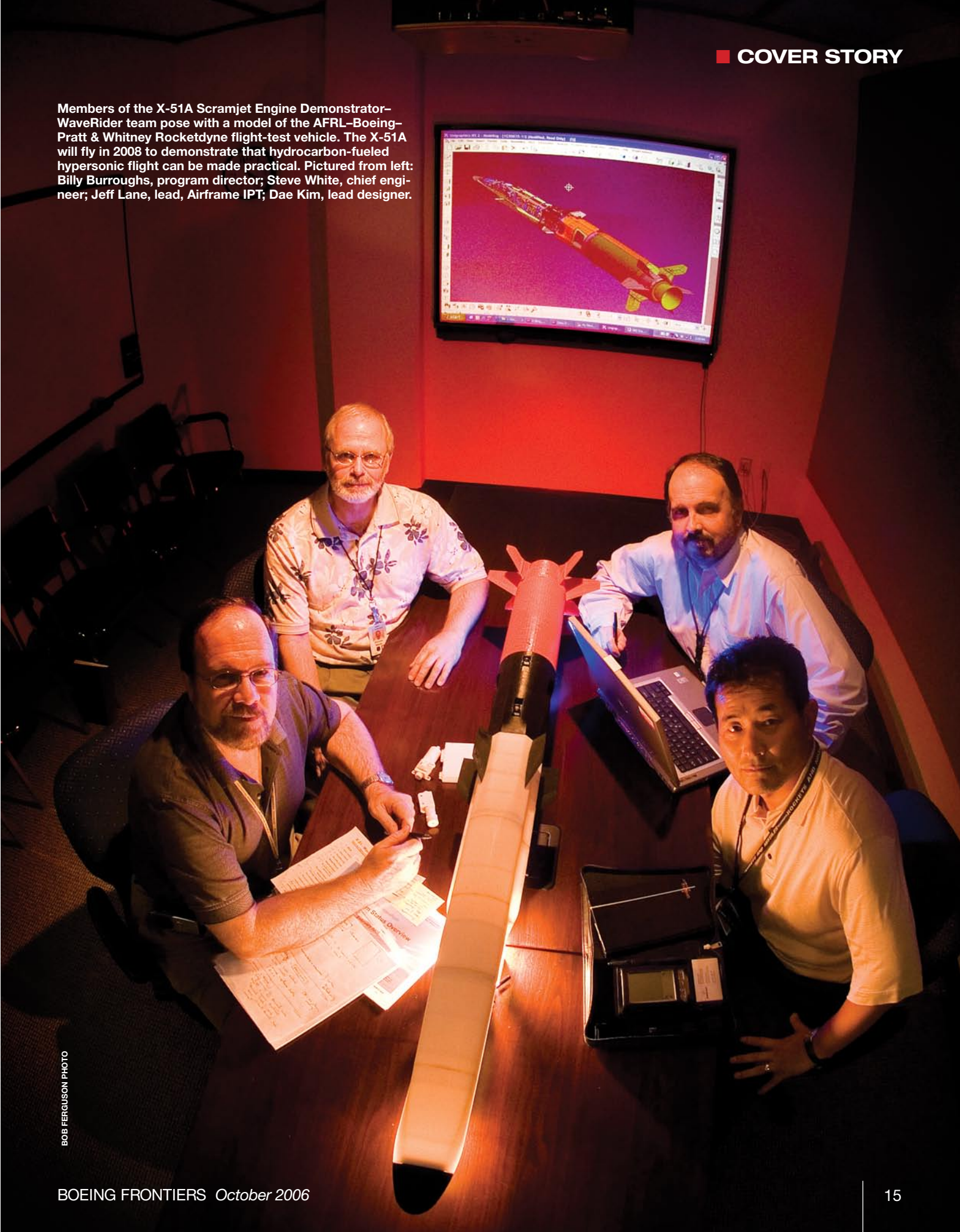
“Innovation is important, but in this day and age, affordability is just as critical,” said George Muellner, president, Advanced Systems. “We're not only improving how we do our work, but ensuring that when we hand off a program to a business, the benefits of the Lean+ and Global Sourcing (companywide growth and productivity) initiatives are already built in for the full life cycle of the program.”

The challenge of cost can be particularly tough in development programs where one-of-a-kind systems are being built. But Muellner's team knows if they build in cost savings during development, those savings can carry through to the production phase.

Additionally, Advanced Systems is taking a tougher look at programs earlier in their development. “We're going to drop programs earlier if we find they're not working with our strategy,” Muellner said. “That will allow us to move dollars into the areas that will get the best return and get those programs to market faster. So, with the same investment dollars, we'll get greater growth.” ■

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Members of the X-51A Scramjet Engine Demonstrator-WaveRider team pose with a model of the AFRL-Boeing-Pratt & Whitney Rocketdyne flight-test vehicle. The X-51A will fly in 2008 to demonstrate that hydrocarbon-fueled hypersonic flight can be made practical. Pictured from left: Billy Burroughs, program director; Steve White, chief engineer; Jeff Lane, lead, Airframe IPT; Dae Kim, lead designer.



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