Employees share joy of engineering

This year, JSC celebrated eight years of observing National Engineers Week when some 175 civil service and contractor employees visited elementary, middle and high school classrooms to encourage students to pursue careers in engineering, science, math and technology. The visits were part of a national outreach program called Discover “E” (“E” for Engineering).

This year’s activities continued into March. To reach more students this year, JSC’s Education and Community Support Branch partnered with Texas Education Agency’s Education Service Centers last August to distribute brochures concerning JSC’s JASON Project to about 3,000 Houston area teachers. “As a follow-on to that partnership, we developed a National Engineers Week invitation list that included some twenty school districts,” said Mae Mangieri, JSC’s National Engineers Week coordinator. “We were pleased that twenty-seven Houston Independent School District schools responded to our invitation to participate in this year’s program. In 1998, only eight HISD schools responded to our invitation.”

The volunteers shared their unique space-related knowledge with students and teachers as part of JSC’s commitment to the local educational community. During their classroom presentations, they engaged students by using a variety of hands-on experiments and visual props like space-suit items, helmets and gloves.

Howard Hu of JSC’s Guidance, Navigation and Control’s Design and Analysis Branch and Tara Jochim of Boeing’s International Space Station Communication and Tracking Group gave presentations on the International Space Station to several eighth grade classes at Webster Intermediate. Hu and Jochim presented a brief overview of the ISS including its mission, its design specification, the benefits of international partner participation, and the types of research planned on board the space station. The students were shown a video that provided additional information about the ISS and its research capabilities.

“I had a great experience talking about the space station at Webster Intermediate,” said Hu. “The students asked good questions and at times surprised me with how much they knew about the International Space Station. Some of the students with whom we spoke were just beginning a mini-course on the station, and I think our presentation provided them with a great starting point.”

For the first time, astronauts visited local area high schools, and the response on the part of teachers and students was outstanding. “It was very interesting to hear how an average high school student grew up to be an astronaut,” wrote Mark Stamp, chemistry teacher at Ball High School in Galveston about Astronaut Dan Tani’s visit. “The kids were impressed with the possibilities.”

Almost all of the evaluation forms received from teachers were highly positive about the JSC presenters. “Philip Curell and Rich Mrozinski were excellent guest speakers,” wrote fourth grade teacher Jan Romeis from Greentree Elementary School in Humble ISD about two JSC employees. “Their ‘team’ presentation was most informative, and this visit provided an excellent opportunity for our students and school to connect with our NASA resources.”

“Current information about the space station was very interesting for the volunteers,” said Yolanda Evans from Paul Revere Middle School in the Houston Independent School District. “I would like to continue with the space station theme and what it will mean to the students in the future.”

The visits to the local schools were as exciting for the teachers and students as they were for the volunteers. “I typically request to make my presentation to at-risk students at schools where the dropout rate is the highest,” said Michael Ruiz, aerospace engineer in JSC’s Aeroscience and Flight Mechanics Division. “Whatever positive change I can make in their lives, however slight, brings me joy. That’s the satisfaction I get out of participating in National Engineers Week.”

JSC’s Education Outreach Program provides volunteers for local schools year round, and new volunteers are always needed. As a volunteer, employees can help educators inspire students by participating as guest speakers, career day speakers, science fair judges, tutors and mentors. Time spent participating in an approved event is official duty time, and with supervisory approval civil service employees may charge their volunteer time to a special education labor code.
Shuttle veterans complete Hubble servicing crew

NASA HAS NAMED two veteran astronauts and a first-time flyer to the crew that will pay an early visit to the Hubble Space Telescope this October. Four experienced space walkers already have been training for the mission, designated STS-103, a nine-day flight to service and maintain the Hubble Space Telescope. Commander Curtis Brown, Pilot Scott Kelly and European Space Agency Astronaut Jean-François Clervoy will join space walkers Steven Smith, Michael Foale, John Grunsfeld and ESA Astronaut Claude Nicollier.

Part of the servicing mission that had been scheduled for June 2000 was moved up after three of the telescope’s six gyroscopes failed. Three gyroscopes must be working to meet the telescope’s very precise pointing requirements, and the telescope’s flight rules dictated that NASA consider a “call-up” mission before a fourth gyroscope failed. Having fewer than three working gyroscopes would preclude science observations.


Kelly, a member of the 1996 Astronaut Candidate class, will be a first-time space traveler. A lieutenant commander in the U.S. Navy, he reported to NASA in April 1996, completing two years of training to qualify for assignment as a shuttle pilot.

Clervoy will be making his third flight. As a mission specialist on STS-66, he used the shuttle’s robot arm to deploy the CRISTA-SPAS atmospheric satellite. On STS-84 in 1997, he visited the Russian Mir Space Station.

The four mission specialists already in training include Payload Commander Steve Smith, a veteran of two space flights. Smith brings extensive Hubble servicing experience to the crew, having performed three space walks on Hubble servicing mission STS-82 in 1997.

Foale is a veteran of four space flights, including a long-term stay aboard Mir, and 10.5 hours of space walking. He also serves as the assistant director, technical, of JSC. A veteran of two flights, Grunsfeld served on STS-67 in 1995, the second shuttle flight of the Astro observatory, and STS-81 in 1997, the fifth mission to Mir. Nicollier is another veteran of Hubble servicing, having flown on STS-61 in 1993, the first servicing mission. He flew two other shuttle missions in 1992 and 1996.

For 16 DAYS LAST YEAR, a crew of seven astronauts dedicated themselves to furthering our knowledge of the nervous system in an ambitious space shuttle mission called “Neurolab.”

The STS-90 crew supported 26 experiments in eight disciplines, focusing on basic research in neuroscience. Crewmembers served as both subjects and operators as they carried out the experiments using a wide array of biomedical instrumentation, including some developed especially for the mission. Crewmembers included Commander Rick Searfoss, Pilot Scott Altman, Mission Specialists Kay Hire, Dr. Rick Linnehan and Dr. Dave Williams, and Payload Specialists Dr. Jay Buckey and Dr. Jim Pawelczyk.

“Neurolab, which was NASA’s hallmark contribution to the ‘Decade of the Brain,’ has been recognized as the most scientifically sophisticated and technically complex life sciences mission ever undertaken by NASA,” said mission scientist Dr. Jerry Homick of JSC. “As the result of a dedicated effort by the entire science support team and the crew, all of the scientific objectives of the mission were met, and in some cases exceeded. The data from Neurolab will significantly increase our understanding of how the nervous system and brain develop in and adapt to microgravity spaceflight, and will provide new insights regarding the diagnosis and treatment of neurological disorders experienced by people on Earth.”

Scientists will present preliminary results of the research conducted on Neurolab at a symposium in Washington, D.C. April 14-16.

Earlier this month, to commemorate NASA’s support of neuroscience research, and as the one-year anniversary of Neurolab approaches, Dr. Joan Vernikos, director of the Life Sciences Division at NASA headquarters, presented a banner flown on the STS-90 Neurolab mission to David Maloney, chair of The Dana Alliance for Brain Initiatives. She made the presentation March 17 at a luncheon in the Russell Senate Office Building in Washington, D.C., to mark Brain Awareness Week (March 15-21).

Now in its fourth year, Brain Awareness Week unites the Society for Neuroscience with The Dana Alliance and a coalition of more than 440 science, advocacy and other health organizations that share an interest in elevating public awareness of brain and nervous system research. Also taking part in this year are Jim Pawelczyk, left, payload specialist, and Richard Linnehan, payload commander.
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tlood makes life possible. And this miraculous fluid enables hospitals to function. These were the primary messages about a dozen JSC employees who were given during their recent tour of St. Luke’s Episcopal Hospital. They got a firsthand look at how blood donated to St. Luke’s during JSC’s annual blood drive is put to use saving lives. Attendees toured the cardiac catheterization laboratory, the Texas Heart Institute and the blood lab and viewed a cardiovascular operation in progress.

“About fifty times each year, we intervene using a tunneled ventricular assist device,” said Dr. Arthur Bracey, medical director, Blood Bank and Transfusion Service, St. Luke’s Episcopal Hospita! “These devices take the place of the normal heart function. We wouldn’t be able to perform these surgeries without blood donations. Ten to twenty units of red blood cells are needed to do this surgery.”

Since 1992, there has been a continued increase in the use of blood. More than 100 units of blood are transfused at the hospital on peak days. Cardiovascular surgical patients receive more than 50 percent of all blood donations. Coupled with this increasing demand for blood, the existing donor base has been declining due to the age of baby boomers. Modern medicine has developed numerous new procedures to save lives. These include bone marrow and liver transplants, new cardiovascular procedures and a range of other aggressive therapies. But none of this progress would be possible without blood products. In addition, according to Bracey, “we wouldn’t be able to make advances in treating sickle cell anemia, immune deficiency, cancer and other diseases without blood donors.”

Given the additional testing that blood donors must now undergo, maintaining an adequate blood supply is a challenge for the hospital. And donors who give on a consistent basis—such as many JSC employees—are rare finds. “Many of you have donated blood many times,” said Stephanie Logsdon, manager of the Blood Donor Program, St. Luke’s Episcopal Hospital. “That’s really an advantage for us when we have to talk to patients and their families about the safety of our blood supply. I can point out just why this matters so much. Not only do I have years of testing on many of you, but we have many patients who have been trans- fused and done well with your blood.”

St. Luke’s personnel have learned how to increase the blood donor base from their association with JSC. “I want to thank you all for what you do for us,” said Linda Wesley, administrative direc- tor, Department of Pathology, St. Luke’s Episcopal Hospital. “When we talk about how we might increase our donor base, we try to learn from you because you do a terrific job of bringing in new donors year after year.”

During JSC’s cardiac catheterization laborato- ries are the largest and most fully equipped catheterization labs in the world. More than 10,500 diagnostic and cardiac catheterization procedures are performed in the cath labs annually. In cardiac catheterization, a thin catheter is inserted through an artery or vein and advanced into the major vessels and heart chambers. Depending on the type of test, the physician may, under pressure, view the inside of blood vessels, widen a narrowed heart valve, or clear a blocked artery.

Located in St. Luke’s Hospital, the Texas Heart Institute is a nonprofit orga- nization devoted to advancing the under- standing and treatment of cardiovascular disease through programs in research, education and patient care. Its work is made possible by a combination of philan- thropy, government grants and research contracts.

According to Mike McGee, vice presi- dent of research administration, Texas Heart Institute, researchers are currently developing new heart pumps and new artificial heart valves and gene therapy—releasing genetically engi- neered materials into the heart to cause cells to behave properly—has also begun. Attendees ended their visit with a tour of the blood lab and a demonstration of how blood is tested, centrifuged to break the cells down, how blood is tested, packaged and stored.

JSC/CCISD team prepares for pillow fight in Orlando

By Norm Chaffee

The Phillips Gymnasium in Pasadena was the site of a practice pillow fight on February 21 as JSC’s robot sparred with a robot from Pasadena ISD for team this year’s robotic competition.

For the third year, JSC and contractor engineers and machinists are training with students and teachers from the Clear Creek Independent School District to enter the annual national robotic competition sponsored by FIRST (For Inspiration and Recognition of Science and Technology), to be held in late April for the fifth consecutive year at Disney’s Epcot Center in Orlando, Fla.

FIRST, a nonprofit educational organization, promotes the development of engineering, science and technology among high school students by sponsoring annual robotics competitions across the country. This is the eighth year that the organization has sponsored a national competition.

A series of seven regional competi- tions were held throughout the country in February and March, prior to the nationals. A total of 281 teams will be competing in the national competition, sponsored by NASA Headquarters and field centers are sponsoring several teams again this year. Regional competitions are being hosted at Ames Research Center and at the Kennedy Space Center. Teams are comprised of high school students and teachers working in tight collaboration with engineers and machinists from sponsoring organizations.

The competition simulates a real-world project in which the teams have only a seven- week period to conceive, design, build, test, modify and train with their robot prior to shipping it to the competition site. This year the teams received the competition requirements and rules on January 9 and were required to ship the completed robot by February 24.

“We’ve got an awesome robot this year,” said Terry Brandhorst, the K-12 science coordinator for CCISD, who organized the student and teacher involvement this year. “And we wrapped it up with plenty of time to spare,” boasted Scott Askew of JSC’s Automation, Robotics and Simulation Division, who was JSC’s team leader, as he watched the robot depart from the practice area in Bldg. 9 on February 24.

The JSC/CCISD team includes students and teachers from Clear Creek, Clear Brook, and Clear Lake high schools, and engineers and machinists from several JSC divisions and contractor organizations. Other teams in the Houston area include Pasadena ISD/Houston Lighting and Power Co.; Friendswood ISD/Oceanering Space Systems; Houston ISD (Booker T. Washington Engineering Magnet High School/Brown and Root/Etxon); and Conroe ISD (Oak Ridge High School/Hatch).

This year’s unique competition game, devised by the mechanical engineering faculty and students at the Massachusetts Institute of Technology, requires two teams of two robots each to compete with one another during a series of two-minute rounds in a 24-foot by 27-foot rectangular arena. Within the arena is a movable six-foot-wide octagonal platform called the “puck.” It is five inches high and mounted on casters so that it can be moved.

The game requires the robot to pick up thin circular items, called “floppies,” that are 30 inches in diameter. Each floppy has a central Velcro button and a strip of Velcro around its periphery, which can be used to pick it up. Each robot scores one point for each floppy they can pick up. The score increases to three points per floppy if the robot can raise it at least eight feet in the air. In addition, if the robot can use the “puck” to lift itself at least two inches off the ground, the floppy score is tripled. The robot may elevate itself by grabbing the “puck” or by climbing up on it. And finally, if the puck can be shoved into the opponent’s side of the arena when the match time expires, all other scores are doubled.

Each team has ten floppies, and the floppies can be loaded onto the robot by a lifting device on the machine or can be placed or thrown onto the robot by a human player who must stand in a pre-designated location. The robots are driven by radio control by the student members of the team. The robots are equipped with locomotion, steering, picking up floppies, lifting the floppies above eight feet, turning off the floor, and controlling the puck.

In each competition two robots are randomly paired just prior to the match. The teams must devise a cooperative strategy to jointly acquire and control the floppies and the puck, while attempting to feel the efforts of their two opponents. This is the first year in which the game involved an alliance among robots.

To prepare for this year’s national competition, the local area teams arranged for a mini-competition at Pasadena ISD’s Phillips gymnasium on February 21. The CCISD and Pasadena ISD robots were able to participate in the competition and successfully demonstrate their capabilities, viewed by a crowd of interested spectators, parents, teachers and students.

The enthusiasm and spirit of the JSC/CCISD team at the Pasadena mini- competition was so high that great results are expected in Orlando. But the students themselves demonstrate the best results of the competition. “Several kids who didn’t know anything about engineering were now planning to study engineering in college,” said Josh Mehling, a Clear Creek High School senior and one of the student leaders of the team. And privately he admitted that the last two years’ work on the team has helped him gain admission to several fine universities and receive substantial scholarship offers. That’s the kind of result that really counts.
Please Pardon Our Dust
The Construction Projects
Roundup at JSC

By Robert P. Kehoe

A lot of construction is happening around Johnson Space Center. More projects are planned.

“We are proud to be doing what it takes to keep the center operating day-to-day,” said newly appointed Center Operations Director Bill Parsons. Construction projects are part of that effort. “We are committed to having a robust construction program by doing more with the resources we have,” he said. “A robust construction program fits in well with the Center Operations Directorate goal of providing products and services that make JSC a dynamic and vital center for the nation’s future.”

COD functions include logistics, environmental compliance, security, facility engineering, and maintenance and operations. The directorate and the Base Operations Support Services contractor, Brown & Root Services/Pioneer, form a strategic team for meeting JSC’s infrastructure needs.

The Construction Office, part of the Plant Engineering Division, manages construction projects at JSC. Five civil servants manage construction activity at the center. They team with Gilbane Building Co., which provides independent construction inspection and management services.

“Most of our recent construction activity that you have been seeing is either repair, modification, or rehabilitation work,” said Bill Roeh, chief of the Plant Engineering Division. “We have not had the thrust of large, new construction projects like there were seven or eight years ago in support of the International Space Station.”

A number of construction projects are either in progress or just being completed:

- A $1 million project to replace a cooling tower on Bldg. 30, the mission control complex. Contractor BRSP is about half-way through the $5 million project. It includes replacement of the huge 2,000-ton capacity cooling towers behind Bldg. 44, the Emergency Power Building, with an additional 500-ton chiller. This project will allow greater flexibility and reliability in providing emergency power to Mission Control.

- Construction at JSC is a total team effort,” said Grady Owens, chief of the Facility Development Division. Its design engineers, the Plant Engineering Division Mechanical Operations Office engineers, Electrical Operations Office engineers, the BJ3 procurement staff, NT2 safety staff with Hernandez Engineering Inc. safety engineers, JB2 security engineers, the BJ3 procurement staff, NT2 safety engineers, JSC project engineers, and the Gilbane Construction Co. project engineer.

- The Construction Projects Management Office teams with Gilbane Building Co. which provides independent construction inspection and management services. It is the last of a series of projects that have revitalized the substation. It is the last of a series of projects that have revitalized the substation.

- A $5 million phase of major upgrades to the Central Heating and Cooling Plant, Bldg. 24, is half finished. Five of the huge 2,000-ton capacity cooling towers behind Bldg. 24 are being replaced by C. L. Vick Construction Co., Inc. Two of the new towers have to be finished before Houston’s warm weather. The three others will be replaced next winter.

- The $5 million phase of major upgrades to the Central Heating and Cooling Plant, Bldg. 24, is half finished. Five of the huge 2,000-ton capacity cooling towers behind Bldg. 24 are being replaced by C. L. Vick Construction Co., Inc. Two of the new towers have to be finished before Houston’s warm weather. The three others will be replaced next winter.

- The male-long trench on the south side of Avenue B is part of the installation of 12 new fiber optic links between Bldg. 44 and the Sonny Carter Training Facility for ISS communications system testing. Contractor TCI Network Solutions should complete the work in early April.

- Major modifications at Bldg. 29 will accommodate the new Bio-Plex complex. This $2 million project in the building’s old “WEIT” includes four new 15- by 30-foot steel cylinders and backup utilities for closed cycle, controlled growth environmental experiments.

- The 200 and 300 areas have just had their overhead high-voltage electrical wires replaced by a $1 million project. The construction contractor was Barnes Electric.

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- The Bldg. 48 Chiller No. 2 in Bldg. 48, the Emergency Power Building, is being replaced to add to backup cooling capacity to the Bldg. 30, the Mission Control complex. Contractor BRSP is about half-way through the $600,000 project.

- Another Bldg. 48 project involves installation of a new transformer. The $500,000 project will allow greater flexibility and reliability in providing emergency power to Mission Control.

- "Construction at JSC is a total team effort,” said Grady Owens, chief of the Facility Development Division. Its design engineers, the Plant Engineering Division Mechanical Operations Office engineers, Electrical Operations Office engineers, the BJ3 procurement staff, NT2 safety staff with Hernandez Engineering Inc. safety engineers, the Gilbane Construction Co. project engineer, and the Gilbane construction engineers “really make for an effective team,” he said.

- The team guides each project through the definition phase, the design phase, and finally through the construction phase, which generally takes three to four years. “The people who work these construction projects are challenged in some very unique ways,” Owens said. “It’s apparent that they are having some fun along the way.”

- “If you think these projects are fun,” said Parsons, “wait until we build the proposed 10-acre simulated Lunar and Mars landscapes along Avenue B. It will be a great place to take a break and reflect on the space program and its future.”
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what types of space-suits will be required to support long-duration human space flights planned for the next millennium? NASA will need advanced spacesuits and life support systems that will be able to withstand extended space walks to operate the International Space Station or travel back to the moon or on to Mars. Beyond developing new suits and life support systems, new gloves, helmets and computers are being developed to meet increasing performance demands. The space-walking astronaut travels in a personal spaceship, complete with propulsion, communications and thermal control systems. New technologies are creating new products to fill needs in each of these areas.

“In the space-walking world, we think of the astronaut as embodying the whole spacecraft in miniature,” says Mike Lawson, NASA project manager of the Advanced Technology Spacesuit Project. “All of the systems that are in a spacecraft are in this one-person spacecraft. That’s what makes this particular area very unique. While most people work on one element or system, we work on almost all of them.”

Members of JSC’s Advanced Technology Spacesuit Project team, including civil servants and Lockheed Martin employees, are currently developing and evaluating new spacesuits and life support systems for three different missions: post-assembly station flights, lunar missions and missions to Mars. The next-generation spacesuit and life support system could be similar for all three missions except for hardware for the Mars mission, which will require unique carbon dioxide removal and thermal insulation systems.

“We’ve changed our philosophy from looking at what spacesuit provides the best mobility to considering the weight of the spacesuit as well,” adds Lawson. “The objective now is to make spacesuits more mobile and lighter.”

Those suits may be used for ISS operations. Beyond that, NASA has no official plans for a human space flight back to the moon or on to Mars, but the Advanced Technology Spacesuit Project team has to be prepared for whatever missions may come along. As a major part of this effort, outside contractors are developing the new spacesuits, while civil servants and Lockheed Martin employees are designing the life support systems on site.

New helmets and computers are also being developed. Advanced communication systems will be integrated into the helmet. To deliver visual information, a retinal or heads-up display as well as a TV monitor could be incorporated into the helmet. To clear the chest area where the controls for the suit are located, NASA plans to move all controls to a computer mounted on the astronaut’s arm or wrist.

“We are also continuing to investigate various developments towards enhancing glove mobility and locomotor comfort,” says Joe Kosmo, NASA’s senior project engineer for advanced spacesuit development. In the life support arena, three designs have been proposed as replacements for the current 165-pound Portable Life Support System. All three are suggested ways of packaging life support system components (such as the oxygen module and the ventilation loop). Each design is flexible enough to accommodate whatever equipment is needed to support station, lunar or Mars missions.

Two prototype suits were recently delivered to JSC. The first is from ILC in Fredrica, Del. Called the I-suit, it is a lighter version of NASA’s current 125-pound spacesuit. It has a soft upper and lower torso with minimum use of bearing “joints.” The suit weighs 65 pounds (without life support).

The second prototype, from David Clark Co. in Worcester, Mass., was designed to have fewer metal bearings to reduce weight. The suit is modeled after the NASA escape suit worn for emergency escapes during shuttle liftoffs and landings, but with several additions and modifications to the joints. Fabric toroidal joints in the knees and hips are flexible without being heavy. The suit weighs in at a slight 26 pounds.

Members of Motherboard Team are, from left, front: Howard Slade, team lead, Lockheed; Luis Trevino, NASA; back: Kevin Groneman, ILC; Kase Urban, ILC; Robert Trevino, NASA; Eric Kanon, Lockheed; Mark Swan, ILC; Sharon Luteau, NASA.

1. LEGO Team members are, from left, front: Heath Paul, NASA; Mary O’Connell, team lead, Lockheed; Luis Trevino, NASA; back: Kevin Groneman, ILC; Kase Urban, ILC; Robert Trevino, NASA; Eric Kanon, Lockheed; Mark Swan, ILC; Sharon Luteau, NASA.

2. Foam Team members are, from left, front: Wendel Smith, ILC; Kevin Groneman, ILC; back: Heath Paul, NASA; Kase Urban, ILC; Richard Stimson, Lockheed; Scott Andrea, Lockheed; Eric Kanon, Lockheed; Mike Rouen, NASA; Mark Swan, ILC.

3. Members of Motherboard Team are, from left, front: Howard Slade, team lead, Lockheed; Heath Paul, NASA; back: Siraj Jalali, Lockheed; Heath Paul, NASA; back: Siraj Jalali, Lockheed; George Kessler, OSS; Tres Smith, OSS; Cyle Sprick, OSS; Eric Kanon, Lockheed; George Kessler, OSS; Jeff Templeman, OSS.
EUROPEAN SPACE AGENCY ASTRONAUT

By Mary Peterson

It was Night, on a road not heavily traveled. A man on his way home, when suddenly his car smashed into a bridge, injuring the driver seriously. It would have been just another wreck and may have gone little noticed, except the driver was famed country singer George Jones, and the cause of the wreck was believed to have been, at least in part, the result of his talking on a cellular phone.

In still another incident, reported by the National Highway Traffic Safety Administration, a woman was driving her minivan on a rural road near her home when she became startled by the ring of her cell phone. As she reached over to retrieve the instrument from its bracket, she drifted off the road to the right, sidescaping a tree. Her child, in the right front passenger position, died as a result of head injuries received in the collision.

There are countless, similar stories. Even JSC has not been immune: A close call was reported when a car driving on 2nd Street, adjacent to the Bldg. 17 parking lot and heading toward the Saturn Lane exit, narrowly missed hitting a pedestrian in the crosswalk. The pedestrian, at midpoint, had looked both ways and, thank goodness, was paying attention. The driver, who was busily talking on a cell phone, did not stop, and never appeared to notice.

What was once thought of as a novelty used primarily by business has now become commonplace among the masses, with the NHTSA estimating the current number of cell phones in use nationwide at 54 million – a number that could double by the year 2000. And the road hazard is expected to get worse.

“As cars more and more become an extension of the home and office, we’re creating a whole new array of potentially hazardous distractions,” says NHTSA Administrator Ricardo Martinez. It is, admittedly, hard to practice defensive driving when you’re talking on the phone.

“But, to increase concentration and cut your risk, there are things you can do,” suggests Barb Buchholz of the AAA.

Dialing for disaster

By Mary Peterson

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By Mary Peterso
By Matt Lemke

TEAMWORK has long been the foundation on which many NASA successes have been built. One latest success involves the Space to Space Communications System.

Mark Chavez, David Lee and Matt Lemke of the Avionic Systems Division and Mark Schnualz of the Systems Engineering Office have led a large, diverse group of contractors and civil service professionals who have created a communications network capable of linking the International Space Station, the orbiter, and space walking astronauts simultaneously.

The radio system was flown successfully during the STS-95 mission. Astronauts aboard STS-96 and later flights will use it as their primary communications system for spacewalks. Plans call for the station radio to be launched on Flight 5A with the U.S. Laboratory Module, and SSCS will become fully functional during Flight 6A when the station’s external antennas are installed.

The project began in 1991 as a study of how to enhance the capabilities of the current communications system while providing the new capabilities required for the space station. A state-of-the-art time division, multiple access radio network was selected to provide digital-quality audio communications among up to five radios simultaneously. This capability will be essential for station assembly flights to allow multiple space-walking astronauts to communicate with both the orbiter and the station. In addition to providing voice communications, the radios can transmit status and crew health data to the orbiter and the station and exchange information between the orbiter and station computers.

To accomplish all of these tasks simultaneously, each radio has a custom designed modem that operates more than 10 times faster than the best commercial modems available today.

The SSCS consists of numerous pieces of hardware from around the country. Radars were designed and tested in the Avionic Systems Division with a joint NASA and Lockheed Martin team. After the initial design was completed, Litton Amecon in College Park, MD, joined the team as the manufacturer and worked in a concurrent engineering role to ensure the radios would be easy to build. Boeing, Litton and Lockheed Martin designed and built antennas.

As anyone with a yard in Texas can attest, typical landscapes are also major water users and can account for well over half the residential water consumption during the summer months. By providing a demonstration conservationscape, JSC and Clean Water for Armand Bayou hope to increase awareness of residents in the Houston and Clear Lake area of alternate landscape options and their beneficial effect on local water bodies.

Clean Water for Armand Bayou is a federally funded program administered by the Texas Agricultural Extension Service, "As a part of a larger project to demonstrate clean water practices in both residential and agricultural settings. The Texas State Soil and Water Conservation Board and the Armand Bayou Nature Center join TAES in this cooperative effort. Clean Water for Armand Bayou is building several demonstration conservationscapes throughout the Armand Bayou watershed, most notably the Hanson House Conservationscape at the Armand Bayou Nature Center."

The team of Dr. John Jacobs (TAES) and Colin Slackeford (Texas A&M) with Clean Water for Armand Bayou, Ivy Alexander, project manager for JSC’s Tolman Grounds, Pat Kolkmann of J2’s Mechanical Operations Office, and Sandy Parker of JSC’s Environmental Services Office all worked closely with Mark Fox Landscaping (who provided the final design and installed the plants) on the conceptual design. The low flow irrigation system was designed, provided and installed by the TAE Services.

For more information on conservationscapes, call Dr. John Jacob at 281-291-9022.
Key Management Assignments

Kevin Watson moves from the International Space Station Program Office to the Engineering Directorate.

Promotions

Carolyn Wooten was named chief, Biomedical Hardware Development and Engineering Office, Engineering Directorate.

Retirements

Manuel Avila, a professor at the Center for International Space Law, is retiring.

Figure 1: A NASA-industry team has used the results of space research to develop new flu-fighting drugs.

Dr. Ming Luo, a professor at the Center for Macromolecular Crystallography at the University of Alabama at Birmingham, adapted a laser system from an atmospheric testing environment to expose the virus to the development of symptoms in those exposed to the virus.

The mapping exposed the virus' weaknesses in greater detail and our industrial partners were able to develop a drug that exploits those weaknesses.

Dr. Ming Luo, a professor at the Center for Macromolecular Crystallography, and an international team of crystallographers developed the "molecular map" of the flu virus from space- and ground-based research.

Scientists from Langley Research Center have used the results of space research to develop new flu-fighting drugs.

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