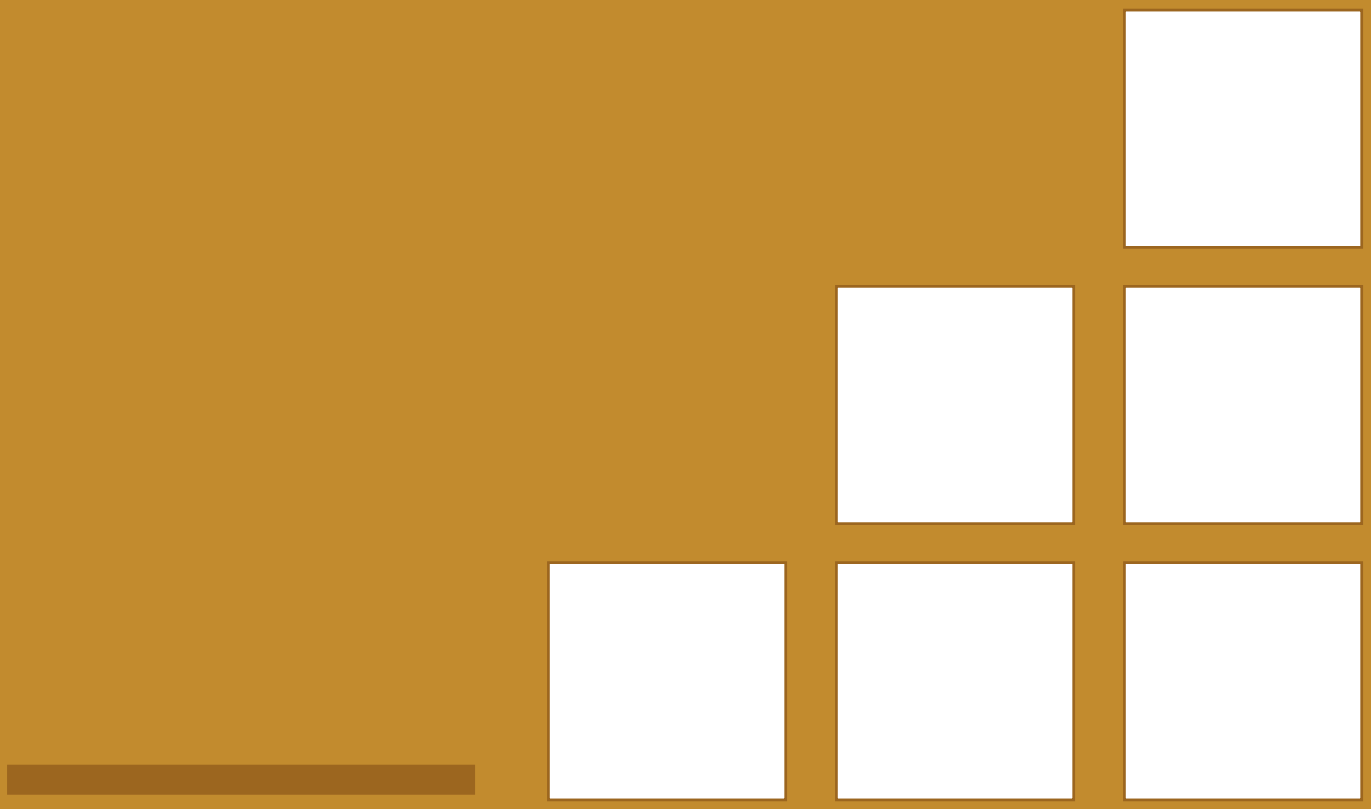
2001 KSC ANNUAL REPORT



In this mixed media painting by artist Chet Jezierski, Space Shuttle Columbia lifts off on mission STS-1, the first of the Shuttle program.

A technician performs final testing on Starshine 3 to prepare for the launch of the Kodiak Star at Kodiak Island, Alaska.

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A Message from the Center Director

In fiscal year 2001, Kennedy Space Center joined forces with several new partners and enjoyed continued achievements in the arena of space exploration. The year is highlighted by 14 safe and successful launches that history will record as milestones on our quest to understand the universe. This year also marked the 20th anniversary of Space Shuttle launches.

KSC again played a pivotal role in the development of the International Space Station taking shape high above Earth. More than 66 tons of Station elements and cargo were processed here and successfully launched on seven Shuttle missions, each dedicated to Space Station assembly. Many landmark components were launched from KSC, such as the U.S. Laboratory (Destiny), the Space Station Remote Manipulator System (Canadarm 2), and the Joint Airlock (Quest), which marked the completion of Phase II of the ISS assembly process and allowed a permanent resident crew of three. In addition, three resupply and outfitting missions were successfully completed utilizing the MPLM and other Payload Carriers.

Our Expendable Launch Vehicle Program celebrated the success of seven launches from a diverse set of launch sites: Vandenberg Air Force Base in California, Kwajalein Missile Range in the Pacific Ocean, the new Kodiak Launch Complex in Alaska, and Cape Canaveral Air Force Station. KSC also debuted the new Launch Vehicle Data Center (LVDC), replacing an older, single control room with three new control rooms and state-of-the-art equipment.

KSC has worked diligently to seek out and form partnerships that are vital sources of support and collaboration for several current and future endeavors. One such project is the International Space Research Park™ (ISRP), a new partnership with the state of Florida that will create an environment for research and technology development. Construction has begun on the Space Experiment Research and Processing Laboratory (SERPL), also a joint venture between KSC and the state of Florida. This magnet facility of the ISRP will become a primary gateway to the International Space Station for science experiments and a world-class home to ground-based investigations in fundamental and applied biological science.

With KSC leading the way in spaceport and range technology development, the quest is on to continually develop new technologies and coordinate these efforts with many state and federal agencies as well as private

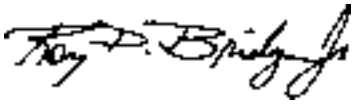
industry and academia. NASA and the Air Force have signed a Memorandum of Agreement (MOA) detailing the high level approach to cooperative efforts for advanced range technology development. This MOA sets in motion the Advanced Range Technology Working Group (ARTWG), co-chaired by NASA-KSC and Air Force Space Command, with the goal of forming a national roadmap developed by all range stakeholders. This technology development roadmap will be the formal plan for developing the ranges of the future. Similarly, NASA-KSC also chairs the Advanced Spaceport Technology Working Group (ASTWG), to develop the national roadmap for technology development for existing and future spaceports.

KSC led the NASA Civil Service Centers in FY 2000 and FY 2001 in Space Act Awards for inventions and other scientific and technical contributions that have helped to achieve NASA's aeronautical and space goals. In FY 2001, KSC distributed $187,300 of awards to inventors. KSC was also awarded the 2000 NASA Commercial Invention of the Year. The invention is a new emissions control system developed for oxidizer scrubbers that could eliminate the current oxidizer scrubber liquid waste and lower the nitrous oxide (NOx) emissions by 1 to 2 orders of magnitude. The output is a form of fertilizer, which is beneficial for KSC's citrus crops.

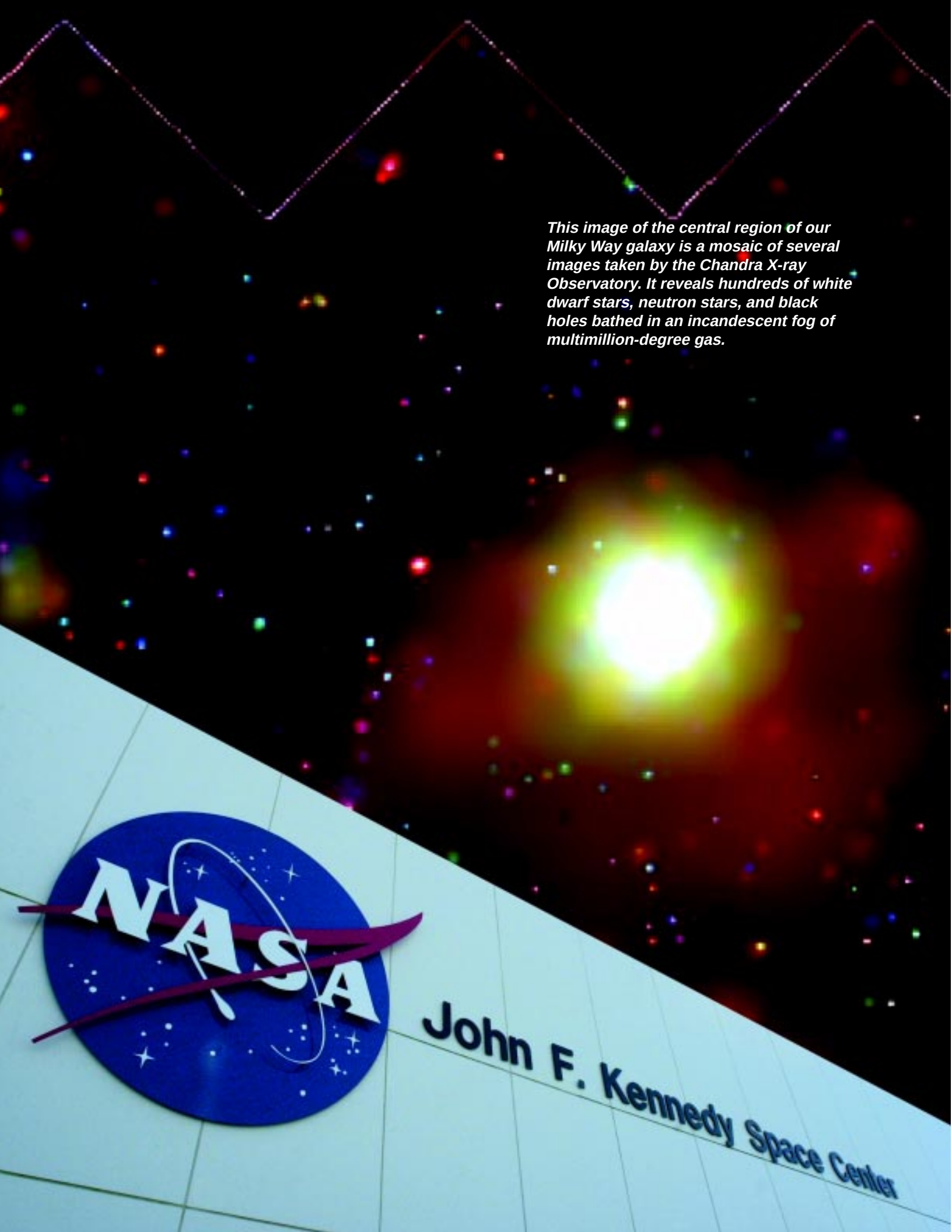
Over the past years, KSC has been preparing the workforce for the changes associated with KSC's new strategic direction by offering the "Seven Habits of Highly Effective People" training to more than 1,100 civil service employees. KSC's Change Leaders Network (CLN) facilitated this training and, in 2001, KSC was awarded the prestigious Franklin Covey Team Award for Synergy and Impact. KSC was among only six organizations worldwide to receive the award in that category, which recognizes teams for "outstanding effectiveness in the workplace and community." The Federal Council recognized KSC for Skin Cancer Prevention with an award for the NASA Solar Safe Program. This prevention program was developed at KSC in support of our Principal Center assignment for Agency Occupational Health, and was deployed across the Agency. KSC is seriously committed to the safety and health of employees, and Solar Safe is a part of that commitment.

KSC continues to be a focal point for NASA's public outreach, attracting millions of visitors and providing public communications opportunities through high visibility space launches and landing activities. KSC employees personally touch thousands as they host launch visitors, provide orientation briefings, volunteer for the Speakers Bureau, host special events, provide displays and exhibits at symposiums and conferences, and judge local science fairs and participate in Career Days. Formal education programs reach thousands of students and faculty with curriculum-related immersive experiences. One new partnership with Florida's Department of Education provides an overnight educational and shuttle launch viewing experience for fifth-grade students.

I am proud to be a part of the KSC team as we forge ahead, working together with our partners to ensure a future in which the questions of our universe will be answered by the discoveries of safe, efficient space ventures.



Roy D. Bridges, Jr.



This image of the central region of our Milky Way galaxy is a mosaic of several images taken by the Chandra X-ray Observatory. It reveals hundreds of white dwarf stars, neutron stars, and black holes bathed in an incandescent fog of multimillion-degree gas.

Vision and Mission

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

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

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

KSC Strategic Goals

- Assure and advance access to space for exploration, development, and use
- Provide innovative spaceport and range technologies for safe space operations and exploration missions
- Provide and assure safe, world-class services for operations and development functions

KSC Guiding Principles

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

At dawn on Launch Pad 36A, an Atlas IIA/Centaur rocket is fueled for launch of NASA's Tracking and Data Relay Satellite (TDRS-H).

KSC: A Historical Timeline

October 1957 – 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 during a 15-minute suborbital Mercury 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 comprised 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 rocket safely boosted Neil Armstrong, Buzz Aldrin and Michael Collins into space on July 16, culminating in the first landing on the moon on July 20 at 10:56 p.m. EST.

KSC: A 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 an unmanned Saturn V rocket completed 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. On board the Apollo spacecraft were astronauts Thomas Stafford, Vance Brand and Donald "Deke" Slayton. On board the Soyuz spacecraft were cosmonauts Alexei Leonov and Valeriy Kubasov.

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.

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

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. On board Space Shuttle Columbia were astronauts John Young and Robert Crippen.

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

KSC: A Historical Timeline

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

June 1994 – The Space Station Processing Facility (SSPF), 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 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 Major General, 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.

June 1998 – The Joint Performance Management Office (JPMO) is formed to manage the upcoming Joint Base Operations and Support Contract (J-BOSC). JPMO is now called the Cape Canaveral Spaceport Management Office (CCSMO).

August 1998 – Space Gateway Support (SGS) is awarded the J-BOSC contract, in which KSC and the 45th Space Wing combine resources and requirements to cut expenses, reinvest savings and consolidate functions.

October 1998 – President Clinton visits KSC for the launch of Shuttle Discovery on STS-95. The world watches as U.S. Sen. John Glenn, one of the original Mercury astronauts, begins his second voyage into space after 36 years.

October 1998 – Expendable Launch Vehicle (ELV) Program is consolidated at KSC. KSC assumes contract management responsibilities for ELV launch services.

December 1998 – STS-88, the first Space Shuttle mission dedicated to the assembly of the ISS was launched from Pad 39A on December 4 carrying the Unity node.

May 1999 – Shuttle Discovery was launched from Pad 39B on May 27 on the first docking mission with the International Space Station.

July 1999 – The first Space Shuttle mission commanded by a female, astronaut Eileen Collins, began with the launch of Shuttle Columbia on STS-93.

December 1999 – Launch of STS-103, the third Shuttle mission to service the Hubble Space Telescope.

KSC: A Historical Timeline

January 2000 – KSC hosted the first Florida Space Summit to discuss the future of space as it relates to the state of Florida.

May 2000 – Launch of STS-101, the first servicing mission to the International Space Station.

May 2000 – KSC 2000 reorganization effort is set in place, streamlining the Center and adapting it to modern technology and customer needs.

May 2000 – KSC, the Air Force 45th Space Wing Command, and Florida Space Authority begin planning for the future of the Spaceport by starting work on a Cape Canaveral Spaceport Master Plan.

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.

September 2000 – Ribbon cutting for the first Checkout and Launch Control System at the Hypergolic Maintenance Facility.

Astronaut John H. Glenn, Jr. climbs into spacecraft Friendship 7 prior to launch.

This oil painting by Robert A. M. Stephens shows the first launch of the Space Shuttle Discovery, mission 41-D, on August 30, 1984 at 8:41 a.m. from Kennedy Space Center.

Significant Events During Fiscal Year 2001

10/9/00 – Launch of the High-Energy Transient Explorer 2 (HETE-2) on a Pegasus vehicle from Kwajalein Missile Range in the south Pacific, marking the first time NASA's Expendable Launch Vehicle Services at Kennedy Space Center remotely managed a launch.

10/11/00 – Launch of STS-92/Discovery carrying the Integrated Truss Structure Z-1, part of the backbone of the Space Station, and the third Pressurized Mating Adapter, providing a Shuttle docking port. This launch marked the 100th Shuttle Launch.

10/24/00 – Annual KSC and 45th Space Wing Business Opportunities Expo at Port Canaveral.

11/2/00 – Commissioning of the new high-pressure helium pipeline to service launch needs at the new Delta IV launch complex, Complex 37, at the Cape Canaveral Air Force Station (CCAFS).

11/14-15/00 – NASA-KSC, the 45th Space Wing and Florida Space Authority host the 6th Annual Cape Canaveral Spaceport Symposium in Port Canaveral.

11/21/00 – Launch of the Earth Observing (EO1) Satellite, part of the New Millennium Program, on a Delta rocket from Vandenberg Air Force Base.

11/30/00 – Launch of STS-97/Endeavour to deliver the first set of four U.S.-developed solar arrays to the International Space Station.

1/4/01 – Mars Odyssey spacecraft arrives at KSC from Denver, Co.

2/1/01 – Donatello Multi-Purpose Logistics Module arrives at KSC from the factory of Alenia Aerospazio in Turin, Italy.

2/7/01 – Launch of STS-98/Atlantis to attach the U.S.-built 15-ton Destiny lab to the International Space Station.

2/8/01 – Groundbreaking for Space Experiment Research and Processing Laboratory (SERPL) and connecting roadway.

2/8/01 – Florida Space Research Institute (FSRI) and NASA-KSC sign a contract to collaborate on FSRI's Advanced Learning Environment (ALE) initiative.

3/1/01 – First meeting of the Advanced Range Technology Working Group (ARTWG) at Kennedy Space Center.

3/5/01 – Kennedy team is honored with NASA's Commercial Invention of the Year Award for developing a process to convert hazardous waste to a useful fertilizer.

3/8/01 – Launch of STS-102/Discovery to deliver the Leonardo Multi-Purpose Logistics Module to the International Space Station and complete NASA's first crew shift change in orbit.

Significant Events During Fiscal Year 2001

4/2/01 – KSC takes part in a celebration of Space Day in Tallahassee. NASA astronauts answer questions, state legislators speak to the crew aboard the ISS, and a Space Art Contest winner received a savings bond.

4/7/01 – Launch of Mars Odyssey spacecraft from CCAFS aboard a Delta II rocket on a journey to map the Martian surface.

4/19/01 – Launch of STS-100/Endeavour to deliver the first of three Canadian-built robotic components, known as the Space Station Robotic Manipulator System (SSRMS), to the International Space Station, along with the Raffaello Multi-Purpose Logistics Module.

4/20/01 – Microwave Anisotropy Probe (MAP) arrives at Kennedy Space Center from Goddard Space Flight Center in Greenbelt, Md.

4/24/01 – KSC senior executives meet with community leaders at the KSC Visitor Complex for the annual Community Leaders Briefing.

5/15/01 – Dedication of the new Launch Vehicle Data Center at Hangar AE, beginning a new era in the monitoring of expendable vehicle data.

5/15/01 – First meeting of the Advanced Spaceport Technology Working Group (ASTWG) at Kennedy Space Center.

5/31/01 – Genesis Spacecraft arrives at KSC from Denver, Colo.

6/30/01 – Launch of a Delta II rocket carrying the Microwave Anisotropy Probe (MAP) on a mission to reveal the size, matter content, age, geometry and fate of the universe.

7/12/01 – Launch of STS-104/Atlantis to carry the Joint Airlock to the International Space Station, thereby allowing resident Station crews to carry out spacewalks without the presence of a Space Shuttle.

7/23/01 – Launch of the Geostationary Operational Environmental Satellite (GOES-M) aboard an Atlas II rocket, with a Solar X-ray Imager which can be used in forecasting space weather and the effects of solar storms.

7/30/01 – Second Florida Space Summit is attended by elected officials, agency directors and industry leaders at the University of Central Florida (UCF) Orlando Campus.

8/8/01 – Launch of a Delta II rocket, sending the Genesis spacecraft on a journey to collect several micrograms of solar wind and return them to Earth for research.

8/10/01 – Launch of STS-105/Discovery to deliver The Early Ammonia Servicer (EAS) tank and conduct the second crew exchange on the International Space Station.

9/29/01 – Launch of an Athena I launch vehicle, carrying the Kodiak Star spacecraft, on the first NASA launch from the new Kodiak Launch Complex in Alaska.

Technicians guide The Gamma Ray Spectrometer (GRS); into place to be installed on the Mars Odyssey Orbiter.

The second stage of the GOES-M Atlas II rocket is lifted up the gantry for mating with the first stage at Launch Complex 36-A, Cape Canaveral Air Force Station, in preparation for launch in July 2001.

Expendable Launch Vehicle (ELV) Program

Kennedy Space Center leads NASA's acquisition and management of expendable launch vehicle (ELV) launch services. In line with its vision statement, "Global Leadership in Launch Service Excellence," KSC's role is to provide, at an affordable price, launch service excellence, expertise and leadership to ensure mission success for every customer. For more than ten years, NASA has purchased ELV launch services directly from commercial providers, whenever possible, for its scientific and applications missions.

NASA's ELV Program launches satellites using Delta, Atlas, Taurus, Pegasus and Titan expendable launch vehicles. This year the ELV Program also launched a group of satellites on an Athena vehicle. Seven ELV missions were launched successfully, placing 13 spacecraft into orbit during fiscal year 2001.

In October 2000, NASA's High-Energy Transient Explorer 2 (HETE-2) was launched on a Pegasus XL vehicle from Kwajalein Missile Range in the South Pacific. This launch marked the first time that NASA's ELV Program managed a rocket launch remotely with the primary launch team executing their functions from NASA Hangar AE on CCAFS. It also demonstrated one of the KSC guiding principles, which is "to support our customers anytime, anywhere."

In November 2000, the first Delta dual payload mission was launched from VAFB. This mission combined NASA's Earth Observer 1 (EO1) satellite with Argentina's Satelite de Aplicaciones Cientificas-C (SAC-C), using a newly designed and built dual payload attach fitting. EO1 is part of the New Millennium Program. Its purpose is to validate revolutionary communications, power, propulsion, thermal and data storage technologies that will reduce costs and increase capabilities for future land imaging missions.

NASA's 2001 Mars Odyssey probe was launched aboard a Delta in April 2001. The Odyssey probe will help NASA understand the potential for life elsewhere in the universe, understand the relationship to Earth's climate change processes, and understand how Mars evolved and the resources it provides for future exploration.

KSC also launched three satellites from CCAFS during the summer quarter. The Microwave Anisotropy Probe (MAP), part of Goddard Space Flight Center's Explorers Program, was launched aboard a Delta in June 2001. MAP's mission is to probe conditions in the early universe by measuring the properties of the cosmic microwave background radiation over the entire sky. In July, the GOES-M weather satellite launched aboard an Atlas IIAS. GOES-M will provide meteorological information on worldwide weather phenomena in order to facilitate improved forecasting and prediction for the National Oceanic and Atmospheric Administration (NOAA). The GOES-M spacecraft has search and rescue signal replay capability.

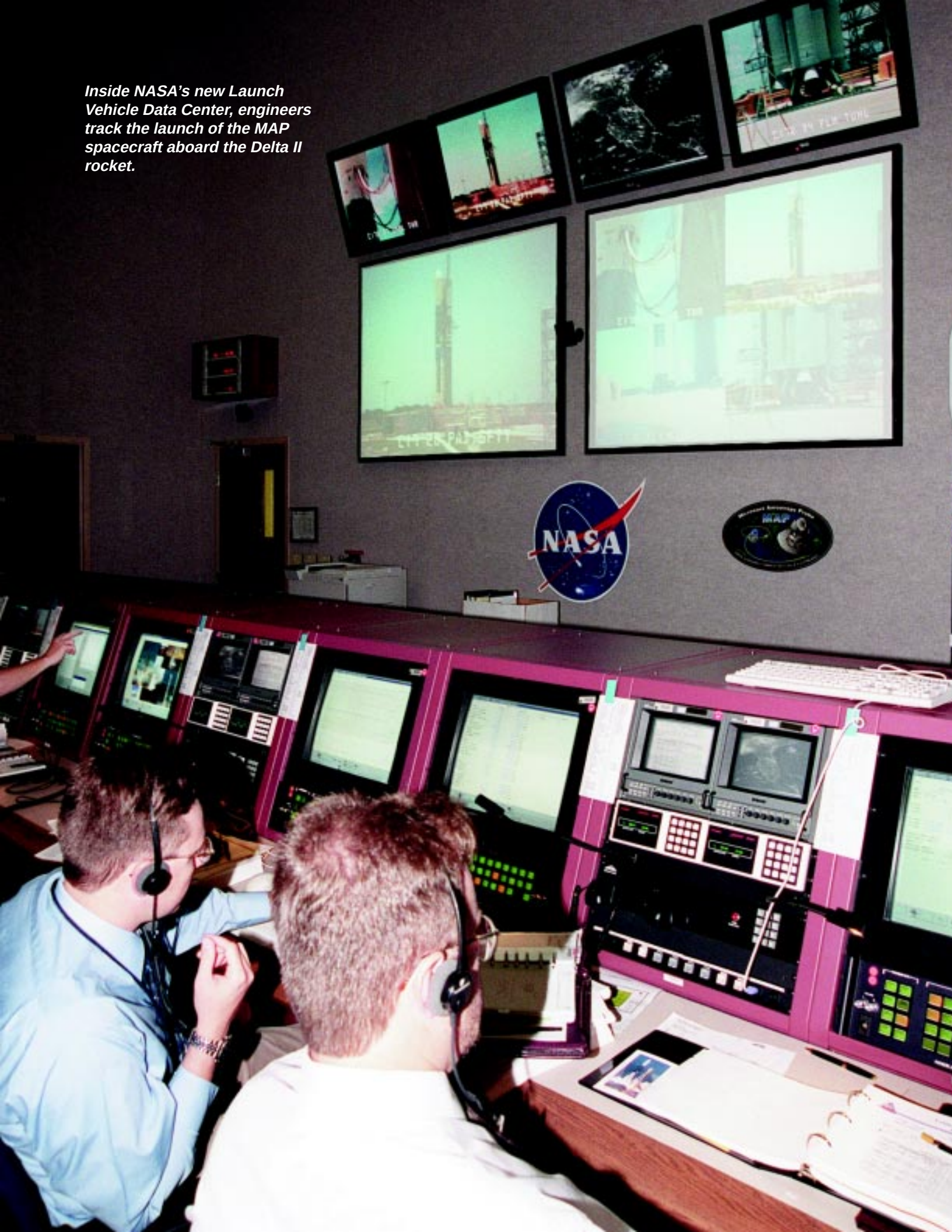
Expendable Launch Vehicle (ELV) Program

KSC's ELV Program sent the Jet Propulsion Laboratory (JPL) Genesis spacecraft sunward aboard a Delta in August 2001. Genesis' purpose is to collect pieces of the sun, called solar wind, which will help NASA determine what the sun is made of and compare it to samples of the Earth and other planets.

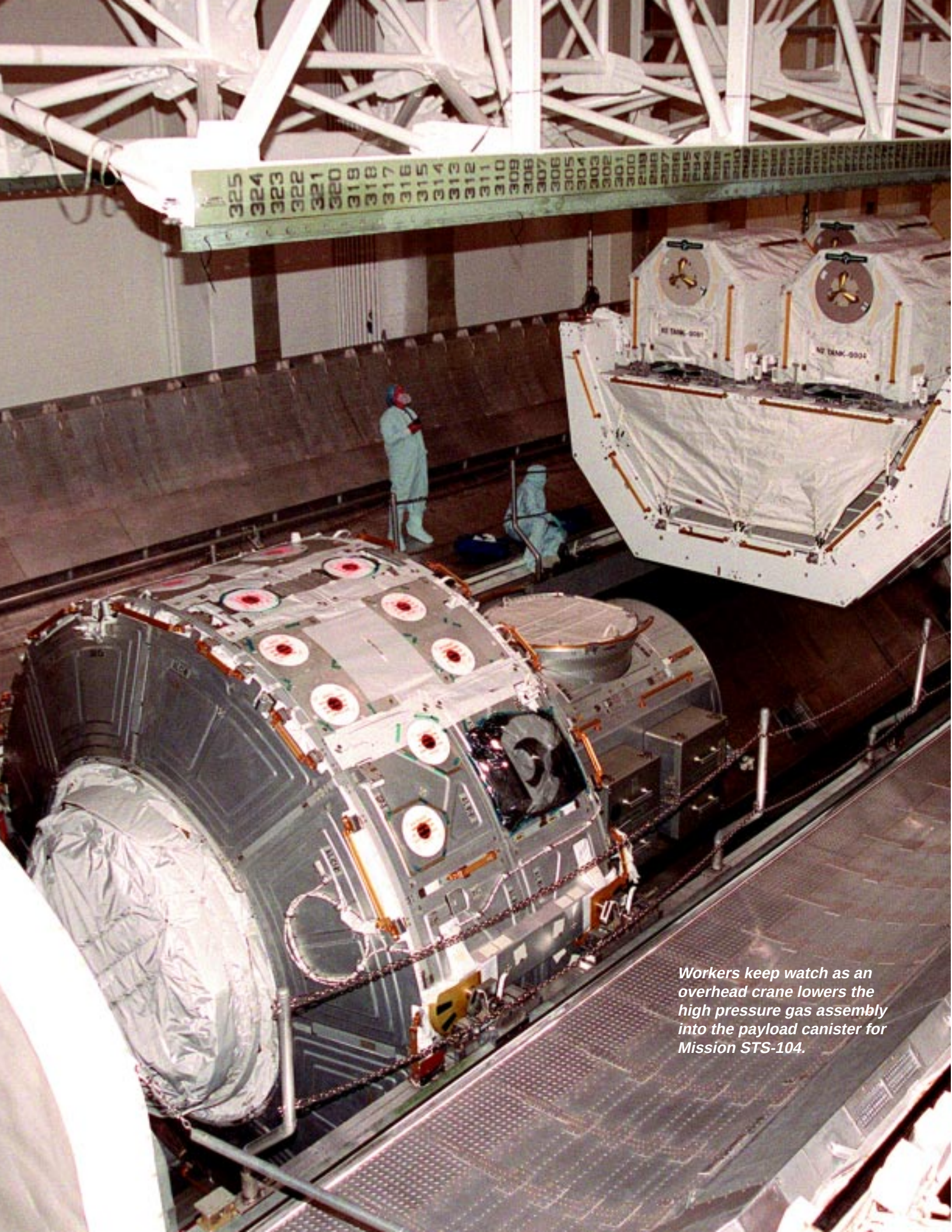
The Kodiak Star mission was launched aboard an Athena I launch vehicle in September from the new Kodiak Launch Complex in Alaska. The mission marked the first orbital launch of any kind from this new launch complex. The ELV Program was instrumental in bringing this new launch complex online. The Athena carried the NASA-sponsored Starshine 3 and three Department of Defense satellites into low-Earth orbit. Starshine 3 is a student-built satellite consisting of 1,500 hand-polished mirrors, 31 retro-reflectors and seven clusters of solar cells powering an amateur radio transmitter. The spherical satellite will help scientists study orbital decay. The ELV Program not only provided the launch service, but also acted as the NASA Mission Manager for the spacecraft.

Helping to usher NASA's ELV Program into the 21st century, KSC opened the new Launch Vehicle Data Center (LVDC) inside NASA's historic Hangar AE on Cape Canaveral Air Force Station. The LVDC was officially dedicated in May 2001. The new facility's three individual control rooms replace a single LVDC control room that had been in use since the mid-1970's.

The new LVDC, six years in the making, was developed to support multiple test operations occurring at the same time in parallel or a single large launch operation. Up to 100 launch vehicle engineers can monitor the voice, data and video systems that support the checkout and launch of an expendable launch vehicle and the integrated spacecraft. The LVDC can also be linked with NASA's control rooms at Vandenberg Air Force Base (VAFB), Calif., which is used for launching polar-orbiting spacecraft. The first use of the LVDC was during the launch of the Mars Odyssey in April 2001.



Inside NASA's new Launch Vehicle Data Center, engineers track the launch of the MAP spacecraft aboard the Delta II rocket.



Workers keep watch as an overhead crane lowers the high pressure gas assembly into the payload canister for Mission STS-104.

Payload Carriers Program

The Payload Carriers Program successfully completed another year of support to Space Shuttle payload developers and users by providing improved carrier hardware to meet International Space Station and science mission requirements. The program validated newly developed analytical techniques to improve payload processing and initiated innovative partnerships with experiment developers for future missions.

This year, the Payload Carriers Program embarked on the task of modifying three existing Multi-Purpose Experiment Support Structures (MPESS) to more lightweight carriers. This modification provided improved cargo carrying capabilities in the payload bay of the Orbiter vehicles. In addition, the modification allowed for later manifesting of International Space Station (ISS) Launch On Need logistics items. It also provided secondary science payload capabilities in the additional space gained from the modification.

The Program initiated the use of Intelligent Synthesis Environment technology, an analytical tool that provides three dimensional modeling and real-time simulation capabilities, to answer payload processing issues for the ISS Launch On Need requirements. The program can simulate many operations in facilities before the hardware arrives.

In the area of partnerships, the Payload Carriers Program initiated joint activities with several experiment developers at the Jet Propulsion Laboratory (JPL) and Goddard Space Flight Center (GSFC). These partnerships provided carrier hardware and mission planning support for future flights to the Station. Proposals are being developed that define the specific experiments and necessary support.

The Payload Carriers Program supported three Space Shuttle missions to the International Space Station by providing carrier hardware to support major components. On four other Space Shuttle missions, the Program safely and successfully processed other payloads including the Hitchhiker Experiment Advancing Technology (HEAT) payload consisting of three experiments including an ejectable satellite; three Get-Away-Special (GAS) payloads; and two Space Experiment Module (SEM) payloads.

In a cooperative effort with Payload Carrier project offices at Kennedy Space Center, Marshall Space Flight Center, and GSFC, analysis and hardware integration activities supported preparations for flight of two Hitchhiker and one Lightweight MPESS Carrier missions. These missions will support a total of 12 experiments and six GAS payloads on two Space Shuttle flights in early 2002. The Program is providing the opportunity to replace up to two GAS payloads with ISS Launch On Need logistics items as needed.

The Payload Processing organization completed outfitting and certification of new payload canister transporters received at the end of fiscal year 2000. An old transporter is now used by the Space Shuttle Program for use in moving the Solid Rocket Booster segments to and from Center facilities.

A KSC midbody technician works to prepare Columbia's payload bay for an upcoming mission. This photo was taken from the Orbiter's internal airlock, looking aft into the payload bay.

Space Shuttle Program

Fiscal year 2001 was an ambitious and very successful year for the Space Shuttle Program at KSC. A year of spectacular Space Shuttle launches carried astronauts and thousands of pounds of hardware, equipment and science experiments to the Station.

KSC's Space Shuttle Program safely and successfully launched seven Shuttle missions, using three of NASA's four Space Shuttles to carry 37 astronauts and two Expedition crews to the Station. The crews traveled a total of 34.8 millions miles in space.

Significant events included the launch of Mission STS-92, the 100th Space Shuttle Mission; the first crew rotation; and delivery of several vital segments to the Station that completed Phase 2 of Station assembly.

New and effective programs were implemented to KSC's Shuttle processing that resulted in efficient and cost-effective results. These include a new facility control and monitoring system for Ground Systems, the Kennedy Complex Control System, that was developed to replace the former launch processing system. It has reduced system maintenance cost while increasing system interface capabilities. Also, two operational television cameras were installed on the gaseous oxygen Vent Arm Hood at Launch Pads 39A and B that have improved visibility of External Tank Louvers during cryogenic propellant loading.

KSC Shuttle Processing is partnering on the Industrial Engineering for Safety Initiative. The goal is to reduce risk to personnel and hardware and improve maintenance and overall efficiency in Space Shuttle processing.

A new Laser Tracker procedure was developed for the Mobile Launch Platform hold down posts and was used on two alignments. The new technology and its procedure reduced processing time by 12 hours. Also, the Optics Lab new re-certification process increased usable life of the hold-down post bearings from two flights to at least eight flights.

During processing of STS-100, workers removed a Fuel Cell from orbiter vehicle Endeavour and replaced it using lifting ground support equipment that was modified to accommodate a fuel cell lift with the external airlock installed. In the past, three days were required to install the airlock strongback (or reinforcement rods), remove airlock struts and install a complex rail system. The modified ground support equipment allowed removal of the fuel cell without using three days for airlock preparations.

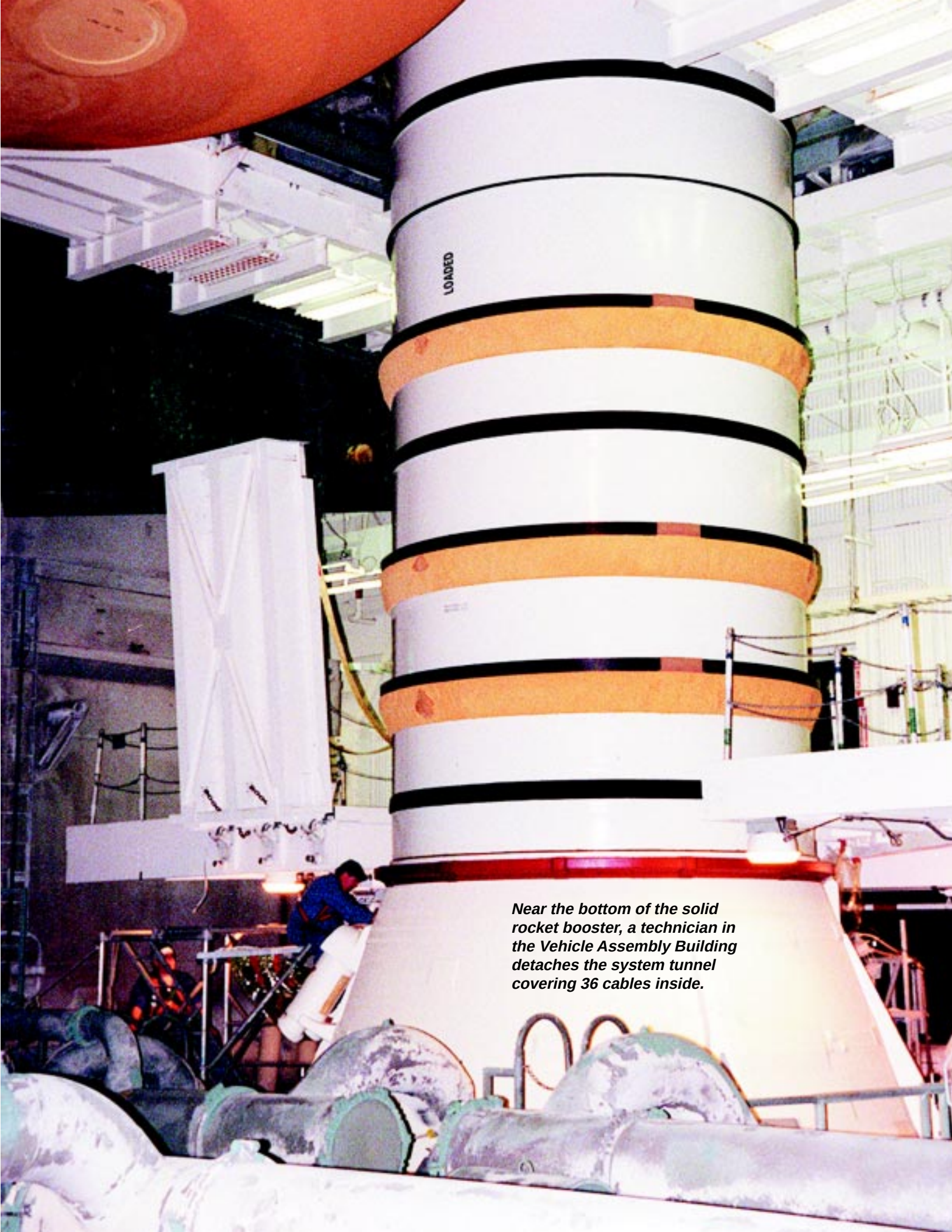
Integrated Logistics instituted a program to assess the condition of special test equipment used to support fabrication or repair of Space Shuttle orbiter hardware. The results helped to determine those test items that needed refurbishment and those that needed to be replaced. Critical test equipment parts will be machined and processed through NASA's Shuttle Logistics Depot since some of the original equipment manufacturers are no longer available.

Space Shuttle Program

The Shuttle processing team continued to work to ensure safe prelaunch and post-landing Shuttle hardware and systems processing in order to ensure the safety of the crew and the success of the program. Knowledge and hard work of the processing team helped to solve several problems while the Shuttle fleet was on the ground.

One instance occurred during post-landing processing of orbiter Atlantis after mission STS-104. Upon return from the landing facility in California, water intrusion was detected in the vehicle and tiles. Infrared scanning was used on 1,008 tiles to pinpoint the wet tiles. Arrays of high-intensity lights were used to bake large areas of the Shuttle's tile surfaces and a conductivity tool was used to probe individual tiles and inspect for remaining moisture. Even with the significant amount of work, the Atlantis launch schedule was maintained.

Another accomplishment was the extensive upgrade of the Orbiter engine Service Platform/Engine Changeout Platform Winch System and associated electrical systems on all three mobile launch platforms within tight launch manifest schedules.



Near the bottom of the solid rocket booster, a technician in the Vehicle Assembly Building detaches the system tunnel covering 36 cables inside.

Space Shuttle Discovery is mated to its external tank and solid rocket boosters inside the Vehicle Assembly Building for Mission STS-105.

Space Shuttle Upgrades

Shuttle Program Upgrades continued to work towards implementation of projects at Kennedy Space Center. In partnership with USA, a “Mixed Fleet Operations Study” was performed to identify the impact of incorporating the Shuttle Program Upgrades into the launch and landing process.

As orbiter vehicles are upgraded in turn, a mixed fleet period exists. The study provides a crucial link between KSC facilities, ground support equipment, vehicle configurations and the Checkout and Launch Control System to ensure that KSC can support all Space Shuttle processing and launches. The study also recommended options to minimize the mixed fleet period in order to keep the processing and launch of vehicles on track.

A computer database was developed that provides an interactive capability to identify and track the impacts of orbiter modifications and upgrades to KSC Ground Operations. The purpose of this database is to identify the process and support areas affected in order to ensure synchronization to support the implementation plan for Orbiter modifications. Since the initiation of the Space Shuttle Program upgrades project, the database was expanded to include additional impact areas from an Upgrades Impact Checklist that includes future upgrades and modifications.

The database allows the Concurrent Engineering process to be accessed from KSC and other Centers to obtain KSC Ground Operations assessments for modifications and upgrades.

The Checkout and Launch Control System Project designed and implemented replacement facilities (inset, lower left) and software for the launch control rooms and designed, tested and brought on-line other orbiter-processing facilities’ system software.

Major accomplishments for the year included the completion of the second phase of installation of system equipment in Operations Control Room 1 and implementation of the Titan system software delivery and testing for the Orbiter Processing Facilities. The delivery of this new software represents a significant contribution for the development and validation testing of the initial software needed to upgrade these facilities.

The project also completed testing of equipment being developed for the Cargo Integrated Test Equipment in the Space Station Processing Facility. This hardware will be used to test payload interfaces prior to their installation in the Space Shuttle.

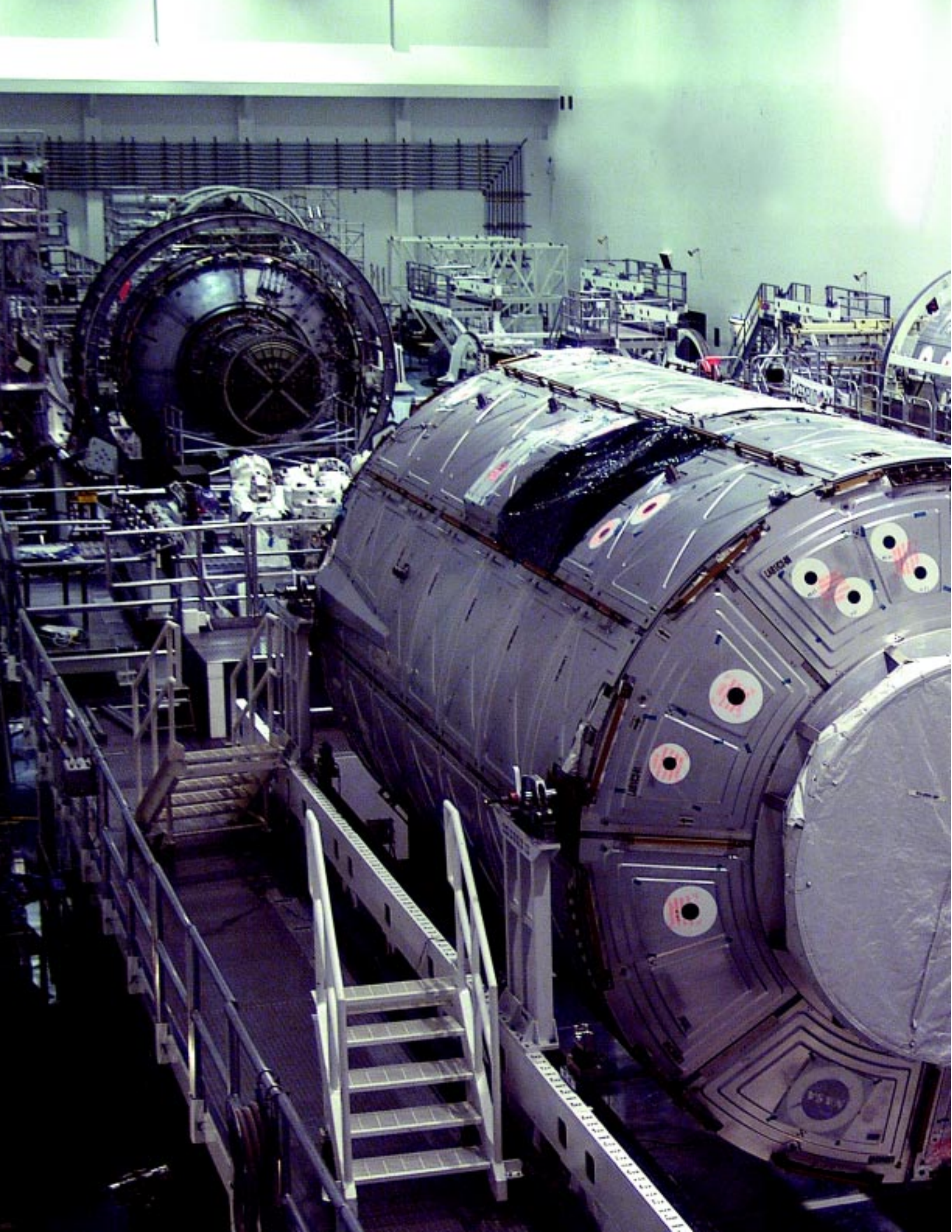
Space Shuttle Upgrades

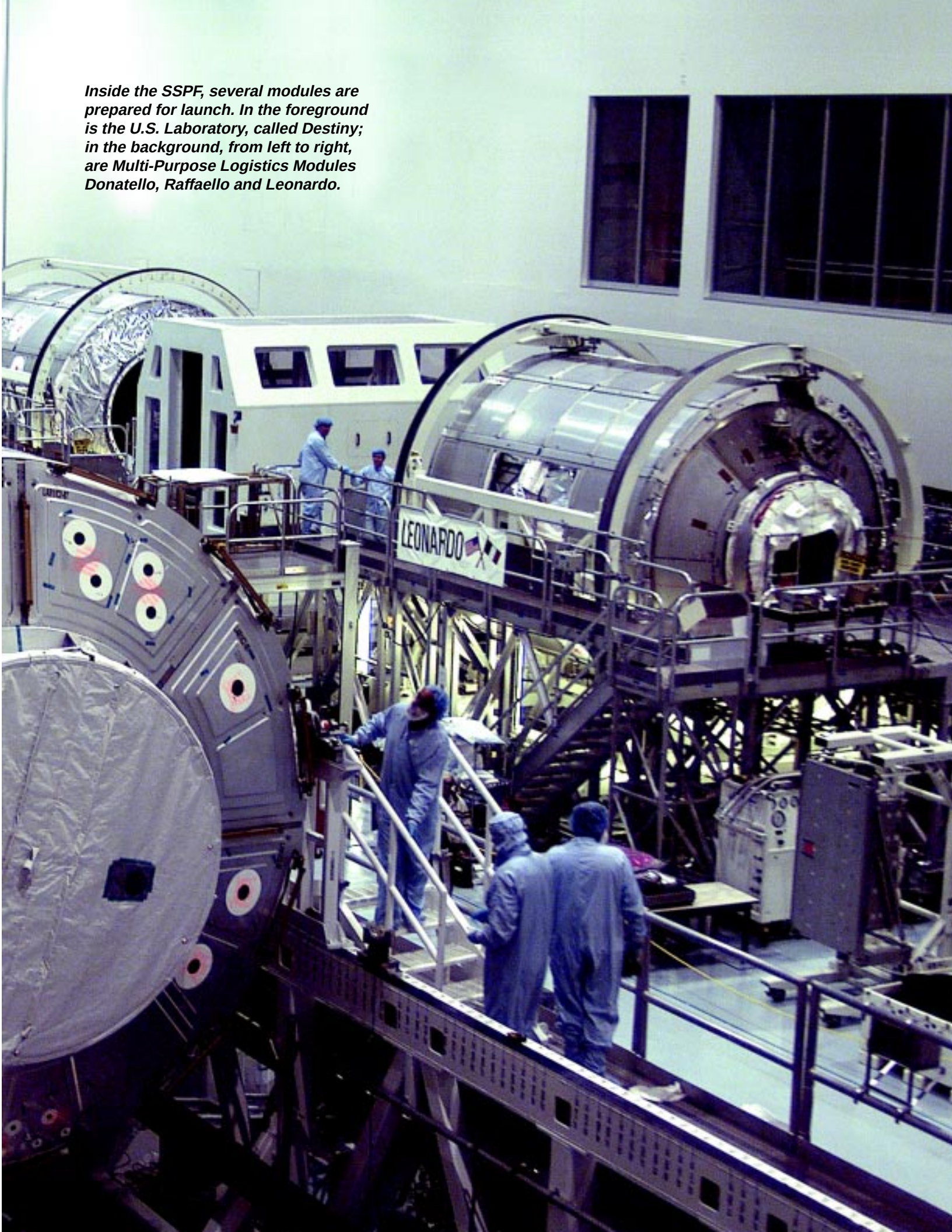
Also, new Aft Propulsion System application software was developed and tested to support the checkout of Space Shuttle orbital maneuvering systems and forward reaction control system components in the Hypergolic Maintenance Facility. This software will be used to perform operational testing at the facility using the Checkout and Launch Control System programs previously installed.

During the year, Orbiter Columbia underwent more than 100 improvements for its Orbiter Maintenance and Modification Period at Palmdale, Calif. One of the many improvements was the installation of the Multifunctional Electronic Display Subsystem, also known as the “glass cockpit.”

Modifications performed at KSC included some electrical re-wiring to Orbiter vehicles Atlantis and Endeavour to increase safety. Several quick disconnects to the auxiliary power units of Orbiter vehicles Columbia, Atlantis and Endeavour were changed out to allow for commonality throughout Hypergol systems, improve maintenance and gain better performance. Also, a delta pressure measurement device was added to the External Tank/Orbiter interface umbilical plate to allow for better visibility during the umbilical purge setup for launch and to monitor the umbilical purge pressure data real time during cryogenic loading.

Like a sun on a fast rise, Space Shuttle Atlantis arcs into the still-black sky over the Atlantic Ocean, beginning mission STS-104.





Inside the SSPF, several modules are prepared for launch. In the foreground is the U.S. Laboratory, called Destiny; in the background, from left to right, are Multi-Purpose Logistics Modules Donatello, Raffaello and Leonardo.

International Space Station

Kennedy Space Center continued to support assembly of the International Space Station during fiscal year 2001.

Of the approximately 140 tons of Space Station elements and cargo that were transported to the Station, more than 66 tons were processed in KSC's Space Station Processing Facility.

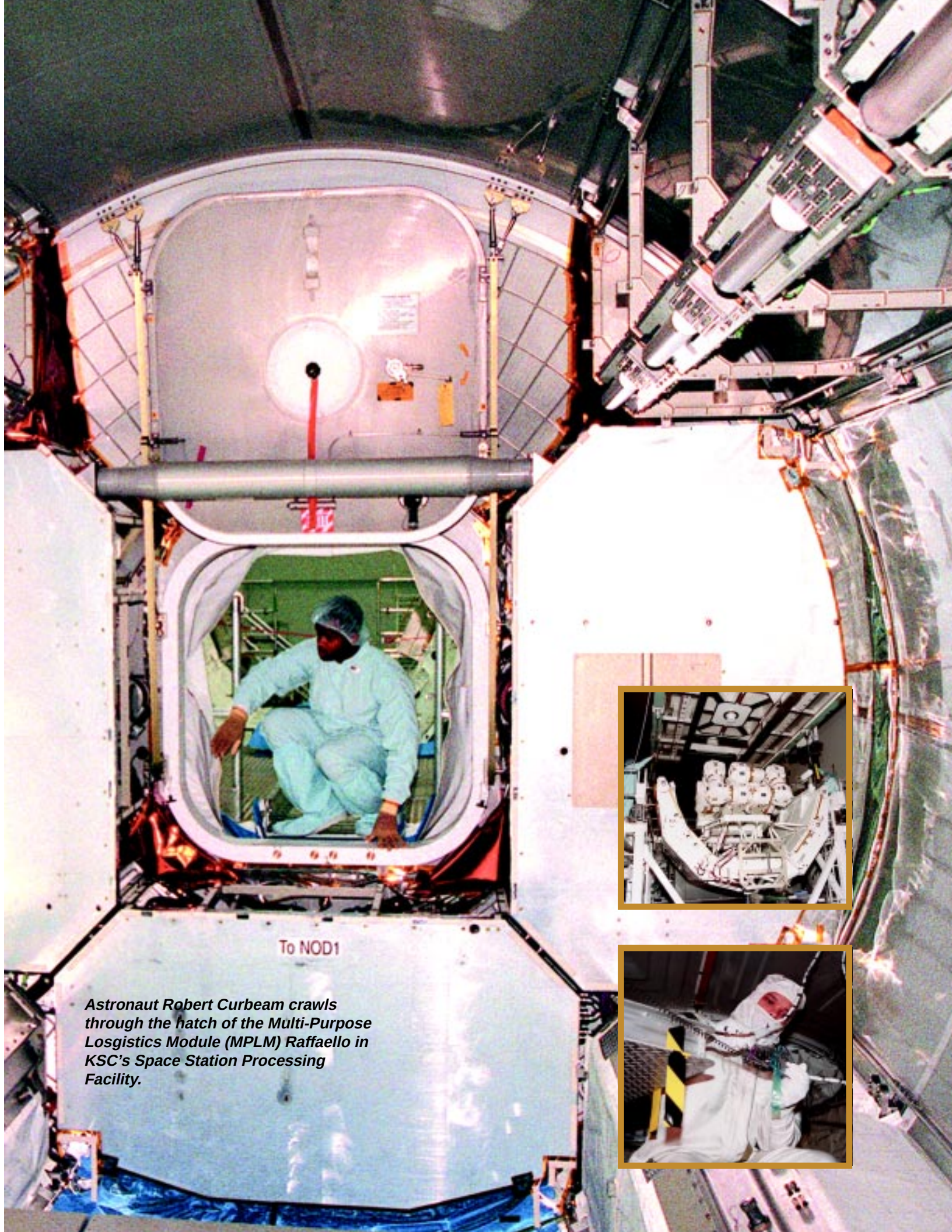
Fifteen major elements, including payload hardware, were received, checked out, and readied for delivery to the International Space Station by the processing team.

Assembly elements processed at KSC included the Z1 Truss, the U.S.-made Joint Airlock (Quest), the U.S. Destiny Laboratory, three missions of the Multi-Purpose Logistics Modules, the Space Station Remote Manipulator System (SSRMS) also called the Canadarm 2, the Early Ammonia Servicer, several high pressure gas tanks, and laboratory racks.

Phase II of Space Station assembly was completed with the delivery and installation of the Joint Airlock during mission STS-104 in July 2001. The Joint Airlock allows U.S. and Russian astronauts to perform spacewalks and work in space without the presence of the Space Shuttle.

Because of the team effort and timely processing of these crucial components, KSC contributed to the success of seven Space Station assembly missions and two successful crew rotations.

KSC continued the second phase of Multi Element Integrated Testing (MEIT II) on the U.S. Truss Elements and the Canadian Mobile Base System (MBS). MEIT is performed to assure the operability of the Station hardware once on orbit. MEIT verifies electrical, structural and fluid connections between interfacing Station flight elements. These series of tests, in place since 1999, have helped the Station Program find and correct hundreds of hardware and software problems during ground processing and significantly reduced potential for rework on orbit. The successful operational performance of the current Phase II Station elements including the first ISS science payloads Express Rack and Human Research Facility rack can be attributed, in part, to MEIT testing performed at KSC.



Astronaut Robert Curbeam crawls through the hatch of the Multi-Purpose Losgistics Module (MPLM) Raffaello in KSC's Space Station Processing Facility.

A research chemist performs an analysis for Tuber Induction Factor in the Life Sciences area at KSC.

Spaceport and Range Technologies

Kennedy Space Center's Mission Area assignment in spaceport and range technology development led to formulation of working groups, program plans, and risk management plans as well as provided expertise to spaceport developers around the nation.

Formal kickoff meetings were held at KSC for the Advanced Range Technology Working Group (ARTWG) and Advanced Spaceport Technology Working Group (ASTWG) to integrate and coordinate national technology development activities. These two working groups, led by KSC, are forums for a focused effort by NASA, the Air Force, Federal Aviation Administration, Department of Commerce, state spaceports, industry and academia. These two working groups will provide the forum to coordinate the research and development of spaceport and range technologies, leveraging resources and soliciting input and advice from all stakeholders. KSC continues to work closely with NASA Headquarters to establish a unique funding line to support these spaceport and range development activities.

In support of its Spaceport Technology Center vision, KSC established a center-wide team for integrated Spaceport Technology Planning and Roadmapping. Based on the team's findings, KSC aligned the Small Business Innovation Research Program (SBIR), the Small Business Technology Transfer Program (STTR), Center Director's Discretionary Fund (CDDF) and university funded grants with the Spaceport Technology thrust areas.

The KSC Process and Human Factors Engineering Working Group was also chartered and implemented. The group has representatives from other NASA centers, NASA Headquarters, industry and academia.

KSC Operations Assessment Models are now integrated into the NASA-wide Design/ Engineering Environment. The KSC Assessment Models were used to provide spaceport inputs to influence second-generation program operating cost and turnaround time.

The Spaceport Engineering and Technology Directorate helped avoid a possible orbiter vehicle rollback and launch delay when a critical hydraulic component failed during processing of orbiter Atlantis. A new concept was developed to freeze fluid into "freeze plugs" in the hydraulic lines and was tested at the Cryogenics Testbed Facility. The new cryogenic system was successfully used on orbiter Atlantis throughout the 30-hour change out procedure. This allowed replacement of the failed component without rolling the vehicle back from the pad, thereby preventing a launch slip of three weeks or more.

The Life Sciences research activities over the past year included crop growth under light emitting diodes (LEDs) to assess optimal spectral combinations for growth and yield. Testing included lettuce, spinach, and radish as potential crops for future life support systems and near-term use on the International Space Station. These studies were carried out by Dynamac Corp. and funded by a grant from the Office of Biological and Physical Research (Code U) through Advanced Life Support Project through Johnson Space Center.

Spaceport and Range Technologies

Additional Life Science activities included preparations for the Photosynthesis Experiment and System Testing and Operation (PESTO) experiment, which will study photosynthetic rates of wheat plants in space. The experiment will be the first plant experiment flown on the ISS by NASA's Fundamental Biology Program, and is scheduled for the STS-110 mission in April of 2002. Preparations also continued for a related study, Water Offset Nutrient Delivery Experiment (WONDER), which will compare different watering techniques for micro-gravity conditions of space flight. The experiment is tentatively schedule for 2004, and both studies are supported by grants from NASA's Office of Biological and Physical Research (Code U).

A vastly improved version of the Technical Document Management System (TechDoc) was released at KSC and Stennis Space Center to maintain center-wide documentation. Over 151,000 technical and administrative technical documents reside in the system. TechDoc is a totally web-based, platform independent system, providing many security enhancements and other advanced features. Due to TechDoc, it is now possible to easily make documents available to the world, including all NASA Centers, contractors, and NASA partners not located at Centers.

A Competency Management System (CMS) was developed to identify and analyze the corporate knowledge of the organizational workforce. In order to provide insight and manage competencies, a web-based application was developed. CMS is used for employees to manage their competencies and experience, for supervisors to define skills needed to perform tasks, and for management and human resource offices to analyze workforce capabilities versus mission requirements.

KSC is leading the way in forming a true Spaceport Technology Center for NASA and the international aerospace community. As these projects and working groups gather momentum, KSC plays a vital role in the development of future launch vehicles, as well as spaceport and range technology.

Technology Spinoffs

Each year technical contributions from KSC, in the form of spinoffs, have provided many technologies, originally designed for the space program, to the American people.

For the second year in a row KSC received more Space Act Award dollars than any of the other NASA Centers. Space Act Awards for KSC NASA Civil Service and contractor innovators in fiscal year 2001 totaled $187,300.

KSC and contractor employees submitted 123 new invention disclosures. This represented 10 percent of all the Invention Disclosures submitted by the ten NASA centers and NASA Headquarters. KSC initiated five new license agreements and two have been finalized representing 7 percent of all new NASA licenses. KSC received $56,000 in royalties for the fiscal year, representing 6 percent of all NASA royalties for the period.

Seventeen new technologies were released by KSC to the public through the Internet. As a result, the total of all available technologies grew to 112 active and 403 technologies archived. KSC developed technologies were highlighted in 41 articles notifying commercial industry of available technologies. Thirty of these appeared in NASA's Tech Briefs magazine and eleven

Spaceport and Range Technologies

were published in NASA Aerospace Technology Innovation magazine. These articles resulted in over 400 requests for further information.

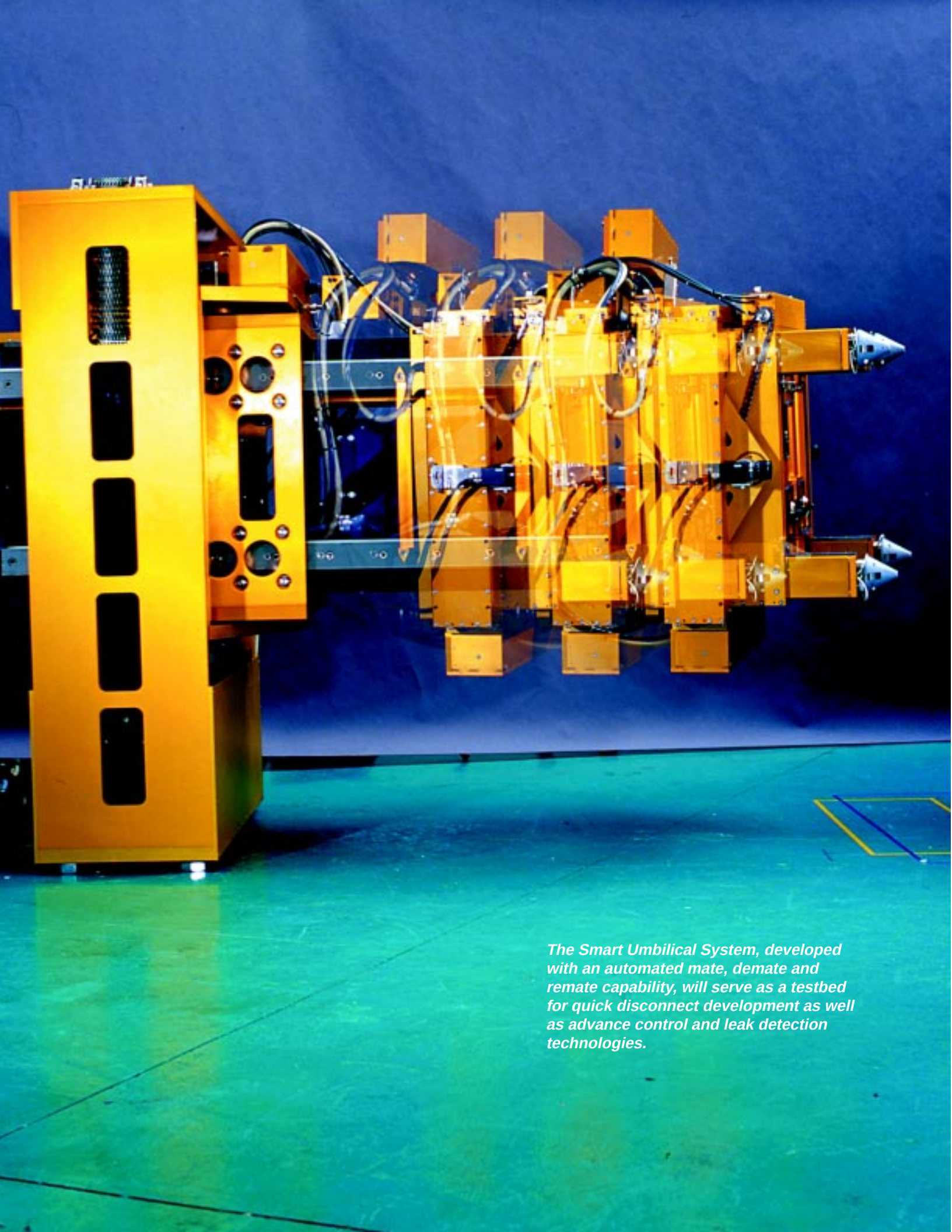
- **Thermal Insulation System and Method**
  The Cryogenics Test Laboratory designed a cryogenic insulation system and a method for manufacturing and packaging the insulation. The spacing scheme between the insulation layers allows it to provide higher insulation properties at soft vacuum conditions than current cryogenic insulation. The new insulation can be manufactured in blanket, sheet, or sleeve form, depending on the application.

- **Active Particle Fallout Monitor**
  The Active Particle Fallout Monitor measures the size and number of particles, as small as 5 micrometers in diameter, that are collected on a witness surface. This provides multiple cleanliness measurements that conform to military standards. The technology has been patented, licensed and commercialized. Targeted markets include aerospace, semiconductors, medicine, and electronics fabrication.

- **Improved Lightning Strike Locator**
  The Improved Single-Station Accurate Location of Lightning Strikes technology was developed at KSC to determine the ground strike point of lightning in the immediate vicinity of the Space Shuttle launch pads. This technology allows for determining the location (within a meter) of a strike within the perimeter of the observation area. The prototype system consists of a network of one electric field sensor and four sonic sensors separated from each other by about 1 or 2 meters, and one sensor located above the center within the perimeter of the observation area.

- **Photographic Images Scaling Device**
  This is a tool that can be attached directly to charge-coupled device or film cameras and through use of four laser beams, projects a known pattern into the field of view. When a photograph is taken, the image of this pattern appears, along with the image of the object under investigation, allowing the viewer quantifiable information as to the size of the object. The device is small, powered with a 3-volt battery, and can be easily turned off and on, allowing the photographer to provide scaling information within a picture as needed.

- **Signaling Enhancing Subsystem**
  The Signaling Enhancing Wireless Communications Headset Subsystem technology was developed to provide NASA with wireless push-to-talk signaling for use in its launch operations. This universal interface adapter is a wireless subsystem that provides push-to-talk signals to a communications system as if the user were directly wired to the system. The technology permits multiple wireless users to operate independently in the same environment without interference. The technology can be used with any off-the-shelf wireless headset and communications system without modification, or it can be directly integrated into headsets to perform various functions.



The Smart Umbilical System, developed with an automated mate, demate and remate capability, will serve as a testbed for quick disconnect development as well as advance control and leak detection technologies.

Future Vehicles

With the continued momentum and successes of the Space Launch Initiative (SLI), Kennedy Space Center holds a critical position in this program as a supplier to and manager for the Marshall Space Flight Center-managed development program. SLI is the program to develop technologies necessary to build a second-generation Reusable Launch Vehicle (RLV). There are 11 Technology Areas in SLI. KSC is involved in most as developer or consultant. Additionally, KSC manages Technology Area 4, Ground Operations, for MSFC.

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 for the flight vehicle development teams.

The KSC team has established key partnerships and contracts with all the major aerospace companies that are developing new architectures and technologies for the second-generation RLV. Through these partnerships and contracts, KSC is working in the areas of densified, or super-cooled cryogenic fuels, advanced checkout and control systems, integrated vehicle health management systems development, as well as sharing our world-class knowledge of vehicle and payload processing.

In-house KSC tasks, worked primarily by KSC civil servants, progress well in the area of future umbilical development, as well as space-based range safety systems. Automated launch vehicle umbilicals for launch pad cryogenic propellant loading are being developed to enhance ground operations turnaround times, reduce cost and increase reliability.

Also, in support of the new Delta IV expendable launch vehicle, new and unique design features have been incorporated into a cost-effective environmental control system ground-disconnect umbilical that provides a reliable connection and release mechanism that can be adapted for different payload sizes and mission profiles during heavy-lift launch vehicle launches. This work was done under a reimbursable Space Act agreement between NASA KSC and the Boeing Company.

During Super Safety and Health Day, workers from Florida Power and Light demonstrate how to safely handle power lines.

Safety and Health

Kennedy Space Center spent fiscal year 2001 operating under a new organization, accomplishing many milestones and embarking on several initiatives to support safety and health first—the Center's top priority.

For the first time during recent history, KSC completed the fiscal year (2001) with a record low of three lost time injuries. This resulted in an injury rate for the year of 0.19, which is below the agency expectation of 0.20.

KSC continued to integrate safety and health planning into all phases of operations. Safety and health remain the Center's core value, and personnel at all levels are evaluated on their performance regarding safety and health.

The OSHA Voluntary Protection Program (VPP) criteria are used as the benchmark for safety and health program improvement at KSC. The Center plans to apply for the VPP Star Program in December 2002. In support of that goal, KSC embarked on a major safety and health program upgrade initiative that parallels the OSHA VPP elements. Significant improvements are underway in the areas of line management accountability for safety and health, training programs, job hazard analysis and employee involvement.

KSC actively pursued health and wellness for the KSC population by chartering the Health Education and Wellness (HEW) Council. HEW coordinates center-wide health education and activities to help KSC meet the U.S. Department of Health and Human Services Healthy People 2010 objectives. As a result of the Center's efforts, more than 17,000 members of KSC's workforce interacted with HEW. In the KSC Cardiovascular Disease Risk Factor Reduction Program, more than 75 percent of individuals identified as high risk participated in counseling sessions, exceeding KSC's goal of 60 percent.

New processes for employee involvement and hazard reporting were implemented at the Center. One of these new developments includes the creation of a Safety Ombudsman position. The Safety Ombudsman serves as a "safety valve or reporting conduit" in the event that an employee, for any reason, is uncomfortable with the traditional chain of command for safety reporting processes.

As the Principal Center for Occupational Health, KSC was instrumental in the continuance and modifications to a NASA Federal Acquisition Supplement, which provides emergency medical evacuation for NASA personnel on travel to medically underserved areas. This process ensures a greater degree of health protection for those who serve NASA in remote areas of the world. The mechanism allows those who could not get treated for potentially life threatening injury or illness in a remote area to be medically evacuated in the most expeditious manner by aircraft to a location where more definitive medical treatment is available.

Safety and Health

The first Agency-wide gathering of NASA health physicists and Radiation Protection Officers took place under NASA's Principal Center Occupational Health sponsorship. The network of professionals exchanged ideas on concerns that face the KSC team such as radiation health and safety issues as well as information on common issues such as problem resolution.

The interactive web-based training module "Managing Harmful Stress at NASA" was deployed and provided to the entire NASA workforce. The training module delivers credible health care information allowing employees to quantify and successfully cope with the demanding inherent stressors of working for a high visibility, cutting edge technology employer such as NASA. Within a few days of launching the module, more than 7,000 NASA and NASA contractor employees had accessed the site. An Employee Assistance Module for Supervisors interactive web-based training module was also made available.

KSC supported several health related outreach initiatives including participation in the NASA Educational Web Chat (on the topic of space medicine) and a presentation on "The Medical Physiology of Space Flight" to the Florida Association of Science Teachers.

The Center also developed a heat stress awareness website for use by the KSC community during Florida's long summer. The web site helps organizations implement procedures to ensure employees work without risk of heat-related illnesses.

National Employee Health and Fitness Day (NEHFD) was sponsored by the KSC Fitness Centers, and supported by several other KSC groups. Approximately 800 attended over two days and over 1,500 informational pieces were delivered.

KSC supported a Federal Aviation Administration (FAA) workshop on the development of guidelines for medical standards for commercial space flight passengers.

A Department of Labor workshop for all KSC supervisors concerning the Federal Employee Compensation Act (FECA), which describes how federal employees qualify for workers' compensation benefits, was sponsored by KSC. The Center organized the training session in hopes of better controlling KSC's workers' compensation costs.

A plan for bioterroism threats was developed by KSC. The policy and procedures implemented at KSC include prevention, identification (Ruggedized Advanced Pathogen Identification Device—RAPID System), response and treatment.

KSC employees participate in a variety of fun and educational activities and displays during National Employee Health and Fitness Day.

After removing a young manatee from the van that brought it from Sea World, Orlando, Fla., workers get ready to release it into the Banana River.

Environmental Stewardship

Implementing procedures that promote a safe and healthy workplace while using energy resources efficiently was commonplace at Kennedy Space Center during fiscal year 2001.

The Light Management Plan (LMP) for Launch Complexes 39A and 39B saved KSC energy and money. Lighting at both pads resulted in sea turtle disorientation. After analyzing existing light configurations (more than 1,500 lights and 435,000 watts), KSC staff designed a plan to use less than 50 percent of these lights when a Shuttle is not on the pad. The plan also involves using only necessary lights for tasks, so the entire launch structure isn't illuminated. Energy usage was reduced by 123,250 watts with an annual cost savings of $32,390 and reduced turtle disorientation.

Seventeen experts from NASA Headquarters, Glenn Research Center, and a contractor conducted a two-week comprehensive Environmental Functional Review (EFR) of KSC environmental management. They assessed compliance with Federal, state, local policies and NASA regulations, and also evaluated the quality of KSC's environmental program management. The team found no circumstances posing direct or imminent threat to the environment, or the Agency mission.

In addition, the team noted 12 instances where KSC went beyond requirements to enhance environmental protection. Findings included KSC's Web site as an excellent public information resource, staff working to develop good relationships with state and Federal regulators, and use of the Geographic Information System (GIS) for effective management of the program. The team's final report explained KSC serves as a model for the rest of the Agency.

KSC funded two pollution prevention projects in conjunction with the NASA Principle Center for Pollution Prevention. KSC's recycling program encompassed materials ranging from scrap metal, copper, and aluminum to paper and toner cartridges. The Center's recycling efforts bring in an average of $120,000 annually.

The Center collaborated with the 45th Space Wing to host an event to raise awareness of environmental and energy issues, and to promote ways to conserve resources and reduce costs. Seventy-five vendors attended with displays ranging from recycled furniture to energy products. Also, organizations made presentations on environmental issues. KSC employee turnout for the event increased 65 percent from FY 2000.

Technicians insert a pin into a vat of liquid nitrogen at the Cryogenics Testbed.

Partnerships

Partnerships allow Kennedy Space Center to consistently offer innovative technologies that enhance research and development.

Cape Canaveral Spaceport Master Plan

To explore the possibilities for the successful future development of the Spaceport and to maintain and further its premier global status, NASA, the Air Force and the state of Florida continued work on a Cape Canaveral Spaceport Master Plan.

The master planning process evaluates existing conditions, forecasts future growth and focuses on developing opportunities to respond to and lead changing market conditions over a 50-year planning period and beyond. Ultimately, the Master Plan will bring its vision of the future into focus today, enabling the Cape Canaveral Spaceport and other community stakeholders to take necessary steps to meet its goal as a showcase for technology and innovation.

International Space Research Park

The International Space Research Park™ (ISRP) is a new partnership between NASA and the State of Florida to build an environment for world-class research and technology development performed through the collaborative efforts of industry, academia, and government.

A 400-acre tract of land, located just south of the Kennedy Space Center Visitor Complex, has been designated for development as the research park. The site will eventually become home to new research, technology development, and associated facilities that will help KSC advance as a Spaceport Technology Center, foster the commercial utilization of the International Space Station, and support customers of the Cape Canaveral Spaceport. Space Commerce Way, the new arterial highway that will open up the site by connecting State Road 3 and the NASA Causeway, is already under construction.

Considerable progress to plan and implement the new research park was achieved in 2001. KSC and Florida Space Authority (FSA) formalized the partnership and have collaborated on a concept development effort that included advice from the widely respected Urban Land Institute (ULI).

The ULI Advisory Panel visited KSC in July and concluded that there is a great opportunity in the park, and recommended that KSC proceed with a partnership with the State of Florida and the private sector. Business planning, including a market assessment and analysis of alternative financial and management approaches, was initiated and is targeted for completion in May 2002. Already, commercial and academic organizations are expressing strong interest in becoming future park residents.

Space Experiment Research and Processing Laboratory

The research park partnership evolved from another joint effort between KSC and the state of Florida, the Space Experiment Research and Processing Laboratory (SERPL). SERPL will be the primary gateway to the International Space Station for science experiments and a world-class home to ground-based investigations in fundamental and applied biological science. It will also serve as a magnet facility for the planned research park.

Partnerships

In February 2001, a very successful groundbreaking occurred at KSC for SERPL and the Space Commerce Way. Participants included Florida's Lt. Governor Frank Brogan, Congressman Dave Weldon and many other government, academic, and industrial leaders. During the past year, facility design was completed and construction was initiated. Scheduled for completion in 2003, SERPL will feature shared-use laboratories where Florida university researchers will collaborate with NASA scientists and ISS principal investigators on a day-to-day basis.

More than two-dozen distinct laboratories will be clustered by scientific disciplines to enable a broad range of investigations both in space, and on the ground. NASA's life sciences support personnel will carefully house and prepare experiments for launch aboard the Space Shuttle to the Station.

SERPL also will host KSC's contribution to the NASA Advanced Life Support (ALS) Project as well as the newly planned University of Florida (UF) Center for Space Agriculture and Biotechnology Research and Education (SABRE). This work, performed in collaboration with other NASA Centers, is exploring various aspects of a bioregenerative life support system. Such research and technology development will be crucial to long-term habitation of space by humans.

Advanced Learning Environment

In March, the NASA Education Programs and University Research Division, United Space Alliance and Boeing established a partnership with the Florida Space Research Institute (FSRI) to work with KSC subject matter experts to develop an Advanced Learning Environment. Technology developed by Langley Research Center is being used as the basis for the development of a simulated instructional environment for students. The partnership was formed to develop a prototype cryogenics module, which can be used to reduce the amount of time required to train and certify a cryogenics engineer supporting launch activities. The project involves monies from Work Force Florida, Inc. as well as NASA. The agreement also focuses on developing additional partnerships with national and international universities and aerospace industry representatives to take the learning environment into the academic community as well as utilize it in other industries.

Partnerships

Spaceport Planning and Customer Service

The Cape Canaveral Spaceport Planning and Customer Service Office (SPCSO), is a strong, customer oriented, new, cooperative partnership of the Air Force, NASA, and the FSA, is tasked with supporting visions for future spaceport development. The new office assures the needs of the government, commercial industry, the state and other local stakeholders are included in the future spaceport. The office assigns each new launch or program customer a "Spaceport Manager." The Spaceport Manager acts as a facilitator and advocate for the customer from the time the customer arrives to completion of the launch or program. Spaceport Managers help handle public safety issues, real estate agreements, and environmental concerns in addition to walking customers through all unfamiliar requirements and associated agencies and working to use feedback to improve the entire Spaceport.

Advanced Technology Development Center

The NASA-led Advanced Technology Development Center (ATDC) project being developed at Complex 20 (SLC-20) is a partnership of NASA, Air Force (45th Space Wing, Air Force Research Laboratory) and state of Florida (Florida Air National Guard) agencies and academia. This center will allow for full-scale demonstration, testing and qualification of Spaceport Technologies within an infrastructure resembling a launch environment. Spaceport Technology projects that show promise in a laboratory environment can be deployed and qualified at the ATDC under "real world" conditions.

Corrosion Testbed

KSC's Beach Corrosion Test Site has been documented as having higher atmospheric corrosion rates than any other test site in the U.S. In collaboration with the U.S. Army and Dynacs Engineering Co., Inc., KSC is testing the effectiveness of chloride rinse agents as corrosion inhibitors for use on Army aircraft, missile, and ground vehicle systems.

Nine different metals specified by the U.S. Army will undergo exposure and observation for two years in a harsh, outdoor, marine environment. In addition, the data is being collected with a sensor that may ultimately serve as a tool for predicting corrosion initiation.

Cryogenics Testbed

In its second year, the Cryogenics Testbed Facility, a venture in technology and research collaboration, is offering research and development capabilities that are benefiting projects originating from KSC, academia, and private industry. Cryogenic science deals with the production of very low temperatures and the behavior of materials at those temperatures and is vital to KSC's spaceflight operations.

NASA established a Space Act Agreement with Dynacs. The Dynacs team offers extensive experience in the KSC operational environment performing design, modeling, operation and maintenance of large, complex, cryogenic systems.

Partnerships

KSC also teamed with Oak Ridge National Laboratory, a United States Department of Energy multiprogram science and technology lab. The Interagency Agreement focuses on producing new flexible piping that performs better than straight piping, so that energy efficient, high-temperature, superconducting cable can become a reality for the world's power industry.

Materials Test and Evaluation

KSC offers unique facilities and extensive expertise for failure analysis in areas such as flight hardware and ground support equipment, testing, and reengineering of materials used in nearly every commercial and aerospace industry. Capabilities include chemical analysis, materials testing, environmental simulation, and nondestructive evaluation.

Pioneering research placed KSC and Langley Research Center (LaRC) at the forefront of new materials and structural concepts for aerospace vehicles and other applications. This partnership, incorporating the study of high-performance foams, has led to research in the development of KSC's Cryogenics Testbed.

Electromagnetic Physics

Electrostatic testing of thin films and clothing materials has been routinely performed at KSC since the 1960s, leading to a compilation of a large database on electrostatic material properties. KSC's laboratory is capable of supplying electrostatic information on thousands of thin films immediately, and on-site testing devices and techniques can provide electrostatic data on new materials on the spot. Spacecraft and payload preparation and launch require electrostatic control measures to avoid excessive charge buildup. Future launches from the moon or Mars will require stricter preventive measures.

In 2001, KSC's Electromagnetic Physics Laboratory partnered with NASA's Jet Propulsion Lab (JPL) for joint electrostatic studies and material characterization to assist on various issues related to electrostatic charge generation and prevention in the Shuttle, International Space Station, and payload work areas, as well as on planetary surfaces such as those of Mars or the moon. Specifically, the focus is to characterize the electrostatic properties of a Martian soil simulant with various insulating materials.

KSC partnered with Jet Propulsion Laboratory on a NASA Electronic Parts and Packaging Program, which evaluates commercial electronic nose instruments. KSC also will be working with Glenn Research Center, Johnson Space Center (JSC), Case Western Reserve University and Makel Engineering to develop a Microsystem-based Hydrazine Detection System for the Station and EVA application. KSC along with JSC and JPL also developed an instrument for monitoring ammonia, hypergolic fuel and oxidizer in the Shuttle and ISS airlock.

A separate partnership with Glenn Research Center will provide expertise in ruggedization – the redesign of the hydrogen sensor to withstand the environment it will be exposed to during flight.

A groundbreaking ceremony begins construction of the Space Experiment Research and Processing Laboratory (SERPL).

The Kennedy Space Center Visitor Complex saw 1,800,000 touring visitors through its doors in FY 2001.

Outreach to the World

Kennedy Space Center is part of a larger network of customers, partners, stakeholders, and friends, in the local community and beyond. The Center's FY 2001 outreach effort began in our own backyard through endeavors such as Days of Caring, Combined Federal Campaign, Community Appreciation Day and Volunteer Appreciation Breakfasts. But work also extended across the globe as guests from around the world visited the Kennedy Space Center Visitor Complex and came for launches. Additionally, a variety of educational programs and offerings extended a hand to thousands of students and teachers from around the United States.

KSC also reached out through its public web site at www.ksc.nasa.gov. Several new World Wide Web-based simulations and tours were developed for the general public, providing a fun and exciting way for space enthusiasts to acquire a deeper understanding of KSC's role in space exploration. These applications include the Shuttle Launch Simulation, the Firing Room Virtual Tour, the NASA Time Capsule, and the International Space Station Docking Simulation.

Global Outreach - The Kennedy Space Center Visitor Complex

The public's primary gateway to Kennedy Space Center, the Visitor Complex shared the excitement of space flight with more than 1,800,000 touring visitors in FY 2001. To better serve the increasing number of visitors, the Visitor Complex completed many enhancements and developed plans for future expansions. In July, a long-range comprehensive Master Plan was delivered to assure that any future expansion by the Visitor Complex is done in an orderly manner. A bypass road currently under construction is a portion of the Master Plan, and in the future will allow separation of tour bus and service vehicle traffic from visitor traffic, improving safety as well as security.

A new, live stage show, "Mad Mission to Mars 2025," debuted, augmenting the Visitor Complex's child-oriented programming. Using hands-on activities, 3-D computer animation and theatrical effects such as artificial winds, the Mars-focused show transforms the audience into "astronaut trainees." The show was created to inspire children of all ages to understand space exploration.

The Rocket Garden was redesigned to enhance the information, landscaping, creature comforts and safety. To accomplish this, new exhibit labels have been developed and a new lighting system designed for nighttime operations to enhance the Rockets and displays, as will a new sound system. A new water feature will highlight the landscape.

The Apollo/Saturn V Center has evolved as a major destination for daily and launch visitors. Because of increased souvenir sales at this location, a design was completed for an expansion of the souvenir sales area to meet the increasing demand.

Outreach to the World

Community Outreach

During the Combined Federal Campaign in FY2001, KSC raised more than $260K, well over the goal of $220K. The successful campaign also marked the first time KSC raised in excess of a quarter of a million dollars. Forty percent of the funds went directly to the local community, while the remainder was distributed to national and international organizations.

In the last week of October, more than 250 KSC employees joined forces with local volunteers for Days of Caring. Volunteers participated in a variety of community service projects around Brevard County, benefiting health and human service agencies funded by the United Way of Brevard.

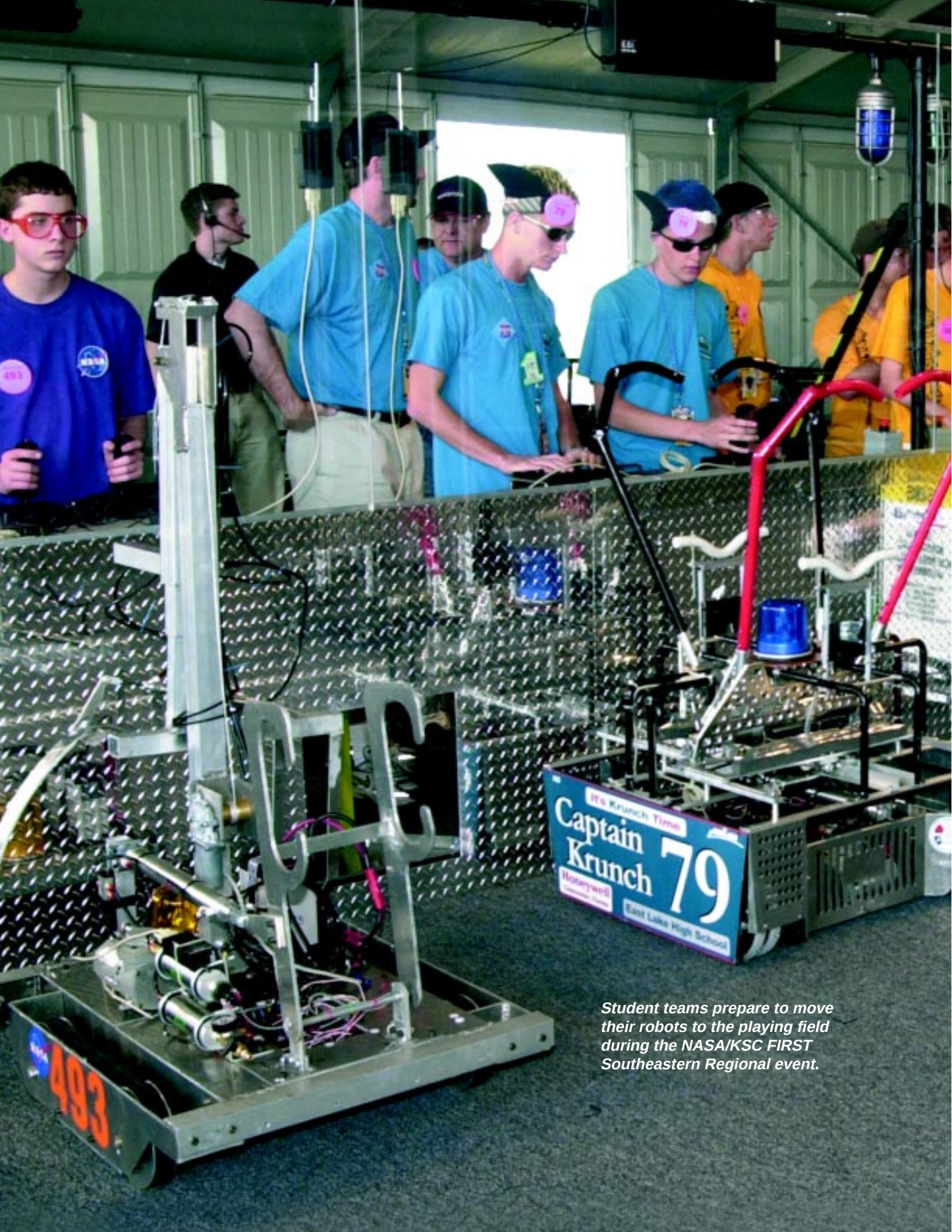
On Nov. 4, 2000, more than 43,000 Brevard County residents, KSC and CCAFS employees attended Community Appreciation Day. A phenomenal success, the event provided KSC and CCAFS the opportunity to share an up-close look inside the space program's vehicles and one-of-a-kind facilities. Activities were highlighted by a drive-by tour of Launch Pad 39B, with Shuttle Endeavour on the pad, and a behind-the-scenes look from the ISS Center viewing window to see Station elements being readied for flight.

On February 20, KSC's volunteers were recognized at a Volunteer Appreciation Breakfast at the KSC Visitor Complex in February 2001. Many of these volunteers are active in the NASA Alumni League and spend countless hours each year assisting at KSC in a wide variety of ways.

KSC also joined in a celebration of Space Day in Tallahassee on April 2. News media representatives took part in an informal question-and-answer session with NASA astronauts Ken Cockrell, Mark Polansky and David Brown. Florida Gov. Jeb Bush, Lt. Gov. Frank Brogan and Speaker of the House Tom Feeney spoke from the floor of the House Chamber to the Expedition Two crew aboard the International Space Station. Astronauts and Florida Commissioner of Education Charlie Crist presented a savings bond to the winner of a statewide art contest sponsored by KSC and USAF contractor Space Gateway Support.

"The Odyssey Continues" was this year's theme for the Community Leaders Briefing, held April 23. KSC Director Roy D. Bridges Jr. and Deputy Director James L. Jennings met with community leaders from Brevard County and the state of Florida to discuss the long-term viability of KSC and how the space program benefits the community. Leaders heard KSC's vision for the future, the current KSC budget, employment trends, educational partnerships, future goals, and major facility projects. They also took part in a lively question and answer period with the director.

The entrance to the new "Mad Mission to Mars 2025" show stands in front of the Rocket Garden, which recently received upgrades.



Student teams prepare to move their robots to the playing field during the NASA/KSC FIRST Southeastern Regional event.

Education

Kennedy Space Center's Education Programs and University Research Division is reflecting on one of its busiest and most successful years. Throughout the fiscal year, more than 120,000 teachers, students, and citizens participated in KSC's education programs. During the summer, KSC's education division managed more than 350 students and educators at a time from a variety of programs, including Equal Opportunity scholars, university-level education, numerous K-12 programs, and the NASA-sponsored Space Life Sciences Training Program (SLSTP).

More than 1,000 K-12 teachers from around the world participated in KSC's summer educator workshops, which are modeled after the national standards in math, science and technology. A "hands on/minds on" instructional approach is used in Earth Science, Aerospace Technology, Human Exploration and Development of Space (HEDS) and Space Science workshops, enabling teachers to adapt this new knowledge and experience into their specific educational situations.

KSC transitioned the Fundamental Biology Outreach Program (FBOP), formerly Life Sciences Outreach Program, from Ames Research Center to KSC. FBOP provides quality opportunities for customers to gain understanding of, or to participate in, research objectives and benefits of NASA's fundamental biology research.

KSC's 2001 Undergraduate Student Research Program (USRP) summer program was a pilot program sponsored by NASA Headquarters Education Division. KSC received more than 500 applications from undergraduate students representing more than 300 colleges and universities from all 50 states and Puerto Rico. The 12 interns selected, fully representing America's rich diversity, worked with technical mentors in their chosen discipline during the summer.

Space Life Sciences Training Program (SLSTP) provided 32 U.S. and Canadian students an opportunity to participate on site in projects emphasizing ecology, closed biological systems and flight experiments. These projects highlighted the unique features of research conducted in space and the challenges associated with planning and conducting long-duration space flight missions and experiments. The intensive six-week session also examined the environmental impacts of the Space Shuttle Program on KSC and local ecology.

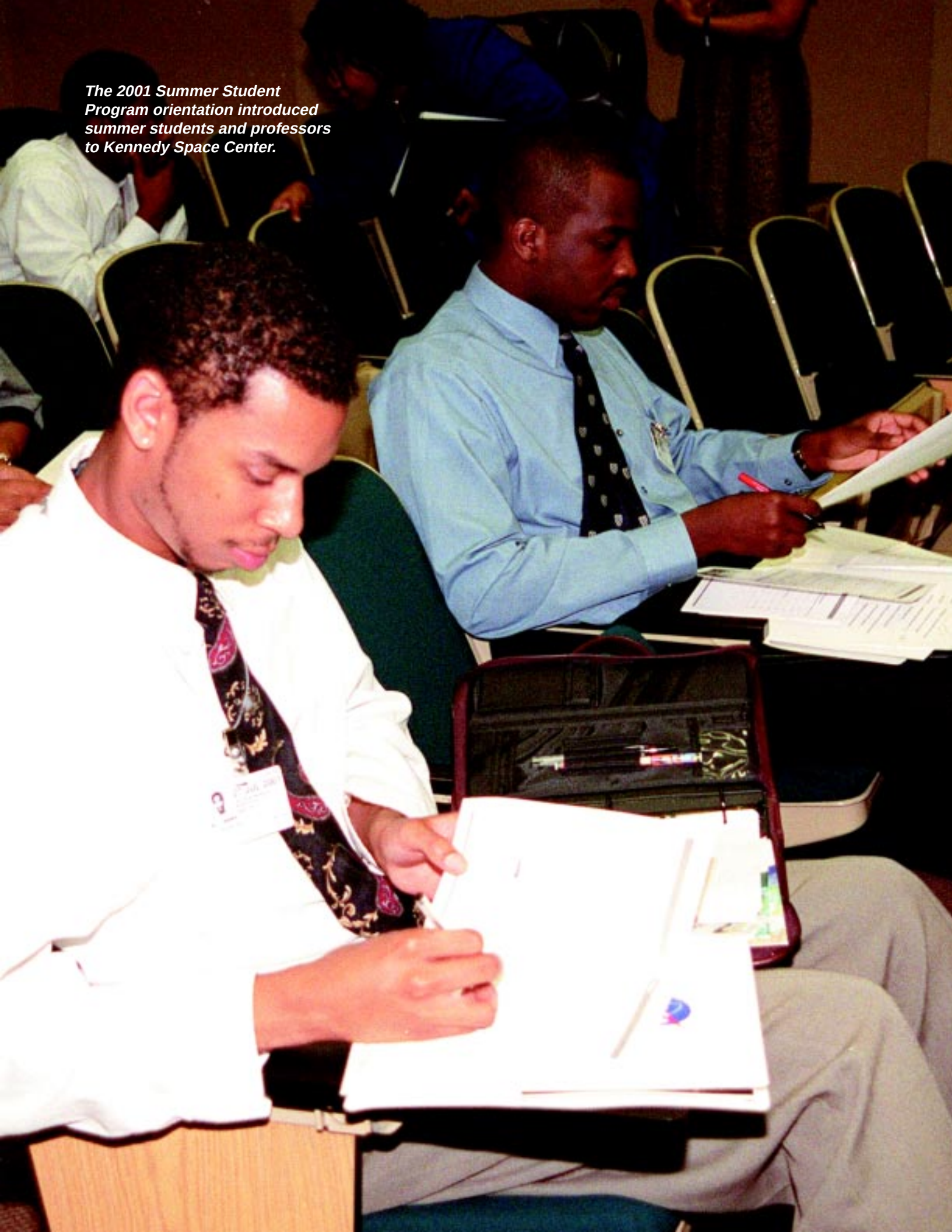
Education

Through the International Space Station (ISS) Web cast series sponsored by KSC and NASA Quest, students and educators got a behind-the-scenes look at KSC's role in Space Station processing. Topic areas included the 100th shuttle launch, an overview of the ISS featuring the Destiny module and roles of the international partners, life in space, and KSC's role in meeting astronaut medical requirements. This Internet-based program allowed participating viewers worldwide to "tour" KSC and have their questions answered live by NASA experts.

In March, 40 teams of high school students and thousands of interested visitors descended upon KSC for the third Southeast Regional competition of the First Inspiration and Recognition of Science and Technology (FIRST) tournament, which was carried live on NASA Television. The student teams built robots according to precise specifications, and then unleashed their creations to battle the clock and each other in assigned robotics tasks.

During 2001, KSC initiated the "SEE NASA – Student Educational Experience" program in partnership with the state of Florida. SEE NASA targets 5th grade students in Florida who come to KSC to participate in a two-day experience of learning and view a Shuttle launch. The idea for the student experience was provided during a discussion between Mrs. Columba Bush, wife of Florida Governor Bush, and NASA Administrator Dan Goldin, in April 2001. The program was planned with representatives of NASA Headquarters, Kennedy Space Center, Delaware North Park Services (Kennedy Visitor Center), and Florida Education officials.

During calendar year 2001, more than 200 students and educators visited the Space Center. Students from the Florida panhandle, the Tampa area and the Hialeah area were represented. The schools were selected by the State of Florida Commission of Education to reward their achievement in significantly improving their overall FCAT scores through a focus on higher order thinking skills and increased parent involvement.



The 2001 Summer Student Program orientation introduced summer students and professors to Kennedy Space Center.

Economic Impact

The work done at the Kennedy Space Center in Brevard County not only helps the nation achieve its objectives in outer space, it also enlarges and enhances the nearby economy. These economic effects are broad and substantial. The money spent on space exploration directly supports employment and production at Kennedy Space Center and generates additional jobs, earnings, and output elsewhere in Florida through the purchase of goods and services from firms in the private sector. KSC enhances the productivity of the region's workers, raising their wages and standard of living.

To conduct its exploration of space, NASA requires an extraordinary range of commodities including fuel, missile engines, computers, and photographic equipment. The range of services it purchases is just as wide, including communications, laboratory testing, and university research. In meeting NASA's demand for these goods and services, local contractors employ workers, fund payrolls, and generate output. These workers and contractors generate additional impacts as they spend their incomes and place orders with other regional firms for materials and services. Each round of such spending recirculates NASA's initial demand among Florida's businesses and households, multiplying the direct impact on the economy.

Kennedy Space Center Workforce

Full-time Civil Servants		1,802
Civil Service Skill Mix		
Scientific & Engineering	61.3%	
Administrative	23.5%	
Technical	8.5%	
Clerical	6.7%	
Contractor Employees		11,001
Tenants		1,266
Total KSC Employees		**14,069**

Economic Impact Summary

The University of Florida performed an Economic Impact Study to determine NASA's (KSC and other Centers and the ancillary operations of the Visitor Complex) economic impact on Brevard County and the central Florida region. The main results are summarized in the following table and chart. During 2001 NASA's direct impact (final demand) on the Central Florida region amounted to $1.061 billion. The total impact on private sector output came to $1.957 billion and provided 20,500 workers with $798 million of earnings.

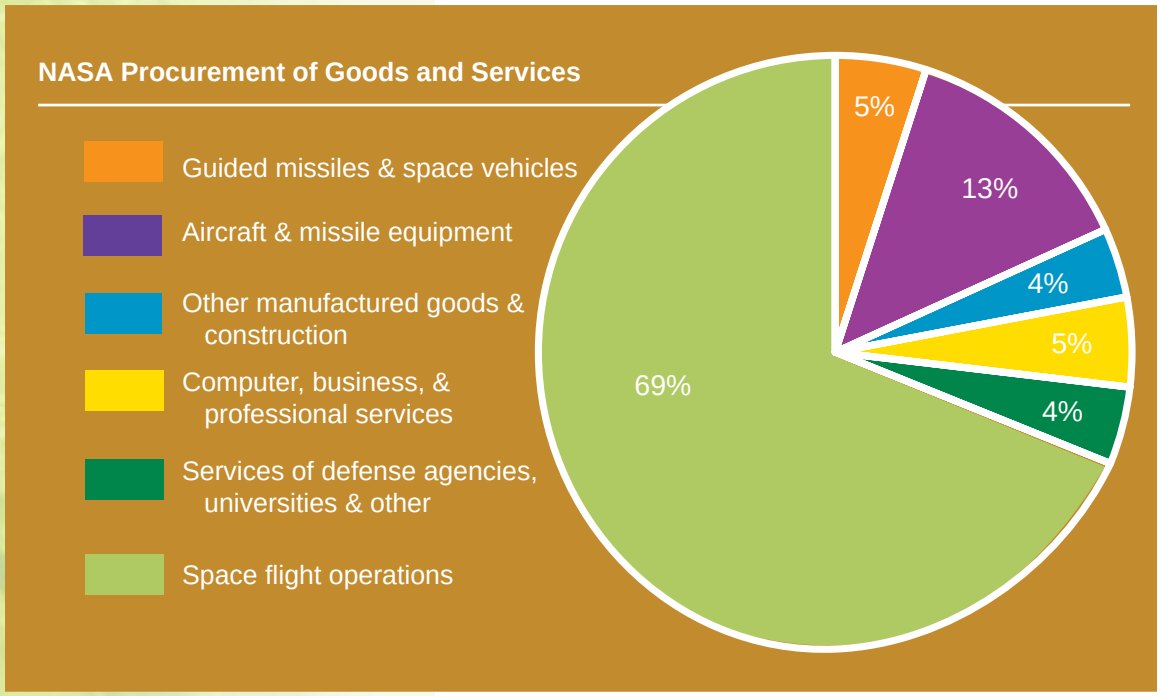
Upon request, a full report is available from the KSC Chief Financial Office.

	Brevard County		Central Florida	
	2001	2000	2001	2000
	Millions of 2001 dollars			
Procurement	1,296	1,134	1,315	1,186
Final Demand	885	826	1,011	974
Output of Goods and Services	1,356	1,269	1,862	1,789
Earnings	589	547	768	729

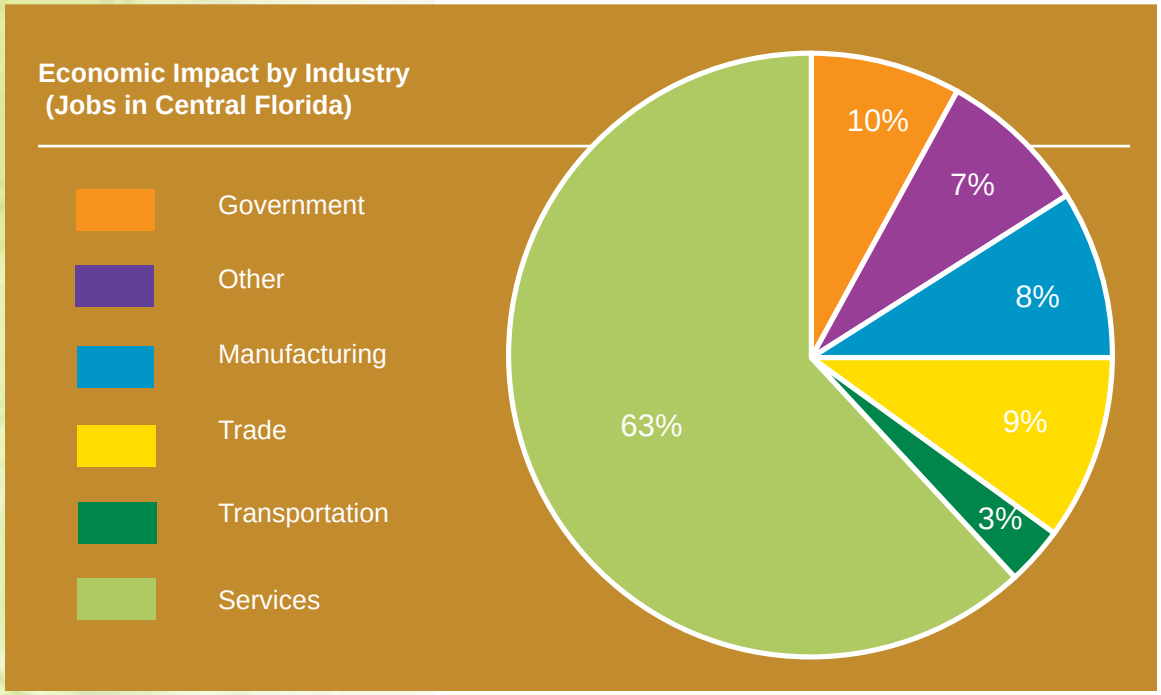
Procurement:	Cost of goods and services paid out by NASA and Visitors' Center to vendors/suppliers within the study area
Final Demand:	Value of goods, services and labor produced and performed within the study area
Output of Goods and Services:	Total economic impact of NASA spending by region
Earnings:	Salaries of direct workforce + salaries of jobs created by NASA acquisition

Economic Impact Summary

NASA Procurement of Goods and Services



Economic Impact by Industry (Jobs in Central Florida)



Workers in the Spacecraft Assembly and Encapsulation Facility-2 prepare the Microwave Anisotropy Probe (MAP) for launch.

Statement of the Chief Financial Officer

The Fiscal Year (FY) 2001 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.

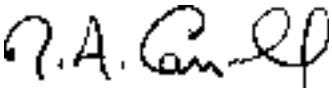
These financial statements were prepared in accordance with Federal accounting standards. These standards are evolving through the efforts of the Federal Accounting Standards Advisory Board (FASAB). This board includes members from the Office of Management and Budget (OMB), the General Accounting Office (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 funding through annual Congressional appropriations, authorizes and funds KSC operations. KSC's total operation expenses for FY 2001 by appropriation were:

Appropriation	Amount In thousands
Mission Support	$ 288,943
Human Space Flight	474,791
Science, Aeronautics & Technology	299,534
Construction of Facilities	362
Total Expenses	**$ 1,063,630**

The 2001 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 Statement

Statements of Financial Position
As of September 30, 2001
(In Thousands)

	2001	2000
Assets:		
Intragovernmental Assets:		
Fund Balance With Treasury (Note 2)	$ 466,673	$ 457,200
Accounts Receivable, Net (Note 3)	17,282	19,271
Governmental Assets:		
Accounts Receivable, Net (Note 3)	1,555	1,104
Advances and Prepayments	58	510
Property, Plant and Equipment (Note 4)	2,073,077	2,033,508
Other Assets (Note 5)	113,140	117,560
Total Assets	$ 2,671,785	$ 2,629,153
Liabilities:		
Liabilities Covered by Budgetary Resources:		
Intragovernmental Liabilities:		
Accounts Payable	$ 15,072	$ 17,881
Other Liabilities (Note 6)	358	393
Governmental Liabilities:		
Accounts Payable	243,720	241,225
Other Liabilities (Note 6)	12,450	13,838
Total	$ 271,600	$ 273,337
Liabilities not Covered by Budgetary Resources:		
Intragovernmental Liabilities:		
Other Liabilities (Note 6)	$ 385	$ 418
Governmental Liabilities:		
Other Liabilities (Note 6)	14,286	13,739
Total	$ 14,671	$ 14,157
Total Liabilities	$ 286,271	$ 287,494
Net Position (Note 7):		
Unexpended Appropriations	$ 213,962	$ 204,442
Invested Capital	2,186,217	2,151,068
Cumulative Results of Operations	5	306
Future Funding Requirements	(14,670)	(14,157)
Total Net Position	$ 2,385,514	$ 2,341,659
Total Liabilities and Net Position	$ 2,671,785	$ 2,629,153

The accompanying notes are an integral part of these statements.

Financial Statement

Statements of Operations and Changes in Net Position
For the Year Ended September 30, 2001
(In Thousands)

	2001	2000
Revenues and Financing Sources:		
Appropriated Capital Used	$ 902,405	$ 897,363
Revenues from Sales of Goods and Services:		
To the Public	4,939	4,747
Intragovernmental	155,985	134,539
Other Revenues and Financing Sources (Note 8)	719	769
Less: Receipts Transferred to Treasury	(719)	(769)
Total Revenues and Financing Sources	$ 1,063,329	$ 1,036,649
Expenses:		
Program or Operating Expenses by Appropriation:		
Mission Support	$ 283,586	$ 302,216
Human Space Flight	361,968	357,702
Science, Aeronautics and Technology	256,789	235,744
Construction of Facilities	362	1,366
Space Flight Control and Data Communications	-	46
Reimbursable Expenses	160,925	139,286
Total Expenses	$ 1,063,630	$ 1,036,360
Total Revenues and Financing Sources In Excess of Expenses	$ (301)	$ 289
Nonoperating Changes:		
Unexpended Appropriations (Note 7)	$ 9,520	$ (4,026)
Invested Capital (Note 7)	35,149	41,432
Cumulative Results from Operations (note 7)	(301)	289
Future Funding Requirements (Note 7)	(513)	1,807
Total Nonoperating Changes	$ 43,855	$ 39,502
Change in Net Position	$ 43,855	$ 39,502
Net Position, Beginning Balance	2,341,659	2,302,157
Net Position, Ending Balance	$ 2,385,514	$ 2,341,659

The accompanying notes are an integral part of these statements.

Financial Statement

Notes to the Financial Statements
For the Year Ended September 30, 2001

1. Summary of Accounting Policies and Operations

Basis of Presentation

These financial statements were prepared to report the financial position and results of operations of John F. Kennedy Space Center (KSC), pursuant to the requirements of the Chief Financial Officers Act of 1990. The statements were prepared from the books and records of KSC, in accordance with the comprehensive basis of accounting specified in OMB Bulletin 94-01.

Reporting Entity

KSC is one of nine NASA field centers established to aid NASA in its mission to provide for aeronautical and space activities. Financial management of its operations is the responsibility of Center officials at all organizational levels. KSC's accounting system is one of ten distinct operations located at nine NASA Centers and Headquarters. Although KSC, like the other Centers, is independent and has its own Deputy Chief Financial Officer for Finance, it operates under Agencywide financial management regulations. KSC provides payroll accounting for approximately 1,802 civilian employees and processes approximately 6,508 nonpayroll-related accounting transactions monthly. This data provides the basic information necessary to meet internal and external financial reporting requirements and provides both funds control and accountability.

Four appropriations require individual treatment in the KSC accounting and control system.

(1) The Human Space Flight (HSF) appropriation supports human space flight research and development activities for space flight, spacecraft control, and communications actions. This includes research, development, operations, services, maintenance, and construction of facilities, which encompasses the repair, rehabilitation, and modification of real and personal property.

(2) The Science Aeronautics and Technology (SAT) appropriation provides for the conduct and support of science, aeronautics, and technology. This includes research, development, operations, services, maintenance, and construction of facilities, which encompasses the repair, rehabilitation, and modification of real and personal property.

(3) The Mission Support (MS) appropriation provides for safety, reliability, and quality assurance activities supporting Agency programs, space communication services for NASA programs, salaries, and related expenses in support of research in NASA Field Centers, and construction of facilities, which encompasses the repair, rehabilitation, and modification of real and personal property.

(4) The Construction of Facilities (C of F) appropriation, which was restructured and replaced in the 1995 budget, includes the construction of new facilities and the repair, rehabilitation, and modification of facilities.

Financial Statement

The Space Flight, Control, and Data Communications (SFCDC) appropriation, which was restructured and replaced in the 1995 budget, included production, operations, and support activities for the Space Transportation System, which includes the Space Shuttle and expendable launch vehicles. The appropriation also provided for tracking, telemetry, command, and data acquisition support of all flight projects. All FY appropriations within SFCDC were closed as of FY 2001 and are included for comparative purposes only.

In addition to the basic operating programs described above, KSC expenditures in FY 2001 included $161 million of reimbursable activity.

Basis of Accounting

KSC accounts are maintained on an accrual basis (i.e., expense and revenue are recorded in the accounts for the period in which they are incurred or earned). Expenses are classified in the accounts according to the appropriation that financed the activity. These expenses are coded in accordance with the Agencywide coding structure, which sets forth a uniform classification of financial activity that is used for planning, budgeting, accounting, and reporting. The expenses are further categorized in the General Ledger as operating expenses or capitalized expenses.

Funds with the U.S. Treasury and Cash

KSC's cash receipts and disbursements are processed by the U.S. Treasury. The funds with the U.S. Treasury include appropriated funds, trust funds, and deposit funds for advances received for reimbursable services. Balances are not held outside the U.S. Treasury.

Advances

KSC funds its University Contracts and Grants program through the use of predetermined payment schedules where letters of credit are not used; recipients are required to schedule draw-downs to coincide with actual, immediate cash requirements, in accordance with OMB Circular A-125 and Department of Treasury regulations. Quarterly financial reporting of cash transactions is provided on Federal Cash Transactions Reports (SF 272's). Detailed monitoring and accountability records are maintained; monitoring includes audits by the Defense Contract Audit Agency (DCAA) and NASA's Office of the Inspector General.

Financial Statement

Accounts Receivable

The largest portion of accounts receivable is due from other Federal agencies and includes research and development of satellites as well as launch services. Nongovernmental customers are required to provide advance payments, which are credited to the applicable appropriation. Advances are then used to offset services as performed. In unusual cases, exceptions and waivers to this general rule have been granted under the Space Act, allowing customers to postpone advance payments.

Property, Plant, and Equipment

KSC-owned Property, Plant, and Equipment may be held by the Center or its contractors. Under the provisions of the Federal Acquisition Regulation (FAR), contractors are responsible for control over and accountability for such property in their possession.

Under the User Charge Act and OMB Circular A-25, Property, Plant, and Equipment may be depreciated, while in prior years a "use" charge was applied to commercial reimbursable customers, which included a factor for depreciation of facilities and equipment. KSC is permitted to charge depreciation under the "full cost" concept to nongovernment reimbursable customers. Depreciation is not included in cost at the Center level but is calculated and reflected in the Agency level financial statements.

All internal use software, whether it is commercial off-the-shelf, contractor-developed, or internally developed, which meets the capitalization criteria, is subject to the provisions of SFFAS Number 11 and its cost shall be capitalized when accepted. When such software is integrated into and necessary to operate general PP&E, rather than perform an application, it is considered part of the PP&E of which it is an integral part, and capitalized and depreciated accordingly. In these cases, the aggregate cost of the PP&E and software is used to determine whether the item meets the dollar threshold for capitalization.

Equipment with a unit cost of $100,000 or more and a useful life of 2 years or more, not intended for sale in the ordinary course of operations, and has been acquired or constructed with the intention of being used, or being available for use by the Agency, is capitalized. Capitalized cost includes unit cost, transportation, installation, and handling and storage costs.

Real property, such as land, buildings, and other structures and facilities, is capitalized when the asset value is $100,000 or more. The capitalized value represents the total cost to NASA, including both acquisition and preparation costs. Land values are recorded at original acquisition cost and do not reflect current value nor include the cost of improvements. Buildings are also valued at acquisition cost, including the cost of capital improvements and fixed equipment required for functional use of the facility. Other structures include the acquisition cost of capital improvements.

Financial Statement

Government-owned/Contractor-held property includes KSC materials, plant equipment, Agency-peculiar property, special tooling, and special test equipment. Contractors are directed to annually report all plant equipment costs for the fiscal year. Plant equipment costing $100,000 or more and having a useful life of 2 years will be capitalized. Contractors electronically report property changes during the fiscal year, as of September 30, on a NASA Form 1018, Report of Government-owned/Contractor-held Property. The electronic submissions do not have digital signature, and are validated by Department of Defense (DOD) or NASA Property Administrator (NASA PA), Industrial Property Management Specialist (IPMS) and Deputy Chief Financial Officer (DCFO).

Contractor-held Agency-peculiar property includes flight pallets, mission peculiar experiment support structures, spacelab, transfer tunnel, and similar components unique to NASA space programs and held by NASA prime contractors or their first-tier subcontractors who are responsible for building, refurbishing and launching the hardware. Contractor reporting is stipulated in the NASA Federal Acquisition Regulation Supplement, NFS Part 1845. These items are priced in accordance with guidance set forth in this NASA supplement. The unit acquisition cost shall include all costs incurred to bring the property to a form and location suitable for its intended use per NFS Part 1845.7101.3.

Other Assets

Other assets include Government-owned/Contractor-held materials.

Liabilities

Accounts payable includes amounts recorded for receipt of goods or services furnished to the Center, based on receiving reports and billings rendered. Additionally, KSC accrues cost and recognizes liability based on information that is provided monthly by contractors on cost and performance reports (NASA Form 533, Contractor Financial Management Report). KSC relies on independent audits by the DCAA to ensure the reliability of reported costs and estimates. To provide further assurance, financial managers are required to test the accuracy of cost accruals generated from the NF 533's, and NASA Headquarters independently analyzes the validity of KSC's data.

Revenues and Other Financing Sources

KSC receives the majority of its funding through multi-year appropriations. These include 3-year appropriations for construction activities, 2-year appropriations for operational and space flight activities, and a single year appropriation for civil service payroll and travel. In addition to appropriated funds, the Center performs services for other Federal agencies and the public and receives reimbursable funding authority.

Financial Statement

2. Fund Balance with Treasury:
(In Thousands)

Fund Balances:	Obligated	Unobligated Available	Unobligated Restricted	Fund Balance
Appropriated Funds	$ 379,819	$ 81,957	$ 4,522	$ 466,298
Deposit Funds				
Suspense/Clearing Accounts				375
Total Fund Balance with Treasury				$ 466,673

3. Accounts Receivable, Net:
(In Thousands)

	Entity Accounts Receivable	Non-Entity Accounts Receivable	Allowance for Uncollectible Receivables	Net Amount Due
Intragovernmental	$ 17,282	$ -	$ -	$ 17,282
Governmental	1,819	314	(578)	1,555
Total	$ 19,101	$ 314	$ (578)	$ 18,837

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

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

	2001	2000	Change
Government-owned/Government-held:			
Land	$ 73,672	$ 73,672	$ -
Structures, Facilities and Leasehold Improvements	1,416,836	1,390,332	26,504
Equipment	205,486	219,919	(14,433)
Work in Process	4,705	2,753	1,952
Total	$ 1,700,699	$ 1,686,676	$ 14,023
Government-owned/Contractor-held:			
Structures and Facilities	$ 7,567	$ 7,567	$ -
Equipment	61,602	64,562	(2,960)
Special Tooling	1,590	928	662
Special Test Equipment	58,702	60,430	(1,728)
Space Hardware	242,151	212,551	29,600
Work in Process	766	794	(28)
Total	$ 372,378	$ 346,832	$ 25,546
Total Property, Plant and Equipment	$ 2,073,077	$ 2,033,508	$ 39,569

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

Financial Statement

5. Other Assets:
(In Thousands)

	2001	2000	Change
Contractor-held Materials	$ 113,140	$ 117,560	$ (4,420)
Total	$ 113,140	$ 117,560	$ (4,420)

6. Other Liabilities:
(In Thousands)

Liabilities Covered by Budgetary Resources:

	Current	Non-Current	Total
Intragovernmental Liabilities:			
Liability for Deposit and Suspense Funds	$ 358	$ -	$ 358
Total	$ 358	$ -	$ 358
Governmental Liabilities:			
Liability for Deposit and Suspense Funds	$ 1,576	$ -	$ 1,576
Accrued Funded Payroll and Benefits	10,874	-	10,874
Total	$ 12,450	$ -	$ 12,450

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	$ -	$ 385	$ 385
Total	$ -	$ 385	$ 385
Governmental Liabilities:			
Accounts Payable for Closed Appropriations	$ -	$ 1,239	$ 1,239
Contingent Liabilities	-	-	-
Unfunded Annual Leave	-	13,047	13,047
Total	$ -	$ 14,286	$ 14,286

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

Financial Statement

7. Net Position:

(In Thousands)

	2001 Appropriated Funds	2000 Appropriated Funds	Change
Unexpended Appropriations:			
Undelivered	$ 127,483	$ 146,663	$ (19,180)
Unobligated:			
Available	81,957	51,314	30,643
Unavailable	4,522	6,465	(1,943)
	$ 213,962	$ 204,442	$ 9,520
Invested Capital	$ 2,186,217	$ 2,151,068	$ 35,149
Cumulative Results	$ 5	$ 306	$ (301)
Future Funding Requirements:			
Annual leave	$ (13,047)	$ (12,490)	$ (557)
Closed appropriations	(1,623)	(1,667)	44
Other	-	-	-
	$ (14,670)	$ (14,157)	$ (513)
Total	$ 2,385,514	$ 2,341,659	$ 43,855

8. Other Revenues and Financing Resources:

(In Thousands)

	2001	2000
General Fund Proprietary Receipts	$ 719	$ 769
Total	$ 719	$ 769

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

This acrylic painting by Stan H. Stokes captures the lift-off of Atlantis, mission 61-B, November 26, 1985, in a dramatic night launch.

Dawn casts a pink glow across the landscape as a Boeing Delta II rocket stands ready to launch the Mars Odyssey spacecraft.

STS-105 crew captured this view of the International Space Station over a moderately cloud-covered land area.