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Annual Report 2000

A New Era Begins for the Spaceport Technology Center Vision

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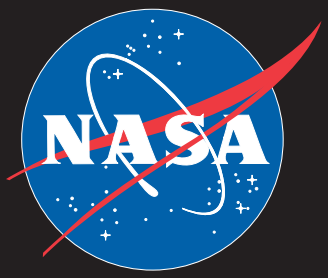

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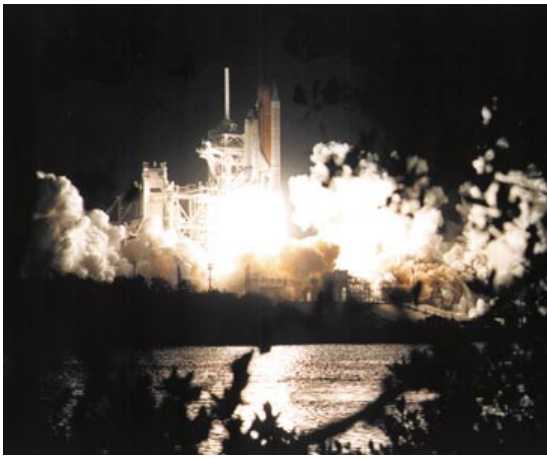

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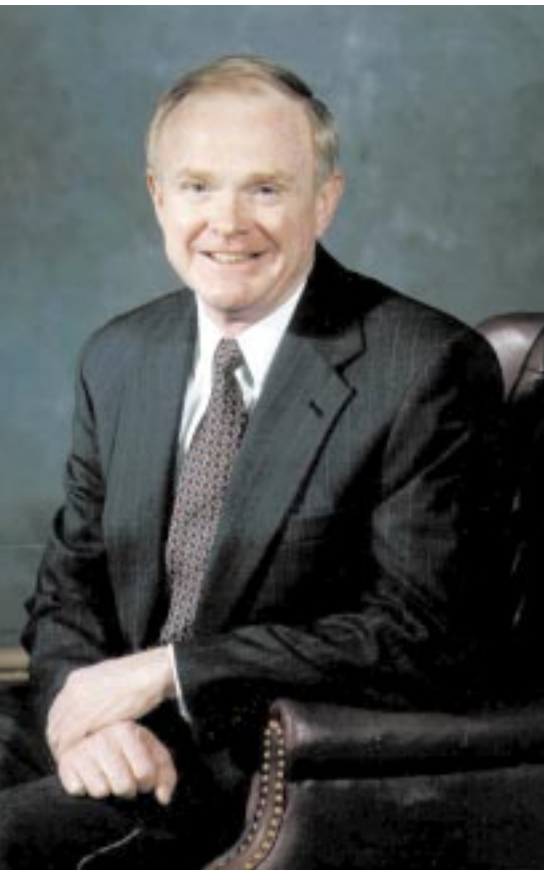
A Message from the Center Director



The past year at Kennedy Space Center has proven to be a time of vital change, new challenges and the realization of fundamental partnerships that will change the face of the Center. As we follow our roadmap to the future of KSC, with each small step we forge new ground in becoming a true Spaceport Technology Center.

One step in achieving our goal was the KSC 2000 reorganization effort that has positioned the Center for a productive future. KSC launched a new era on May 7, when its new organizational structure officially took effect. The improvement replaced the previous 21 organizations with 15 organizations reporting to the Center Director, streamlining the Center and adapting it to the technology and customer needs of today. While fully meeting our responsibilities for ground operations and continuing our tradition of excellence, KSC can now participate in NASA's cutting edge engineering initiatives in its role as a Spaceport Technology Center.

As lead center for NASA's acquisition and management of Expendable Launch Vehicle (ELV) Launch Services, KSC kept its momentum going by selecting Boeing Delta Launch Services Inc. and Lockheed Martin Commercial Launch Services Inc. for the NASA Launch Services contract awards.

In addition to the six ELV launches flown in the last fiscal year, KSC launched four successful Shuttle missions, two of which flew to the International Space Station (ISS) in preparation of the first resident crew. The other missions focused on the servicing of the Hubble Space Telescope and the Shuttle Radar Topography Mission (SRTM) to map the Earth.

KSC also saw numerous ribbon cuttings including the Space Experiment Research and Processing Laboratory (SERPL), the Cryogenics Testbed Facility, the Vehicle Assembly Building Safe Haven and the first Checkout and Launch Control System (CLCS) in the Hypergolic Maintenance Facility.

Partnerships with the Cape Canaveral Air Force Station strengthened as we widened the bridge over the river. In June 2000, Brig. Gen. Donald Pettit, commander of the 45th Space Wing, and I signed an interagency agreement that established

the Joint Planning and Customer Service (JPCS) office. The agreement brought together an integrated staff so that Spaceport customers will have a one-stop shop with expertise both from the 45th Space Wing and KSC.

The Florida Space Summit held in January 2000 brought influential leaders from federal and state government, industry and academia together to discuss the future for space exploration. I had the pleasure of moderating a discussion about the future of space as it related to the state of Florida during the Summit. A fascinating discussion ensued between participants like Senator Bob Graham, Rep. Dave Weldon, Gov. Jeb Bush, Brig. Gen. Pettit, and NASA Administrator Dan Goldin. Lieutenant Governor Brogan and I also signed a Memorandum of Understanding (MOU) to document the long-term intent to form new partnerships with public and private academic institutions for development of new technology learning environments for the training of our aerospace workforce. We followed up this year adding funding to start the first phase of the agreement.

Through these efforts and others, KSC began the new millennium with a reinvigorated sense of destiny and a clear plan for continuing excellence in launch operations and technology development.

Each year presents different challenges than the previous one, but our vision for the Spaceport Technology Center, along with the promise of continuing partnerships, will ensure the safety and success of future missions into space to explore and discover keys to mysteries of this grand universe God created for us.

Roy D. Bridges, Jr.

Kennedy Space Center

Within NASA's framework of space and development centers, Kennedy Space Center is the Center of Excellence for Launch and Payload Processing Systems, Lead Center for Acquisition and Management of Expendable Launch Vehicle Launch Services and Lead Center for Payload Carriers and Support. In November 2000, the NASA Administrator amended KSC's Mission Area and assigned KSC as "Space Launch Operations and Spaceport and Range Technologies." Each step forward to expand KSC's capabilities is accomplished in partnership with other NASA centers to achieve the vision and mission of the National Aeronautics and Space Administration.

NASA Vision

NASA is an investment in America's future. As explorers, pioneers and innovators, we boldly expand frontiers in air and space to inspire and serve America and to benefit the quality of life on Earth.

NASA Mission

- Advance and communicate scientific knowledge and understanding of the Earth, the solar system, and the universe
- Advance human exploration, use and development of space
- Research, develop, verify and transfer advanced aeronautics, and space technologies

The strategic goals, vision and guiding principles developed at Kennedy mirror the dedication, excellence and integrity of investing in America's future through continued space exploration.

KSC Strategic Goals

- Assure sound, safe and efficient practices are in place for private/commercial processing
- Increase the use of operational knowledge in the design/development of payloads and new vehicles
- Partner to develop new technologies for future space initiatives
- Continually enhance core capabilities to meet customer needs

KSC Guiding Principles

- Safety and Health First
- Build Reliance and Teamwork Everywhere
- Satisfy Our Customers' Needs Anytime, Anywhere
- Environmental Leadership

Historical Timeline

October 1958 - Just six days after NASA was formally organized from the National Advisory Committee for Aeronautics, the first American human space flight program, Project Mercury, was initiated.

May 1961 - Alan B. Shepard Jr. became the first American to fly into space, when he rode his Mercury capsule on a 15-minute suborbital mission.

August 1961 - NASA announced that it intends to expand the Cape Canaveral facilities to launch humans to the moon by acquiring 80,000 acres of land north and west of the Air Force Missile Test Center facilities at the Cape.

February 1962 – John H. Glenn Jr. became the first American to orbit the Earth on the Mercury flight Friendship 7.

July 1962 - Dr. Kurt H. Debus was named Director of the Launch Operations Center, which later became the John F. Kennedy Space Center.

July 1963 - Construction of the Vehicle Assembly Building began, making it at the time, the largest building in the world with more than 129,480,000 cubic feet.

November 1963 - President Johnson renamed both the Launch Operations Center and the Cape Canaveral Auxiliary Air Force Station to the John F. Kennedy Space Center seven days after the president was assassinated.

August 1965 - Construction of the first stretch of the Crawlerway, between the Vehicle Assembly Building and Launch Pad 39A, was completed.

January 1967 - The three-man crew for the first manned Apollo spaceflight (AS-204) died in an accidental flash fire at Launch Complex 34 during the first major dress rehearsal. The crew included Virgil I. Grissom, Edward H. White and Roger B. Chaffee.

November 1967 - One of KSC's two new pads at Launch Complex 39, Pad A, was used for the first time to launch the Saturn V spacecraft development flight. This was also the first time that one of the firing rooms in KSC's Launch Control Center was used.

July 1969 - A Saturn V safely boosted Neil Armstrong, Buzz Aldrin and Michael Collins into space on July 16, culminating in the first lunar landing on the moon on July 20 at 10:56 p.m. EST.

Historical Timeline

May 1973 - Florida Gov. Reuben Askew signed a legislative enactment that restored the name of the geographic cape to Cape Canaveral from Cape Kennedy, a name it had held for almost ten years.

May 1973 - Launch of a Saturn V rocket to complete first Skylab mission.

January 1975 - Lee R. Scherer officially assumed his duties as the second KSC Director.

July 1975 - Launch of Apollo-Soyuz Test Project (ASTP) designed to test rendezvous and docking system compatibility for American and Soviet spacecraft and open the way for future joint human flights.

September 1979 - Richard G. Smith was named the third KSC Director.

March 1979 - The first Space Shuttle orbiter, Columbia, arrived at KSC and spent 610 days being prepared for launch in one of the twin bays in the Orbiter Processing Facility.

April 1981 - The newly refurbished and modified Pad A, at Launch Complex 39, was used for the first launch in the Space Shuttle program on April 12, the 20th anniversary of Yuri Gagarin's first launch into orbit for humankind.

February 1984 - For the first time, following the completion of STS 41-B, the Space Shuttle landed at the Shuttle Landing Facility (SLF).

January 1986 - Pad B at Launch Complex 39 was used for the first time in the Space Shuttle Program to launch Space Shuttle Challenger on mission STS 51-L. Approximately 73 seconds after its launch on January 28 at 11:38 a.m. EST, an explosion occurred causing the loss of the orbiter and its crew.

September 1986 - Lt. Gen. Forrest S. McCartney was named the fourth KSC Director.

September 1988 - Space Shuttle flights resumed after an extensive investigation into the STS 51-L accident and an assessment of the Space Shuttle program was conducted.

September 1991 - A third Orbiter Processing Facility bay was dedicated. The former Orbiter Modification and Refurbishment Facility, which had been used for off-line

Historical Timeline

orbiter inspection, modifications and repair work, was converted using existing service structures and work platforms transported to KSC from Vandenberg Air Force Base.

January 1992 - Robert L. Crippen was named the fifth KSC Director.

June 1994 - The Space Station Processing Facility, which serves as the central preflight checkout and processing point for elements of the International Space Station, was dedicated.

June 1995 - The first piece of hardware to be processed for flight in the Space Station Processing Facility (SSPF) arrived at KSC. It was the Russian Docking Module, which was attached to the Mir Space Station during STS-74 .

January 1995 - Jay F. Honeycutt was named the sixth KSC Director.

March 1997 - Roy D. Bridges Jr. was named the seventh KSC Director. A former astronaut and retired Air Force Maj. Gen., he is the current Center Director overseeing Space Shuttle launches as assembly of the International Space Station progresses.

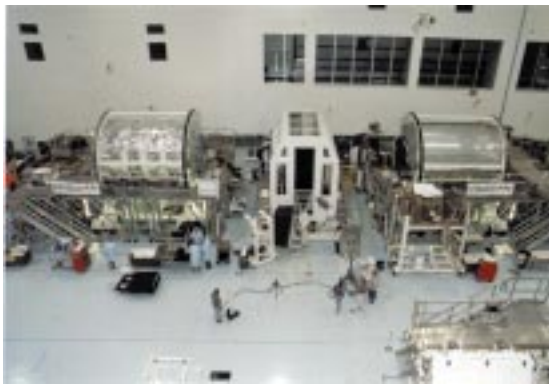
July 1997 - The Kennedy Space Center Implementation Plan and Road Map, a bold plan for KSC's future through the year 2025, was unveiled.

October 1997 - KSC was designated lead center for acquisition and management of Expendable Launch Vehicle Launch Services for the agency.

December 1998 - The first Space Shuttle mission dedicated to the assembly of the ISS was launched from Pad 39A on December 4 at 3:36 a.m. EST carrying the Unity node.

May 1999 – Shuttle Discovery was launched from Pad 39B on May 27 at 6:49 p.m. on the first mission for a Shuttle to dock with the International Space Station.

July 1999 – The first Space Shuttle mission commanded by a female, astronaut Eileen Collins, began when Shuttle Columbia launched from Pad 39B on July 23 at 12:31 a.m.



Significant Events FY 2000

- **October 1999** – Ribbon cutting for the Consolidated Support Operations Center
- **October 1999** – S1 truss for the International Space Station arrived at KSC
- **November 1999** – P3 truss for the International Space Station arrived at KSC
- **December 1999** - Launch of an Atlas IIAS ELV from Vandenberg Air Force Base on the EOS Terra mission
- **December 1999** - STS-103, the third Shuttle mission to service the Hubble Space Telescope
- **December 1999** - Launch of a Taurus ELV from Vandenberg Air Force Base on the Active Cavity Radiometer Irradiance Monitor Satellite(ACRIMSAT) mission
- **January 2000** - KSC hosted the first Florida Space Summit
- **February 2000** - STS-99, the Shuttle Radar Topography Mission to produce 3-D image of Earth
- **March 2000** - Launch of a Delta II on the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) mission
- **March 2000** - KSC hosted the second Southeast Regional FIRST (For Inspiration and Recognition of Science and Technology) Robotics competition
- **April 2000** - Ribbon cutting for the Cryogenics Testbed Facility
- **May 2000** - STS-101, the first servicing mission to the International Space Station
- **May 2000** - Launch of an Atlas IIA from Cape Canaveral Air Force Station on the Geostationary Operational Environmental Satellite (GOES-L) mission
- **May 2000** - KSC 2000 reorganization effort in place
- **June 2000** - Launch of an Atlas IIA from Cape Canaveral Air Force Station on the Tracking and Data Relay Satellite (TDRS-H) mission
- **June 2000** - KSC and the Air Force sign an interagency agreement establishing the Joint Planning and Customer Service office
- **June 2000** - Boeing Delta Launch Services Inc. and Lockheed Martin Commercial Launch Services were selected for the NASA Launch Service contract
- **August 2000** - The VAB's Safe Haven modifications were tested
- **September 2000** - Launch of a Titan II from VAFB on the National Oceanic and Atmospheric Administration's (NOAA-L) mission
- **September 2000** - STS-106, second servicing mission to the International Space Station
- **September 2000** - Ribbon cutting for the first Checkout and Launch Control System at the Hypergolic Maintenance Facility

ELV Program

Since the beginning of FY 1999, Kennedy Space Center has been the fully functional lead center for NASA's acquisition and management of Expendable Launch Vehicle (ELV) Launch Services. Six ELV missions were successfully launched during 2000. Eleven ELV missions from both KSC, Vandenberg Air Force Base in Calif., and Kodiak, Alaska, are currently planned for launch in 2001.

In June 2000, NASA selected Boeing Delta Launch Services Inc. and Lockheed Martin Commercial Launch Services Inc. for the NASA Launch Services contract. An Indefinite Delivery/Indefinite Quantity contract was awarded to each contractor with a minimum of one launch service over 10 years. NASA is authorized to order a total of 70 launch services under all the contracts bringing the total estimated value to $5 billion.

KSC's ELV team expanded capabilities this year when they remotely managed a Pegasus rocket launch of High-Energy Transient Explorer 2 (HETE-2) from the Kwajalein Missile Range in the South Pacific. Using a newly developed, innovative remote monitoring system from Hangar AE, the team was able to track the vehicle and spacecraft as well as a launch at Cape Canaveral.

KSC's ELV team managed the launch of two missions from CCAFS in FY 2000. Satellites launched were the Geostationary Operational Environmental Satellite (GOES-L) weather satellite in May and NASA's latest Tracking and Data Relay Satellite (TDRS-H) in June.

From Vandenberg Air Force Base in California, the KSC team supported the successful launch of both Terra, a new series of satellites that are part of the U.S. Global Change Research Program, and Active Cavity Radiometer Irradiance Monitor Satellite (ACRIMSAT) in December 1999; the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) in March 2000; and the National Oceanic and Atmospheric Administration's NOAA-L spacecraft in September 2000.

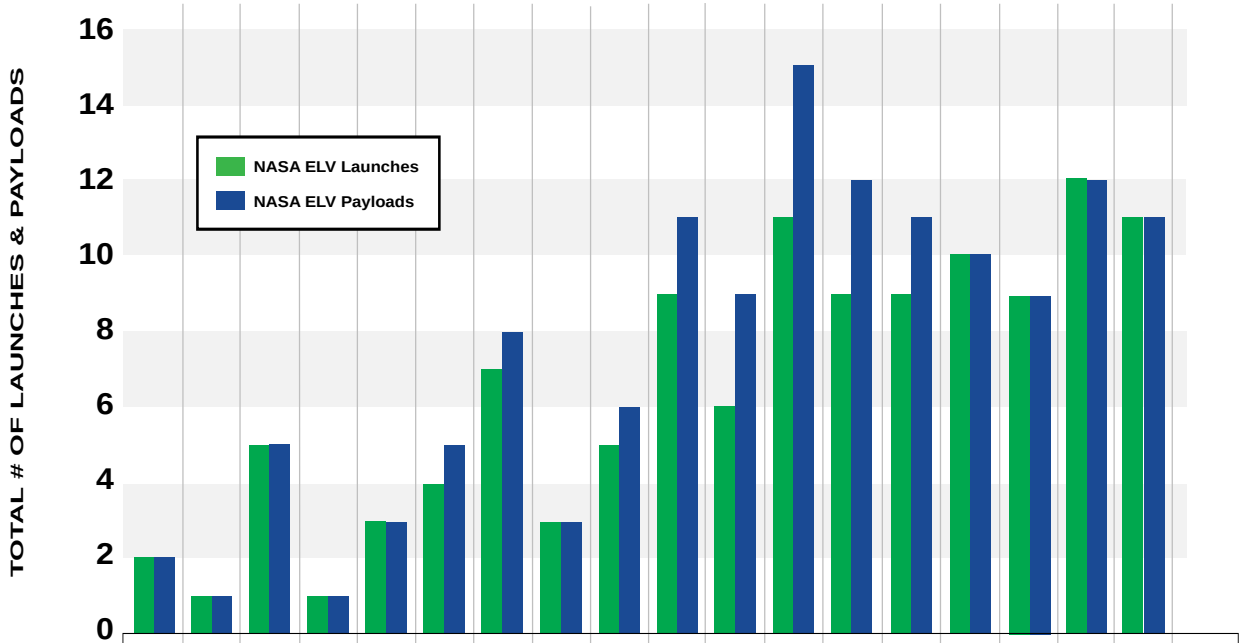
To ensure safe and successful missions, KSC participated in an Agency-wide Red Team created to proactively

ELV Program

search for possible problems or situations that could impact all future missions to Mars and outer planets. Findings of this Red Team caused NASA to realign some of its major programs, changing both the focus and scope, to orchestrate the success and safety of future missions.

With an ambitious schedule set for 2001, the ELV Program will focus efforts on providing vehicle qualifications, payload integration with mission assurance leading to safe, successful launches of both new and existing launch vehicles.

NASA ELV Total Launch Rate



YEAR	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	TOTAL
NASA ELV Launches	2	1	5	1	3	4	7	3	5	9	6	11	9	9	10	9	12	11	117
NASA ELV Payloads	2	1	5	1	3	5	8	3	6	11	9	15	12	11	10	9	12	11	134

International Space Station

As the quest continues to construct an orbiting research facility, KSC continued to help ensure safe and successful ground operations for the International Space Station (ISS) flight hardware. KSC's team processed approximately 275,000 pounds of hardware for flight aboard 11 future missions.

KSC successfully completed Phase I of Multi Element Integrated Testing (MEIT) involving the U.S. Laboratory Destiny; electrical power, control and communication modules; docking port; and the Canadian-built robot arm. KSC teams focused efforts on MEIT Phase II test planning and completed the first MEIT II test configuration involving a KSC developed ground support US Lab Emulator, additional power modules and Mobile Transporter.

MEIT was designed to verify electrical, structural and fluid connections between interfacing Station flight elements. The series of end-to-end tests revealed numerous hardware and software problems that were corrected during ground processing, preventing potential rework on orbit. Due to the success of MEIT, the National Space Club presented the prestigious Eagle Award to the team. The Eagle Award is intended for persons who, through direct effort in the design, development, production, test, evaluation, launch, space operation or recovery of human space flight equipment, have influenced successful completion of one or more human space flight missions by limiting risks or hazards to the flight crew or mission objective.

The Vapor Containment Facility (VCF), completed ahead of schedule in July 2000, supported STS-92, STS-97 and STS-98 mission critical path processing this year. Ninety seven percent of all potentially hazardous ammonia leak paths were relocated to the VCF, thus dramatically increasing personnel safety in the Space Station Processing Facility (SSPF) and reducing the chances of affecting work in that facility.

One of the first payloads to reside on the Station, the Protein Crystal Growth - Enhanced Gaseous Nitrogen Dewar, was processed at KSC for flight STS-106 and was returned from orbit on flight STS-92, demonstrating the full cycle for ISS hardware performing research in space.

Space Shuttle

During the past fiscal year, the Space Shuttle program produced many breathtaking launches, transported numerous pounds of Station hardware to orbit, implemented several hi-tech orbiter upgrades, and passed a major historic milestone.

KSC safely and successfully launched four Shuttle missions carrying 27 astronauts. The crews traveled a total of 17.5 million miles in space.

The Shuttle program, while still having more than three-quarters of its design lifetime available, has provided NASA with numerous accomplishments for nearly 20 years. Since April 1981, the Shuttle has transported about three million pounds of cargo and hundreds of astronauts have had the unique privilege of traveling aboard this unrivaled space vehicle.

STS-103, the first flight of the fiscal year, launched a seven-member crew aboard Discovery on a mission to repair the Hubble Space Telescope. The crew restored Hubble to working order and upgraded some of its systems allowing the decade-old observatory to prepare to begin its second decade of astronomical observations.

The year 2000 started with a first-of-its-kind mission called the Shuttle Radar Topography Mission to map the Earth. The crew deployed a 200-foot mast protruding from the payload bay to produce unrivaled 3-D images that will contribute to the production of better maps as well as help create more realistic flight simulators and enhanced navigation safety.

After those first two missions focused on science not related to the International Space Station, the next two missions, STS-101 and STS-106, brought our center of attention back to the goal of permanently living and working in space with servicing missions to prepare the Station for the first resident crew, Expedition One.

During the year, KSC's expertise in operational technology was used to provide immediate applications to help with the safety and success of Shuttle missions. The launch of STS-101 was delayed due to a 320-pound Power Drive Unit (PDU) for the orbiter's rudder/speed brake that had to be replaced. To speed the replacement process, it was performed at the pad. This procedure had never been attempted before. It was a precarious operation because of the risk of air intrusion – an unacceptable condition for flight. KSC's new Cryogenic Testbed Facility was used to research the inherent dangers and to organize a plan to freeze the six titanium hydraulic lines that lead to the PDU, thereby eliminating the possibility of air intrusion. Because of the operational technology skills that exist here at KSC, a

Space Shuttle

Shuttle rollback was prevented and the operation and subsequent retests were completed.

Space Shuttle Upgrades

As the Space Shuttle fleet prepares for a new decade of challenging missions, the orbiters are being ferried in turn to Palmdale, Calif., to receive more than 100 21st Century modifications.

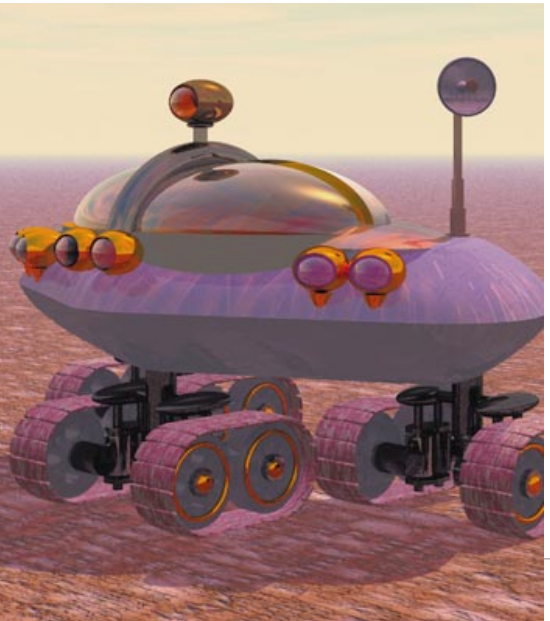
Flying for the first time aboard Atlantis on mission STS-101, was the "glass cockpit" composed of 11 new, full-color, flat-panel displays on the flight deck. Columbia, the second in the orbiter fleet to undergo these modifications, was ferried to Palmdale in the fall of 1999. A glass cockpit and many other upgrades are being installed. Various upgrades include a relocated airlock to prepare for International Space Station assembly flights, an updated communications system and better protection elements for the orbiter's cooling system.

Improved flight hardware and vehicle upgrades were not the only equipment enhancements. The Checkout and Launch Control System (CLCS) Project will upgrade the Space Shuttle's outdated launch processing software. The first CLCS room was declared operational at the Hypergolic Maintenance Facility in September 2000. It is the first of several new CLCS control rooms to come on line and is being used to process the Orbital Maneuvering System pods and Forward Reaction Control System modules. Future facilities include three control rooms in the Launch Control Center, which will eventually monitor and control the Shuttle during countdown and ground processing.

After Hurricane Floyd just missed hitting the East Coast of Florida, managers realized that KSC needed to increase the Vehicle Assembly Building's (VAB) storage capacity to provide a safe haven for a Shuttle at the pad. A buried portion of the Apollo-era Crawlerway leading to the VAB on the southwest side was modified as part of KSC's Safe Haven project. High Bay 2 now provides protection for a third fully stacked Shuttle to improve KSC's readiness for hurricane season.

The Shuttle program also received a long-awaited pair of new transporters for Shuttle payload canisters. The new transporters, manufactured in Germany and delivered to KSC by barge, carry spacecraft and International Space Station elements from payload facilities to the pads. The transporters were needed to support the Space Shuttle Program well into the new millennium.

Future Vehicles



As the time for new vehicles to be launched at KSC draws closer, Kennedy Space Center has established a key position in the Space Launch Initiative (SLI). SLI is the program to develop technologies necessary to build a second-generation Reusable Launch Vehicle (RLV). The Space Shuttle is America's first generation RLV, and NASA has established a goal that the next generation RLV should be ten times cheaper to operate, and 100 times safer. KSC is providing the project leadership for ground operations technology development work, as well as providing team members to the flight vehicle development teams. KSC has also begun key partnerships with all the major aerospace companies that are developing new technologies for the second-generation RLV. Technology development focus areas to date have included umbilical systems as well as ground based and space based range safety systems.

The White House Office of Science and Technology Policy led an inter-agency working group to study the future use and management of the U.S. space launch bases and ranges. This report, as signed by the President, recommends that NASA should name KSC as the center for next generation range technology development. Subsequently, NASA Headquarters revised Kennedy Space Center's mission to lead spaceport and range technology development. Formulation was begun on the Spaceport and Range Technology Development Initiative to integrate and coordinate national technology development activities. This involves federal and state agencies, industry and academia.

As these projects gather momentum, KSC is playing a vital role in the development of future launch vehicles and technology.

Safety and Health First

Supporting our value of safety and health first, in 2000 KSC kicked off the effort to pursue Star Certification in the OSHA Voluntary Protection Program (VPP) with the target for certification being 2002. VPP certification is conferred by OSHA on only the safest worksites and is an indicator that both management and employees are taking an active role in a sound safety program. The KSC VPP certification is the most complex and largest attempt by an organization in the United States, according to OSHA representatives while visiting KSC.

KSC took a leading role in health education for NASA employees. A skin cancer screening and detection workshop was held at KSC and was presented as a model for other centers and to the American Academy of Dermatology. Programs on industrial hygiene, health physics, emerging diseases and aging were also offered to both KSC employees and employees at other centers.

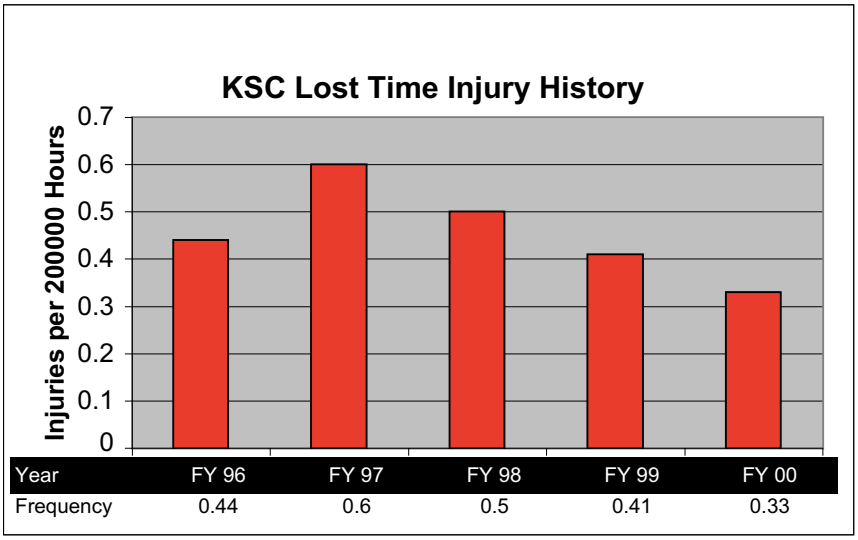
A Bone Marrow Registration Drive registered 1200 new potential bone marrow donors, the largest number of any KSC Bone Marrow Registration Drive, and marked the first time KSC worked with the 45th Space Wing for a marrow donor drive. The success of the drive, which covered KSC, Cape Canaveral Air Force Station, and Patrick Air Force Base, was made possible through high visibility support from KSC and 45th Space Wing senior leaders, contractors, and volunteers.

KSC and the 45th Space Wing also joined forces to heighten awareness about work place safety during the 3rd annual Super Safety and Health Day. All normal work activities, with the exception of mandatory services such as

Safety and Health First

fire and security, were suspended permitting thousands of KSC employees and contractors to participate in a full day of informative activities. The compelling speakers reminded employees that the health and safety of the workforce, both on and off duty, is crucial to the overall effectiveness and success of mission goals and objectives and to protecting the lives of our astronauts.

KSC had another successful year with respect to prevention of injuries. FY 2000 marked the fifth successive year in which accident and injury rates decreased.



Partnerships

Space Experiment Research and Processing Laboratory (SERPL)

Examples of KSC partnerships involve the future Space Experiment Research and Processing Laboratory (SERPL) magnet facility for a planned Space Commerce Park. NASA and the Spaceport Florida Authority teamed to develop the laboratory and park concepts to accommodate commercial, government and international space research and technology development programs. This collaborative effort also included the State's Office of Tourism; Trade and Economic Development; the Department of Management Services; Florida Space Research Institute; University of Florida; University of Central Florida; Florida Institue of Technology; and local contractors including Dynamac, Bionetics, SGS, and Delaware North Parks Services. The facility will feature shared-use laboratories where Florida university researchers will collaborate on a day-to-day basis, with the University of Florida as lead.

Plans for the 400-acre park on the Kennedy Space Center included building a facility to support life sciences, biological flight experiment processing and research for the International Space Station. Local universities will use SERPL to combine post-flight research at KSC with biological research that will be undertaken onsite. NASA is currently designing the facility. The State of Florida appropriated $14 million for the project. The remaining funding necessary for construction is expected to be in the state's next budget. The facility, co-managed by the Florida Space Research Institute, will partner to get the best of the best Florida universities and colleges actively involved at KSC.

Once it is completed, the State-owned SERPL will be available for lease by NASA's Life Sciences Support Contractor.

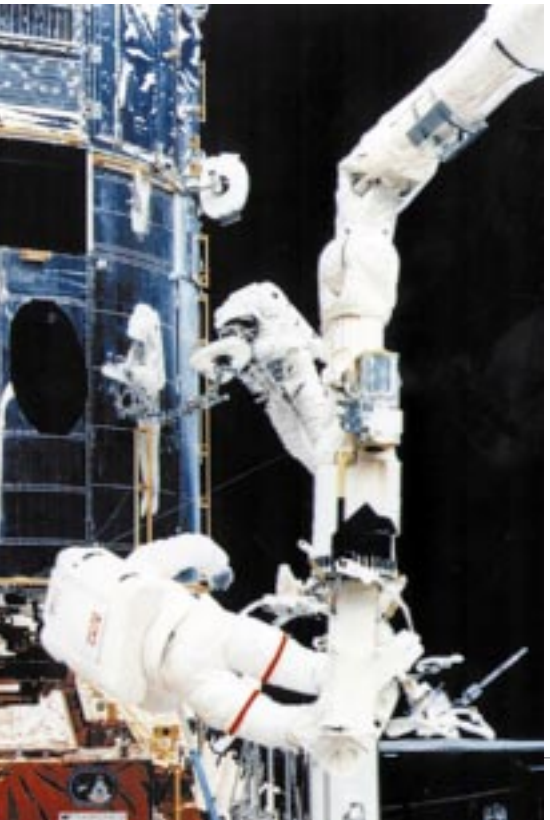
Cape Canaveral Spaceport

A partnership that has taken root and flourished is the formation of the Joint Performance Management Office (JPMO), which manages the Joint Base Operations and Support Contract (J-BOSC). This partnering effort between NASA and the USAF/45th Space Wing fo-

"The principal missions of the Interagency Agreement is to eliminate bureaucracy, serve as a 'one-stop shop' for new customers of the two federal agencies and to continue to expand the Air Force/NASA partnership."

Brig. Gen. Donald Pettit USAF

Partnerships



cuses on building a unified Cape Canaveral Spaceport by generating efficiencies and reducing the cost of supporting the nation's spacelift requirements.

This year, the NASA and USAF partnership has created a new Joint Planning and Customer Service Office to improve current customer satisfaction and especially pay attention to needs of new spaceport customers. This is a "One Stop Shop" where spaceport customers can come and discuss their requirements and receive recommendations for their business; all without going to multiple offices and entities.

The Spaceport's unique integration of KSC, Cape Canaveral Air Force Station, Merritt Island National Wildlife Refuge and Canaveral National Seashore requires a unified vision to become the premier prototype spaceport that is both gateway to space and steward of Earth's environment. The Cape Canaveral Spaceport Comprehensive Master Planning efforts began in FY 2000, with the hiring of an A&E consultant, ZHA Inc. located in Orlando, Fla. A leadership team was established from the financial partners, as well as the other significant land manager partners and the Navy. Formal visioning sessions with the spaceport community including: employees, commercial operators, government entities, industry, academia and community neighbors and businesses produced a master planning vision statement. This statement will guide the alternative development, analysis and selection this fiscal year. Final implementation planning will be completed in FY 2002.

Last year, NASA/KSC and the USAF/45th Space Wing signed the Consolidated Comprehensive Emergency Management Plan (CCEMP). The CCEMP established uniform policy guidelines for the effective mitigation of, preparation for, response to and recovery from a variety of emergency situations at the Spaceport.

Emergency Preparedness was further enhanced by the acquisition of the Mobile Command Center (MCC), a specially equipped emergency response vehicle. The MCC allows the emergency response team to better respond when emergencies at the Cape Canaveral Spaceport require a mobile field command center. The vehicle was purchased by the J-BOSC contractor Space Gateway

Partnerships

Support using J-BOSC contract savings.

Working together in partnership, NASA hopes to continue its movement into the new millennium with the support of government, academia, contractors and the local community.

Cryogenics Testbed Facility

The Cryogenics Testbed Facility, a new venture in technology and research collaboration, is just one more example of the partnerships being forged at KSC. Cryogenics and high vacuum techniques and technology are being used more widely all around the world. Kennedy Space Center created this facility to better apply cryogenics to our lives in the fields of medicine, biology, food, computers, industry, rocket propulsion and the spaceports of the future. The special facility was a jointly funded agreement between Dynacs Engineering Co., Florida Department of Community Affairs, the Technological Research and Development Authority and NASA.

The facility has already paid dividends in applying technology solutions to operational issues at the Space Shuttle launch pad. Several commercial cryogenic projects have already been completed with the number of businesses seeking services steadily starting to climb. The Testbed demonstrates the win-win philosophy and innovative initiatives in technology transfer that Kennedy Space Center has become known for and will be the pathfinder for making other KSC Testbeds commercially available as well.

Advanced Technology Development Center

In 2000, KSC began the development and expansion of the Advanced Technology Development Center (ATDC). To be developed over the next six years, the ATDC will be a national resource for other state and federal government agencies, as well as academia and the aerospace industry. KSC will utilize its capabilities to develop technologies to support KSC's role in spaceport and range technology that will benefit all future vehicles.

"It's often said that it's a long way from the laboratory to the marketplace. In a similar way, it's a big jump from the laboratory to outer space. The niche is the testbed. We aim to fill the gap by bringing together under one virtual roof the elements of research, engineering, operations and industry."

James Fesmire
Engineering Development

Environmental Efforts

The Kennedy Space Center has implemented aggressive recycling, pollution prevention, and energy conservation efforts not only to ensure a safe, healthy workplace, but also to minimize costs from waste cleanup, excess energy use, and inefficient use of resources.

KSC recycles materials ranging from scrap metal, copper, and aluminum to paper and copier toner cartridges. Recycling revenues in FY 2000 totaled over $93,000 compared to about $57,000 in FY 1999, a 60 percent increase that will generate funding for future recycling efforts.

The energy conservation efforts at KSC were nationally recognized during the year, when the Environmental Protection Agency (EPA) awarded the KSC Child Development Center with the Energy Star Label for Buildings. The center demonstrated energy performance in the top 25 percent of similar buildings while maintaining indoor air quality, resulting in a healthier environment.

KSC also completed three technology demonstrations planned as candidates for site clean up of contaminated groundwater. Workers seek to use the demonstrations to find the most effective and cost-effective remedies for environmental contamination.

KSC collaborated with the 45th Space Wing to host a joint week-long event to raise awareness of environmental and energy issues, and to promote ways to conserve resources and reduce costs. A 100 percent increase in staff attending the annual events attests to the increased environmental and energy awareness at KSC.

Environmental monitoring, management, and ecological research activities at KSC cover more than 140,000 acres of land that is home to some of the most biologically diverse marine, estuarine, fresh-water, wetland, and terrestrial communities in North America. The Biological Sciences Programs (BSP) at KSC support the ecological research and management needs of the Merritt Island National Wildlife Refuge and the Canaveral National Seashore, as well as NASA's launch and landing sites.

Technology

KSC, through the Technology Programs and Commercialization Office, led all of the NASA field centers for the fiscal year in the licensing of technologies. KSC leadership continued to foster the Center's development as a Spaceport Technology Center. Each year Kennedy Space Center's technical contributions to the world, in the form of spinoffs, send hundreds of technologies, originally developed for the space program, into the hands of American people. License agreements were negotiated for ten patents and software copyrights during FY 2000. Specific technology areas targeted for emphasis were Fluid System Technologies; Spaceport Structures and Materials; Process Engineering; Command, Control, Monitoring and Range Technology; and Plant and Microbiological Sciences. Part of the royalties from the licensing of these technologies will help to fund other research or development projects.

Technology Spinoffs

- **Nitrogen Oxide Waste Conversion to Fertilizer**
  The Space Shuttle uses nitrogen tetroxide as the oxidizer for the hypergolic propellant in its on-orbit orbital maneuvering and reaction control systems. When the oxidizer is transferred from ground storage tanks into the Shuttle storage tanks – and during maintenance operations- some nitrogen tetroxide vapor creates a hazardous by-product. Kennedy Space Center installed an improved Nitrogen Tetroxide Scrubber system to trap the vapors in water and then use hydrogen peroxide to produce nitric acid. The addition of another compound, potassium hydroxide, converts the nitric acid into potassium nitrate. This process produces a useful commercial fertilizer.

- **Medevac Oxygen System**
  KSC created a new, cost-saving Medevac Oxygen System that it now being used in various military

*"Over the past four years, KSC has vigorously implemented NASA Administrator Dan Goldin's **Agenda for Change**, which calls for increasing the number of partnerships with the commercial sector."*

Gale Allen
Deputy Chief
Technologist

Technology

aircraft. The system was originally designed to provide oxygen to astronauts being flown aboard aircraft in case of a forced landing at a Space Shuttle Transatlantic Abort Landing (TAL) site. This new system cost only $1,300 per kit versus an expansion of the old system that could have had a staggering cost of more than $1 million each. Through an intergovernmental agency technology transfer, the system is now being tested for planned incorporation into the U.S. Air Force Air Mobility Command.

- **Personal Cabin Pressure Altitude Monitor**
  Another KSC innovation, the Personal Cabin Pressure Altitude Monitor, promises to significantly contribute to public aviation safety. The monitor, which is about the size of a hand-held pager, is designed to warn individuals of potentially dangerous or deteriorating aircraft cabin pressure altitude conditions through audio, vibratory and visual alarms. Licensee(s) will be selected to commercialize the patented invention.

- **Water-Based Electroactive/ Conducting Polymers**
  Water-based electroactive/ conducting polymers will help extend the life cycle of structural steel used in buildings, bridges and marine equipment, which will have a dramatic economic impact in every society. An Ohio company is commercializing a NASA-patented technique to produce superior corrosion control coatings under a license agreement with KSC. GeoTech Chemical Company is marketing the products under the Catize™ name. The method KSC licensed increases the solubility and processing of the polymers in an inexpensive and environmentally safe way.

- **Command and Control Toolkit** (CCTK)
  A NASA software technology licensed to a Titusville company, Command And Control Technologies, Corp. (CCT), is returning to KSC to help improve systems

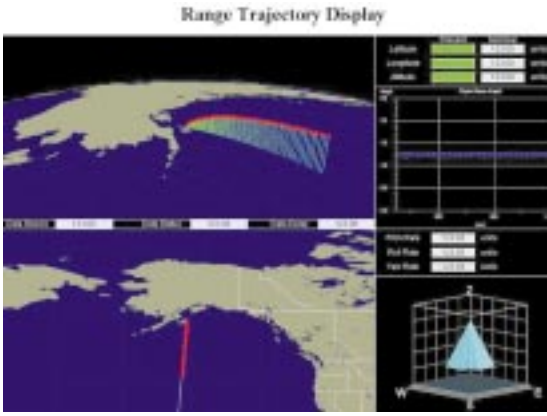
Technology

that monitor NASA's Expendable Launch Vehicle (ELV) Program. CCT has announced it will install an advanced telemetry system to demonstrate the benefits of new commercial spaceport software, based on the company's flagship product, the Command and Control Toolkit™ (CCTK). The new system will be deployed in NASA's Hangar AE, located at Cape Canaveral Air Force Station. The new system will provide state-of-the-art capabilities in telemetry, real-time data processing, launch data analysis, data distribution and visualization.

- **X-1R Advanced Lubricant**
  KSC and X-1R were inducted in the Space Technology Hall of Fame. Sun Coast Chemicals of Daytona Inc. is commercializing multiple products based on a biodegradable, non-toxic lubricant it originally developed to replace the Space Shuttle Crawler's standard lubricant. X-1R led to an industrial product line of 19 separate specialty lubricants. The first three industrial products were Train Track Lube, Penetrating Spray Lube and Biodegradable Hydraulic Fluid.

Ongoing Research

Research includes new cryogenic insulation, advanced umbilical systems, lightning occurrence prediction, life sciences, plant growth, and corrosion protection in coastal regions. Research is also underway to validate plant flight hardware for the International Space Station, and generate technologies in support of building biological life support systems.



Outreach to the World

People all over the world have taken notice of the space program with the recent surge of launches from KSC to the International Space Station (ISS). With 16 countries participating in the construction of the ISS, millions of people from all walks of life feel a vested interest in the space program and an overwhelming pride for their country's contribution to the orbiting outpost.

Kennedy Space Center Visitor Complex

The Visitor Complex is an avenue for NASA to tell the amazing journey of space exploration, both past and present, to millions of visitors per year. Several new exhibits, an Astronaut Encounter presentation and the Early Space Exploration exhibit at the Dr. Kurt Debus Conference Facility opened at KSC Visitor Center during FY 2000. The additions represented the final phase of a $120 million redevelopment project by Delaware North Parks Services of Spaceport Inc. The new conference facility features the Early Space Exploration exhibit, which highlights early U.S. space missions. A second new exhibit, Exploration in the New Millennium, showcases explorations to Mars and beyond.

To assure funding for future upgrades to the Visitor Center, a new admissions policy went into effect. An all-inclusive admission ticket now provides full and unlimited access to the KSC bus tour, IMAX films, Astronaut Encounter, Early Space Exploration exhibit, Shuttle Explorer, Robot Scouts, Universe Theater, International Space Station Center, Launch Complex 39 Observation Gantry and the Apollo/Saturn V Facility.

Community Outreach

KSC's commitment to reach out to help the surrounding community is apparent each year through the overwhelming support of time, money and energy that is given by employees. KSC's contributions through the 1999 Combined Federal Campaign exceeded its goal of $216,000, with more than $245,000 given by KSC Civil Service employees. During Make a Difference Day, about 65 employees shared their time by volunteering to read and play with children, delivering hot meals to the elderly, and painting hallways at Baxley Manor senior apartment complex. In addition, 1,174 KSC, CCAFS and PAFB employees joined the National Bone Marrow Donor Program at KSC's third annual registration drive. These employees registered hoping their marrow would be a perfect match for someone whose life depends on this much-needed donation.

In August, KSC hosted the annual Community Leaders Briefing. KSC executives met with hundreds of community leaders from across Brevard County and the State of Florida about long-term viability of KSC and benefits the space program contributes to the community.

Educational Outreach

One outcome of Kennedy Space Center's reorganization was the consolidation of all education programs within one organization. The consolidation helped create synergy necessary for the Center to better meet the educational needs of the community and to meet the agency's goal of educational excellence. The new education division sponsored more than 300 student aides, interns, K-12 teachers and faculty during the summer of 2000. Hundreds of teachers and students participated in successful educational programs both on and off site.

- Lieutenant Governor Frank Brogan and Center Director Roy D. Bridges Jr. signed a Memorandum of Understanding (MOU) to document the long-term intent to form new partnerships with public and private academic institutions for development of aerospace related learning environments using radical new technologies.

- KSC sponsored nine interactive Web casts during FY 2000 providing thousands of faculty and students access to information regarding ongoing projects and the opportunity to interact with engineers and senior management. The "landing to launch" series highlighted the processing of the orbiter from the time it lands at the Shuttle Landing Facility through the moment of launch. This Internet-based program allowed more than 20,000 students to take a virtual tour of the facilities at KSC and to have their questions answered live by NASA experts.

- The Exploration Station, located in the Center for Space Education, accommodated more than 175,000 visitors including students, teachers and public, while the Educators Resource Center hosted 103,057 teachers. Another 11,527 teachers benefited from 354 educator workshops and tours. KSC also developed and hosted a pilot workshop for informal educators, 50 librarians from Brevard and surrounding counties.

- Students from all over the country gathered for the second FIRST (For Inspiration and Recognition of Science and Technology) regional competition at the KSC Visitor Complex. Thirty

Educational Outreach

teams of high school students tested the limits of their imagination using robots they designed to compete in a technological battle against other schools' robots.

- The Spaceflight and Life Sciences Training Program (SLSTP) expanded this year through partnering with The Tuskegee Institute. The program also expanded its scope to include international activities and identified SLSTP training opportunities for foreign students.
- For the first time in several years, KSC recruiters were on college campuses across the United States to encourage students to participate in a revitalized KSC cooperational education program. The recruiters interviewed potential candidates for new engineers and specialists for the NASA workforce.

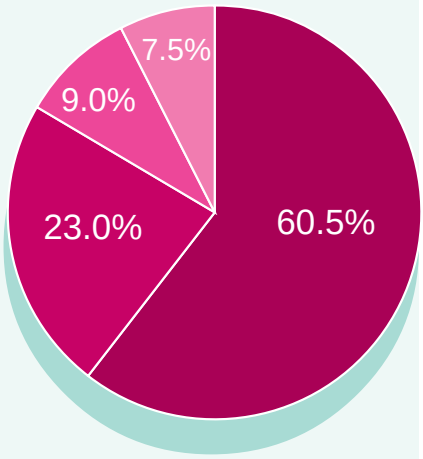
Economic Impact

The work done at the Kennedy Space Center in Brevard County not only benefits the space program, but also enlarges and enhances the total Florida economy. The effects are broad and substantial. The money spent on space exploration not only directly supports economic activity and employment at Kennedy Space Center, but also generates additional output, earnings, and jobs elsewhere in the region through purchases of labor, goods and services.

The federal government's expenditure on space exploration enlarges the local economy by generating final demand for labor, goods, and services needed to operate and maintain Kennedy Space Center. In meeting this final demand, NASA's private sector contractors employ workers, fund payrolls, and generate output. Workers and contractors generate additional impacts as they spend their incomes and place orders with other local firms for materials and services. Each round of such spending multiplies the initial change in the government's final demand, recirculating NASA's original expenditure among Central Florida businesses and households.

Workforce

Civil Servants	**1,739** Full-time
Skill Mix	
Scientific & Engineering	60.5%
Administrative	23.0%
Technical	9.0%
Clerical	7.5%
Contractor Employees	**11,484**
Tenants	**1,521**
Total KSC Employees	**14,744**

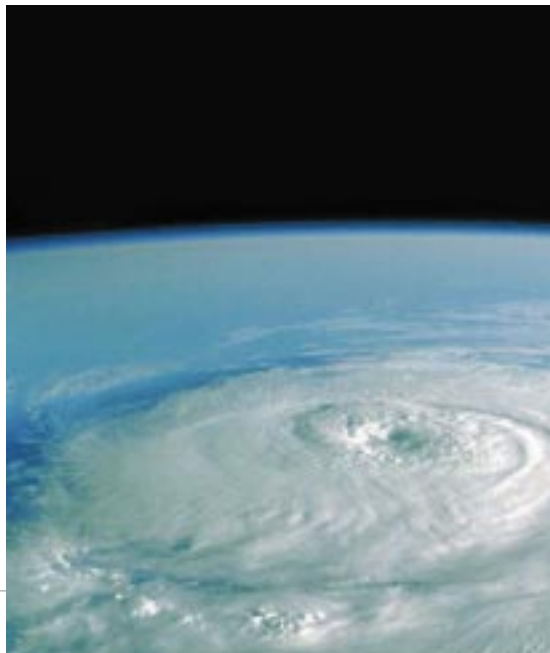


Economic Impact

The University of Florida has performed an Economic Impact Study to determine NASA's (KSC and other Centers, and the ancillary operations of the Visitor Complex and the Exchange Council) economic impact on Brevard County and the Central Florida region. The main (preliminary) results are summarized below.

Fiscal Year 2000	Brevard County	Central Florida
Expenses	$1,126 million	$1,298 million
Final Demand Generated	$ 827 million	$ 940 million
Output of Goods & Services	$1,249 million	$1,729 million
Earnings for Private & Public Sector Workers	$ 536 million	$ 705 million

Upon request, a full report is available from the KSC Chief Financial Office.



Statement of the Chief Financial Officer

The Fiscal Year (FY) 2000 financial statements (unaudited) have been prepared to report the financial position and results of NASA's Kennedy Space Center operation, pursuant to the requirements of the Chief Financial Officers (CFOs) Act of 1990 and the Government Management Reform Act of 1994 (GMRA). The statements include the Statement of Financial Position and the Statement of Operations and Changes in Net Position.

The statements have been prepared from the books and records of NASA, in accordance with the comprehensive basis of accounting prescribed by the Office of Management and Budget (OMB) Bulletin 94-01, "Form and Content of Agency Financial Statements." The statements are different from financial reports used to monitor and control budgetary resources, which are prepared from the same books and records.

The statements should be read with the realization that they are for an agency of the U.S. Government, a sovereign entity. Liabilities not covered by budgetary resources cannot be liquidated without the enactment of an appropriation, and payment of all liabilities, other than for contracts, can be abrogated by the sovereign entity.

These financial statements were prepared in accordance with Federal accounting standards. These standards are evolving through the efforts of the Federal Accounting Standards Advisory Board (FASAB). This board includes members from the Office of Management and Budget (OMB), the General Accounting Office (GAO), and the Department of Treasury (Treasury). Currently, NASA observes the following hierarchy of accounting standards as required by OMB:

- Individual FASAB standards published by OMB, GAO and Treasury;
- OMB guidance on the form and content of financial statements;
- Agency accounting guidance, which represents prevalent practices; and
- Accounting principles published by other authoritative sources.

NASA Headquarters, which receives its funding through annual Congressional appropriations, authorizes and funds KSC operations. KSC's total operational expenses for FY 2000 by appropriation were:

Appropriation	Amount (in thousands)
Mission Support	$ 306,139
Human Space Flight	453,997
Science, Aeronautics and Technology	274,812
Construction of Facilities	1,366
Space Flight Control and Data Communications	46
Total Expenses	**$ 1,036,360**

The 2000 Annual report and Financial Statements were the result of the work of a dedicated team of professionals at KSC.

N.A. Carroll, Chief Financial Officer

Financial Statements

John F. Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, FL 32899
(321) 867-5000
www.ksc.nasa.gov

	2000	Restated 1999
Assets:		
Intragovernmental Assets:		
Fund Balance With Treasury (Note 2)	$ 457,200	$ 502,299
Accounts Receivable, Net (Note 3)	19,271	10,345
Governmental Assets:		
Accounts Receivable, Net (Note 3)	1,104	1,630
Advances and Prepayments	510	260
Property, Plant and Equipment (Note 4)	2,033,508	1,996,953
Other Assets (Note 5)	117,560	112,684
Total Assets	$ 2,629,153	$ 2,624,171
Liabilities:		
Liabilities Covered by Budgetary Resources:		
Intragovernmental Liabilities:		
Accounts Payable	$ 17,881	$ 16,092
Other Liabilities (Note 6)	393	(143)
Governmental Liabilities:		
Accounts Payable	241,225	**277,373**
Other Liabilities (Note 6)	13,838	12,728
Total	$ 273,337	$ 306,050
Liabilities not Covered by Budgetary Resources:		
Intragovernmental Liabilities:		
Other Liabilities (Note 6)	$ 418	$ 418
Governmental Liabilities:		
Other Liabilities (Note 6)	13,739	15,546
Total	$ 14,157	$ 15,964
Total Liabilities	$ 287,494	$ 322,014
Net Position (Note 7):		
Unexpended Appropriations	$ 204,442	$ 208,468
Invested Capital	2,151,068	2,109,636
Cumulative Results of Operations	306	**17**
Future Funding Requirements	(14,157)	(15,964)
Total Net Position	$ 2,341,659	$ 2,302,157
Total Liabilities and Net Position	$ 2,629,153	$ 2,624,171

The accompanying notes are an integral part of these statements.

Financial Statements

	2000	Restated 1999
Revenues and Financing Sources:		
Appropriated Capital Used	$ 897,363	$ 1,062,818
Revenues from Sales of Goods and Services:		
To the Public	4,747	4,048
Intragovernmental	134,539	135,332
Other Revenues and Financing Sources (Note 8)	769	975
Less: Receipts Transferred to Treasury	(769)	(975)
Total Revenues and Financing Sources	$ 1,036,649	$ 1,202,198
Expenses:		
Program or Operating Expenses by Appropriation:		
Mission Support	$ 302,216	$ 287,593
Human Space Flight	357,702	363,892
Science, Aeronautics and Technology	235,744	405,513
Construction of Facilities	1,366	2,792
Research and Development	-	2,6347
Research and Program Management	-	3
Space Flight Control and Data Communications	46	376
Reimbursable Expenses	139,286	139,380
Total Expenses	$ 1,036,360	$ 1,202,196
Total Revenues and Financing Sources In Excess of Expenses	$ 289	$ 2
Nonoperating Changes:		
Unexpended Appropriations (Note 7)	$ (4,026)	$ 64,907
Invested Capital (Note 7)	41,432	183,204
Cumulative Results from Operations (note 7)	289	2
Future Funding Requirements (Note 7)	1,807	946
Total Nonoperating Changes	$ 39,502	$ 249,059
Change in Net Position	$ 39,502	$ 249,059
Net Position, Beginning Balance	2,302,157	2,053,098
Net Position, Ending Balance	$ 2,341,659	$ 2,302,157

The accompanying notes are an integral part of these statements.

Financial Statements

2. Fund Balance with Treasury:
(In Thousands)

Fund Balances:	Obligated	Unobligated Available	Unobligated Restricted	Unobligated Restricted
Appropriated Funds	$ 398,738	$ 51,314	$ 6,465	$ 456,517
Deposit Funds				2
Suspense/Clearing Accounts				681
Total Fund Balance with Treasury				$ 457,200

3. Accounts Receivable, Net:
(In Thousands)

	Entity Accounts Receivable	Non-Entity Accounts Receivable	Allowance for Uncollectible Receivables	Net Amount Due
Intragovernmental	$ 19,271	$ -	$ -	$ 19,271
Governmental	1,110	310	(316)	1,104
Total	$ 20,381	$ 310	$ (316)	$ 20,375

Non-entity accounts receivable represent amounts that will be deposited to miscellaneous receipts when collected.

4. Property, Plant and Equipment:
(In Thousands)

	2000	1999	Change
Government-owned/Government-held:			
Land	$ 73,672	$ 73,672	$ 0
Structures, Facilities and Leasehold Improvements	1,390,332	1,383,596	6,736
Equipment	219,919	218,012	1,907
Work in Process	2,753	3,585	(832)
Total	$ 1,686,676	$ 1,678,865	$ 7,811
Government-owned/Contractor-held:			
Structures and Facilities	$ 7,567	$ 7,660	$ (93)
Equipment	64,562	60,238	4,324
Special Tooling	928	980	(52)
Special Test Equipment	60,430	65,412	(4,982)
Space Hardware	212,551	182,864	29,687
Work in Process	794	934	(140)
Total	$ 346,832	$ 318,088	$ 28,744
Total Property, Plant and Equipment	$ 2,033,508	$ 1,996,953	$ 36,555

See Note 1 for further discussion on property, plant and equipment.

Financial Statements

5. Other Assets:
(In Thousands)

	2000	1999	Change
Contractor-held Materials	$ 117,560	$ 112,684	$ 4,876
Total	$ 117,560	$ 112,684	$ 4,876

6. Other Liabilities:
(In Thousands)

Liabilities Covered by Budgetary Resources:

	Current	Non-Current	Total
Intragovernmental Liabilities:			
Liability for Deposit and Suspense Funds	$ 393	$ -	$ 393
Total	$ 393	$ -	$ 393
Governmental Liabilities:			
Liability for Deposit and Suspense Funds	$ 1,943	$ -	$ 1,943
Accrued Funded Payroll and Benefits	11,895	-	11,895
Total	$ 13,838	$ -	$ 13,838

The liability for deposit and suspense funds includes cash advances received from other Government agencies and public reimbursable customers. Also included are funds on deposit with the U. S. Treasury for employees' savings bonds and state tax withholdings.

Liabilities Not Covered by Budgetary Resources:

	Current	Non-Current	Total
Intragovernmental Liabilities:			
Accounts Payable for Closed Appropriations	$ -	$ 418	$ 418
Total	$ -	$ 418	$ 418
Governmental Liabilities:			
Accounts Payable for Closed Appropriations	$ -	$ 1,249	$ 1,249
Contingent Liabilities	-	-	-
Unfunded Annual Leave	-	12,490	12,490
Total	$ -	$ 13,739	$ 13,739

See Note 1 for further discussion of liabilities not covered by budgetary resources.

Financial Statements

7. Net Position:

(In Thousands)

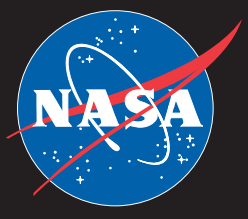
	2000 Appropriated Funds	Restated 1999 Appropriated Funds	Change
Unexpended Appropriations:			
Undelivered	$ 146,663	$ 153,087	$ (6,424)
Unobligated:			
Available	51,314	43,101	8,213
Unavailable	6,465	12,280	(5,815)
	$ 204,442	$ 208,468	$ (4,026)
Invested Capital	$ 2,151,068	$ 2,109,636	41,432
Cumulative Results	$ 306	**$ 17**	**$ 289**
Future Funding Requirements:			
Annual leave	$ (12,490)	$ (12,129)	$ (361)
Closed appropriations	(1,667)	(2,559)	892
Other	-	(1,276)	1,276
	$ (14,157)	$ (15,964)	$ 1,807
Total	$ 2,341,659	$ 2,302,157	39,502

8. Other Revenues and Financing Resources:

(In Thousands)

	2000	1999
General Fund Proprietary Receipts	$ 769	$ 975
Total	$ 769	$ 975

General Fund Proprietary Receipts represent user fees, gifts, fines or interest penalties.



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