

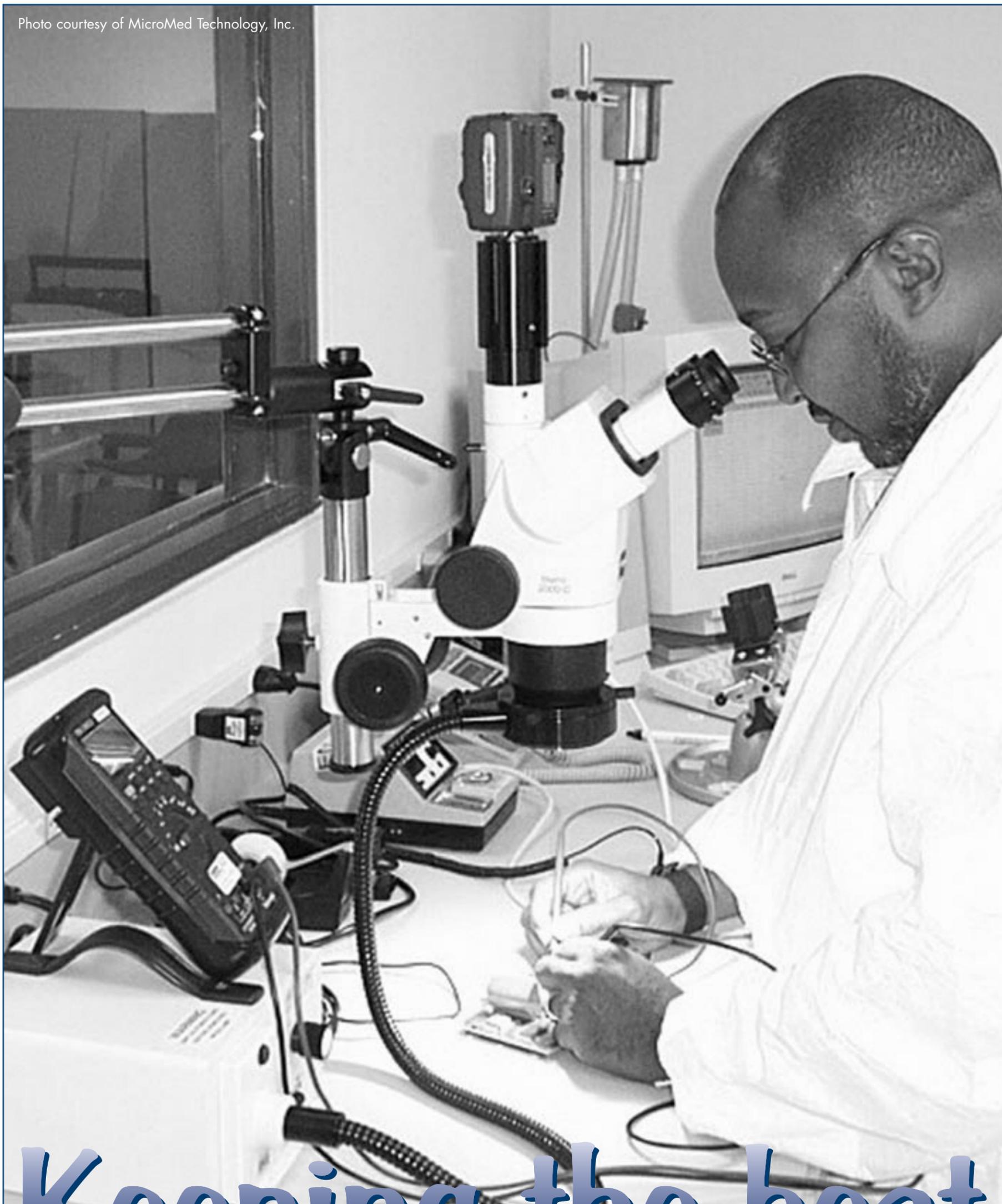


SPACE CENTER

Roundup

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Photo courtesy of MicroMed Technology, Inc.



Keeping the beat

In a manufacturing laboratory, Quality Engineering Technician Terry Martin works meticulously to produce a medical marvel: A tiny, implantable heart pump. Co-developed by Johnson Space Center's engineers and Dr. Michael DeBakey, this product of ingenuity saves lives, proving to be a huge technology transfer success. JSC's Technology Transfer and Commercialization Office (TTCO) helps bring what was once only imagined to reality. To learn more about this remarkable breakthrough and TTCO, please turn to **Page 4**.

America's Best Gets Better

By Ron Dittmore, Space Shuttle Program Manager



Over the past decade, the Space Shuttle Program has achieved remarkable success in adjusting to environmental influences, implementing change to vehicle configuration, organization and contract structures to increase the capability and efficiency of the program. For example:

- Configuration changes have led to an 80-percent decrease in launch risk and nearly a 100-percent increase in cargo capability to low-Earth orbit.
- Increased stabilization of processes and procedures has contributed to a 70-percent decrease of in-flight anomalies.
- Aggressive efforts to control and reduce operational costs has led to an amazing 40-percent decrease in the overall program cost and workforce while, at the same time, achieving a 26-percent reduction in the number of workforce accidents.

America's best has certainly gotten better! But only through the hard work and commitment of the NASA and contractor teams, working together with open and honest communication, have we been able to achieve these remarkable results. With the increasing likelihood that the space shuttle will be the primary human space transportation system through 2020, it is inevitable that the program forecast will continue to include change and challenges to become more efficient.

Efforts to reduce program risk through vehicle upgrades and configuration change will continue. Increased emphasis on maintaining the safety and integrity of the existing system infrastructure (system, facilities, skills, knowledge, process control, etc.) is a key ingredient of our strategy to control risks and maintain a safe and viable system through 2020. Technology advancements, obsolescence and budget constraints are but a few of the challenges that have and will continue to affect the strategic path of the Space Shuttle Program.

As we pursue efforts to develop the near-term and long-term strategies to meet the challenges before us, our commitment to work together to overcome the hurdles of the future must be paramount. The business of space travel is not about the individual. On the contrary, our success has been and continues to be built upon the chemistry and power of the team.

Our constancy amid change must be dependent upon the team approach, where diversity of background and experience produces innovative ideas and revolutionary concepts necessary for us to adapt to the ever-changing environment.

The last 20 years of space shuttle operations have been incredible. The next 20 years will be even more remarkable as we begin to fully utilize an orbiting laboratory and open wide the doors of space travel and discovery. We can make it happen. We will make it happen!

Center Director Message



PAY ATTENTION TO DETAIL!

FROM THE DESK OF LT. GEN. JEFFERSON D. HOWELL, JR.

I usually don't worry much. I try to live as my mother advised me: "If there's something you can do about it, do it and quit worrying; if there's nothing you can do about it, it's silly to worry about something that is out of your hands."

In following this philosophy, I normally don't get too worked up about what may or may not happen in the future and I sleep very soundly at night.

Lately, though, I've had a sense of unease. I haven't been able to put my finger on why, but something seems to be bugging me. I suspect that the main cause of my disquiet centers around the incredible amount of activities that have been filling up all of our schedules and will continue to do so for the next couple of months (launch activities, World Space Congress, off-sites, back to school, etc.) The rash of mishaps that we have experienced over the past several weeks is a signal that we are not coping with our situation very well.

What can we do about it? The answer: WE MUST ALL PAY ATTENTION TO DETAIL! That simple act is what separates professionals from amateurs. That simple act is what makes the difference between doing things correctly versus doing things carelessly. You can't have professional excellence without paying attention to detail.

We are all part of a large, dynamic team that is involved in a high-risk endeavor that cannot succeed unless all of its players do their part. If one of us fails, we all fail. We must each focus on the task at hand and not allow ourselves to be distracted by events occurring around us, or our concerns about future events.

We are all in this together. Let's focus. Let's pay attention to detail.

JSC commended by state committee

By Kendra Ceule

JSC was recently selected as a recipient of the Public Employer Award from the Texas Governor's Committee on People with Disabilities. This award recognizes a government employer for outstanding commitment to hiring, accommodating and advancing employees with disabilities. The committee grants only five employer awards each year.

The Center was nominated for the honor by United Cerebral Palsy (UCP) of Greater Houston, which operates a program called High School/High Tech (HS/HT).

The program encourages students with developmental disabilities to pursue secondary education and high-tech careers, in part by placing them in summer internships with technologically advanced employers. JSC is one of those employers.

"JSC has always been a tremendous supporter of this program," said UCP's Kelly Dietrich, who wrote the Center's nomination. "The people there go above and beyond to get these kids into JSC internships."

One former JSC intern, who was placed here through the High School/High Tech program, wrote about his I/T experience at the Center in his application essay to Baylor University. He is now a student there. Other HS/HT interns have been offered permanent jobs at JSC.

The award will be presented to JSC at a ceremony in Lubbock, Texas, on Oct. 25. Estella Gillette, Director of Equal Opportunity Programs, will accept the award. Gillette said the award belongs to the entire Center because of the teamwork that earned it.

"Without JSC's management support, Human Resources' work and the organizations' support in placing our summer interns from the High School/High Tech program, and without resources to accommodate persons with disabilities when necessary, JSC would not have won this award," she said.

"We should all be proud of the recognition that Governor Rick Perry has bestowed upon us."

2

SPACE CENTER
Roundup

Learning from the past to benefit the future

JSC Lessons Learned Database is now online

It has been said that people should strive to learn something new everyday. Now, JSC employees have a convenient way to share lessons they've learned at work. The Johnson Space Center Lessons Learned Database (LLDB) is now the official vehicle for documenting lessons learned in various JSC programs. It is located at <http://iss-www.jsc.nasa.gov/ss/issapt/lldb/>.

Any user with a JSC workstation may submit a lesson via the system, as well as search the LLDB database for lessons by keyword, lesson number or category. No identification or password is required.

"Before the database was developed, JSC Directorates recorded their lessons-learned information in a wide variety of ways – some in electronic files, some in the International Space Station lessons learned database, some in the NASA headquarters database and still other records were kept in file cabinets," said Ralph Anderson, Project Improvements Office Manager.

This fragmented approach did not take advantage of Web technology to share and disseminate valuable lessons-learned information.

"Our previous individual system's shortcomings were two-fold," Anderson said. "Retrieving information for later use was difficult and impractical, and sharing across multiple organizations was not practiced."

Anderson said the new database addresses these two issues and adds a wealth of new features that greatly enhances recording and retrieval capabilities. The new JSC LLDB provides entirely new functionality for a new JSC user base. It incorporates most of the functionalities of the ISS LLDB application and includes many enhancements as well.

The JSC LLDB includes the following upgrades and enhancements:

- LLDB users may attach photographs or graphics associated with their lessons.
- A spell-check feature is now available when the lesson is submitted.

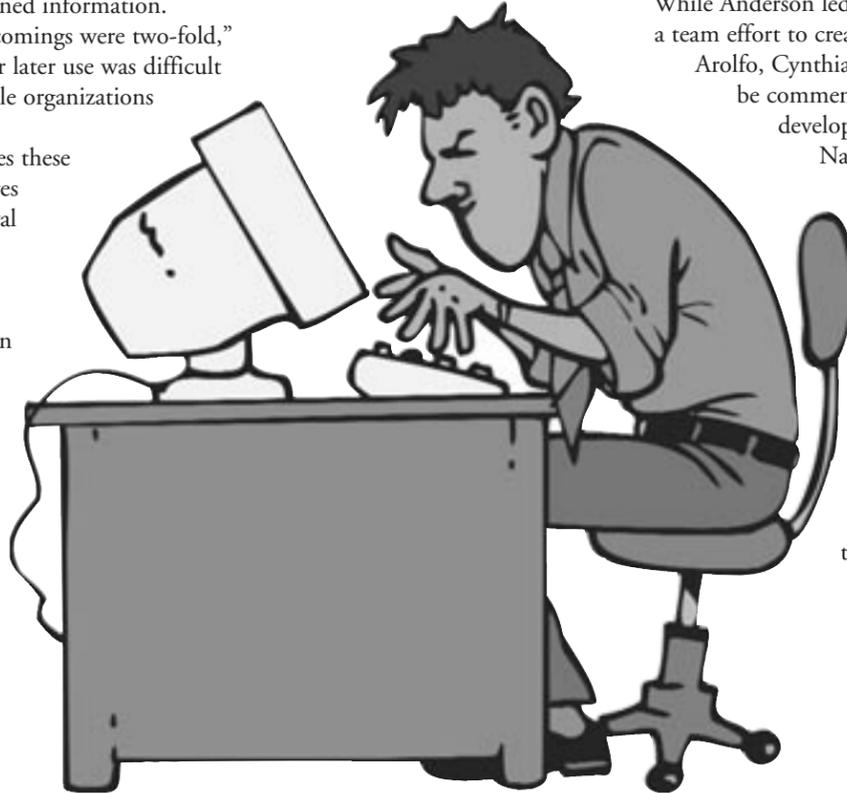
- All JSC lessons learned progress through a newly developed review process documented in detail in the Common Work Instruction titled "JSC Lessons Learned Process."
- Automated e-mails notify registered users as lessons move through the JSC review process.
- Additional report options are available to the Systems Management Office and Directorate Level Organization Reps, including a quarterly report.
- When a lesson is approved by the Systems Management Office and released for public viewing, the text of the lesson is automatically e-mailed to the JSC CDM for submittal to the NASA Headquarters LLIS.

Anderson added he can give Superior Accomplishment Awards to civil-servant employees who successfully submit a lesson. The Superior Accomplishment Award includes a \$250 cash award.

While Anderson led the database project, he is quick to say it was a team effort to create it. "The professional Barrios team of Linda Arolfo, Cynthia Fontenot, Kevin Sharpe and Beth Walls is to be commended, as well as the NASA JSC requirements development team of Vince Berend, Brent Fontenot, Nancy Munoz and Ron Montague," he said.

"Without their support, this project may not have materialized."

The database, which took less than a year to create, will have long-term benefits for the space program. "This was a fun project to develop, and I got the feeling of contributing something worthwhile to the Center and for the Agency," Anderson said. "Making the documentation and retrieval of lessons learned easier for our personnel will enhance our successors' abilities to benefit from the information we leave for generations to come." ♦



Efficient, effective, accountable

Freedom to Manage Program helps streamline processes

By Kendra Ceule

A new government-wide program is helping Johnson Space Center employees work more efficiently. Freedom to Manage, or F2M, has been implemented throughout the Agency and strives to eliminate roadblocks to effective management.

F2M can help JSC employees do their jobs more efficiently by streamlining process, removing barriers and cutting red tape.

F2M was born of a commitment established in this year's President's Management Agenda, in which President Bush declared that his Administration would be "dedicated to ensuring that the resources entrusted to the federal government are well managed and wisely used."

The program has already initiated some changes at JSC. For example, the Center now has increased authority when it comes to hiring its senior executives or making changes to organizational

charts, said Greg Hayes, Director of Human Resources. Hayes is JSC's point of contact for F2M, and also serves on NASA's F2M Task Force.

"These things used to have to be approved by Headquarters," Hayes said. "Now the Centers have much more flexibility."

Part of Hayes' responsibility with the Freedom to Manage program is to sort through the suggestions submitted by JSC employees. The suggestions that are deemed feasible are passed on to the appropriate contacts to be examined and possibly implemented.

Employee suggestions are at the heart of F2M: The more management impediments

that are pointed out, the more that can be addressed. Contractors and civil servants alike are strongly encouraged to submit their suggestions.

"Don't hesitate to suggest something," said Hayes. "We're always looking for fresh ideas."

Visit <http://f2m.nasa.gov/submit.htm> for instructions on submitting your F2M suggestions in order to make JSC a more efficient place to work. ♦

“Don't hesitate to suggest something. We're always looking for fresh ideas.”

– Greg Hayes

Keeping the beat

By Amiko Nevills

Kendell Johnson's heart beats again, thanks to NASA-developed technology and technology transfer capabilities. Two years ago, his future was not so certain. The 18-year-old student collapsed on a court while playing basketball in Newark, N.J. Soon after, he was diagnosed with congestive heart failure. While Kendall remained on a heart donors' list, doctors determined that his failing heart could endure no longer.

It was then that Kendall became a noted name both in medical history and NASA. On May 6, 2001, he received an innovative heart pump – the MicroMed DeBakey VAD®. The VAD has the unique capability of providing continuous blood flow with one internal moving part: A space shuttle fuel pump technology originally developed by NASA.

Kendall continued to live for another two weeks – long enough to receive his new heart. After his lifesaving operation, he went on to attend his high-school prom and walk across the stage to receive his diploma.

Now, at the age of 20, Kendall is a college student and just one of many success stories that have come from Johnson Space Center's Technology Transfer & Commercialization Office (TTCO).

The Beat on JSC Technology Transfer & Commercialization

From its inception, NASA has practiced technology transfer, which is sharing its knowledge and technology development with the private sector. A 1986 Federal Technology Transfer Act mandates that all federal laboratory scientists and engineers have a responsibility to make their technologies available to the private sector.

JSC embraces this responsibility and attempts to stretch its boundaries to maximize its benefits.

"The mechanism of technology transfer offers the means to produce great benefits to the economy by creating jobs and increasing the competitive advantage of our country," said Charlene Gilbert, Director of JSC's TTCO.

"The products generated from these efforts are invaluable to the improvement of our everyday lives."

JSC's TTCO was created in January 1994. Today the office maintains efficiency with 22 civil service and contractor employees who possess a unique mix of skills and expertise. Together the team supports a variety of critical tasks, including:

- Patenting
- Marketing and licensing technologies
- Establishing partnerships with private companies
- Educating the general public

JSC's Office of Patent Counsel provides a vital function for TTCO. "With a patent, the recipient of a license has the power of the patent system behind him or her to exclude others from making, using or selling the technology," said Patent Counsel Ed Fein. "Exclusivity encourages a licensee to invest the risk capital necessary to commercialize the technology – the ultimate goal."

Over the past three decades, JSC has established a portfolio of about 640 patents and pending applications, 150 of which are available now for license by businesses and individuals. Last year, the U.S. Patent Trademark Office issued 15 patents to JSC scientists and engineers. Emerging inventions include a solar-powered refrigerator, a robotic human-like hand and a method and device to treat prostate cancer using microwave energy.

Marketing specialists assist private companies and entrepreneurs in locating relevant technologies to their business. "Increasing the awareness of individuals and various industry sectors is one of the most interesting outcomes of this activity," said Terri Gilbert, the Mid-Continent Technology Transfer Center Marketing Manager for TTCO.

TTCO also establishes partnerships with businesses to research and develop new technologies. One example is the partnership between JSC and the HED (hypohidrotic ectodermal dysplasia) Foundation. The mission of the foundation is to improve the quality of life for children suffering from HED, Sun and Light Reaction Syndrome, Xeroderma Pigmentosum and related disorders that affect the body's ability to cool itself.

Together, JSC and the HED Foundation advanced the development of the ultraviolet protective suits and made them available to children who suffer from disorders causing extreme Sun sensitivity.

"We're bringing this technology out of space and down to Earth to give these children a better quality of life and freedom," said Sarah Moody, HED's founder, before her passing earlier this year.

To learn more about the TTCO, visit: www.technology.jsc.nasa.gov.

Get involved: Teach and inspire

TTCO is dedicated to educating the general public about successes like the heart pump and UV protective suit. One education tool for this purpose is the Benefits of Space traveling exhibit.

Touring across America, the exhibit showcases about a dozen of more than 60,000 products developed from the space program. The trailer also houses a surround-sound theater in which guests view a 10-minute video about the future of human space exploration.

With supervisor's approval, JSC civil service employees may volunteer to travel with the exhibit and teach visitors about the national assets NASA provides.

"I enjoy the opportunity to show the public how space research can benefit their lives," said volunteer Judy White of the Financial Management Division.

Last year, the trailer visited 27 states and had almost 96,000 visitors. In a recent survey, visitor Diane Magnuson said, "It was awesome that such an education was free!"

For more information about how to volunteer, e-mail: commercialization@jsc.nasa.gov

Why TTCO is important to JSC and you

TTCO seeks research and development that can potentially meet industry and national needs. JSC civil service and contractor employees – including managers, researchers, scientists and engineers – play a vital role in meeting this goal.

Reporting new technologies is every NASA employee's responsibility. This reporting allows JSC to maintain an accurate inventory of its available assets to best identify partnerships and eligible companies.

JSC's inventors are key in maintaining a cutting-edge technology inventory. Royalty-sharing opportunities are available to the inventors and researchers involved in successfully licensed technologies.

Sharing knowledge and inventions creates public awareness of successes and increases the Agency's perceived value as a contributor to America's future.

"I am always proud and honored to represent the work we do at JSC and am thankful to all who contribute to NASA's mission of technology transfer," Charlene Gilbert said. ♦

JSC Inventors honored

Nineteen scientists and engineers were honored this year at the Annual JSC Inventors' Luncheon held at the Gilruth Center on June 21. Following are this year's honorees:

- Gregory S. Aber
- G. Dickey Arndt
- Daniel George Cencer
- Gregg A. Edeen
- Michael K. Ewert
- Patrick W. Fink
- Horacio M. de la Fuente
- Linda F. Hess
- Kriss J. Kennedy
- James D. Lester
- Chin H. Lin
- James P. Locke
- Christopher Scott Lovchik
- Richard H. Malecki
- Dennis R. Morrison
- Phong H. Ngo
- Jasen L. Raboin
- William C. Schneider
- Scott M. Smith

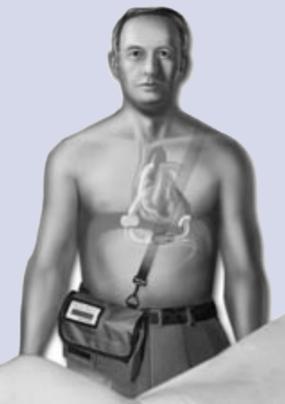
Pictured at right is one example of last year's successful patents: Michael Ewert's Solar-powered Refrigeration System. Initiated in 1998, the resourceful refrigeration system uses pure sunlight to keep things cooled down. Ewert explained, 'The system stores the energy collected during the day and uses it without requiring a battery.' A start-up company developed primarily to license this technology, Sun Danze Refrigeration, is now focusing on the commercial potentials within developing countries where electricity is not available.

Got ideas?

To report a new technology, submit NASA Form 1679, "Disclosure of Inventions and New Technology," to the TTCO, Mail Code HA, Bldg. 1, Room 257.

Your new technology will be considered for patent application, license potential to U.S. businesses, NASA Tech Briefs publication and/or a scientific and technical contribution award.

To learn more about reporting new technologies, visit: <http://newtechnology.jsc.nasa.gov>



Local surgeon given prestigious NASA Invention Award

NASA Administrator Sean O'Keefe presented the NASA Commercial Invention of the Year Award to renowned surgeon Michael DeBakey, M.D., during an award ceremony at Headquarters on June 25. Dr. DeBakey, Chancellor Emeritus at Baylor College of Medicine in Houston, was honored for his dedicated work on the development of a space-based medical breakthrough.

Dr. DeBakey worked with a team of JSC engineers to develop a miniature ventricular-assist device designed to bridge the gap of time between a heart patient's need for immediate support and the availability of a donor heart. The same technology used in space shuttle fuel and oxidizer pumps led to the major design of this unique implantable device. It is unique because of its ability to provide continuous blood flow, and its petite size allows it to be used in smaller adult patients.

The heart pump, now known as the MicroMed DeBakey VAD®, is the result of a successful transfer of NASA technology. This medical breakthrough has already been credited with saving many lives. To date the device has been implanted in 136 heart patients, 115 of which were implanted during European trials and 21 during ongoing U.S. trials. The trials in the U.S. will involve about 180 total implants.



The Technology Transfer and Commercialization Office team is pictured here. Bottom row (left to right): Rose Rodriguez, Muniz; David Haines; Edward Fein, Patent Counsel; Charlene Gilbert, Director; John 'Jack' James, Deputy Director and Tanya Jefferson. Second row (left to right): James Cate; David Forrest; Mary Barker, Hernandez Engineering; Tom Diegelman; and Kathy Acuna, Hernandez Engineering. Third row (left to right): Kathy Maltese, Meador Staffing; Ted Ro; Esther Williams; Dina Supple, University of Houston; and James Whittington, REI Systems, Inc. Top row (left to right): Terri Gilbert, Mid-Continent Technology Transfer Center; Collin Hieger, REI Systems, Inc.; Reginald Williams; and Stephanie Hunter.

NASA JSC 2002e33321 Photo by James Blair

A CLOSER LOOK: MICHAEL DEBAKEY, M.D.

Practice makes perfect

This year marks the 25th anniversary of shuttle's free-flight tests

By Lisa Tidwell

Like a child who must learn to walk before running, the space shuttle had to prove it could safely land before it could become NASA's main mode of transportation into space. The shuttle's landing abilities were proven in the Approach and Landing Test (ALT) program, using the orbiter test vehicle called *Enterprise*.

This year marks the 25th anniversary of the successful ALT program. The *Enterprise* began its journey at Rockwell International's Space Division in Palmdale, Calif., where it was assembled. In January 1977, the *Enterprise* traveled 36 miles over land from Palmdale to the place of its first flight – NASA's Dryden Flight Research Facility at Edwards Air Force Base.

While at Dryden, eight captive flight tests, three of them crewed, took place with the orbiter mounted atop the Shuttle Carrier Aircraft (SCA). The captive tests verified the aerodynamics and handling of the orbiter/747 combination and the orbiter systems. After these successful captive flights, the *Enterprise* was ready to fly solo.

On August 12, 1977, the NASA Space Shuttle *Enterprise* made history with its first free flight when it was released from atop the SCA at an altitude of 24,000 feet and guided to a successful landing on Runway 17 at Edwards. The shuttle spent five minutes and 22 seconds gliding down to Earth.

Astronauts Fred W. Haise and C. Gordon Fullerton were in control of the *Enterprise* during the historic first free flight.

"Just about everything associated with the ALT program was new and untried," Fullerton said recently. "In addition to the orbiter itself, the simulator, the Shuttle Training Aircraft, the Shuttle Carrier Aircraft, the manufacturing and checkout facilities at Palmdale were all being used for the first time during the preparation for the ALT flights."

During the subsequent four free flights, the astronaut flight crew alternated between Haise and Fullerton to Joe Engle and Richard Truly. The crews continued to release the shuttle from its perch atop the SCA to simulate free-flight landing conditions of a shuttle returning from orbit. These five free-flight tests allowed the pilots and engineers to learn how the shuttle handled during low-speed flight



Astronauts Fred W. Haise, Jr., left, and C. Gordon Fullerton are pictured in the cockpit of the *Enterprise* prior to the fifth and final free flight.



and simulated how it would land at the end of an orbital mission. The final free flight test, which took place Oct. 26, 1977, proved the space shuttle could successfully land on a concrete runway. After the ALT program, the Space Shuttle *Enterprise* was ferried around the world for air shows and made an appearance at the 1984 World's Fair in New Orleans, La. After a few months visiting NASA Centers, *Enterprise* became the property of the Smithsonian Institution in 1985. It was moved to Washington, D.C., where it still remains.

Since the early days of the shuttle program, nearly 700 passengers have been carried into orbit aboard the five shuttles: *Columbia*, *Challenger*, *Discovery*, *Atlantis* and *Endeavour*. *Discovery* is the most flown shuttle with 30 flights to its credit. ❖

The Approach and Landing Test Program

QUICK FACTS

- The program consisted of 13 flights in all – five captive, three captive-active and five free flights – all of which occurred during 1977.
- The first free flight occurred on August 12, 1977. *Enterprise* was released from atop the Shuttle Carrier Aircraft at an altitude of 24,000 feet and spent five minutes and 22 seconds gliding down to Earth.
- Astronauts Fred W. Haise and C. Gordon Fullerton were in control of the *Enterprise* during the historic first free flight.
- Haise, who had also been the lunar module pilot for Apollo 13, resigned from NASA in 1979 and retired as president of Northrop Grumman Technical Services in 1996. Fullerton was the pilot of STS-3, commander of STS-57F and currently is a research pilot at NASA's Dryden Flight Research Center at Edwards.
- *Enterprise*, the space shuttle flight test prototype, was originally to be named "Constitution" in honor of the U.S. Constitution's bicentennial. However, viewers of the popular television show "Star Trek" started a write-in campaign urging the White House to name the first shuttle *Enterprise* after the show's "starship."



A walk on the wild side: White Sands Testing Facility is naturally interesting

Not many NASA employees can say they come across rare night-blooming flowers, white pelicans or mating roadrunners as part of their jobs. However, that's all in a day's work for Amanda Skarsgard and Harold Harrison, who work as environmental scientists at JSC's White Sands Test Facility (WSTF) near Las Cruces, N.M.

The site has not been open to the public since its completion in 1964 because of the hazardous nature of the rocket engine and materials testing conducted there. Hunting, hiking and other recreational activities are prohibited on WSTF grounds, which means that the site's wildlife and vegetation have been protected for the past 38 years.

The undisturbed wildlife provides plenty of work for the two scientists. Skarsgard and Harrison have cataloged, observed and located a fascinating variety of artifacts, snakes, rare plants and birds on the site.

One night only: Night-blooming Cereus

WSTF is alive with 130 species of cataloged plants. Of these, Skarsgard estimates that 21 species are rare plants, with "rare" defined as threatened, endangered or species of concern. One of those rare plants is the Night-blooming Cereus, a cactus that grows within the branches of shrubs. It takes advantage of the reduced temperature and sunlight provided by the "nurse plant." Sixty-nine of these plants have been located on WSTF grounds.

"The individual flowers bloom for one night only," said Skarsgard, which is where the Night-blooming Cereus gets its name. "Its other name is *reina de la noche* or Queen of the Night," she said.

The plant is notable in other ways as well. Skarsgard cited the flower's extraordinary size and scent, as well as the plant's "cryptic" nature. "Very little is actually known about the Night-blooming Cereus behavior," she said.

Uncertainty about how the Cereus is pollinated is one reason for the decline of the plant's natural populations. Another reason is the collection and sale of the plants by individuals. Also, as the plant grows partially hidden within other plants, a Cereus may be uprooted with its nurse plant before it is even noticed.

Past and present

The WSTF grounds have a rich history: "We have 93 prehistoric archeology sites within the WSTF boundaries, including Love Ranch," Skarsgard said.

J. D. Love was a medical doctor and cattle rancher whose ranch was taken over during World War II for the U. S. Government to compile what is now the White Sands Missile Range. Today, the test facility's acreage backs up to the edge of the missile range, forming 28 square miles of refuge for New Mexico flora and fauna.

"The Test Facility and Missile Range are full of unique wildlife diversity," said Doug Burkett, Wildlife Biologist for the Missile Range. Desert bighorn sheep used to flourish in the area, but the population was devastated by parasitic infections several years ago. Now, "the New Mexico Department of Game and Fish is reestablishing the desert bighorn sheep in this area," Burkett said.

"A total of 176 bird species have been observed at the test facility, with many of them being sighted at Love Ranch," Harrison said.

He listed the following birds as rare sightings: Brown thrasher, a yellow-throated warbler, white pelicans, snipes and a vermilion flycatcher. He has also spotted white-throated swifts at WSTF's overflow lagoons – birds that Harrison said "were surely studied by the engineers and designers for the Stealth airplane."

Another of Harrison's favorite wildlife anecdotes involves what at first looked like "a fluttering pile of feathers in the roadway." He soon realized it to be "two mating roadrunners, the male with a lizard in his mouth. Afterwards, he gave the lizard to his companion."

Legacy of responsibility

Mark Leifeste, Honeywell Program Manager for the test facility, said that WSTF has "an obligation to maintain our facility and the surroundings that interface with our facility in a responsible fashion."

Joseph Fries, NASA Manager of the test facility, agreed. "I believe that we are good stewards of the environment, and that we have a moral obligation to take care of the land and its inhabitants," he said. "Many people have different opinions about taking care of the environment. I feel there should be a balance, rather than a strict policy, in creating regulation."

Fries said WSTF has a proactive plan it has worked out with the State of New Mexico and the U. S. Environmental Protection Agency. "We have accomplished and agreed upon a plan that will work in undoing the past sins of the test facility," he said. "I do want our grandkids to be able to enjoy the outdoors the same way my generation has."

Fries said that protecting and watching over the environment at the test facility is part of NASA's mission: To improve life here, to extend life to there, and to find life beyond. ❖



NASA WSTF 0702-1751

Harold 'Coach' Harrison and Amanda Skarsgard are environmental scientists at White Sands Test Facility. Skarsgard and Harrison have cataloged, observed and located a fascinating variety of artifacts, snakes, rare plants and birds on the site.

Teamwork pays off

By Kylie Moritz

No one at JSC has ever won NASA's prestigious **Software of the Year Award** since its inception in 1994. That is, until now.

The hard work of an engineering team, led by Gerald "Jay" LeBeau, in the Aeroscience and Flight Mechanics Division has earned it this year's prize of \$50,100.

"This is great recognition – not only for our team, but for the division, engineering directorate and JSC as well," LeBeau said.

LeBeau and his team earned the award for their Direct Simulation Monte-Carlo (DSMC) Analysis Code (DAC) software, which simulates rarefied gas dynamic environments. Because tests to gain knowledge on the interactions of spacecraft and rarified environments are difficult and expensive to perform, the software has the potential of saving many millions of dollars.

It has been used to support many JSC programs, including the International Space Station, X-38, space shuttle servicing missions to the Hubble Space Telescope and the Shuttle-Mir program. Other NASA Centers have used it to analyze the Mars Pathfinder, Stardust, Genesis, X-33, X-37, Mars Global Surveyor and Mars Odyssey vehicles. The revolutionary software is even being used by other government agencies, including the Department of Defense, to provide critical design information for missile defense concepts.

The team members who worked together to create the software include JSC's LeBeau, Forrest Lumpkin, Katie Jacikas and Phil Stuart, and Langley Research Center's Richard Wilmoth and Christopher Glass.

LeBeau first came to JSC in 1987 through the Cooperative Education Program program. In the early 1990s, LeBeau was working with simulation software to analyze how shuttle jet thruster firings might affect a future space station during rendezvous and docking operations. It was then that he started writing a completely new software package from scratch with better analysis capabilities than the current software, originally developed at Langley Research Center.

The team members at JSC, all stationed in the same room in Building 16, have worked together to improve the software. As part of NASA's Professional Development Program (PDP), Lumpkin taught a class at Rice University on the theory of the DSMC method. LeBeau and Stuart attended that class, which provided the fundamentals for LeBeau to create the new software.

"It may have even helped that I was a little inexperienced with the subject because I wasn't afraid to try things that hadn't been considered before," LeBeau said.

In 1995, during a one-year rotation through the PDP, LeBeau began writing the new software with help from the team members at Langley. Wilmoth, who had much more familiarity in the field, served as a mentor to LeBeau, providing expert insight to the project. Glass helped by verifying and validating the upgraded software.

In 2000, Jacikas brought in fresh ideas when she began working on the project at JSC as a co-op student. With LeBeau's guidance, she helped implement new capabilities for the software and continues to work with the team as a permanent employee. Stuart has worked with the team to

integrate some of the software's post-processing capabilities.

The JSC team was co-awarded the Software of the Year Award with a team at Ames Research Center by NASA's Inventions and Contributions Board and Chief Information Officer.

"It is definitely an honor to be considered in the same league as the team members at Ames. I have a lot of respect for them and their work," LeBeau said. The software developed at Ames, Cart3D, is an aerodynamic simulation tool that provides designers and engineers with an automated, highly accurate computer-simulation suite that streamlines the conceptual and preliminary analysis of both new and existing aerospace vehicles.

More information about the winners may be found online at: <http://icb.nasa.gov/swoy2002/>.



NASA JSC 2002e36405 Photo by David DeHoyos

A NASA engineering team, led by Johnson Space Center's Jay LeBeau, was recently selected for the NASA Software of the Year Award. Pictured clockwise are the JSC team members who worked together to create the software: Katie Jacikas, Phil Stuart, Jay LeBeau and Forrest Lumpkin. Not pictured are Richard Wilmoth and Christopher Glass, two team members from Langley Research Center.

SPACE CENTER Roundup

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