

Space News ROUNDUP!

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NASA Photo

STS-87 Mission Specialists Winston Scott and Takao Doi grab the Spartan satellite during a space walk on Nov. 24 after its attitude control systems failed to activate.

Space walkers' gloved hands grab Spartan

By Kyle Herring

Space Shuttle *Columbia* was scheduled to wrap up its 16-day science mission, which included an unplanned but dramatic retrieval of the Spartan satellite after its failure to activate on the second day of the flight, about 6:23 a.m. CST today.

The unexpected problem with Spartan occurred the day after *Columbia's* mid-afternoon launch on Nov. 19 to start the STS-87 mission, which is the eighth and final flight of the year. The next mission is planned for mid-January when *Endeavour* heads to the Russian Space Station Mir to drop off Andy Thomas and bring home Dave Wolf.

Columbia's mission started with a new "twist" when a second roll maneuver was initiated by the on-board guidance system to allow for earlier communications capability with communications satellites. The roll to heads up was almost transparent to the crew since it occurred virtually out of the Earth's atmosphere about six minutes after the 1:46 p.m. CST launch.

Problems with Spartan began shortly after its deployment when an automatic "pirouette" maneuver to verify its health did not occur just minutes after release from the robot arm. An attempt to regrip the satellite put it into a slight spin that made it impossible to retrieve by any method other than manual capture during a space walk, which coincidentally was already planned on this mission by Mission Specialists Winston Scott and Takao Doi.

The Spartan science team and mission managers are continuing an investigation into why the satellite did not receive the activation command and also why the regrip attempt put the satellite into its slow rotation.

The evening of Nov. 24, Scott and Doi headed out into the payload bay for the modified space walk beginning with the manual capture of Spartan after being placed within reaching distance by Commander Kevin Kregel flying *Columbia*.

Scott reported capture of the satellite at 8:09 p.m. CST as *Columbia* flew over the Pacific Ocean.

"OK, I've got my end," Scott said.

"OK, I've got my end," replied Doi.

"OK, now that we got it, Mr. Doi, let's decide what we are going to do with it," Scott quipped.

The pair wrestled the car-sized Spartan safely into the payload bay, about two hours after the start of the space walk. But it was up to Mission Specialist Kalpana Chawla, operating the 50-foot-long robot arm, to secure it in its latching mechanisms.

"OK, K.C.'s got it," Kregel said. "You guys can let go."

The space walkers then proceeded with tests of a crane and tools that will make eventually their way to the International Space Station for routine maintenance activity. The tools and techniques evaluated on this and other shuttle flights are designed to ease the burden of work outside the new space complex scheduled to be assembled in space during the next five years starting with

Please see **STS-87**, Page 8



Wolf sends greetings to Earth

Mir crew celebrates 'den blagodarenia' on orbit

NASA Astronaut Dave Wolf and his Russian colleagues aboard the Mir Space Station offered holiday greetings to all Americans last week as they prepared to eat turkey and trimmings.

"We want to wish you the happiest Thanksgiving possible," Wolf said in a downlink opportunity that also involved news media questions from his hometown of Indianapolis.

"In the last hour and a half," Wolf said, "we circled the whole Earth, and it dawns on us that there's one thing in particular that all space-faring people notice. Among many different perceptions of space, it is universal that they notice how awesome the great planet Earth is and we see it out the window just to the right, right now. We're going that way at just under 18,000 miles per hour, and it looks like another spaceship flying in formation with us and is a beautiful spaceship. And it dawns on us how careful we have to be with it. So maybe, our Thanksgiving prayer then would be to have such a wonderful Earth to come back to

and that we should all take such good care of our wonderful spaceship Earth."

Mir 24 Commander Anatoly Solovyev also offered Thanksgiving, or *den blagodarenia*, greetings, and Wolf translated those into a wish that everyone should be in the best spirits possible, enjoy meeting with their families and "spend a nice, long time eating and cooking together."

Wolf showed off smoked turkey, freeze-dried mashed potatoes, peas and milk that the crew would enjoy for its Thanksgiving meal.

Mir-24 Flight Engineer Pavel Vinogradov closed out the holiday greetings by wishing "all Americans happiness and a good time at home," Wolf translated.

Wolf and his crewmates also received holiday greetings in a phone call from NASA Administrator Daniel Goldin.

Wolf said he feels as if he has gotten "over the hump" in his four-month stay, and that although he is enjoying his life in orbit he is beginning to look forward to the return home.

Please see **WOLF**, Page 8



'Twas a month before Christmas but gift rules already were out

JSC Chief Counsel Mike Winchell briefed top JSC managers Monday on the importance of being careful about accepting holiday gifts as the season approaches.

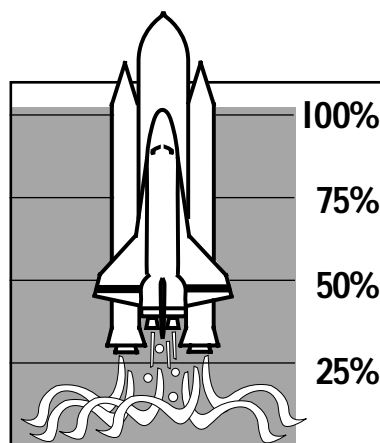
Winchell reminded the senior staff members that all employees must follow the guidelines in the NASA Standards of Conduct, framing his comments in the form of a poem, with the meter lifted from "The Night Before Christmas."

The holiday season—a time for good cheer!
For eggnog, for parties, for friends to be near.
But I must be careful
Lest I accept free
A gift not permitted, no matter how wee.

Part two six three five of the 5CFR
Explains in detail the relevant bar.
It defines the term gift
To mean all things worth money.
That's NBA tickets or jars full of honey.

Some gifts may be taken but some are verboten.
The source is the key—it's the rule that I'm quotin'.
When from me or others
The source seeks some act,
I must find an exception or I could be sacked.

Even others who give can cause problems for me.
If my job prompts the giving—my position, you see.



1997 GOAL: \$480,000



Combined Federal Campaign passes goal by \$10,000

Almost 2,100 JSC employees have contributed \$486,940 to this year's Combined Federal Campaign, and other government employees working at JSC and retirees boosted the total to \$489,084.

The final total is expected to climb above \$490,000. Contributions are almost \$10,000, or 1 percent above this year's goal and last year's giving.

A total of 2,088 of 3,136 eligible employees, or 67 percent, contributed toward the \$480,000 goal. Six organizations—the Human Resources Office, Legal Office, Office of the Chief Information Officer, Equal Opportunity Programs

Please see **COMBINED**, Page 3

Wolf looking forward to January space walk using Russian suit

(Continued from Page 1)

He said he would make the trip again "in a minute."

All systems were functioning normally aboard Mir after an interruption in Mir's Motion Control System computer that caused a temporary loss of automatic attitude control on Nov. 21. Russian flight controllers traced the problem to a failure of the three channels that supply data to Mir's electronically operated gyroscopes. While the problem was being fixed, Mir's crew powered down all non-essential systems.

Mir 24 Commander Anatoly Solovyev and Flight Engineer Pavel Vinogradov exchanged the faulty computer with a unit that was brought up on the last Progress resupply vehicle, which was launched Oct. 5.

Since the Mir's batteries did not drain before the gyroscopes spun down following the computer glitch, the crew was able to replace and reinitialize the MCS computer and spin up the gyroscopes almost immediately.

U.S. and Russian officials have agreed that the next two space walks aboard the Mir Station will be tentatively scheduled for Jan. 5 and 9.

In a public letter home, Wolf said he's looking forward to a possible opportunity to accompany Solovyev on one of those space walks. The first will install a new seal to the leaking Kvant-2 exterior airlock hatch and secure the damaged solar array on the Spektr module.

The second is designed to retrieve a U.S. experiment, the Optical Properties Monitor, that was deployed during astronaut Jerry Linenger's space walk on April 29. OPM has examined the degradation of different materials when they are exposed to the space environment. The materials are being tested for possible use on the International Space Station. The Optical Properties Monitor is scheduled to return on the next shuttle mission to Mir, STS-89, scheduled in mid-January.

Wolf has been helping his crew mates with system activities aboard Mir, as well as continuing his science program. He began an investigation that measures bone

loss during long-term space flight.

Previous studies have shown that long duration exposure to the microgravity environment causes a gradual loss in total bone mineral. This condition mimics osteoporosis, a medical condition characterized by brittle bones. By learning more about the process of bone mineral loss and recovery, researchers hope to be able to develop more effective treatments for those who suffer from bone disorders on Earth.

Wolf is beginning the tenth week of his four-month mission which will end in January when he is replaced by U.S. Astronaut Andy Thomas, who will be launched aboard *Endeavour* on STS-89. Wolf will return to Earth as part of the STS-89 crew.



France's Tognini on STS-93

Veteran French Space Agency astronaut Michel Tognini will fly aboard Space Shuttle Columbia as a member of the STS-93 crew, slated for an August 1998 launch.

A member of NASA's 1995 astronaut class, Tognini was one of seven astronauts selected by CNES in 1985. The French Air Force



Tognini

colonel trained extensively at the Gagarin Cosmonaut Training Center in Star City, Russia, in support of joint Soviet-French space missions. In 1992, he spent 14 days aboard

the Mir space station with crew mates Anatoly Solovyev and Sergei Avdeiev. STS-93 will mark Tognini's first flight on the space shuttle. During the five-day mission, Tognini and his crew mates will deploy the Advanced X-ray Astrophysics Facility Imaging System, which will conduct comprehensive studies of the universe. AXAF consists of three major elements: a spacecraft with an inertial upper stage rocket motor, a telescope, and a science instrument module. Its principal objectives are to study X-ray emissions of stars and planets and to resolve images of extended supernova remnants.

The remaining STS-93 crew members will be named later.

Readdy to discuss shuttle upgrades

Astronaut Bill Readdy, manager of Space Shuttle Program Development, will discuss the space shuttle upgrade program at 5:30 p.m. Tuesday, Dec. 9, at the Gilruth Center.

The discussion is being hosted by the American Institute of Aeronautics and Astronautics Houston Section. Cost is \$5 for members, \$10 for non-members and \$3 for students.



Photo courtesy Lockheed Martin

The first super lightweight tank for the space shuttle is stacked in Cell A of the Vertical Assembly Bldg. at the NASA Michoud Assembly Facility in New Orleans.

First super lightweight tank achieves major milestone

The first super lightweight tank for the space shuttle achieved a major production milestone as mating of major components was completed by Lockheed Martin Michoud Space Systems personnel in late October.

The liquid oxygen tank/intertank and liquid hydrogen tank were stacked in the Vertical Assembly Bldg. at the NASA Michoud Assembly Facility in New Orleans. The SLWT is in final assembly at Michoud for completion of mechanical, electrical and thermal protection system installation, and final acceptance tests.

The tank is on schedule for delivery to NASA in January in support of the May launch of STS-91, the final scheduled shuttle-Mir docking mission.

The tank, designed and assembled by Lockheed Martin Michoud Space Systems, is a redesigned external tank, using aluminum-lithium alloys and other design enhancements to reduce overall weight by 7,500 pounds. The weight savings will result in increased shuttle payload capacity.

Increased performance is critical for deployment of International Space Station elements.

STS-87 astronauts move on to science

(Continued from Page 1)

launch of the first component next summer.

The space walk lasted 7 hours, 43 minutes, but the astronauts were not able to complete all of its objectives, so early this week mission managers were discussing the possibility of a second space walk by Scott and Doi.

A second deployment of the Spartan satellite was nixed this past Sunday when propellant margins on the shuttle were deemed insufficient to protect all of the options associated with a safe rendezvous and capture of Spartan again.

"It just wasn't enough," said Lee Briscoe, who added that scientists believe the spacecraft is healthy and can be brought home and reflown on another, as yet undefined, shuttle flight.

"All indications are we have a healthy spacecraft," said Craig Tooley, Spartan project manager. "We are still not sure what caused this. It was basically idling, and it never got out of the idle mode."

In and around the activity with Spartan, data was gathered around the clock by a number of investigations in support of STS-87's primary experiment package, the United States Microgravity Payload, flying for the fourth time on the shuttle.

The USMP-4 experiment package mounted in the rear of *Columbia's* payload bay requires little or no interaction by the crew, but another set of "hands-on" experiments in the microgravity glovebox facility in the mid-deck required near constant involvement by crew members.

Five instruments on the support structure near the orbiter's tail include a furnace to study semiconductor material solidification; a crystal growing facility using a materials processing furnace; an experiment to study thermal properties of materials; an investigation into the theories and assumptions concerning the solidification process of metal products; and a study measuring the effects of vibrations on the support structure for the sensitive experiments.

Already scientists have reported measuring the fastest growth rate

ever for a tiny tree-like crystalline, called a dendrite, using an acid that serves as a stand in for metals such as aluminum and copper. This acid allows investigators to see into the solution and observe the growing dendrites. The experiment may help in improving the quality of metals and their performance.

The glovebox serves as a mini laboratory for the study of combustion science, composite component strength, and uniform mixing of different metal alloys during the melting and solidification process.

Operations in the Advanced Automated Directional Solidification



Furnace ended earlier than planned Sunday afternoon when the science team noted unexpected readings from several temperature sensors.

"Prior to this mission the furnace was modified to allow the exchange of samples aboard the shuttle," said Assistant Mission Manager Jimmie Johnson. "Although we

were unable to complete the third experiment run, the two we have completed will potentially yield more science from this mission than the previous two missions combined."

The furnace, with its precise temperature control, is used to gradually grow large, near-perfect lead-tin-telluride crystals—semiconductor materials that determine the speed and amount of information stored and sent by computers and electronics.

If landing occurs on schedule, the STS-87 crew will brief employees at 7 p.m. Dec. 17 in the IMAX Theater at Space Center Houston. JSC Director George Abbey will present the crew's Space Flight Medals, and other awards to individuals and teams who made key contributions to the flight. The program will conclude with the IMAX movie "The Dream is Alive." Limited seating will be available. The program is open to JSC employees, family members, friends, contractors both on and off site, and guests. Doors open at 6:30 p.m. and seating is first-come, first-served. Admission and parking at Space Center Houston are free.

Life support chamber crew counts blessings

Thanksgiving is a time for reflection and counting your blessings, and the Lunar Mars Life Support Test Project Phase III crew was no exception.

"As we approach the end of this test, we have many, many things to be thankful for," said Commander Nigel Packham. "First, the test has been extremely successful, and we have learned so much from these short three months, both about life support systems and the humans they keep alive. The life support systems are working so well that 1998 will be spent evaluating flight versions of these systems for possible inclusion as space station baseline hardware. We are thankful for this accomplishment. Packham said the crew is thankful

for family and friends that have given tremendous support; technicians who put together the testbed; engineers who designed, maintained and kept the systems singing throughout the test; scientists who dreamed of dancing molecules and gave them life; test directors who kept them informed, safe and comfortable; crew support personnel who were the legs and voice of the crew outside of "this steel beast"; chamber operators who delivered everything they needed to keep going; experimenters who put together the science package; and for the data collected.

"We are thankful for the tremendous support we have received from all levels of management, NASA and contractor," Packham added. "We are thankful that 52 of our friends and col-

leagues have been launched into space on eight shuttle missions this year, and that four of them have traveled to and/or from Mir to investigate how long-duration stays in microgravity affect them. Finally, we are thankful that the dream of setting foot upon another planet is alive and kicking."

With the end of the test set for Dec. 19, there are still many goals to be accomplished. The team was to speak with about 6,500 students of various grade levels in Iowa via three video link-ups this past week, spreading the word about the benefits of NASA programs and the importance of a good education. An on-orbit link-up with the STS-87 crew and JSC Director George Abbey and U.S. Rep Nick Lampson, D-Texas, also was planned.



JSC Photo by Nigel Packham

Lunar Mars Life Support Test Project Phase III test subjects, from left, Vickie Kloeris, a JSC shuttle food system manager; John Lewis, a Lockheed-Martin life support system engineer; and Laura Supra, an AlliedSignal life support system engineer, enjoy Thanksgiving dinner "inside the tank."

Community News



97-16451

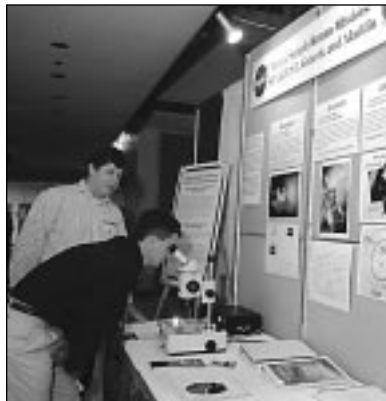
Above: A group of Space Camp friends that passes on what it learns in NASA visits through school speeches, scouting activities and other hometown opportunities listens as James Lewis of JSC describes the Magnetic Berthing Demonstration System in Bldg. 13. From left are Kathy Nicholas, Everett Bennett, Margaret Doran, Sue Gilbert, Mary Helen Atkins, and JSC co-op engineering student Laura Marstad. Right: Bob Heppel, left, and Mike Lecrone, center, of Zeus Co., listen as Jason Andringa describes an animated presentation of the capabilities of the X-38 crew return vehicle. A scale model of the X-38 is being built in the background. Below left: 3-D glasses enhance the effects of a computer generated film shown in the Bldg. 9 International Space Station virtual environment fly-through theater. Below right: Dr. Michael Zolensky of JSC's Space and Life Sciences Directorate helps a visitor use a microscope to see what happens when a particle is fired through Aerogel at extreme velocities. Aerogel is a light, silica-based material developed at NASA's Jet Propulsion Laboratory that will be used to capture interstellar dust grains for study.



97-16453



97-16449



97-16446

Inspection 97 'top notch,' guests report

By Debi Shoots

Despite uncooperative weather, about 2,500 visitors from 45 states across the nation and nine different countries flocked to Inspection 97, and in their eyes, it was a huge success.

"I've been here three days, probably the best three days of the year," said one guest, Phillip Puddy of Puddy and Associates. "I found some things that I can use in my company and personally, at least a dozen. I didn't realize I97 would be this grand of a scale. Several people [that I've talked to] said that it's the best gathering of technical knowledge they've seen in a lifetime of attending this kind of thing."

Peter Simmang, with American Builders Mortgage in Austin, said he hadn't realized the extent of the practical applications for the kinds of space technology developed at JSC.

"We all know that some things make it down to use here on Earth," Simmang said. "I wasn't expecting to see quite so much that we can use in everyday life. I think the hardest thing is figuring out what you want to go see — there is so much."

Although JSC technologies and capabilities greatly impressed the guests, it was the I97 volunteers who made the event special. Repeatedly, visitors indicated they found the one-on-one communication with JSC workers of particular value. Quotes received from interviews and comment cards praised the enthusiasm of JSC's employees.

"This event is a spectacular example of masterful planning and organization—four-star all the way," said one attendee. "The JSC hosts were top-notch professionals—courteous, friendly and knowledgeable. I wish I had the stamina to do this tour for a week, because there is so much to see."

Another guest commented, "I think this Inspection was awesome. You've given me pride and ownership in our space program. The people here were helpful and had lots of information. Thanks for a wonderful experience."

James Whittington, a JSC employee host from the Small Business

Innovation Research Office, spoke of his experience, "We had one gentleman come by who said that he had learned in one hour of more contracting opportunities than he had learned of probably in the last year. Some guests from California told me they had an image of NASA as a closed-off agency with not much access to the public, and were very surprised by how friendly and open everyone was, and how many opportunities for doing business were here."

Repeat visitors noticed improvements in JSC's second inspection.

"Inspection was organized better this year," said Guadalupe Herrera with Radiant Technology in Dallas, "the way it was laid out, everything is running a lot smoother. There's new technology that's just completely changing every year."

In addition to providing business, community, and education leaders with one-on-one contact with the technology and projects at JSC, the success of I97 also can be measured by the creation of new and better opportunities for visitors and for NASA.

Dr. Bob Rice, an I97 exhibitor from the Somatic Sciences Institute in The Woodlands, said he came to Inspection Days last year for the first time.

"There I saw an opportunity to take an idea that brought me here as a visitor, meet with folks from different directorates here at JSC, and out of that create a joint-venture opportunity," he said. "Emerging from a visitor status to an exhibitor status one year later is really the whole idea of what Inspection is all about."

Inspection 97 Chairman Doug Blanchard thanked all of the exhibitors, volunteers and employees for the hard work and considerate demeanor that allowed the I97 guests to take home a wealth of information.

"The technical breadth of our work, combined with that of visiting corporate executives, business owners, entrepreneurs, and technical experts, created an incredibly fertile technical environment for new ideas, concepts, and business initiatives."

Participation runs high

Combined Federal Campaign continues to accept contributions

(Continued from Page 1)

Office, Technology Transfer and Commercialization, and Space Operations Management Office—achieved 100 percent participation.

Fifteen organizations exceeded their dollar goal. The Office of the Director contributed 184 percent. The Human Resources Office contributed 248 percent. The Office of the Chief Information Officer contributed 149 percent.

The Equal Opportunity Programs Office contributed 222 percent. The Legal Office contributed 166 percent. The Public Affairs Office contributed 183 percent. The Business Management Directorate contributed 103 percent. The Mission Operations Directorate contributed 111 percent. The Technology Transfer and Commercialization contributed 145 percent. The Office of the

Chief Financial Officer contributed 124 percent. The Space Shuttle Program contributed 134 percent. The Safety, Reliability, and Quality Assurance contributed 108 percent. The Space Operations Management Office contributed

102 percent. The EVA Projects Office contributed 146 percent. And the Phase 1 Program Office contributed 143 percent.

Almost 200 employees have pledged more than \$600 a year. More than 350 employees gave one-hour's pay per month, and 194 gave two-hour's pay per month.

"JSC employees' generosity will go a long way to help those less fortunate in our community," said Coordinator Teresa Sullivan.

Employees who have not already made their contributions may still do so. Contact Sullivan at x31034.



JSC Safety Alert

Unauthorized Relocation of Wall Hanging Systems or Modular Furniture

What Happened

A Herman Miller™ Systems furniture bookshelf attached to a wall partition in Bldg. 4 North fell and struck an employee on the head. The employee was not injured.

Outcome of the Investigation

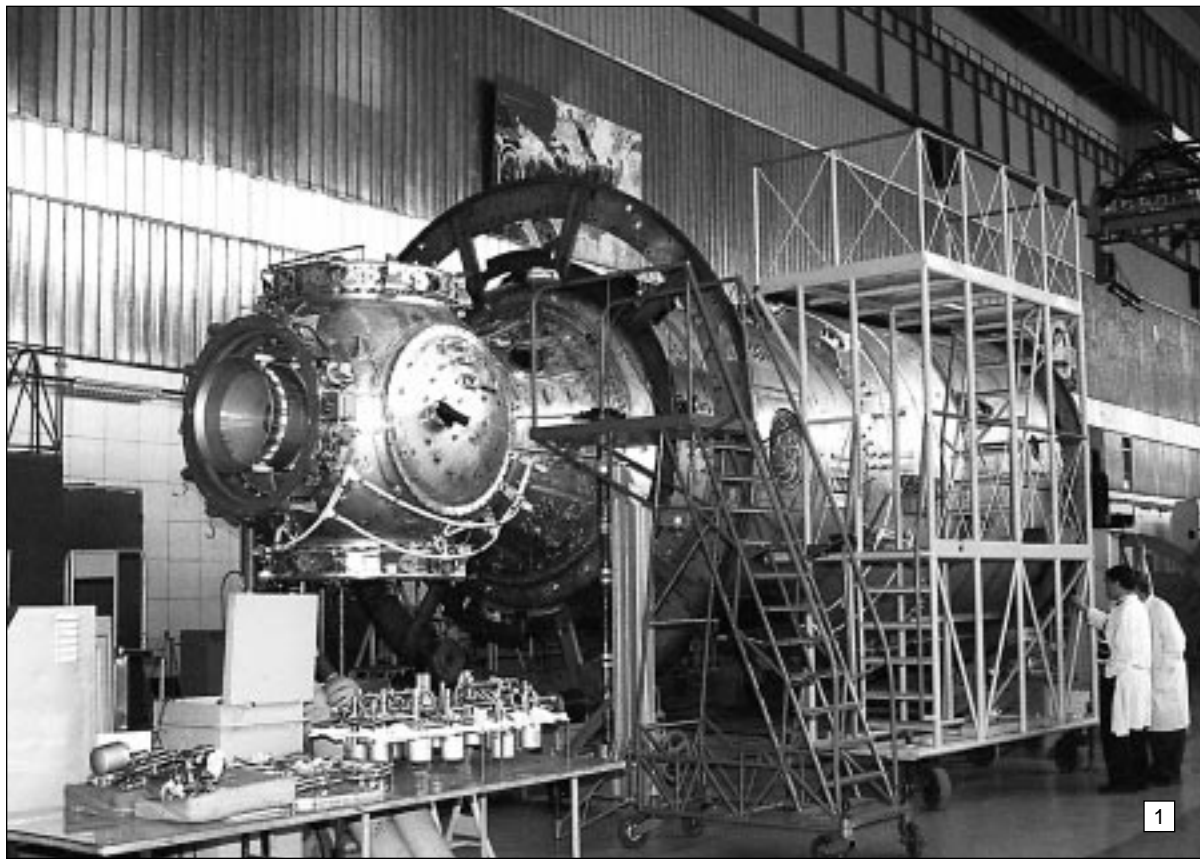
The permanently mounted book shelf was removed from one wall panel section within a cubical and relocated to another wall panel section by someone other than a personnel trained by the manufacturer. Unauthorized moving of any systems or modular-type furniture may create an unsafe condition due to improper mounting, unstable wall panels, and at times will reduce the legally required amount of walking area required by the National Fire Protection Association Life Safety Code. The furniture is designed to be installed, removed, and relocated only by trained personnel. If improperly installed, the framework and support brackets will bend, the screws will pull out, and the structure will not support the intended load limits.

What Can You Do

Always work through the Furniture Group/Support Operations Division when you need additional shelves, or when you need to have any wall-mounted shelf unit or bookcases relocated. This is the NASA documented procedure and must be followed to provide you with a safe workplace.

Recommended Corrective Actions

The SOD will inspect each office and cubical on the second floor of Bldg. 4 North to identify and flag any existing unsafe placement or unsafe mounting of Herman Miller™ Systems furniture. An inventory will be compiled of the damaged furniture, and replacement parts will be requested. If you have relocated systems or modular furniture from one location to another, notify your building's Facility Manager to have it inspected for safety.



S97-12607



S97-10684

Pace picks up for station crews, builders

As preparations continue for the launch of the first International Space Station elements next year, photographic evidence of station hardware and crew training are mounting.

In Russia, construction of the Functional Cargo Block—known by the Russian acronym FGB—and Service Module are progressing, and the first resident crew is training for its launch and a five-month stay on orbit.

In the U.S., work on Node 1—a connecting passageway to the U.S. laboratory module, Node 3 and an airlock with six docking hatches—is undergoing check-out at the Kennedy Space Center, and the STS-88 crew that will deliver it to orbit is practicing procedures for connecting it to the FGB. Left to right, top to bottom:

1) The 20-ton FGB, which will be launched on a Russian Proton rocket, is built at the Khruichev State Research and Production Space Center in Moscow.

2) The first ISS crew poses aboard a

Black Sea freighter before beginning water survival training. From left are Soyuz Commander Yuri Gidzenko; Commander Bill Shepherd and Flight Engineer Sergei Krikalev, and in the background is a mockup of the Russian Soyuz spacecraft descent module used in training. The crew is scheduled to be launched aboard a Soyuz spacecraft in January 1999.

3) Shepherd, Gidzenko and Krikalev undergo survival training, releasing smoke bombs that would help rescuers locate them if they landed in water.

4) U.S. Astronaut Carl Walz, who will be a member of the fourth ISS resident crew, looks out a porthole at the Khruichev factory.

5) Shepherd prepares to plunge into the water from a Soyuz mockup in the Black Sea during survival training.

6) Pressurized Mating Adapter-1 is moved for further processing in KSC's Space Station Processing Facility. The cone-shaped connector is one of two

that will be attached to Node 1 during ground processing. Node 1 and the two PMAs will be launched aboard the Space Shuttle *Endeavour* on STS-88 in July 1998.

7) Shepherd plunges from the Soyuz mockup into the Black Sea.

8) STS-88 crew members pose with Node 1 in the high bay at KSC. From left are Pilot Rick Sturckow, Mission Specialist Nancy Currie, Commander Bob Cabana and Mission Specialist Jim Newman.

9) Covered in a protective sheath, Node 1 is hoisted from its transporting container for installation in its work stand at KSC. The 18-foot-in-diameter, 22-foot-long aluminum module was manufactured by The Boeing Co. at Marshall Space Flight Center.

10) Russian technicians work on the almost completed aft portion of the U.S.-funded and Russian-built FGB.

11) Russian technicians work on the

Service Module shortly after it completed a pressurization test in September. The first fully Russian contribution to the ISS is to launch in December 1998 and provide early power, propulsion, life support, communications and living quarters.

12) A Russian technician works on the forward end of the Service Module, which will be the third station element, joining the FGB and Node 1 on orbit.

13) A close-up view of Node 1 in its work stand in the Space Station Processing Facility shows two of its six hatches that will serve as docking ports.

14) *Endeavour* prepares to capture the FGB using the shuttle's mechanical arm in this artist's depiction of the first assembly flight. The shuttle will carry Node 1, and attach it to the already orbiting FGB. Once the FGB is captured using the mechanical arm, Astronaut Nancy Currie will maneuver the arm to dock the FGB to the conical mating adapter at the top of Node 1 in the shuttle's cargo bay.

15) This digital artist's concept shows the first two elements of the International Space Station joined in orbit, the FGB on the left and Node 1 on the right.

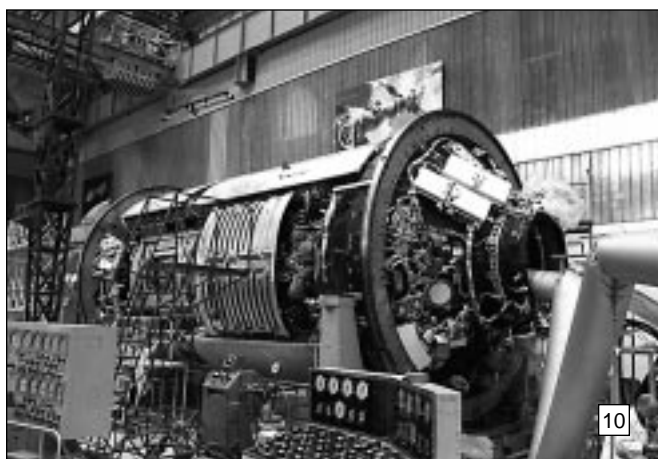
16) JSC space walk trainer Wayne Wedlake, second from right, demonstrates an EVA power tool to STS-88 crew members Jerry Ross, left, Jim Newman and Rick Sturckow, right.

17) Ross practices using the tool during an acceptance test with Pressurized Mating Adapter 1 and Node 1 at KSC.

18) From right, Ross, Sturckow and Newman practice removing cable umbilicals from their stowed position on the pressurized mating adapters and attaching them to Node 1, using specially designed tools.

19) Pressurized Mating Adapter 2 awaits prelaunch processing in the Space Station Processing Facility at KSC.

20) STS-88 Commander Bob Cabana looks over the area around a hatch from inside the Node 1 module at KSC. □



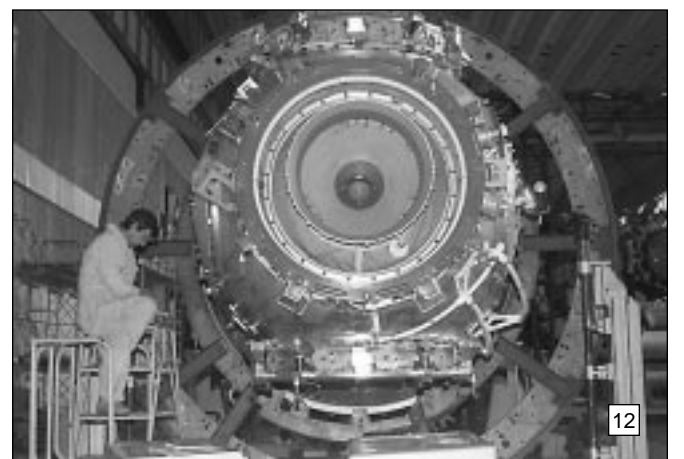
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KSC-97PC-1519



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KSC-97PC-1522



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NASA Photos



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KSC-97PC-944



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KSC-97PC-1491



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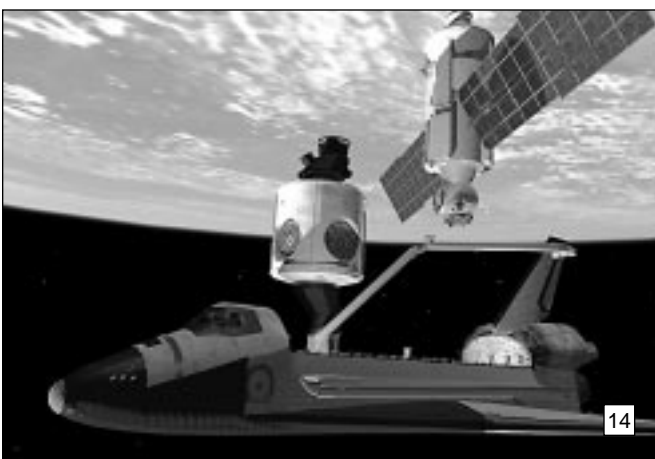
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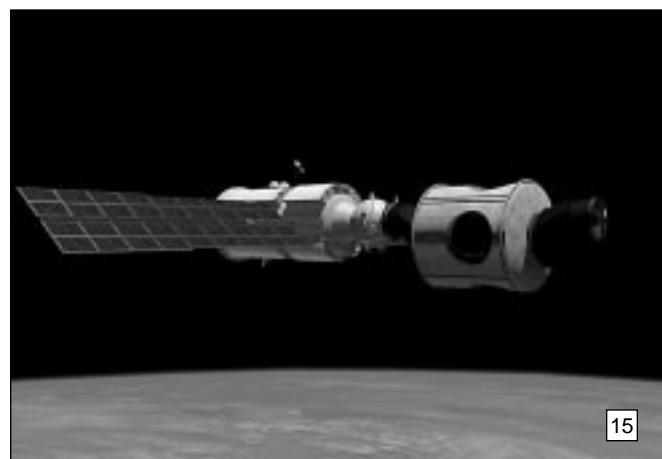
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KSC-97PC-941



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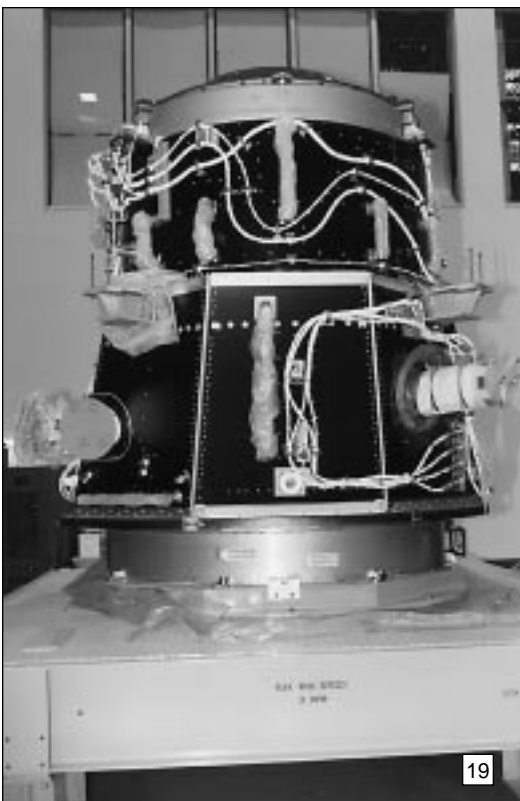
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S97-10535



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KSC-97PC-1528



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KSC-97PC-1530



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KSC-97PC-1526

32 Years Ago at MSC

Light pad damage

No-holds Gemini VII launch dual mission's perfect start

Reprinted from the Dec. 10, 1965, issue of Space News Roundup.

The Gemini VII/VI long-duration and rendezvous mission was well on its way to success December 4 when the Gemini VII lifted off at 1:30 p.m. CST following a perfect no-holds countdown.

Smoke from the Gemini launch vehicle's engines had not fully cleared away before damage assessment teams were inspecting Launch Complex 19 for pad damage assessment teams were inspecting Launch Complex 19 for pad damage to determine how soon Gemini VI and its launch vehicle could be reerected on the pad for lift-off next Monday. Pad damage was exceptionally light and both stages of the Gemini VI launch vehicle were trundled out of the hangar and out to the pad.

By 2:30 a.m. the following morning, both stages had been erected; by noon, the Gemini VI spacecraft had been mated to the launch vehicle and pre-launch checkouts and tests were begun.

Gemini VII's crew, Frank Borman and Jim Lovell quickly settled down for the long 14-day haul after a half-hour period of station-keeping with the second-stage booster. Both men slept approximately eight hours the first night and 10 hours the second night (by Houston time reference). Radio silence was maintained during these periods by stations in the Manned Space Network and by Mission Control Center-Houston.

Telemetry readouts, activated by ground radio commands, kept tabs on the condition of the spacecraft systems and the astronauts' physical condition.

An early drop in fuel cell cryogenic oxygen pressure, reminiscent of the early hours of Gemini V, was corrected when the crew of Gemini VII elected to open the cross-over valve which allows the supply of breathing oxygen to boost pressure in the fuel cell reactant oxygen tank.

Gemini VII was inserted into orbit with a perigee of 82.7 nm and an apogee of 177.1 nm and inclined 28.89 degrees to the equator. (Planned 87/183, 28.87 degrees).

A 59 ft/sec posigrade OAMS burn at 3 hours 45 minutes elapsed time raised perigee to 120 nm. The next maneuver was made yesterday circularizing the orbit and proper phasing with the Gemini VI launch.

The first several days of the Gemini VII mission have been spent in conducting experiments. Toward the end of the fifth day in orbit, after 77 revolutions, the crew of Gemini VII will use the spacecraft's OAMS thrusters to adjust the orbit to about 161 nm circular to optimize launch conditions for Gemini VI and for subsequent rendezvous of the two spacecraft.

Gemini VI spacecraft is scheduled for launch Sunday, at 8:50 a.m. CST contingent upon testing and recheck-out of the spacecraft and launch vehicle. Launch of Gemini VI should nominally occur at 7 days 19 hours and 20 minutes Gemini VII elapsed time and at the beginning of Gemini VII's 119th revolution.

Rendezvous and "formation flying" of the two spacecraft should begin in the fourth orbit at about 5 hours 40 minutes Gemini VI elapsed time.

Formation flight, or station keeping, will continue for two and one half revolutions. Gemini VI reentry and landing in the West Atlantic recovery zone will be at 46 hours 45 minutes elapsed time at about 7:20 a.m. CST.

Gemini VII will continue its flight for a total elapsed time of about 329 hours 30 minutes, landing in the West Atlantic zone at 7 a.m. CST two days after Gemini VI recovery.

The prime mission of Gemini VII is 14 days duration, regardless of whether or not the Gemini VI mission is launched within the same time frame.

All the medical experiments that have been developed for the Gemini

program are being flown on the Gemini VII mission.

These medical experiments are: M-1, Cardiovascular Reflex Conditioning; M-3, In-Flight Exerciser; M-4, In-Flight Phonocardiogram; M-5, Bioassays of Body Fluids; M-6, X-Ray Densitometry; M-7, Calcium Balance Study; M-8, In-Flight Sleep Analysis, and M-9, Vestibular Effects.

The Cardiovascular Effects of Spaceflight, once classified as Experiment M-2, is now a routine pre- and post-flight medical procedure involving tilt-table tests...

By contrast, the two-day Gemini VI mission will carry no medical experiments. As in all manned missions, telemetry readouts of the Gemini VI crew physical condition will be watched as a matter of operational routine by medical monitors at stations in the Manned Space Flight Network and by flight surgeons in Mission Control.

In addition to the eight medical experiments carried aboard Gemini VII, nine scientific experiments are being conducted in the mission. These experiments are:

D-4/D-7, Celestial, Space and Terrestrial Object Radiometry ... D-5, Star Occultation Measurement ... D-9, Simple Navigation ... S-8/D-13, Visual Acuity/Astronaut Visibility ... S-2, Synoptic Terrain Photography ... S-6, Synoptic Weather Photography ... MSC-2/MSC-3, Proton Electron Spectrometer and Tri-Axis Flux Gate Magnetometer ... MSC-4, Optical Communications ... MSC-12, Landmark Contrast ...

Two of the Scientific experiments carried aboard Gemini VII will also be carried on Gemini VI: S-5, Synoptic Terrain Photography and S-6, Synoptic Weather Photography.

The third and last Gemini VI experiment is D-8, Radiation Experiment, which measures the radiation level and radiation flux inside the spacecraft and measures radiation level intensity especially in the crew vicinity.



NASA Photos 65-H-1853 and S65-62589

Above: Spacecraft Gemini VII lifts off from Launch Complex 19 at 1:30 p.m. CST December 4 with crewmen Frank Borman and Jim Lovell aboard following a perfect no-holds countdown for a two-weeks stay in orbit and a planned rendezvous with the Gemini VI spacecraft. Below: NASA and Department of Defense recovery coordinators in the Recovery Control Room at Mission Control Center-Houston focus their attention toward a projected TV image of the Gemini VI launch.



Gilruth Center News

Hours: The Gilruth Center is 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.

Sign up policy: All classes and athletic activities are first come, first served. 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, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

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 \$10. Dependents must be between 16 and 23 years old.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$40 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

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

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

Weight safety: Required course for employees wishing to use the weight room will be offered from 8-9:30 p.m. Call for next available class. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.

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

Aikido: Introductory martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.

Step/Bench aerobics: Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks. Kristen Taragzewski, instructor.

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Monday. 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.

Gilruth Home Page: Check out all activities at the Gilruth online at: <http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday and in the Bldg. 3 Exchange Store from 7 a.m.-4 p.m. Monday - Friday. For more information call x35350 or x30990.

EAA Christmas Dinner/Dance: Dec. 13, \$25 per person

EAA New Year's Eve Dinner/Dance: Dec. 31, \$27.50 per person

Moody Gardens: Tickets are \$9.50 for two of four events

Space Center Houston: Adult \$8.95; children (4-11) \$6.40 JSC civil service employees free.

Movie discounts: General Cinema, \$5.25; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75

Shirts: JSC logo T-shirt, \$10, polo style, \$23; International Space Station logo golf shirts, \$26 and \$28

Stamps: Book of 20, \$6.40

1998 Franklin Planner replacement refill orders being taken now.

Sweetwater Pecans: Orders are being taken now; cost is \$5.75 per pound.

Metro passes: Tokens and value cards available.

Book available: *Suddenly Tomorrow Came: A History of Johnson Space Center.*

Upcoming events: EAA Spring Break Ireland Trip: March 21-29, \$1,399 per person, double occupancy (\$200 deposit per person, final payment due Jan. 21).

Roundup Deadlines

The Space News Roundup is published every other Friday. Story ideas should be submitted as far in advance as possible, but no later than two weeks prior to the date of publication.

The deadline for Dates & Data calendar items is three weeks prior to the date of publication.

Stories and ideas should be submitted to Kelly Humphries in Bldg. 2, Rm. 180, or via e-mail to kelly.o.humphries1@jsc.nasa.gov

Secretaries complete series of college-level classes to refresh business English skills

Congratulations are in order for the more than 230 secretaries who recently completed a series of college-level business English classes designed to ensure they possess a solid up-to-date grammar foundation.

The Communication Skills Building Blocks Series, otherwise known as Building Blocks, began last August as a one-year training requirement targeted at all JSC secretaries. The task at hand was rigorous: take 14 three-hour "modules" over the course of one year and a post assessment at the conclusion of each module; or take a skills assessment before taking any of the classes potentially to "place out" of selected modules.

Realizing that the secretary's success is important to the center's ability to meet its commitments, JSC Director George Abbey asked the Human Resources Office to develop a comprehensive approach to training the secretarial workforce so that they could become more versatile in their skills, remain proficient in leading-edge office technologies, and increase their competitiveness for future positions.

With that in mind, Nancy Garrick of the Human Resources Development Branch took on the task. The result was a completely revamped office support training curriculum with the Building Blocks being the key component. The new curriculum features required core

classes and optional supplemental classes designed to emphasize basic skills development, enhancement, and refinement with the Building Blocks series laying the foundation.

When this effort began, close to 200 secretaries opted to take the skills assessment, which individually evaluated their grammar skills. To ensure excellence, a score of 85 percent or better was needed to "place out" of selected modules. Yet, some secretaries who passed the entire skills assessment elected to take all the classes to reinforce their grammar skills.

Flight Crew Operations Director David Leestma even took the assessment so that he would be aware of the types of things the secretaries in his organization would be required to learn.

"I took the assessment," Leestma said, "and it was tough! I was lucky and had an excellent English teacher, who was also my mother, who drilled me on grammar and punctuation constantly. It was interesting to test how much I had remembered, and surprising to see that some of the rules have changed."

After the assessments were scored and the results returned, the task of scheduling multiple classes for each module began. The 14 modules became the secretarial standard for learning grammar all over again. For the secretaries who wanted to spend more time than the required three hours, a full eight-hour class was

offered. Maureen Giacchino, owner of The Training Team and teacher of the Building Blocks, was also available for tutoring. Giacchino's sense of humor and style made each class fun and interesting, Garrick said.

Under Giacchino's tutelage, the secretaries delved into parts of speech, identified nouns and substituted pronouns. They tensed verbs, and taught them to agree; unsplit infinitives and undangled participles; modified with adjectives and adverbs; drove straight through conjunction junction; wrote sentences that questioned and exclaimed; punctuated with colons and semicolons; and ended with an element of style.

"The secretaries took a very daunting task and turned it into a positive, learning experience. And that showed their professionalism," Flight Crew Operations secretary Elaine Kemp said on behalf of the Senior Secretarial Council.

At the conclusion of the one-year effort all of the civil service secretaries had participated in some way, and 97 percent had completed the requirement. A group of almost 50 secretaries worked with Giacchino and Garrick to plan a graduation extravaganza, which included awards, speakers, decorations, food, punch and music. More than 200 secretaries came to the Building Blocks Bash on Oct. 7 at the Gilruth Center.

"Your success is important to us and critical to the center's ability to meet its commitments," Abbey said. "I



JSC Photo

Secretaries celebrate the completion of the Building Blocks courses. From left are Laura Jackson, Isabel Elizondo, Claudia Pruneda and Debra Eaton.

can't over emphasize how important you are to our success."

Several senior staff members also attended the ceremony.

"I have been a strong supporter of the program, first in Mission Operations and now in Business Management," said Business Management Director James Shannon. "I am so proud of the high percentage of the secretaries at the center who completed the program. In every sector of the center the secretarial workforce is a key factor to our success. I look forward now to the real payoff,

which is continued professional excellence."

"NASA is lucky to have such a great group of secretaries. You met every challenge that was given to you with style and class," Giacchino said. "Teachers dream of moments like this. I learned and received as much as you did from the program."

A new set of Building Blocks began in September and will continue for another year for those who didn't complete the initial set and for the new secretaries who were hired since the effort began.

People on the Move

Human Resources reports the following personnel changes as of November 22:

Additions to the Workforce

Barbara Corbin joins the Space Operations Business Management Office as a business analyst.

Promotions

Beverly Yell was selected as a secretary in the Advanced Development Office of the Engineering Directorate.

Reassignments Between Directorates

Susan Sinclair moves from the Safety, Reliability, and Quality Assurance Office to the Mission Operations Directorate.

Retirements

Rhea Seddon of the Flight Crew Operations Directorate.
Dave Forward of the Space Shuttle Program Office.

Resignations

Susan Cupples of the Engineering Directorate.

Dunn earns top secretary award

Linda Dunn received the Marilyn J. Bocking Secretarial Award for Excellence in October.

Dunn was recognized for her ability to be adaptable and flexible as a division-level secretary for the Assessment Office in the Business Management Directorate during an extremely active year and a half in that office. While the Business Management Directorate was undergoing many different changes at the

Directorate office, she also is pursuing her own professional development. She is working on obtaining her bachelor's degree in business management, and has also participated in Project IQ, Office Support Curriculum and Secretarial Communication Skill Building Block Series.

Her dedication and willingness to assist in the professional and friendly manner she maintains and her motivation and dependability earned her the nomination.

Along with her success in supporting the Business Management

Directorate office, she also is pursuing her own professional development. She is working on obtaining her bachelor's degree in business management, and has also participated in Project IQ, Office Support Curriculum and Secretarial Communication Skill Building Block Series.

Dunn is now a purchasing agent for the Institutional Business Management Office.

Krishen earns technological achievement award

Dr. Kumar Krishen, chief technologist for the Technology Transfer and Commercialization Office at JSC, recently was awarded the 1997 Business Opportunity Symposium Series Conference Outstanding Technological Achievement Award.

Krishen was presented the award for his advancement of original concepts regarding health systems, remote sensing, sensor systems, mission support technologies,

automation and robotics technologies, science payloads, and communications and tracking systems.

His work at NASA includes developing strategies for joint research, technology projects and plans with universities, industries, government agencies and other NASA centers.

Krishen is involved with numerous agency, interagency and international panels and committees. He also is the post-doctoral adviser

for the NASA NRC Program, and doctoral adviser for the NASA Graduate Program and Summer Faculty Program.

Krishen is the principal technologist and JSC representative on the NASA Council on Science and Technology.



Krishen

Dates & Data

Dec. 8

Space Act of 1958: Dr. Eilene Galloway will speak on her participation in formulating the 1958 Space Act and international Sputnik relations at 3 p.m. Dec. 8 in Bldg. 30A Auditorium. For more information call John Stanford at x31347.

Dec. 9

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. Dec. 9 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

NPMA meets: The National Property Management Association will meet at 5 p.m. Dec. 9 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Dinner costs \$14. For more information call Sina Hawsey at x36582.

Dec. 10.

PSI meets: The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. Dec. 10 at the Holiday Inn, NASA Road 1. Dinner costs \$13. For details, call Elaine Kemp at x30556.

Astronomy seminar: The JSC Astronomy Club will meet at noon Dec. 10 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at x35037.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. Dec. 10 at Lockheed Martin, 555 Forge River Road. For more information, contact Richard Lehman at 281-333-6004 or Melissa Sommers at 281-332-0698.

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. Dec. 10 at the House of Prayer Lutheran Church. For more information, call Jeannette Darcy at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. Dec. 10 at United Space Alliance, 600 Gemini. For details, call Patricia Blackwell at 281-282-4302 or Brian Collins at x35190.

Dec. 11

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 5 p.m. Dec. 11

at Mario's Pizza in Webster. For more information, call Gerard Valle at x38835.

Radio club meets: The JSC Amateur Radio Club will meet for its November/December meeting at 6:30 p.m. Dec. 11 at the Piccadilly Cafeteria, 2465 Bay Area Blvd. For details, call Larry Dietrich at x39198.

Dec. 12

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. Dec. 12 at the Center for Advanced Space Studies, 3600 Bay Area Blvd. For more information, call Chuck Shaw at x35416.

Space Society meets: The Clear Lake area chapter of the National Space Society will meet at 6:30 p.m. Dec. 12 at the Radisson Hotel - Hobby Airport. Dr. Norman LaFave will speak on the "Cosmos Mariner - Reusable Launch Vehicle." For details, call Murray Clark at (281) 367-2227.

Dec. 17

STS-87 briefing: If landing is on time, the STS-87 astronauts will brief employees on their mission at 7

p.m. Dec. 17 in the IMAX Theater at Space Center Houston. The event will be open to all JSC employees, contractors, friends, family members, and public guests. An award presentation, with JSC Director George Abbey presenting the crew's Space Flight Medals and Lead Flight Director Bill Reeves presenting other awards to key players in the mission will precede the crew briefing. After the crew's presentation, the IMAX movie "The Dream is Alive" will be shown. For more information, call Helen Harris at x38413.

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Scuba club meets: The Lunarfins will meet at 7:30 p.m. Dec. 17 at the Redfish Restaurant under the Kemah/Seabrook bridge, Seabrook side. For more information, call Fred Toole at x33201.

Dec. 18

Child Care directors meet: The Space Family Education board of directors will meet at 11:30 a.m. Dec. 18 in Bldg. 45, Rm. 712D. For more information on this open meeting, call Gretchen Thomas at x37664.

Dec. 25

Christmas Day: Most JSC offices will be closed Dec. 25 and 26 in observance of the Christmas holiday.

NASA Briefs

New device paves way for all-electric aircraft of future

Engineers at NASA's Dryden Flight Research Center have completed tests on a device that paves the way for developing future all-electric airplanes that could be safer and more fuel efficient than today's aircraft. The device, the Electro-Hydrostatic Actuator, eliminates or minimizes airborne dependence on pneumatic, hydraulic and mechanical systems. Its use reduces complexity and improves reliability, and could lead to fuel savings, a reduction in ground equipment, and a reduction in the vulnerability of military aircraft in combat situations—eliminating hydraulic lines in the fuselage and wing box. Taking its signals from the aircraft's flight-control computers, the device uses its electronics to "fool" aircraft computers into thinking a standard actuator is on board.

Global land rainfall increases this century

Global land precipitation has increased during the 20th Century, especially at the mid and high latitudes, according to a paper published in the November 1997 issue of the *Journal of Climate*, written by Drs. Inez Fung, Anthony Del Genio, and Aiguo Dai. The report is based on a recalibrated compilation and analysis of data from 1900-1988 and confirms previous speculation that land precipitation is increasing. The new research shows a global land trend of a 2.4 millimeters per decade increase in annual precipitation amounts. Multiplied by almost nine decades, this means that there is about 22 mm more rain falling now each year than there was at the turn of the century—rainfall as a global mean has risen by slightly more than two percent.

NASA, GSA cooperate on computer buys

NASA and the General Services Administration have agreed to work together to procure desktop computing and networking services in a way that should save taxpayers millions of dollars in the coming years. NASA Administrator Daniel Goldin and GSA Administrator Dave Barram announced the formation of the partnership after extensive discussions and working group sessions within the agencies. Under the terms of the partnership, the agencies will work closely together to implement GSA's Seat Management Program and NASA's Outsourcing Desktop Initiative.

Tailless fighter shows greater agility than conventional jets

The NASA/Boeing X-36 Tailless Fighter Agility Research Aircraft successfully completed its flight research program—demonstrating the feasibility of future tailless fighters achieving agility levels superior to today's best military fighter aircraft.

The project goals are to develop and demonstrate enhanced technologies to improve the maneuverability and survivability of future fighter aircraft. "All of our project goals were met or exceeded," said Mark Sumich, X-36 project manager at NASA's Ames Research Center, Moffett Field, Calif.

During the final flight phase, the

X-36 project team examined the aircraft's agility at low speed/high angles of attack and at high speed/low angles of attack. "We also achieved the final flight's goal to expand the X-36's speed envelope up to 206 knots (234 miles per hour)," Sumich said. "The aircraft's stability and handling qualities were excellent at both ends of the speed envelope."

Thirty-one flights were made during the flight research program at NASA's Dryden Flight Research Center. The first flight occurred on May 17. The final flight, which closed out the third phase of the program, took place on Nov. 12

and lasted 34 minutes. The X-36 flew a total of 15 hours and 38 minutes and used four different versions of flight control software. The aircraft reached an altitude of 20,200 feet and a maximum angle of attack of 40 degrees.

The 28-percent-scale X-36, built by the Boeing Phantom Works in St. Louis, is designed to fly without the traditional tail surfaces common on most aircraft. The X-36 is 18 feet long with a 10 foot wingspan; three feet high; and weighs 1,270 pounds. The aircraft is powered by a Williams Research F112 turbofan engine that provides 700 pounds of thrust. The aircraft is remotely con-

trolled by a pilot in a ground station cockpit, complete with a head-up display. The pilot-in-the-loop approach eliminates the need for expensive and complex autonomous flight control systems.

"We now have a proven research aircraft that can be used for future tests. As people become aware of the aircraft's capabilities, interest is increasing in using it for future flight tests," said Gary Jennings, X-36 program manager for Boeing Phantom Works.

With the flight test program completed, the X-36 will be placed in flyable storage condition in a hangar at Dryden.



Photo courtesy Halliburton

CHENEY VISITS—Former U.S. Secretary of Defense Dick Cheney visited JSC recently to meet with JSC Director George Abbey. Cheney, who has served as chairman of the board and chief executive of Halliburton Co. since January 1996, made his visit on Oct. 27 with Halliburton President and Chief Operating Officer David Lesar. The six-term Congressman was defense secretary from March 1989 to January 1993.

Follow holiday feasting with fitness program

The Health-Related Fitness Program is entering its fifteenth year, and the program's staff is ready to accept new enrollees for any of its three fitness courses, nutrition intervention or weight control programs.

Starting in October 1983 with 72 enrollees, the program has grown to 1,774 active participants, including civil servants, retirees, contractors and dependents.

The three Health-Related Fitness courses combine education with exercise based on medical screening and fitness tests. Medical exams include a maximal stress test for men over age 39 and women over age 49.

Free examinations are available for civil servants at the JSC Clinic. Contract employees and dependents must get the screening off-site at their expense.



total health

Classes meet for one hour at either 6:30 a.m., 11:30 a.m., or 4:15 p.m.; a full schedule of class dates is available from the program staff.

The Nutrition Intervention Program includes a free JSC Clinic blood chemistry assessment, followed by seven weeks of education on the role of nutrition in health. Additional samples are taken 12 weeks and a year after the start to determine program effects. Classes meet once a week on Wednesdays at 4 p.m.

Overweight employees may participate in the Complete Weight Control Program, which includes a fitness program and group reinforcement and support meetings at 11:30 a.m. Thursdays. Thursday meetings are led on a rotating basis by a social worker, exercise scientist and registered dietitian.

To apply, contact the Health-Related Fitness Office, Rm. 146 in the Gilruth Center, or call x30301.

Postal Service to unveil stamp honoring Mars Pathfinder mission

The U.S. Postal Service will pay tribute to NASA's Mars Pathfinder mission in a Dec. 10 ceremony to unveil its new \$3 Priority Mail stamp, which features a panoramic view of the Martian landscape with the rover still stowed on a petal of the lander.

The ceremony at NASA's Jet Propulsion Laboratory will be opened with music by the U.S. Marine Corps' Third Marine Corps Aircraft Wing Band and a brief introduction by JPL Deputy Director Larry Dumas. Dr. Robert Parker, manager of the NASA Management Office at JPL and Pasadena Postmaster Robert Mysel will preside over the activities, which will culminate in the unveiling of the stamp by Dumas and Dr. Tirso del Junco, chairman of the U.S. Postal Service Board of Governors.

The Pathfinder image selected for the \$3 priority mail stamp was one of the first to be transmitted after landing on July 4, 1997. In the foreground the Sojourner rover is still folded up and waiting to be released from the petal of the lander. Within a day of landing, Sojourner had exited the lander's ramp to

begin its travels around the landing site. Fifteen million stamp sheets have been printed for first day issuance on Dec. 10, with information about the image and the mission printed on the reverse side.

"That first image of Pathfinder and Sojourner sitting safely on the surface of Mars ignited worldwide interest in our efforts to explore Mars," said JPL Director Dr. Edward Stone. "It is an honor for this mission to be recognized by issuance of this special U.S. postage stamp."

"As one of the most significant achievements in the history of America's space program, it is fitting that the Pathfinder mission be honored on a U.S. postage stamp," added Postmaster General Marvin Runyon. "When this stamp lands in stamp collections or on priority mail packages nationwide, it will be a reminder of the unmatched ingenuity that leads the world in space exploration."

The Mars Pathfinder stamp is the third U.S. stamp to incorporate invisible images to prevent counterfeiting, the Postal Service reported.

Humorous poem explains seriousness of gift regulations

(Continued from Page 1)

But lucky for me,
Some exceptions exist.
They're in subpart B and they
should not be missed.

I can pay market value if the gift I
do like,
Or I can at my option say "go
take a hike."
I can always say no,
But I need not decline.
If worth twenty or less then the
gift can be mine.

This exception has prompted
some very loud hollers.
It says gifts are okay if worth
twenty dollars.
But surely the public
Is certain to see,
I could never be bought for a
sandwich and tea.

Restrictions apply so it does not
suffice
To pay twenty bucks for a gift
twice the price.
And in any one year
I can't use it, of course,
To go over the limit—fifty dollars
per source.

For gifts that a friend or my sister
might send,
The rules recognize I don't want
to offend.
Regardless of value,
It only must be
That their motive to give wasn't
business, but me.

The rule's much the same in the
case of my spouse
Who happens to work as she
can't stand our house.
Although her employer

Is one of those sources,
I can go to their fete and avoid
more divorces.

In the case of most parties, the
rule's not so close
As the agency must have an
interest, I fear.
If worth more than twenty
And it's no friend true,
Then I'd better seek guidance or
I could be blue.
What of those in the office with
whom I share much
Are all treats a taboo—must we
always go dutch?
The rules here are different,
They're in subpart C
They okay some gifts even to
and from me.

I can give to my boss to a limit of
ten,

A baseball, a cap, or a blue ball-
point pen.
If not to my boss
Or my chain of command,
To a friend I can give more with-
out being canned.

I always look forward to my office
party.
We're all in good moods and the
food is so hearty.
If no arm is twisted,
Collecting's okay
To make sure that everyone has
a good day.

So go forth with good cheer and
know there's no reason
To think that the gifts rules will
ruin your season!

For more about accepting gifts,
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The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. Deadline for the submission of articles is Friday, three weeks before the desired date of publication.

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