



**Federal Aviation  
Administration**

# **Technology Transfer**



# PARTNERSHIPS

The image shows a vast industrial interior, likely a test facility. The ceiling is a complex network of steel trusses and beams, supported by a series of vertical columns. Several bright overhead lights illuminate the space, creating a high-contrast environment. In the foreground and middle ground, there is a large, multi-axle vehicle or piece of machinery on a set of rails or a paved track. The floor is dark and appears to be made of asphalt or concrete, with some white and yellow markings. The overall atmosphere is one of a large-scale engineering or manufacturing project.

**Cooperative Research and Development Agreement (CRDA) with the Boeing Company to construct the Pavement Test Facility which measures pavements subjected to simulated aircraft traffic.**



### *The Key to Economic Success*

The Government invests billions of dollars annually in its laboratories for research and development (R&D). This investment created Federal laboratories that produce advanced technologies that can serve not only Government interests, but also the interests of the business and academic communities.

Technology transfer is the process by which existing knowledge, facilities, or capabilities developed with Federal funding are transferred and utilized to fulfill public and private needs.

Fostering cooperation among Government, academia, State and local governments, and industry is highly encouraged if the United States is to remain a world leader in developing innovative and leading-edge technologies. Technology transfer addresses this need for Government and private sector cooperation by enabling companies, academic institutions, State and Local Governments, and Federal laboratories to collaboratively work together to develop innovative technologies and marketable products.

### *You and the FAA as Partners*

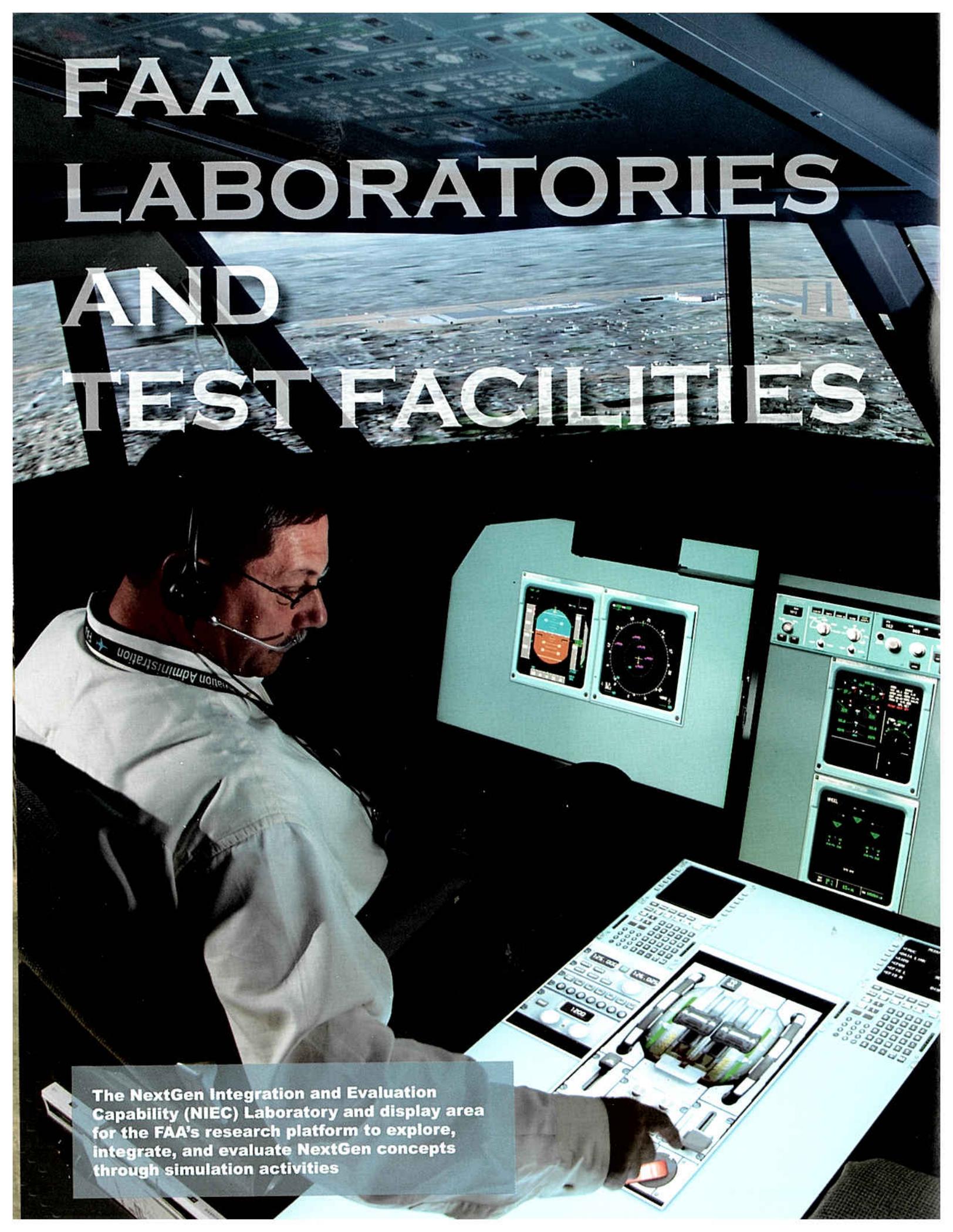
The FAA Technology Transfer Program provides an opportunity for your organization to tap into the endless resources that our laboratories have to offer. As a technology transfer partner with the FAA, you have access to our advanced technologies, state-of-the-art facilities, and the expertise of our highly skilled scientists and engineers. This access can help you leverage resources and develop products and technologies that will be commercially successful.

### *How You Can Benefit From Technology Transfer*

- *Access to facilities and equipment.* Technology transfer gives you access to some of the most scientifically advanced laboratories and test facilities in the world.
- *Expertise.* Our scientists, engineers, and other highly skilled personnel are considered to be at the top of their fields and are committed to working with you to develop innovative technologies.
- *Technologies that are advanced, yet cost-effective.* You can use our advanced technologies and high level expertise to leverage your resources and reduce your start-up costs for product development
- *Intellectual Property.* Technology Transfer provides legal protection for marketing intellectual property developed from technology transfer related efforts and for the sharing of licenses, royalties, fees, and other income.
- *Profitability.* Licenses issued by the FAA may result in significant income for you, and the results of your technology transfer effort will be used to its fullest commercial potential.

Through your technology transfer partnership with the FAA, you will take an active role in maintaining our world leadership in aviation.

# FAA LABORATORIES AND TEST FACILITIES



The NextGen Integration and Evaluation Capability (NIEC) Laboratory and display area for the FAA's research platform to explore, integrate, and evaluate NextGen concepts through simulation activities



### **NIEC Simulation**

The FAA's Federal laboratory is the William J. Hughes Technical Center located at the Atlantic City International Airport, New Jersey. The Technical Center is one of world's leading aviation engineering, research, development and testing facilities that serves as the national scientific testbed for the FAA.

The FAA's researchers and scientists develop the technologies, tools, and procedures to ensure that the FAA accomplishes critical aviation safety and efficiency goals. Programs include testing and evaluation in air traffic control, communications, navigation, surveillance, airports, and aircraft safety.

Some of the laboratories at the Technical Center include:

#### The National Airspace Systems Laboratories

These NAS laboratories are the cornerstone of the Center's air traffic laboratory complex and support all stages of research and acquisition from concept exploration and system development to field implementation. These cutting-edge laboratories provide seamless integration for thorough and advanced research development, support, and testing of operational air traffic control systems and subsystems.

#### Aircraft Safety Laboratories

The continued safety of this country's air carriers is an important element in maintaining the public's confidence in America's airways. The Technical Center has the largest full-scale aviation fire test facility as well as an aircraft components fire test facility, wind tunnels, impact test facility, pavement test facility, and fuel safety laboratory. Researchers at the FAA's aviation safety laboratories introduce new technologies, procedures, and training methods developed by agency scientists and engineers in conjunction with industry research partners to ensure that the FAA accomplishes critical aviation safety and efficiency goals.



### **Alternative Fuels Research**

#### Human Factors Laboratory

This state-of-the-art facility is designed for the development of aviation related human factors issues that can be studied in a controlled scientific environment. The laboratory provides computer-human interface rapid prototyping, real-time air traffic control simulations, and human performance data collection and analysis for future air traffic control concepts and current technology.

#### Other Facilities

The research and laboratory facility at the Civil Aerospace Medical Institute (CAMI) at the Mike Monroney Aeronautical Center is located adjacent to the Will Rogers World Airport in Oklahoma City. It is considered to be the world's premier aerospace medical research facility that supports government and industry researchers from the United States and abroad. CAMI is significantly enhancing aviation safety through the application of medical and human factors knowledge in highly complex technological environments.

#### Access to Facilities/Resources

Joining the FAA in its technology transfer efforts enables organizations to utilize all of these state-of-the-art facilities to meet their research and development needs. Even though the FAA laboratories and test facilities were built primarily to address aviation related issues, organizations with specialties as diverse as communications, electronics, avionics, and healthcare have used the laboratories' resources to successfully develop new technology and products to give them an edge in today's marketplace. This is an important element in a working relationship and has led to the FAA working side-by-side with its partners in becoming a leading participant in technology transfer.

# CREATIVITY



**Research Psychologists at the Human Factors Laboratory utilize the Tower Operations and Digital Data System which replaces paper Flight Progress Strips with Electronic Flight Data**

## *How Technology Transfer Works*

Congress has found that technology and innovation are central to the economic, environmental, and social well-being of citizens of the United States.

Competition in the global marketplace has intensified as many nations are striving to develop advanced technologies and products. American industry and academia are taking note of this trend and are looking for ways to gain a significant edge over other nations.

One option growing in importance is becoming research and development partners with Federal laboratories through collaborative agreements.

By entering into a partnership with the FAA, organizations have access to technical expertise, state-of-the-art facilities and equipment, intellectual property, and know-how that can lead to the development of commercial

products and applications. The result is an increase in the competitiveness of the American economy in the global market.

## *Mechanisms*

The FAA uses several approaches to establish and maintain technology transfer partnerships. Some of these include:

Cooperative Research and Development Agreement (CRDA). A CRDA is a cooperative research and development agreement to develop an idea, prototype, process, or product for direct application to the aviation community. A CRDA enables the FAA and its partnering organization to share personnel, resources, services, facilities, intellectual property, and equipment for specific projects. A CRDA can also result in the development of intellectual property that is protected according to the terms and conditions of the agreement.



#### *Personnel Exchanges*

Technology transfer facilitates the personnel exchange of scientific and technical personnel among academia, industry, State and local governments, and Federal laboratories as well as assignments in embassies of the United States.

#### *Patents and Licensing*

In return for participating in FAA technology transfer efforts, we can grant a patent license or assign future ownership rights. In addition, if you have an interest in an invention that the FAA is developing, you can enter into a cooperative arrangement with us to further the development of the invention.

#### *Loan, Lease, or Donate Excess Research Equipment*

Under technology transfer, the Government can loan, lease, or give research equipment to an educational institution or non-profit organization for the conduct of technical and scientific education and research activities.

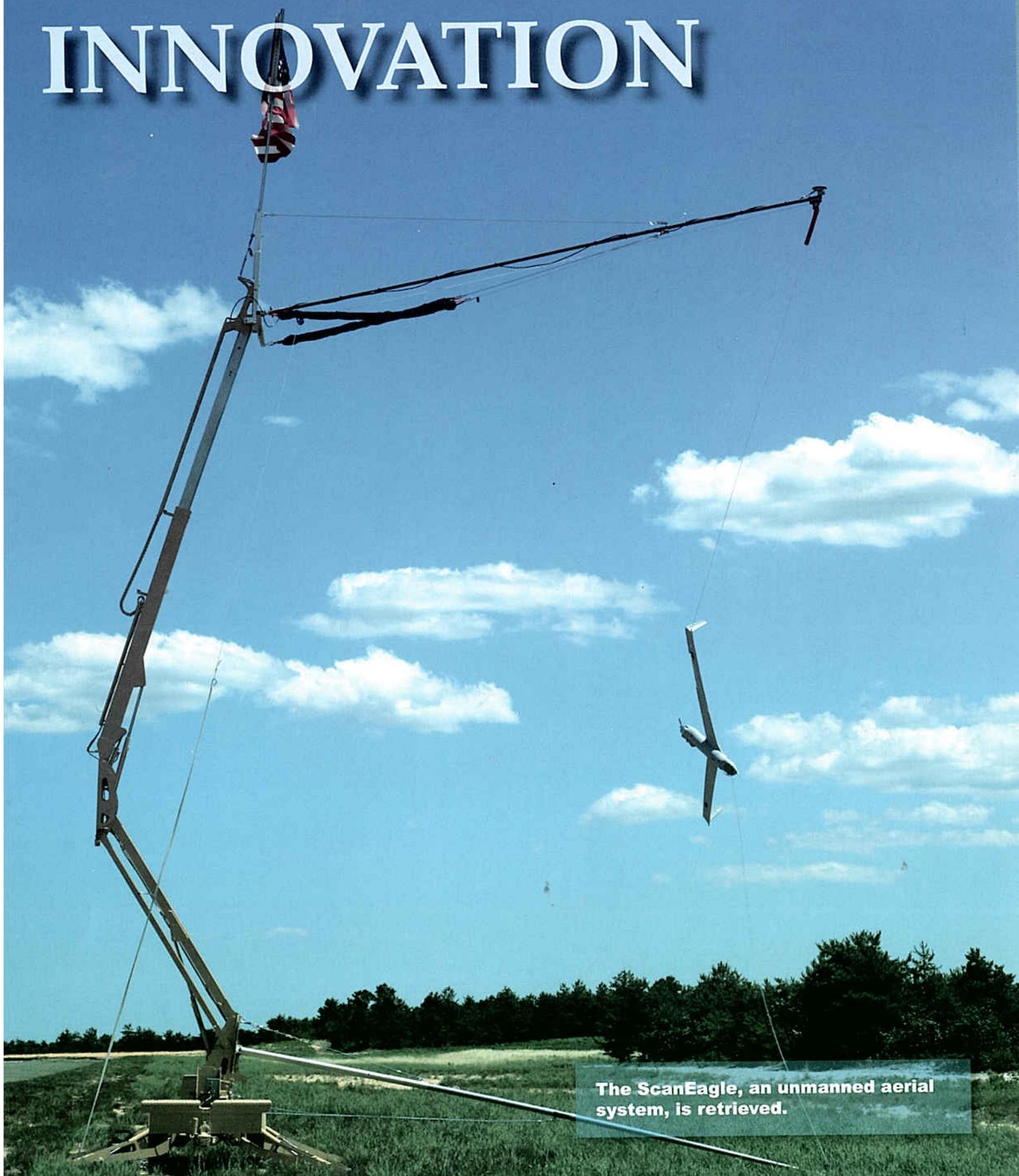
#### *Networking*

The FAA has been successful in gathering together representatives from Government, academia, State and local governments, and industry to exchange ideas and information through a series of advanced technology seminars, international symposiums, and open houses.

#### *Cooperative Research Programs*

The FAA may participate in the Small Business Innovation Research (SBIR) Program using high-level expertise in the small business community throughout the United States.

# TECHNOLOGICAL INNOVATION



**The ScanEagle, an unmanned aerial system, is retrieved.**

Technology transfer has had a dramatic impact on fostering mutually beneficial technology between the FAA and its partners. These innovative partnerships have significantly contributed to the mission and vision of the FAA and its partners and have enhanced the economic well-being of the nation.

#### *Results of Innovative Partnerships*

Many CRDAs and other agreements have been established between the FAA and its partners and are examples of synergistic benefits of technology transfer. The FAA is proud of the accomplishments of these partnerships, which include:

- Boeing Corporation of Seattle, Washington, established the National Airport Pavement Test Machine at the William J. Hughes Technical Center
- Engineered Arresting Systems Corporation of Aston, Pennsylvania, developed a soft ground arrestor system using light weight cellular concrete to safely stop aircraft from going beyond the runway
- General Electric Aviation Systems, Grand Rapids, Michigan, to support the integration of Unmanned Aircraft Systems in the National Airspace System
- General Atomics Aeronautical Systems Inc., San Diego, California, to support the integration of Unmanned Aircraft Systems in the National Airspace System
- AAI Corporation, Hunt Valley, Maryland, to support the integration of Unmanned Aircraft Systems in the National Airspace System
- New Mexico State University, Las Cruces, New Mexico, to establish an initiative to develop policies, and procedures to enable operation of Unmanned Aircraft Systems
- Insitu, Inc., Bingen, Washington, to establish a regulatory-based Safety Management System approach for studying technical issues of Unmanned Aircraft Systems integration into the National Airspace System

**Engineered Material Arresting System**



# COMMERCIALIZATION



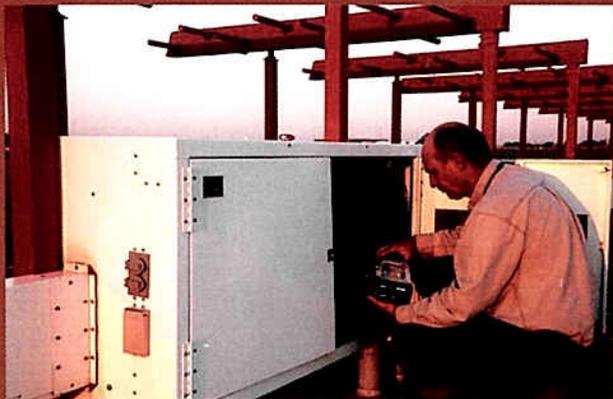
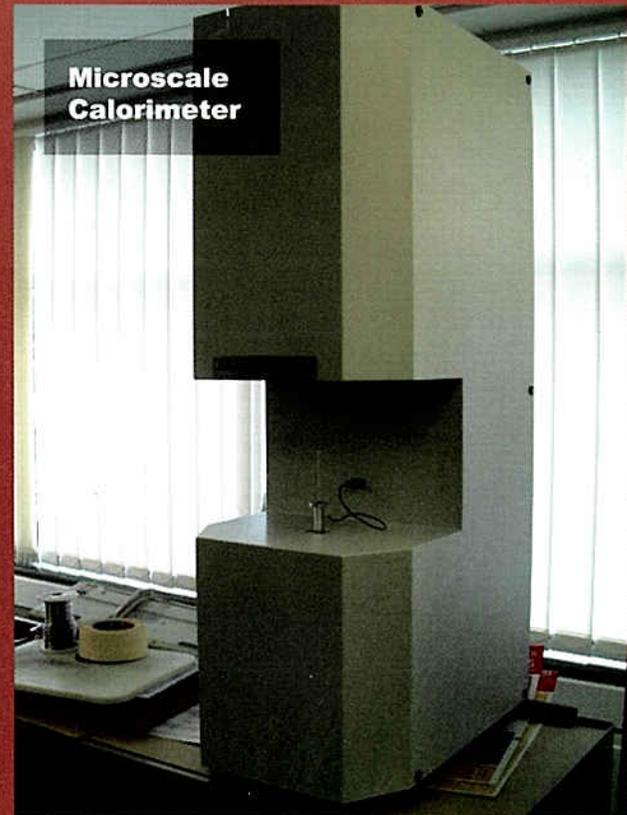
**Adiabatic Expansion Nozzle**

As part of the Government's commitment to assist American industry by means of technology transfer, the FAA participates in commercializing and capitalizing on the results of their R&D activities. These resulting products are known as intellectual property and can include reports, technical data, invention disclosures and patents, software and software documentation, and other types of technical information and products. In addition to the intellectual property, the Government receives certain rights to this intellectual property, which it may then pass on to others for commercialization.

### *Patents*

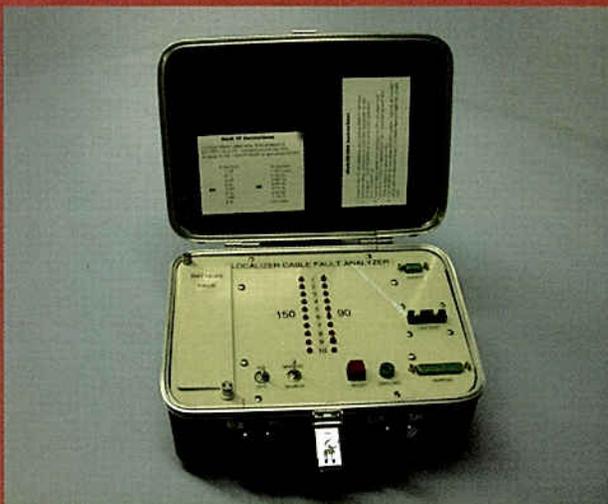
A patent is a government grant that gives the inventor the right to exclude others from making, selling or using the invention for 20 years. Patents issued by the United States Patent and Trademark Office are valid throughout the U.S. However, foreign patent protection is available as well.

The FAA has its own portfolio of issued patents based on the work of its scientists and engineers. Examples of recent FAA-owned patents include:



**Localizer Cable Fault Analyzer**

- Localizer Cable Fault Analyzer that memorizes which antenna in a Localizer antenna array caused a fault
- Heat Release Rate Calorimeter is a calorimeter that measures heat release rates of very small samples
- Adiabatic Expansion Nozzle is a nozzle for producing a continuous gas/solid or gas/aerosol stream from a liquid having a high room vapor pressure
- Microscale Combustion Calorimeter is a calorimeter for measuring flammability parameters of materials using only milligram sample quantities



### *Licensing of FAA Inventions*

Licensing is the most effective vehicle used by the FAA to commercialize its technologies. A license is an agreement that permits the private sector company to use FAA inventions and other technology with the permission of the Government. The FAA may award various exclusive or non-exclusive licenses, depending on which promises to be most successful in bringing the invention into the marketplace. Government owned patents may provide a source of revenue to the FAA through licensing to the private sector.



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