



MARSHALL STAR

Serving the Marshall Space Flight Center Community

Oct. 18, 2007

Discovery stands ready for STS-120 mission

Space shuttle Discovery is on the launch pad at the Kennedy Space Center, Fla., set to launch on the STS-120 mission to the International Space Station. The targeted launch date is Oct. 23 at 10:38 a.m. CDT. It will be the 23rd shuttle mission to the space station and the 120th shuttle flight.

The 14-day mission will deliver Harmony, an Italian-built U.S. multi-port module that will serve as a connecting point between the U.S. Destiny lab, the European Space Agency's Columbus module and the Japanese Kibo module. Retired Air Force Col. Pamela A. Melroy will command the STS-120 mission to deliver the Node 2 connecting module to the station. Melroy, a veteran shuttle pilot, is the second woman to command a shuttle. Marine Corps Col. George D. Zamka will serve as pilot. The flight's mission specialists will be Scott E. Parazynski, Army Col. Douglas H. Wheelock, Stephanie D. Wilson and Paolo A. Nespoli, a European Space Agency astronaut from Italy. Zamka, Wheelock and Nespoli will be making their first spaceflight.

Expedition 15/16 flight engineer Clayton Anderson will return to Earth from the space station on board shuttle mission STS-120, which will deliver his replacement, Expedition 16 flight engineer Daniel Tani, to the station. Tani will return on shuttle mission STS-122, targeted to launch in December 2007.



Posing for the STS-120 crew portrait, from left, are mission specialists Scott E. Parazynski, Douglas H. Wheelock and Stephanie D. Wilson; pilot George D. Zamka; commander Pamela A. Melroy; Expedition 16 flight engineer Daniel M. Tani; and mission specialist Paolo A. Nespoli, representing the European Space Agency. Tani will join Expedition 16 as flight engineer on board the International Space Station and is scheduled to return home on mission STS-122, targeted to launch in December 2007.

Tank was a 'great learning tool' ET-120 gets a new lease on 'life' and a date with Discovery

By Sanda Martel

The space shuttle external tank slated to fly on Discovery on STS-120, which is targeted to launch Oct. 23, was "brought back to life," or returned to flight readiness, after being the subject of an extensive foam loss investigation.

"This tank had sections of its thermal protection system,
See ET-120 on page 3

Harmony ready to expand International Space Station

By Dauna Coulter

Harmony, a key building block for the International Space Station, is scheduled to be delivered on the STS-120 mission of space shuttle Discovery targeted for launch on October 23. Formerly known as Node 2, the module received its new name in March following a nationwide student competition held by NASA. Aptly named, Harmony will be a piece that brings space station parts together.

"A node is like a tinker toy hub — you know, the round piece with holes in it where you can add the other pieces? Well, in this
See Harmony on page 6

Jody Singer reassigned as deputy manager of Marshall's Shuttle Propulsion Office

Jody Singer has been reassigned to the position of deputy manager of the Marshall Center's Shuttle Propulsion Office.

Singer began her career as a lead methods and planning engineer at Packard Electric, a division of General Motors Corporation. She joined Marshall in October 1985 as an engineer in the Program Planning Office. In 1986, Singer became the lead engineer in the Space Shuttle Main Engine Project Office where she was responsible for hardware and asset management. Since that time, Singer has held a variety of positions, including assistant manager of

the External Tank Project, deputy project manager of the External Tank Project Office and assistant manager of the Space Shuttle Projects Office. Most recently, Singer has served as the manager of the Reusable Solid Rocket Booster Project.

Singer holds a Bachelor of Science degree in industrial engineering from The University of Alabama in Tuscaloosa. She has completed numerous executive- and management-level training courses, including managerial training at Simmons College Graduate School of Management in Boston, Mass., and Penn State University in University Park, Pa. She is the recipient of several awards, including a NASA Exceptional Service Medal and five Special Service Awards. Singer was recently recognized for her superb leadership and professionalism when she was named Women's Equality Day Supervisor of the Year.

Singer and her husband have three children and live in Decatur.



Jody Singer

Engineering Directorate members honored at awards ceremony



Doug Staffer/NSFC

Dan Dumbacher, director of Marshall's Engineering Directorate, jokes with the audience at the directorate's awards ceremony.

By Lori Meggs

The Marshall Center's Engineering Directorate recognized 27 team members for their outstanding contributions during an awards ceremony held Oct. 2 in Building 4316.

In recognition of their extraordinary leadership, 15 employees received the Engineering Directorate Director's Award from Dan Dumbacher, director of the Engineering Directorate. Those receiving the top honor included Geoffrey Beech, Richard Cloyd, Miria Finckenor, Matt Hammond, Pattie Miller, John McDougal, Patrick McDuffee, Erin Muldoon, Tom Nesman, Robert Newton, Rusty Parks, Terry Rolin, Michelle Schneider, Young Kim and Peter Valentine.

Program and project managers from other Marshall organizations also were asked to nominate engineering employees for the outstanding support they provide as partners. Engineering Directorate Partnership John Horack, manager of the Science and Mission Systems Office, presented awards to Jeffrey Apple, Susan Best, Mark James and Robert Lake. Teresa Vanhooser, deputy manager of the Ares Project Office, presented awards to Richard Ballard, Wendy Cruik, Jeff Dilg and Stan Rhodes. Jody Singer, deputy manager of the Shuttle Propulsion Office, recognized James Holt, Rene Ortega, Mark Seaford and Alison Protz.

"We truly appreciate the hard work and accomplishments of our folks day after day," said Dumbacher. "It's an honor to work with them and show them how vital their work is to the many programs and projects at Marshall."

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.



Dan Dumbacher, right, presents an Engineering Directorate Partnership Award to Rene Ortega of the Propulsion Systems Department for his work with Marshall's Shuttle Propulsion Office.

ET-120

Continued from page 1

known as TPS, removed and dissected as part of an investigation following the STS-114 significant foam loss event," said Tim Owen, an engineer in the External Tank Project Office, who led the effort to repair the tank and recertify it for flight. "The question became, 'Can this tank be restored to flight configuration or is it destined to be a test article or museum piece?'"

ET-120 was returned to Michoud Assembly Facility in New Orleans in October 2005 from the Kennedy Space Center, Fla., for post STS-114 TPS modifications and was used as a dissection test article during the STS-114 foam loss investigation. Results from the investigation provided unprecedented information about the tank from end-to-end in many critical areas.

Foam loss from the protuberance air load ramps, or PAL ramps, and ice/frost ramps during STS-114 required dissections on ET-120 to further understand foam loss mechanisms. Dissections revealed TPS cracking conditions at the liquid hydrogen PAL ramp and liquid hydrogen ice/frost ramp locations. Other TPS applications considered "at risk" to the overall Space Shuttle Program for thermal cracking also were removed and evaluated. Cuts and dissections on the tank were required to "chase cracks" in the underlying foam — down to the metal in some cases — resulting in potholes and scars on the tank's TPS surface.

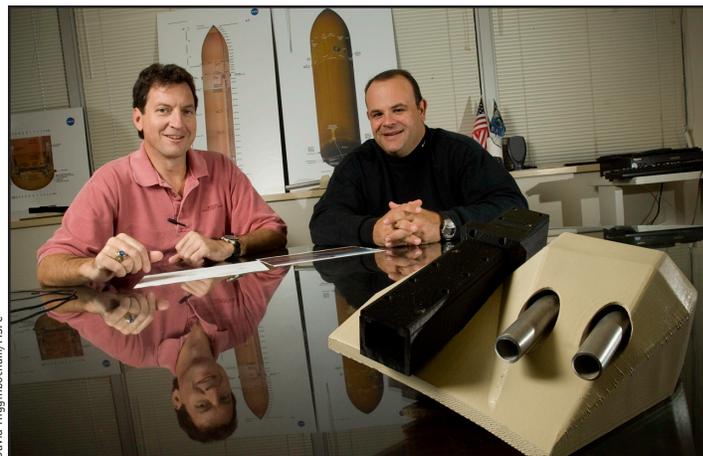
ET-120's ice/frost ramps required restoration at 14 locations on the liquid hydrogen tank and four locations on the liquid oxygen tank. However, with restoration, design improvements were made to the liquid hydrogen tank ice/frost ramps. This design became the basis for a new design for all future tanks, beginning with ET-128, which will fly on STS-124. The liquid hydrogen ice frost ramp dissections required the removal of acerage foam — large areas of foam applied by machine — and a unique repair and verification was required to return the tank to flight status.

Jim Doll, a Lockheed Martin engineer at Michoud, developed a repair and recovery plan for ET-120, said Owen. After the plan was approved by the project office and the Space Shuttle Program, Owen worked side-by-side with Doll for four months at Michoud to help lead the repair and recovery effort.

The goal for the tank's foam repairs was to maintain the integrated debris risk at the same level or better than the existing configuration. Repair work began in October 2006 to support the August 2007 launch-on-need, or rescue, mission for Endeavour/STS-118 and the primary tank for Discovery/STS-120.

"It's now our best tank ever," said John Chapman, manager of the External Tank Project Office. "We've learned more from ET-120 than from any other flight tank in the program, and the knowledge gained from the dissection and study of ET-120 will impact the design on all future tanks."

STS-114, the first Return to Flight mission, reveals more about the journey and history of ET-120. The tank originally shipped from Michoud to the Kennedy Center in December 2004, designated to fly on Discovery on the first Return to Flight shuttle mission. It was replaced by ET-121 after ET-120 diffuser and engine cut-off, or ECO, sensor hardware issues surfaced. But while on the launch pad at Kennedy,



David Higginbotham/MSC

From left, Tim Owen, an engineer in the External Tank Project Office who led the effort to repair the tank and recertify it for flight, and John Rector, safety and mission assurance lead for ET-120, with a model of an external tank liquid hydrogen ice/frost ramp. Fourteen liquid hydrogen ice/frost ramps were modified for the STS-120 mission with a different foam configuration to minimize foam loss.

it was subjected to two tanking cycles — loading and pressurization of both the hydrogen and oxygen tanks — before being rolled back to the Vehicle Assembly Building. ET-120 was the first tank to be modified with recommendations mandated by the Columbia Accident Investigation Board report.

After ET-120 was recertified for flight, it shipped from Michoud the second time on July 24, 2007, and arrived at Kennedy on July 29 for its upcoming mission.

However, one more change was in store for ET-120. During the previous shuttle mission, STS-118, a piece of foam from ET-117's liquid oxygen feedline bracket was liberated and struck the orbiter during ascent. This resulted in a decision by the shuttle program to modify four of ET-120's feedline brackets with a different foam configuration to minimize possible foam loss. The liquid oxygen feedline, approximately 70 feet long and 17 inches in diameter, carries liquid oxygen from the oxygen tank in the forward section of the external tank to the main engines.

Chapman said getting the tank ready to fly again was due to dedicated individuals and groups, including Owen; John Rector, safety and mission assurance lead for ET-120; and Steve Holmes, structures and materials lead for the External Tank Project Office. Broad support from several organizations across the agency was required to certify the redesign, including engineering staffs from the Marshall Center and the Johnson Space Center in Houston; safety and mission assurance staffs at the Marshall, Kennedy and Johnson centers; the Marshall Propulsion Systems Engineering and Integration Office, Shuttle Propulsion Office; the Space Shuttle Program's Systems Engineering and Integration Office at the Johnson Center; NASA's Engineering and Safety Center, Langley Research Center, Hampton, Va.; and two independent review teams, led for NASA by Marshall's Paul McConnaughey and for Lockheed Martin by Dan Callen.

"The Lockheed Martin ET team has done an excellent job, not only in returning ET-120 to flight status, but also in exceeding the Shuttle Program's requirement by restoring the tank to a much better condition than the 2005 version," said Owen.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

39 selected for Space Flight Awareness honors

Thirty-nine Marshall Center employees and contractors are being honored for their significant contributions to the space program. The honorees are attending a special recognition event in Orlando

on Oct. 20-23. There will be an awards ceremony in their honor, and they will tour Kennedy Space Center and view the launch of STS-120, targeted for Oct. 23.



Peter W. Allen
Engineering Directorate



Susan B. Allison
Shuttle Propulsion Office



Patrick A. Baldwin
COLSA



Julie Bassler
Science & Mission Systems Office



Daris Borden
Chickasaw Nations Industries Inc.



John E. Branch
SEI Group Inc.



John W. Burton
Teledyne Brown Engineering



Francis Celino
Office of the Director



Lisa Cooper
COLSA



Tracie Marie Crane
Qualis Corporation



Angela Daniels
Shuttle Propulsion Office



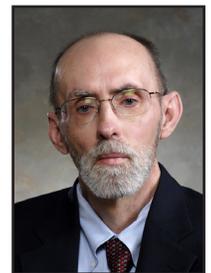
Darrell Davis
Engineering Directorate



Adrienne R. Day
Freedom Information Services



Leland N. Dutro
Ares Projects Office



Tim Elkins
SAIC



Beth W. Ewing
Office of Center Operations



Cynthia L. Frost
Science & Mission Systems Office



Steve Glover
Shuttle Propulsion Office



Jimmy L. Hill
Safety & Mission Assurance Directorate



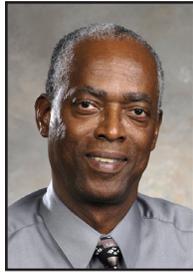
Ronald E. Hodge
Engineering Directorate

See Space Flight Awareness on page 5

*Space Flight Awareness
honors continued
from page 4*



Steve Hudson
Engineering Directorate



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SAIC UNITEs



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*Shuttle Propulsion
Office*



Joe Lashley
*Jacobs Engineering
Office*



**Jennifer B.
McCaghren**
Office of Procurement



Walt McGregor
Qualis Corporation



Gary Moore
*Teledyne Brown
Engineering*



Jim Roger Neeley
Jacobs Engineering



Frank Olinger
*Bastion Technologies
Inc. (HEI)*



Steven Pavelitz
*Science & Mission
Systems Office*



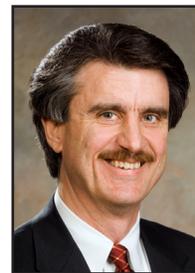
Tonia Rasberry
*Bastion Technologies
Inc. (HEI)*



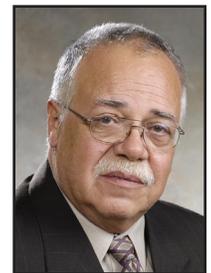
Jim Rice
Engineering Directorate



Patricia R. Schultz
Office of Human Capital



Jerry L. Seemann
*Office of the Chief
Counsel*



Dave Sissel
SAIC UNITEs



Clarissia R. Smith
Engineering Directorate



**Sean William
Thompson**
*Science & Mission
Systems Office*



May Wales
*Office of Strategic
Analysis &
Communications*



Justina J. Walker
*Office of the Chief
Financial Officer*

Harmony

Continued from page 1

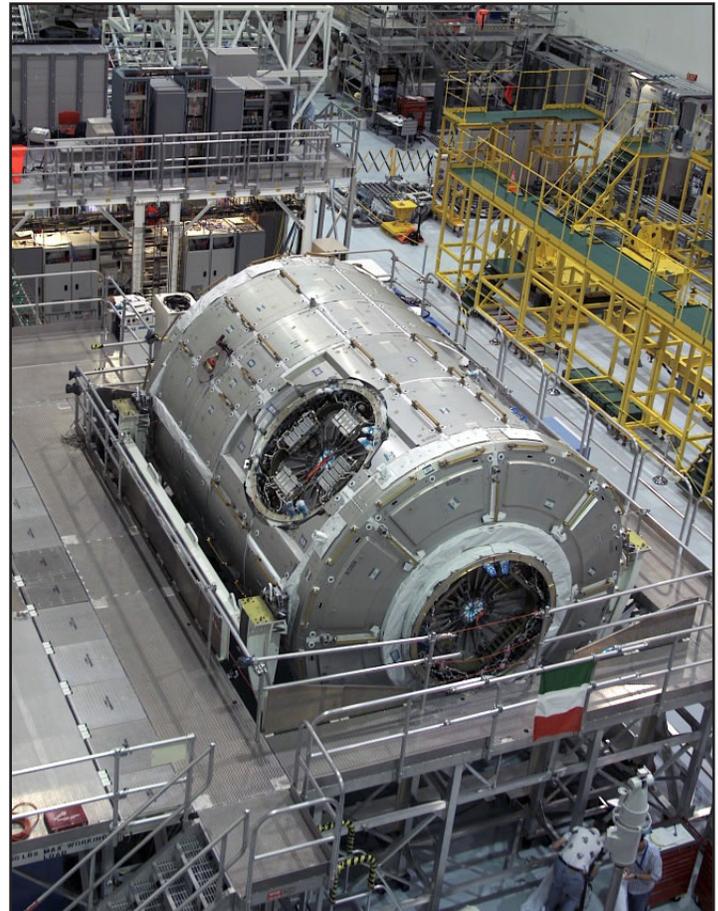
case, the pieces to be added are the modules,” says Gregg McDaniel, manager of the Marshall Center’s Space Station Vehicle Office, in describing Harmony.

The Nodes Project began in 1997, when the Space Station Program negotiated with the European Space Agency to build two node modules, Node 2 and Node 3, in exchange for NASA launching the Columbus Module. The European Space Agency delegated management of the Nodes to the Italian Space Agency, who selected Alenia Spazio — now called Thales Alenia — as prime contractor and integrator.

Marshall was responsible for overall system engineering of Node 2 and 3 including system analysis for the Space Station Program Office at Johnson Space Center. The Nodes Project Integration Office at Marshall provides integration and coordination of Node 2 day-to-day activities among NASA, contractors and international partners.

Harmony will provide a passageway between the three space station science experiment modules. It will attach to the U.S. Destiny Laboratory and provide a location for the European Space Agency’s Columbus module and the Kibo Japanese Experiment Module to dock in the future.

Cargo elements to berth to Harmony include the Multi-Purpose Logistics Modules, which are pressurized modules managed by the Marshall Center for the International Space Station Vehicle Office, and the Japanese H-II Transfer Vehicle. The Pressurized Mating Adapter 2, mated to the front of Harmony, will be the primary location for space shuttle docking. Additionally, Harmony is equipped with a powered grapple fixture from which Canadarm2, the space station’s robotic arm, can operate.



After arriving in June 2003, Node 2 is prepared for processing at Kennedy Space Center.

Harmony is about 23.6 feet long and 14.5 feet in diameter and weighs in at about 31,500 pounds. It will make the space station much roomier — expanding the area to about 18,000 cubic feet of pressurized volume.

Originally designed solely to provide berthing locations and utility links to other modules, Harmony now also includes crew accommodations. Utilities for up to four crew quarters racks were added to the design to provide sleep stations and private relaxation/communication areas — an important step toward housing a six-person crew.

“Harmony is an Italian module filled with U.S. components,” says Steve Pavelitz, Node 2 element lead for the Marshall Center’s Vehicle Office.

This “tinker toy hub” will form a centerpiece for the International Space Station, allowing it to expand in area, but, more importantly, in function — giving it more capabilities to make scientific discoveries and send them back to Earth.

“Harmony is the next big stepping stone to growing the space station significantly,” says McDaniel.

The writer, a Schafer employee, supports the Office of Strategic Analysis and Communications.



Node 2 interior just prior to hatch closure for flight.

NASA

Students from Tennessee School for the Blind to visit Marshall on Oct. 23

Twenty-four students from the Tennessee School for the Blind in Nashville will visit the Marshall Center on Oct. 23.

The tour will include stops at Building 4200 for a presentation and briefings by members of the shuttle propulsion team, a hot-fire engine test in the test area, science demonstrations in Building

4583 and a visit to the historic Redstone Rocket site.

Norma Englehardt, a science teacher at the school, and five chaperones will escort the young visitors, who include eight 5th, 6th and 7th graders, and 16 highschool-age students. Students from the school have visited the Marshall Center and the U.S. Space & Rocket Center in Huntsville each fall for more than 30 years.

The Tennessee School for the Blind, established as the official state school for the blind by the Tennessee legislature in 1844, serves nearly 200 blind and visually impaired students. For more information, visit <http://www.tsb.k12tn.net>.

For more information about the visit, e-mail Allan Day at allan.v.day@nasa.gov.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Oct. 25, is 4:30 p.m. Thursday, Oct. 18.

Miscellaneous

- Two-year-old, side-by-side fridge, white, ice maker, filtered water in door, \$900. 783-1466
- Seven champagne glasses, crystal, platinum rimmed; four cut-crystal wine glasses, \$40. 464-7074
- Cascade Crib, honey pine, mattress, \$180; bedding, safari, \$50. 337-2534
- Loggy Bayou MEGA Transformer Pro-Staff treestand, shooting rail, padded seats, aluminum, \$225. 497-8894
- White wicker chairs, loveseat, coffee table, two end tables, \$300; computer desk, \$125. 603-8408
- Body-Solid Ab & Back Machine, \$125. 520-4750
- One sheet of 40 29-cent Elvis Presley stamps, \$15. 890-0499
- Cherry desk chair, two small TV stands, oak, cherry, 7-foot Christmas tree, Christmas items. 722-5282
- Two True Companion crypts, Valhalla Memory Gardens, \$5,500. 883-9292

- Martin Jaguar Magnum compound bow, \$200. 753-0020
- Coffee table, two end tables, \$100 obo. 509-2536
- Boss GT-8 guitar multi-effects processor, \$375. 655-6293
- Matching refrigerator, dishwasher, smooth-top stove, microwave, less than one year old, black. 852-1726
- Armoire, walnut finish, for 37-inch TV, equipment, \$250. 658-5855
- Upright piano, ebony finish, \$300. 665-6021
- Parson Dining Chairs, six, high-back, fabric, \$85 each; gray dining table, \$200. 468-8306
- Korg digital piano, \$100. 653-9304

Vehicles

- 2007 Honda TRX450R Sport ATV/quad, electric start, plastics black/flames, red frame, \$5,400. 345-9555
- 2006 Chevy 1500 crew cab LT2 Z71, silver, birch metallic, 35k miles, \$26,000. 412-3406
- 2006 Toyota Camry LE, maroon/tan, 28k miles, \$16,000. 683-6433 or 683-6435
- 2004 Chevy Suburban Z71, loaded, 69k miles, \$24,000 obo. 683-6433
- 2004 Nissan Frontier XE, extended cab, light brown, automatic, 40k miles, \$10,900. 355-5870
- 2003 Ford Ranger XLT, super cab, four door, 50k miles. 431-0582 or 810-8945
- 2003 Escalade, black, DVD, 77k miles, \$22,500; 2007 Chrysler 300, silver, 21k miles, \$18,500. 520-2802
- 2003 Toyota 4-Runner SR5, V6, side airbags, sunroof, new tires, 57k miles, \$17,200. 655-9638
- 2003 Harley-Davidson Ultra Classic Electraglide motorcycle, 100th anniversary edition, fuel injection, loaded, \$16,000. 683-1846
- 2003 Honda Accord EX, V6, leather, sunroof, power, heated seats, 82.5k miles, \$14,000. 426-1822

- 2002 Dodge Neon SE, tan, automatic, 90k miles, \$5,100. 426-1822
- 2001 Chevy S10 Pickup, red, three door, new tires, 67k miles, \$7,600. 864-0413
- 2001 Honda CRV LX, black/gray, power windows/locks, luggage rack, 95k miles, \$9,900. 883-6894
- 2000 GMC custom-designed work truck, 4x4, V6, automatic, skid plates, 92k miles, \$4,000. (931) 967-7307
- 1999 Pontiac Grand AM GT Coupe, V6, black, leather, sunroof, new tires, 130k miles, \$4,800. 694-0656
- 1986 Nissan 300ZX, red, 186k miles, \$2,000 obo. 539-7140
- 19-foot Bayliner Capri Bowrider, 125 hp, trailer, covers, extras, \$4,000. 653-3647

Wanted

- Alabama, Mississippi State football tickets, Nov. 10 game, up to 4. 651-5847
- Suspended ceiling parts, 24-inch cross-tees, older style for 25- to 40-year-old grid system. 233-0705
- House cleaning part-time in evenings, laundry, ironing, cooking, references required. 464-8933

Shuttle Buddies to meet Oct. 22

The Shuttle Buddies will meet at 9 a.m. Monday, Oct. 22, at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

Obituaries

John A. Barber, 76, of Huntsville died Sept. 24. He retired from the Marshall Center in 1986 as an electronics technician. He is survived by his wife, June Barber.

Albert Allen Johnson, 72, of Dallas, Ga., died Sept. 25. He retired from the Marshall Center in 1976 as an illustrator. He is survived by his wife, Jeanette Johnson.

Olene T. Duggan, 88, of Huntsville died Sept. 27. He retired from the Marshall Center in 1974 as an electrical engineer.

James Phillips, 85, of Owens Cross Roads died Oct. 3. He retired from the Marshall Center in 1982 as an aerospace engineering technician. He is survived by his wife, Estelle Phillips.

Combined Federal Campaign under way; rally to be held Oct. 25



The Marshall Center's 2007 Combined Federal Campaign was officially launched Oct. 8, when Center Director David King wrote the inaugural donation check for the annual fundraising effort.

To date, Marshall employees have given \$105,151.54 toward the center's goal of \$600,000.

The center will hold its annual CFC rally at 10 a.m. Oct. 25 in Morris Auditorium in Building 4200. Amy George, director of special projects for the Huntsville Hospital Foundation, will be the guest speaker. Door prizes will be given away during the event, and refreshments will follow in the 4200 lobby.

The 2007 Combined Federal Campaign runs through Dec. 7.

For more information about volunteering for 2007 CFC Community Service Days or participating in bus tours of local charity organizations, visit Inside Marshall. For more information about the campaign, call Irene Taylor at 544-2051.



Doug Staffer/MSFC

Marshall Center Director David King signs the first donation check for the 2007 Combined Federal Campaign effort.

Are you receiving the Marshall Star by mail?

Do you get your Marshall Star by mail?

Then you should soon receive a postcard, which you must return to the Marshall Center to continue to receive the weekly publication. The postcard has the return mailing address printed on it. Just sign the postcard, affix the proper postage of 26 cents and mail it by Nov. 13. If you do not

respond, your name will be taken off the mailing list by the end of December.

If you do not receive the postcard by the end of October and would like to continue to receive the Star, please contact Jessica Wallace at 256-544-3749 or e-mail jessica.d.wallace@nasa.gov.

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