SPACE CENTER
Roundup

September 8, 2000

VOL. 39, NO. 18 LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEXAS

New Mission Control Room portends increasing pace of human space flight, rapid space station expansion

By James Hartsfield

In the next 18 months, the International Space Station will grow to be the largest spacecraft ever built, but before it is assembled in space, the station will be put together dozens of times by flight controllers in a new Mission Control training room opened in early August.

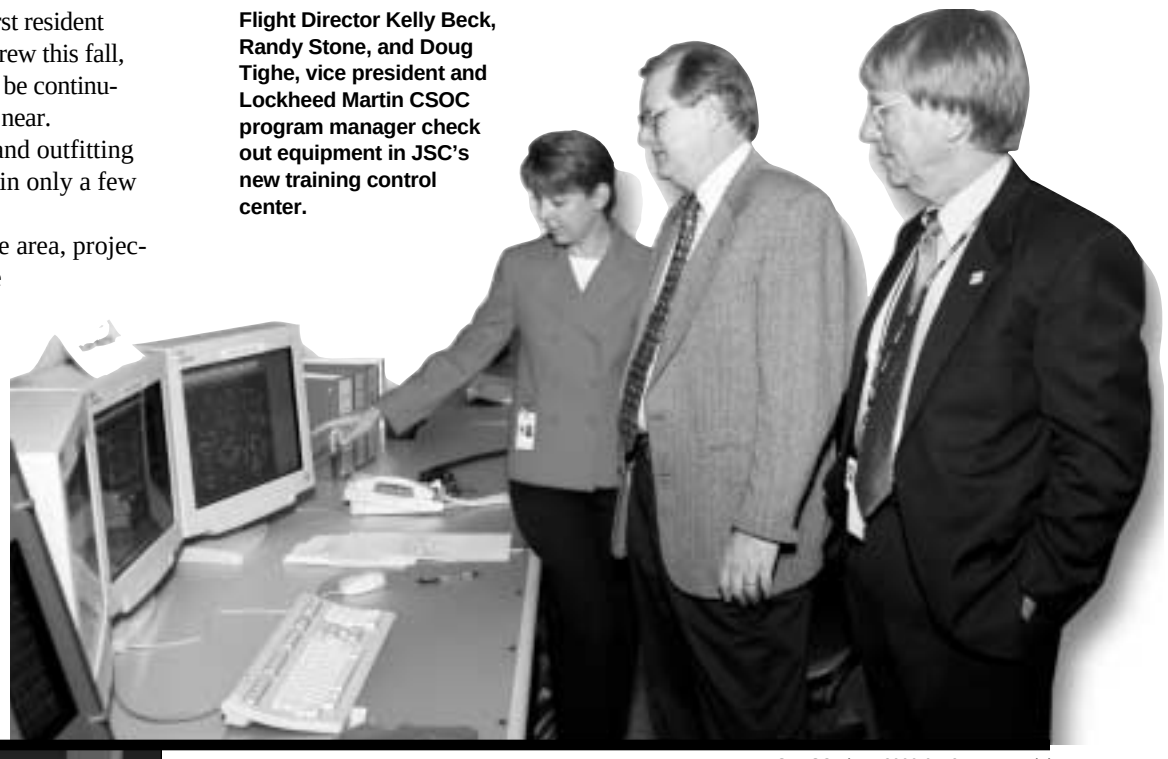
The new training flight control room, a replica of the control rooms used to operate the space shuttle and the International Space Station, has begun training teams to oversee upcoming station missions. The new room is located in the Mission Control Center building, adjacent to the most famous of all control rooms – the Apollo Flight Control Room from which controllers monitored the lunar landings.

"Opening this room is a milestone – it prepares us for the start of a new era in Mission Control beginning in just a few months. It will be an era where 24 hours a day, seven days a week, year after year, teams in Houston will be working with astronauts in space," said Flight Director Kelly Beck. "When a crew begins living aboard the International Space Station this fall, this new room will become our primary training ground."

Several times during the past few years, studies of future mission training indicated another facility would be needed to train flight control teams when the Space Station Flight Control Room and the Space Shuttle Flight Control Room were occupied with flight activities. However, due to higher priority space shuttle and space station control center changes, a dedicated training facility was not pursued and interim solutions using existing facilities were used. As operations in Mission Control continued to increase, the need for a dedicated facility was addressed again last year. Like the previous studies, that study showed that with the launch of the first resident International Space Station crew this fall, the time when all rooms will be continuously occupied was drawing near.

The actual construction and outfitting of the room was completed in only a few months.

"We had to take a storage area, projection room and project office located behind the historic Apollo control room and transform that space into a new training control center in just six months," said Doug Tighe, vice president and program manager of Lockheed Martin Space Operations' Consolidated Space Operations Contract. "That's really operating at warp speed."



Flight Director Kelly Beck, Randy Stone, and Doug Tighe, vice president and Lockheed Martin CSOC program manager check out equipment in JSC's new training control center.

NASA JSC Photo 2000-05585.James Blair

NASA JSC Photo 2000-05586 by James Blair

JSC's new Flight Control Center provides a venue exclusively for training.

Construction work in the new room was performed by BRSP, Inc., a task that involved designing and remodeling in a manner that ensured the changes did not interfere with the permanent preservation of the neighboring historic Apollo room.

In 1994, an entire new version of Mission Control was ushered in that replaced the antiquated, custom mainframe computer system with a new system of commercially available workstations. The new system increased the capabilities of the control center and reduced operating costs.

"Ten years ago, we could have never developed a new room so quickly," said Lynn Vernon, project manager for the control center's development. "The architecture we have now allows us to build and operate this training room without interrupting ongoing control of space shuttle flights or the space station in other rooms."

The new room includes 17 consoles and large front projection screens, identical to those in the flight control rooms. Like the rooms used for flight operations, the training flight control room can be linked to astronaut training facilities around the Johnson Space Center and other space flight control centers around the world. The flight controllers that will use it helped lead the effort to develop the new room.

"We want to train the way we fly and fly the way we trained, so we needed a training room that was almost identical to the rooms we use during a flight," explained Rick Gavin, who headed the Operations Cadre, a group that represents flight controllers and control room developers, during much of the room's development. "The hard part was to determine where it would go and how we could put it together by the time it was needed."

The team surveyed all of the floor space in Bldg. 30, and came up with a list of almost 20 rooms. But virtually all of them already were in use for critical activities. With those eliminated, the list was narrowed to three or four possibilities, Gavin said. Of those, the Apollo control room's "back room" was the leading candidate, but there were concerns about altering the historic preservation of the neighboring room. The group contacted the Texas State Historical Preservation Office for an opinion on a slight modification to one wall of the Apollo projection room.

"We contacted the office's regional representative for southeast Texas, and they came to visit," Gavin said. "After that tour, they came to the conclusion that the small alteration needed to create the training room would not affect the historical preservation of the Apollo landmark." Permission to modify the room and begin construction work was granted in February of this year.

"I think a major part of the success in developing this room quickly was the work that was done to put the requirements for the room together and to stick with those requirements through to the project's completion," Gavin said. "Everyone, contractors, flight controllers and representatives from every directorate involved, has just done an excellent job." ■

Dr. Robert R. Gilruth, center's first director, dies at 86.

Story on Pages 4-5

Robert Gilruth was a true pioneer in every sense of the word and the father of human space flight. His vision, energy and dedication helped define the American space program. His leadership turned the fledgling Manned Spacecraft Center into what it is today, the leader in humanity's exploration of outer space. He will be greatly missed.

–JSC Director George W. S. Abbey

JSC opens world-class Child Care Center

More JSC parents will be able to enjoy the convenience and security of on-site child care with the opening of the new, larger JSC Child Care Center earlier this month. The new facility, which opened its doors August 16, expands capacity nearly 70 percent and features many modern, child care center innovations.

"I am extremely pleased with how the JSC team pulled together to create a world-class facility that will help serve the needs of families in our workforce," said Center Director George Abbey. "They can now take advantage of this wonderful new facility, where the children will receive guidance and loving care while their parents support the center's programs and build a future for their sons and daughters."

NASA JSC Photo 2000-05671 by James Blair

The ribbon is cut on JSC's new Child Care Center. Space Education board members, joined by Center Director George Abbey, made the opening official at a ceremony August 16.

The new Child Care Center has nine classrooms, a commercial-grade kitchen, nursing room, laundry room, cafeteria, staff lounge and several offices. But it's the numerous features that have the parents and staff referring to the building as the "Cadillac of child care centers." Some of the center's features include half walls that increase visibility for the staff and two-way viewing mirrors in the corridors for watchful parents.

NASA JSC Photo 2000-05672 by James Blair

JSC's new Child Care Center features many new amenities such as a computer lab, video monitoring, half-walls and a commercial-grade kitchen.

"We toured all of the area's top day-care centers to see what the latest trends were; what worked and what didn't work," said Kristy Hirning, executive director for the JSC Child Care Center. "I studied all of the benefits and we assessed what we wanted and incorporated it into our plans."

Other amenities include video recorders in each room that can be viewed from the waiting room, an indoor play area, a computer lab with 16 PCs, an intercom system and a revamped playground designed by the parents that features unique, age-appropriate play structures.

The new Child Care Center is more than 13,000 square feet and will expand occupancy to 116 children and a staff of 28 adults.

"We were only given a year to have this facility designed, constructed and ready to open for the next school year, so we used the design/build process to streamline procurement time," said Henry Wyndon, project manager.

Constructed in five months, the new center will help accommodate the growing demand for on-site child care of JSC employees and contractors.

Hirning says the new facility's capacity has eliminated the waiting list for toddlers and two-year-olds. Because there is limited infant care in the Clear Lake area however, a waiting list still exists for newborns.

"There's a widespread myth that the waiting list for the Child Care Center is several years, but that is not the case," stresses Hirning. "We can accept toddlers and two-year-olds, and if a waiting list does develop, it is not that long."

The original Child Care Center opened ten years ago and quickly filled to capacity. An annex building was constructed to increase the center's capacity up to 78 children and 17 adults; however, the effects of Houston's high humidity on the wooden floor, combined with normal wear and tear, necessitated that the main building be replaced.

The new Child Care Center can accommodate 116 children, from infancy to kindergarten, and a staff of approximately 28 adults. The new facility, Bldg. 211, is a 13,292-square-foot, light steel frame facility, with a metal roof, and stone exterior wall cladding. It is heated with natural gas instead of electricity to reduce energy costs. The facility meets the accreditation requirements of the National Association for the Education of Young Children and allows for possible future expansion of the facility to the east to accommodate a total capacity of 224 children and 44 adults. ■

SPACEHAB, Inc. receives ISO 9001 certification

Shown here, left to right, are OTS Quality Registrar Ron Platt; Director, Quality System, Jim Schultz; SPACEHAB President David Rossi; and U. S. Congressman Nick Lampson.

On July 14, 2000, SPACEHAB, Inc. and its subsidiary company, Johnson Engineering, earned ISO 9001 certification upon completion of an external ISO registrar audit.

At the certification ceremony held on August 8, Ron Platt, manager of certification, OTS Quality Registrars, formally presented the official certificate to SPACEHAB President, David Rossi. According to Platt, "Only two percent of the companies audited by OTS Quality Registrars have been certified without any major or minor non-conformances on the initial audit."

David Rossi gave credit to Jim Schultz, director, SPACEHAB Quality System, for doing an outstanding job in getting the company so well prepared for the audit. United States Congressman Nick Lampson, who took time from his busy schedule to participate in the ceremony, congratulated the company employees for achieving this important milestone. ■

EAA awards annual scholarship

JSC's Exchange Scholarship winner for 2000 is Elizabeth Lesenski, daughter of Kevin Lesenski of the Aircraft Operations Division at Ellington Field. She is a May 2000 graduate of LaPorte High School, finishing in the top 20 percent of 402 students. Her plans are to attend San Jacinto College and later transfer to the University of St. Thomas. She plans to major in history and education and become a history teacher.

The NASA Exchange College Scholarship is an annual award to provide financial assistance for dependents of JSC civil service employees to attend college. Applicants are evaluated on the basis of academic achievement, financial need, and involvement in school or community activities. The scholarship winners may pursue any course of study leading to a recognized degree at any accredited college in the country. ■

NASA JSC Photo 2000-05486 by Benny Benavides

Elizabeth Lesenski, daughter of Kevin Lesenski from JSC's Aircraft Operations Division, is the 2000 JSC Exchange Scholarship recipient. The student was joined by her grandparents Ray and Frances Zann (shown left to right), father Kevin Lesenski, sister Christina, and mother Monica, as she received the award from Director George Abbey (far right).

Awareness, intervention keep JSC free of workplace aggression

JSC is one of the best places to work. According to a survey of federal employees, NASA was ranked the most satisfying federal workplace in America. Our ranks are filled with bright, professional, well-taken-care-of individuals. We have a management team that makes our safety our highest priority and we all work on high-profile projects that are endeared by people the world-over.

Because of some of these factors, NASA is very fortunate to have a very low occurrence rate of workplace assault or violence. However, our comfort level should not transcend into complacency.

Increasing awareness of the causes and early indicators of workplace volatility can be the best prevention. Experts say the few instances of workplace conflicts at JSC could have been avoided by taking action earlier but we don't always know how to identify or respond to the signs.

"Our low occurrence rate actually makes JSC more vulnerable to workplace violence," says Jackie Reese, director of JSC's Employee Assistance Program. "Because we have few incidents, we are less familiar with how to respond to the ones we do have."

Reese says there are signs that can help employees identify potential problems. Changes in behavior over a prolonged period, such as a change in attendance, mood, personality or even productivity, can be an indicator of an impending problem.

Additionally, being aware and respectful of trauma in our coworkers' lives can help avoid emotionally triggered outbursts. Illnesses, extreme stress, personal loss and relationship complications such as divorce, can lessen their ability to contain feelings, according to Reese.

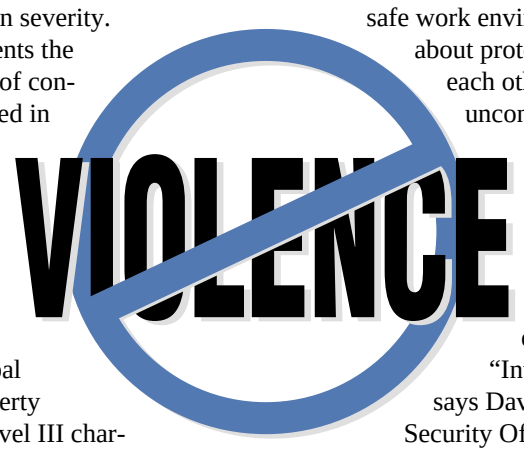
"Be mindful of your own behavior," adds Bob Hall of JSC's Human Resources Office. "Be sensitive about the words you use and take care to ensure that what you say and how you say it won't be misconstrued and won't provoke others."

The workplace is far different than it was only a few generations ago, and the way you communicate may be more important than you think. Inappropriate jokes or commentary regarding workplace violence should be avoided.

"Employees have been reported, as they should be, for joking about 'going postal' or similar conversations," said Reese. "The climate does not allow for that anymore. It's too serious an issue."

In fact, JSC has released an updated policy and guidelines on workplace violence and threatening behavior. The new policy will be distributed as JSCA 00-047 and can be reviewed online via the JSC internal Web site Announcements link. The announcement outlines behavior symptomatic of workplace violence, recommendations and required action for employees. The policy applies to all JSC civil service employees, detailees, contractors and visitors.

Conflicts are categorized into three levels, based on severity. Level I represents the earliest stages of conflict, represented in veiled threats or even inappropriate tones. Level II includes threatening gestures, written or verbal threats or property abuse. And Level III characterizes the escalation of conflict including scuffles, assaults or a loss-of-control event creating fear of imminent harm. From the earliest stages, employees should report incidents to their supervisors.



"Talk to your supervisor no matter how insignificant you may feel an incident was," says Reese, who also says one of the most popular misconceptions regarding workplace conflict is that it will solve itself and go away. "If you teach people how to get involved early, you can avoid getting to the later stages of a conflict."

There is no magic indicator or profile when it comes to emotional issues and workplace aggression. Women are just as likely as men, and JSC is just as susceptible as any other large organization. It is up to each of us every day to provide a safe work environment and be proactive about protecting and caring for each other. In some cases, uncontrollable emotions can be the result of a medical condition, such as thyroid disorders, and bringing it to the attention of professionals may help expedite treatment.

"Intervention is the key," says Dave Davenport of JSC's Security Office. "We don't have to have this type of incident if everyone gets involved early. It's just a matter of everyone helping everyone." ■

If you suspect someone may be having difficulty controlling their emotions, or you are finding yourself more irritable and unable to contain your emotions – get involved and get assistance through your supervisor or call the Employee Assistance Program at x36130.

GILRUTH CENTER NEWS

Sign up policy:

All classes and athletic activities are on a first-come, first-served basis. Sign up in person at the Gilruth Center and show a yellow Gilruth or weight room badge. Classes tend to fill up two weeks in advance. Payment must be made in full, by cash or by check, at the time of registration.

No registration will be taken by telephone. For more information, call x33345.

Gilruth badges:

Required for use of the Gilruth Center. Employees, spouses, eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday and 9 a.m.-2 p.m. Saturdays. Cost is $12. Dependents must be between 16 and 23 years old.

Open from 6:30 a.m.-10 p.m. Monday-Thursday, 6:30 a.m.-9 p.m. Friday, and 9 a.m.-2 p.m. Saturday. Contact the Gilruth Center at (281) 483-3345.
http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm

Nutrition intervention program: This is a free seven-week program designed to provide an understanding of the role diet and nutrition play in health. The program includes a series of lectures and private consultations with a dietitian. You will learn how to use dietary vitamins, minerals and herbal nutriceuticals for optimizing health. Classes are held on Wednesdays from 4 p.m. to 5 p.m. For details call Tammie Labiche, registered dietitian, at (281) 483-2980.

Defensive driving: One-day course is offered once a month at the Gilruth Center. Pre-registration required. Cost is $25. Call for next available class.

Stamp club: Meets every second and fourth Monday at 7 p.m. in Rm. 216.

Weight safety: Required course for employees wishing to use the Gilruth weight room. Pre-registration is required. Cost is $5. Annual weight room use fee is $105. The cost for additional family members is $58.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is $24 for eight weeks.

Step/bench aerobics: Low-impact cardiovascular workout. Classes meet from 5:25-6:25 p.m. Tuesdays and Thursdays. Cost is $40 for eight weeks.

Yoga stretching: Stretching class of low-impact exercises designed for people of all ages and abilities in a Westernized format. Meets Thursdays 5-6 p.m. Cost is $40 for eight weeks. Call Darrell Matula, instructor, at x38520 for more information.

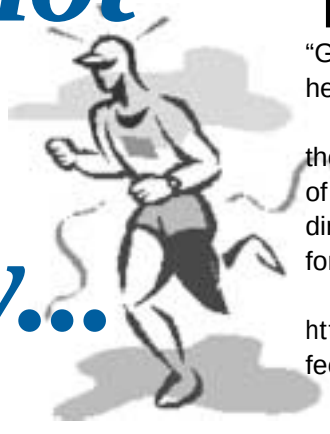
Ballroom dancing: Classes meet Thursdays from 6:30-7:30 p.m. for beginner, 8:30-9:30 p.m. for intermediate and 7:30-8:30 p.m. for advanced. Cost is $60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Mondays. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Mondays. Cost is $20 per couple.

Fitness program: Health-related fitness program includes a medical screening examination and a 12-week individually prescribed exercise program. For more information call Larry Wier at x30301.

Aikido: Martial arts class for men and women meets 5-6 p.m. Tuesdays and Wednesdays. No special equipment or knowledge is needed to participate. Aikido teaches balance and control to defend against an opponent without using strength or force. Beginning and advanced classes start each month. Cost is $35 per month.

It's not too early...



To begin thinking about the Health Run/Walk on Safety and Total Health Day and how your directorate could be the lucky winner of the "George Award," JSC's answer to the Oscar for health event participation.

The good thing is, it doesn't go to the swiftest in the race. Instead, this special award, named in honor of Center Director George Abbey, will be given to the directorate that has the highest percentage turnout for the Gilruth Center Health Run/Walk.

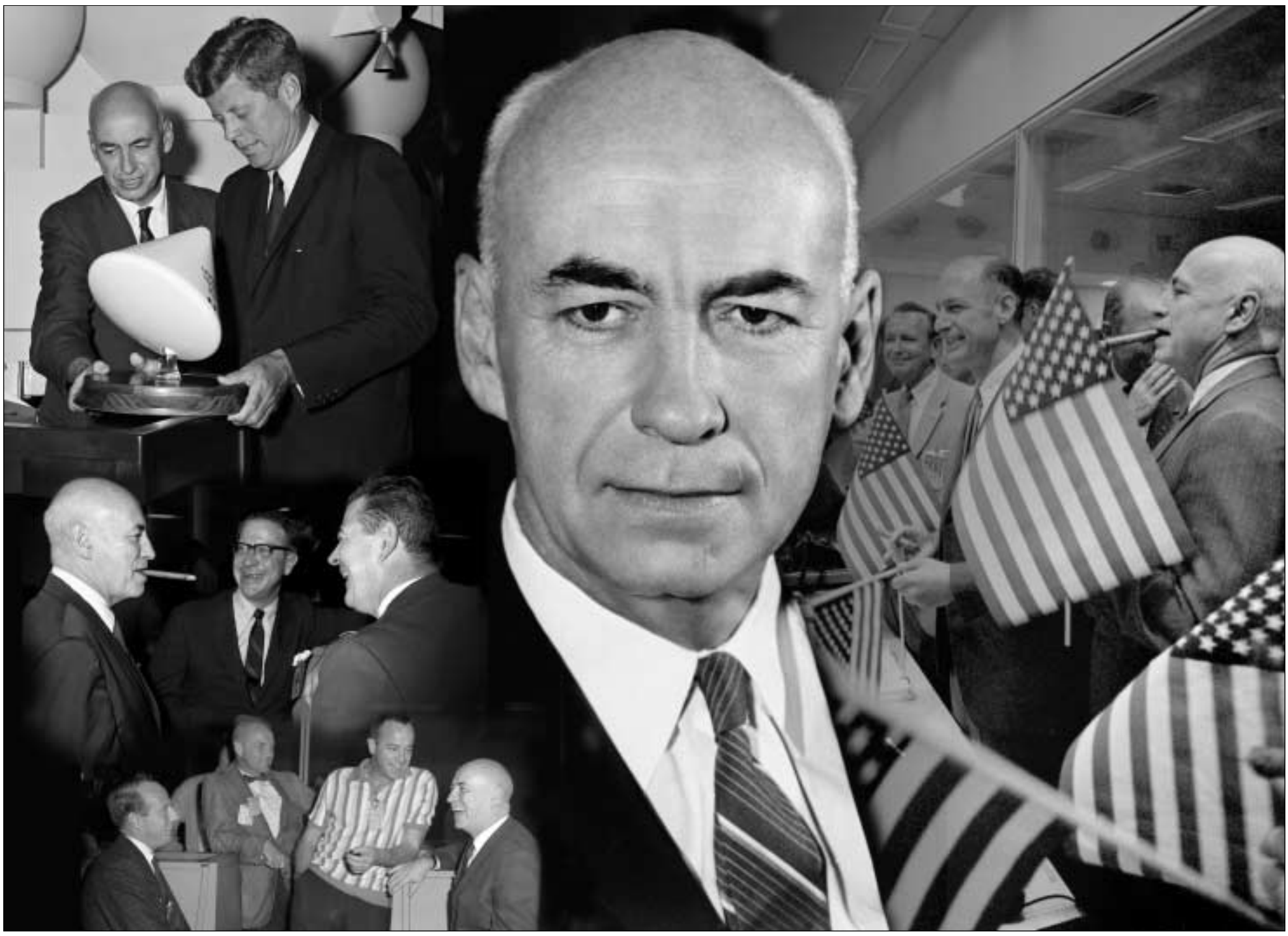
Participants are encouraged to register online at http://www.srqa.jsc.nasa.gov/sth2000/. There is no fee to participate. The first 1,500 registrants may purchase a commemorative T-shirt for only $3 while supplies last.

The first annual George Award was won by the Safety, Reliability and Quality Assurance Office for having an astonishing 97 percent participation in the 1999 Safety and Total Health Day Health Run/Walk event.

The George Award, a handsome space-motif trophy, will be yours to display for the entire year as a reminder to your employees and visitors alike that taking part in a health event as a team is important to you and something you worked harder to accomplish than anyone else at JSC in the year 2000. ■

JSC Remembers Gilruth, Father of America's Human Space Flight Program

October 8, 1913 – August 17, 2000



Gilruth led the Johnson Space Center through 25 manned space flights including Alan Shepherd's first Mercury flight in May 1961, the first lunar landing by Apollo 11 in July 1969, the dramatic rescue of Apollo 13 in 1970, and the Apollo 15 mission in July 1971.

Dr. Robert Rowe Gilruth, one of the earliest leaders of our nation's space program and the first director of what is now the Johnson Space Center, died August 17. He was 86.

Credited as the "father of human space flight" by JSC Director George Abbey, Gilruth was honored at a memorial service at JSC August 28.

Teague Auditorium filled with legends of the space program as well as friends, family and admirers who came to share stories, memories and pay tribute to the man who championed the Mercury, Gemini, and Apollo programs and led our country to ultimate victory in the space race.

> ***His courage to explore the unknown, his insistence on following strict scientific procedures, and his technical expertise directly contributed to the ultimate success of the Apollo program and the landing of a man on the moon.***
>
> –Daniel S. Goldin
> NASA Administrator

"He had the fortitude to take the risks required to accomplish the tasks," said former JSC Director Dr. Chris Kraft in a speech at the memorial service. "From the beginning days of flying Atlas rockets to the recovery from a tragic fire to landing men on the moon and returning them safely to Earth - his courageous leadership was tested and proven."

"His zeal for winged space vehicles led to the design and development of the space shuttle," added Kraft. "His vision of a space station is being realized by building of ISS. There is no airplane design in the United States or space program at NASA that did not benefit from his research."

Accordingly, Gilruth was cited for his expertise in solving problems and his commitment to crew safety. Astronaut John Young, whose life ultimately lay in Gilruth's hands during the early space programs, shared stories from Gemini through the shuttle program.

When engineers were stumped by the challenges associated with the tiles on the shuttle, Gilruth played a role in determining a tile densification solution. "That's just the kind of fellow he was," said Young. "He was very quiet and would always do things people never knew about, but he did them and helped us all do the things in human space exploration… His work is still going on and we can be mighty thankful for that."

Other speakers included Gilruth's wife Jo Gilruth, his daughter Barbara Jean Wyatt, Dr. Maxime A. Faget, Dr. Charles Berry and Abbey, many of whom attributed the present success of NASA to those early successes during Gilruth's tenure.

"Gilruth enabled this nation's human space flight program," said Abbey. "Enabled it to get humans into orbit, and did much more to get men to the moon and successfully back to Earth. He's left a great legacy – this center, a center he built."

"We have the International Space Station and the space shuttle programs today because of the vision and dedicated effort of Bob Gilruth," added Abbey.

A tree in honor of Gilruth was planted in the Memorial Grove on the JSC grounds following the Teague service. A T-38 flyover and a bagpipe solo completed the ceremony.

Profile of a Pioneer

Gilruth, a celebrated aerospace scientist and engineer, was instrumental in shaping the American space program during a time when the glory and success of manned space flight was yet to be realized.

Born in Minnesota in 1913, Gilruth would be a key member of the generation that fostered the vastest amount of technological changes and advancement for our country.

Piqued by an early interest in engineering, Gilruth attended the University of Minnesota, earning a bachelor of science degree in aeronautical engineering in 1935 and a master of science in aeronautical engineering in 1936.

Armed with his mind, Gilruth began his professional career at Langley Memorial Aeronautical Laboratory where he conducted flight research, his principal work being in the field of stability, control and handling qualities of airplanes.

At age 31, Gilruth was selected to manage the National Advisory Committee for Aeronautics' (NACA, forerunner of NASA), newly established free-flight guided missile range at Wallops Island, Virginia. He led the team which later became the Pilotless Aircraft Research Division (PARD) and led to the creation of NACA's Wallops Island Launching Range. Here, Gilruth compiled basic information on the aerodynamic and structural behavior of wings, controls and other key items in missile and aircraft design. His work established aerodynamic principles that have become the cornerstone of aircraft and spacecraft design.

"He was a major contributor to the advancement of the state of the art of flight," said Kraft, "He defined the first set of flying qualities for airplanes, a compendium of the characteristics of a good flying machine and the maneuvers

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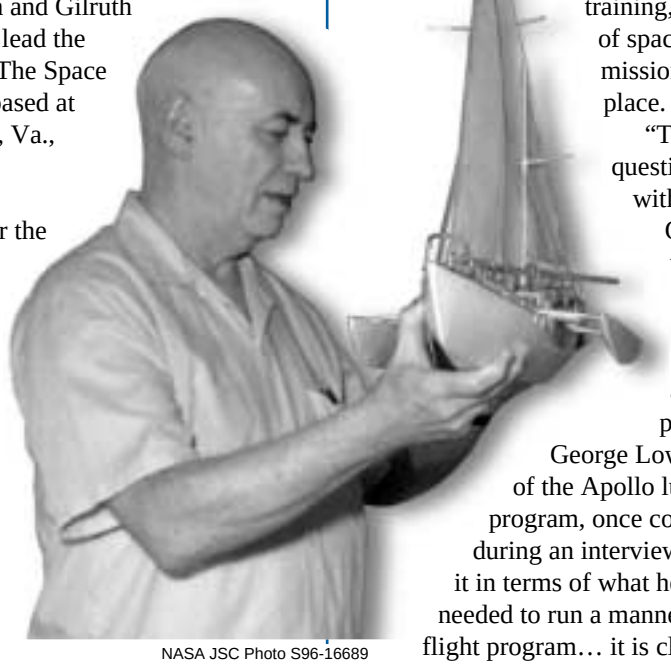
GILRUTH

required to test for them. They have since been adopted by the U.S. Air Force, the FAA and most countries. They are still used as the basic set of rules for acceptable flying machines."

In 1952, Dr. Gilruth was appointed assistant director of the Langley Laboratory with the responsibility for directing research efforts in hypersonic aerodynamics at the Wallops Island Station and research in high-temperature structures and dynamic loads at the Langley Laboratory.

In 1957, the Soviet Union launched Sputnik, the world's first satellite, and set the stage for the space race that would drive the United States to seek its own position in space history.

By October 1958, NACA became the National Aeronautics and Space Administration (NASA). At that time, the United States put the wheels in motion for its own human space flight program and Gilruth was tapped to lead the organization. The Space Task Group, based at Langley Field, Va., would be the organization responsible for the design, development and flight operations of Project Mercury.



NASA JSC Photo S96-16689

In the years ahead, Gilruth began to organize a diverse group of engineers that would be assembled in Houston to develop the nation's Manned Spacecraft Center. In 1961, he became the director of that center and enabled our country to achieve one of its most glorious moments in history. Gilruth led the center, later renamed Johnson Space Center, for the next decade through 25 manned space flights including Alan Shepherd's first Mercury flight in May 1961, the first lunar landing by Apollo 11 in July 1969, the dramatic rescue of Apollo 13 in 1970, and the Apollo 15 mission in July 1971.

During his tenure as MSC director, the center evolved into the heart of the U.S. space program where all flight crew selection and training, and control of space flight missions takes place.

JSC Photo S91-30118

Robert and Jo Gilruth

"There is no question that without Bob Gilruth there would not have been a Mercury, Gemini or an Apollo program," George Low, director of the Apollo lunar landing program, once commented during an interview. "He built it in terms of what he felt was needed to run a manned space flight program… it is clear to all who have been associated with him that he has been the leader of all that is manned space flight in this country."

In January 1972, after retiring as director of the MSC, Gilruth became NASA's director of Key Personnel Development, reporting to the deputy administrator in Washington, D.C. In this capacity, he had responsibility for identifying near and longer range potential candidates for key jobs in the agency and for creating plans and procedures which would aid in the development of these candidates.

In December 1973, Gilruth retired from NASA and, in January 1974, was appointed a consultant to the administrator of NASA.

In February 1974, Gilruth was appointed to the Board of Directors of Bunker Ramo Corporation, Oak Brook, Ill. He was also appointed a member of the National Academy of Engineering Aeronautics and Space Engineering Board, and asked to serve as a member of the Houston Chamber of Commerce Energy Task Force.

> ***The most challenging task of all was when he came here. He wanted to do this for the pride of our country and because it was a challenge and he really knew that these people were the ones who were going to make it work. And when it was successful, he was very proud because the pride of our country had been restored and he was proud that he had been a part of it.***
>
> –Mrs. Jo Gilruth

Gilruth, well known for his passion of boating and boatmaking, spent much of his spare time designing and building boats. He built the first successful sailing hydrofoil system and in 1973 completed the "Outrigger," a 52-foot multihull sailboat he designed and built.

Gilruth achieved a long list of awards and honors. He was a member of the National Academy of Engineering; an Honorary Fellow in the American institute of Aeronautics and Astronautics; a Fellow in the American Astronautical Society; an Honorary Fellow of the Royal Aeronautical Society; and a member of the International Academy of Astronautics.

Gilruth also received the prestigious Goddard Memorial Trophy of the National Rocket Club, the Louis W. Hill Space Transportation Award, the Reed Aeronautics Award and the National Aeronautical Association and National Aviation Club's Robert J. Collier Trophy for "…the greatest achievement in aeronautics and astronautics in America."

In April 1974, Gilruth was elected a member of the National Academy of Sciences. He also received honorary doctoral degrees from the University of Minnesota, the Indiana Institute of Technology, George Washington University, Michigan Technological University, and New Mexico State University. Gilruth was one of the first people installed in the National Space Hall of Fame.

Gilruth is survived by his wife Jo and daughter Barbara Jean Wyatt. ■

NASA JSC Photo 2000-06015 by Robert Markowitz

Family, friends and longtime associates pay tribute to Gilruth's memory by planting a tree in the Memorial Grove on the JSC grounds. The day's observances concluded with a "missing man" fly-over by NASA astronauts.

> ***Dad was endlessly curious – always making or inventing things. His ingenuity knew no bounds. I never saw him stumped… There was no plan unthinkable. No dream out of reach.***
>
> –Barbara Jean Wyatt

In the dark immensity of night,
I stood upon a hill and watched the light
of a star soundless and beautiful and far.

A scientist standing there with me said,
'It is not the star you see, but a glow
that left the star light years ago.'

Men are like stars in a timeless sky.
The light of a good man's life shines high
golden and splendid, long after his
brief life years are ended.

–Author unknown

Poem read by Barbara Jean Wyatt
at the memorial service

Ripped from the ROUNDUP

Ripped straight from the pages of old Space News Roundups, here's what happened at JSC on this date:

1 9 7 0

The Apollo spacecraft command and service modules will be modified to enhance their potential use in an emergency mode.

The decision followed an extensive study of consumables and emergency equipment aboard the spacecraft as recommended by the Apollo 13 Review Board.

The modification includes adding a 400-amp-hour battery in the service module as an alternate power source in the event the spacecraft's main power supply failed. Provisions will be made to store an additional 20 pounds of water in the command module.

Earlier, a decision was made to add a third oxygen tank in the service module as part of the redesigned spacecraft oxygen system.

1 9 8 0

NASA television engineers at JSC are modifying an Air Force television camera for live, real-time TV transmission by crewmembers taking spacewalks outside the Space Shuttle Orbiter.

Like a third eye or miner's light mounted on the forehead, the camera is positioned in the astronauts' extravehicular visor assembly. It protrudes from the visor, seeing what he sees, and transmits black and white scenes back to a TV monitor for a crewmember in the spacecraft. Also it may transmit live back to Earth or record onboard for later replay.

1 9 9 0

Flight controllers at NASA's Jet Propulsion Laboratory lost and regained communication with Magellan a second time this week as scientists revealed startling photos from its first radar test pass.

Before the first communications loss occurred, scientists received their first look at Venus through Magellan's eyes. A test pass with the spacecraft's synthetic aperture radar revealed an unexpectedly "violent" surface with ridges, valleys, lava flows, volcanic craters and fracturing.

"Right now, I think that is just a crack in the door," said Steve Saunders, Magellan project scientist. "I'm looking through a little slit down at Venus and we're seeing some things we've never seen before."

Barton, Poulos first at JSC to receive Space Flight Awareness Leadership Awards

Richard L. Barton, chief, applied aeroscience and CFD branch, and Steve Poulos of the EVA Project Office, are the first at JSC to receive the coveted Space Flight Awareness Leadership Award.

NASA JSC Photo 2000e19534 by Robert Markowitz

Frank Benz and Richard Barton

Richard Barton

Frank Benz, director, Engineering, presented Barton with the award at a ceremony June 28. Barton was commended for his outstanding managerial leadership during his 35-year career at NASA. He was recognized for his strong management background and expertise in personnel management, as well as his support and guidance to his employees, leading them to their own great achievements by being proactive and empowering them.

"Rick models himself after the One Minute Manager," said Aldo J. Bordano, chief, Aeroscience and Flight Mechanics Division, "and encourages his employees to strive towards the doctrine illustrated within *The Seven Habits of Highly Effective People (Engineers)*. But he does not just preach these principles – he puts them into practice. His motto is 'Do the right thing!' Accordingly, he may be the most proactive person alive."

According to Bordano, Barton's career with NASA is laced with enthusiasm, leadership, innovation and employee appreciation.

"Rick firmly believes in awarding excellence, and has even devised an award of his own creation called the Top Ace that is given to the Branch employee(s) of the month for delivery of a product," explained Bordano. "The award includes the use of his reserved parking space, a certificate and recognition in the presence of the awardees' peers. He has done this for more than 12 years."

Barton also has cultivated a creative and empowered environment among his ranks which has resulted in technical innovation and success. Bordano cites many examples where Barton's pursued excellence and challenged employees to "strive for the next level." For instance, when the Orbiter was to visit Mir and the issue of reaction control system plume loads was raised, he reinvented his Branch and produced a world-class plume prediction capability.

Steve Poulos

Greg Harbaugh, manager, EVA Project Office, presented Poulos with his award August 1. Poulos' strong management background and leadership strengths also were recognized, as was his ability to standardize processes within the organization and improve overall efficiency and function of the office.

"Steve established an atmosphere of open communication and developed the forums and standards for the EVA community to follow," said Harbaugh.

As the EVA Project Office deputy manager, Poulos assists in the final review and approval for all areas of EVA including safety, training, integration and operations, research and development for suits, systems, and support equipment and all EVA-related advanced technology.

Poulos is a proactive participant in numerous review teams across the center including the NBL Review Team, NBL Space Station Remote Manipulator System Review, secretarial staffing team, center director metrics team, and the Simplified Aid For EVA Rescue failure investigation after STS-86.

"[Poulos'] strong ability to look at the issues, weigh factors and make clear, concise decisions has made him an asset to these teams," said Harbaugh.

Also according to Harbaugh, after the STS-88 mission, Poulos was chartered to lead a center-wide team to define the root cause of the EVA hardware losses and corrective actions. Over a short time-frame, across multi-center elements, this team provided recommendations that were presented to EVA CCB and Station Development and Operations Meeting.

Barton and Poulos were presented with a commemorative trophy encasing a flown mission flag and an engraved plaque.

The SFA Leadership Award is a newly created award to recognize mid-level and higher managers, both NASA and contractor, who exemplify those characteristics necessary for success, such as loyalty, empowerment, accountability, diversity, excellence, respect, sharing, honesty, integrity and proactivity. ■

Steve Poulos and Greg Harbaugh

DATES & DATA

September 12

Aero Club meets: The Bay Area Aero Club meets at 7 p.m. at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For details contact Larry Hendrickson at x32050.

NPMA meets: The National Property Management Association meets at 11:30 a.m. at the Gilruth Center. For details contact Ray Whitaker at (281) 212-6030.

September 13

Astronomy seminar: The JSC Astronomy Seminar Club will meet at noon September 13 and 20 in Bldg. 31, Rm. 248A. For more information contact Al Jackson at x35037.

IAAP meets: The Clear Lake/NASA Chapter of the International Association of Administrative Professionals (formerly Professional Secretaries International) meets at 5:30 p.m. at Bay Oaks Country Club. Cost is $16. For details and reservations, call Tami Barbour at (281) 488-0055, x238.

MAES meets: The Society of Mexican-American Engineers and Scientists meets at 11:30 a.m. in Bldg. 16, Rm. 111. For details contact Laurie Carrilo at x45203.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters meet at 11:30 a.m. September 13, 20 and 27 at United Space Alliance, 600 Gemini. For details contact Patricia Blackwell at (281) 280-6863.

September 14

Airplane club meets: The Radio Control Airplane Club meets at 7 p.m. at the Clear Lake Park building. For more information contact Bill Langdoc at x35970.

Communicators meet: The Clear Lake Communicators, a Toastmasters International club, meet September 14, 21 and 28 at 11:30 at Wyle Laboratories, 1100 Hercules, Suite 305. For more information contact Allen Prescott at (281) 282-3281 or Richard Lehman at (281) 280-6557.

September 20

Scuba club meets: The Lunarfins meets at 7:30 p.m. For more information contact Mike Manering at x32618.

September 21

Directors meet: The Space Family Education board of directors meets at 11:30 a.m. in Bldg. 45, Rm. 712D. For more information contact Lynn Buquo at x34716.

September 28

Radio Club meets: The JSC Amateur Radio Club meets at 6:30 p.m. DATE at Piccadilly, 2465 Bay Area Blvd. For more information contact Larry Dietrich at x39198.

NASA lead test director's life filled with ups and downs

John Yaniec lives the life that we all dreamed of when we were youngsters. For him, every week is one large science fair.

NASA JSC Photo S96-16689

NASA JSC Photo 2000e12106 by Robert Markowitz

John Yaniec

John Yaniec is the NASA lead test director at Ellington Field for the Reduced Gravity Program. He schedules experiments to be flown aboard the "Weightless Wonder," NASA's KC-135 aircraft. He manages the schedule with all NASA centers, manages the budget for the KC-135 program, and briefs senior management on the status of the program.

Yaniec and his staff supervise the loading of all experiments and the boarding of all researchers onto the plane and ensure that all goes safely aboard the KC-135.

Yaniec's job requires a unique combination of technical, organizational, and people skills; a strong physical constitution wouldn't hurt either.

"A technical background is an absolute necessity for this job," said Yaniec. "We deal with a number of experiments and our primary job is safety on this aircraft. As a test director, my primary duty is ensuring that the operation is safe both on the ground and in the air. And being a good people person is also important because we work with people ranging from high school students to multi-degreed individuals from around the world. Also, having a strong stomach to be able to do 40 to 50 parabolas per flight, four days a week, 30 to 35 weeks a year on a continuous basis helps."

NASA JSC Photo 99e13311 by Robert Markowitz

Not all experiments flown on the KC-135 are bolted to the floor. John Yaniec and David Thiessen (Washington State University) free float the Microgravity Sciences Experiment, "Capillary Bridge Active and Passive Stabilization Experiment," from Glenn Research Center.

Astronauts in training, students, scientists across the NASA centers, and researchers who have grants or are funded by NASA or other government agencies fly aboard the KC-135. Researchers fly experiments in the areas of fluid physics, life sciences, combustion, materials sciences, and engineering development for both the shuttle and the International Space Station. Research coordinators at Glenn Research Center, Marshall Space Flight Center, and Johnson Space Center coordinate all of the experiments to be flown aboard the KC-135.

Yaniec credits the success of the Reduced Gravity Office to his staff – test directors John R. Bain, Andrew Nash and Troy Whitney; administrative aide Brandy Quarles; aircraft engineering co-op Brian Barnett; and KC-135 lead flight engineer John Lamb. It is a team effort all the way.

Yaniec and a support team of engineers read through the test equipment data packages before the experiments fly on the aircraft at JSC or when the KC-135 is deployed to Glenn Research Center (GRC), making sure that they have all the answers to their safety questions and concerns resolved.

Flight operations of the KC-135 are not restricted to just JSC. The aircraft deploys to GRC six or seven weeks per year to support the microgravity researcher operations there.

During flight weeks, Yaniec manages the experiments as they come in and works with the researchers as they prepare for their flights. He leads the test readiness reviews (TRR) for all packages scheduled to fly during the week. The TRR meetings are held on Monday mornings at Ellington Field. During the review, the team takes a final look at the experiment before it is loaded onto the aircraft to make sure that it is safe to fly.

Once the TRR is completed, the loading process begins. Loading the aircraft with the experiments can take a couple of hours or all day, depending on the number and size of the experiments.

On flight days, typically Tuesday through Friday, preparations include issuing flight suits, holding safety and morning preflight briefings, making the final changes to the manifest, preparing the aircraft's weights and balances, and ensuring that all individuals are approved to board the aircraft for flight. Once aboard the aircraft, a final check is done of the aircraft cabin area, ensuring that all experiments are safely secured and ready for flight.

During pre-flight briefings held just before boarding the aircraft, a review of the weather, aircraft status, and researchers' needs for parabola requirements (types and increments of parabolas) is given for all researchers and personnel involved with the day's flight. Typical flights, which last approximately 90 to 120 minutes, include four sets of 10 parabolas, each set separated by a 2- or 3-minute turn. But according to Yaniec, there are sometimes deviations, and that's one reason why the pre-flight briefings are held. "To conduct their experiments properly, some researchers require simulations of lunar, Martian, or other gravity conditions between –0.1 g and 1 g."

The typical flight crew includes a pilot, copilot, flight engineer, and two test directors. Five to seven experiments are usually flown per flight.

Once airborne, Yaniec and the other test director advise researchers when zero-g conditions begin and issue a warning just before the pullout maneuver begins with its resulting 1.8-g force. Safety is always his overriding concern.

"As a test director, my primary job is safety," said Yaniec. "Once we board the aircraft, we go through the aircraft to make sure that everything is secure and that everyone and everything is ready for takeoff. Once we are airborne, our primary job is the safety of the researchers onboard."

The KC-135 provides a cost-effective means for researchers to do their research in a microgravity environment without having to incur the high cost of using the space shuttle. "We can provide the microgravity environment, 40 to 50 times a flight, four days a week, and the researchers can fly with their experiments. They can go home, do their analysis, and draw their conclusions," said Yaniec.

NASA JSC Photo 2000e06607 by Robert Markowitz

KC-135 Test Directors John Bain and John Yaniec assist the Univeristy of Michigan team (Liquid Droplet Radiator Pointing Experiment II) during the College Student Flight Campaign this past spring.

However, some experiments that are initially flown aboard the KC-135 are destined to be flown aboard the space shuttle or the space station because longer microgravity durations are needed to run the experiment. Even for those experiments that will be flown aboard the space shuttle or the space station, the KC-135 serves as a valuable testbed.

"We can test the flight hardware before it goes up to orbit, and the researchers can come onboard with the astronaut crews who will be conducting their experiments aboard the space shuttle," said Yaniec. "They can work together, and the astronauts can give the researchers some valuable advice as to how to design their experiments to ensure the best chance of success on orbit."

The KC-135 is also used in a NASA-funded program, the Reduced Gravity Student Flight Opportunities Program, which selects experiments proposed by students and flies the student researchers with their experiment. There are currently three student programs: a nationwide university program, a statewide community college program, and a statewide high school program.

For many, the opportunity to participate in this program has been a life-changing experience. "We have received some comments from high school and college students noting how their experiences participating in the program, either as flight crewmembers or as members of ground crews, impacted their career paths," said Yaniec. "Many now want a job with NASA, and they see now that their education is important. For those in high school especially, they see how important math and science are to their future development. They can see a means to an end now, believing that if they do study hard, perhaps they can eventually get a job with NASA."

Yaniec joined NASA at the Lewis Research Center (now GRC) in 1991, working on logistics for the electrical power system for Space Station Freedom. In 1993, when LRC had an opening for someone with organizational skills to organize the DC-9 microgravity program, he applied and got the job. He worked with the DC-9 program from aircraft outfitting until it ended in July 1997.

Yaniec served as the KC-135 aircraft experiment coordinator for GRC-based experiments until September 1998, when he transferred to JSC to become a test director for the KC-135. He was named lead test director for the KC-135 program last June.

He has flown almost 18,000 parabolas – more than 7,000 on the DC-9 and 10,729 on the KC-135 – and has logged about 1,100 hours of flying time on the two aircraft since he started with the DC-9 in 1994.

Yaniec will celebrate 30 years of government service this month, having spent 21 years with the Air Force both as a GI and civilian employee before joining NASA. ■

PEOPLE on the MOVE

Human Resources reports the following personnel changes:

Key Personnel Assignments

Jay Greene was named chief engineer, Johnson Space Center.

Vernon Nixon was selected as chief, Security Office, Center Operations Directorate.

Allen Flynt was named deputy manager, EVA Project Office.

Mike Mankin was named lead, EVA Technology and Russian Integration, EVA Project Office.

Glenn Lutz was named lead, EVA Hardware Development, EVA Project Office.

Dick McMinimy was selected as technical assistant to the chief of the security office, Security Office, Center Operations Directorate.

Jeff Arend was selected as manager, System Integration and Analysis Office, Program Integration Office, International Space Station Program.

Bruce Luna was named manager, Management Integration Office, International Space Station Program.

Pat Pilola was named deputy manager, Management Integration Office, International Space Station Program.

Bob Egusquiza was selected as chief, Power Systems Branch, Energy Systems Division, Engineering Directorate.

Additions to the Workforce

Amy Voigt joins the Legal Office as a law clerk.

Jennifer Krause joins the Institutional Procurement Office, Office of Procurement, as a contract specialist.

Karen Adams joins the Projects Procurement Office, Office of Procurement, as a contract specialist.

Kim Wilson joins the Human Resources Management Branch, Human Resources Office, as a human resources representative.

Justin Bowen joins the Orbit Dynamics Branch, Flight Design and Dynamics Division, Mission Operations Directorate, as a trajectory design analyst.

Gavin Mendeck joins the Ascent/Descent Dynamics Branch, Flight Design and Dynamics Division, Mission Operations Directorate, as a trajectory design analyst.

Sean Fuller joins the Operations Division, Mission Operations Directorate, as an operations lead.

Deon Brown joins the Systems Training Branch, Space Flight Training Division, Mission Operations Directorate, as a training instructor.

Douglas Branham joins the Communications and Data Systems Branch, Systems Division, Mission Operations Directorate, as a flight controller.

Randolph Lillard and *Darby Vicker* join the Applied Aeroscience and Computational Fluid Dynamics Branch, Aeroscience and Flight Mechanics Division, Engineering Directorate, as fluid mechanics engineers.

Stacie Bennett joins the Electronic Design and Development Branch, Avionic Systems Division, Engineering Directorate, as an avionics systems engineer.

Kris Romig joins the Propulsion and Fluids Systems Branch, Energy Systems Division, Engineering Directorate, as a liquid propulsion systems engineer.

Kevin Smith joins the Engineering Resources Management Office, Office of the Chief Financial Officer, as a program analyst.

Stanley Whalen joins the Cost Accounting, Reporting, and Property Branch, Financial Management Division, Office of the Chief Financial Officer, as an accountant.

Jennifer Rivera joins the Institutional Resources Management Office, Office of the Chief Financial Officer, as a program analyst.

Don Totton joins the Safety and Mission Assurance/Program Risk Office, International Space Station Program, as lead of the Payload Safety Review Panel.

Michael Zigmond joins the White Sands Test Facility as an environmental engineer.

OUT&ABOUT★

Photo by Michael Ruiz

The festive sounds of the Mariachi Los Gallitos filled the air at the 17th Annual Mexican American Engineer and Scientists Scholarship Banquet held August 4. Former NASA Flight Director Gene Kranz, center, presented the keynote address on his new book, *Failure Is Not An Option*. To his right is MAES Secretary and JSC Ascent Analyst Laurie Carrilo. For more information about MAES, contact Carrillo at x45203.

Carlton Allen joins the Earth Science and Solar System Exploration Division, Space and Life Sciences Directorate, as the astromaterials curator.

Diana Risin joins the Medical Sciences Division, Space and Life Sciences Directorate, as the assistant manager for science in the Cellular Biotechnology Program.

Promotions

G. R. Kolb was selected as a contracting officer in the Space Station Procurement Office, Office of Procurement.

Michael Lonchambon was selected as a contracting officer in the Projects Procurement Office, Office of Procurement.

Reassignments to Other Centers

Ann Hutchison moves to Ames Research Center.

Reassignments to Other Directorates

Troy Estes moves from the Engineering Office, White Sands Test Facility, to the Office of the Chief Information Officer.

Jennifer Mendeck moves from the Engineering Directorate to the Mission Operations Directorate.

Leslie Schaschl moves from the Mission Operations Directorate to the Engineering Directorate.

Linda Ham moves from the Mission Operations Directorate to the Space Shuttle Program Office.

Garland Bauch moves from the Space Shuttle Program Office to the Safety, Reliability, and Quality Assurance Office.

Merrylee Weber moves from the Center Operations Directorate to the Safety, Reliability, and Quality Assurance Office.

Karl Zimmer moves from the Engineering Directorate to the International Space Station Program Office.

Retirements

Leonard Nicholson of the Office of the Associate Director.

Robert G. Musgrove and *Bill Schneider* of the Engineering Directorate.

Richard Swalin of the Space Shuttle Program Office.

Constantinos Katsikas of the Safety, Reliability, and Quality Assurance Office.

Gilbert Whittaker of the White Sands Test Facility.

Resignations

Robert Yowell of the EVA Project Office.

Correction

Shown in the photo of the Expedition 1 crew on Page 4 of the August 25, 2000, issue are, from left, Yuri Gidzenko, Sergei Krikalev and Bill Shepherd.

NASA BRIEFS

DEEP SPACE 1 SPACECRAFT KEEPS GOING... AND GOING...

It has the little engine that could, and the pint-sized power plant on board NASA's Deep Space 1 probe has been doing it longer and more efficiently than anything ever launched. The spacecraft, designed to test new technologies, has run its unique propulsion system for more than 200 days (4,800 hours).

"The ion propulsion engine on Deep Space 1 has now accumulated more operating time in space than any other propulsion system in the history of the space program," said John Brophy, manager of the NASA Solar Electric Propulsion Technology Applications Readiness project, at the agency's Jet Propulsion Laboratory.

Unlike the fireworks of most chemical rockets using solid or liquid fuels, the ion drive emits only an eerie blue glow as ionized (electrically charged) atoms of xenon are pushed out of the engine. Xenon is the same gas found in photo flash tubes and many lighthouse bulbs.

The almost imperceptible thrust from the system is equivalent to the pressure exerted by a sheet of paper held in the palm of your hand. The ion engine is very slow to pick up speed, but over the long haul it can deliver 10 times as much thrust per pound of fuel as more traditional rockets.

Previous ion propulsion systems, like those found on some communications satellites, were not used as the main engines, but only to keep the satellites on track. Deep Space 1 is the first spacecraft to use this important technology as its primary means of propulsion. The NASA Space Electric Rocket Test 2, launched into Earth orbit in 1970, had the previous record for ion propulsion, thrusting for about 161 days.

The ion particles travel out at about 68,000 miles per hour. However, Deep Space 1 doesn't move that fast in the other direction, because it's much heavier than the ion particles. By the end of the mission, the ion engine will have changed the spacecraft's speed by about 6,800 mph (over 11,000 kph).

The only other system that has operated longer is a ground-based replica of the spacecraft's engine. The ongoing extended-life test, being done in a vacuum test chamber at JPL, has run its ion propulsion system for almost 500 days (12,000 hours) and is scheduled to complete nearly 625 days (15,000 hours) by the end of the year.

The Deep Space 1 ion engine could have a total operating time of more than 583 days (14,000 hours) by the end of its mission in the fall of 2001.

More information can be found on the Deep Space 1 Home Page at:

http://nmp.jpl.nasa.gov/ds1/

VIDEO GAMES MAY LEAD TO BETTER HEALTH

For decades doctors have used biofeedback as a way to help control stress and tension. Now NASA technology adds a new twist by combining this mind-over-matter technique with the hand-eye coordination of video games.

According to researchers at NASA's Langley Research Center, the results may actually improve and protect a player's mental and physical health.

This unique interactive system, tested at Eastern Virginia Medical School in Norfolk, trains people to change their brainwave activity or other physiological functions while playing popular off-the-shelf video games. This is accomplished by making the video game respond to the activity of the player's body and brain.

Signals from sensors attached to the player's head and body are fed through a signal-processing unit to a video game joystick or other control device. As the player's brainwaves come closer to an optimal, stress-free pattern, the video game's joystick becomes easier to control. This encourages the player to produce these patterns or signals to succeed at the game.

SPACE CENTER Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Johnson Space Center, Houston, Texas, and is published by the Public Affairs Office for all space center employees. The Roundup office is in Bldg. 2, Rm. 181. The mail code is AP3. The main telephone number is x38648, and the fax is x32000. Electronic mail messages may be directed to:

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