NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 6, 1997
KSC Contact: Joel Wells
KSC Release No. 1-97

Note to Editors/News Directors:
KSC TO CELEBRATE GRAND OPENING OF APOLLO/SATURN V CENTER JAN. 8

On Wednesday, Jan. 8, news media representatives will have several opportunities to interview former Apollo astronauts, NASA and KSC officials, and Space Shuttle astronauts at the new Apollo/Saturn V Center.

From 11 a.m. to 3 p.m. members of the media will be able to interview several former Apollo astronauts at the Apollo/Saturn V Center. Media interested in conducting interviews during this time block must contact Melissa Tomasso, KSC Visitor Center, at (407) 449-4254 by close of business on Jan. 7. She will schedule all interview appointments. Media members should arrive at the KSC Press Site 30 minutes before their scheduled interview time for transport to the Apollo/Saturn V Center.

In addition, a formal grand opening gala is planned for Wednesday evening. Several Apollo astronauts will also be available for interview at 6 p.m. at the Apollo/Saturn V Center. Media interested in this opportunity must be at the KSC Press Site by 5:30 p.m. for transport to the new facility.

Invited guests and media wishing to attend the gala at the regular time will meet at the KSC Visitor Center (KSCVC) between 6:30 p.m. and 7:30 p.m. for transport to the Apollo/Saturn V Center. A tour of the new facility's shows and exhibits is included. A ceremony featuring presentations from NASA Administrator Dan Goldin, KSC Director Jay Honeycutt, and former astronauts John Young and Eugene Cernan will begin at 8 p.m. The gala is a formal event and media should dress accordingly.

Transportation will be provided from the gala for news media interested in covering the 10 p.m. STS-81 crew arrival at the Shuttle Landing Facility, or to the Press Site or the Visitor Center parking lot.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 8, 1997
KSC Contact: Lisa Malone
KSC Release No. 2-97

Notice to Editors/News Directors:
MISSION STS-81 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Jan. 12 launch of the Space Shuttle Atlantis on Mission STS-81, the 81st launch in the Shuttle program. These events are scheduled to be carried live on NASA Television unless noted (please refer to the STS-81 TV schedule for exact times).

At 7 a.m. EST Thursday, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 4:27 a.m. EST on Sunday, Jan. 12. The launch window is open for about seven minutes.

The six STS-81 crew members are scheduled to arrive at KSC on Wednesday, Jan. 8, at 10 p.m. EST. News media representatives wishing to cover the event must be at the News Center by 9 p.m. Wednesday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility. News media attending the Apollo/Saturn V Center gala will be transported directly to the runway for crew arrival.

News media representatives with proper authorization may obtain STS-81 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island. The hours during which media may obtain mission credentials are listed at the end of this document.

# # # #

STS-81 BRIEFING & EVENTS SCHEDULE
(all times are in EST and conferences are held inside the KSC Press Site auditorium)

L-4 Days - Wednesday, Jan. 8

- STS-81 fight crew arrival (live) ----- **10:00 p.m.**

L-3 Days - Thursday, Jan. 9

- Launch countdown begins ----- **7:00 a.m.**

- Countdown Status Briefing ----- **9:00 a.m.**
  John Guidi, Shuttle Test Director
  Sharon Walchessen, STS-81 Payload Manager
  Ed Priselac, Shuttle Weather Officer

- STS-81 fight crew arrival (replay) ----- **9:30 a.m.**

L-2 Days - Friday, Jan. 10

Countdown Status Briefing ----- **9:00 a.m.**
Doug Lyons, Shuttle Test Director
Sharon Walchessen, STS-81 Payload Manager
Ed Priselac, Shuttle Weather Officer

- Pre-launch News Conference ----- **4:00 p.m.**
(or immediately following the management team's meeting)
Wil Trafton, Associate Administrator for the Office of Space Flight, NASA HQ
Dr. Arnauld Nicogossian, Associate Administrator (acting), Office of Life and Microgravity Sciences, NASA Headquarters
Tommy Holloway, NASA Shuttle Program Manager, Johnson Space Center
Frank Culbertson, NASA Phase One Program Manager, Johnson Space Center
Valery Ryumin, Russia Phase One Manager, RSC Energia
Bob Sieck, Director of Shuttle Operations, KSC
USAF Capt. Scott Jacobs, Launch Weather Officer

L - 1 Day - Saturday, Jan. 11

- Rotating Service Structure moves (press departure at 9:00 a.m.) ----- **8:30 a.m.**

- Countdown Status Briefing ----- **9:00 a.m.**
Mark Gordon, NASA Test Director
Sharon Walchessen, STS-81 Payload Manager
Ed Priselac, Shuttle Weather Officer

- Remote Camera Setup at Pad ----- **10:30 a.m.**

- News media orientation tour (optional depending on interest) ----- **1:00 p.m.**

- Tanking begins ----- **approx. 7:00 p.m.**

- NASA Television live launch programming begins ----- **11:00 p.m.**

Launch Day - Sunday, Jan. 12

- Launch of Atlantis ----- **4:27 a.m.**

- Post-launch press conference ----- **L + 1 hour**
Loren Shriver, Manager of Space Shuttle Launch Integration
Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-81
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Thursday, Jan. 9	7:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Friday, Jan. 10	8:00 a.m. - 7:00 p.m.
(Launch minus 1 day) Saturday, Jan. 11	8:00 a.m. - around-the-clock
(Launch day) Flight day 1, Sunday, Jan. 12	- 2:00 p.m.

(Office hours are 8 a.m. - 4:30 p.m. Monday - Friday, however hours may be adjusted depending on mission events and timelines.)

News media representatives may obtain STS-81 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Thursday, Jan. 9 -- 8 a.m. to 4:30 p.m.
Friday, Jan. 10 -- 8 a.m. to 4:30 p.m.

Saturday, Jan. 11 -- 8 a.m. to 4:30 p.m.
Sunday, Jan. 12 -- Midnight to 3:30 a.m.

News media with annual Shuttle credentials are reminded to sign the log book at the photo and interview counter in the News Center. The 1996 annual badges will be effective through launch day. Qualifying news media representatives may obtain the 1997 annual badge at the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 8, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 3-97

SPACE SHUTTLE MISSION STS-81 LAUNCH COUNTDOWN TO BEGIN JAN. 9

NASA will begin the countdown for launch of Space Shuttle Atlantis on the fifth mission to dock with Russia's space station Mir on Jan. 9 at 7 a.m. at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 1 of the Launch Control Center.

The countdown includes 26 hours and 27 minutes of built-in hold time leading to the opening of the launch window at about 4:27 a.m. (EST) on Jan. 12. The launch window extends for about 7 minutes. The exact time of launch will be determined about 90 minutes before liftoff based on the location of the Mir space station.

In order to accommodate the short window necessary to rendezvous and dock with Mir, some changes have been made to the standard launch countdown. Most significant is the addition of an extra 30 minutes to the normal 10 minute built-in hold at T-9 minutes. Tanking is scheduled to begin at about 7 p.m. Saturday, Jan. 11.

STS-81 is the first Space Shuttle mission of 1997. This will be the 18th flight of the orbiter Atlantis and the 81st flight overall in NASA's Space Shuttle program. Atlantis last flew on the fourth Shuttle/Mir docking flight in September 1996.

Atlantis was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 3 on Dec. 5 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39B on Dec. 10. The vehicle was processed for flight without any significant or unexpected techincal difficulities. However, due to problems experienced with Columbia's airlock hatch actuator on the previous Space Shuttle mission, all six of Atlantis' airlock hatch actuators were removed and recertified for flight.

On mission STS-81, Atlantis will carry into orbit a six member crew. Mission Specialist Jerry Linenger will replace John Blaha on the Mir space station. Blaha will return to Earth with the rest of the STS-81 crew. Linenger will remain on Mir until Atlantis again docks with the space station in May.

The STS-81 crew are: Commander Michael Baker, Pilot Brent Jett, and Mission Specialists Jeff Wisoff, John Grunsfeld, Marsha Ivins and Jerry Linenger. All members of the STS-81 crew are veteran Shuttle flyers.

The crew are scheduled to arrive at KSC at about 10 p.m., Jan. 8. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

(The countdown will target launch for about 4:27 a.m. on Sunday, Jan. 12. The exact launch time will be adjusted at the T-9 minute hold.)

COUNTDOWN MILESTONES
***all times are Eastern**

Launch - 3 Days (Thursday, Jan. 9)

- Prepare for the start of the STS-81 launch countdown
- Perform the call-to-stations (6:30 a.m. Thursday, Jan. 9)
- All members of the launch team report to their respective consoles in Firing Room 1 in the Launch Control Center for the start of the countdown.
- Countdown begins at the T-43 hour mark (7 a.m.)
- Start preparations for servicing fuel cell storage tanks
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Atlantis' general purpose computers
- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms

Enter first planned built-in hold at T-27 hours for duration of four hours (11 p.m.)

Launch - 2 Days (Friday, Jan. 10)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (3 a.m.)

- Clear launch pad of all personnel
- Begin operations to load cryogenic reactants into Atlantis' fuel cell storage tanks (4:30 - 9:30 a.m.)
- After cryogenic loading operations, re-open the pad

Enter four-hour built-in hold at T-19 hours (11 a.m.)

- Resume orbiter and ground support equipment close-outs
- Demate orbiter mid-body umbilical unit and retract into fixed service structure

Resume countdown (3 p.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Activate the orbiter's flight controls and navigation systems
- Install mission specialists' seats in crew cabin
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 37 minutes (11 p.m.)

- Install film in numerous cameras on the launch pad

Launch -1 Day (Saturday, Jan. 11)

- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Activate orbiter's inertial measurement units
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walkdown
- Move Rotating Service Structure (RSS) to the park position (10 a.m.)
- Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Resume countdown (12:37 p.m.)

- Continue installation of time critical flight crew equipment
- Perform pre-ingress switch list
- Start fuel cell flow-through purge
- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Atlantis' purge air to gaseous nitrogen

Enter planned two-hour built-in hold at the T-6 hour mark (5:37 p.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 7 p.m.)

Resume countdown (7:37 p.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 10 p.m.)
- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines

Enter two-hour hold at T-3 hours (10:37 p.m.)

- Close-out crew and Final Inspection Team proceeds to Launch Pad 39B

Launch Day (Sunday, Jan. 12)

Resume countdown at T-3 hours (12:37 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 12:42 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 1:22 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Atlantis' crew hatch (about 2:37 a.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (3:17 a.m.)

- NASA Test Director conducts final launch team briefings

Resume countdown (3:27 a.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter 40-minute hold at T-9 minutes (3:38 a.m.)

(This is the last planned built-in hold. Other hold options are available if necessary. During this hold, the exact launch time will be determined based on the exact location of the Mir space station. The hold time could vary by as much as a minute or two.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 4:18 a.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-5:30)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-81

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	11:00 p.m. Thurs.	3:00 a.m. Fri.
T-19 hours	4 hours	11:00 a.m. Fri.	3:00 p.m. Fri.
T-11 hours	13 hours, 37 min.	11:00 p.m. Fri.	12:37 p.m. Sat.
T-6 hours	2 hours	5:37 p.m. Sat.	7:37 p.m. Sat.
T-3 hours	2 hours	10:37 p.m. Sat.	12:37 a.m. Sun.
T-20 minutes	10 minutes	3:17 a.m. Sun.	3:27 a.m. Sun.
T-9 minutes	about 40 minutes	3:38 a.m. Sun.	4:18 a.m. Sun.

CREW FOR MISSION STS-81

Commander (CDR):	Michael Baker
Pilot (PLT):	Brent Jett
Mission Specialist (MS1):	Jeff Wisoff
Mission Specialist (MS2):	John Grunsfeld
Mission Specialist (MS3):	Marsha Ivins
Mission Specialist (MS4):	Jerry Linenger (up)
Mission Specialist (MS4):	John Blaha (down)

SUMMARY OF STS-81 LAUNCH DAY CREW ACTIVITIES

Saturday, Jan. 11

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   5:30 p.m.     Wake up
   6:00 p.m.     Breakfast
* 11:27 p.m.     Lunch and crew photo
  11:57 p.m.     Weather briefing (CDR, PLT, MS2)
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Sunday, Jan. 12

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  12:12 a.m.     Don launch and entry suits (MS1, MS3, MS4)
  12:22 a.m.     Don launch and entry suits (CDR, PLT, MS2)
* 12:30 a.m.     Crew suiting photo
* 12:42 a.m.     Depart for launch pad 39B
*  1:22 a.m.     Arrive at white room and begin ingress
*  2:37 a.m.     Close crew hatch
*  4:27 a.m.     Launch
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*Televised events (times may vary slightly)
All times Eastern

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 10, 1997
KSC Contact: Joel Wells
KSC Release No. 4-97

NASA AND DEPARTMENT OF DEFENSE TO TEST LASER IMAGING TECHNOLOGY DURING STS-81 LAUNCH

The Space Shuttle Atlantis, scheduled to launch Jan. 12, will be used in the testing and demonstration of a new Laser Imaging System being developed by Naval Research and Development (NRaD). The technology will be provided to the U.S. Air Force 45th Space Wing Range Safety to improve the tracking of launch vehicles.

Currently, Range Safety officials monitor a vehicle's position using optical tracking methods that can be impaired by vehicle engine plume, low level clouds and fog. By illuminating a portion of the launch vehicle with a non-invasive laser beam, clear and defined images of the vehicle can be obtained even in low visibility situations. Officials hope that this new technology will help reduce some of the launch constraints involving visibility on future expendable and Shuttle launches.

NRaD'S Innovative Science and Technology Experimentation Facility (ISTEF), located near the Banana Creek at KSC's southernmost border, has transportable tracking systems that project the laser from various sites on KSC or Cape Canaveral Air Station (CCAS). For STS-81 the tracking system will be located at the KSC camera site just north of the new Apollo/Saturn V Center and the Banana Creek launch viewing site.

Atlantis' aft end and the aft portion of one solid rocket booster will be illuminated at specific points during countdown and launch. The first illumination took place on Thursday night. A second illumination will occur for 30 minutes at the end of the external tank loading process late Saturday night. Atlantis will be illuminated again for 15 minutes during the T-9 minute hold and then again from T-9 minutes and counting through SRB separation.

Operation of the low power laser is carefully controlled by ISTEF and monitored by NASA and CCAS. It poses no hazard to personnel at the pad or to anyone observing the launch. Aircraft and boats which are outside the normal hazard areas associated with launch operations are also free of any danger.

The laser will produce light at two wave lengths, one of which is in the infrared portion of the spectrum and is invisible to the human eye. A second wavelength appears as a green light, similar to the colored beams seen in laser light shows at tourist attractions. Because STS-81 is a night launch the laser beam may be visible to observers, however the circular "foot print" projected on the Shuttle may not be visible due to lighting at the pad.

Previous tests have included expendable launch vehicles and Space Shuttle Columbia on mission STS-80. Columbia's daylight launch time prevented the lasers from being seen by the viewing public.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 1997
KSC Contact: George H. Diller
KSC Release No. 5-97

RECEIVING SPACE SHUTTLE ASTRONAUT VOICE COMMUNICATIONS

Space Shuttle air-to-ground communications is transmitted on one of two designated S-band frequencies, and simultaneously on one of two UHF frequencies. Because the S-Band voice is digitized, it is unintelligible. However, the air-to-ground voice on the UHF band may be heard either on 259.7 mhz or 296.8 mhz when the orbiter is above the horizon. It will, of course, be necessary to know if and when the Space Shuttle will be above the horizon at your location. Unless you are near a NASA tracking station, you will hear only the "down-link," or one side of the conversation, which will be the astronauts talking to ground controllers.

The Space Shuttle's orbital inclination is frequently 28.45 degrees, meaning that communications can be heard no farther north in the U.S. than the latitude of Cape Canaveral, the Canary Islands in the Atlantic Ocean region or Midway Island in the Pacific. However, flights which rendezvous with the Russian Mir Space Station and many scientific Space Shuttle missions have higher inclinations, ranging between 39 degrees and 57 degrees. At these inclinations, voice may be heard as far north as the Gulf of Alaska, Hudson Bay in Canada, and the Hebrides in Scotland.

During all Space Shuttle flights, air-to-ground voice (both uplink and downlink) and video from the orbiter are transmitted on NASA Television which is a C-band satellite transmission on Spacenet II, transponder 5, channel 9 (3880.0 mhz). This is a geostationary satellite with an orbital location of 69 degrees West. Audio only is also available on 6.8 megahertz. While the Space Shuttle is in orbit, this system is always broadcasting. The signal is not encoded, or scrambled, and may be picked up with a home satellite receiver. Some cable television companies carry it, at least on a limited basis.

The Space Shuttle on-orbit communications through the Tracking and Data Relay Satellite system (TDRS) uses S-band and K-band. This is encrypted and also transmitted digitally. It is not possible for a home satellite system to receive air-to-ground voice or television from TDRS.

The Amateur Radio Club at the Goddard Space Flight Center in Greenbelt, Maryland also rebroadcasts the air-to-ground Space Shuttle communications on shortwave frequencies. The best reception on each frequency will vary based on the time of day. The frequencies are:

3.860 mhz
7.185 mhz
14.295 mhz
21.395 mhz
28.650 mhz

Some amateur radio organizations rebroadcast NASA Television or mission audio. As an example, an amateur radio FM transmitter located on Merritt Island near Gate 2 at the Kennedy Space Center, rebroadcasts Space Shuttle air-to-ground communications on 146.940 mhz. It is also broadcast by the amateur radio club at the Goddard Space Flight

Center on frequency 147.45 mhz, and by the club at the Johnson Space Center in Houston on 146.64 mhz. The signals can be received for about 25 miles. Transmitters of various power on other frequencies are provided by local amateur radio organizations in cities around the country.

Some Space Shuttle missions also carry amateur radio transmitters called SAREX (Shuttle Amateur Radio Experiment). As the schedule permits, amateur radio operators can have their call sign confirmed directly by a member of the crew. When the crew is busy, a repeater will automatically transmit a computer message.

For further information on amateur station repeater frequencies or the SAREX program frequencies contact the American Radio Relay League, 225 Main Street, Newington, CT 06111, (860) 594-0200.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 14, 1997
KSC Contact: Patti Phelps
KSC Release No. 6-97

TWO KSC WORKERS HONORED BY NASA ASTRONAUTS

Two NASA/KSC employees recently were presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Tommy G. Purer of Merritt Island and Connie J. Stallings of Cocoa were presented the award at KSC on Jan. 8 by astronaut Pamela A. Melroy.

Purer, an aerospace engineer with the Safety and Mission Assurance Directorate, was commended for the independent assessments he performed on the Tethered Satellite System and Wake Shield Facility payloads before their reflights. "Your review of the anomalies, waivers, deviations, and corrective action were comprehensive and very thorough," Melroy told him. "Your success in this effort is measured by the fact that none of the anomalies re-occurred during the reflights of these missions. We are fortunate to have such a conscientious, dedicated individual assessing our high-profile missions."

Stallings, a personnel management specialist with the Administration Office, was recognized for her advice and assistance to management in establishing and staffing the new Space Station organization at Kennedy Space Center. "By accomplishing this in record time, you have enabled management to better meet mission goals in a timely manner," Melroy said. "In addition, your exceptional work and customer service to your KSC-assigned organizations and your responsiveness to the needs of management and employees provide a significant contribution to the overall success of the Center’s mission." Stallings also was applauded for her coordination of the "Tiger Team" at the Banana Creek launch viewing site for KSC guests.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 16, 1997
KSC Contact: George H. Diller
KSC Release No. 7-97

GOES-K WEATHER SATELLITE ARRIVES AT KSC FOR FINAL TESTING

The GOES-K weather satellite, to be launched aboard an Atlas I rocket in late April, arrived today by C-5 air cargo plane at KSC's Shuttle Landing Facility from the manufacturing plant in Palo Alto, Calif.

GOES-K is the third spacecraft to be launched in the new advanced series of geostationary weather satellites for the National Oceanic and Atmospheric Administration (NOAA). The spacecraft is a three-axis internally stabilized weather satellite which has the dual capability of providing pictures while performing atmospheric sounding at the same time. Once in orbit the spacecraft is to be designated GOES-10.

The satellite is being transported today to Astrotech in Titusville where final testing of the imaging system, scientific instrumentation, communications and power systems will be performed. These tests will take approximately two months to complete. Then the spacecraft will be fueled with propellant for the attitude control system, enscapsulated in the Atlas nose fairing and prepared for transportation to Launch Complex 36 on Cape Canaveral Air Station.

The Lockheed Martin Atlas rocket and its Centaur upper stage are scheduled to arrive at Cape Canaveral on Feb 27. This will be AC-79, the final vehicle in the Atlas 1 series which began launches for NASA in 1962. Future launches of GOES weather satellites in the current series will be on Atlas II vehicles.

The booster erection at Launch Pad 36-B will begin the week of Mar. 10. A countdown "wet dress" rehearsal in which the vehicle is fully fueled is planned for Apr. 8. On Apr. 11 the satellite will be transported from Astrotech to Launch Complex 36 for mating to the Atlas I rocket.

The launch of AC-79/GOES-K is currently planned for Apr. 24 at the opening of a launch window which extends from 1:56 - 3:19 a.m. EDT, a duration of 83 minutes.

The GOES-K satellite is built for NASA and NOAA by Space Systems/LORAL of Palo Alto, Calif. NASA's Goddard Space Flight Center in Greenbelt, Md., is responsible for the procurement of the GOES satellites for NOAA including final testing in Florida and the initial on-orbit checkout. NOAA is responsible for satellite operation and data distribution.

Kennedy Space Center is responsible for government oversight of the Atlas I processing activities for AC-79, integration of the GOES-K spacecraft with the launch vehicle and launch countdown activities.

NASA's Lewis Research Center in Cleveland, Oh., is responsible for the NASA launch services management role. Lockheed Martin of Denver, Co., is under contract to Lewis Research Center to provide launch services.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 15, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 8-97

BOBBY G. BRUCKNER DESIGNATED DIRECTOR OF PAYLOAD PROCESSING

Bobby G. Bruckner, originally of Drew, MS, and a current resident of Merritt Island, FL, was recently designated as the director of Payload Processing at NASA's Kennedy Space Center, FL (KSC).

Bruckner earned bachelor of science degrees in mathematics and physics from Delta State University in 1966, and a master of science degree in electrical engineering from Florida Institute of Technology in 1971. Bruckner joined NASA in June 1966 as an electrical engineer responsible for developing telemetry and data display systems used in the test and checkout of Apollo/Saturn launch vehicles. Prior to his recent assignment he served as the director, Payload Ground Systems. Among his many honors are NASA's Exceptional Service and outstanding Leadership Medals.

In his new position as one of KSC's senior executives, Bruckner will be responsible for the management and technical direction of preflight checkout and integration of Space Shuttle and expendable vehicle payloads. This includes customer payloads, Spacelab, special structures, deployable payloads and upper stages. His assignment is subject to formal approval by NASA Headquarters.

Bruckner is the son of Mrs. Ruth Bruckner of Drew, MS. He and his wife, the former Marilyn Everitt of Drew, are the parents of two sons and one daughter - Brian, a student at the University of Florida School of Medicine in Gainesville, FL; Rob, an electrical engineer with the Intel Corporation in Portland, OR; and Lisa, a nurse with the Orlando Regional Medical Center in Orlando, FL.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

January 15, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 9-97

STERLING W. WALKER DESIGNATED DIRECTOR OF ENGINEERING DEVELOPMENT

Sterling W. Walker, originally of Charleston, SC, and a current resident of Cocoa Beach, FL, was recently designated as the director of Engineering Development at NASA's Kennedy Space Center (KSC), FL.

Walker earned a bachelor of science degree in mechanical engineering from Clemson University in 1964. After three years as a nuclear power engineer with the Navy Nuclear Program at Charleston Naval Shipyard, he joined NASA at the Kennedy Space Center as a liquid oxygen systems engineer in 1967. Prior to his recent assignment he served as the director, Mechanical Engineering. Walker currently serves on the Industry Advisory Committee for the Department of Mechanical and Aerospace Engineering at the University of Central Florida; the Advisory Board of the NASA/Kennedy Management Association; and is chairman of KSC's Disabilities Action and Awareness Working Group. Among his many KSC and NASA awards is the Exceptional Service Medal.

In his new position as one of KSC's senior executives, Walker will be responsible for the planning, development, design, acquisition, sustaining engineering, modification and rehabilitation of all KSC facilities, systems and equipment. His assignment is subject to formal approval by NASA Headquarters.

Walker and his wife, the former Patricia Newcome of Charleston, SC, are the parents of a son, Sterling Jr., who lives in Palm Bay, FL, and a daughter, Angela Norman, a resident of Orlando, FL.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 15, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 10-97

WARREN I. WILEY DESIGNATED DEPUTY DIRECTOR OF ENGINEERING DEVELOPMENT

Warren I. Wiley, originally of Naples, NY, and a current resident of Merritt Island, FL, was recently designated as the deputy director of Engineering Development at NASA's Kennedy Space Center (KSC), FL.

Wiley is a 1967 graduate of Naples Central School, Naples, NY. He earned his bachelor of science degree in space technology from Florida Institute of Technology in 1971, and a master of science in computer science from the same institution in 1974. He joined NASA in 1971 as a mechanical and propulsion systems engineer for the launch vehicles of the Apollo/Saturn, Skylab and Apollo Soyuz Test Project programs. Prior to his recent assignment he served as deputy manager, Space Shuttle Program Launch Integration Office. During his career he has received several performance awards and commendations including the NASA Medal for Exceptional Engineering Achievement and the NASA Exceptional Service Medal.

In his new position as one of KSC's senior executives, Wiley will be responsible for assisting in the planning, development, design, acquisition, sustaining engineering, modification and rehabilitation of all KSC facilities, systems and equipment. In addition, he will serve as the KSC focal point for the X- 33, X-34 programs as well as the next generation of reusable launch vehicles. This will include responsibility for developing the infrastructure necessary to support the launch and landing of these vehicles at KSC. His assignment is subject to formal approval by NASA Headquarters.

Wiley is the son of Mrs. Ruth Wiley of Lake Worth, FL. He and his wife, the former Judy Malnassy of Satellite Beach, FL, reside on Merritt Island, FL, and are the parents of three daughters - Laura, Kristina and Melinda.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 4, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 11-97

TITUSVILLE, FL FIRM AWARDED CONTRACT TO MODERNIZE SPACE SHUTTLE LAUNCH PAD FIRE SUPPRESSION SYSTEM

HM2 Corporation, Titusville, FL, has been awarded a $3.2 million firm fixed price contract to upgrade and modernize the Firex fire suppression system at Kennedy Space Center's Space Shuttle launch pads 39A and 39B.

The small business firm began work under the contract Jan. 27 and is scheduled to complete the work within two years of the startup date. The work outside the pads includes modernizing the existing Firex water pumping station that services both launch pads and the installation of new pipelines from the pumping station to each pad. Two diesel-engine-driven pump assemblies at the pumping station will be removed and replaced with four new ones, each with a 5,000-gallon-per-minute pumping capacity. Other work at the pumping station includes refurbishment of a hydro-pneumatic tank system and other pump controls and piping.

Work on the pad includes the installation of 18 valve stations and associated piping and tubing, control cabinets and electrical cable. A high-pressure compressed air system also will be added.

The Firex system will be kept operational at all times during construction work. The work is necessary to modify and replace elements of the 30-year-old system that protects the Space Shuttle, payloads and launch facilities from fire at the pads.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 17, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 12-97

CHARLES B. MARS DESIGNATED DIRECTOR, ISO PROJECT OFFICE

Charles B. Mars, originally of Fultondale, AL, and a current resident of Titusville, FL, was recently designated as the director, ISO Project Office at NASA's Kennedy Space Center, FL (KSC).

Mars earned a bachelor of science degree in electrical engineering from Vanderbilt University, Nashville, TN, in 1958. He spent more than four years in private industry designing ground support equipment for the LaCrosse and Pershing missile systems before joining NASA in 1963. His hardware experience covers the Mercury, Gemini, Apollo, Skylab, Shuttle and Space Station programs. Prior to his recent assignment he served as the director, Mission Assurance at KSC. Among his many NASA honors are two NASA Exceptional Service Medals and the Outstanding Leadership Medal.

In his new position as one of KSC's senior executives, Mars will be responsible for managing KSC preparations for ISO third-party certification. ISO is a series of quality standards that have been adopted by over 80 nations since 1987, and have become an important element of many business' total quality management. The ISO program describes the requirements of an effective quality system which space center organizations will have to develop, document and implement subject to external review by auditors from private industry. The agency-wide ISO program requires certification of both technical and administrative program areas.

Mars and his wife, the former Barbara Gross of York, PA, have raised eight children.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 17, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 13-97

TCDT MEDIA OPPORTUNITY WITH STS-82 CREW SET FOR NEXT WEEK

The crew of Space Shuttle mission STS-81 will be at Kennedy Space Center next week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities at KSC. The TCDT ends with a mock launch countdown culminating in a simulated main engine cutoff. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect their mission payloads in the orbiter's payload bay.

The seven-member crew of mission STS-82 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 2:30 p.m. Monday, Jan. 20. No media opportunity will be available for this event.

On Tuesday, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39B. Media interested in participating in this question and answer session should be at the KSC Press Site by 10:30 a.m. Tuesday for transport to the pad.

On Thursday, the crew will take part in simulated launch day events, including entering the orbiter Discovery fully suited as a main engine ignition and cut-off is simulated. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Discovery is now targeted for launch on Feb. 11 at 3:56 a.m. EST. Mission STS-82 will be the second servicing mission to the Hubble Space Telescope. The mission is expected to last about 10 days.

Crew members for mission STS-82 are: Commander Ken Bowersox, Pilot Scott Horowitz and Mission Specialists Joe Tanner, Steven Hawley, Greg Harbaugh, Mark Lee and Steven Smith.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 21, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 14-97

ATLANTIS SCHEDULED TO LAND AT KSC

The orbiter Atlantis is scheduled to land at Kennedy Space Center on Wednesday, Jan. 22 at 7:47 a.m. EST, completing its 10-day STS-81 mission which was launched from KSC on Jan. 12.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 160 at a mission elapsed time of 10 days, 3 hours, 20 minutes. The deorbit burn will occur at about 6:42 a.m. Wednesday.

The two KSC landing opportunities on Wednesday are: 7:47 a.m. and 9:23 a.m. In the event a landing is not possible at KSC on Wednesday due to weather concerns, a landing could be made at Edwards Air Force Base (EAFB), CA. Landing opportunities at Edwards on Wednesday are at 10:51 a.m. and 12:27 p.m. EST. If managers decide to keep Atlantis in orbit an additional day, two landing opportunities are available at KSC and two at Edwards on Thursday.

KSC Thursday landing times are: 8:17 a.m. and 9:53 a.m. EST.

EAFB Thursday landing times are: 9:45 a.m. and 11:21 a.m. EST.

The landing of Atlantis will mark the 34th landing at KSC in the history of Space Shuttle flight. It will be the first landing of the Shuttle at KSC this year.

About six hours after landing at KSC, select members of the flight crew will be present for a post-mission press conference. The conference will be held at the KSC TV auditorium and carried live on NASA TV. Astronaut John Blaha, returning to Earth after spending about four-months on the Mir space station, will not participate in the post-mission astronaut press conference.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Atlantis Jan. 12. The primary functions of the Space Shuttle recovery convoy are: provide immediate service to the orbiter after landing, assist crew egress, prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of

coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC the day after landing.

If Atlantis lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 8 hours after Atlantis lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 3 for post-flight deservicing. Preparations will then begin for Atlantis' next mission, STS-84, currently scheduled for launch in May.

-- end --

NOTICE TO EDITORS: Media wishing to view Atlantis' landing should be at the KSC press site between 4:30 - 6:30 a.m. Wednesday, Jan. 22, for transport to the SLF. Other specific information is available at the KSC News Center regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 15-97

TOM PURER HONORED BY NASA ASTRONAUTS

Tom Purer, a native of Liberal, KS, and son of Pete and Mary Purer of Liberal, KS, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Purer graduated in 1960 from Liberal (KS) High School. He received a bachelor of science degree in chemistry and mathematics in 1965 from the Fort Hays State University in Hays, KS, and a master's in computer science in 1983 from the Florida Institute of Technology (FIT), Melbourne, FL. He has taught computer science courses at FIT, at Brevard Community College in Florida and at the University of Bari in Italy.

Purer and his wife, the former Karroll Landess, live in Merritt Island, FL. They have two children.

Astronaut Pamela A. Melroy presented the Silver Snoopy Award on Jan. 8 at KSC to Purer, an aerospace engineer with the NASA/KSC Safety and Mission Assurance Directorate. He joined the space center in 1967.

Purer was commended for the independent assessments he performed on the Tethered Satellite System and Wake Shield Facility payloads before their reflights. "Your review of the anomalies, waivers, deviations, and corrective action were comprehensive and very thorough," Melroy told him. "Your success in this effort is measured by the fact that none of the anomalies re-occurred during the reflights of these missions. We are fortunate to have such a conscientious, dedicated individual assessing our high-profile missions."

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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STS-82
Discovery
Second Hubble servicing mission

KSC Release No. 16-97
January 1997

STS-82 is the second of four planned servicing missions for the orbiting Hubble Space Telescope (HST), which has rewritten the astronomy textbooks since its deployment nearly seven years ago.

The primary mission objectives are to retrieve, service and then re-deploy HST. Depending on the orbiter's available fuel, the seven-member crew also will use Discovery's Vernier Reaction Control System jets to boost the bus-sized Hubble to an orbit slightly higher -- by 1 to 5 nautical miles (1.8 to 9 kilometers) -- to prolong its orbital life and compensate for the slow decay of its approximately 320-nautical-mile-high (593-kilometer) orbit above Earth.

Four of the seven crew members will be divided into two teams to perform the scheduled four extravehicular activities (EVAs) or spacewalks required for the servicing.

The first servicing, on STS-61 in December 1993, was one of the most challenging and complex manned missions ever attempted by NASA. During that 11-day flight, a record five back-to-back spacewalks were performed to install new hardware and instruments, some of which corrected a flaw in Hubble's main mirror. The more than 24,000-pound (10,886-kilogram) HST was deployed by the five-member STS-31 crew in April 1990. Servicing missions also are planned in 1999 and 2002.

On STS-82, astronauts will replace two outdated scientific instruments with two new instruments on HST: the Near Infrared Camera and Multi-Object Spectrometer (NICMOS) will take the place of the Faint Object Spectrograph; and the Space Telescope Imaging Spectrograph (STIS) will be installed, after the removal of the Goddard High Resolution Spectrograph.

Among other planned changes to enhance the science capabilities of HST are the replacement of a reaction wheel assembly, two tape recorders, a data interface unit and solar array electronics; and installation of a refurbished fine guidance sensor and magnetometer covers.

Among Hubble's most important scientific discoveries since it became operational in 1990 are: the first conclusive evidence for the existence of massive black holes; detection of light emitted from distant galaxies when the universe was only 5 percent of its current age; evidence that the universe may be much younger than has been previously thought; revealing of dynamic weather changes on nearly all planets; and discovery of disks that might be embryonic planetary systems around young stars, implying that planets, and presumably life, may be abundant in the universe.

STS-82, the second of eight planned Shuttle missions for 1997, will be the 22nd flight of Discovery (OV-103). Discovery last flew on STS-70 in 1995; it was then sent to California for a period of refurbishment and modification.

The 82nd Space Shuttle launch will begin with liftoff from Pad A, Launch Complex 39. Discovery will ascend at a 28.45-degree inclination to the equator for direct insertion to a 362-statute-mile (314-nautical-mile/582- kilometer) orbit. The 10-day mission is scheduled to conclude with a landing at KSC's Shuttle Landing Facility.

The crew

Three-time space flyer Kenneth D. Bowersox (Cmdr., USN) will lead the experienced seven-member crew as mission commander. He was the pilot of STS-50 in 1992 and the first Hubble servicing mission, STS-61, in 1993, and commander of STS-73 in 1995.

Assisting him at the orbiter controls will be Pilot Scott J. "Doc" Horowitz (Lt. Col., USAF). He flew once before, as pilot of STS-75 in 1996.

The payload commander will be Mark C. Lee (Col., USAF), a veteran of three space flights. He was the payload commander of STS-47 in 1992 and a mission specialist on STS-30 in 1989 and on STS-64 in 1994, during which he performed the first untethered spacewalk in 10 years while testing a self-rescue jetpack.

For STS-82, NASA has paired two experienced spacewalkers with astronauts who have not yet performed an EVA.

Joining Lee on the first and third spacewalks of this mission will be Mission Specialist Steven L. Smith, who also flew on STS-68 in 1994 as a mission specialist.

Performing the second and fourth spacewalks will be Mission Specialists Gregory J. Harbaugh and Joseph R. "Joe" Tanner. Harbaugh has flown three times as a mission specialist, on STS-39 in 1991, on STS-54 in 1993 and on STS-71 in 1995. He did an EVA on STS-54.

Tanner was a mission specialist on STS-66 in 1994. This will be his first spacewalk.

Steven A. Hawley, who has two degrees in astronomy, also will fly on STS-82 as a mission specialist, as well as the flight engineer. He has primary responsibility for operation of the orbiter's Remote Manipulator System (RMS) arm -- both for capture and redeployment of HST and as a work platform for the spacewalkers. He will manipulate the robot arm from controls inside the orbiter. He used the RMS arm to deploy the Hubble Space Telescope on STS-31 in 1990.

Three-time space flyer Hawley also was a mission specialist on STS-41D in 1984 and on STS-61C in 1986. He was deputy chief of the Astronaut Office before leaving in 1990 to assume the post of associate director of NASA's Ames Research Center in California. He came back to JSC in 1992 as deputy director of Flight Crew Operations, and was returned to astronaut flight status in early 1996.

On-orbit activities

Rendezvous with and grapple of HST is scheduled to occur on Flight Day 3. The crew will use the orbiter's robotic arm to capture HST and berth it in in the Shuttle bay on the HST Flight Support System.

Although Hubble was built with handholds and other accessories to enable spacewalking astronauts to service it, the crew also will have more than 150 crew aids and tools, known as space support equipment (SSE). The EVAs will begin on Flight Day 4 and continue through Flight Day 7. The reboost probably will be done in stages, spread out over two or more days at the end of EVAs. The re-deployment of HST is planned on Flight Day 8.

Besides Hawley, Lee and Harbaugh are trained to operate the RMS arm for the spacewalks. When the Lee-Smith team is conducting an EVA, Tanner will be the Intravehicular (IV) crew member who oversees the spacewalk from inside Discovery; when the Harbaugh-Tanner team is performing an EVA, Smith will be the IV crew member. During an EVA, the spacewalking team members will take turns as a "free floater" on a safety tether or anchored at the end of the RMS arm.

A brief description of the major planned activities on each of the six-hour spacewalks follows:

EVA 1, Flight Day 4, Lee and Smith: The two new scientific instruments, NICMOS AND STIS, will be installed, taking the place of two instruments which were designed and built more than two decades ago as part of the original Hubble.

Both NICMOS and STIS are about the size of refrigerators. NICMOS, which weighs approximately 815 pounds (370 kilograms), is HST's first cryogenic instrument -- its sensitive infrared detectors must operate at very cold temperatures of minus 355 degrees Fahrenheit or 58 degrees Kelvin. Frozen nitrogren ice inside a cryogenic dewar is designed to cool the detector for up to five years. The University of Arizona under contract with NASA's Goddard Space Flight Center (GSFC) headed the development of NICMOS. STIS has the major capabilities of the two

spectrographs which will be removed from HST, as well as new technological features such as two-dimensional spectroscopy. The Laboratory for Astronomy and Solar Physics at GSFC headed the development of STIS.

EVA 2, Flight Day 5, Harbaugh and Tanner: A major task will be to change out one of three fine guidance sensors (FGS) on Hubble with an upgraded spare weighing about 485 pounds (220 kilograms). Two FGSs are used to point the telescope at an astronomical object and hold the target in the HST instrument's field of view. The third FGS can be used as a scientific instrument for celestial measurements.

Also planned that day are the replacement of the optical electronics enhancement kit and the engineering/science tape recorder-2. The latter is one of three mechanical, reel-to-reel tape recorders which records all science data from Hubble. The outdated recorder has failed.

EVA 3, Flight Day 6, Lee and Smith: Several important tasks will be performed, including the replacement of the data interface unit-2, and the engineering/science tape recorder-1 with the solid state recorder. Unlike the current HST tape recorders, the digital solid state recorder has no moving parts to wear out. It also is more flexible than a reel-to-reel recorder and can store more than 10 times as much data.

Also scheduled for the third EVA, if it could not be accomplished by Lee and Smith during the first spacewalk, is the changeout of the reaction wheel assembly. One of Hubble's four reaction wheel assemblies recently failed. HST has no propellant for attitude control; the reaction wheel assemblies help to maneuver it.

EVA 4, Flight Day 7, Harbaugh and Tanner: The final scheduled EVA will feature the replacement of the solar array drive electronics-2 (SADE-2) and installation of the new upgraded magnetic sensing system covers.

HST has two SADE boxes which control the solar arrays. One of them had some transistor failures and was changed out during the first servicing mission. That SADE was fixed and now will replace one of the boxes currently on Hubble. The new magnetometer covers will replace the makeshift wrapping which was installed by the first servicing crew and has since degraded.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 30, 1997
KSC Contacts: Lisa Malone/Bruce Buckingham
KSC Release No. 17-97

NASA MANAGERS SET FEB. 11 AS LAUNCH DATE FOR SECOND SHUTTLE SERVICING MISSION TO HUBBLE TELESCOPE

Following completion of a flight readiness review meeting today, NASA managers set Feb. 11, 1997 as the official launch date for NASA's second Shuttle mission of the year.

The mission, designated STS-82, is the second in a series of planned servicing missions to the orbiting Hubble Space Telescope (HST). Following rendezvous with and retrieval of HST on the third day of the mission, four space walks on four successive days will take place as the astronauts remove and replace various HST components. Work performed on the telescope will significantly upgrade the scientific capabilities of HST and keep the telescope functioning smoothly until the next scheduled servicing mission in 1999.

The launch window on Feb. 11 opens at 3:56 a.m. EST and extends for 65 minutes. Discovery's mission duration is planned for 9 days, 22 hours, 47 minutes. The STS-82 mission will conclude with Discovery returning home to the Kennedy Space Center on Feb. 21 at about 2:43 a.m. EST.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 5, 1997
KSC Contact: Patti Phelps
KSC Release No. 18-97

CONNIE J. STALLINGS HONORED BY NASA ASTRONAUTS

Connie J. Stallings, a 1965 graduate of Hart (TX) High School and daughter of Mr. and Mrs. Joe D. Bailey of Hart, TX, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Born in Ottumwa, IA, Stallings also attended South Plains College in Levelland, TX.

She and her husband, Johnny E. Stallings, live in Cocoa, FL. They have two children.

Astronaut Pamela A. Melroy presented the Silver Snoopy Award on Jan. 8 at KSC to Stallings, a personnel management specialist with the NASA/KSC Administration Office. She joined the space center in 1985.

Stallings was recognized for her advice and assistance to management in establishing and staffing the new Space Station organization at Kennedy Space Center. "By accomplishing this in record time, you have enabled management to better meet mission goals in a timely manner," Melroy said. "In addition, your exceptional work and customer service to your KSC-assigned organizations and your responsiveness to the needs of management and employees provide a significant contribution to the overall success of the Center's mission." Stallings also was commended for her coordination of the "Tiger Team" at the Banana Creek launch viewing site for KSC guests.

Snoopy, of the comic strip "Peanuts, " has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 5, 1997
KSC Contact: Patti Phelps
KSC Release No. 19-97

NASA HONORS KENNEDY SPACE CENTER EMPLOYEES

Kennedy Space Center (KSC) will honor 46 of its civil service and contractor employees at a special Honoree Event to be held Feb. 9-11 at the space center.

The KSC employees are among some 250 NASA and industry employees from around the country who will be honored by top NASA and industry leaders for their significant contributions to the nation's space program.

The KSC employees will attend a special reception in their honor, and will be joined by astronauts and senior NASA and industry officials of the Space Shuttle team. They will be given a VIP tour of Kennedy Space Center and will participate in various briefings. They also will watch the STS-82 launch of the Space Shuttle Discovery, which is scheduled Feb. 11, from a special VIP viewing site. STS-82 is the second Hubble Space Telescope servicing mission.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. Recipients are selected for their professional dedication and outstanding achievement in support of the human space flight program.

Ten civil service employees will be honored. They are Jeffrey J. Angermeier, Guy J. Etheridge, Larry D. Jones, James D. Lichtenthal, Michael Murray, Robert A. Prohaska, Terence J. Ross, Dawn M. Steele, Norbert G. Violette and Doretha H. Worthy.

Contractor employees to be honored include Robert B. Singleton, The Bionetics Corp.; Matthew J. McClelland, Boeing North American Inc., Rocketdyne; Kimberlee D. Cochran and Gary W. Grant, Boeing North American Inc., Space Systems Division; Henry L. Badore and Richard J. Blondin, Sherikon Space Systems Inc.; and Curtis E. Satterthwaite, I-NET Inc.

Also, Dennis W. Crocker, Christopher J. Pollio, Dorothy F. Rhine, John A. Schmalenberger and Willis M. Swarthwood, EG&G Florida Inc.; Lisa A. Roth, Wiltech Corp.; Martha Lynn Saltsman, Jack Selman and Joseph J. Smitelli, United Technologies, USBI Co.; and Clifton L. Burkett, Wayne E. Derbyshire, Thomas G. Luman, A. Lynn Pemberton and G. Scott Strickland, McDonnell Douglas Space and Defense Systems-KSC.

United Space Alliance employees who will be honored are Howard L. Baker, Donna M. Blankmann-Alexander, Robert W. Chancey, Leon O. Dufresne, Rodger K. Loeffler, James J. Marshall, David R. McCormick, Walter R. McCormick, Glen M. Miracle, Harry L. Moore, Douglas D. Oldham, Donald E. Runaas, Susan C. Schoettl, Lee J. Withington and Dallas L. Wright.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 6, 1997
KSC Contact: Lisa Malone
KSC Release No. 20-97

Notice to Editors/News Directors:
MISSION STS-82 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Feb. 11 launch of the Space Shuttle Discovery on Mission STS-82. These events are scheduled to be carried live on NASA Television unless noted (please refer to the STS-82 TV schedule for exact times).

The seven STS-82 crew members are scheduled to arrive at KSC on Friday, Feb. 7, between 8 and 8:30 a.m. News media representatives wishing to cover crew arrival must be at the News Center by 7 a.m. Friday for transport to the Shuttle Landing Facility. News media needing credentials for crew arrival should make arrangements by calling the News Center at 867-2468.

The launch countdown will begin at the T-43-hour mark at 4 a.m. EST Saturday, Feb. 8. Launch is currently targeted for 3:56 a.m. EST on Tuesday, Feb. 11, at the opening of a 65-minute launch window.

News media representatives with proper authorization may obtain STS-82 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island.

The office will be open during the mission to support all mission status briefings from the Johnson Space Center, which are listed in the TV schedule.

# # # #

STS-82 BRIEFING & EVENTS SCHEDULE
(all times are in EST and conferences are held inside the KSC Press Site auditorium)

L-4 Days - Friday, Feb. 7

- STS-82 flight crew arrival (live) ----- **about 8:00 a.m.**

L-3 Days - Saturday, Feb. 8

- Launch countdown begins ----- **4:00 a.m.**

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Roelof Schuiling, STS-82 Payload Operations Engineer
  * Ed Priselac, Shuttle Weather Officer

- Crew arrival replay ----- **(to follow briefing)**

L-2 Days - Sunday, Feb. 9

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, NASA Test Director
  * Roelof Schuiling, STS-82 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- Pre-launch News Conference ----- **3:30 p.m.**
  (or immediately following the management team's meeting)

  * Tommy Holloway, Shuttle Program Manager, Johnson Space Center
  * Dr. Wesley Huntress, Ass. Admin., Office of Space Science, NASA HQ
  * Ian Pryke, European Space Agency
  * Bob Sieck, Director of Shuttle Operations, KSC
  * Capt. Scott Jacobs, Launch Weather Officer

L-1 Day - Monday, Feb. 10

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, NASA Test Director
  * Roelof Schuiling, STS-82 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- Rotating Service Structure moves (press departure at 9 a.m.) ----- **9:30 a.m.**

- Remote Camera Setup at Pad ----- **10:30 a.m.**

- News media orientation tour (optional depending on interest) ----- **1:00 p.m.**

- Tanking begins ----- **7:36 p.m.**

- NASA Television live launch programming begins ----- **11:00 p.m.**

Launch Day - Tuesday, Feb. 11

- Launch of Discovery ----- **3:56 a.m.**

- Post-launch press conference ----- **L + 1 hour**
  * Loren Shriver, manager, Space Shuttle Program Launch Integration
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-82
(hours may be adjusted for in-flight events)

(Launch minus 4 days) Friday, Feb. 7	7:00 a.m. - 4:30 p.m.
(Launch minus 3 days) Saturday, Feb. 8	8:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Sunday, Feb. 9	8:00 a.m. - 7:00 p.m.
(Launch minus 1 day) Monday, Feb. 10	8:00 a.m. - around-the-
(Launch day) Flight day 1, Tuesday, Feb. 11	-clock - 4:30 p.m.

(Times may vary and be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-82 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Saturday, Feb. 8 -- 8:00 a.m. to 4:30 p.m.

Sunday, Feb. 9 -- 8:00 a.m. to 4:30 p.m.
Monday, Feb. 10 -- 8:00 a.m. to 4:30 p.m.; 11:00 p.m. -
Tuesday, Feb. 11 -- midnight to 3:00 a.m.

News media with annual Shuttle credentials are reminded to sign the log book at the photo and interview counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 18, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 21-97

FIVE KSC EMPLOYEES HONORED BY BREVARD COUNTY SCHOOLS

Five Kennedy Space Center (KSC) employees were recently honored at the Brevard County School Board's winter award ceremonies for their contributions to the district's educational programs. The employees are active participants in KSC's "Adopt-A-School" program, where participating KSC organizations foster an ongoing relationship with one or more schools and their employees participate in classroom instruction, demonstrations and other projects designed to enhance school programs.

Dennis Chamberlain, Cindy Coddington, Denise Coleman, Carol Dunn and Doug Hendriksen were recognized for a variety of contributions including assisting at science fairs; arranging for school visits and presentations by NASA astronauts and engineers; coordinating special events and school projects; arranging NASA student field trips; mentoring students; and locating and providing computer software used to enhance ongoing educational programs.

"Kennedy Space Center has really made a difference in our schools and we are very fortunate to be located so near a NASA facility," said Dr. David Sawyer, Superintendent of Brevard County Schools. "NASA's engineers, scientists and other volunteers have all been exceptionally capable and supportive of Brevard County's educational programs."

Chamberlain was honored by Golfview Elementary Magnet School in Rockledge for assisting in the set up of the school's Project MARS (Mission to America's Remarkable Students) involving the coordination of biology experiments, the provision of teacher's aids and telephone question and answer mentoring by NASA scientists.

Coddington was recognized by Fairglen Elementary School in Cocoa for serving as a student mentor; arranging and serving as a guide for NASA field trips; and coordinating the participation of NASA personnel as mentors, science presenters, science team members, science fair judges and presenters.

Coleman was cited by South Lake Elementary School in Titusville for arranging visits and demonstrations by NASA engineers and astronauts, for assisting with the school's science fair and for her coordination of the end-of- school-year student launch team and model rocket launch day activities.

Dunn received the Outstanding Business Partner Award from Atlantis Elementary School in Merritt Island, and was recognized for her two years of service as the school's NASA liaison, for coordinating the NASA employee mentor program and for donating her time to work directly with the school's students.

Hendriksen was honored by Golfview Elementary Magnet School for his assistance in obtaining needed software and accessories for the school's computer lab and classroom computers.

The Brevard County School Board holds awards programs twice a year in each of its four school districts. The purpose of these ceremonies is to recognize area students, teachers, parents and business community members who have made significant contributions to Brevard County public schools.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 7, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 22-97

SPACE SHUTTLE MISSION STS-82 LAUNCH COUNTDOWN TO BEGIN FEB. 8

NASA will begin the countdown for launch of Space Shuttle Discovery on the second mission to service the Hubble Space Telescope on Feb. 8 at 4 a.m. at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center.

The countdown includes 28 hours and 56 minutes of built-in hold time leading to the opening of the launch window at 3:56 a.m. (EST) on Feb. 11. The launch window extends for 65 minutes.

STS-82 is the second Space Shuttle mission of 1997. This will be the 22nd flight of the orbiter Discovery and the 82nd flight overall in NASA's Space Shuttle program. Discovery last flew in July 1995. STS-82 is scheduled to last 9 days, 21 hours, 34 minutes and end with a planned KSC landing at 1:30 a.m. on Feb. 21.

Discovery was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 2 on Jan. 11 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building the following day. The Shuttle stack was then transported to Pad 39A on Jan. 17.

The STS-82 crew are: Commander Ken Bowersox; Pilot Scott Horowitz; Mission Specialists Joe Tanner, Steve Hawley, Greg Harbaugh, Mark Lee and Steve Smith. All members of the STS-82 crew are veteran Shuttle flyers.

The crew arrived at KSC at about 7:30 a.m., today. Their activities at KSC prior to launch will include final inspections of the Hubble Space Telescope servicing payloads, crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES
***all times are Eastern**

Launch - 3 Days (Saturday, Feb. 8)

- Prepare for the start of the STS-82 launch countdown
- Perform the call-to-stations (3:30 a.m.)
- All members of the launch team report to their respective consoles in Firing Room 3 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (4 a.m.)
- Start preparations for servicing fuel cell storage tanks
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Discovery's general purpose computers

- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms

Enter first planned built-in hold at T-27 hours for duration of four hours (8 p.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Launch - 2 Days (Sunday, Feb. 9)

Resume countdown (12:01 a.m.)

- Clear launch pad of all personnel
- Begin operations to load cryogenic reactants into Discovery's fuel cell storage tanks (2 - 7 a.m.)
- After cryogenic loading operations, re-open the pad

Enter eight-hour built-in hold at T-19 hours (8 a.m.)

- Off-load extra cryogenic reactants not required for flight
- Resume orbiter and ground support equipment close-outs

Resume countdown (4 p.m.)

- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Activate the orbiter's flight controls and navigation systems
- Install mission specialists' seats in crew cabin
- Begin startracker functional checks
- Close-out the tail service masts on the mobile launcher platform

Launch -1 Day (Monday, Feb. 10)

Enter planned hold at T-11 hours for 13 hours, 36 minutes (12:01 a.m.)

- Install film in numerous cameras on the launch pad
- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Activate orbiter's inertial measurement units
- Complete flight crew equipment late stowage
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down
- Move Rotating Service Structure (RSS) to the park position (9:30 a.m.)
- Start fuel cell flow-through purge

Resume countdown (1:36 p.m.)

- Perform pre-ingress switch list
- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Discovery's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (6:36 p.m.)

Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 7:06 p.m.)

Resume countdown (7:36 p.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 10 p.m.)
- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines

Enter planned two-hour built-in hold at T-3 hours (10:36 p.m.)

- Close-out crew and Final Inspection Team proceed to Launch Pad 39A

Launch Day (Tuesday, Feb. 11)

Resume countdown at T-3 hours (12:36 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 12:31 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 1:01 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Discovery's crew hatch (about 2:26 a.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (3:16 a.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (3:26 a.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (3:37 a.m.)
(This is the last planned built-in hold. Other hold options are available if necessary.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 3:47 a.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)

Start mission recorders (T-5:30)

- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	8:00 p.m. Sat.	12:01 a.m. Sun.
T-19 hours	8 hours	8:00 a.m. Sun.	4:00 p.m. Sun.
T-11 hours	13 hours, 36 minutes	12:01 a.m. Mon.	1:36 p.m. Mon.
T-6 hours	1 hour	6:36 p.m. Mon.	7:36 p.m. Mon.
T-3 hours	2 hours	10:36 p.m. Mon.	12:36 a.m. Tues.
T-20 minutes	10 minutes	3:16 a.m. Tues.	3:26 a.m. Tues.
T-9 minutes	10 minutes	3:37 a.m. Tues.	3:47 a.m. Tues.

CREW FOR MISSION STS-82

Commander (CDR):	Ken Bowersox
Pilot (PLT):	Scott Horowitz
Mission Specialist (MS1):	Joe Tanner
Mission Specialist (MS2):	Steve Hawley
Mission Specialist (MS3):	Greg Harbaugh
Mission Specialist (MS4):	Mark Lee
Mission Specialist (MS5):	Steve Smith

SUMMARY OF STS-82 LAUNCH DAY CREW ACTIVITIES

Monday, Feb. 10

	7:30 p.m.	Wake up
	8:00 p.m.	Breakfast
*	11:21 p.m.	Lunch and crew photo
	11:51 p.m.	Weather briefing (CDR, PLT, MS2)
	11:51 p.m.	Don launch and entry suits (MS1, MS3, MS4, MS5)

Tuesday, Feb. 11

	12:01 a.m.	Don launch and entry suits (CDR, PLT, MS2)
*	12:20 a.m.	Crew suiting photo
*	12:31 a.m.	Depart for launch pad 39A
*	1:01 a.m.	Arrive at white room and begin ingress
*	2:26 a.m.	Close crew hatch
*	3:56 a.m.	Launch

* Televised events (times may vary slightly)
All times Eastern

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 7, 1997
KSC Contact: Joel Wells
KSC Release No. 23-97

KSC PROVIDES $1.135 BILLION BOOST TO FLORIDA'S ECONOMY IN FY 96

Space related employment and contracts at NASA Kennedy Space Center yielded a $1.135 billion boost to Florida's economy during the 1996 fiscal year which ended Sept. 30. This figure represents $1.01 billion in Florida contracts and purchases along with $125.1 million in civil service personnel compensations.

Over ninety-eight percent of the Florida dollars, about $993 million, was expended within Brevard County. Of KSC's total expenditures, $953 million went to contractors operating on-site at the space center.

An additional $39.8 million went to off-site businesses in Brevard County, while $17.1 million was awarded to Florida businesses outside the county. Out-of-state purchases totaled about $79.8 million.

KSC surpassed its small business contract goal of $56 million by awarding over $74 million in contracts to small, disadvantaged and woman-owned businesses.

Permanent federal employees at KSC totaled 2,073 on Dec. 31, 1996. While 2,879 people were employed through construction and tenant jobs at KSC, the majority of the workers were employed by the on-site contractors and numbered 9,518. Including 50 non-permanent federal employees, approximately 14,520 workers were employed at KSC through the close of the year.

Feb. 3 was the last day that NASA workers could take advantage of the agency's third buyout offer. The downsizing effort resulted in the voluntary departure of 168 federal employees, leaving KSC with a current civil service work force of about 1,925.

During fiscal year 96, major contractors at KSC included Lockheed Martin Space Operations, the Shuttle Processing Contractor; EG&G Florida Inc., the Base Operations Contractor; McDonnell Douglas Aerospace, Space and Defense Systems-KSC, the Payload Ground Operations Contractor; and Rockwell International Corp., the Shuttle Orbiter Logistics Contractor. On Oct. 1, United Space Alliance officially began work on the Space Flight Operations Contract, a consolidation of Shuttle processing contracts at KSC.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 19, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 24-97

NASA OFFERS SCHOOLS FREE COMPUTER SOFTWARE

Kennedy Space Center (KSC) is offering free computer software to educational institutions through a recently established surplus software loan program. As another component of KSC's ongoing educational support efforts, this loan program complements the special one-time computer system donation program that KSC featured last year as well as an on-going program that allows schools to claim surplus computer hardware.

KSC program coordinator Doug Hendriksen explained that "there is a continuous turnover of software at the space center and we regularly receive a wide range of DOS-based and Windows applications for our loan program." While the inventory of software changes regularly, there is normally a good selection of word processing, graphics, spreadsheet, database management and specialized applications available for all educational levels. "We also have a limited selection of networking and MacIntosh software at hand," he added, "as well as other accessories such as keyboards, mouses, cables and computer plug-in boards."

"There is not a lot of red tape involved in this program," said Hendriksen. "All we ask is that schools have some idea of what they are looking for before they call. If we have what they want, we will arrange for them to come out and pick it up."

Representatives from any public or private educational institution, including approved home tutoring programs, can contact Hendriksen at (407) 867-2551, from 8 a.m. to 4:30 p.m., Monday through Friday.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

February 19, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 25-97

NEW RUNWAY CENTERLINE LIGHTS AT KSC'S LANDING FACILITY WILL HELP GUIDE ORBITER HOME

When Mission Commander Kenneth Bowersox steers the orbiter Discovery toward final approach to Kennedy Space Center's runway Friday morning, new runway centerline lights will provide an additional visual aid to help him guide the orbiter safely home. Discovery is scheduled to land at 1:48 a.m. EST, Feb. 21.

The new lights will assist any aircraft pilot making a night landing at KSC's Shuttle Landing Facility (SLF), but astronaut requests for improved centerline visibility during orbiter landings was the driving factor for installation. KSC is the prime landing site for all Shuttle missions and night or dawn landings are becoming more commonplace, as evidenced by end-of-mission landings in 1996. Six of the seven Shuttle missions last year ended at KSC. One occurred during nighttime (STS-72), two near dawn (STS-77, STS-80), one was scheduled to occur around dawn but was waved off to a later opportunity (STS-75) and preparations for the other two (STS-78 and STS-79) would have begun under low-light conditions.

Existing visual navigation aids such as the Xenon searchlights at the end of the runway and edgelights along each side of the landing strip are an invaluable help to the spacecraft commander, along with electronic aids. However, astronauts had reported that centerline visual cues became less distinct during the final phase of a landing when the spaceplane rolls down the runway, making it difficult to detect a possible orbiter drift away from the centerline.

The new lighting system features a series of 52 lights positioned every 200 feet in the center section of the 15,000-foot long runway. They begin at 2,475 feet down the runway, the optimum touchdown point for an end-of-mission landing. The system has redundant circuits allowing centerline lighting even with a single-circuit failure. The lights are FAA-approved 80-Watt Halogen bulbs with the added benefit of adjustable intensity. Prior to a Shuttle launch or an end-of-mission landing, the Shuttle Training Aircraft (STA) pilot can advise SLF personnel which setting will work best around touchdown time.

Providing adequate lighting is only half the challenge of installing centerline lights on a runway used by the Space Shuttle program. Making sure the surface remains as smooth as possible is the other. The SLF was originally equipped with centerline lights located 50 feet apart, but they were removed prior to STS-1 because of concerns about damage to the orbiter tires as they rolled over the three-quarter-inch high bump presented by the old-style lights. A landing Shuttle orbiter travels considerably faster than a commercial aircraft - 200-220 miles per hour for the spaceplane versus 120-140 miles per hour for commercial jets - which means any bumps can tear a tire to shreds. The critical time of tire spin-up - the instant the tire touches the runway and begins turning at a very high rate - is an especially vulnerable phase. The runway surface itself has undergone modifications over time to prevent tire damage.

"New design and manufacturing methods have allowed us to obtain and install a low-profile light without the height hazard of the original system," said Ron Feile, SLF coordinator. The current SLF standard for any height variation is one-eighth inch or less - considerably more stringent than civilian airport standards - and the new fixtures extend to just the one-eighth-inch mark above surface level. The minimal elevation is necessary in order to provide directional

lighting to the aircraft pilot or orbiter commander, Feile added.

"The lighting system now in place at the SLF meets Shuttle mission commanders' desire for better centerline cues while also protecting the orbiter," observed Bob Bryan, SLF airport manager for Base Operations Contractor EG&G Florida. Advanced Electrical Installations Inc., Titusville, FL, completed the installation using the Halogen lights supplied by Hughey & Phillips Inc., Simi Valley, CA.

Work began in December, and members of the STS-82 crew tested the system while flying STA sorties prior to launch Feb. 11. Bowersox was very pleased with the new system during his pre-launch checkout flights, Feile reported.

"A diverse group of NASA personnel from both KSC and Johnson Space Center as well as contractors and subcontractors made this possible well ahead of schedule," said Ed Taff, NASA SLF site manager. "The safety margin for the orbiter has been increased due to everyone's efforts."

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 19, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 26-97

DISCOVERY SCHEDULED TO LAND AT KSC

The orbiter Discovery is scheduled to land at Kennedy Space Center on Friday, Feb. 21 at about 1:48 a.m. EST, completing its 10-day STS-82 mission which was launched from KSC on Feb. 11. This marks only the fourth nighttime landing of the Shuttle at KSC. Five nighttime landings have occurred at Edwards Air Force Base (EAFB), CA.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 149 at a mission elapsed time of 9 days, 21 hours, 53 minutes. Deorbit burn will occur at about 12:43 a.m. Friday.

The two KSC landing opportunities on Friday are at 1:48 a.m. and 3:31 a.m. EST. If a landing is not possible at KSC on Friday due to weather concerns, a landing could be made at Edwards. EAFB landing opportunities on Friday are at 3:22 a.m. and 5:04 a.m. EST.

If managers decide to keep Discovery in orbit an additional day, two landing opportunities are available at KSC and two at Edwards on Saturday.

KSC Saturday landing times are: 1:58 a.m. and 3:40 a.m. EST.
EAFB Saturday landing times are: 3:31 a.m. and 5:13 a.m. EST.

This landing of Discovery will mark the 35th landing at KSC in the history of Space Shuttle flight. It will be the second landing of the Shuttle at KSC this year.

About five to six hours after landing at KSC, select members of the flight crew will be present for a post-mission press conference. The conference will be held at the KSC TV auditorium and carried live on NASA TV.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Discovery Feb. 11. The primary functions of the Space Shuttle recovery convoy are: provide immediate service to the orbiter after landing, assist crew egress, prepare the orbiter for towing to the Orbiter Processing Facility bay 2.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE

suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC later in the day.

If Discovery lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 3 1/2 hours after Discovery lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Preparations will then begin for Discovery's next mission, STS-85, currently scheduled for launch in July.

-- end --

NOTICE TO EDITORS: Media wishing to view Discovery's landing should be at the KSC press site between 10:30 p.m. Thursday - 12:30 a.m. Friday, for transport to the SLF. Other specific information is available at the KSC News Center regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 28-97

LISA ROTH HONORED FOR ROLE IN SPACE PROGRAM

Lisa Roth, a resident of New Smyrna Beach, FL, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Jacksonville, FL, Roth graduated in 1980 from St. John's Country Day School in Jacksonville. She received a bachelor of science degree in chemistry in 1984 from Stetson University, Deland, FL.

At KSC, Roth is employed by Wiltech Corp. as manager of the Toxic Vapor Detection Laboratory. She joined the space center in 1985.

She is married to Andrew James Roth, who works at KSC as a mechanic.

The 46 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior officials from NASA and the space industry. The Honorees also were taken to a special VIP viewing area to watch the STS-82 launch of the Space Shuttle Discovery on Feb. 11.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-82 was the second Hubble Space Telescope servicing mission. Crew members were Mission Commander Kenneth D. Bowersox, Pilot Scott J. "Doc" Horowitz, Payload Commander Mark C. Lee, and Mission Specialists Steven L. Smith, Gregory J. Harbaugh, Joseph R. "Joe" Tanner and Steven A. Hawley.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 29-97

ROBERT B. SINGLETON HONORED FOR ROLE IN SPACE PROGRAM

Robert B. Singleton, a resident of Daytona Beach, FL, and a graduate of Daytona Beach Community College, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Savannah, GA, Singleton graduated in 1960 from Campbell High School in Daytona Beach, FL. He received certification in basic electronics from Daytona Beach Community College in 1981.

At KSC, Singleton is employed by The Bionetics Corp. as a calibration technician. He joined the space center in 1967. Singleton is married to the former Natalie Wallace.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 30-97

JEFFREY JOSEPH ANGERMEIER HONORED FOR ROLE IN SPACE PROGRAM

Jeffrey Joseph Angermeier, a native of Altoona, PA, and a 1987 graduate of Pennsylvania State University, University Park, PA, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Angermeier graduated in 1983 from Bellwood-Antis High School, Bellwood, PA. He earned a bachelor's degree in electrical engineering from Pennsylvania State University, and a master's in space systems in 1993 from the Florida Institute of Technology, Melbourne, FL. His parents, Joseph and Joan Angermeier, live in Ringgold, GA.

At KSC, Angermeier is employed by NASA as manager of multiflow integration for Space Shuttle processing. In July 1994, he completed a one-year assignment at NASA Headquarters in Washington, D.C., as manager of the Space Shuttle/Space Station manifest for the Office of Space Flight. He joined KSC in 1988 and has won two KSC Certificates of Commendation.

Angermeier and his wife, the former Robin Marie Corfield, live in Merritt Island, FL.

The 46 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior officials from NASA and the space industry. The Honorees also were taken to a special VIP viewing area to watch the STS-82 launch of the Space Shuttle Discovery on Feb. 11.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-82 was the second Hubble Space Telescope servicing mission. Crew members were Mission Commander Kenneth D. Bowersox, Pilot Scott J. "Doc" Horowitz, Payload Commander Mark C. Lee, and Mission Specialists Steven L. Smith, Gregory J. Harbaugh, Joseph R. "Joe" Tanner and Steven A. Hawley.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 31-97

MICHAEL MURRAY HONORED FOR ROLE IN SPACE PROGRAM

Michael Murray, a native of Lewiston, ME, and a 1955 graduate of Lewiston (ME) High School, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Murray studied business management and accounting at Northern Virginia Community College. He also served in the U.S. Air Force, retiring in 1975 with the rank of senior master sergeant. During his military career, he earned the Bronze Star, the Vietnam Service Medal and four Air Force Commendation Medals.

At KSC, Murray is employed by NASA as a logistics systems analyst. He joined the space center in 1982 and has won two NASA Group Achievement Awards. He is a member of the Society of Logistics Engineers.

Murray and his wife, the former Roberta H. Connelly, live in Titusville, FL. They have three grown children.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 32-97

NORBERT G. VIOLETTE HONORED FOR ROLE IN SPACE PROGRAM

Norbert G. Violette, a resident of Melbourne, FL, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Van Buren, ME, Violette graduated in 1955 from East Hartford (CT) High School. In 1974, he earned a bachelor's degree in aeronautical science at Embry-Riddle Aeronautical University, Daytona Beach, FL. He also served in the U.S. Army from 1955-1980, retiring with the rank of chief warrant officer. He won numerous medals and decorations during his Army career, including master Army aviator and master parachutist.

At KSC, Violette is employed by NASA as the chief pilot for NASA Aircraft Operations. He has accumulated 14,500 flight hours, including 2025 combat flight hours in Vietnam, and is qualified in five types of helicopters and seven airplanes.

The 46 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior officials from NASA and the space industry. The Honorees also were taken to a special VIP viewing area to watch the STS-82 launch of the Space Shuttle Discovery on Feb. 11.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-82 was the second Hubble Space Telescope servicing mission. Crew members were Mission Commander Kenneth D. Bowersox, Pilot Scott J. "Doc" Horowitz, Payload Commander Mark C. Lee, and Mission Specialists Steven L. Smith, Gregory J. Harbaugh, Joseph R. "Joe" Tanner and Steven A. Hawley.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 33-97

DORETHA H. WORTHY HONORED FOR ROLE IN SPACE PROGRAM

Doretha H. Worthy, a resident of Rockledge, FL, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Augusta, GA, Worthy is the daughter of James and Ruby Henry of Cocoa, FL. She received an associate's degree in business administration from Brevard Community College in 1992.

At KSC, Worthy is employed by NASA as an administrative officer with the Administration Office. She joined the space center in 1968 and has won several awards, including a Silver Snoopy Award from the Space Shuttle astronauts and a KSC Certificate of Appreciation.

Worthy has two children, Keila Bartley and Quentin Worthy II.

The 46 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 34-97

JIM LICHTENTHAL HONORED FOR ROLE IN SPACE PROGRAM

Jim Lichtenthal, a native of Buffalo, NY, and son of Donald and Patricia Lichtenthal of Eden, NY, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Lichtenthal graduated in 1979 from Eden (NY) Central High School. He received a bachelor's degree in chemical engineering from the University of Buffalo in 1985 and a master's in engineering management from the University of Central Florida in 1991.

At KSC, Lichtenthal is employed by NASA as a quality engineer. He joined the space center in 1991 and has won a Group Achievement Award. He is a member of the American Society of Quality Control.

Lichtenthal and his wife, the former Julie Ann Elkins, live in Chuluota, FL. They have two children, Kristen and Derek.

The 46 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 24, 1997
KSC Contact: Patti Phelps
KSC Release No. 35-97

CURTIS E. SATTERTHWAITE HONORED FOR ROLE IN SPACE PROGRAM

Curtis E. Satterthwaite, a native of Tarboro, NC, and son of Mrs. Sallie Satterthwaite and the late Powell Satterthwaite of Tarboro, NC, was among 46 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Satterthwaite graduated in 1966 from North Edgecombe High School, Leggett, NC. In 1981, he received an associate's degree in aviation maintenance technology from the Community College of the Air Force, Gunter Air Force Base, AL. He also earned a bachelor's degree in occupational education in 1982 from Southern Illinois University, Carbondale, IL, and a master's certificate in acquisition management in 1995 from the University of Central Florida. He served in the U.S. Air Force from 1968-88, retiring with the rank of chief master sergeant. He received numerous awards during his Air Force career, including Meritorious Service Medals and Commendation Medals.

At KSC, Satterthwaite is employed by I-NET Inc. as a senior logistician. He joined the space center in 1988 and is a member of the National Contract Management Association.

He is married to Marlene Blaha Satterthwaite, who is employed by NASA at KSC as a realty specialist. He has one grown daughter, Jennifer.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 25, 1997
KSC Contact: George H. Diller
KSC Release No. 36-97

KSC DONATES SPACE SHUTTLE MOCKUP TO SPACE COAST STADIUM

Kennedy Space Center will help launch the 1997 spring training season of the Florida Marlins baseball team with the unveiling of a new Space Shuttle mockup during opening day ceremonies. The event will take place on Saturday, March 1 at 11:30 a.m. at Space Coast Stadium in Viera. The mockup is being donated by Kennedy Space Center to the stadium, home of the Florida Marlins spring training facilities and the Brevard County Manatees baseball team. Making the presentation to Space Coast Stadium will be Jay Honeycutt, Director, Kennedy Space Center.

The mockup is 13 feet tall, 5 1/2 feet wide, weighs approximately 350 pounds and is a high fidelity 1/15th scale model mounted on a conical pedestal. The orbiter is made from fiberglass and the external tank and solid rocket boosters are made from aluminum.

The money for the Space Shuttle mockup was donated by Lockheed Martin Space Operations Company, Rockwell International, EG&G Florida, Delaware North Park Services of Spaceport, the NASA Exchange Council and the multi-contractor Joint Industry Press Center. The cost of the mockup is aproximately $15,000. At the base of the conical stand is a brass plaque identifying the organizations who contributed the money to finance the project.

The mockup is being contributed by KSC with the intent of replacing the aging model of an early concept of NASA's spaceplane.

The unveiling is open to the media and members of the public attending the Florida Marlins first spring training home game.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 13, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 37-97

KENNEDY SPACE CENTER ENGINEERS TAKE CLEANLINESS TO NEW HEIGHTS

The first images from the Hubble Space Telescope's (HST) newly installed instruments have generated considerable excitement in the scientific community, and Kennedy Space Center (KSC) played a critical role. KSC contamination control specialist Jean Abernathy and her contractor counterparts, David Baska and Sally Hill, were responsible for protecting these instruments from earthly contamination during the time they were being readied for flight at KSC.

Several months prior to their launch aboard Discovery on Feb. 11, 1997, the Space Telescope Imaging Spectrograph (STIS) and the Near Infrared Camera and Multi-Object Spectrometer (NICMOS) were transferred to KSC where they were readied for flight.

The multi-million dollar scientific instruments, composed of a series of exceptionally sensitive optics and automated mechanisms, required a near pristine environment as pre-launch check-outs were conducted. Some components were initially processed in ultra-clean facilities in Hanger AE on the Cape Canaveral Air Station but, due to space limitations, the complete systems were ultimately assembled at KSC's Vertical Processing Facility (VPF). While all of NASA's payloads require high degrees of cleanliness, this second HST servicing mission demanded extra care and a highly controlled environment that exceeded that available in the VPF.

"In order to ensure that these instruments would function at optimum levels while in space," Abernathy said, "extraordinary measures were taken while they were assembled and readied for launch at KSC." For example, in some cases, several elements were double and triple bagged using a special super thin, super strong material. Also, a perpetual nitrogen purge provided a 24-hour flush of the highly sensitive optics. All the while, real-time sensors constantly scanned the immediate area around the payloads for unseen airborne and surface contamination. Visual inspections involving a survey of every inch of visible payload surface were also performed, looking for even the smallest speck of intruding material.

"The greatest source of contamination to a clean room is often caused by the very individuals who are working on the payloads," Abernathy said.

In order to reduce potential contaminants introduced by employees, workers don clean-room garments prior to entry into the clean room. This garment consists of a hood that covers the head and face; a zippered pair of coveralls with long sleeves and pants legs; snap-on gloves with cuff sealers; and elastic high top boots. Makeup, cologne, perfume and lipstick are prohibited.

Abernathy has been the KSC contamination control specialist for nearly two years. "I began working with my Goddard counterparts on this mission nearly two years ago," she said, "in order to set up payload requirements and to prepare the necessary documentation to help them get what they needed."

Prior to the arrival of the first piece of flight hardware at KSC last October, Abernathy led a campaign to sensitize and inform the hundreds of base operations personnel at the space center as to the special nature of the HST payloads. She also coordinated with other KSC personnel to schedule the spraying of insecticides, building construction, controlled

burns, asphalt work and similar operations, during times when the payloads were fully exposed and more sensitive to contamination.

"It was exciting to be a part of something so special," Abernathy said, "and to see how much people benefit from NASA's technology and advancements."

Abernathy is the daughter of Robert and Marie Estes of New Smyrna Beach, FL, and a 1990 graduate of New Smyrna Beach High School. In 1994, she earned her bachelor of science degree in mechanical engineering from the University of Miami, Miami, FL. She and her husband Brett, reside in Titusville, FL, and are the parents of a son named Nathaniel.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 26, 1997
KSC Contact: Lisa Malone
KSC Release No. 38-97

Note to Editors/News Directors:
KSC'S NEW DIRECTOR ROY BRIDGES TO MEET WITH NEWS MEDIA MARCH 3

KSC's new Director, Roy D. Bridges, Jr., will meet with news media representatives his first day on the job, Monday, March 3 from 1 - 2 p.m. at the Press Site auditorium.

This will be an informal meeting and will not be broadcast on NASA Television. Video and audio tapes will be provided.

A former Shuttle astronaut and retired U.S. Air Force Maj. Gen., Bridges becomes the seventh KSC director succeeding Jay F. Honeycutt, who announced his retirement last October. Bridges was named as the new director by NASA Administrator Dan Goldin on Jan. 21.

Bridges becomes the second astronaut and the third with a military background to serve as KSC director. Prior to Honeycutt, Robert L. Crippen, a veteran of four Shuttle flights and a retired Navy Captain, served as director from 1992-95. Retired USAF Lt. Gen. Forrest S. McCartney was KSC's leader from 1986-91. Richard G. Smith served as KSC director from 1979-1986. Lee R. Scherer was at the helm from 1974-79. KSC's first director was Dr. Kurt H. Debus who served for the longest period of time during 1961-74.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 5, 1997
KSC Contact: Joel Wells
KSC Release No. 39-97

KSC VOLUNTEERS JUDGE BREVARD COUNTY, STATE SCIENCE FAIRS

Over the last three weeks, KSC employees have pored over an abundance of new scientific data, but this data was not gathered in space. Brevard County students were the earth-bound researchers and KSC experts served as their science fair judges.

The judicious volunteers perused more than 700 science exhibits at three separate regional fairs sponsored by the Brevard County School Board. At each fair, 10 students in grades 6 through 12 received certificates of outstanding achievement from NASA for exceptional projects related to space research. Each student winner also received a V.I.P. invitation to attend an upcoming Space Shuttle launch with their family.

"Because I love the space program and I eventually want to work for NASA, their impression of my project is very important", said Kelly Kimbrough, a Cocoa High School sophomore whose physics exhibit won "Best of Show" at the north Brevard science fair and bids to both state and international competitions. "I can't wait to see a launch up close - that will be better than any trophy."

The Brevard South Regional Science Fair, in Melbourne, FL, kicked off the string of weekly expositions on Feb. 14. Each was a showcase of the Space Coast's youthful talent and interest in space and technology. The fair featured 325 exhibits from 11 south Brevard junior and senior high schools.

The Brevard Intracoastal Regional Science Fair, held on Merritt Island on Feb. 21, followed with 208 exhibits from 12 central Brevard schools. Titusville, FL, hosted the Brevard Mainland Regional Science Fair on Feb. 28 with 215 student projects from 11 north Brevard schools. Officials estimate that at least one-third of the county's exhibits dealt with space or related topics.

"I always look forward to these fairs," said Steven Barry, volunteer judge and NASA payload quality specialist. "The kids learn a lot from their research, but you'd be amazed at how smart they already are."

Several KSC employees also served as official judges to select projects from all categories for competition at the state level. Beyond the annual science fair support, KSC workers act as mentors to students supplementing their classroom learning with hands-on experience.

"It is enjoyable, but it's also our duty as servants to the taxpayers to contribute our knowledge and expertise into the education process," said Dr. Tom Dreschel, Science Education Coordinator for Dynamac, KSC's life science contractor.

"We really count on the support that KSC delivers every year," said Science Fair Director Dave Murray. "NASA's presence alone displays a real world application that encourages young people to excel in science and math."

The encouragement will continue at the Florida State Science and Engineering Fair in Ft. Lauderdale, FL, on April 3 and 4. Finalists from county fairs across the state will continue their competition at the Broward County Convention

Center. NASA judges will again be on-hand to present special awards.

NASA plans to recognize ten outstanding exhibitors at the state fair and each will receive an achievement award and an invitation to attend an upcoming Shuttle launch. Two of those students will be awarded summer job opportunities at KSC.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 10, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 40-97

TCDT MEDIA OPPORTUNITY WITH STS-83 CREW SET FOR THIS WEEK

The crew of Space Shuttle mission STS-83 will be at Kennedy Space Center this week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities at KSC. The TCDT ends with a mock launch countdown culminating in a simulated main engine cutoff. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect their mission payloads in the orbiter's payload bay.

The seven-member crew of mission STS-83 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 5 p.m. Tuesday, March 11. Members of the media who wish to view this event should be at the KSC Press Site by 3:30 p.m. for possible early arrival. This is a photo opportunity only.

On Thursday, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39A. Media interested in participating in this question and answer session should be at the KSC Press Site by 12:30 p.m. Thursday for transport to the pad.

On Friday, the crew will take part in simulated launch day events, including entering the orbiter Columbia fully suited for the simulated main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Columbia is now targeted for launch on April 3 at 2:01 p.m. EST. Mission STS-83 will feature the first flight of the Microgravity Science Laboratory and is scheduled to last 16 days.

Crew members for mission STS-83 are: Commander Jim Halsell; Pilot Susan Still; Mission Specialists Janice Voss, Michael Gernhardt and Donald Thomas; and Payload Specialists Roger Crouch and Greg Linteris.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

March 11, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 41-97

STS-83 SPACE SHUTTLE COLUMBIA ROLLS OUT TO PAD 39A

Rollout of Space Shuttle Columbia from the Vehicle Assembly Building to Pad 39A began at 6:30 a.m. today. Earlier this morning, the crawler transporter was positioned under the mobile launcher platform (MLP) with the Shuttle mounted on top and final preparations were made for the 3.4 mile move to the pad. The move is expected to be complete by early this afternoon when the vehicle is secured on the pad and orbiter's umbilical connections made.

Columbia is scheduled to be launched on mission STS-83 April 3 on a 16 day flight.

The entire complement of crawler transporter, MLP and Shuttle weigh in excess of 18 million pounds. The transporter moves at an average rate of less than one mile-per-hour with the Shuttle on top and uses a laser docking system to precisely position the MLP on the pad surface. A leveling system on the crawler transporter keeps the Shuttle perfectly stable during the roll out and during the climb up the 5 percent grade to the launch pad surface.

Once at the pad, workers will prepare to hot fire auxiliary power unit No. 2 late Tuesday evening. The Rotating Service Structure will be placed around the vehicle Wednesday morning and preparations made for the Terminal Countdown Demonstration Test later in the week.

STS-83 will be the 22nd mission for NASA's first Space Shuttle orbiter. Columbia first flew on STS-1 in April 1981 and most recently on STS-80 -- NASA's longest Shuttle mission to date -- in November/December 1996. All together, Columbia has spent over 217 days in space during its previous 21 missions and carried 97 different astronauts into Earth orbit.

-- end --

Information about the countdown and mission can be accessed electronically via the Internet at:

http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

KSC press releases and other information are available on the KSC PAO Home Page at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

For automatic e-mail subscriptions to daily Shuttle status reports or KSC originated press releases, send an Internet electronic mail message to: domo@news.ksc.nasa.gov. In the body of the message (not the subject line) type the words "subscribe shuttle-status", or "subscribe ksc-press-release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

To remove your name from the list at any time, send an e-mail address to domo@news.ksc.nasa.gov. In the body of the message (not the subject line), type (no quotes) "unsubscribe shuttle-status", or "unsubscribe ksc-press-release."

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STS-83
Columbia
Microgravity Science Laboratory-1 (MSL-1)

KSC Release No. 42-97
March 1997

The Microgravity Science Laboratory-1 (MSL-1) Spacelab module that will be the primary payload aboard the Space Shuttle orbiter Columbia during the STS-83 mission will serve as a testbed for some of the hardware, facilities and procedures that will be used on the International Space Station. Columbia is scheduled to lift off on its 22nd flight from Launch Pad 39 at the beginning of a 2 1/2-hour launch window to enter an orbit of 184 statute miles and an inclination of 28.45 degrees to the Earth's equator. The seven-member flight crew will also conduct combustion, protein crystal growth and materials processing experiments during the 16-day mission. Weather permitting, the orbiter will touch down at KSC's Shuttle Landing Facility to conclude the 83rd Space Shuttle mission.

The Crew

Mission Commander James D. Halsell, Jr., (Lt. Col., USAF) is on his third spaceflight, having served as pilot of both STS-74 and STS-65. He is a former SR-71 Blackbird test pilot and holds master's degrees in management and space operations. Pilot Susan L. Still (Lt. Cdr., USN)) is the second woman to fly in this capacity on a Space Shuttle. She has more than 2,000 flight hours in 30 different types of aircraft and holds a master's degree in aerospace engineering. Payload Commander Janice Voss (Ph.D.) has flown on STS-63 and STS-57. She holds a doctorate degree in aeronautics/astronautics from the Massachusetts Institute of Technology and has earned two NASA Space Flight Medals. Mission Specialist Michael L. Gernhardt (Ph.D.) first flew in this capacity on STS-69. He has been a professional deep sea diver and engineer and holds a doctorate in bioengineering. Mission Specialist Donald A. Thomas (Ph.D.) has flown on both STS-70 and STS-65. He holds a doctorate in materials science and has been the Principal Investigator for a Space Shuttle crystal growth experiment. Payload Specialist Roger K. Crouch is the Chief Scientist of the NASA Microgravity Space and Applications Division. He has served as a Program Scientist for previous Spacelab microgravity missions and is an expert in semiconductor crystal growth. Payload Specialist Gregory T. Linteris (Ph.D.) holds a doctorate in mechanical and aerospace engineering. He has worked at the National Institute of Standards and Technology and is the Principal Investigator on a NASA microgravity combustion experiment.

Catherine "Cady" Coleman (Major, USAF) has been training as the backup crew member for Thomas, who was injured earlier this year. Thomas is expected to recover in time to fly on STS-83. Paul D. Ronney is the Alternate Payload Specialist.

Spacelab as a Testbed for Space Station

During the STS-83 mission, the Spacelab module will become a real-world testing platform for some of the new hardware and procedures developed for the International Space Station. This hardware will be different from Spacelab

experiment racks in nearly every way, from the way experiments are integrated (from the front instead of the rear of the racks so that experiments can be quickly changed out on orbit) to how they are processed before and after launch.

The new rack system, flying for the first time on this mission, is known as the Expedite the Processing of Experiments to Space Station (EXPRESS) Rack. It will take the place of a standard Spacelab double experiment rack. The EXPRESS rack and the prelaunch processing procedures for it are expected to significantly reduce the amount of time required for getting experiments into space.

Both the Physics of Hard Spheres Experiment (PHaSE) and the Astro/Plant Bioprocessing Apparatus (Astro/ PGBA) investigations will be conducted in the EXPRESS rack. The PHaSE experiment will study the fundamental physics of the transition from a liquid to solid state and back again. The Astro/PGBA) experiment will be located in Columbia's middeck for launch and relocated by the crew to the EXPRESS rack once on orbit, just as experiments will be handled during International Space Station operations. The Astro/PGBA experiment will investigate how plants adapt to spaceflight. Data from this and similar experiments could possibly help scientists on Earth learn to manipulate plant growth on Earth to enhance commercial production.

Spacelab as Microgravity Research Tool

In addition to conducting investigations for the International Space Station program, experiments aboard the MSL-1 Spacelab module will continue NASA's microgravity research efforts to provide advances in the fields of materials science, protein crystal growth and physics.

Experiments conducted in Spacelab modules have accumulated considerable amounts of data that have led to advances in several fields. For example, results from investigations conducted during the STS-73/U.S. Microgravity Laboratory (USML-2) and STS-75/U.S. Microgravity Payload-3 (USMP-3) missions in 1996 are expected to help scientists develop better synthetic drugs, less expensive alloys and metal products, improved environmental cleanup methods, a better understanding of the Earth's weather and climate and a greater knowledge of how blood clots in the human body.

STS-83 Spacelab Experiments

Protein Crystal Growth -- Since proteins are essential elements of all living cells, the goal of NASA's microgravity program is to further research in this area by producing protein crystals that are near-perfect and larger than those that can be grown on Earth. Such crystals are easier to analyze to determine just how they perform specific functions in the human body and plants. Gaining a better understanding of how proteins work helps scientists find out how new drugs will work on diseases and viruses, for example. Many large protein crystals have been successfully grown on Shuttle flights, including proteins that have never been crystallized on Earth. Three protein crystal growth experiments will fly on the MSL-1 mission, the Protein Crystal Growth Using the Protein Crystallization Apparatus for Microgravity (PCAM), the Protein Crystal Growth Using the Second Generation Vapor Diffusion Apparatus (VDA-2) and the Protein Crystal Growth Using the Hand-Held Diffusion Test Cells (HHDTCs) experiment.

Combustion Experiments -- Although the combustion process plays a key role in our lives and has been researched for more than a century, many of the fundamental combustion processes are still little understood. Two MSL-1 combustion experiments, Laminar Soot Processes (LSP) and the Structure of Flame Balls at Low-Lewis Number (SOFBALL), will be conducted in the Combustion Module-1 (CM-1). This unit requires two Spacelab racks and houses a combustion chamber and seven cameras, as well as the experiment package. The Droplet Combustion Experiment is designed to provide information that could lead to the safer and more efficient use of fossil fuels.

Materials Science -- During the MSL-1 mission, 19 materials science experiments will be conducted in four facilities aboard the Spacelab module. The experiments will investigate the materials in solid and fluid form, since materials often change from solids to fluids and back again during manufacturing processes. Five experiments will be conducted in the Large Isothermal Furnace (LIF) that can heat metal samples to 1,600 degrees Celsius to study the physics of materials processing. The Electromagnetic Containerless Processing Facility will use electromagnetic levitation for the containerless processing of metallic samples in ten experiments (TEMPUS). The Middeck Glovebox Facility supports five experiments to research physical theories of materials processing, including the Coarsening in Solid-Liquid

Mixtures (CSLM) Facility furnace.

Other Payloads

The High-Packed Digital Television (HI-PAC DTV) hardware will be flying on the MSL-1 mission to provide scientists in the Mission Operations Control Center at NASA's Marshall Space Flight Center with real-time video of experiments as they are conducted in the Spacelab module. Other MSL-1 experiments include four to measure microgravity, the Cryogenic Flexible Diode (CRYOFD) Hitchhiker experiment mounted on the right-hand side of Columbia's payload bay and the Shuttle Amateur Radio Experiment-II (SAREX-II).

KSC Shuttle and Payloads Processing

Payload integration of the MSL-1 module began in March.1996 in the Operations and Checkout (O&C) building. The payload was transported to Orbiter Processing Facility (OPF) bay 1 and installed in Columbia's payload bay Jan. 31, 1997. Columbia's last mission was the STS-80/ORFEUS-SPAS-II-Wake-Shield Facility-3 (WSF-3), which lifted off Nov. 19, 1996 and ended with a KSC landing on Dec. 7. The orbiter was rolled out to Pad 39A on March 11, 1997.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 13, 1997
KSC Contact: George H. Diller
KSC Release No. 43-97

GOES-K PHOTO OPPORTUNITY SET FOR MONDAY, MARCH 17

The Geostationary Operational Environmental Satellite-K (GOES-K) weather satellite, to be lofted into orbit by a Lockheed Martin Atlas 1 rocket next month, will be the subject of a news media photo opportunity on Monday, March 17. The event will be held at the Astrotech Space Operations facility starting at 10 a.m.

GOES-K is the latest in the current series of advanced geostationary weather satellites in service. Once in orbit it will become GOES-10, joining GOES-8 and GOES-9 in space.

Procedures for optically sensitive spacecraft must be followed for individuals entering the cleanroom where the spacecraft is being processed. Guidelines for controlled access to the cleanroom have been developed by quality control personnel and will be monitored prior to entering the facility. Cleanroom attire will be furnished. A request may be made to clean cameras or accessories using alcohol wipes which will be provided.

Long pants and closed toe shoes must be worn -- no shorts or skirts. Non-essential equipment such as camera bags or other carrying cases should be left outside the cleanroom. Flash photography cannot be permitted. There is adequate metal halide lighting in the facility for photography (white with slight green cast). No pencils or felt-tipped pens can be permitted, only ball point pens may be used.

On Monday, media may proceed directly to Astrotech located in the Spaceport Florida Industrial Park, 1515 Chaffee Drive, Titusville. Spokespeople will be available from NOAA, NASA and Space Systems/ LORAL to answer questions or for interviews if desired.

The Atlas 1 launch vehicle was erected on Pad B at Complex 36 this week. Launch is scheduled for Thursday, April 24 at the opening of a launch window which extends from 1:56 - 3:19 a.m. EDT.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 20, 1997
KSC Contact: Joel Wells
KSC Release No. 44-97

KSC LIFE SCIENCE STUDY PLACES CLEANLINESS NEXT TO GARDENING

KSC life science workers are adding laundry and bathing to their official duties as part of an 84-day plant study. The experiment uses volunteers as astronaut stand-ins to find out how plants might respond to a steady diet of used wash water or gray water in space.

Because the cost of resupplying oxygen, water and food is unfeasible on long duration missions, NASA has focused on plants as primary providers of life support. This particular study will help scientists understand how to maintain healthy, productive crops while recycling the limited quantities of water that accompany space travelers.

"We will look closely at the crop productivity with emphasis on the microbiology and plant nutrition in the system," said Dr. John Sager, NASA research manager for Advanced Life Support at KSC. "This is a first step toward recycling all human waste through the crop production system."

Investigators planted 400 wheat seeds into four culture trays and 20 potato plantlets into another four trays. The young crops are housed in a walk-in plant growth chamber, about the size of a large closet, that controls their light, temperature, humidity and carbon dioxide supply.

The experiment calls for one tray of each crop to be nourished from a tank filled with a standard nutrient solution. A second set of potatoes and wheat receives sustenance from a tank of synthetic gray water solution, and the two remaining sets are fed from tanks containing human generated gray water.

One day each week for 12 weeks a volunteer will take a quick shower with igepon soap, which is slated for use on the International Space Station. Three additional workers will wear designated socks and T-shirts each Monday and wash them on the following Tuesday. With 18 participants rotating tasks throughout the experiment, researchers plan to collect 26 liters of gray water each week until the experiment concludes in June.

"As a participant I'm excited about being physically involved with the experiment, but as a researcher I'm interested in the potential application this has for recycling water both on Earth and in space," said volunteer Neil Yorio, a plant physiologist with KSC's life science contractor Dynamac Corporation.

Since the soap contains sodium - - high levels of sodium can be toxic to many plants - - researchers will closely monitor its presence in the gray water and in the edible plant materials. Investigators will also assess the ability of human-associated microorganisms to survive in a plant growth system. Periodic plant measurements, root samples and nutrient solution samples will allow scientists to keep up with the experiment's progress.

The crops will be harvested 84 days after planting. Investigators will then conduct extensive chemical and microbiological analysis of both the plants and hydroponic plant growth systems to detect any impacts of recycling gray water.

# # # #

NOTE TO EDITORS: On Friday, March 21, members of the media will have an opportunity to visit the site of the gray water study. NASA researchers will be on hand for interviews and the shower and laundry water collection will be observed. Interested media should meet at the KSC Press Site, Friday at 8:30 a.m. for departure to Hangar L. Please call Joel Wells by C.O.B. today at (407)867-2468 if you plan to participate.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 1, 1997
KSC Contact: George H. Diller
KSC Release No. 47-97

SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

L-24 hr 0 min: Briefing for Flight Director and astronauts
L-21 hr 0 min: Briefing for removal of Rotating Service Structure
L-9 hr 00 min: Briefing for external tank fuel loading
L-4 hr 30 min: Briefing for Space Shuttle Launch Director
L-3 hr 55 min: Briefing for astronauts
L-2 hr 10 min: Briefing for Flight Director
L-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.

b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table

becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
(kts)	0-64%	65-74%	75-79%	80-89%	90-100%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 34 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 20 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.
- Launch will not occur if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch, unless the source of lightning has moved more than 10 nautical miles away from the pad or the flight path.
- The one-minute average of the electric field mill network, used to measure electric fields, shall not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad at any time within 15 minutes prior to launch.

The above rule need not apply if the following two conditions are observed to exist:

1. There are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.

2. A known source of electric fields such as ground fog, smoke or "sunrise effect" is occurring near the field mill which are conditions previously determined and documented to be benign and is clearly causing the elevated readings.

Clouds: (types known to contain hazardous electric fields)

- The Space Shuttle may not be launched if the planned flight path is through a layer of clouds with a thickness of 4,500 feet or greater where the temperature of any part of the layer is between 32 degrees F. and -4 degrees F.
- The Space Shuttle may not be launched if the planned flight path is through a cumulus type cloud with its top between the 41 degrees F. temperature level and 23 degrees F. temperature. Launch may occur if: 1) the cloud is not producing precipitation; 2) the distance from the furthest edge of the cloud top to at least one operating field mill is less than the altitude at the 23 degree F temperature level or 3 nautical miles, whichever is less; 3) field mill readings within five nautical miles of the flight path must be between -100 volts per meter and +1000 volts per meter.
- The Space Shuttle may not be launched through 1) cumulus type clouds with tops higher than the 23 degree F. temperature level; 2) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 3) through or within 10 nautical miles of the nearest edge of any cumulonimbus or thunderstorm cloud including nontransparent parts of its anvil; 4) through or within 10 nautical miles of the nearest edge of a nontransparent detached anvil cloud for the first hour after detachment from the parent thunderstorm or cumulonimbus cloud.
- The Space Shuttle may not be launched if the flight path is through any clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation within five nautical miles of the flight path.
- The Space Shuttle may not be launched if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected or observed.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				**July**			
Temp	**Low**	**Avg**	**High**	**Temp**	**Low**	**Avg**	**High**
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8, 000 feet. This requirement may be satisfied using optical tracking sites or a forward observer

- For cloud ceilings of any thickness between 6, 000 feet and 8, 000 feet the following conditions must be met for launch to occur:

a.) the vehicle integrity can be observed without interruption through 6, 000 feet.

b.) all required Range Safety instrumentation is functioning properly

c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4, 000 feet and 6, 000 feet the following conditions must be met for launch to proceed:

a.) the thickness of the clouds must be less than 500 feet

b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8, 000 feet

c.) all required Range Safety instrumentation is functioning properly

d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A **"Good Sense Rule"** is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTLS), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTLS with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA, TAL and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required.

- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability .

- For the RTLS site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.

- An RTLS rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:

a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels

within and below the clouds.

b.) Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.

c.) The movement of the showers is observed to be consistent and no additional convective development is forecast.

d.) Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.
- Headwind not to exceed 25 knots.
- Tailwind not to exceed 10 knots average, 15 knots peak.
- Turbulence conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. At decision time for the deorbit burn 90 minutes before landing the weather conditions must be:

- Cloud coverage of 4/8 or less below 10,000 feet and a visibility of 5 miles or greater is required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots
- Tailwind cannot exceed 10 knots average, 15 knots peak
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.

- Vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.

- Turbulence must be less than or equal to moderate intensity.

- The Flight Director must consider a possible "no go" to landing if at the deorbit burn decision time there are observed to be scattered cloud layers below 10,000 feet with greater than 2/8 sky coverage but not exceeding 4/8 sky coverage. Cloud conditions greater than 4/8 sky coverage below 10,000 feet constitute a cloud ceiling and is therefore "no go."

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

- **Radar:** Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.

- **Field Mill Network:** Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.

- **Lightning Detection System:** Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.

- **Lightning Detection And Ranging (LDAR):** Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.

- **National Lightning Detection Network:** Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.

- **Rawinsonde:** A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.

- **Jimsphere balloon:** A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.

- **Doppler Radar Wind Profiler:** Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.

- **Rocketsonde:** A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and 370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

- **Satellite Images and Data:** Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Spaceflight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.

- **Meteorological Interactive Data Display System (MIDDS):** Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.

- **Towers:** 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.

- **Buoys:** Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.

- **Solid Rocket Booster Retrieval Ships:** These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.

- **Weather Reconnaissance Aircraft:** A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 19, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 48-97

KSC HOSTS ANNUAL COMMUNITY LEADERS BRIEFING MARCH 26

The annual KSC community leaders briefing will be held March 26 at the KSC Visitors Center. KSC Director Roy D. Bridges, Jr., will meet with community leaders from Brevard County and the State of Florida to review the 1996 space center milestones and present projections for future plans of America's space program and the economic impact these plans may have in the local community.

Attendees will gather at the Galaxy Center at 7:30 a.m. for a continental breakfast and then proceed to the IMAX 2 theater for Bridges' remarks at 8:30 a.m. Following the briefings and presentations, guests will be given an opportunity to tour the new Apollo/Saturn V Center.

Over 900 invitations have been sent to a wide variety of community leaders, business executives, state and local government officials and other community organizations.

Media representatives are invited to attend and should contact the KSC News Center at 407/867-2468 before March 26 to make arrangements.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 20, 1997
KSC Contact: Lisa Malone/Bruce Buckingham
KSC Release No. 49-97

NASA MANAGERS SET APRIL 3 AS LAUNCH DATE FOR THE MICROGRAVITY SCIENCE LABORATORY MISSION

Following completion of the Flight Readiness Review today, NASA managers set April 3, 1997, as the official launch date for NASA's Microgravity Science Laboratory (MSL-1) mission.

The focus of the upcoming mission, designated STS-83, will concentrate on NASA's efforts to further understand the subtle and complex phenomena associated with the influence of gravity in many aspects of daily life.

The STS-83 flight mirrors future work set to take place aboard the International Space Station. STS-83 will be the 22nd flight of Columbia and the 83rd mission flown since the start of the Space Shuttle program in April 1981.

The crew of mission STS-83 includes: Commander Jim Halsell; Pilot Susan Still; Mission Specialists Janice Voss, Michael Gernhardt and Donald Thomas; and Payload Specialists Roger Crouch and Greg Linteris.

Thomas, who suffered a broken ankle following a routine training exercise on Jan. 29, has officially been cleared to fly as planned.

"We are very pleased that Don has been cleared for flight and are confident in his ability to carry out his mission responsibilities," said David C. Leestma, director of Flight Crew Operations.

Cady Coleman, who was training with the STS-83 crew as a backup mission specialist, will return to her previous duties supporting crew habitability activities for the Astronaut Office.

The launch window for STS-83 on April 3 opens at 2:01 p.m. EST and extends for 2 hours, 30 minutes. Columbia's mission duration is planned for 15 days, 16 hours. The STS-83 mission will conclude with Columbia's landing at Kennedy Space Center on April 19 at about 7:30 a.m. EDT.

- end -

Status reports and other NASA publications are available on the World Wide Web at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm .

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

March 24, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 50-97

ENDEAVOUR SCHEDULED TO RETURN TO KSC FOLLOWING ORBITER MODIFICATIONS IN PALMDALE, CA.

NASA's Space Shuttle orbiter Endeavour, a veteran of 11 missions, is scheduled to return to Kennedy Space Center, FL, on Wednesday, March 26. Endeavour has been at Palmdale, CA, since July 1996 for extensive inspections and modifications. These enhancements will give the Shuttle the capability to dock with Russia's Mir Space Station and the planned International Space Station.

Endeavour spent about eight months in Palmdale as part of its first scheduled Orbiter Maintenance Down Period (OMDP), an action that periodically removes all four of NASA's orbiters from flight operations. At Palmdale, about 100 modifications were performed. Eight to 10 of these modifications are directly associated with work required to support International Space Station operations. The most extensive of these was the installation of an external airlock, which replaced the original internal airlock.

Other modifications include upgrades to the orbiter's power supply system, general purpose computers and the thermal protection system; work to allow installation of new light-weight commander and pilot seats and other weight-saving modifications; and a number of safety and turn-around enhancements.

Endeavour was turned back over to NASA today as it rolled out of the Palmdale orbiter processing facility. It will be mated to the 747 Shuttle Carrier Aircraft (SCA) tonight and prepared for departure Tuesday morning. A two-day ferry flight is scheduled to feature an overnight stop at the Naval Air Station in Corpus Christi, TX, for public viewing, weather permitting. The orbiter will then depart Corpus Christi Wednesday morning and make a brief refueling stop at Ellington Field in Houston, TX, before continuing on to KSC. Arrival at KSC is expected as early as mid-afternoon, Wednesday, March 26.

All ferry flight plans are subject to weather restrictions and alternate landing sites may be selected en route if necessary. Ferry flight rules state the orbiter/SCA cannot fly through precipitation, thick clouds or high turbulence. There are also wind and temperature restrictions.

News media interested in viewing Endeavour's return to KSC should contact the KSC Press Site at 407-867-2468 Wednesday morning for an updated arrival time.

-- end --

Status reports and other NASA publications are available on the World Wide Web at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 1997
KSC Contact: George H. Diller
KSC Release No. 51-97

RECEIVING SPACE SHUTTLE ASTRONAUT VOICE COMMUNICATIONS

Space Shuttle air-to-ground communication is transmitted on one of two designated S-band frequencies. Because the S-Band voice is digitized, it is unintelligible. When the orbiter is above the horizon, air-to-ground voice on the UHF band can be heard either on 259.7 mhz or 296.8 mhz. However these frequencies are primarily used only during launch and landing. It will, of course, be necessary to know if and when the Space Shuttle will be above the horizon at your location. Unless you are near a NASA tracking station, you will hear only the "downlink," or one side of the conversation, which will be the astronauts talking to ground controllers.

On some missions, the Space Shuttle's orbital inclination is 28.45 degrees, meaning the orbiter travels no farther north in the U.S. than the latitude of Cape Canaveral, the Canary Islands in the Atlantic Ocean region or Midway Island in the Pacific, which limits geographical voice coverage. However, flights which rendezvous with the Russian Mir Space Station and many scientific Space Shuttle missions have higher inclinations, ranging between 39 degrees and 57 degrees. At these inclinations, voice may be heard as far north as the Gulf of Alaska, Hudson Bay in Canada, and the Hebrides in Scotland.

During all Space Shuttle flights, air-to-ground voice (both uplink and downlink) and video from the orbiter are transmitted on NASA Television which is a C-band satellite transmission on GE-2, Transponder 9C, (3880.0 mhz). This is a geostationary satellite with an orbital location of 85 degrees West. Audio only is also available on 6.8 mhz. GE-2 can be received in all 50 states and much of Canada, Mexico and the Caribbean. While the Space Shuttle is in orbit, this system is always broadcasting. The signal is not encoded, or scrambled, and may be picked up with a home satellite receiver. Some cable television companies carry it, at least on a limited basis.

The Space Shuttle on-orbit communications through the Tracking and Data Relay Satellite (TDRS) system uses S-band and K-band. This is encoded and also transmitted digitally, so it is not possible for a home satellite system to receive air-to-ground voice or television from TDRS.

The Amateur Radio Club at the Goddard Space Flight Center in Greenbelt, Maryland, WA3NAN, retransmits the air-to-ground Space Shuttle communications on shortwave frequencies. The best reception on each frequency will vary based on the time of day. The frequencies are:

- 3.860 mhz
- 7.185 mhz
- 14.295 mhz
- 21.395 mhz
- 28.650 mhz

Some amateur radio organizations retransmit NASA Television or mission audio. As an example, an amateur radio FM transmitter, located on Merritt Island near Gate 2 at the Kennedy Space Center, retransmits Space Shuttle air- to-ground communications on 146.94 mhz. Mission Audio is also transmitted by the amateur radio club at the Goddard

Space Flight Center on frequency 147.45 mhz, and by the club at the Johnson Space Center in Houston on 146.64 mhz. The signals can be received for about 25 miles. An amateur television transmitter (ATV) in Cocoa, Fla., retransmits NASA Television on 421.25 mhz. This can be received with a normal cable-ready television set on Channel 57 by using an external antenna. The signal can be received for at least 20 miles.

Transmitters of various power on other frequencies are provided by local amateur radio organizations in cities around the country. A list of amateur retransmissions of audio or video/audio from NASA TV is available on the World Wide Web at http://amsat.org/amsat/sarex/shutfreq.html

Some Space Shuttle missions also carry amateur radio transmitters called SAREX (Shuttle Amateur Radio Experiment). As the schedule permits, amateur radio operators can have their call sign confirmed directly by an astronaut. When the flight crew is busy, a "computer packet module" will automatically transmit a computer message. For further information on the SAREX program frequencies, contact the American Radio Relay League, 225 Main Street, Newington, CT 06111, (860) 594-0200. A SAREX Worldwide Web Page from the NASA Goddard Space Flight Center may be found at http://www.nasa.gov/sarex/sarex_mainpage.html

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 26, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 52-97

Note to Editors:
ENDEAVOUR SCHEDULED TO RETURN TO KSC, THURSDAY, MARCH 27

The Space Shuttle orbiter Endeavour, returning from eight months of modifications in Palmdale, CA, is scheduled to arrive at KSC as early as 7:45 a.m. Thursday, March 27, weather permitting.

Endeavour, riding atop a modified 747, will remain overnight at Warner Robbins Air Force Base, GA, before departing early tomorrow morning on the last leg of its cross-country ferry flight back to KSC.

Media who wish to view the arrival of Endeavour at KSC's Shuttle Landing Facility (SLF) are advised to be at the KSC Press Site by 7 a.m. Thursday for transport to the SLF. The Press Site will open at 6:30 a.m. Media who do not have current annual badges must contact the Press Site before close of business today to arrange for credentials.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 27, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 53-97

NEW CHECKOUT AND LAUNCH CONTROL SYSTEM UNDER DEVELOPMENT AT KENNEDY SPACE CENTER

A NASA-led effort is under way at Kennedy Space Center to design, develop and implement a new Checkout and Launch Control System (CLCS) for the Space Shuttle with the capability to support future launch vehicles. The first major milestone of this five-year effort will be reached March 28 with the opening of an experimental control room in the Launch Control Center.

Development of CLCS incorporates a progressive and innovative approach that involves the user community to the fullest extent.

"Customer involvement at every phase is crucial to our success," KSC Director Roy Bridges observed. "The new Checkout and Launch Control System is a ‘must-do-and-deliver’ project for us. We cannot support our mission without it."

The CLCS is the successor to the Launch Processing System (LPS). The Shuttle version of the LPS dates back to the early 1970s and is the successor to the LPS developed for the Apollo program. Illustrative of how advanced computer technology has become in the brief time span since the Shuttle LPS became operational is the amount of memory in a single LCC firing room minicomputer. The average new home computer has 16 megabytes of Random Access Memory (RAM) - 250 times more than the average LCC computer.

The CLCS will feature several major improvements over the LPS, including the capability to monitor more than one orbiter from the same firing room. Incorporation to the fullest extent possible of commercial off-the-shelf hardware and software will reduce system operating costs by 50 percent while making it easier to add upgrades.

The CLCS will be implemented in increments and is scheduled to be fully operational by September 2001. A NASA/contractor team, led by Retha Hart from the KSC Shuttle Processing Directorate, is developing the system. Major participating contractors include United Space Alliance (USA), the Space Flight Operations Contractor; I-NET, the Engineering Support Contractor; and Lockheed Martin of the Johnson Space Center-based Mission Support Contract.

"Because of the importance of the project to the future of KSC," Bridges said, “I have asked the CLCS team to report directly to me."

Project History

The CLCS was conceived in 1996 by a specially-formed team working under the charter of Shuttle Processing Director Robert Sieck. One of the constraints on previous efforts to modernize the Shuttle LPS was the requirement to retain the computer language GOAL (Ground Operations Aerospace Language).

GOAL is a KSC-unique language which has driven checkout and validation requirements due to its design. A major

concern about GOAL was that simple displays are created from the same programs that execute critical commands. As a result, even the simplest of changes require rigorous and exhaustive testing to insure the critical command function remains intact. The LPS Upgrades Review Team chartered by Sieck concluded that the new launch processing system needed to be free of the constraints imposed by GOAL. After further refinement, the team came up with an operational concept that is now being implemented as CLCS.

Features of CLCS

"CLCS is committed to providing a system that allows Shuttle processing to be achieved efficiently, flexibly and at a reduced cost over the current system," said Project Manager Retha Hart.

The CLCS concept emphasizes the universal rather than the specialized. With the LPS, specific firing room consoles are assigned to specific Shuttle or ground support systems. The CLCS will feature generically-configured consoles which can handle the checkout and test of any Shuttle system. Key capabilities will be:

*** Command and monitor data will be separated.** Monitor data can be distributed free of the risk of issuing inadvertent commands. Launch team members will be able to view data in their office instead of having to go to the control room. (Note: CLCS terminology refers to the firing room as an Operational Control Room, or OCR);

*** Multi-orbiter control.** More than one orbiter will be controlled from the same room. With LPS, one firing room is assigned per vehicle per flow. With CLCS, a single control room can be divided into multiple flow zones, each linked to a different orbiter under test. After the vehicle is fully stacked in the Vehicle Assembly Building, one control room will again be assigned to that Shuttle.

*** Multidiscipline testing.** With CLCS, test engineers will be able to monitor and control multiple systems from the same console.

*** Consolidated data.** Data currently residing on separate computer networks will be integrated into a single data stream available to all CLCS users. For example, weather data from the pad now being stored in the Processing Control Center will be incorporated into CLCS.

*** Integrated complex/facility control.** Control of facility systems will be combined into the control rooms, instead of being located separately in the Complex Control Center on the 1st floor.

*** Local commanding operations.** Subsystem testing can be performed locally at the test site with minimal control room support. An engineer with a laptop computer can conduct an orbiter system test in one of the Orbiter Processing Facility bays without requiring the presence of an engineer in the LCC control room, as is the case with the LPS.

*** Program-compatible data.** CLCS will incorporate data formats and protocols compatible with other NASA centers, making it easier for different centers to share data and more easily compare information.

User Community Involvement

The user community has been involved with CLCS development since the beginning. "We are very customer-oriented," noted Hart.

Acting as full-time liaisons for the user community are Jeff Wheeler, NASA, and Chris Best, USA. Wheeler and Best regularly involve representatives from virtually every directorate at KSC, from payloads to Shuttle operations, including the NASA Test Director (NTD) world, that interact with the current system. "We are constantly trying to involve the user in the process so that when we reach the end product we have something that the user is comfortable with," Wheeler said.

The user community is closely involved in the design of the Human Computer Interface (HCI), which refers to the configuration of the consoles in the firing room, from keyboards to monitors to the software that will allow checkout, test and launch of the Shuttle.

Wheeler pointed out some of the other issues which also must be resolved: Preserving "legacy" systems, which refers to systems such as the Operational Television (OTV) network and Operational Intercom System (OIS) that predate CLCS and are being retained; and identifying what it takes to maintain a console configuration once it is established.

CLCS: New architecture, new look

CLCS will provide the same functionality as the current LPS, but with a new architecture. This distributed architecture, based on commercial off-the-shelf technology and industry-standard hardware and software, will provide flexibility and automation enabling significant reduction in Shuttle operations costs.

CLCS will produce a fresh new look for the control rooms. All aspects of the control room consoles will be replaced, from the computers to the display monitors and keyboards to the shells in which they are encased. The very layout of the firing room is up for discussion and could end up completely different from the present layout.

No changes will be made on the vehicle side of CLCS -- the interface between Shuttle hardware/software elements and the new processing system. This was one of the ground rules established by the CLCS project personnel.

One of the biggest challenges KSC faces in upgrading the LPS is maintaining the Shuttle launch manifest while transitioning from the old to the new, said Tom Fleming, a member of the CLCS project controls staff. To achieve CLCS without imposing delays, the new processing system will begin installation in firing room 4 and then move through firing rooms 3 and 2. The rooms will be renumbered under CLCS, with LPS firing room 4 becoming CLCS Operational Control Room 1 (OCR 1). A conference room located next to firing room 4 will become part of OCR 1. When firing room 2 has been converted into OCR 3, the system will be at full capability. LPS Firing Room 1 will be retired from operational use.

Delivery Schedule

Implementation of CLCS also incorporates an innovative philosophy. Rather than delivering a final product by a certain date, the new launch system will be brought online in six-month increments over the next five years. "Each delivery provides a new capability," Hart said. It can be actual equipment or simply modifications to a facility to prepare it for CLCS. The most critical deliveries will be of software elements that provide a new or improved capability.

The milestones are named individually after historic launch vehicles, with the March 28 delivery called Juno. Juno will mark the establishment of an experimental control room in Firing Room 2 of the LCC featuring two different prototype consoles for the user community to experiment with. The new technology being infused into CLCS is evidenced by flat-panel monitors featured on one prototype. "This is indicative of the way we will deliver the system: Build a little, test a little, deliver a little, until the entire system is complete," Hart said.

Completion

The CLCS system is scheduled to be fully operational by September 2001. First operational use will occur in March 1999 at the Hypergol Maintenance Facility (HMF) in the KSC Industrial Area, and the first CLCS-supported orbiter flow will begin in August 2000.

"It is important that the Space Shuttle launch team have the tools needed to execute safe and successful launches," said Shuttle Operations Director Robert Sieck. "With this new tool, the CLCS, our team will be able to maintain its reputation as the ‘greatest launch team in the universe’ well into the 21st century."

The CLCS Web Site is at http://lpsweb.ksc.nasa.gov/CLCS/

-- end --

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 28, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 54-97

SPACE SHUTTLE MISSION STS-83 LAUNCH COUNTDOWN TO BEGIN MARCH 31

NASA will begin the countdown for launch of Space Shuttle Columbia on the first Microgravity Science Laboratory on March 31 at 2 p.m. at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 1 of the Launch Control Center.

The countdown includes 29 hours and 1 minute of built-in hold time leading to the opening of the launch window at 2:01 p.m. (EST) on April 3. The launch window extends for 2 hours, 30 minutes.

STS-83 is the third Space Shuttle mission of 1997. This will be the 22nd flight of the orbiter Columbia and the 83rd flight overall in NASA's Space Shuttle program. Columbia last flew in November/December 1996. STS-83 is scheduled to last 15 days, 16 hours, 36 minutes and end with a planned KSC landing at 7:37 a.m. EDT on April 19.

Columbia was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 1 on March 5 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building the following day. The Shuttle stack was then transported to Pad 39A on March 11.

The STS-83 crew are: Commander Jim Halsell; Pilot Susan Still; Mission Specialists Janice Voss, Michael Gernhardt and Donald Thomas; and Payload Specialists Roger Crouch and Greg Linteris.

The crew is scheduled to arrive at KSC at 2:30 p.m., Monday, March 31. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES
***all times are Eastern**

Launch - 3 Days (Monday, March 31)

- Prepare for the start of the STS-83 launch countdown
- Perform the call-to-stations (1:30 p.m.)
- All members of the launch team report to their respective consoles in Firing Room 1 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (2 p.m.)
- Start preparations for servicing fuel cell storage tanks
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Columbia's general purpose computers

Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms

Launch - 2 Days (Tuesday, April 1)

Enter first planned built-in hold at T-27 hours for duration of four hours (6 a.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (10 a.m.)

- Begin operations to load cryogenic reactants into Columbia's fuel cell storage tanks (10 a.m. - 10 p.m.)

Enter eight-hour built-in hold at T-19 hours (6 p.m.)

- After cryogenic loading operations, re-open the pad
- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Launch -1 Day (Wednesday, April 2)

Resume countdown (2 a.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Activate the orbiter's flight controls and navigation systems
- Install mission specialists' seats in crew cabin
- Begin startracker functional checks
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 41 minutes (10 a.m.)

- Install film in numerous cameras on the launch pad
- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Activate orbiter's inertial measurement units
- Complete flight crew equipment late stowage
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down
- Move Rotating Service Structure (RSS) to the park position (8 p.m.)

Resume countdown (11:41 p.m.)

- Start fuel cell flow-through purge

Launch Day (Thursday, April 3)

- Perform pre-ingress switch list
- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Columbia's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (4:41 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 5:11 a.m.)

Resume countdown (5:41 a.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 8 a.m.)
- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines

Enter planned two-hour built-in hold at T-3 hours (8:41 a.m.)

- Close-out crew and Final Inspection Team proceed to Launch Pad 39A

Resume countdown at T-3 hours (10:41 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 10:41 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 11:16 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Columbia's crew hatch (about 12:31 p.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (1:21 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (1:31 p.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (1:42 p.m.)
(This is the last planned built-in hold. Other hold options are available if necessary.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 1:52 p.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-5:30)
- Start Auxiliary Power Units (T-5:00)

- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-83

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	6:00 a.m. Tues.	10:00 a.m. Tues.
T-19 hours	8 hours	6:00 p.m. Tues.	2:00 a.m. Wed.
T-11 hours	13 hours, 41 minutes	10:00 a.m. Wed.	11:41 p.m. Wed.
T-6 hours	1 hour	4:41 a.m. Thurs.	5:41 a.m. Thurs.
T-3 hours	2 hours	8:41 a.m. Thurs.	10:41 a.m. Thurs.
T-20 minutes	10 minutes	1:21 p.m. Thurs.	1:31 p.m. Thurs.
T-9 minutes	10 minutes	1:42 p.m. Thurs.	1:52 p.m. Thurs.

CREW FOR MISSION STS-83

Commander (CDR):	Jim Halsell (Red Team)
Pilot (PLT):	Susan Still (Red Team)
Mission Specialist (MS1):	Janice Voss (Blue Team)
Mission Specialist (MS2):	Michael Gernhardt (Blue Team)
Mission Specialist (MS3):	Donald Thomas (Red Team)
Mission Specialist (PS1):	Roger Crouch (Blue Team)
Mission Specialist (PS2):	Greg Linteris (Red Team)

SUMMARY OF STS-83 LAUNCH DAY CREW ACTIVITIES

Thursday, April 3

	1:30 a.m.	Wake up (Red Team)
	3:30 a.m.	Breakfast (Red Team)
	8:30 a.m.	Lunch (Red Team)
	9:06 a.m.	Wake up (Blue Team)
	9:36 a.m.	Breakfast (Blue Team)
*	9:40 a.m.	Crew Photo (All)
	10:06 a.m.	Weather briefing (CDR, PLT, MS2)
	10:06 a.m.	Don launch and entry suits (MS1, MS3, PS1, PS2)
	10:16 a.m.	Don launch and entry suits (CDR, PLT, MS2)
*	10:30 a.m.	Crew suiting photo
*	10:41 a.m.	Depart for launch pad 39A
*	11:16 a.m.	Arrive at white room and begin ingress
*	12:31 p.m.	Close crew hatch
*	2:01 p.m.	Launch

* Televised events (times may vary slightly)
All times Eastern

-- end --

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 28, 1997
KSC Contact: Lisa Malone
KSC Release No. 55-97

Notice to Editors/News Directors:
MISSION STS-83 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Apr. 3 launch of the Space Shuttle Columbia on Mission STS-83. These events are scheduled to be carried live on NASA Television unless noted (please refer to the STS-83 TV schedule for exact times).

The STS-83 crew members are scheduled to arrive at KSC on Monday, Mar. 31, at about 1:30 p.m. News media representatives wishing to cover crew arrival must be at the News Center by 12:30 p.m. Monday for transport to the Shuttle Landing Facility.

The launch countdown will begin at the T-43-hour mark at 2 p.m. EST Monday, Mar. 31. Launch is currently targeted for 2:01 p.m. EST on Thursday, Apr. 3, at the opening of a 2 hour, 30-minute launch window.

News media representatives with proper authorization may obtain STS-83 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during the hours listed at the end of this release.

# # # #

STS-83 BRIEFING & EVENTS SCHEDULE
(all times are in EST and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Monday, Mar. 31

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Scott Higginbotham, STS-83 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- STS-83 flight crew arrival (live) ----- **about 1:30 p.m.**

- Launch countdown begins ----- **2:00 p.m.**

L-2 Days - Tuesday, Apr. 1

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, Shuttle Test Director
  * Scott Higginbotham, STS-83 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

L-1 Day - Wednesday, Apr. 2

- Pre-launch News Conference ----- **10:30 a.m.**
  (or immediately following the management team's meeting)

  * Loren Shriver, Manager, Space Shuttle Program Launch Integration
  * Joel Kearns, Manager, Microgravity Office, MSFC
  * Bob Sieck, Director of Shuttle Operations, KSC
  * Capt. Dave Biggar, Launch Weather Officer

- Remote Camera Setup at Pad ----- **10:30 a.m.**

- News media orientation tour (optional depending on interest) ----- **1:00 p.m.**

- Rotating Service Structure moves (press departure at **8:30 p.m.**) ----- **8:00 p.m.**

Launch Day - Thursday, Apr. 3

- Tanking begins ----- **5:11 a.m.**

- NASA Television live launch programming begins ----- **8:00 a.m.**

- Launch of Columbia ----- **2:01 p.m.**

- Post-launch press conference ----- **L + 1 hour**
  * Loren Shriver, Manager, Space Shuttle Program Launch Integration
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-83
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Monday, Mar. 31	8:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Tuesday, Apr. 1	8:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Apr. 2	8:00 a.m. - midnight
(Launch day) Flight day 1, Thursday, Apr. 3	4:00 a.m. - 7:00 p.m.

The News Center will be open Monday - Friday 8 a.m. to 4:30 p.m. and closed on weekends unless mission events dictate otherwise.

MISSION CREDENTIALS

News media representatives may obtain STS-83 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Monday, Mar. 31 -- 8:00 - 9:00 a.m.; 11:00 - 2:00 p.m.
Tuesday, Apr. 1 -- 8:00 a.m. to 2:00 p.m.
Wednesday, Apr. 2 -- 8:00 a.m. - 4:30 p.m.
Thursday, Apr. 3 -- 7:00 a.m. - 1:30 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the photo and interview counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL

ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 31, 1997
KSC Contact: Joel Wells
KSC Release No. 56-97

NASA AND DEPARTMENT OF DEFENSE CONTINUE TESTING OF LASER IMAGING TECHNOLOGY DURING STS-83 LAUNCH

The Space Shuttle Columbia, scheduled to launch Apr. 3, will be used in the testing and demonstration of a new Laser Imaging System being developed by Naval Research and Development (NRaD). The technology will be provided to the U.S. Air Force 45th Space Wing Range Safety to improve the tracking of launch vehicles.

Currently, Range Safety officials monitor a vehicle's position using optical tracking methods that can be impaired by vehicle engine plume, low level clouds and fog. By illuminating a portion of the launch vehicle with a non-invasive laser beam, clear and defined images of the vehicle can be obtained even in low visibility situations. Officials hope that this new technology will help reduce some of the launch constraints involving visibility on future expendable and Shuttle launches.

NRaD'S Innovative Science and Technology Experimentation Facility (ISTEF), located near the Banana Creek at KSC's southernmost border, has transportable tracking systems that will project three lasers from various sites on KSC and Cape Canaveral Air Station (CCAS). For STS-83 the tracking systems will be located at the KSC camera site north east of the new Apollo/Saturn V Center, at a CCAS camera site west of launch complex 40 and at a site west of Pad 39B.

Columbia's aft end and the aft portion of the solid rocket boosters will be illuminated at specific points during countdown and launch. The first illumination takes place on Apr. 1 at 7:20 a.m. for one hour. The next three illuminations occur on Apr. 3 at 7:31 a.m. for 30 minutes, 1:21 p.m. for 15 minutes and at T-9 minutes and counting through solid rocket booster separation.

Operation of these low power lasers is carefully controlled by ISTEF and monitored by NASA and CCAS. It poses no hazard to personnel at the pad or to anyone observing the launch. Aircraft and boats which are outside the normal hazard areas associated with launch operations are also free of any danger.

The lasers produce light at two wavelengths, one of which is in the infrared portion of the spectrum and is invisible to the human eye. A second wavelength appears as a green light, similar to the colored beams seen in laser light shows at tourist attractions. Because STS-83 is a day-time launch neither the laser beam nor the circular "foot print" projected on the Shuttle will be visible to observers

Previous tests have included expendable launch vehicles, Space Shuttle Columbia on mission STS-80 and Space Shuttle Atlantis on mission STS-81.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 31, 1997
KSC Contact: Joel Wells
KSC Release No. 57-97

KSC RESPONSIBLE FOR NASA'S OCCUPATIONAL HEALTH PROGRAM

Kennedy Space Center recently assumed Agency-wide responsibility for NASA's occupational health program. In keeping with the agency's lead center concept, a memorandum of understanding calls for a shift of appropriate personnel and funding from NASA Headquarters to KSC.

The focus of the program is to promote a healthy workforce and to prevent health hazards in the work place at all of NASA's field centers. To accomplish that purpose, program managers will evaluate and control health hazards, prevent occupational injury, provide quality healthcare and counseling and ensure agency compliance with related regulations.

Though a transfer of at least two civil service positions to KSC is planned, one senior occupational health physician and one environmental health officer, officials are considering the possibility of providing additional personnel.

"KSC was selected as the optimal site as its activities encompass all aspects of occupational medicine and environmental health that exist at the other NASA centers," said James D. Collier, M.D., director, Aerospace Medicine Division, NASA Headquarters.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

March 31, 1997
KSC Contact: Joel Wells
KSC Release No. 58-97

CONVERTER/COMPRESSOR FACILITY AT KSC TO BE MODIFIED BY JACKSONVILLE, FL, CONSTRUCTION FIRM

Sauer, Inc., Jacksonville, FL, has been awarded a $982,800 contract to modify the Converter/Compressor Facility in KSC's Launch Complex-39 area.

Signed March 12, the contract allows Sauer 306 days to complete modifications to the existing facility. The modifications will provide the capability to accept liquid helium from tankers, convert the liquid to gas, and compress the gas to interface with the existing high pressure compressor system.

The conversion and compression equipment is slated for delivery later this year under several separate contracts. This is KSC's first step toward transition from the existing gaseous helium supply to a liquid conversion system. Commercial suppliers could only meet KSC's large helium requirement by transporting it in liquid form to KSC.

A follow-on construction contract for the second phase of the project will provide an on-site storage capacity of 60,000 gallons of liquid helium. Phase two is scheduled to be complete by May 1999.

KSC is the largest Federal consumer of helium, using over 75 million standard cubic feet per year. Its primary use at KSC is to safe hydrogen systems on the Shuttle and Expendable Launch Vehicles. KSC currently receives gaseous helium delivered in high pressure railcars from the Department of Interior, Bureau of Land Management, Federal Helium Operations (formerly the Bureau of Mines) located in Amarillo, TX.

Recently, the Helium Privatization Act of 1996 mandated closure of the Department of Interior's Federal Helium Refining Program and requires that helium be provided to government agencies by private producers and suppliers. The law requires this closure by April 1998.

KSC officials expect to have a fully operational conversion system before closure of the Federal Helium Operations next year.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 4, 1997
KSC Contact: Joel Wells
KSC Release No. 59-97

NASA RETURNS IN FORCE TO LAKELAND SUN 'N FUN AIR SHOW

Exhibits on NASA-developed technology and forums on its contribution to the aviation industry will highlight the Experimental Aircraft Association's (EAA) Sun 'n Fun Air Show in Lakeland, FL, April 6 - 12.

The air show encourages sport aviation and provides a myriad of entertaining and educational activities and forums to anyone interested in aviation or aerospace. "We are proud that NASA is supporting our event," said Billy Henderson, Sun 'n Fun Executive Chairman. "We expect thousands of aircraft designers and builders from around the world, so NASA's willingness to share its expertise is very important to us."

Representatives from various NASA field centers will staff an exhibit tent next to the air show's flight line. NASA's exhibit features a cockpit simulator and several displays on NASA developments currently used by the aviation industry. A second NASA exhibit will display educational videos and handouts, which serve as resources for children and teachers.

On April 7and 9, a series of 10 NASA forums are scheduled from 9 a.m. to 1 p.m. The presentations address topics ranging from general aviation de-icing technology to advanced aviation design and aviation support for the Space Shuttle program.

Astronaut Richard A. Searfoss, a veteran of two Space Shuttle flights, will fly into the air show in a NASA T-38 training jet, on April 9. The KSC Visitors Center Spaceman will visit the exhibit as well.

Daily air shows will feature home-built airplanes, warbirds, antiques, helicopters and the latest aviation designs. World renowned aerobatics champions and ultralight pilots will demonstrate their skills as well.

"We see this as an excellent forum to promote NASA's accomplishments in technology," said Joni Richards-Gruendel, KSC Technology Transfer and Commercialization Office.

For information on registration and directions to the event call Sun 'n Fun at (941) 644-2431.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 7, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 61-97

COLUMBIA SCHEDULED TO LAND AT KSC

The orbiter Columbia is scheduled to land at Kennedy Space Center on Tuesday, April 8 at 2:33 p.m. EDT. Landing, originally scheduled for April 20, comes 12 days early due to a failure of fuel cell No. 2. This marks only the third time in NASA's 83 Space Shuttle missions that a flight has been cut short due to mechanical problems.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 64 at a mission elapsed time of 3 days, 23 hours, 12 minutes. Deorbit burn will occur at about 1:31 p.m. Tuesday.

The two KSC landing opportunities on Tuesday are at 2:33 p.m. and 4:09 p.m. EDT. If a landing is not possible at KSC on Tuesday due to weather concerns, a landing could be made at Edwards. EAFB landing opportunities on Tuesday are at 4 p.m. and 5:36 p.m. EDT.

If managers must keep Columbia in orbit an additional day, two landing opportunities are available at KSC and three at Edwards on Wednesday.

KSC Wednesday landing times are: 2:42 p.m. and 4:18 p.m. EDT.

EAFB Wednesday landing times are: 12:58 p.m., 2:34 p.m. and 4:09 p.m. EDT.

This landing of Columbia will mark the 36th landing at KSC in the history of Space Shuttle flight. It will be the third landing of the Shuttle at KSC this year.

About four hours after landing at KSC, select members of the flight crew will be present for a post-mission press conference. The conference will be held at the KSC TV auditorium and carried live on NASA TV.

SLF and KSC Ground Operations:

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Columbia April 4. The primary functions of the Space Shuttle recovery convoy are: provide immediate service to the orbiter after landing, assist crew egress, prepare the orbiter for towing to the Orbiter Processing Facility bay 1. The orbiter Endeavour is currently in OPF bay 1, but it will be moved temporarily to the Vehicle Assembly Building tomorrow to make room for Columbia.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC the morning after landing.

If Columbia lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 3 1/2 hours after Columbia lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 1 for post-flight deservicing.

-- end --

NOTICE TO EDITORS: Media wishing to view Columbia's landing should be at the KSC press site between 10 a.m. - 1:30 p.m. Tuesday, for transport to the SLF. Other specific information is available at the KSC News Center regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 11, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 62-97

VINTAGE ET TO CALL KSC VISITOR CENTER HOME

One of NASA's original external tanks (ET) will be calling Kennedy Space Center's Visitor Center home after it arrives from Stennis Space Center, MS, where it has been on display since 1993.

The ET was shipped by barge from Michoud Assembly Facility, New Orleans, LA, on April 10 and is scheduled to arrive at the turning basin near the KSC Press Site on Monday, April 14. The tank will remain in the parking lot until it is moved to the back lot of the Visitor Center on Saturday, April 19. It will remain there for refurbishment and preparations completed for its permanent display with the solid rocket boosters adjacent to the Shuttle orbiter mock-up, already on display near the entrance to the Visitor Center.

The tank was built in 1977 as one of three test articles at the start of the Shuttle program. It was located at the Marshall Space flight Center, Huntsville, AL, for a time, then transported to Stennis in 1993 and displayed outdoors.

Though never intended to fly with the Shuttle into space, the ET, from all outward appearances, looks exactly like real flight hardware. It is 154 feet long and 27.5 feet in diameter.

The tank is painted white, the original color of the external tanks on STS-1 and STS-2. The ETs were not painted after the second shuttle flight and the foam insulation that covers the tank is a natural bronze color. The ET will be repainted during the final refurbishment period before it goes on formal display with the other Shuttle element mock-ups.

The tank is scheduled to be moved from the Press Site parking lot to the Visitor Center parking lot on April 19. The move is schedule to begin at 6:30 a.m. and take about 6-8 hours to complete. Because the tank is so large, NASA security will block off sections of the Saturn Causeway, the KSC Parkway (State Road 3) and the NASA Causeway between the KSC Press Site and the Visitor Center. A number of road signs, traffic lights and other obstacles will be temporarily removed to allow for the passage of the tank. Because lengthy traffic delays are inevitable, it is requested that non-essential traffic restrain from using these roads during the times of the move.

NASA security will escort the tank on Saturday morning. It is expected to reach the NASA Causeway/State Road 3 intersection about 11 a.m. That intersection and the westbound lanes to the Visitor Center will be closed to traffic from about 10 a.m. to 2 p.m.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 15, 1997
KSC Contact: George Diller
KSC Release No. 63-97

LAUNCH OF GOES-K WEATHER SATELLITE SCHEDULED FOR APRIL 24

The launch of the GOES-K weather satellite for NASA and the National Oceanic and Atmospheric Administration (NOAA) aboard a Lockheed Martin Atlas 1 rocket (AC-79) is scheduled for April 24. Liftoff is targeted to occur at the opening of a launch window which extends from 1:50 - 3:09 a.m. EDT, a duration of one hour and 19 minutes. Launch will occur from Pad B at Complex 36 on Cape Canaveral Air Station.

GOES-K is the third spacecraft to be launched in the new advanced series of geostationary weather satellites for NOAA. The spacecraft is a three-axis internally stabilized weather satellite which has the dual capability of providing pictures while performing atmospheric sounding at the same time. Once in orbit the spacecraft is to be designated GOES-10.

AC-79 marks the final launch of an Atlas 1 rocket, a derivative of the original Atlas Centaur developed by NASA which had its first successful launch in 1963. Future launches of GOES weather satellites in the current series will be on Atlas II vehicles.

NASA/NOAA Prelaunch Press Conference

The prelaunch press conference will be held at the NASA News Center at KSC on Tuesday, April 22 at 1 p.m. EDT. Participating in the briefing will be:

- Floyd Curington, NASA Launch Manager, Kennedy Space Center
- Pat Symons, NASA Launch Vehicle Manager, Lewis Research Center
- Sy Baker, Director, Atlas Launch Operations, Lockheed Martin
- Martin Davis, GOES Project Manager, Goddard Space Flight Center
- Gerry Dittberner, GOES Program Manager, NOAA
- Susan Zevin, Deputy Director for Operations, National Weather Service
- Joel Tumbiolo, Launch Weather Officer, 45th Weather Squadron, USAF

A postlaunch news conference is not planned.

Launch Day Press Coverage

On launch day, media covering the event should assemble at the Gate 1 Pass and Identification Building on Cape Canaveral Air Station located on State Road 401. The convoy to Press Site 1 will depart at 12:30 a.m.

Those who wish to cover the prelaunch press conference and the launch of GOES-K should send a letter of request on news organization letterhead.Include the names and Social Security numbers of those desiring accreditation. Letters should be faxed to 407/867-2692 or may be addressed to:

GOES-K Launch Accreditation

NASA PA-MSB
Kennedy Space Center, FL 32899

GOES-K/AC-79 mission badges may be picked up at the NASA News Center beginning on Monday, April 21. Badges may also be obtained on launch day at the Gate 1 Pass and Identification Building starting at 12:15 a.m. To obtain a badge, proper media identification must be presented, or a letter requesting accreditation should be sent in advance to the NASA News Center.

On launch day, a GOES-K/AC-79 mission badge is required for all media covering the launch from Press Site 1. No other badges can be honored.

Remote Camera Placement

On Wednesday, Apr. 23 at 9 a.m., a bus will depart from the NASA News Center for Complex 36 for media photographers who wish to establish remote cameras at the pad. There will be no access or transportation from Gate 1 for remote camera set-ups.

Atlas-1 Photo Opportunity

A photo opportunity of the Atlas 1 vehicle at launch pad Pad 36-B will be available for press representatives at the time of tower rollback. Media wishing to participate will depart from the Gate 1 Pass and Identification Building on Cape Canaveral Air Station at 10:15 p.m.

NASA News Center Overnight Hours for Launch

The NASA News Center at KSC will open on launch day at 12 midnight and remain open until a successful mission has been confirmed. This is expected to be known within one hour following launch.

NASA Television Coverage

NASA Television will carry live the GOES-K/AC-79 Prelaunch Press Conference on Tuesday, April 22 starting at 1 p.m.

On launch day, April 24, video programming will begin at 12:15 a.m. EDT. Launch commentary will begin at 12:30 a.m. and continue until a successful mission can be confirmed.

Audio only of the prelaunch press conference and the launch coverage will be carried on the NASA "V" circuits which may be accessed by dialing 407/867-1220...1240...1260.

NASA Television is available on the GE-2 satellite, Transponder 9C, located at 85 degrees West.

Status Reports

Recorded status reports on the launch of GOES-K/AC-79 will be available on the KSC news media codaphone starting on April 21. The telephone number is 407/867-2525.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 15, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 64-97

TWO NEW TOUR SITES NOW UNDER CONSTRUCTION AT KSC

Construction has begun on two major new tour sites for the visiting public at the Kennedy Space Center - a 60-foot observation gantry located in the heart of Launch Complex 39 and an International Space Station exhibit facility which will include a viewing gallery overlooking the actual Space Station processing high bay.

The two new stops represent the first projects of a $35 million improvement to KSC public tour and visitor facilities which follow on the heels of the recently completed Apollo/Saturn V Center. The funding for the new improvements is through private financing arranged by Delaware North Park Services of Spaceport, operators of the KSC Visitor Center, under the terms of its concession agreement with NASA.

Both projects are expected to be completed by year-end and are coming at a time when the KSC Visitor Center is experiencing substantial growth in attendance. Already far and away NASA's largest and best attended visitor facility, the KSC Visitor Center attracted nearly 2.5 million visitors in 1996.

The Launch Complex 39 Observation Gantry is being constructed alongside the crawlerway at the intersection of the turnoff to Launch Pad 39B. An enclosed, air-conditioned observation deck with a surrounding open-air walkway, providing a panoramic view of LC 39, will be located at the top level of the gantry. Elevators will take visitors to the observation deck at the 45-foot level. The tour site will also include a small theater, Space Shuttle processing exhibits and concession services.

Delaware North has awarded a $4.65 million contract to Rush Construction, Inc., of Titusville, FL, for construction of the Launch Complex 39 tour site.

In the KSC Industrial Area, a facility which once supported Apollo astronaut training and then housed Apollo-era exhibits is being made-over into an International Space Station exhibit with high fidelity mock-ups of the station elements that visitors will be able to wander through as they learn about why a space station is needed, how it will be constructed, how it will be used, and how it will benefit people. The high bay area of the old Flight Crew Training Facility, now designated the Engineering Development Lab, will resemble the high bay processing area of the Space Station Processing Facility across the street.

Visitors will be able to walk across an elevated link between the two facilities and enter a viewing gallery on the side of the Space Station Processing Facility. From there, visitors will be able to witness actual Space Station processing activity as it is underway in the high bay. The site will also include a small theater and limited concession services.

Delaware North has awarded a $3.058 million contract to Ivey Construction Inc., Merritt Island, FL, for the Space Station exhibit facilities and viewing gallery.

BRPH Architects-Engineers, Inc. designed both the LC 39 observation gantry and the remodeled exhibit area of the Engineering Development Lab.Reynolds, Smith & Hills, Merritt Island, designed the visitor viewing gallery and link walkway.

Edwin Schlossberg Incorporated, New York, designed the visitor experiences and exhibit concepts for both tour sites. Delaware North will award separate contracts for exhibit and show production and installation.

The addition of the two new tour sites will greatly expand public visitor access to KSC operational areas and will facilitate full implementation of a new approach to the public tour in which visitors can choose which tour destinations they wish to visit and how long they wish to stay.

-- end --

NOTE TO EDITORS: Recent videos and photographs of these new sites under construction are available upon request at the KSC Press Site - 407-867-2468.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 15, 1997
KSC Contact: George H. Diller
KSC Release No. 65-97

OXYGEN GENERATOR AVAILABLE FOR MEDIA SHOWING WEDNESDAY

An oxygen generator to be carried to the Russian Mir space station aboard Space Shuttle Atlantis on STS-84 in mid-May will be the subject of a media opportunity on Wednesday, Apr. 16 at 1 p.m. The location is the Spacehab Processing and Integration Facility located on SR 401 outside of Gate 1 on Cape Canaveral Air Station.

The oxygen generator, which resembles a cylinder, is 4.2 feet in length, 1.4 feet in diameter and weighs 253 pounds. It functions by electrolysis, a process which separates water into its oxygen and hydrogen components.The hydrogen is vented while the oxygen is used for breathing by the crew. This will be the first of two units replacing the pair currently on Mir which have been having difficulty. The oxygen generator is manufactured in Russia by RSC Energia.

Those wishing to attend this opportunity may proceed directly to the Spacehab facility. Spokepersons from RSC Energia, Spacehab and NASA will be available to discuss the oxygen generator and its preparations for launch and to answer questions.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 21, 1997
KSC Contact: George Diller
KSC Release No. 66-97

CASSINI SPACECRAFT ARRIVES AT KSC FOR LAUNCH PREPARATION

NASA's Cassini spacecraft, due for launch toward the planet Saturn in early October, arrived today at Kennedy Space Center, FL. It was shipped from Edwards Air Force Base, CA, by a U.S. Air Force C-17 air cargo plane. The spacecraft will now undergo final integration and testing prior to being taken to Launch Complex 40 for mating to an Air Force Titan IV launch vehicle.

Saturn is best known for its complex ring system and a complex banded atmosphere with very high velocity winds. The Cassini spacecraft will deploy an instrumented probe called "Huygens" to the Saturnian moon Titan, itself the size of a small planet. Huygens will ride a parachute through Titan's dense atmosphere, which may have important similarities to the early atmosphere of Earth. Studies of Saturn's atmosphere along with its rings and moons, will help us produce a better understanding of planetary evolution.

At KSC, after post-arrival inspections of the spacecraft have been completed, integration of the 12 science instruments not already installed will be finished. Next, the large parabolic high gain antenna and the propulsion module will be mated to the spacecraft. At that point, an integrated functional test will be run to verify that all of these systems are operating properly together.

Finally, the Huygens probe, which up to now has been undergoing its component integration and associated testing separately, will be mated with the Cassini spacecraft, fully completing spacecraft integration.

Cassini is built and managed for NASA by the Jet Propulsion Laboratory in Pasadena, CA. The European Space Agency (ESA) is contributing the Huygens probe. The high gain antenna and elements of several of Cassini's science instruments are being provided by the Italian Space Agency (ASI).

Cassini is scheduled for launch on Oct. 6, 1997 at 5:38 a.m. EST to begin its 6.7 year journey to the outer solar system. Arrival at the planet is projected to occur July 1, 2004. During the 4-year mission at the planet it will complete 60 orbits touring Saturn and its moons.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 24, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 67-97

TCDT MEDIA OPPORTUNITY WITH STS-84 CREW SET FOR THIS WEEK

The crew of Space Shuttle mission STS-84 will be at Kennedy Space Center early next week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cutoff. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The seven-member crew of mission STS-84 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 9:30 a.m. Sunday, April 27. No photo opportunity is scheduled for this event.

On Monday, April 28, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39A. Media interested in participating in this question and answer session should be at the KSC Press Site by 9:30 a.m. Monday for transport to the pad. This event will be carried live on NASA TV.

On Tuesday, the crew will take part in simulated launch day events, including entering the orbiter Atlantis fully suited for the simulated main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Atlantis is now targeted for launch on May 15 at about 4:08 a.m. EDT. Mission STS-84 will feature the sixth docking of Atlantis to Russia's Mir space station. The mission is scheduled to last 10 days.

Crew members for mission STS-84 are: Commander Charles Precourt; Pilot Eileen Collins; and Mission Specialists Jean-Francois Clervoy, Carlos Noriega, Edward Lu, Elena Kondakova and Michael Foale. Foale will remain on Mir and Mission Specialist Jerry Linenger, who has been on Mir since January, will return in his place.

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STS-94
Columbia
Microgravity Science Laboratory-1 (MSL-1)

KSC Release No. 68-97
June 1997

The Microgravity Science Laboratory-1 (MSL-1) Spacelab module that will be the primary payload aboard the Space Shuttle orbiter Columbia during the STS-94 mission will serve as a testbed for some of the hardware, facilities and procedures that will be used on the International Space Station. Columbia is scheduled to lift off on its 23rd flight from Launch Pad 39 at the beginning of a 2 1/2-hour launch window to enter an orbit of 184 statute miles and an inclination of 28.45 degrees to the Earth's equator. The seven-member flight crew will also conduct combustion, protein crystal growth and materials processing experiments during the 16-day mission. Weather permitting, the orbiter will touch down at KSC's Shuttle Landing Facility to conclude the 85th Space Shuttle mission.

The STS-94 crew and payloads are the same that flew on STS-83, which lifted off from KSC on April 4, 1997. Mission managers later decided to cut this flight short due to indications of a faulty fuel cell. This was only the third time in the history of the Shuttle program that an orbiter was called home early due to a mechanical problem. Columbia landed at KSC April 8 after a mission-elapsed time of 3 days, 23 hours and 12 minutes.

The Crew

Mission Commander James D. Halsell, Jr., (Lt. Col., USAF) is on his fourth space flight, having served as commander of STS-83 and pilot of both STS-74 and STS-65. He is a former SR-71 Blackbird test pilot and holds master's degrees in management and space operations.

Pilot Susan L. Still (Lt. Cdr., USN)) became the second woman to fly in this capacity on a Space Shuttle on STS-83. She has more than 2,000 flight hours in 30 different types of aircraft and holds a master's degree in aerospace engineering.

Payload Commander Janice Voss (Ph.D.) has flown on STS-83, STS-63 and STS-57. She holds a doctorate degree in aeronautics/astronautics from the Massachusetts Institute of Technology and has earned two NASA Space Flight Medals.

Mission Specialist Michael L. Gernhardt (Ph.D.) first flew in this capacity on STS-69 and again on STS-83. He has been a professional deep sea diver and engineer and holds a doctorate in bioengineering.

Mission Specialist Donald A. Thomas (Ph.D.) has flown on STS-83, STS-70 and STS-65. He holds a doctorate in materials science and has been the Principal Investigator for a Space Shuttle crystal growth experiment.

Payload Specialist Roger K. Crouch is the Chief Scientist of the NASA Microgravity Space and Applications Division

and flew on STS-83. He has served as a Program Scientist for previous Spacelab microgravity missions and is an expert in semiconductor crystal growth.

Payload Specialist Gregory T. Linteris (Ph.D.) flew on STS-83 and holds a doctorate in mechanical and aerospace engineering. He has worked at the National Institute of Standards and Technology and is the Principal Investigator on a NASA microgravity combustion experiment.

Spacelab as a Testbed for Space Station

During the STS-94 mission, the Spacelab module will become a real-world testing platform for some of the new hardware and procedures developed for the International Space Station. This hardware will be different from Spacelab experiment racks in nearly every way, from the way experiments are integrated (from the front instead of the rear of the racks so that experiments can be quickly changed out on orbit) to how they are processed before and after launch.

The new rack system, flying for the second time on this mission, is known as the Expedite the Processing of Experiments to Space Station (EXPRESS) Rack. It will take the place of a standard Spacelab double experiment rack. The EXPRESS rack and the prelaunch processing procedures for it are expected to significantly reduce the amount of time required for getting experiments into space.

Both the Physics of Hard Spheres Experiment (PHaSE) and the Astro/Plant Bioprocessing Apparatus (Astro/ PGBA) investigations will be conducted in the EXPRESS rack. The PHaSE experiment will study the fundamental physics of the transition from a liquid to solid state and back again. The Astro/PGBA) experiment will be located in Columbia's middeck for launch and relocated by the crew to the EXPRESS rack once on orbit, just as experiments will be handled during International Space Station operations. The Astro/PGBA experiment will investigate how plants adapt to spaceflight. Data from this and similar experiments could possibly help scientists on Earth learn to manipulate plant growth on Earth to enhance commercial production.

Spacelab as Microgravity Research Tool

In addition to conducting investigations for the International Space Station program, experiments aboard the MSL-1 Spacelab module will continue NASA's microgravity research efforts to provide advances in the fields of materials science, protein crystal growth and physics.

Experiments conducted in Spacelab modules have accumulated considerable amounts of data that have led to advances in several fields. For example, results from investigations conducted during the STS-73/U.S. Microgravity Laboratory (USML-2) and STS-75/U.S. Microgravity Payload-3 (USMP-3) missions in 1996 are expected to help scientists develop better synthetic drugs, less expensive alloys and metal products, improved environmental cleanup methods, a better understanding of the Earth's weather and climate and a greater knowledge of how blood clots in the human body.

STS-94 Spacelab Experiments

Protein Crystal Growth -- Since proteins are essential elements of all living cells, the goal of NASA's microgravity program is to further research in this area by producing protein crystals that are near-perfect and larger than those that can be grown on Earth. Such crystals are easier to analyze to determine just how they perform specific functions in the human body and plants. Gaining a better understanding of how proteins work helps scientists find out how new drugs will work on diseases and viruses, for example. Many large protein crystals have been successfully grown on Shuttle flights, including proteins that have never been crystallized on Earth. Three protein crystal growth experiments will fly on the MSL-1 mission, the Protein Crystal Growth Using the Protein Crystallization Apparatus for Microgravity (PCAM), the Protein Crystal Growth Using the Second Generation Vapor Diffusion Apparatus (VDA-2) and the Protein Crystal Growth Using the Hand-Held Diffusion Test Cells (HHDTCs) experiment.

Combustion Experiments -- Although the combustion process plays a key role in our lives and has been researched for more than a century, many of the fundamental combustion processes are still little understood. Two MSL-1 combustion experiments, Laminar Soot Processes (LSP) and the Structure of Flame Balls at Low-Lewis Number

(SOFBALL), will be conducted in the Combustion Module-1 (CM-1). This unit requires two Spacelab racks and houses a combustion chamber and seven cameras, as well as the experiment package. The Droplet Combustion Experiment is designed to provide information that could lead to the safer and more efficient use of fossil fuels.

Materials Science -- During the MSL-1 mission, 19 materials science experiments will be conducted in four facilities aboard the Spacelab module. The experiments will investigate the materials in solid and fluid form, since materials often change from solids to fluids and back again during manufacturing processes. Five experiments will be conducted in the Large Isothermal Furnace (LIF) that can heat metal samples to 1,600 degrees Celsius to study the physics of materials processing. The Electromagnetic Containerless Processing Facility will use electromagnetic levitation for the containerless processing of metallic samples in ten experiments (TEMPUS). The Middeck Glovebox Facility supports five experiments to research physical theories of materials processing, including the Coarsening in Solid-Liquid Mixtures (CSLM) Facility furnace.

Other Payloads

The High-Packed Digital Television (HI-PAC DTV) hardware will be flying on the MSL-1 mission to provide scientists in the Mission Operations Control Center at NASA's Marshall Space Flight Center with real-time video of experiments as they are conducted in the Spacelab module. Other MSL-1 experiments include four to measure microgravity, the Cryogenic Flexible Diode (CRYOFD) Hitchhiker experiment mounted on the right-hand side of Columbia's payload bay and the Shuttle Amateur Radio Experiment-II (SAREX-II).

KSC Shuttle and Payloads Processing

Columbia was moved to Orbiter Processing Facility 1 after landing at KSC following the STS-83 mission. Preparations soon began for the reflight of the orbiter and MSL-1 payload. Both fuels cell No. 1 and No. 2 were removed and replaced. The Spacelab module remained in the orbiter's payload bay during the reservicing process for STS-94, although the Spacelab tunnel was removed to provide better access to the MSL-1. This was the first time that a primary payload was reserviced in this manner, paving the way for possible quick turnaround processing for future flights. After final checkout, Columbia was scheduled to be rolled out to Launch Pad 39A on June 11th.

Go to the *KSC Fact Sheets* home page

Go to the *KSC Press Releases* home page

STS-84
Atlantis
Sixth Shuttle-Mir Docking

KSC Release No. 69-97
May 1997

Space Shuttle Mission STS-84 aboard Atlantis will be the sixth of nine planned dockings of the Shuttle with the Russian Space Station Mir. It will include the transfer of the fifth U.S. astronaut to live and work on the Russian orbiting outpost.

STS-84 Mission Specialist C. Michael Foale will join Mir 23 cosmonaut crew members, Commander Vasily Tsibliev and Flight Engineer Alexander Lazutkin, by replacing STS-81 mission specialist and Mir 23 crew member Jerry M. Linenger on Mir. Linenger has been on the Russian outpost since Jan. 15, shortly after Atlantis last docked with Mir during the STS-81 mission. Foale is scheduled to remain on Mir for slightly more than four months when he will be picked up by Atlantis in late September and returned to Earth.

The primary objectives of STS-84 are the docking and exchange of U.S. astronaut crew members; the transfer of science equipment, Russian logistics and other supplies; and performance of joint experiments, including Risk Mitigation Experiments in support of Phase 1 of the International Space Station.

The 84th Space Shuttle launch and 19th flight of Atlantis (OV-104) will begin with liftoff from Pad A, Launch Complex 39. Atlantis will ascend at a 51.6-degree inclination to the equator for direct insertion to a 184-statute-mile (160-nautical-mile/296-kilometer) orbit. Atlantis is expected to rendezvous and dock with Mir at an altitude of 213 nautical miles on Flight Day 3, and remain docked for five days.

The planned nine-day mission is scheduled to conclude with a landing at Kennedy Space Center's Shuttle Landing Facility.

The Crew

As mission commander, two-time space flyer Charles J. Precourt (Col., USAF) will lead the crew of four other veteran space flyers and two rookies. Precourt flew as a mission specialist on STS-55 in 1993 and as the pilot of STS-71, the first Space Shuttle docking with Mir, in 1995. He became an astronaut in 1991. From October 1995 to April 1996, he had responsibility for mission operations activities in the joint Shuttle-Mir program as director of operations for NASA at the Gagarin Cosmonaut Training Center in Star City, Russia.

Assisting him at the orbiter controls will be Pilot Eileen Marie Collins (Lt. Col., USAF). Her initial space flight in 1995 was as the first woman Shuttle pilot. On that flight, STS-63, Discovery and its crew made the first Shuttle orbiter approach and flyaround of Mir. Collins became an astronaut in 1991.

Three-time space flyer Foale was a fellow crew member with Collins on STS-63, and also served as a mission specialist on STS-45 in 1992 and on STS-56 in 1993. The native of England has a doctorate in laboratory astrophysics. Foale was selected as an astronaut candidate in 1987. He trained at the Russian cosmonaut training center in preparation for the long-duration flight as a Mir crew member.

NASA astronauts also serving as mission specialists on STS-84 are rookie space flyers Carlos I. Noriega (Major, USMC) and Edward Tsang Lu.

A native of Lima, Peru, Noriega was selected by NASA as an astronaut candidate in 1994.

Lu has a doctorate in applied physics. He also was selected as an astronaut candidate in 1994.

The European Space Agency (ESA) and the Russian Space Agency contributed the other two mission specialists for STS-84. A native of France, Jean-Francois Clervoy was selected in the second group of French Space Agency astronauts in 1985, before joining ESA's astronaut corps in 1992. Clervoy flew once before on the Shuttle, as a mission specialist on STS-66 in 1994.

Russian Space Agency cosmonaut Elena V. Kondakova will be making her second space flight, but her first on the Space Shuttle. She was on the Russian space station when Collins and the other members of the STS-63 crew performed the first approach/flyaround of Mir. She spent 169 days in space as flight engineer of the 17th main mission on Mir from Oct. 4, 1994, to March 9, 1995. She flew to Mir on the Russian Soyuz spacecraft. Kondakova was selected as a cosmonaut candidate in 1989. She will be the third Russian cosmonaut to fly on the Shuttle as a mission specialist.

Linenger will join the remaining six members of the STS-84 (minus Foale) on their return to Earth. During his stay on Mir, he became the first U.S. astronaut to conduct a spacewalk wearing a Russian spacesuit. Before he arrived on Mir aboard Atlantis on STS-81, Linenger flew as a mission specialist on STS-64 in 1994. He has a doctorate in medicine and a doctor of philosophy degree in epidemiology. He joined the astronaut corps in 1992.

International Space Station Program

After STS-84, three more dockings and two more crew exchanges are planned through May 1998 as part of Phase 1 of the International Space Station program. During Phase 1, Americans and Russians work together in laboratories on the Mir and the Shuttle orbiters, conduct joint spacewalks and practice space station assembly by adding new modules to Mir. Under Phase 1, four Americans so far have lived on Mir.

Former astronaut Norman E. Thagard was the first U.S. astronaut to live and work on Mir. He spent four months on the Russian space station in 1995.

Astronaut Shannon W. Lucid kicked off a continuous U.S. presence in space by her March 22, 1996, launch on Mission STS-76. She spent a U.S.-record 188 days in space until her return to Earth on Sept. 26, 1996, at the conclusion of the STS-79 flight.

John E. Blaha replaced Lucid on Mir, and spent 128 days in space until his return on Jan. 22, 1997, at the end of the STS-81 mission.

Blaha's successor was Linenger, who was launched on the STS-81 mission on Jan. 12, 1997.

Foale will be replaced by STS-86 Mission Specialist Wendy B. Lawrence (Cmdr., USN). The STS-86 launch is targeted for liftoff in mid-September 1997.

Lawrence is scheduled to be succeeded by David A. Wolf (M.D.), who would arrive aboard Discovery during the STS-89 mission early next year. Wolf is the last U.S. astronaut scheduled for a long-duration stay on Mir. The final Shuttle-Mir docking to pick up Wolf would be STS-91 targeted for next May.

Assembly of the International Space Station program is expected to get under way next year with the Russian and American launches of the first station elements. Under Phase 2, components will be assembled to establish a three-person crew capability and a laboratory environment for science and technology activities.

Phase 3 through 2002 will complete the assembly and provide permanent habitation quarters for up to seven people, and full international science research capability.

Payloads and Experiments

For the third consecutive Shuttle-Mir docking mission, a pressurized SPACEHAB Double Module will be used to carry more than 6,000 pounds (2,722 kilograms) of science equipment/experiments; long-duration crew items such as

medical equipment and supplies; and logistics such as food, clothing and batteries to the 11-year-old Russian space station. About 1,400 pounds (635 kilograms) of water generated by the orbiter's fuel cells will be transferred from Atlantis to Mir.

The Double Module also will carry a nearly 300-pound (136-kilogram) oxygen generator to replace one of two Mir units which have experienced malfunctions. The Russian-made generator functions by electrolysis, which separates the Mir wastewater into its oxygen and hydrogen components. The hydrogen is vented and the oxygen is used for breathing by the Mir crew. Atlantis will return the generator which is not working.

ESA's **Biorack** facility will share a double rack in the module with the **Life Sciences Laboratory Equipment Refrigerator/Freezer.** The Biorack is a multipurpose facility which enables biological investigations of the effects of microgravity and cosmic radiation on the development of plants, cells, tissues and fungus. The refrigerator/freezer will carry processed samples from the Biorack and Mir samples such as urine and saliva from the crew.

The **Risk Mitigation Experiments (RME)** are a series of investigations to monitor the Mir for crew health and safety and to evaluate technology applications for the International Space Station. Also scheduled to fly are experiments to monitor cosmic radiation.

The **JSC Project Human Life Sciences** payload supports several experiments, including the effects of microgravity on sleep, metabolic stress response, protein metabolism, immune functions and sensory perception.

The **Queen's University Experiment in Liquid Diffusion** is a joint investigation among the U.S., Canadian and Russian Space Agencies.

Middeck payloads include the **Biological Research in Canisters;** two protein crystal growth (PCG) experiments, **PCG-Single Thermal Enclosure System** and the **Diffusion-Controlled Crystallization Apparatus for Microgravity;** the **Fundamental Biology Beetle Kits** to study microgravity effects on Tenebrionid Beetles; and the **Electrolysis Performance Improvement Concept Studies (EPICS)** to test water electrolysis technology.

The **Shuttle Ionespheric Modification with Pulsed Local Exhaust (SIMPLEX)** and the **Midcourse Space Experiment (MSX)** require no hardware.

Shuttle/Payload Processing

Atlantis' last flight was the fifth docking mission, STS-81, in January. It also is scheduled to fly the next docking mission, STS-86, in September.

The SPACEHAB Double Module was prepared for flight at the SPACEHAB Payload Processing Facility in Cape Canaveral. Atlantis rolled out to the pad on April 24 and the SPACEHAB Double Module was installed in the orbiter's payload bay on April 28.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 30, 1997
KSC Contact: Lisa Malone/Bruce Buckingham
KSC Release No. 70-97

MAY 15 SELECTED FOR SIXTH SHUTTLE-MIR MISSION LAUNCH

NASA managers today set May 15 as the official launch date for Space Shuttle Atlantis' sixth docking with Russia's Space Station Mir following completion of the Flight Readiness Review at the Kennedy Space Center, FL.

The STS-84 launch window opens at about 4:08 a.m. EDT and extends for approximately seven minutes. The actual opening of the window may vary by a couple of minutes based on the Shuttle's rendezvous requirements and Mir's precise location in space at the time of launch. An on-time launch May 15 will result in Atlantis landing at about 7:49 a.m. EDT, Saturday, May 24 at KSC completing nine days in space.

"We have just completed a comprehensive review of the STS-84 mission," said Johnson Space Center Director George Abbey, who chaired the meeting."Together with our Russian partners, we reviewed the status of Atlantis and the Mir station and have agreed that everything is ready to proceed with the next docking mission. We look forward to welcoming Jerry Linenger home after his stay on Mir and also look forward to watching Mike Foale continue our cooperative efforts and joint science experiments on the station."

STS-84 is the sixth in a series of docking missions between the Shuttle and Mir and the third involving the exchange of American astronauts. Linenger, who has been a Mir crew member since January 15, will be replaced by Foale who then will spend more than four months on the station before returning to Earth on the STS-86 Atlantis/Mir docking mission in September.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 2, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 71-97

KSC TEAM HONORED FOR X-33 ENVIRONMENTAL IMPACT EFFORTS

Earlier this week a team from Kennedy Space Center was recognized by Marshall Space Flight Center, Huntsville, AL, for supporting the X-33 environmental impact effort.

Mario Busacca, Gail King, Barbara Naylor and Dave Barker helped prepare the Environmental Impact Assessment (EIA) issued in June 1996. They are still supporting work on the Environmental Impact Statement to be released in June of this year. Both documents are mandatory federal requirements that must be completed before NASA makes final selection on the location of the launch site at Edwards Air Force Base, CA, and landing sites throughout the Western United States.

Rebecca C. McCaleb, director, Environmental Engineering and Management Office, MSFC, Huntsville, AL, called the KSC team "a model for cooperation in the Agency."

KSC and other X-33 environmental experts traveled to various sites, studied the area and prepared for 12 public meetings to discuss the X-33 program. KSC was asked to participate because of its expertise in environmental aspects of launch and landing operations.

KSC expertise is also assisting the X-33 program by engineering and testing specific launch elements. "KSC is designing the umbilicals and holddown posts for the launch site at Edwards, " said KSC's Deputy Engineering Development Director Warren Wiley. KSC is also designing vehicle positioning and handling equipment, assisting in the areas of hazardous gas detection systems, and supporting the X-33 program on the West Coast in a variety of additional consultant roles.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 9, 1997
KSC Contact: Patti Phelps
KSC Release No. 72-97

NASA HONORS KENNEDY SPACE CENTER EMPLOYEES

Kennedy Space Center (KSC) will honor 49 of its civil service and contractor employees at a special Honoree Event to be held May 13-15 at the space center.

The KSC employees are among some 250 NASA and industry employees from around the country who will be honored by top NASA and industry leaders for their significant contributions to the nation's space program.

The KSC employees will attend a special reception in their honor, and will be joined by astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. They will be given a VIP tour of Kennedy Space Center and will participate in various briefings. They also will watch the STS-84 launch of the Space Shuttle Atlantis, which is scheduled May 15, from a special VIP viewing site. STS-84 will be the sixth docking of the Space Shuttle with the Russian Space Station Mir.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. Recipients are selected for their professional dedication and outstanding achievement in support of the human space flight program.

Ten civil service employees will be honored. They are Helen D. Allen, John J. Branard, Shirley P. Bumatay, Helen D. Coddington, Ray W. Garrett, Cheryl C. Hurst, David A. Kruhm, Kenneth W. Mathews, J. Charles Sawyer Jr. and Dale L. Sewell.

Contractor employees to be honored include Marley F. Story, The Bionetics Corp.; William H. Muddle, Boeing North American Inc., Rocketdyne; Phillip L. Koon and Elaine West, Boeing North American Inc., Space Systems Division; Guy V. Smith, I-NET Inc., and Boyce G. Reeves, Lockheed Martin Space Mission Systems and Services.

Also, Ferrell R. Ard, Wang Federal Inc.; Michael K. Garten, Wiltech Corp; Ronald E. Feile, Suzanne B. Larson, Joseph A. Prann, Robert Trujillo and William F. Woodward, EG&G Florida Inc.; Paula R. Shawa and Susan M. Walsh, Sherikon Space Systems Inc.; Francis J. Beach, Michael H. Cressy, Brenda W. Morgan, Nancy P. Schulte and Vijai K. Tiwari, McDonnell Douglas Space and Defense Systems-KSC; Claude "Chip" Albers, Florida Seal and Rubber Co.; Kathy Johnson Dudley, Precision Fabricating & Cleaning Co.; and John Ghaneie, Randy Halcom and Herbert W. Muchow, United Technologies, USBI Co.

United Space Alliance employees who will be honored are James D. Adams, John M. Bailey, Joseph A. Coughlin, Sherrie L. Dennison, David G. Eadens, Timmy C. Griffith, Katherine M. Laufenberg, Richard L. Louizos, Steven P. Murphy, Paula L. Partlow, Clifford R. Pitts, Edward D. Preciado, Dayton C. Reedy and Lisa M. Sullivan.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 9, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 73-97

Notice to Editors/News Directors:
MISSION STS-84 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the May 15 launch of the Space Shuttle Atlantis on Mission STS-84, the 84th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-84 TV schedule for exact times.

The seven STS-84 crew members are scheduled to arrive at KSC on Sunday, May 11, at 10:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 9:30 p.m. Sunday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the News Center at 867-2468 by close of business Friday, May 9, to make arrangements.

News media representatives with proper authorization may obtain STS-84 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

KSC press releases and other information are available on the KSC PAO Home Page at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

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STS-84 BRIEFING & EVENTS SCHEDULE *(all times are EDT)*
(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-4 Days - Sunday, May 11

- STS-84 Flight Crew Arrival (Live on NASA TV) ----- **10:30 p.m.**
- (Launch countdown begins at **11:00 p.m.**)

L-3 Days - Monday, May 12

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, Shuttle Test Director
  * Todd Corey, STS-84 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- Televised replay of the STS-84 Flight Crew Arrival ----- **(immediately following Status Briefing)**

L-2 Days - Tuesday, May 13

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Todd Corey, STS-84 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- News media orientation tour ----- **1:00 p.m.**

- Pre-launch News Conference ----- **3:30 p.m.**
  (or immediately following the management team's meeting)
  * Tommy Holloway, NASA Shuttle Program Manager, JSC
  * Frank Culbertson, Phase One Shuttle-Mir Program Director, NASA, JSC
  * Valery Ryumin, Phase One Director, RSC Energia
  * General Yuri Glazkov, Deputy Director Gagarin Cosmonaut Training Center
  * Jean-Jacques Dordain, Special Advisor/Director General, European Space Agency
  * Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
  * Capt. Dave Biggar, Launch Weather Officer, USAF 45th Weather Squadron

L-1 Day - Wednesday, May 14

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, Shuttle Test Director
  * Todd Corey, STS-84 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- Rotating Service Structure moves ----- (press departure at **9:00 a.m.**) ----- **10:00 a.m.**
  (Tanking begins at about **6:15 p.m.**)

- NASA Television live launch programming begins ----- **11:00 p.m.**

Launch Day - Thursday, May 15

- Launch of Atlantis ----- **about 4:07 a.m.**

- Post-launch press conference ----- **L + 1 hour**
  * Loren Shriver, manager of Launch Integration for the Space Shuttle Program
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-84
(hours may be adjusted for in-flight events)

- (Launch minus 4 days) Sunday, May 11 ----- 8:30 p.m. - midnight
- (Launch minus 3 days) Monday, May 12 ----- 8 a.m. - 4:30 p.m.
- (Launch minus 2 days) Tuesday, May 13 ----- 8 a.m. - 6 p.m.
- (Launch minus 1 day) Wednesday, May 14 ----- 8 a.m. - around-the-clock
- (Launch day) Flight day 1, Thursday, May 15 ----- around-the-clock - 4:30 p.m.
- Flight Day 2, May 16 ----- 8 a.m. - 4:30 p.m. & 9 p.m. - midnight
- Flight days 3-4, May 17-18 ----- 9 - 11 a.m.
- Flight days 5-6, May 19-20 ----- 8 a.m. - 4:30 p.m.
- Flight day 7, May 21 ----- 5:30 a.m. - 4:30 p.m.

- Flight days 8-9, May 22-23 ----- 8 a.m. - 4:30 p.m.
- Flight day 10, May 24 (Landing) ----- 4:30 a.m. - 3:30 p.m.

(Times may vary and be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-84 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

- Sunday, May 11 ----- 8:30 p.m. - 10:00 p.m.
- Monday, May 12 ----- 8:00 a.m. - noon
- Tuesday, May 13 ----- 8:00 a.m. - 4:30 p.m.
- Wednesday, May 14 ----- 8:00 a.m. - 4:30 p.m.
- Thursday, May 15 ----- 10:00 p.m. (Wed.) - 3:00 a.m.

News media with annual Shuttle credentials are reminded to sign the log book at the photo and interview counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 9, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 74-97

SPACE SHUTTLE MISSION STS-84 LAUNCH COUNTDOWN TO BEGIN MAY 11

NASA will begin the countdown for launch of Space Shuttle Atlantis on the sixth mission to dock with Russia's space station Mir on May 11 at 11 p.m. at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center.

The countdown includes 34 hours and seven minutes of built-in hold time leading to the opening of the launch window at about 4:07 a.m. (EDT) on May 15. The launch window extends for about 7 minutes. The exact time of launch will be determined about 90 minutes before liftoff based on the location of the Mir space station.

In order to accommodate the short window necessary to rendezvous and dock with Mir, some changes have been made to the standard launch countdown. Most significant is the addition of an extra 30 minutes to the normal 10 minute built-in hold at T-9 minutes. Tanking is scheduled to begin at about 6:15 p.m. Wednesday, May 14.

STS-84 is the fourth Space Shuttle mission of 1997. This will be the 19th flight of the orbiter Atlantis and the 84th flight overall in NASA's Space Shuttle program. Atlantis last flew on the fifth Shuttle/Mir docking flight in January.

Atlantis rolled out of Kennedy Space Center's Orbiter Processing Facility bay 3 on April 19 and was mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39A on April 24. The vehicle was processed for flight without any significant or unexpected technical difficulties.

On mission STS-84, Atlantis will carry into orbit a seven member crew. Mission Specialist Michael Foale will replace Jerry Linenger on the Mir space station. Linenger will return to Earth with the rest of the STS-84 crew. Foale will remain on Mir until Atlantis again docks with the space station in September.

The STS-84 crew are: Commander Charles Precourt, Pilot Eileen Collins, and Mission Specialists Jean-Francois Clervoy, Carlos Noriega, Edward Lu, Elena Kondakova and Michael Foale.

The crew are scheduled to arrive at KSC at about 10:30 p.m., May 11. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

(The countdown will target launch for 4:07 a.m. on Thursday, May 15. The exact launch time will be adjusted at the T-9 minute hold.)

COUNTDOWN MILESTONES
***all times are Eastern**

Launch - 4 Days (Sunday, May 11)

- Prepare for the start of the STS-84 launch countdown
- Perform the call-to-stations (10:30 p.m. Sunday, May 11)
- All members of the launch team report to their respective consoles in Firing Room 3 in the Launch Control Center for the start of the countdown.
- Countdown begins at the T-43 hour mark (11 p.m.)

Launch - 3 Days (Monday, May 12)

- Start preparations for servicing fuel cell storage tanks
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Atlantis' general purpose computers
- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms

Enter first planned built-in hold at T-27 hours for duration of four hours (3 p.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (7 p.m.)

- Clear launch pad of all personnel
- Begin operations to load cryogenic reactants into Atlantis' fuel cell storage tanks (7 p.m. - 3 a.m.)

Launch - 2 Days (Tuesday, May 13)

- After cryogenic loading operations, re-open the pad

Enter four-hour built-in hold at T-19 hours (3 a.m.)

- Resume orbiter and ground support equipment close-outs
- Demate orbiter mid-body umbilical unit and retract into fixed service structure

Resume countdown (7 a.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Activate the orbiter's flight controls and navigation systems
- Install mission specialists' seats in crew cabin
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 21 hours, 17 minutes (3 p.m.)

- Install film in numerous cameras on the launch pad

Launch -1 Day (Wednesday, May 14)

- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Activate orbiter's inertial measurement units
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walkdown
- Move Rotating Service Structure (RSS) to the park position (10 a.m.)
- Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Resume countdown (12:17 p.m.)

- Continue installation of time critical flight crew equipment
- Perform pre-ingress switch list
- Start fuel cell flow-through purge
- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Atlantis' purge air to gaseous nitrogen

Enter planned two-hour built-in hold at the T-6 hour mark (5:17 p.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 6:15 p.m.)

Resume countdown (7:17 p.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 9 p.m.)
- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines

Enter two-hour hold at T-3 hours (10:17 p.m.)

- Close-out crew and Final Inspection Team proceeds to Launch Pad 39A

Launch Day (Thursday, May 15)

Resume countdown at T-3 hours (12:17 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 12:42 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 1:12 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Atlantis' crew hatch (about 2:27 a.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (2:57 a.m.)

- NASA Test Director conducts final launch team briefings

Resume countdown (3:07 a.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter 40-minute hold at T-9 minutes (3:18 a.m.)

(This is the last planned built-in hold. Other hold options are available if necessary. During this hold, the exact launch time will be determined based on the exact location of the Mir space station. The hold time could vary by as much as a minute or two.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 3:58 a.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-5:30)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

CREW FOR MISSION STS-84

```
          Commander (CDR):  Charles Precourt
              Pilot (PLT):  Eileen Collins
Mission Specialist (MS1):  Jean-Francois Clervoy
Mission Specialist (MS2):  Carlos Noriega
Mission Specialist (MS3):  Edward Lu
Mission Specialist (MS4):  Elena Kondakova
Mission Specialist (MS5):  Michael Foale (up)
Mission Specialist (MS6):  Jerry Linenger (down)
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SUMMARY OF STS-84 LAUNCH DAY CREW ACTIVITIES

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Wednesday, May 14

   6:00 p.m.    Wake up
   6:35 p.m.    Breakfast
* 11:32 p.m.    Lunch and crew photo

Thursday, May 15

  12:02 a.m.    Weather briefing (CDR, PLT, MS2)
  12:02 a.m.    Don launch and entry suits (MS1, MS3, MS4, MS5)
  12:12 a.m.    Don launch and entry suits (CDR, PLT, MS2)
* 12:30 a.m.    Crew suiting photo
* 12:42 a.m.    Depart for launch pad 39A
*  1:12 a.m.    Arrive at white room and begin ingress
*  2:27 a.m.    Close crew hatch
*  4:07 a.m.    Launch
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*Televised events (times may vary slightly)

All times Eastern

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 12, 1997
KSC Contact: George H. Diller
KSC Release No. 75-97

SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

L-24 hr 0 min: Briefing for Flight Director and astronauts
L-21 hr 0 min: Briefing for removal of Rotating Service Structure
L-9 hr 00 min: Briefing for external tank fuel loading
L-4 hr 30 min: Briefing for Space Shuttle Launch Director
L-3 hr 55 min: Briefing for astronauts
L-2 hr 10 min: Briefing for Flight Director
L-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.

b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table

becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
(kts)	0-64%	65-74%	75-79%	80-89%	90-100%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 34 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 20 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.
- Launch will not occur if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch, unless the source of lightning has moved more than 10 nautical miles away from the pad or the flight path.
- The one-minute average of the electric field mill network, used to measure electric fields, shall not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad at any time within 15 minutes prior to launch.

The above rule need not apply if the following two conditions are observed to exist:

1. There are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.

2. A known source of electric fields such as ground fog, smoke or "sunrise effect" is occurring near the field mill which are conditions previously determined and documented to be benign and is clearly causing the elevated readings.

Clouds: (types known to contain hazardous electric fields)

- The Space Shuttle may not be launched if the planned flight path is through a layer of clouds with a thickness of 4,500 feet or greater where the temperature of any part of the layer is between 32 degrees F. and -4 degrees F.
- The Space Shuttle may not be launched if the planned flight path is through a cumulus type cloud with its top between the 41 degrees F. temperature level and 23 degrees F. temperature. Launch may occur if: 1) the cloud is not producing precipitation; 2) the distance from the furthest edge of the cloud top to at least one operating field mill is less than the altitude at the 23 degree F temperature level or 3 nautical miles, whichever is less; 3) field mill readings within five nautical miles of the flight path must be between -100 volts per meter and +1000 volts per meter.
- The Space Shuttle may not be launched through 1) cumulus type clouds with tops higher than the 23 degree F. temperature level; 2) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 3) through or within 10 nautical miles of the nearest edge of any cumulonimbus or thunderstorm cloud including nontransparent parts of its anvil; 4) through or within 10 nautical miles of the nearest edge of a nontransparent detached anvil cloud for the first hour after detachment from the parent thunderstorm or cumulonimbus cloud.
- The Space Shuttle may not be launched if the flight path is through any clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation within five nautical miles of the flight path.
- The Space Shuttle may not be launched if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected or observed.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				**July**			
Temp	**Low**	**Avg**	**High**	**Temp**	**Low**	**Avg**	**High**
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8, 000 feet. This requirement may be satisfied using optical tracking sites or a forward observer

- For cloud ceilings of any thickness between 6, 000 feet and 8, 000 feet the following conditions must be met for launch to occur:

a.) the vehicle integrity can be observed without interruption through 6, 000 feet.

b.) all required Range Safety instrumentation is functioning properly

c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4, 000 feet and 6, 000 feet the following conditions must be met for launch to proceed:

a.) the thickness of the clouds must be less than 500 feet

b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8, 000 feet

c.) all required Range Safety instrumentation is functioning properly

d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A **"Good Sense Rule"** is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTLS), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTLS with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA, TAL and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required.

- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability.

- For the RTLS site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.

- An RTLS rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:

a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels

within and below the clouds.

b.) Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.

c.) The movement of the showers is observed to be consistent and no additional convective development is forecast.

d.) Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.
- Headwind not to exceed 25 knots.
- Tailwind not to exceed 10 knots average, 15 knots peak.
- Turbulence conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. At decision time for the deorbit burn 90 minutes before landing the weather conditions must be:

- Cloud coverage of 4/8 or less below 8,000 feet and a visibility of 5 miles or greater is required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots
- Tailwind cannot exceed 10 knots average, 15 knots peak
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.

- Vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.

- Turbulence must be less than or equal to moderate intensity.

- The Flight Director must consider a possible "no go" to landing if at the deorbit burn decision time there are observed to be scattered cloud layers below 8,000 feet with greater than 2/8 sky coverage but not exceeding 4/8 sky coverage. Cloud conditions greater than 4/8 sky coverage below 8,000 feet constitute a cloud ceiling and is therefore "no go."

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

- **Radar:** Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.

- **Field Mill Network:** Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.

- **Lightning Detection System:** Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.

- **Lightning Detection And Ranging (LDAR):** Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.

- **National Lightning Detection Network:** Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.

- **Rawinsonde:** A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.

- **Jimsphere balloon:** A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.

- **Doppler Radar Wind Profiler:** Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.

- **Rocketsonde:** A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and 370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

- **Satellite Images and Data:** Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Spaceflight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.

- **Meteorological Interactive Data Display System (MIDDS):** Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.

- **Towers:** 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.

- **Buoys:** Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.

- **Solid Rocket Booster Retrieval Ships:** These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.

- **Weather Reconnaissance Aircraft:** A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 13, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 76-97

PHOTOGRAPHIC EXPOSURE GUIDELINES FOR NIGHT SPACE SHUTTLE LAUNCHES

Launch of the Space Shuttle during hours of darkness offers photographers a challenging opportunity to photograph a nighttime liftoff from Kennedy Space Center's Complex 39.

Due to the unusual lighting situations on the pad at the time of launch and the enormous burst of illumination at the time of main engine and solid rocket booster (SRB) ignition, questions are frequently raised regarding proper exposure times, aperture settings and film types.

On the launch pad, the Space Shuttle is illuminated by 40 daylight-balanced xenon searchlights. The light level is 200 foot-candles with a color temperature of 6000K up until the time the main engines are ignited. Daylight balanced films are recommended.

The following tables indicate recommended film speeds and exposure settings as general guidance for photographing the shuttle at night.

Table I provides guidelines prior to ignition with the illumination of the xenon lights.

TABLE 1

SHUTTLE ON PAD AT NIGHT PRIOR TO IGNITION (WITH XENON LIGHTS)		
ISO/ASA	**SHUTTER**	**f/STOP**
64	1/30	4.0
100	1/60	3.5
125	1/60	4.0
160	1/125	2.8
200	1/125	3.5
400	1/125	4.5
800	1/250	4.5
1000	1/250	5.6
1600	1/250	6.3
3200	1/250	11.0

Immediately following SRB ignition through the time the vehicle clears the top of the launch tower, illumination will consist of both the xenon searchlights and reflected flame from the main engines and twin solid rocket boosters. The light levels will rapidly rise to about 1000 foot-candles during this five or six second period. Table II lists exposures

using the maximum light level.

TABLE II

SHUTTLE IMMEDIATELY FOLLOWING LIFTOFF AND PRIOR TO CLEARING THE LAUNCH TOWER (WITH XENON LIGHTS AND FLAME REFLECTION)		
ISO/ASA	**SHUTTER**	**f/STOP**
64	1/25	4.5
100	1/250	4.0
125	1/250	4.5
200	1/250	5.6
400	1/250	8.0
800	1/500	8.0
1000	1/500	8.0
1600	1/500	11.0
3200	1/500	16.0

After the Space Shuttle has cleared the tower, the only source of light will be from the engine flame itself. Light level of the engine flame will be about 4,500 foot-candles, but only a portion of the orbiter's engines will be visible.

Table III provides guidelines for photographers after the Shuttle has cleared the tower through solid rocket booster burnout.

TABLE III

AFTER SHUTTLE HAS CLEARED THE TOWER THROUGH SRB BURNOUT (WITH ENGINE-FLAME ONLY)		
ISO/ASA	**SHUTTER**	**f/STOP**
64	1/125	11.0
100	1/1250	11.0
125	1/1250	11.0
200	1/250	11.0
400	1/250	16.0
800	1/500	16.0
1000	1/500	16.0
1600	1/1000	22.0
3200	1/1000	22.0

Streak exposures may be taken to show the shuttle's long, arcing path over the Atlantic Ocean east of the pad. For this, it is best to frame the shuttle on the pad low in the frame using a relatively wide lens. Lock the shutter open for the duration of the exposure.

The following table offers suggested f/stops for various film speeds with the shutter open.

TABLE IV

STREAK EXPOSURE

(OPEN SHUTTER)		
ISO/ASA	**SHUTTER**	**f/STOP**
64	Open	4.0
100	Open	5.6
125	Open	5.6
200	Open	6.3
400	Open	8.0
800	Open	11.0
1600	Open	22.0
3200*	Open	22.0

The exposure guidelines listed in these tables may require some variation due to differences in individual cameras and film processing.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 77-97-A

SUSAN BESAW WALSH HONORED FOR ROLE IN SPACE PROGRAM

Susan Besaw Walsh, daughter of George and Madeline Besaw of Lenox, MA, and a former reporter at The Berkshire Eagle, was among 49 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Pittsfield, MA, Walsh grew up in Lenox. She graduated in 1971 from Lenox Memorial High School and received a bachelor of science degree in journalism summa cum laude from Boston University in 1975. She worked at the Eagle during summer and winter vacations while attending college. She edited Berkshires Week after graduation and then became the Lenox reporter.

At KSC, Walsh is employed by Sherikon Space Systems Inc., as a Public Affairs writer/editor. She joined the space center in 1988 and previously won several awards, including two Public Service Group Achievement Awards and a Productivity Team Award.

Walsh lives in Cape Canaveral, FL.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 49 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior officials from NASA and the space industry. The Honorees also were taken to a special VIP viewing area to watch the STS-84 launch of the Space Shuttle Atlantis on May 15.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-84 was the sixth docking of the Space Shuttle with the Russian Space Station Mir. Crew members on the trip to Mir were Commander Charles J. Precourt, Pilot Eileen Marie Collins, and Mission Specialists C. Michael Foale, Carlos I. Noriega, Edward Tsang Lu, Jean-Francois Clervoy of the European Space Agency, and Elena V. Kondakova of the Russian Space Agency. Foale replaced astronaut and Mir 23 crew member Jerry M. Linenger, who will return to Earth aboard Atlantis after an approximate four-month stay on the Russian space station.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 77-97-B

SUSAN BESAW WALSH HONORED FOR ROLE IN SPACE PROGRAM

Susan Besaw Walsh, a 1975 graduate of Boston University, was among 49 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Pittsfield, MA, Walsh grew up in adjacent Lenox, MA. She graduated in 1971 from Lenox Memorial High School and received a bachelor of science degree in journalism summa cum laude from Boston University's School of Public Communication.

At KSC, Walsh is employed by Sherikon Space Systems Inc., as a Public Affairs writer/editor. She joined the space center in 1988 and previously won several awards, including two Public Service Group Achievement Awards and a Productivity Team Award.

Walsh lives in Cape Canaveral, FL.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 78-97

HELEN ALLEN HONORED FOR ROLE IN SPACE PROGRAM

Helen Allen, a resident of Titusville, FL, and a 1965 graduate of Titusville High School, was among 49 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

At KSC, Allen is employed by NASA as a secretary in the Computers Office. She joined the space center in 1965.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 79-97

SHIRLEY P. MEARES BUMATAY HONORED FOR ROLE IN SPACE PROGRAM

Shirley P. Meares Bumatay, a native of Lumberton, NC, and a current resident of Titusville, FL, was among 49 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Bumatay graduated in 1971 from Lumberton (NC) Senior High School. She is the daughter of the late Edith Currie Meares of Lumberton. Her brother, Robert Meares, lives in Lumberton. She also has four sisters in the area: Mary Meares of Maxton; Frances Laramee of St. Pauls; and Betty Cunningham and Jean Stanley, both of Fayetteville.

Bumatay received a bachelor degree in accounting magna cum laude from the University of Central Florida in Orlando in 1971, and a master's in business administration from the Florida Institute of Technology in Melbourne in 1997. She also served in the U.S. Army for four years, from 1971-75.

At KSC, Bumatay is employed by NASA as an accountant. She joined the space center in 1988.

She and her husband, Samuel, an engineer at KSC, have three children.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 80-97

DAVID KRUHM HONORED FOR ROLE IN SPACE PROGRAM

David Kruhm, son of Gerald and Betty Kruhm of New Smyrna Beach, FL, and a graduate of the University of Central Florida (UCF) in Orlando, was among 49 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Orlando, Kruhm graduated in 1978 from New Smyrna Beach (FL) Senior High School. He earned a bachelor's degree in electrical engineering in 1984 and a master's in industrial engineering in 1993, both from UCF.

At KSC, Kruhm is employed by NASA as an electronics engineer with the Engineering Development Directorate. He joined the space center in 1980.

Kruhm and his wife, the former Dolores Joly, have one child. They live in Merritt Island, FL.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 81-97-A

J. CHARLES SAWYER JR. HONORED FOR ROLE IN SPACE PROGRAM

J. Charles Sawyer Jr., son of Joseph C. and Beulah P. Sawyer of Ventura, CA, and a graduate of the University of California in Berkeley and the University of Southern California in Los Angeles, was among 49 Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Jefferson City, MO, Sawyer graduated in 1960 from Ventura (CA) Senior High School and in 1962 from Ventura College. He earned a bachelor's degree in mechanical engineering from the University of California in 1965 and a master's in systems management from the University of Southern California. He was a former member of the Student Engineering Development Program sponsored by the Pacific Missile Test Center, Point Mugu, CA, and Ventura College. He also previously was employed by the Range Safety Office at the Pacific Missile Test Center in Point Mugu.

At KSC, Sawyer is employed by NASA as the payload carriers integration program manager. He joined the space center in 1994.

Sawyer and his wife, Sandra Lee Godsey, live in Satellite Beach, FL. He has three grown children: Steven M. Sawyer of Los Osos, CA; Kimberly M. Stoskopf of Wichita, KS; and Cynthia D. Sawyer of Navarre, FL.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 81-97-B

J. CHARLES SAWYER JR. HONORED FOR ROLE IN SPACE PROGRAM

J. Charles Sawyer Jr., the former director of range safety at the Air Force Development and Test Center, Eglin Air Force Base, FL, was among 49 Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Sawyer is the father of Cynthia D. Sawyer and son-in-law of Kathleen Wells, both of Navarre, FL. Born in Jefferson City, MO, he graduated in 1960 from Ventura (CA) Senior High School and in 1962 from Ventura College. He earned a bachelor's degree in mechanical engineering from the University of California in 1965 and a master's in systems management from the University of Southern California.

At KSC, Sawyer is employed by NASA as the payload carriers integration program manager. He joined the space center in 1994.

Sawyer and his wife, Sandra Lee Godsey, live in Satellite Beach, FL. Besides Cynthia Sawyer, he has two other grown children: Steven M. Sawyer of Los Osos, CA; and Kimberly M. Stoskopf of Wichita, KS.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 49 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 82-97

DALE L. SEWELL HONORED FOR ROLE IN SPACE PROGRAM

Dale L. Sewell, son of Ben and Myrna Sewell of Estes Park, CO, and a 1993 graduate of New Mexico State University, Las Cruces, NM, was among 49 Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Boulder, CO, Sewell is a 1981 graduate of Valley High School, Las Vegas, NV. He received a bachelor of science degree in mechanical engineering from New Mexico State University. He has served in the U.S. Naval Reserve since 1981.

At KSC, Sewell is employed by NASA as an experiment fluids engineer in the Payload Operations Directorate. He joined the space center in 1991.

Sewell lives in Cape Canaveral, FL.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 83-97

KEITH GARTEN HONORED FOR ROLE IN SPACE PROGRAM

Keith Garten, a resident of Mims, FL, and son of Robert and Carol Garten of Titusville, FL, was among 49 Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Titusville, Garten graduated in 1979 from Titusville High School.

At KSC, Garten is employed by the Wiltech Corp., as a sampling technician. He joined the space center in 1979.

Garten is married to the former Desiree Bratcher, who also is a sampling technician at KSC. They have a 13-year-old son, Erick.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 23, 1997
KSC Contact: Patti Phelps
KSC Release No. 84-97

FERRELL R. ARD JR. HONORED FOR ROLE IN SPACE PROGRAM

Ferrell R. Ard Jr., son of Mr. and Mrs. Ferrell Ard Sr. of Macon, GA, and a graduate of Georgia Tech, was among 49 Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Macon, GA, Ard graduated in 1964 from Lanier High School in Macon. He earned a bachelor's degree in 1964 and a master's degree in 1969, both in computer engineering from Georgia Tech. He served in the U.S. Navy from 1969-73, and earned the Naval Achievement Medal.

At KSC, Ard is employed by Wang Federal Inc., as a technical manager. He joined the space center in 1983 and was named Systems Analyst of the Year in 1986.

Ard lives in Cocoa Beach, FL.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

May 22, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 85-97

ATLANTIS SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-84

The orbiter Atlantis is scheduled to land at Kennedy Space Center on **Saturday, May 24 at 7:52 a.m. EDT** completing its 9-day STS-84 mission which was launched from KSC on May 15.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 143 at a mission elapsed time of 9 days, 3 hours, 45 minutes. Deorbit burn will occur at about 6:49 a.m. Saturday.

The two **KSC landing opportunities on Saturday are: 7:52 a.m. and 9:28 a.m. EDT**. If a landing is not possible at KSC on Saturday managers likely will elect to keep Atlantis in orbit an additional day rather than land at Edwards Air Force Base, CA.

If managers must keep Atlantis in orbit an additional day, two landing opportunities are available at KSC and two at EAFB on Sunday.

KSC Sunday landing times are: 8:29 a.m. and 10:05 a.m. EDT.

EAFB Sunday landing times are: 9:58 a.m. and 11:34 a.m. EDT.

This landing of Atlantis will mark the 37th landing at KSC in the history of Space Shuttle flight. It will be the fourth landing of the Shuttle at KSC this year.

Four to six hours after landing at KSC, select members of the flight crew will be present for a post-mission press conference. (Mission Specialist Jerry Linenger will not participate.) The conference will be held at the KSC Press Site TV auditorium and carried live on NASA TV.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Atlantis May 15. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE

suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC the day after landing.

If Atlantis lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 3 1/2 hours after Atlantis lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 3 for post-flight deservicing. The orbiter Endeavour is currently in OPF bay 3, but it will be moved temporarily to the Vehicle Assembly Building on Friday to make room for Atlantis. Operations in OPF bay 3 will be made to prepare Atlantis for its next mission, STS-86, scheduled for launch in September.

-- end --

NOTICE TO EDITORS: Media wishing to view Atlantis' landing should be at the KSC press site between 4:30 - 7 a.m. Saturday, for transport to the SLF. Accreditation must be arranged in advance, prior to close of business Friday, May 14. Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 4, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 86-97

KENNEDY SPACE CENTER HONORS EMPLOYEES

The Kennedy Space Center Annual Honor Awards Ceremony was held today at the KSC Visitor Center recognizing over 200 employees for contributions significant to the Center's mission.

Held in the IMAX 1 theater, KSC Director Roy Bridges presented the awards to individuals and groups who were spot-lighted for their contributions to every aspect of KSC work, from visitor attractions to Space Shuttle and payload processing and launch.

Awards went to individuals whose overall accomplishments were deemed outstanding and worthy of distinction.

The highest award that the Center confers on an employee, the KSC Director's Award, went to Ann D. Montgomery. She was recognized for her leadership in providing an agency model for planning, coordination and partnering with contractor counterparts in the transition of the Space Flight Operations Contract.

The Presidential Executive Rank Awards went to Alan D. Parrish and to former KSC Director Jay Honeycutt for their extraordinary accomplishment in the management of programs of the U.S. government and for noteworthy achievement of quality and efficiency in the public service.

The NASA Distinguished Public Service Medal, given to individuals who are not employees of the federal government but who contributed substantially to the NASA mission, went to Lee D. Solid, vice president/general manager, Rockwell (now Boeing); Gerald T. Oppliger, president (retired), Lockheed Martin Space Operations (now USA); and George R. Faenza, vice president/general manager (retired), McDonnell Douglas Aerospace and Defense Systems.

The KSC Equal Opportunity Award was bestowed upon Arthur D. Flowers for his outstanding contributions to equal opportunities.

The NASA Equal Employment Opportunity Medal was presented to James A. Thomas for his contribution to the goals of NASA's Equal Employment Opportunity programs.

Mary L. Boger was honored as the KSC Secretary of the Year and KSC Service Awards were given to Marvin Jones and Norbert G. Violette for faithful service to NASA over their 40 year careers with the government.

NASA Outstanding Leadership Medals were given to Scott D. Kerr, Dr. Irene Long, Stephen C. Robling, Walter J. Stampley Jr., Ann H. Watson and Carol A. Whitcomb.

NASA Exceptional Service Medals were distributed to: Coleman J. Bryan, Marjorie Elrod, Albert R. Hight, John T. Madura, Cynthia M. Martin, Mack McKinney, Larry E. Morgan, Donald J. Schiller, Richard S. Schneider, Jimmy L. Shehane, Wendell A. Simpson, Gene B. Thurston, Oscar Toledo, Ned A. Voska II and Darrow L. Webb.

NASA Public Service Medals were awarded to: Rick Abramson, Douglas L. Britt, Frank Kinney, Kenneth R. Oyer,

Donald C. Schedler, James R. Schofield, Renee Vanderbrink, Kenneth C. Walla and Dennis Weaver.

NASA Exceptional Achievement Medals went to: James E. Ball, Pamela M. Biegert, J. Bryan Boatright, Linda K. Buckles, Karen Corne, David L. Facemire, Barbara Lockley, Kirk Lougheed, Nicole M. Passonno and Rita G. Willcoxon.

Various NASA Group Achievement Awards, Certificates of Commendation and Certificates of Appreciation were also presented to others honored at the ceremony.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

June 9, 1997
KSC Contact: Hugh Harris
KSC Release No. 87-97

KENNEDY SPACE CENTER ANNOUNCES NEW APPOINTMENTS

Loren Shriver has been named Deputy Director of NASA's Kennedy Space Center for Launch and Payload Processing, effective Aug. 15, 1997, after the launch of STS-85. Shriver has been serving as Manager of Launch Integration for the Space Shuttle Program. In the interim period, he will begin assuming duties of his new position while assuring a smooth transition of his previous duties to his successor in the Space Shuttle Program.

At the same time, Kennedy Director Roy D. Bridges, Jr. also appointed James Jennings as Deputy Director for Business Operations, and JoAnn Morgan as Associate Director for Advanced Development and Shuttle Upgrades.

The appointment of Shriver completes Bridges' top management team. Together, they will assist the Director in strategic planning and work in partnership with directors of line organizations on customer requirements and mission execution.

"With the addition of Loren Shriver to our existing senior staff, I think we have assembled an outstanding management team," Bridges said. "Their challenge will be to meet the needs of the Agency during the coming years of processing and launching the International Space Station, while preparing the Center to help attain the next goals when humankind will learn to work and explore beyond low-Earth orbit."

Shriver will provide executive leadership, strategic planning and direction for Kennedy's Agency-assigned responsibilities as the Center of Excellence for Launch and Payload Processing Systems. This includes payload carriers, Space Shuttle processing and launch, and processing of payloads including International Space Station elements, and responsibilities assigned to the Center for expendable launch vehicles.

Shriver has served as Launch Integration Manager since May 1993, responsible for final Shuttle preparation, mission execution and return of the orbiter to Kennedy following landings at Edwards, CA. A graduate of the Air Force Academy, he participated in development test and evaluation of the F-15 fighter aircraft and the T-38 lead-in fighter. Selected by NASA as an astronaut-candidate in January 1978, Shriver has flown three Shuttle missions - as pilot of STS-51C and as commander of STS-31 and STS-46.

Jennings will be responsible for direction of Kennedy's institutional services and staff functions, including financial management, procurement, administration and human resources, legal services, information management and equal opportunity. He has served as Acting Deputy Center Director since Jan. 9, 1997, and as Director of the Administration Office since May 1993. In the latter position, he was responsible for industrial labor relations, strategic planning, civil service personnel management and workforce analysis, continual improvement, university liaison and information management. Previously, Jennings served as Deputy Comptroller responsible for the Center's budget process.

Morgan will provide leadership for the Center's Shuttle flight systems upgrades and for creating a customer-driven environment and new opportunities for the Kennedy team to participate in cutting-edge technology development and application. She has served as Associate Director of Safety and Shuttle Upgrades since Sept. 1, 1996, responsible for improvements to meet Shuttle flight safety and operational requirements into the 21st century. Previously, she was

Director for Safety and Mission Assurance and had worked in the Kennedy Payload Operations Directorate managing payload projects and ground operations. Morgan was Kennedy's first female senior executive and the first selected to lead an operating division at Kennedy.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 11, 1997
KSC Contact: Joel Wells
KSC Release No. 88-97

STS-94 SPACE SHUTTLE COLUMBIA ROLLS OUT TO PAD 39A

The Space Shuttle Columbia arrived at Pad 39A at 8 a.m. today. Late last night, the crawler transporter was positioned under the mobile launcher platform (MLP) with the Shuttle mounted on top and final preparations were made for the 3.4-mile move to the pad. The move began at about 2:45 a.m.

Columbia is scheduled to launch on mission STS-94 July 1 on a 16 day reflight of the Microgravity Science Laboratory (MSL) mission. MSL originally flew on STS-83, but NASA managers cut the mission short after 4 days because of suspicious readings from one of Columbia's fuel cells. Along with the same payload, the STS-83 crew members will all fly again on STS-94 -- a NASA first.

The crawler transporter, MLP and Shuttle together weigh in excess of 18 million pounds. The transporter moves at an average rate of less than one mile per hour with the Shuttle on top and uses a laser docking system to precisely position the MLP on the pad surface. A leveling system on the crawler transporter keeps the Shuttle perfectly stable during the roll out and during the climb up the 5-percent grade to the launch pad surface.

Once at the pad, workers will prepare to hot fire auxiliary power units No. 2 and No. 3 tonight. The Rotating Service Structure will be placed around the vehicle tomorrow and work to replace 36 thermal protection system tiles on the nose of the Shuttle will begin.

STS-94 will be the 23rd mission for NASA's first Space Shuttle orbiter. Columbia first flew on STS-1 in April 1981 and holds the record for NASA's longest Shuttle mission to date, STS-80. All together, Columbia has spent over 221 days in space during its previous 22 missions.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 13, 1997
KSC Contact: George H. Diller
KSC Release No. 89-97

ACE SPACECRAFT ARRIVES AT KSC TO BE PREPARED FOR LAUNCH

NASA's Advanced Composition Explorer (ACE), to be launched aboard a McDonnell Douglas Delta II rocket in August, arrived today at the Kennedy Space Center (KSC) to begin prelaunch processing. The spacecraft, built for NASA by the Johns Hopkins University Applied Physics Laboratory, was shipped by truck from the Goddard Space Flight Center in Greenbelt, Md., yesterday.

ACE is a spin-stabilized spacecraft having a combination of nine sensors and instruments. Spinning at five revolutions per minute, it will investigate the origin and evolution of solar phenomenon, the formation of the solar corona, solar flares and the acceleration of the solar wind. The spacecraft will orbit the Libration Point, a location 900,000 miles from Earth where the gravitational effects of the Sun and Earth are balanced. ACE will be able to give scientists information about the effect of the Sun on the near-Earth environment, as well as interplanetary space while also providing clues about the lifestyle of similar stars.

There are also two secondary investigations on the satellite itself. The Real Time Solar Wind Monitor for the National Oceanic and Atmospheric Administration (NOAA) will provide continuous "space weather" information that can give limited advance warning of geomagnetic storms. The Spacecraft Loads and Acoustics Monitor for the Goddard Space Flight Center is a research and development payload which will monitor the sound characteristics a spacecraft experiences within the rocket's nose fairing environment during launch.

The ACE spacecraft will undergo final experiment integration and functional testing at the Spacecraft Assembly and Encapsulation Facility-2 (SAEF-2) located in the KSC Industrial Area. The solar arrays and magnetometer booms will be deployed and tested. The communications systems of the spacecraft will also be checked out which will include a compatibility test with the Deep Space Network. Finally, the propulsion system tanks will be fueled and the spacecraft will be spin tested. About ten days before launch, ACE will be transported to Space Launch Complex 17 and erected atop a Delta II 7920-8, a two-stage rocket manufactured by McDonnell Douglas.

The buildup of the Delta vehicle on Pad 17-A is scheduled to be performed the week of July 21. This will include the erection of the first and second stages and attachment of the nine strap-on solid rocket boosters. Atop the launch vehicle, the nose fairing is to be installed around the spacecraft four days before launch.

Launch of Delta II/ACE is scheduled for Thursday, Aug. 21 at the opening of a launch window which extends from 10:53:38 - 11:18:38 a.m. EDT, a duration of 25 minutes.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 16, 1997
KSC Contact: David Dickinson
KSC Release No. 90-97

SHANNON ROBERTS APPOINTED AS KSC ADMINISTRATION DIRECTOR

Kennedy Space Center Director Roy D. Bridges, Jr., has appointed C. Shannon Roberts to be Director, Administration Office effective June 22, 1997. She succeeds James L. Jennings, who has been named the Center's Deputy Director for Business Operations.

"Shannon Roberts brings a wealth of experience in strategic planning and institutional management," Mr. Bridges said in announcing her appointment, "and I look to her to provide strong support in those areas to me and the rest of the Center's leadership team."

Roberts will lead many important areas including human resources programs for civil service personnel, workforce effectiveness and organization, industrial labor relations, strategic planning, continuous improvement and functional management reviews. She joined the agency in 1990, serving as an assistant to the associate and deputy associate administrators for the Office of Space Flight; director, Benchmarking and Continual Improvement; and leader of the National Performance Review Outreach Team (on detail) while at NASA before transferring to Kennedy Space Center in February 1997.

Prior to joining NASA, Roberts was executive coordinator and director of Communications for the President's Council on Management Improvement in Washington, D.C. She also has served as director of Quality with the Xerox Corporation and has held planning, budgeting and financial management positions with the Department of Justice and the Department of Transportation, including deputy director of Commercial Space Transportation in 1983-84. She is a graduate of the University of North Carolina and holds a master's degree in public administration from Harvard University and a doctorate in public administration from the University of Southern California.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 16, 1997
KSC Contact: Lisa Malone
KSC Release No. 91-97

Note to Editors/News Directors:
KSC's NEWLY APPOINTED TOP MANAGERS TO MEET WITH NEWS MEDIA JUNE 18

Kennedy Space Center Director Roy Bridges and his newly appointed top management team will meet with news media representatives to discuss KSC's focus on the future at 3:15 p.m. Wednesday, June 18. The new managers will shed light on upcoming challenges facing the center.

The briefing will be held in the Press Site auditorium, but will not be broadcast live. Audio and video tapes will be available following the briefing.

Briefing participants include:

- KSC Director Roy Bridges, Jr.
- Loren Shriver, KSC's Deputy Director of Launch and Payload Processing
- James L. Jennings, KSC's Deputy Director for Business Operations
- JoAnn Morgan, KSC's Associate Director for Advanced Development and Shuttle Upgrades

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 18, 1997
KSC Contact: Patti Phelps
KSC Release No. 92-97

BOYCE G. REEVES HONORED FOR ROLE IN SPACE PROGRAM

Boyce G. Reeves, a native of Greenville, KY, and son of Benton and Dorthy Reeves of Central City, KY, was among some 250 NASA and contractor employees from throughout the space agency who were honored recently for their exemplary work in the nation's human space flight program.

Reeves graduated in 1962 from Central City (KY) High School. He attended Western Kentucky University and received a bachelor's degree in computer science from the University of Southern Mississippi in 1977. He also attended the U.S. Army Command and General Staff College. Reeves served on active duty in the Army from 1966-77, and attained the rank of captain. He then served in the U.S. Army Reserve from 1978-94, retiring with the rank of lieutenant colonel.

Reeves is employed by Lockheed Martin Space Mission Systems and Services at Johnson Space Center in Houston, TX. He represents Lockheed Martin as a member of the NASA Shuttle Avionics Software Control Board.

Reeves and his wife, Joyce, live in Seabrook, TX. He has two stepchildren.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior officials from NASA and the space industry. The Honorees also were taken to a special VIP viewing area to watch the STS-84 launch of the Space Shuttle Atlantis on May 15.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-84 was the sixth docking of the Space Shuttle with the Russian Space Station Mir. Crew members on the trip to Mir were Commander Charles J. Precourt, Pilot Eileen Marie Collins, and Mission Specialists C. Michael Foale, Carlos I. Noriega, Edward Tsang Lu, Jean-Francois Clervoy of the European Space Agency, and Elena V. Kondakova of the Russian Space Agency. Foale replaced astronaut and Mir 23 crew member Jerry M. Linenger, who returned to Earth aboard Atlantis after an approximate four-month stay on the Russian space station.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

June 19, 1997
KSC Contact: George H. Diller
KSC Release No. 93-97

Note to Editors/News Directors:
FIRST INTERNATIONAL SPACE STATION FLIGHT HARDWARE TO ARRIVE AT KSC FOR STS-88 PROCESSING

Node 1, which is scheduled for launch on STS-88 and is the first International Space Station flight hardware to arrive at Kennedy Space Center (KSC), will arrive at the Shuttle Landing Facility aboard an Air Force C-5 air cargo plane on Monday, June 23 at 12:15 a.m. The node will be offloaded from the aircraft at 6 p.m. that evening and transported to the Space Station Processing Facility (SSPF).

Media wishing to photograph the offloading of the node from the C-5 should be at the KSC News Center at 5 p.m. and will be taken to the Shuttle Landing Facility at that time. Available to discuss the activity with the media will be Stephen M. Francois, Director, Space Station Launch Site Support at KSC.

A press briefing will be held at 11 a.m. on Thursday, June 26 to discuss the arrival of the node at KSC and to talk about the processing activities which will prepare it for the STS-88 launch next year.

Participating in the briefing will be:

- Randy Brinkley, Space Station Program Manager, NASA-JSC
- Robert Cabana, STS-88 Commander, NASA-JSC
- William G. Bastedo, Jr., Flight 2A Manager, NASA-JSC
- Glenn E. Snyder, STS-88 Payload Manager, NASA-KSC

Following the briefing, a video package will be played on NASA Television featuring the Node 1 activities. This will include arrival at the Kennedy Space Center, the removal of the node from its shipping container at the SSPF and installation into a work stand. Preparation for the STS-88 launch, currently scheduled for July 1998, then begins.

After the briefing, media will be taken to the Space Station Processing Facility to see the node. The STS-88 astronauts and Kennedy Space Center Director Roy Bridges will be on hand to talk with media representatives in addition to those who participated in the briefing. Others who will also be available are:

- Stephen M. Francois, Director, Space Station Launch Site Support, NASA
- John J. "Tip" Talone, Director, Space Station Hardware Integration Office, NASA
- Wayne Owens, Prime Payload Manager, Boeing Aerospace
- Richard E. Pepper, STS-88 KSC Payload Manager, McDonnell Douglas
- John W. Elbon, Flight 2A integrated product/test lead, McDonnell Douglas

Those attending the event in the SSPF are requested to wear long pants and closed-toe shoes. While clean room attire will not be required for this event, no food, tobacco, lighters, matches or pocket knives are permitted inside the SSPF. A routine search of camera bags by KSC security personnel should be anticipated. Electronic flash photography is permitted. The lighting in the facility is mercury vapor.

Those needing accreditation for either of these events should contact the KSC News Center at 407/867-2468.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

June 19, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 94-97

NASA LAUNCHES MINORITY PARTNERSHIP WITH FLORIDA COLLEGES

The National Aeronautics and Space Administration will award a grant and announce a partnership with four Florida minority higher education institutions, as part of a program initiated by the Kennedy Space Center Equal Opportunity Program Office. The partnership will promote high-tech entrepreneurship and better acquaint NASA professionals with researchers at Florida predominately minority-populated institutions. The partnership, which is led by Bethune-Cookman College of Daytona Beach, includes Edward Waters College in Jacksonville, and Florida Memorial College and Florida International University in Miami. NASA officials will officially announce the program at Bethune-Cookman College on June 27, 1997 at 10:00 AM in the East Conference Room of the Carl Swisher Library on campus.

The Partnership program seeks to provide support to Kennedy Space Center's Technology Transfer and Commercialization activities as well as exposing students and faculty at the four institutions to the challenges and rewards of starting and operating high-tech small businesses. The concept is to involve the schools in existing, proven technology transfer programs established by NASA and the state of Florida through the Technological Research and Development Authority. The programs include commercialization of NASA technologies, assistance for companies seeking NASA Small Business Innovative Research Grants, the NASA Small Business Incubation Center, and the Technology Outreach Program.

Students from a variety of disciplines will work with NASA commercialization representatives, engineers, and small-business owners to solve technical problems through the Technology Outreach Program. In addition, university participants will work with the NASA-KSC Commercialization Office to offer assistance. A two-week summer program for university faculty will kick-off the first of this kind of partnership with training and briefings on the programs of the commercialization office at Kennedy Space Center. Representatives from the institutions will learn about the programs at KSC, and prepare to share the opportunities and information on how to access them with other faculty at their respective colleges.

According to Roy Bridges, Director of NASA Kennedy Space Center, "We are pleased to support this unique approach to broadening NASA's familiarity of the resources and talent at Florida's predominately minority institutions." He continued, "This program benefits the programs for students and faculty at the schools and the efforts of our commercialization office." Bridges will meet with Bethune-Cookman College President Oswald P. Bronson, Sr., and meet representatives of the other participating colleges.

Founded in 1904, Bethune-Cookman College is a private, four-year liberal arts higher education institution that places emphasis on academic excellence and character building. Standards at Bethune-Cookman are high; yet they make provisions for individual initiative, responsible academic freedom, and personal creativity. Its diversified student population of more than 2,300 is enriched by a curriculum that offers 37 majors in six academic divisions: Education, Humanities, Social Science, Business, Nursing, Science and Mathematics. A United Methodist-affiliated college, Bethune-Cookman is listed on the John Templeton Foundation Honor Roll of Character Building Colleges, and holds membership in the College Fund/UNCF.

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For further information contact:

Jay Diggs, NASA Kennedy Space Center, 407-867-2307
Cathie Kershaw, Bethune-Cookman College, 904-253-5172
Gwendolyn De Cort or Mary Baker, Technological Research & Development Authority, 407-269-6330

NASA/Florida Minority Institution Entrepreneurial Partnership Fact Sheet

- Participating Institutions are led by Bethune-Cookman College of Daytona Beach and include Edward Waters College in Jacksonville, Florida Memorial College and Florida International University in Miami.
- The partnership is made possible by an $800,000.00 grant through the NASA-Kennedy Space Center Equal Opportunity Program Office.
- The partnership project was developed to take advantage of the existing technology transfer programs that are in place at NASA and gain support from the universities as well as exposing students and faculty to entrepreneurial activities.
- This is the first consortium of Florida predominately minority institutions to propose a combined effort for a NASA program.
- Bethune-Cookman College will act as the overall administrator for the partnership. In addition, faculty and students from the college will work to assist the NASA-KSC Commercialization Office with business assistance, will assist the Technology Outreach Program through the local Economic Development Commission, and will provide a faculty member for the summer to work at the NASA-KSC Commercialization Office.
- Edward Waters College will provide faculty from the school of business with experience in computer information systems, and student interns from marketing/business communications discipline to provide assistance to companies responding to Small Business Innovative Research (SBIR) solicitations. They will also assist the Jacksonville area Technology Outreach Program, and participate in the Summer Faculty program in the NASA-KSC Commercialization Office.
- Florida Memorial College will provide a team comprised of a professor from the College of Business Administration and business and computer science students who will work with the NASA/Florida Small Business Incubation Center. They will also assist the Beacon Council and the Broward Economic Development Council with the Technology Outreach Program in Dade and Broward Counties, and participate in the Summer Faculty Program at KSC.
- Florida International University will provide support for the Commercialization Office in the areas of Technology Commercialization and Licensing, Technology Assessment and the Technology Development program. They will work with the Beacon Council and the Broward Economic Development Council to assist with the Technology Outreach Program, and participate in a Summer Faculty Program at KSC.
- The Technological Research and Development Authority (TRDA), as KSC's state partner in NASA's technology transfer, will assist B-CC with program administration to ensure that the defined objectives are maximized. TRDA will act in a support role to B-CC and all schools and assist faculty and project coordinators with all program coordination.
- The Technological Outreach Program establishes a NASA network throughout Florida to provide free technical assistance to Florida businesses with the goal of creating or saving jobs and creating new economic activity by accelerating the transfer of NASA technology to Florida industry.
- The Florida/NASA Incubation Center is located in Titusville, Florida and serves 7 companies in a variety of

fields including updating/initializing business plans, marketing plans, financial planning, accounting systems and funding searches.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 19, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 95-97

MIAMI SCHOOLS ENTER NEW PARTNERSHIP WITH NASA

The National Aeronautics and Space Administration will award a grant to Florida International University and Florida Memorial College as part of a program initiated by the Kennedy Space Center Equal Opportunity Program Office. This is a partnership of Florida minority-serving institutions to promote high-tech entrepreneurship and to better acquaint NASA professionals with researchers at these institutions. Two additional grants through Kennedy Space Center Equal Opportunity Office were also awarded to Florida International University. NASA officials will officially announce the program at FIU on July 7, 1997 at 10:00 AM at the Center for Engineering and Applied Science, located at 107 Avenue and Flagler Street, one mile north of the University Park Campus, Room EAS 2300.

The partnership program, which is led by Bethune-Cookman College of Daytona Beach, and also includes Edward Waters College in Jacksonville, seeks to provide exposure for students and faculty at minority-serving institutions to the challenges and rewards of starting and operating high-tech small businesses. The concept is to involve the schools in existing, proven technology transfer programs established by NASA and the State of Florida through the Technological Research and Development Authority. The programs include commercialization of NASA technologies, assistance for companies seeking NASA Small Business Innovative Research Grants, the NASA Small Business Incubation Center, and the Technology Outreach Program. According to Jim Jennings, Deputy Director of NASA Kennedy Space Center, "The resources of these two institutions will have a tremendous impact on our commercialization programs, while faculty and students will be getting hands-on technical and business experience." Jennings will tour both facilities after the ceremony.

Florida Memorial College and Florida International University students and faculty will work with NASA commercialization representatives, engineers, and small-business owners to solve technical problems through the Technology Outreach Program. In addition, Florida Memorial participants will work with companies at the Florida/NASA Small Business Incubation Center in Titusville to assist and learn about small businesses. A two-week summer program for university faculties will kick-off the first of its kind partnership with training and briefings on the programs of the commercialization office at Kennedy Space Center. Representatives from the institutions will learn about the programs at KSC, and prepare to share the opportunities and how to access them with other faculty at their respective colleges.

Two other awards to FIU will be announced at the ceremony, which will include community leaders, state and federal government officials and college dignitaries. A grant will be awarded to the FIU initiative for "Applied Research in Industrial and Systems Engineering" (ARISE), which is designed to increase the number of minority students graduating with math, science or engineering degrees. This project provides for five engineering student internships for research.

The third award to FIU (project VISION) focuses on increasing the participation of middle school students in, as well as their understanding of, science, mathematics and technology. Engineering students at FIU and the University of Puerto Rico will aid teachers with hands-on science and mathematics curricula.

Florida International University, located in Miami, is a member of the State University System of Florida. A nationally recognized public research university, FIU currently serves 30,000 students taught by 1,200 faculty members at the graduate and undergraduate levels. Since first opening its doors in 1972, FIU has quickly grown to become the largest university in South Florida and one of the top three producers of university degrees to minority students in the country.

Florida Memorial College is South Florida's only historically black college, and a member of The College Fund/UNCF. It offers degrees in over twenty disciplines on the undergraduate level through six of its seven academic divisions. The seventh, the Division of Extension and Continuing Education, is geared toward working adults. For more information on Florida Memorial College, contact the Office of Public Affairs at (305) 626-3624.

- end -

For further information contact:

Jay Diggs, NASA Kennedy Space Center, 407-867-2307
Barbara Edwards, Florida Memorial College, 305-626-3608
Maydel Santana, Florida International University, 305-348-1555
Gwendolyn De Cort or Mary Baker, Technological Research & Development Authority, 407-269-6330

NASA/Florida Minority Institution Entrepreneurial Partnership Fact Sheet

- Participating Institutions are led by Bethune-Cookman College of Daytona Beach and include Edward Waters College in Jacksonville, Florida Memorial College and Florida International University in Miami.
- The partnership is made possible by an $800,000.00 grant through the NASA-Kennedy Space Center Equal Opportunity Program Office.
- The partnership project was developed to take advantage of the existing technology transfer programs that are in place at NASA and gain support from the universities as well as exposing students and faculty to entrepreneurial activities.
- This is the first consortium of Florida predominately minority institutions to propose a combined effort for a NASA program.
- Bethune-Cookman College will act as the overall administrator for the partnership. In addition, faculty and students from the college will work to assist the NASA-KSC Commercialization Office with business assistance, will assist the Technology Outreach Program through the local Economic Development Commission, and will provide a faculty member for the summer to work at the NASA-KSC Commercialization Office.
- Edward Waters College will provide faculty from the school of business with experience in computer information systems, and student interns from marketing/business communications discipline to provide assistance to companies responding to Small Business Innovative Research (SBIR) solicitations. They will also assist the Jacksonville area Technology Outreach Program, and participate in the Summer Faculty program in the NASA-KSC Commercialization Office.
- Florida Memorial College will provide a team comprised of a professor from the College of Business Administration and business and computer science students who will work with the NASA/Florida Small Business Incubation Center. They will also assist the Beacon Council and the Broward Economic Development Council with the Technology Outreach Program in Dade and Broward Counties, and participate in the Summer Faculty Program at KSC.
- Florida International University will provide support for the Commercialization Office in the areas of Technology Commercialization and Licensing, Technology Assessment and the Technology Development program. They will work with the Beacon Council and the Broward Economic Development Council to assist with the Technology Outreach Program, and participate in a Summer Faculty Program at KSC.

- The Technological Research and Development Authority (TRDA), as KSC's state partner in NASA's technology transfer, will assist B-CC with program administration to ensure that the defined objectives are maximized. TRDA will act in a support role to B-CC and all schools and assist faculty and project coordinators with all program coordination.

- The Technological Outreach Program establishes a NASA network throughout Florida to provide free technical assistance to Florida businesses with the goal of creating or saving jobs and creating new economic activity by accelerating the transfer of NASA technology to Florida industry.

- The Florida/NASA Incubation Center is located in Titusville, Florida and serves 7 companies in a variety of fields including updating/initializing business plans, marketing plans, financial planning, accounting systems and funding searches.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 27, 1997
KSC Contact: Dennis Armstrong
KSC Release No. 96-97

NASA LAUNCHES MINORITY PARTNERSHIP WITH FLORIDA COLLEGES

The National Aeronautics and Space Administration will award a grant and announce the participation of Edward Waters College in a partnership of Florida minority universities as part of a program initiated by the Kennedy Space Center Equal Opportunity Program Office. The partnership will promote high-tech entrepreneurship and to better acquaint NASA professionals with researchers at Florida minority institutions. The consortium is led by Bethune-Cookman College in Daytona Beach, and includes Florida Memorial College and Florida International University in Miami. NASA officials will officially announce the program at Edward Waters College on July 9, 1997 at 10:00 AM in the Milne Auditorium.

The partnership program seeks to provide exposure for students and faculty at minority institutions to the challenges and rewards of starting and operating high-tech small businesses. The concept is to involve the schools in existing, proven technology transfer programs established by NASA and the State of Florida through the Technological Research and Development Authority. The programs include commercialization of NASA technologies, assistance for companies seeking NASA Small Business Innovative Research Grants, the NASA Small Business Incubation Center, and the Technology Outreach Program.

Edward Waters College students and faculty will work with NASA commercialization representatives, engineers, and small-business owners to solve technical problems through the Technology Outreach Program. In addition, they will work with the NASA Commercialization Office and assist in finding and training companies who have great potential to participate in NASA's Small Business Innovative Research Grant program. A two-week summer program for university faculties will kick-off the first of its kind partnership with training and briefings on the programs of the commercialization office at Kennedy Space Center. Representatives from the institutions will learn about the programs at KSC, and prepare to share the opportunities and how to access them with other faculty at their respective colleges.

According to Jim Jennings, Deputy Director of NASA Kennedy Space Center, "The resources of Edward Waters College will have a tremendous impact on our commercialization programs, while faculty and students will be getting hands-on technical and business experience." Jennings will tour the college after the award ceremony on July 9.

Edward Waters College was accredited in 1955 as a junior college and on December 11, 1979 received accreditation as a four-year college by the Southern Association of Colleges and Schools (SACS). On January 1, 1985, Edward Waters became the 43rd institutional member of the United Negro College Fund (UNCF). The college is licensed by the State Board of Independent Colleges and Universities, National University of Continuing Education Association (NUCEA), and Florida Association of Colleges and Universities of Florida.

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For More Information Contact:
Jay Diggs, NASA Kennedy Space Center, 407-867-2307
Yvonne Wagner, Edward Waters College, 904-355-3030

Gwendolyn De Cort or Mary Baker, Technological Research & Development Authority, 407-269-6330

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 17, 1996
KSC Contact: Bruce Buckingham
KSC Release No. 97-13

MOBILE LAUNCHER PLATFORM DEVELOPS CRACK DURING STS-82 ROLLOUT

Rollout of the Space Shuttle Discovery has resumed following evaluation of a 24-foot long crack on the Mobile Launch Platform (MLP). Structural engineers have determined the integrity of the MLP has not been compromised. Discovery's trip to the launch pad resumed shortly after noon, EST.

Rollout of Discovery began shortly after 7 a.m. EST from the Vehicle Assembly Building at the Kennedy Space Center, FL. Rollout was stopped at approximately 8:25 a.m. EST after engineers heard a "loud bang" and noticed that a crack had developed on the MLP. The "Y"-shaped crack is on the surface of the MLP and runs from near the left hand SRB flame hole toward the near corner of the MLP.

Discovery is scheduled for launch on mission STS-82 on Feb. 11.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 24, 1997
KSC Contact: Hugh Harris
KSC Release No. 97-17

ROY BRIDGES SELECTED AS KSC'S NEW CENTER DIRECTOR

Former Shuttle astronaut and retired Air Force Maj. Gen. Roy D. Bridges, Jr., has been named by NASA Administrator Daniel S. Goldin to be the director of the Kennedy Space Center (KSC), FL. Bridges, who will become the seventh KSC center director effective March 2, will succeed Jay F. Honeycutt, who announced his retirement last October.

"I am thrilled Roy is returning to the NASA team," Goldin said. "Roy has a unique and very accomplished background that will be a tremendous asset in his new job as KSC director. He is the right person to take KSC into the next century."

As director, Bridges will be responsible for managing NASA's only site for processing and launch of the Space Shuttle vehicle at a rate of seven to eight flights per year; processing of the payloads flown on both the Shuttle and expendable launch vehicles; and overseeing of expendable launches carrying NASA payloads. He will manage a team of about 2,000 NASA civil servants and about 14,000 contractors.

As a NASA astronaut, Bridges served as pilot for the Space Shuttle Challenger on STS 51-F in July and August 1985.

Bridges later served as the director of requirements, Headquarters Air Force Materiel Command, Wright-Patterson Air Force Base, OH, from June 1993 until his retirement from the Air Force on July 1, 1996. In that position he served as the command focal point for product management policy, processes and resources.

Prior to his assignment at Wright-Patterson, Bridges was the commander, Air Force Flight Test Center, Edwards Air Force Base, CA. He has served in several key leadership positions in the Air Force, including deputy chief of staff, test and resources, Headquarters Air Force Systems Command, Andrews Air Force Base, MD; commander, Eastern Space and Missile Center, Patrick Air Force Base, FL; and commander, 6510th Test Wing, Edwards Air Force Base, CA.

Bridges was born July 19, 1943, in Atlanta, GA, and graduated from Gainesville High School, GA, in 1961. He is a distinguished graduate of the U.S. Air Force Academy, Colorado Springs, CO, earning a bachelor's degree in engineering science in 1965. He received a master of science degree in astronautics from Purdue University, IN, in 1966.

He is the recipient of several awards and honors including recognition as a distinguished graduate of USAF Pilot Training and a top graduate of the USAF Test Pilot School. He is a recipient of the Distinguished Service Medal, the Defense Superior Service Medal with oak leaf cluster; Legion of Merit with oak leaf cluster; Distinguished Flying Cross with two oak leaf clusters; Meritorious Service Medal; Air Medal with 14 oak leaf clusters; Air Force Commendation Medal; NASA Space Flight Medal; and a NASA Certificate of Commendation.

Bridges is married to the former Benita Louise Allbaugh of Tucson, AZ. They have two adult children.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 4, 1997
KSC Contact: Joel Wells/George Diller
KSC Release No. 97-122

COLUMBIA PASSES MILESTONE TOWARD QUICK REFLIGHT

NASA's Space Shuttle program passed a major milestone today on its way to reflying the orbiter Columbia and the first reflight of the same payload and crew in Space Shuttle history. Columbia, which saw an abbreviated mission in April due to indications of a faulty fuel cell, was transported from Florida's Kennedy Space Center (KSC) Orbiter Processing Facility (OPF) to the Vehicle Assembly Building today where it will be mated with an external tank and solid rocket boosters in preparation for roll-out to Launch Pad 39A next week.

With the Spacelab payload secure in the orbiter's cargo bay, NASA remains on track for a targeted July 1 launch date for reflight of the Microgravity Science Laboratory mission.

Suspicious readings from one of Columbia's fuel cells compelled NASA managers to cut the STS-83 mission short after only four days in space, marking only the third time in Shuttle history that a mission was curtailed for mechanical reasons. The original mission was expected to last 16 days.

Since the return of Columbia following the shortened STS-83 mission, the suspect fuel cell has undergone extensive anaylsis. The conclusion is that an undetermined and isolated incident caused a slight change in the voltage of about one-fourth of the 96 cells that make up each fuel cell.

To ensure the health of the fuel cells pre-launch, the power plants will be started earlier than usual to allow for additional monitoring before liftoff. Also, the program is reviewing the possibility of installing new fuel cell performance monitors that will indicate individual cell "health" rather than a single monitor for each of three 32-cell substacks.

This will provide additional insight into pinpointing large voltage shifts in a single cell, which could indicate a potential problem, or a small voltage shift in a number of cells, which is a benign situation. Presently, the performance monitor provides a gross indication of fuel cell health, which caused the team to assume the worst in the case of STS-83.

As with all hardware issues on the Shuttle, fuel cell anomalies are taken seriously and reviewed extensively prior to clearing future missions for launch. Additionally, the flight rules are being reviewed to ensure that proper insight is provided to flight controllers in making decisions on the health of the fuel cells.

Columbia launched on April 4 and landed in Florida on April 8 without completing the mission's science objectives. About two weeks later, Shuttle program managers decided to refly the Microgravity Science Laboratory mission on STS-94 as soon as possible within safety guidelines.

"This decision demonstrated the Shuttle program's confidence in the KSC processing team," said Bob Sieck, Director of Shuttle Processing. "Special credit goes to the workers in Orbiter Processing Facility Bay 1. They produced a quality product in record time."

When marching orders were given, NASA's Shuttle and payload communities teamed up to give Columbia and the Spacelab payload a speedy turnaround. Once in the OPF, replacement of the problem fuel cell was the first order of business and that was completed the week after landing. Managers then put into motion a strategy that minimized the amount of rework performed on the Shuttle and reduced the time required to service the payload.

The ambitious schedule required that all experiment reservicing be done while the Spacelab remained in the Shuttle's payload bay. Between flights, Spacelab is normally removed and then transported to KSC's Operations and Check-out Building for rework in a spacious environment. Payload technicians overcame the Shuttle's cramped conditions and successfully completed many critical tasks such as replenishing the flammable fluids of a combustion experiment.

"This is the first time that a payload has remained in an orbiter between flights," said KSC Payload Manager Scott Higginbotham. "We are excited about having accomplished something that has never been tried before."

Working side-by-side with the payload team, Shuttle technicians and managers faced some challenges of their own. Normally an orbiter visits the OPF for about 85 days in preparation for its next launch, but this reflight called for about 56 days in the facility. Managers saved some time by deferring certain routine structural inspections until Columbia's next mission, but other work could not wait and had to be accomplished before launch.

For example, the Shuttle's forward reaction control system, located in the nose of the vehicle, had to be removed with three out of sixteen steering thrusters requiring replacement. Also, two of the three 85-pound auxiliary power units that provide hydraulic power to Columbia's flight control systems were replaced having reached their run-time limit between overhauls.

An important part of this time-saving strategy was to minimize the burden on the Shuttle processing team. "Most of the time savings in the OPF was the result of a concerted planning effort between NASA and our contractor partners," said Grant Cates, NASA flow director for Columbia. "Once the plan was in place, the team approached this challenge in much the same way that they approach every flow."

To further speed up Columbia's processing for reflight, managers took one main engine scheduled to fly on Atlantis in September and two engines from Columbia's November flight. The external fuel tank and solid rocket boosters being used on STS-94 were originally slated for mission STS-85.

With the original STS-83 astronauts slated to fly again on STS-94, additional time savings were achieved by leaving the crew compartment set-up virtually unchanged. The crew equipment interface test and the terminal countdown demonstration test, both familiarization exercises previously completed by the crew, were deemed unnecessary for this reflight mission.

Columbia is scheduled to roll out of the Vehicle Assembly Building on June 11, bound for launch pad 39A. The STS-94 launch is currently targeted for July 1 at 2:37 p.m. EDT.

Regardless of the efforts necessary to perform a quick turn-around of Columbia and its microgravity science payload, NASA managers and engineers are confident that no safety margins were compromised.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 13, 1997
KSC Contact: Hugh Harris
KSC Release No. 97-134

ASTRONAUTS MCMONAGLE, HARBAUGH TAKE ON NEW ASSIGNMENTS

Astronaut Donald R. McMonagle has been named manager, Space Shuttle Launch Integration, at the Kennedy Space Center, FL, replacing Loren Shriver, effective Aug. 15, following the STS-85 mission.

The announcement by Shuttle Program Manager Tommy Holloway follows the appointment of Shriver earlier this week to the staff of Kennedy Director Roy D. Bridges, Jr., as deputy director, launch and payload processing.

McMonagle will begin the transition to his new position immediately. He will be responsible for final Shuttle preparation, mission execution and return of the Orbiter to Kennedy following landings at Edwards Air Force Base, CA.

As the first manager of the then-newly formed directorate-level position of manager, Extravehicular Activity Projects Office, McMonagle was responsible for overseeing the development of all spacewalk requirements, techniques and tasks for Shuttle-based missions as well as assembly and operation of the International Space Station.

Gregory J. Harbaugh has been named acting manager of the Extravehicular Activity Projects Office, replacing McMonagle. That appointment by Johnson Space Center Director George Abbey is effective immediately to allow a smooth transition between the two, prior to McMonagle's move to Kennedy.

Harbaugh has extensive background in spacewalking, having done so during two different Shuttle missions, STS-54 and STS-82. Prior to his most recent flight, Harbaugh trained as the backup spacewalk astronaut for the first servicing mission to the Hubble Space Telescope in 1993.

McMonagle and Harbaugh flew together on Shuttle flights STS-39 and STS-54. McMonagle was commander of his third mission, STS-66. Harbaugh also flew on STS-71, the first mission to dock with Russia's space station Mir, and most recently on the second servicing mission to the Hubble Space Telescope (STS-82) in February.

For complete biographical information on McMonagle, Harbaugh and other astronauts, see the NASA Internet astronaut biography home page at:

http://www.jsc.nasa.gov/Bios/

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 24, 1997
NASA Headquarters Release No. 97-159

AUGUST 7 SELECTED FOR STS-85 SPACE SHUTTLE MISSION LAUNCH

Space Shuttle Program managers today set August 7 as the launch date for the next Shuttle mission, to deploy and retrieve a science satellite and test a small robotic arm identical to one that will be used on the International Space Station's Japanese Experiment Module.

The launch window for Space Shuttle Discovery extends for one hour, 39 minutes from 10:41 a.m. to 12:20 p.m. EDT. Nominal flight duration is 10 days, 20 hours, 24 minutes, putting the landing on Monday, August 18, at 7:05 a.m. EDT.

Discovery's crew, made up of Commander Curt Brown, Pilot Kent Rominger, Mission Specialists Jan Davis, Robert Curbeam and Steve Robinson and Canadian Payload Specialist Bjarni Tryggvason, will deploy the CRISTA-SPAS spacecraft for nine days of free-flying atmospheric studies and demonstrate the operational capability of the Japanese Remote Manipulator System and its Small Fine Arm.

"From a shirt-sleeve orbiting laboratory one month, to the study of Earth's atmosphere and future flight demonstrations to support the International Space Station the next, the diversity of the Space Shuttle system is once again ready to be demonstrated with STS-85," said Johnson Space Center Director George Abbey, who chaired the Flight Readiness Review from the Kennedy Space Center, FL.

STS-85 will be Discovery's 23rd flight in space, tying it with Columbia as the Orbiter with the most missions. It also will be the 86th Shuttle flight in the program's history.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 25, 1997
KSC Contact: George Diller
NASA Headquarters Release No. 97-160

SECOND U.S. SPACE STATION COMPONENT BEGINS LAUNCH PREPARATIONS

The first of two pressurized mating adapters for the International Space Station arrived today at the Kennedy Space Center, FL, from manufacturer McDonnell Douglas in Huntington Beach, CA.

A pressurized mating adapter is a cone-shaped connector that will be attached to Node-1, the space station's structural building block, during ground processing in Kennedy's Space Station Processing Facility. Node-1 with the adapter attached will be the first element of the Station to be launched aboard the Space Shuttle in July 1998.

The mating adapter will be the connection point between Node-1 and the U.S. financed, Russian-built Functional Cargo Block, which will be launched from Russia as the first Station element to be placed into orbit. The adapter will house Space Station computers and various electrical support equipment and eventually will serve as the passageway for astronauts between the node and the cargo block.

"PMA-1 brings with it the computers that are the intelligence for the node," said Glenn Snyder, Space Shuttle mission STS-88 payload manager. "We're looking forward to testing with those computers."

For processing at Kennedy, the adapter will undergo initial acceptance testing. Then, in early September, it will be mated to Node-1 and a series of integrated tests will be conducted.

"We're pleased that the first mating adapter is now at Kennedy," added John Elbon, test integration leader for McDonnell Douglas. "It is the next of the three elements of flight hardware necessary for the STS-88 mission."

The second adapter, the final element of the STS-88 mission, is expected to arrive at Kennedy this October. It also will be attached to Node-1 in the processing facility. This second adapter will serve as a Space Shuttle docking port during the construction and resupply of the Space Station.

The asymmetrical open-ended cone-shaped pressurized mating adapters are about seven feet long, five feet in diameter at one end and nine feet in diameter at the other. Each adapter consists of five individually machined and welded aluminum ring forgings, thermal insulation blankets and 52 fittings for electrical connections. The outer covering is a double-wall aluminum sheet to protect the adapters from strikes by space particles.

Space Shuttle Endeavour, carrying Node-1 with the two attached adapters, is targeted for launch in July 1998, approximately two weeks after the Functional Cargo Block is launched from Russia.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 7, 1997
KSC Contact: George Diller
NASA Headquarters Release No. 97-173
Cassini images

COUNTDOWN TEST REVEALS FUEL LEAKS ON CASSINI MISSION CENTAUR UPPER STAGE

During the Tuesday, August 5, terminal countdown demonstration test, Air Force and Lockheed Martin engineers observed leakage in the Centaur stage of the Titan IV-B rocket for the Cassini mission to Saturn. This test, in which the Centaur is fully fueled, is normally conducted to identify problems which could affect the performance of the Titan IV. Leakage of this nature can occur on occasion when the Centaur is first tanked with cryogenic propellants. During this test, engineers observed some liquid hydrogen and liquid oxygen leakage in the thrust section.

Engineering assessments are currently being performed to determine the cause of the leakage and what corrective action is necessary to ready the vehicle for the Cassini launch. Until this has been done, what impact this might have on the planned October 6 launch date, if any, cannot be definitely determined. A repeat test will be performed to assure that there are no additional leaks or other issues.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 20, 1997
KSC Contact: George H. Diller
KSC Release No. 97-179

CASSINI LAUNCH REMAINS ON SCHEDULE

The Terminal Countdown Demonstration of the Air Force Titan IV rocket for NASA's Cassini mission has been successfully completed. Today's Terminal Countdown Demonstration was a retest after leaks were repaired on the Centaur upper stage identified during the initial demonstration on Aug. 5.

"The success of the Titan test today keeps the launch of Cassini on target for Oct. 6," said Richard Spehalski, Cassini Program Manager. "The processing of the spacecraft here at KSC has gone well and we are also on schedule."

The Cassini spacecraft is scheduled for liftoff from Cape Canaveral Air Station, Space Launch Complex 40, on Oct. 6 at 5:38 a.m. EDT. This will begin Cassini's 6.7 year journey to explore the planet Saturn.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 12, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 97-199

ATLANTIS' SEVENTH MISSION TO MIR SET FOR SEPT. 25

Space Shuttle program managers today unanimously approved plans for a September 25 launch of the seventh Shuttle mission to rendezvous and dock with Russia's Mir Space Station to deliver supplies and return Mike Foale from the outpost following his four month stay.

"Our review today shows the processing and training teams have done an exceptional job in getting Atlantis and crew ready for this mission," said George Abbey, Director of the Johnson Space Center, who chaired the Flight Readiness Review at the launch site in Florida.

Astronaut Dave Wolf has completed training and is scheduled to replace Michael Foale for a four-month stay on Mir to continue the permanent U.S. presence on the station that began with Shannon Lucid on the STS-76 mission in 1996.

The launch window opens at 10:34 p.m. EDT and closes about 7 minutes later at 10:41 p.m. Following a nominal flight duration of 9 days, 20 hours, 24 minutes, Atlantis is scheduled to land at the Kennedy Space Center, Fla., at about 6:58 p.m., Oct. 5.

In addition to Foale and Wolf, Atlantis' crew includes Commander Jim Wetherbee, Pilot Mike Bloomfield and Mission Specialists Scott Parazynski, Wendy Lawrence, Jean-Loup Chretien and Vladimir Titov. Parazynski and Titov will conduct a spacewalk to retrieve some science experiments from the outside of the station.

STS-86 will be Atlantis' 20th mission into space and the 87th shuttle flight in the program's history.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 19, 1997
KSC Contact: George Diller
KSC Release No. 97-207

CASSINI LAUNCH RESCHEDULED FOR OCT. 13

The launch of NASA's Cassini spacecraft aboard a U.S. Air Force Titan IVB rocket has officially been rescheduled on the Eastern Range for Monday, Oct. 13. The payload is now back at Complex 40 atop the Titan IV Centaur. The launch window for Cassini extends from 4:55 to 7:15 a.m. EDT.

Cassini is a joint NASA-European Space Agency (ESA) mission to Saturn, which is scheduled to arrive at the ringed planet in 2004 after more than six years of interplanetary travel. After arrival, the spacecraft will orbit Saturn for four years studying the gas giant planet, its rings and moons, and the ESA-built Huygens probe will descend to the surface of the giant moon Titan.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 22, 1997
KSC Contact: George Diller
KSC Release No. 97-242

LAUNCH OF LUNAR PROSPECTOR RESCHEDULED FOR EARLY JANUARY

The launch of the Lunar Prospector mission to explore the Moon has been rescheduled for Jan. 5, 1998, NASA officials announced today.

The schedule adjustment is necessary to allow adequate time to complete the rigorous testing, review and preparation of the new Lockheed Martin Athena II launch vehicle (formerly known as the LMLV-2). The previous launch date was Nov. 23, 1997.

A free-flier, Lunar Prospector will orbit above the Moon's surface at an altitude of approximately 63 miles during a one-year mission. Its five science instruments will provide detailed data on the composition and structure of the entire lunar landscape, of which more than 75 percent remains virtually unexplored. A key mission objective is to provide direct evidence of the presence or absence of ice in the shaded lunar polar regions.

Lunar Prospector is the third flight in NASA's Discovery Program series of "faster, better, cheaper" space science missions. The entire mission, including the spacecraft, launch vehicle, science instruments, and data operations and delivery, will be conducted at a total cost to NASA of $62.8 million.

The Lunar Prospector mission is being managed by NASA's Ames Research Center, Moffett Field, CA, via a prime contract with Lockheed Martin Corp., Sunnyvale, CA. The Athena II launch vehicle is being provided by Lockheed Martin Astronautics, Denver, CO, as part of the prime contract.

The launch is scheduled to take place at 8:32 p.m., EST on Jan. 5, 1998, from the new Spaceport Florida Authority Launch Complex 46 in Cape Canaveral, FL. A second, back-up launch window is available approximately 24 hours later on Jan. 6.

Further information on the Lunar Prospector mission, including related images, is available on the Internet at URL: http://lunar.arc.nasa.gov/

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 31, 1997
KSC Contact: William R. Johnson
NASA Release No. 97-255

X-33 PROGRAM SUCCESSFULLY COMPLETES CRITICAL DESIGN REVIEW; MEDIA TELEPHONE CONFERENCE SET FOR 11 A.M. EST MONDAY, NOV. 3

Government and industry representatives today successfully completed a comprehensive design review of the X-33 technology demonstration program, giving the program a vote of confidence and the go ahead for fabrication of all remaining components, completion of subsystems and assembly of the subscale prototype launch vehicle.

"We've had an excellent review of the program, and we're ready to go ahead with all remaining fabrication and assembly for the X-33," said NASA X-33 program manager Gene Austin of NASA's Marshall Space Flight Center, Huntsville, AL.

The five-day operations and systems Critical Design Review (CDR) held this week at Edwards Air Force Base, CA, was the culmination of 51 subsystems and component CDRs held since January. Some 600 representatives from NASA, industry team lead Lockheed Martin, industry partners and the U.S. Air Force participated in this final design review of the X-33 Program. They planned the integration of the various systems and components into the operational vehicle, and finalized plans for the launch, landing and flight support infrastructure.

The review also served as an opportunity for program officials to announce resolution of issues that arose earlier this year regarding vehicle weight and aerodynamic stability and control. Since then the X-33 team's weight reduction efforts, modifications to the design of the vehicle's canted and vertical fins, and plans to use densified propellants to carry additional fuel have paved the way for a successful program, Austin said.

"I'm very pleased with the technical definition of the program," said Cleon Lacefield, Lockheed Martin Skunk Works X-33 program manager. "All the team members have done an outstanding job bringing together all the design elements of the program.

"We are now ready to focus on vehicle fabrication and launch site construction," Lacefield added. "We are on schedule for the flight demonstration program to begin in mid-1999."

The flagship vehicle in NASA's Space Transportation Technology Enterprise, the X-33 is a subscale prototype of a full-scale, commercially developed Reusable Launch Vehicle (RLV) which Lockheed Martin has named "VentureStarTM," planned for development after the turn of the century. A single-stage- to-orbit RLV could dramatically reduce the cost of putting payloads into space from $10,000 per pound to $1,000 per pound.

"Everything we have learned leading up to our Critical Design Review about the development of this prototype vehicle will be directly applied to the design of the full-scale vehicle," Austin said. "We've already earned the price of the X-33 program for what we've learned for the RLV."

The next major milestones for the more than $1 billion X-33 Program are completion of the Environmental Impact Statement process, with the signing of the Record of Decision, and groundbreaking for the launch facility site on the eastern portion of Edwards Air Force Base, both planned for early November. The first arrival of a major vehicle

component at the X-33 assembly facility in Palmdale, CA -- the aluminum liquid oxygen tank from Lockheed Martin Michoud in Louisiana -- is scheduled for January.

The X-33 is scheduled to make as many as 15 test flights beginning in July 1999. Launched vertically from Edwards, it will fly up to 15 times the speed of sound at altitudes approaching 60 miles. Planned landing sites are located at Dugway Proving Ground, UT, and Malmstrom Air Force Base, MT.

-end-

NOTE TO EDITORS: NASA and Lockheed Martin have scheduled a media teleconference with program officials to discuss the Critical Design Review beginning at 11 a.m. EST on Monday, Nov. 3. Gene Austin, NASA X-33 program manager; Jerry Rising, Lockheed Martin Skunk Works vice president X-33/RLV; and Cleon Lacefield, Lockheed Martin Skunk Works X-33 program manager, are scheduled to participate. Media wishing to participate should call 205/544-6903 and enter Conference Code #1779 at the voice prompt.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 13, 1997

MSFC Contact: Jerry Berg
(205) 544-0034

Release No. 97-267

NASA SET TO LAUNCH MICROGRAVITY SCIENCE MISSION, STS-87

The next launch of Space Shuttle Columbia will begin a mission in which several major scientific activities are being overseen and supported from the Marshall Space Flight Center's Spacelab Mission Operations Control Center.

The 16-day mission features a wide variety of research into subjects ranging from improving semiconductor materials to developing stronger metal alloys, and understanding the effects of fires in space. These efforts make up the fourth flight of the U.S. Microgravity Payload (USMP-4).

In addition, key technology to enable automated spacecraft rendezvous and docking will be given an experimental checkout during the flight. The system, developed and managed at Marshall, is part of the effort to provide new technologies in support of the International Space Station and other future space vehicles.

Columbia is targeted for launch at 1:46 p.m. CST on Wednesday, Nov. 19.

NEWS CENTER

The Marshall News Center in Building 4200 will be open every day during the mission, starting at 6 a.m. CST. Hours of operation will be until 4:30 p.m. on weekdays and until 12 noon on weekends. The News Center will be closed Thanksgiving Day. The News Center telephone number is (205) 544-0034. Current mission status information, interviews with mission participants and photography/video of on-orbit activities will be available through the News Center.

STATUS REPORTS

Written microgravity payload status reports will be issued once daily by the News Center at approximately 7 a.m. CST. The reports will be available on the Internet through the World Wide Web, on the Marshall Center payload homepage at: http://liftoff2.msfc.nasa.gov/Shuttle/usmp4/ or the payloads portion of the mission "Overview" section of the NASA Shuttle Web homepage at: http://shuttle.nasa.gov.

The status reports will also be available on the NASA Headquarters Public Affairs Internet Bulletin Board at ftp.pao.hq.nasa.gov. Media desiring to receive the status reports by fax should contact the News Center. Media may also access a daily audio recording on the status of science operations by calling (205) 544-6397.

LIVE TELEVISION INTERVIEWS

Television news organizations may arrange live satellite interviews with mission participants based at Marshall's Science Operations Control Center during the mission by calling the News Center. Interviews and supporting video of

mission activities can be provided via NASA's satellite. Print and broadcast media may also arrange telephone interviews through the News Center.

NASA TELEVISION COVERAGE

Twenty-four hour coverage of the mission, originating from both the Huntsville operations center and Mission Control-Houston, will be broadcast on NASA Television which is available via satellite and on many cable systems. For satellite receptions, programming is carried on GE-2, Transponder 9C at 85 degrees West longitude; frequency is 3880 MHz, audio is 6.8 Mhz. Mission science commentary inserts from Marshall Center will be broadcast daily between 5:30 a.m. and 2:30 p.m., while Shuttle operations commentary will be broadcast around-the-clock from Mission Control-Houston.

In addition to ongoing mission coverage, the USMP-4 Science Status Report, a summary of mission science activities, and periodic news media briefings will be carried on NASA TV. For details regarding programming, please consult the STS-87 mission TV schedule, available on the WWW or by fax on request.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

December 16, 1997
JPL Contact: Jane Platt
Release No. 97-286

CLOSEST EUROPA FLYBY MARKS START OF GALILEO MISSION "PART II"

NASA's Galileo spacecraft today successfully made its closest-ever flyby of Jupiter's icy moon Europa, marking the start of an extended mission that will focus on new and tantalizing scientific questions raised by its just-completed, highly successful two-year primary mission.

"Galileo has earned a place in history as the first mission to orbit an outer planet," said Dr. Wesley T. Huntress, Jr., NASA's associate administrator for space science, Washington, DC. "Galileo already has returned a wealth of new information in its two-year scientific exploration of Jupiter's atmosphere and system of moons. But the best yet may still be ahead of us as Galileo continues its mission at Jupiter with a focus on the moons Europa and Io in the next two years."

Galileo dipped over Europa at an altitude of only 124 miles (200 kilometers), with the signal received on Earth at 7:49 a.m. EST. This was the first encounter of the Galileo Europa mission, which began formally on Dec. 8, following the end of Galileo's primary mission. The Galileo Europa mission will study Jupiter's icy satellite in detail in hopes of shedding more light on the intriguing prospect that liquid oceans may lie under Europa's ice crust.

New images released today from Galileo's Europa encounter of Nov. 6 show more evidence that the moon has been subjected to intense geological deformation. The pictures show a mottled region of dark and splotchy terrain that scientists say represents some of the most recent geologic activity on Europa. It is believed the mottled appearance was created when chaotic areas of the bright, icy crust broke apart and exposed darker material underneath. The new images also show a smooth, gray band where the Europan crust has been fractured, separated, and filled in with material from the interior. Numerous isolated mountains or "massifs" are visible.

The new images represent a small portion of the 1,800 images obtained during Galileo's primary mission, including hundreds of high-resolution images of Jupiter's moons. The images and other information gathered by Galileo's science instruments have dramatically revised our knowledge of Jupiter and its moons, according to mission scientists.

The Galileo Europa mission is designed to follow up on these discoveries and will include eight consecutive Europa flybys through February 1999, followed by four Callisto flybys and one or two Io encounters in late 1999, provided the spacecraft remains healthy.

"The Galileo Europa mission really builds upon the success of the prime mission which has forced us to re-think many of our perceptions of the Jovian system," said Galileo project scientist Dr. Torrence Johnson. "We've acquired a tremendous pool of knowledge about Jupiter, its magnetosphere and its four largest moons."

The key findings of Galileo's primary mission include:

- The existence of a magnetic field on Jupiter's largest moon, Ganymede;
- The discovery of volcanic ice flows and melting or "rafting" of ice on the surface that supports the premise of

liquid oceans underneath at some point in Europa's history;

- The observation of water vapor, lightning and aurora on Jupiter;
- The discovery of an atmosphere of hydrogen and carbon dioxide on the moon Callisto;
- The presence of metallic cores in Europa, Io and Ganymede and the lack of evidence of such a core in Callisto;
- Evidence of very hot volcanic activity on Io and observations of dramatic changes compared to previous observations and even during the period of Galileo's observations.

"We look forward to providing even more fascinating science results over the next two years," said newly appointed Galileo Europa mission project manager Bob Mitchell of NASA's Jet Propulsion Laboratory (JPL), Pasadena, CA.

JPL manages the Galileo mission for NASA's Office of Space Science, Washington, DC. The new images shown at today's briefing are available on the Galileo Internet home page at the following URL:

http://www.jpl.nasa.gov/galileo/

Members of the Galileo mission will answer questions from the public during a Galileo WebChat on Wednesday, Dec. 17 from 6 to 9 p.m. EST, at URL: http://www.jpl.nasa.gov/galileo/chat/

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 19, 1997
KSC Contact: Joel Wells/Lisa Malone
NASA/KSC Release No. 97N-97

Note to Editors:
JULY 1 SELECTED FOR MICROGRAVITY SCIENCES LABORATORY REFLIGHT

NASA managers today set July 1 as the official launch date for Space Shuttle Columbia and the reflight of the Microgravity Science Laboratory-1 payload following completion of the STS-94 Flight Readiness Review at the Kennedy Space Center, FL. The original MSL-1 mission during STS-83 in April was shortened due to the suspect performance of a fuel cell.

The STS-94 launch window opens at 2:37 p.m. EDT and extends for 2 1/2 hours. The MSL-1 mission has a planned duration of 16 days. An on-time launch on July 1 and nominal mission duration will result in Columbia landing at about 7:13 a.m. EDT, on July 17.

"The NASA contractor workforce has put forth an outstanding effort in getting the MSL-1 mission ready to fly again," said Johnson Space Center Director George Abbey, who chaired the meeting. "The quick turnaround in Columbia's processing for launch, will allow the crew and the international team of investigators, the opportunity to finish the important work they began earlier this year. The experiments and activities associated with STS-94 are a preview for the work that will be performed on the International Space Station."

STS-94 will be the 23rd flight of Columbia and the 85th mission flown since the start of the Space Shuttle program in April 1981.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 1, 1997
KSC Contact: George H. Diller
KSC Release No. 98-97

SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

L-24 hr 0 min: Briefing for Flight Director and astronauts
L-21 hr 0 min: Briefing for removal of Rotating Service Structure
L-9 hr 00 min: Briefing for external tank fuel loading
L-4 hr 30 min: Briefing for Space Shuttle Launch Director
L-3 hr 55 min: Briefing for astronauts
L-2 hr 10 min: Briefing for Flight Director
L-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.

b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table

becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
(kts)	0-64%	65-74%	75-79%	80-89%	90-100%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 34 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 20 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.
- Launch will not occur if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch, unless the source of lightning has moved more than 10 nautical miles away from the pad or the flight path.
- The one-minute average of the electric field mill network, used to measure electric fields, shall not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad at any time within 15 minutes prior to launch.

The above rule need not apply if the following two conditions are observed to exist:

1. There are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.

2. A known source of electric fields such as ground fog, smoke or "sunrise effect" is occurring near the field mill which are conditions previously determined and documented to be benign and is clearly causing the elevated readings.

Clouds: (types known to contain hazardous electric fields)

- The Space Shuttle may not be launched if the planned flight path is through a layer of clouds with a thickness of 4,500 feet or greater where the temperature of any part of the layer is between 32 degrees F. and -4 degrees F.
- The Space Shuttle may not be launched if the planned flight path is through a cumulus type cloud with its top between the 41 degrees F. temperature level and 23 degrees F. temperature. Launch may occur if: 1) the cloud is not producing precipitation; 2) the distance from the furthest edge of the cloud top to at least one operating field mill is less than the altitude at the 23 degree F temperature level or 3 nautical miles, whichever is less; 3) field mill readings within five nautical miles of the flight path must be between -100 volts per meter and +1000 volts per meter.
- The Space Shuttle may not be launched through 1) cumulus type clouds with tops higher than the 23 degree F. temperature level; 2) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 3) through or within 10 nautical miles of the nearest edge of any cumulonimbus or thunderstorm cloud including nontransparent parts of its anvil; 4) through or within 10 nautical miles of the nearest edge of a nontransparent detached anvil cloud for the first hour after detachment from the parent thunderstorm or cumulonimbus cloud.
- The Space Shuttle may not be launched if the flight path is through any clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation within five nautical miles of the flight path.
- The Space Shuttle may not be launched if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected or observed.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				**July**			
Temp	**Low**	**Avg**	**High**	**Temp**	**Low**	**Avg**	**High**
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8, 000 feet. This requirement may be satisfied using optical tracking sites or a forward observer

- For cloud ceilings of any thickness between 6, 000 feet and 8, 000 feet the following conditions must be met for launch to occur:

a.) the vehicle integrity can be observed without interruption through 6, 000 feet.

b.) all required Range Safety instrumentation is functioning properly

c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4, 000 feet and 6, 000 feet the following conditions must be met for launch to proceed:

a.) the thickness of the clouds must be less than 500 feet

b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8, 000 feet

c.) all required Range Safety instrumentation is functioning properly

d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A **"Good Sense Rule"** is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTLS), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTLS with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required. For TAL sites, cloud coverage 4/8 or less below 5,000 feet and a visibility of 5 statute miles or greater are required.

- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability.

- For the RTLS site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.

- An RTLS rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:

a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have

not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels within and below the clouds.

b.) Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.

c.) The movement of the showers is observed to be consistent and no additional convective development is forecast.

d.) Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.
- Headwind not to exceed 25 knots.
- Tailwind not to exceed 10 knots average, 15 knots peak.
- Turbulence conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. At decision time for the deorbit burn 90 minutes before landing the weather conditions must be:

- Cloud coverage of 4/8 or less below 8,000 feet and a visibility of 5 miles or greater is required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots
- Tailwind cannot exceed 10 knots average, 15 knots peak
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.

- Vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.

- Turbulence must be less than or equal to moderate intensity.

- The Flight Director must consider a possible "no go" to landing if at the deorbit burn decision time there are observed to be scattered cloud layers below 8,000 feet with greater than 2/8 sky coverage but not exceeding 4/8 sky coverage. Cloud conditions greater than 4/8 sky coverage below 8,000 feet constitute a cloud ceiling and is therefore "no go."

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

- **Radar:** Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.

- **Field Mill Network:** Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.

- **Lightning Detection System:** Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.

- **Lightning Detection And Ranging (LDAR):** Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.

- **National Lightning Detection Network:** Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.

- **Rawinsonde:** A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.

- **Jimsphere balloon:** A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.

- **Doppler Radar Wind Profiler:** Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another

Jimsphere balloon is released.

- **Rocketsonde:** A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and 370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

- **Satellite Images and Data:** Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Spaceflight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.

- **Meteorological Interactive Data Display System (MIDDS):** Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.

- **Towers:** 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.

- **Buoys:** Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.

- **Solid Rocket Booster Retrieval Ships:** These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.

- **Weather Reconnaissance Aircraft:** A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

June 27, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 99-97

SPACE SHUTTLE MISSION STS-94 LAUNCH COUNTDOWN TO BEGIN JUNE 28

NASA will begin the countdown for launch of Space Shuttle Columbia on the reflight of the first Microgravity Science Laboratory on June 28 at 3 p.m. at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 1 of the Launch Control Center.

The countdown includes 28 hours and 37 minutes of built-in hold time leading to the opening of the launch window at 2:37 p.m. (EDT) on July 1. The launch window extends for 2 hours, 30 minutes.

STS-94 is a reflight of mission STS-83 which was cut short in April due to indications of a failed fuel cell. STS-94 is the fifth Space Shuttle mission of 1997. This will be the 23rd flight of the orbiter Columbia and the 85th flight overall in NASA's Space Shuttle program. STS-94 is scheduled to last 15 days, 16 hours, 36 minutes and end with a planned KSC landing at 7:13 a.m. on July 17.

Columbia was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 1 on June 4 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building the following day. The Shuttle stack was then transported to Pad 39A on June 11.

The STS-94 crew are the same who flew on STS-83. They are: Commander Jim Halsell; Pilot Susan Still; Mission Specialists Janice Voss, Michael Gernhardt and Donald Thomas; and Payload Specialists Roger Crouch and Greg Linteris.

The crew is scheduled to arrive at KSC at about 12:30 p.m., Saturday, June 28. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES
***all times are Eastern**
Launch - 3 Days (Saturday, June 28)

- Prepare for the start of the STS-94 launch countdown
- Perform the call-to-stations (2:30 p.m.)
- All members of the launch team report to their respective consoles in Firing Room 1 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (3 p.m.)
- Start preparations for servicing fuel cell storage tanks
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems

- Load backup flight system software into Columbia's general purpose computers
- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms

Launch - 2 Days (Sunday, June 29)

Enter first planned built-in hold at T-27 hours for duration of four hours (7 a.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (11 a.m.)

- Begin operations to load cryogenic reactants into Columbia's fuel cell storage tanks (11 a.m. - 11 p.m.)

Enter eight-hour built-in hold at T-19 hours (7 p.m.)

- After cryogenic loading operations, re-open the pad
- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Launch-1 Day (Monday, June 30)

Resume countdown (3 a.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Activate the orbiter's flight controls and navigation systems
- Install mission specialists' seats in crew cabin
- Begin startracker functional checks
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 17 minutes (11 a.m.)

- Install film in numerous cameras on the launch pad
- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Activate orbiter's inertial measurement units
- Complete flight crew equipment late stowage
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down
- Move Rotating Service Structure (RSS) to the park position (8:30 p.m.)

Launch Day (Tuesday, July 1)

Resume countdown (12:17 a.m.)

- Start fuel cell flow-through purge
- Perform pre-ingress switch list
- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Columbia's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (5:17 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 5:45 a.m.)

Resume countdown (6:17 a.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 8:45 a.m.)
- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines

Enter planned two-hour built-in hold at T-3 hours (9:17 a.m.)

- Close-out crew and Final Inspection Team proceed to Launch Pad 39A

Resume countdown at T-3 hours (11:17 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 11:17 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 11:52 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Columbia's crew hatch (about 1:07 p.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (1:57 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (2:07 p.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (2:18 p.m.)
(This is the last planned built-in hold. Other hold options are available if necessary.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 2:28 p.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-5:30)
- Start Auxiliary Power Units (T-5:00)

- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 27, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 100-97

Notice to Editors/News Directors:
MISSION STS-94 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the July 1 launch of the Space Shuttle Columbia on Mission STS-94, the 85th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-94 NASA TV schedule for exact times.

The seven STS-94 crew members are scheduled to arrive at KSC on Saturday, June 28, at about 12:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 11 a.m. Saturday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-94 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times. Though STS-94 is a reflight of mission STS-83, new credentials still must be obtained to cover the launch from the KSC Press Site.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

KSC press releases and other information are available on the KSC PAO Home Page at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

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STS-94 BRIEFING & EVENTS SCHEDULE
(all times are EDT)
(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Saturday, June 28

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, NASA Test Director
  * Scott Higginbotham, STS-94 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- STS-94 Flight Crew Arrival (Live on NASA TV) ----- **12:30 p.m.**

(Launch countdown begins at **3:00 p.m.**)

L-2 Days - Sunday, June 29

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Scott Higginbotham, STS-94 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

L-1 Day - Monday, June 30

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Scott Higginbotham, STS-94 Payload Manager
  * Launch Weather Officer -- TBD

- News media orientation tour ----- **1:00 p.m.**

- Pre-launch News Conference ----- **3:00 p.m.**
  * Tommy Holloway, NASA Shuttle Program Manager, JSC
  * Joel Kearns, Microgravity Research Program Manager, MSFC
  * Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
  * Capt. Scott Jacobs, Launch Weather Officer, USAF 45th Weather Squadron

- Rotating Service Structure moves (press departure at **7:30 p.m.**) ----- **8:30 p.m.**

Launch Day - Tuesday, July 1

(Tanking begins at about 5:45 a.m.)

- NASA Television live launch programming begins ----- **8:00 a.m.**

- Launch of Columbia ----- **2:37 p.m.**

- Post-launch press conference ----- **L + 1 hour**
  * Loren Shriver, manager of Launch Integration for the Space Shuttle Program
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-94
(hours may be adjusted for in-flight events)

- (Launch minus 3 days) Saturday, June 28 --- **8:00 a.m. - 4:30 p.m.**
- (Launch minus 2 days) Sunday, June 29 --- **8:00 a.m. - Noon**
- (Launch minus 1 day) Monday, June 30 --- **8:00 a.m. - 7:00 p.m.**
- (Launch day) Flight day 1, Tuesday, July 1 --- **4:00 a.m. - 7:00 p.m.**
- Flight days 2-3, July 2-3 --- **8:00 a.m. - 4:30 p.m.**
- Flight day 4, July 4 --- **9:00 a.m. - 3:00 a.m. (July 5)**
- Flight days 5-6, July 5-6 --- **CLOSED**
- Flight days 7-11, July 7-11 --- **8:00 a.m. - 4:30 p.m.**
- Flight days 12-13, July 12-13 --- **CLOSED**
- Flight day 14, July 14 --- **8:00 a.m. - 4:30 p.m.**
- Flight day 15, July 15 --- **3:00 a.m. - 5:00 a.m. and 8 a.m. - 4:30 p.m.**
- Flight day 16, July 16 --- **8:00 a.m. - 4:30 p.m.**
- Flight day 17, July 17 (Landing) --- **3:30 a.m. - 4:30 p.m.**

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-94 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Saturday, June 28 ----- 8:00 a.m. - Noon
Sunday, June 29 ----- 8:00 a.m. - 2:00 p.m.
Monday, June 30 ----- 8:00 a.m. - 4:30 p.m.
Tuesday, July 1 ----- 7:00 a.m. - 1:30 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the photo and interview counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 29, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 100-97, Revision A

Notice to Editors/News Directors:
MISSION STS-94 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the July 1 launch of the Space Shuttle Columbia on Mission STS-94, the 85th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-94 NASA TV schedule for exact times.

The seven STS-94 crew members are scheduled to arrive at KSC on Saturday, June 28, at about 12:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 11 a.m. Saturday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-94 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times. Though STS-94 is a reflight of mission STS-83, new credentials still must be obtained to cover the launch from the KSC Press Site.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

KSC press releases and other information are available on the KSC PAO Home Page at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

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STS-94 BRIEFING & EVENTS SCHEDULE
(all times are EDT)
(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Saturday, June 28

- Countdown Status Briefing ----- **9:00 a.m.**
  * Doug Lyons, NASA Test Director
  * Scott Higginbotham, STS-94 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- STS-94 Flight Crew Arrival (Live on NASA TV) ----- **12:30 p.m.**

(Launch countdown begins at **3:00 p.m.**)

L-2 Days - Sunday, June 29

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Scott Higginbotham, STS-94 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

L-1 Day - Monday, June 30

- Countdown Status Briefing ----- **8:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Scott Higginbotham, STS-94 Payload Manager
  * Launch Weather Officer -- TBD

- News media orientation tour ----- **1:00 p.m.**

- Pre-launch News Conference ----- **3:00 p.m.**
  * Tommy Holloway, NASA Shuttle Program Manager, JSC
  * Joel Kearns, Microgravity Research Program Manager, MSFC
  * Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
  * Capt. Scott Jacobs, Launch Weather Officer, USAF 45th Weather Squadron

- Rotating Service Structure moves (press departure at **7:30 p.m.**) ----- **8:30 p.m.**

Launch Day - Tuesday, July 1

(Tanking begins at about 5:45 a.m.)

- NASA Television live launch programming begins ----- **8:00 a.m.**

- Launch of Columbia ----- **2:37 p.m.**

- Post-launch press conference ----- **L + 1 hour**
  * Loren Shriver, manager of Launch Integration for the Space Shuttle Program
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-94
(hours may be adjusted for in-flight events)

- (Launch minus 3 days) Saturday, June 28 --- **8:00 a.m. - 4:30 p.m.**
- (Launch minus 2 days) Sunday, June 29 --- **8:00 a.m. - Noon**
- (Launch minus 1 day) Monday, June 30 --- **8:00 a.m. - 7:00 p.m.**
- (Launch day) Flight day 1, Tuesday, July 1 --- **4:00 a.m. - 7:00 p.m.**
- Flight days 2-3, July 2-3 --- **8:00 a.m. - 4:30 p.m.**
- Flight day 4, July 4 --- **9:00 a.m. - 3:00 a.m. (July 5)**
- Flight days 5-6, July 5-6 --- **CLOSED**
- Flight days 7-11, July 7-11 --- **8:00 a.m. - 4:30 p.m.**
- Flight days 12-13, July 12-13 --- **CLOSED**
- Flight day 14, July 14 --- **8:00 a.m. - 4:30 p.m.**
- Flight day 15, July 15 --- **3:00 a.m. - 5:00 a.m. and 8 a.m. - 4:30 p.m.**
- Flight day 16, July 16 --- **8:00 a.m. - 4:30 p.m.**
- Flight day 17, July 17 (Landing) --- **3:30 a.m. - 4:30 p.m.**

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-94 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Saturday, June 28 ----- 8:00 a.m. - Noon
Sunday, June 29 ----- 8:00 a.m. - 2:00 p.m.
Monday, June 30 ----- 8:00 a.m. - 4:30 p.m.
Tuesday, July 1 ----- 7:00 a.m. - 1:30 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the photo and interview counter in the News Center.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 30, 1997
KSC Contact: Patti Phelps
KSC Release No. 127-97

TWO KSC WORKERS HONORED BY NASA ASTRONAUTS

Two NASA/KSC employees recently were presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Francis J. Merceret, Ph.D., and David L. Adcock, both of Merritt Island, were presented the award at KSC on June 17 by astronaut Pamela A. Melroy.

Merceret, who has a doctorate in atmospheric physics, is chief of the Applied Meteorology Unit. He was commended for his development of the cold weather temperature recovery algorithm which was used to ensure that no problems occur due to a cold soaked booster on cold launch countdowns of the Space Shuttle. Merceret also was applauded for his analysis of problematic radar returns. "The exceptional manner in which you have carried out your responsibilities exceeds normal requirements and demonstrates pride in your work," astronaut Melroy told him.

David L. Adcock, a gas and fluid systems engineer with the Engineering Development Directorate, was recognized for his help in problem solving and resolution of several discrepancies found during manufacturing and activation of the space station ammonia system equipment. "Additionally, your leadership ability, technical expertise and operational experience in supporting the PG-2 testing of flight simulation equipment and ground support equipment (GSE) at the Lockheed Martin plant in Denver, CO, has resulted in highly successful ammonia loadings and operations of the GSE to support this integrated effort," Melroy told him.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 30, 1997
KSC Contact: Patti Phelps
KSC Release No. 128-97

FRANCIS J. MERCERET HONORED BY NASA ASTRONAUTS

Francis J. Merceret, Ph.D., a native of Baltimore, MD, and a graduate of the Johns Hopkins University and the University of Miami, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Merceret graduated in 1961 from Baltimore (MD) City College High School. He received a bachelor's degree in physics in 1965 and a doctorate in atmospheric physics in 1972, both from Johns Hopkins University. He also earned a law degree from the University of Miami in Florida in 1976. Before joining Kennedy Space Center in 1991, he was a prosecutor in Dade County, FL. Merceret also previously won two world championships in international amateur radio competitions.

He and his wife, the former Elizabeth Carberry, live in Merritt Island, FL. They have two children.

Astronaut Pamela A. Melroy presented the award to Merceret on June 17. He is chief of the Applied Meteorology Unit.

Merceret was commended for his development of a cold weather temperature recovery algorithm for the Space Shuttle program. He also was applauded for his analysis of problematic radar returns. "The exceptional manner in which you have carried out your responsibilities exceeds normal requirements and demonstrates pride in your work," Melroy told him.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 3, 1997
KSC Contact: Patti Phelps
KSC Release No. 129-97

CLYDE F. PARRISH HONORED BY NASA ASTRONAUTS

Clyde F. Parrish, a native of Skillman, KY, and son of Margaret T. Parrish of Lewisport, KY, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Parrish graduated in 1956 from Southern High School in Louisville, KY. He earned a bachelor's degree in chemistry, math and physics from Eastern Kentucky University, Richard, KY, in 1959, and a doctorate in physical chemistry from the University of Louisville (KY) in 1962. He also did post-doctorate work at Notre Dame University in 1970.

Parrish lives in Melbourne, FL. He has two grown children.

Astronaut Pamela A. Melroy presented the award to Parrish on June 17. Parrish is a principal investigator with KSC contractor I-NET Inc. He joined the space center in 1993.

Parrish has 14 patents. A recent project was development of a new scrubber liquor system primarily used in the Space Shuttle and Titan expendable launch vehicle programs. The system converts oxidizer emissions -- one of the largest waste streams at the space center -- into fertilizer for KSC citrus trees and lawns.

"You are to be commended for your outstanding efforts and dedication over the past two years toward improving the Shuttle program by reducing not only hazardous emissions to the atmosphere but also hazardous chemical wastes, while at the same time helping to reduce the cost of Shuttle and other launch vehicle operations," Melroy told him. "Your innovative thinking in the conception of this project, your technical expertise demonstrated in the lab and field tests, and prototype development set an example for every person at KSC."

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 3, 1997
KSC Contact: Hugh Harris
KSC Release No. 130-97

KSC AND PATRICK AIR FORCE BASE PREPARE FOR JOINT BOC CONTRACT

NASA and the Air Force are partnering in a plan to increase service and lower costs for space launch customers.

Kennedy Space Center (KSC) and the 45th Space Wing (45th SW) and are seeking approval from their respective headquarters to combine U.S. Air Force and NASA base support operations at KSC, Cape Canaveral Air Station (CCAS) and Patrick Air Force Base (PAFB).

This initiative is an offshoot of the NASA/Air Force Space Command (AFSPC) Partnership Council, which was established through a Memorandum of Agreement (MOA) signed Feb. 28, 1997. A key feature of the agreement is to identify areas where increased sharing or consolidation of activities can improve support services to civil, military and commercial customers, while producing cost savings for both the Air Force and NASA. These savings -- in turn -- can be passed on to the launch customers.

The MOA provides a mechanism to develop a common strategy and vision for unified space launch initiatives by merging common core requirements and activities whenever possible. The geographic proximity of KSC, CCAS and PAFB make the potential for sharing infrastructure, identifying common-use facilities and joint contracts feasible.

KSC and 45th SW officials say a combined support services contract, with performance to commence Oct. 1, 1998, would be competitively solicited and should ultimately result in substantial future savings. The Air Force and NASA would immediately establish a joint Procurement Development Team to define the unified base support requirements for KSC, CCAS and PAFB and oversee the competition.

The solicitation, which is targeted for March 1998, would combine the tasks in the existing KSC Base Operations Contract (BOC) held by EG&G Florida, Inc. with those functions contemplated by the Air Force Base Support Contract Request for Proposal (RFP). Those functions include a full-range of base support services, such as facility operations and maintenance, security, fire protection and roads and grounds maintenance.

The Air Force requirement was synopsized in March 1997 and will be canceled pending the issuance of an RFP for the combined effort.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 4, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 131-97

ROAD CONSTRUCTION ON NASA CAUSEWAY TO DISRUPT TRAFFIC

A major road construction project at Kennedy Space Center is scheduled to begin Monday, July 7. The project will completely close for about 30 days both westbound lanes of the NASA Causeway (SR 405) between the bridge over the Kennedy Parkway (SR 3) and the entrance to the KSC Visitors Center.

Paving and repaving work is expected to take place during the daylight hours, seven-days a week, forcing the complete closure of these westbound lanes for the 30 day period beginning Monday.

Though two-way traffic will be allowed in the eastbound lanes for the duration of the project, lengthy delays can be expected by both westbound and eastbound travelers, especially during peak traffic hours in the mornings and afternoons as KSC employees travel to and from work.

Due to this disruption in traffic flow, it is highly recommended that vehicles without official business at KSC avoid this construction area if at all possible.

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STS-85
Discovery
Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-2 (CRISTA-SPAS-2)

KSC Release No. 132-97
July 1997

STS-85 images

The STS-85 mission will feature the deployment and retrieval of the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite-2 (CRISTA-SPAS-2). It is also the first flight of a prototype robotic arm designed for the Japanese Experiment Module (JEM) on the International Space Station. In addition, a wide variety of astronomical, new technology and biological experiments will round out the 11-day mission. The Space Shuttle Discovery is scheduled to begin the sixth mission of the year with a mid-morning liftoff from Launch Pad 39A at the beginning of a 1-hour, 41-minute-long launch window. The orbiter will circle the Earth at an altitude of 184 statute miles at an attitude of 57 degrees to the equator. Once in orbit, the six-member crew will conduct the 19 experiments in Discovery's payload bay as well as 10 in-cabin scientific investigations. The 86th Space Shuttle mission is scheduled to end with an early-morning touchdown at Kennedy Space Center's Shuttle Landing Facility.

The Crew

Mission Commander Curtis L. Brown Jr., (Lt. Col., USAF) is on his fourth space flight, having served as pilot of STS-47, STS-66 and STS-77. A test pilot, he has more than 5,000 hours of flight time in jet aircraft.

Pilot Kent V. Rominger (Cdr., USN) is on his third Shuttle mission in this capacity, having previously flown on STS-73 and STS-80. He holds a master's degree in aeronautical engineering and has more than 4,500 hours of flight time and 685 carrier landings.

Payload Commander N. Jan Davis (Ph.D.) has logged nearly 400 hours in space on STS-47 and STS-60. She holds a doctorate in mechanical engineering. During STS-85, Davis will deploy and retrieve the CRISTA-SPAS and operate the prototype Japanese robotic arm.

Mission Specialist Robert L. Curbeam Jr. (Lt. Cdr., USN) is a former radar intercept officer and holds a master's degree in aeronautical engineering. He was selected as an astronaut in 1994 and is one of the three space rookies on this mission.

Mission Specialist Stephen K. Robinson (Ph.D.) has been a NASA employee since 1975 and has worked at NASA's

Ames and Langley Research Centers. He holds a doctorate in mechanical engineering and is a licensed pilot.

Payload Specialist Bjarni V. Tryggvason is a Canadian Space Agency (CSA) astronaut. He has been the principal investigator of the Microgravity vibration Isolation Mount (MIM) now flying on the Russian Mir space station. He will conduct MIM and fluid physics experiments during STS-85.

CRISTA-SPAS-2

The CRISTA-SPAS-2 is the fourth mission in the Astronomy (ASTRO)-SPAS program, a cooperative venture between the German Space Agency (DARA) and the NASA Office of Space Science and Applications. The free-flying satellite is made up of the SPAS carrier and the CRISTA payload. The SPAS serves as the support system for the CRISTA instruments and has its own rotational attitude and cold gas propulsion systems. The CRISTA is a system of three telescopes and four spectrometers designed to measure infrared radiation emitted by the Earth's middle atmosphere. Also onboard the free-flying satellite will be the **Middle Atmosphere High Resolution Spectrograph Investigation (MAHRSI)** to measure ultraviolet radiation emitted and scattered by the Earth's atmosphere. Two other experiments, the **Mini-Dual Earth Sensor (MiDES)** and the **Interferometry Program Experiment-II (IPEX-II)** are also mounted on the SPAS. The CRISTA-SPAS-2 will be deployed by Davis on Flight Day 1 and be retrieved on Flight Day 9.

Other Payload Bay Experiments

Manipulator Flight Demonstration (MFD) -- The MFD experiment is sponsored by the Japanese Space Agency (NASDA). It is designed to test the operational capability of the Japanese Experiment Module Remote Manipulator System (JEM RMS) Small Fine Arm (SFA), which is atop its Multi-Purpose Experiment Support Structure (MPESS) carrier that will serve as a platform in the payload bay for the robotic arm experiment. The newly designed dexterous robot arm, which will be a part of the JEM element of the International Space Station, will be operated by Davis from the orbiter's aft flight deck. Two other experiments also will be mounted on the MPESS. The **Two-Phase Fluid Loop Experiment (TPFLEX)** is a heat transport system that will measure the heat transfer characteristics of this technology under microgravity conditions. The **Evaluation of Space Environment and Effects on Materials Experiment (ESEM)** will test solar cell glass and other materials in the space environment while a cosmic dust collector gathers samples.

Technology Applications and Science-1(TAS-1) -- The TAS-1 holds seven separate experiments mounted on a Hitchhiker MPESS that will provide data on the Earth's topography and atmosphere, study the sun's energy, and test new thermal control devices, as well as several student-developed experiments. The **Shuttle Laser Altimeter-2 (SLA-2)** will demonstrate laser altimeter operations in Earth orbit. It will be a testbed for such sensors and measure the height of clouds, cloud structure and aerosol layering. The **Critical Viscosity of Xenon (CVX)** experiment will measure the viscosity of this element at temperatures closer to its liquid-vapor critical point than can be done on Earth. The **Two Phase Flow** thermal control experiment will demonstrate and characterize flight operation of a capillary pumped loop with advanced features and components. The **Cryogenic On-Orbit Long-Life Active Refrigerator (COOLLAR) Flight Experiment (CFE)** will test the operation of an engineering development model of a cryogenic cooler. **The Infrared Spectral Imaging Radiometer (ISIR)** will measure infrared radiation emitted from cloud tops in the Earth's atmosphere. It will also serve as a testbed for a new type of detector and measure cloud and aerosol layers. The **Solar Constant Experiment (SOLCON)** will measure the amount of the Sun's energy that reaches the Earth and identify variations that occur during a solar cycle. The **Space Experiment Module (SEM)** is a canister on the MPESS that contains 10 separate modules, each containing a separate experiment designed and constructed by students. This payload is part of a NASA initiative to increase educational access to space.

International Extreme Ultraviolet Hitchhiker-2 (IEH-2) -- Four IEH-2 experiments will study ultra-violet radiation from stars, the sun and other sources in the solar system. The **Solar Extreme Ultraviolet Hitchhiker (SHE)** will study fluxes in extreme and far ultraviolet wavelengths from solar system objects and space. The **Ultraviolet Spectrograph for Astronomical Research (UVSTAR)** will record extreme ultraviolet fluxes from Jupiter and other celestial objects, including the comet Hale-Bopp. The **Shuttle GLO** experiment will be used to study Shuttle glow phenomena and ultraviolet emissions of the Earth's limb. **The Distribution and Automation Technology Advancement -- Colorado**

Hitchhiker and Student Experiment of Solar Radiation (DATA-CHASER) will obtain soft X-rays and far ultraviolet emissions from the Sun.

In-Cabin Experiments

The **Southwest Ultraviolet Imaging System (SWIUS)** is a 7-inch imaging telescope that will be pointed out the orbiter's windows by the crew primarily to observe the Hale-Bopp comet. **The Bioreactor Demonstration System (BDS)** is a part of the Johnson Space Center's Medical Sciences Division Bioreactor program. The **Biotechnology Specimen Temperature Controller (BSTC)** is a cell culture incubator that will ultimately lead to the use of microgravity to engineer tissues from individual cells. This investigation will confirm the procedures necessary to conduct cell biology experiments on orbit and investigate the assembly of cardiac and smooth muscle cells in microgravity. Tissue engineering will also be researched in the **Engineering Development Unit #1 Reflight (EDU-1R).**

KSC Shuttle and Payloads Processing

Discovery's last spaceflight was STS-82, the second Hubble Space Telescope servicing mission. Launch took place on Feb. 11, 1997, with landing on Feb. 21 at KSC. The orbiter was then moved to Orbiter Processing Facility 2. Discovery rolled out to Launch Pad 39A for the STS-85 mission on July 14. The CRISTA-SPAS-2 payload was processed in the Multi-Payload Processing Facility, while the TAS-1 and IEH-2 payloads underwent final assembly and checkout in the Space Station Processing Facility. All three payloads were transported to the pad July 10 for installation into Discovery's payload bay.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 10, 1997
KSC Contact: George H. Diller
KSC Release No. 133-96, Rev. A

SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

Weather "outlooks" which are provided by the Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days. These include weather trends, and their possible effects on launch day.

For the Space Shuttle, a formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

During the countdown, formal weather briefings occur approximately as follows:

L-24 hr 0 min	Briefing for Flight Director and astronauts
L-21 hr 0 min	Briefing for removal of Rotating Service Structure
L-9 hr 00 min	Briefing for external tank fuel loading
L-4 hr 30 min	Briefing for Space Shuttle Launch Director
L-3 hr 55 min	Briefing for astronauts
L-2 hr 10 min	Briefing for Flight Director
L-0 hr 35 min	Briefing for launch and RTLS
L-0 hr 13 min	Poll all weather constraints

Launch weather forecasts, ground operations forecasts, and briefings for the Launch Director and Mission Management Team are prepared by the U.S. Air Force Range Weather Operations Facility at Cape Canaveral Air Station. The RTLS, emergency landing and end of mission forecasts, briefings to the Flight Director and the astronauts are prepared by the NOAA National Weather Service Space Flight Meteorology Group at the Johnson Space Center in Houston.

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.

b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	**Relative Humidity**				
(kts)	0-64%	65-74%	75-79%	80-89%	90-100%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 34 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 20 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.

- Launch will not occur if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch, unless the source of lightning has moved more than 10 nautical miles away from the pad or the flight path.

- The one-minute average of the electric field mill network, used to measure electric fields, shall not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad at any time within 15 minutes prior to launch.

The above rule need not apply if the following two conditions are observed to exist:

1. There are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.

2. A known source of electric fields such as ground fog or smoke that is occurring near the field mill which has been previously determined and documented to be benign is clearly causing the elevated readings.

Clouds: (types known to contain hazardous electric fields)

- The Space Shuttle may not be launched if the planned flight path is through a layer of clouds with a thickness of 4,500 feet or greater where the temperature of any part of the layer is between 32 degrees F. and -4 degrees F.

- The Space Shuttle may not be launched if the planned flight path is through a cumulus type cloud with its top between the 41 degrees F. temperature level and 23 degrees F. temperature. Launch may occur if: 1) the cloud is not producing precipitation; 2) the distance from the furthest edge of the cloud top to at least one operating field mill is less than the altitude at the 23 degree F temperature level or 3 nautical miles, whichever is less; 3) field mill readings within five nautical miles of the flight path must be between -100 volts per meter and +1000 volts per meter.

- The Space Shuttle may not be launched through 1) cumulus type clouds with tops higher than the 23 degree F. temperature level; 2) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 3) through or within 10 nautical miles of the nearest edge of any cumulonimbus or thunderstorm cloud including nontransparent parts of its anvil; 4) through or within 10 nautical miles of the nearest edge of a nontransparent detached anvil cloud for the first hour after detachment from the parent thunderstorm or cumulonimbus cloud.

- The Space Shuttle may not be launched if the flight path is through any clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation within five nautical miles of the flight path.

- The Space Shuttle may not be launched if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected or observed.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				**July**			
Temp	**Low**	**Avg**	**High**	**Temp**	**Low**	**Avg**	**High**
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8, 000 feet. This requirement may be satisfied using optical tracking sites or a forward observer

- For cloud ceilings of any thickness between 6, 000 feet and 8, 000 feet the following conditions must be met for launch to occur:

a.) the vehicle integrity can be observed without interruption through 6, 000 feet.

b.) all required Range Safety instrumentation is functioning properly

c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4, 000 feet and 6, 000 feet the following conditions must be met for launch to proceed:

a.) the thickness of the clouds must be less than 500 feet

b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8, 000 feet

c.) all required Range Safety instrumentation is functioning properly

d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A "Good Sense Rule" is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTLS), landings at the Trans- Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTLS with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA, TAL and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required.

- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability .

- For the RTLS site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.

- An RTLS rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:

a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels within and below the clouds.

b.) Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading

alignment circles are clear of showers.

c.) The movement of the showers is observed to be consistent and no additional convective development is forecast.

d.) Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.

- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.

- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.

- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.

- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.

- Headwind not to exceed 25 knots.

- Tailwind not to exceed 10 knots average, 15 knots peak.

- Turbulence conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

All criteria refer to observed and forecast weather conditions. At decision time for the deorbit burn 90 minutes before landing the weather conditions must be:

- Cloud coverage of 4/8 or less below 10,000 feet and a visibility of 5 miles or greater is required.

- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day and night.

- Headwind cannot exceed 25 knots

- Tailwind cannot exceed 10 knots average, 15 knots peak

- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.

- Vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.

- Turbulence must be less than or equal to moderate intensity.

- The Flight Director must consider a possible "no go" to landing if at the deorbit burn decision time there are observed to be scattered cloud layers below 10,000 feet with greater than 2/8 sky coverage but not exceeding 4/8 sky coverage. Cloud conditions greater than 4/8 sky coverage below 10,000 feet constitute a cloud ceiling and is therefore "no go."

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

-Radar: Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radars. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.

-Field Mill Network: Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.

-Lightning Detection System: Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.

-Lightning Detection And Ranging (LDAR): Developed by the NASA Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.

-National Lightning Detection Network: Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.

-Rawinsonde: A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.

-Jimsphere balloon: A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.

-Doppler Radar Wind Profiler: Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.

-Rocketsonde: A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and 370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

-Satellite Images and Data: Provided directly to the satellite terminal at USAF Range Weather Operations and

NOAA National Weather Service Spaceflight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.

-Meteorological Interactive Data Display System (MIDDS): Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.

-Towers: 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short- term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.

-Buoys: Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.

-Solid Rocket Booster Retrieval Ships: These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.

-Weather Reconnaissance Aircraft: A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

July 16, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 133-97

COLUMBIA SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-94

The orbiter Columbia is scheduled to land at Kennedy Space Center on Thursday, July 17 at 6:47 a.m. EDT completing its16-day STS-94 mission which was launched from KSC on July 1.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 251 at a mission elapsed time of 15 days, 16 hours, 45 minutes. Deorbit burn will occur at about 5:44 a.m. Thursday.

The two KSC landing opportunities on Thursday are: 6:47 a.m. and 8:22 a.m. EDT. The two landing opportunities available at KSC on Friday are: 6:45 a.m. and 8:19 a.m. EDT.

If a landing is not possible at KSC due to weather on Thursday or Friday, managers will keep Columbia in orbit the additional time rather than land at Edwards Air Force Base, CA. No landing support is being called up for Edwards until Saturday at the earliest.

This landing of Columbia will mark the 38th landing at KSC in the history of Space Shuttle flight. It will be the fifth landing of the Shuttle at KSC this year.

Four to six hours after landing at KSC, select members of the flight crew will be present for a post-mission press conference. The conference will be held at the KSC Press Site TV auditorium and carried live on NASA TV.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Columbia July 1. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC the day after landing.

If Columbia lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About four hours after Columbia lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Operations in OPF bay 2 will be made to prepare Columbia for its next mission, STS-87, scheduled for launch in November.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 17, 1996
KSC Contact: Patti Phelps
KSC Release No. 134-97

RAVI MARGASAHAYAM HONORED BY NASA ASTRONAUTS

Ravi N. Margasahayam, a resident of Windermere, FL, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

A native of Bombay, India, Margasahayam attended schools there. He received a bachelor's degree in 1975 from the R.V. College of Engineering in Bangalore, India, and a master's in mechanical/aerospace engineering in 1978 from the Illinois Institute of Technology in Chicago, IL. He earned a master's in business administration from Widener University in Pennsylvania in 1990.

He and his wife, Jayanthi, have one child.

Astronaut Pamela A. Melroy presented the award to Margasahayam on June 17. Margasahayam is a principal investigator and engineer with I-NET Inc. He joined the space center in 1989.

Margasahayam was commended for his engineering excellence and outstanding leadership in the development of liquid oxygen pump predictive maintenance techniques, Space Shuttle floodlight coolant system testing support, and ongoing Shuttle launch acoustics analysis. "These efforts characterize your never-ending quest to enhance the efficiency and safety of Shuttle operations," Melroy told him. "Your efforts to vocally promote the benefits of the human space flight program at your numerous international conferences and forums are indicative of your dedication to your work.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 16, 1997
KSC Contact: Lisa Malone
KSC Release No. 135-97

Note to Editors/News Directors:
FLORIDA LT. GOV. TO PRESENT KSC AWARD FOR APOLLO/SATURN V CENTER, HOLD AEROSPACE INDUSTRY FORUM

Lt. Governor Buddy MacKay will present Kennedy Space Center with the 1997 Governor's Space Leadership Award on Friday, July 18 at 2 p.m. at the Apollo/Saturn V Center to recognize the partnership effort with the State of Florida that enabled construction of the new facility.

Following the award, MacKay will meet with local aerospace industry leaders in an economic development forum to discuss the future of Florida's aerospace industry. In attendance will be local private sector leaders, KSC management and Space Coast elected officials.

MacKay stated, "We have designated aerospace as one of Florida's critical economic development sectors that will be the focus of our state's resources and attention. I know that the increased opportunity in commercial space and the changes in federal policy mean that industry decisions will determine whether we succeed in expanding current operations and attracting new opportunities. This meeting is part of our ongoing dialog that is generating new state initiatives to capture new economic opportunities, and create a more prosperous future for Florida."

KSC Director Roy Bridges, Jr., said, "I believe it is very important to the success of the space program's future that all aerospace partners in the government and industry work together as a team. We have some exciting projects and initiatives in the mill and I'm confident we will all come out winners."

News media representatives must be at the Kennedy Space Center News Center by 1:15 p.m. Friday for escort to the Apollo/Saturn V Center. Those media needing press credentials should call 867-2468 to make arrangements.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

July 17, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 136-97

TCDT MEDIA OPPORTUNITY WITH STS-85 CREW SET FOR NEXT WEEK

The crew of Space Shuttle mission STS-85 will be at Kennedy Space Center early next week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cutoff. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The six-member crew of mission STS-85 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 5 p.m. Sunday, July 20. No photo opportunity is scheduled for this event.

On Tuesday, July 22, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39A. Media interested in participating in this question and answer session should be at the KSC Press Site by 12:30 p.m. Tuesday for transport to the pad.

On Wednesday, the crew will take part in simulated launch day events, including entering the orbiter Discovery fully suited for the simulated main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Discovery is now targeted for launch on Aug. 7 at 10:41 a.m. EDT. Mission STS-85 will feature the deployment and retrieval of the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite (CRISTA-SPAS). The mission is scheduled to last 11 days.

Crew members for mission STS-85 are: Commander Curtis Brown, Pilot Kent Rominger, Mission Specialists Jan Davis, Robert Curbeam and Stephen Robinson, and Payload Specialist Bjarni Tryggvason of the Canadian Space Agency.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 1, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 138-97

SPACE SHUTTLE MISSION STS-85 LAUNCH COUNTDOWN TO BEGIN AUG. 4

NASA will begin the countdown for launch of Space Shuttle Discovery on the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere (CRISTA-SPAS) mission on Aug. 4 at 3 p.m. at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center.

The countdown includes 24 hours and 41 minutes of built-in hold time leading to the opening of the launch window at 10:41 a.m. (EDT) on Aug. 7. The launch window extends for 1 hour, 39 minutes.

STS-85 is the sixth Space Shuttle mission of 1997. This will be the 23rd flight of the orbiter Discovery and the 86th flight overall in NASA's Space Shuttle program. STS- 85 is scheduled to last 10 days, 20 hours, 24 minutes and end with a planned KSC landing at 7:05 a.m. on Aug. 18.

Discovery was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 2 on July 7 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building the following day. The Shuttle stack was then transported to Pad 39A on July 14.

The STS-85 crew are: Commander Curtis Brown, Pilot Kent Rominger, Mission Specialists Jan Davis, Robert Curbeam and Stephen Robinson, and Payload Specialist Bjarni Tryggvason of the Canadian Space Agency.

The crew is scheduled to arrive at KSC at about 5 p.m., Monday, Aug. 4. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES
*all times are Eastern

Launch - 3 Days (Monday, August 4)

- Prepare for the start of the STS-85 launch countdown
- Perform the call-to-stations (2:30 p.m.)
- All members of the launch team report to their respective consoles in Firing

Room 3 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (3 p.m.)
- Start preparations for servicing fuel cell storage tanks
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Discovery's general purpose computers
- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms

Launch - 2 Days (Tuesday, August 5)

- Close payload bay doors for flight

Enter first planned built-in hold at T-27 hours for duration of four hours (7 a.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (11 a.m.)

- Begin operations to load cryogenic reactants into Discovery's fuel cell storage tanks (11 a.m. - 7 p.m.)

Enter four-hour built-in hold at T-19 hours (7 p.m.)

- After cryogenic loading operations, re-open the pad
- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Resume countdown (11 p.m.)

Launch-1 Day (Wednesday, August 6)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Install mission specialists' seats in crew cabin
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 21 minutes (7 a.m.)

- Begin startracker functional checks
- Activate the orbiter’s flight controls and navigation systems
- Install film in numerous cameras on the launch pad
- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Activate orbiter's inertial measurement units
- Complete flight crew equipment late stowage
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down
- Move Rotating Service Structure (RSS) to the park position (4:30 p.m.)

Resume countdown (8:21 p.m.)

- Complete pad close-outs for launch
- Start fuel cell flow-through purge
- Perform pre-ingress switch list
- Activate the orbiter's fuel cells

Launch Day (Thursday, August 7)

- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Discovery's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (1:21 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 1:50 a.m.)

Resume countdown (2:21 a.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 4:50 a.m.)
- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines

Enter planned two-hour built-in hold at T-3 hours (5:21 a.m.)

- Close-out crew and Final Inspection Team proceed to Launch Pad 39A

Resume countdown at T-3 hours (7:21 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 7:26 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 7:56 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Discovery's crew hatch (about 9:11 a.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (10:01 a.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (10:11 a.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (10:22 a.m.)
(This is the last planned built-in hold. Other hold options are available if necessary.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 10:32 a.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-5:30)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-85			
T-TIME	**LENGTH OF HOLD**	**HOLD BEGINS**	**HOLD ENDS**
T-27 hours	4 hours	7 a.m. Tues.	11 a.m. Tues.
T-19 hours	4 hours	7 p.m. Tues.	11 p.m. Tues.
T-11 hours	13 hours, 21 minutes	7 a.m. Wed.	8:21 p.m. Wed.
T-6 hours	1 hour	1:21 a.m. Thurs.	2:21 a.m. Thurs.
T-3 hours	2 hours	5:21 a.m. Thurs.	7:21 a.m. Thurs.
T-20 minutes	10 minutes	10:01 a.m. Thurs.	10:11 a.m. Thurs.
T-9 minutes	10 minutes	10:22 a.m. Thurs.	10:32 a.m. Thurs.

CREW FOR MISSION STS-85	
POSITION	**NAME**
Commander (CDR)	Curtis Brown
Pilot (PLT)	Kent Rominger
Mission Specialist (MS1)	Jan Davis
Mission Specialist (MS2)	Robert Curbeam
Mission Specialist (MS3)	Stephen Robinson
Payload Specialist (PS1)	Bjarni Tryggvason

SUMMARY OF STS-85 LAUNCH DAY CREW ACTIVITIES Thursday, August 7	
TIME	**ACTIVITY**
5:46 a.m.	Wake up
6:16 a.m.	Breakfast
***6:16 a.m.**	**Crew Photo (All)**
6:46 a.m.	Weather briefing (CDR, PLT, MS2)
6:46 a.m.	Don launch and entry suits (MS1, MS3, PS1)
6:56 a.m.	Don launch and entry suits (CDR, PLT, MS2)
***7:15 a.m.**	**Crew suiting photo**
***7:26 a.m.**	**Depart for launch pad 39A**
***7:56 a.m.**	**Arrive at white room and begin ingress**
***9:11 a.m.**	**Close crew hatch**
***10:41 a.m.**	**Launch**

*Televised events (times may vary slightly)
All times Eastern

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 8, 1997
KSC Contact: George H. Diller
KSC Release No. 139-97

Note to Editors/News Directors:
ACE SPACECRAFT MEDIA OPPORTUNITY SCHEDULED AT KSC AUG. 12

NASA's Advanced Composition Explorer (ACE), to be launched aboard a Delta rocket from Cape Canaveral later this month, is the subject of a news media opportunity on Tuesday, Aug. 12 at 12:30 p.m.

ACE is a spin-stabilized spacecraft having a combination of nine sensors and instruments. Spinning at five revolutions per minute, it will investigate the origin and evolution of solar phenomenon, the formation of solar corona, solar flares and the acceleration of the solar wind. The spacecraft will orbit the Libration Point, a location 900,000 miles from Earth where the gravitational effects of the Sun and Earth are balanced. ACE will be able to give scientists information about the effect of the Sun on the near-Earth environment, as well as interplanetary space while also providing clues about the lifestyle of similar stars.

Media representatives will be taken inside the clean room at the SAEF-2 spacecraft checkout facility located in the KSC Industrial Area. Those planning to attend are requested to wear long pants and closed-toe shoes. Clean room attire will be provided. Quality control personnel will request cleaning of photographic equipment with alcohol wipes which also will be provided. No suede, leather or vinyl attire or accessories will be permitted in the clean room and ladies are asked not to wear makeup. Special plastic bags will be provided for photographic accessories.

No food, chewing gum, tobacco, lighters, matches, or pocket knives will be permitted inside the clean room. Electronic flash photography is permitted. The lighting in the facility is mercury vapor.

Spacecraft spokespersons available for questions and interviews will be:

- Don Margolies, ACE Mission Manager, Goddard Space Flight Center, MD
- John Thurber, Observatory Manager, Goddard Space Flight Center, MD
- Mary Chiu, Spacecraft Program Manager, Johns Hopkins University, Applied Physics Laboratory, Baltimore, MD

Departure from the KSC News Center for SAEF-2 will be at 12:30 p.m., Tuesday, Aug. 12. Those attending will be returned to the press site by 2:30 p.m.

Media requiring accreditation should contact the KSC News Center at 407/867-2468 by the close of business Monday, Aug. 11. STS-85 mission badges will be

honored for this event.

ACE, aboard a Boeing Delta II rocket, is currently scheduled for launch on Aug. 25 at the opening of a launch window which extends from 10:39 - 11:05 a.m. Liftoff will occur from Pad A at Launch Complex 17 on the Cape Canaveral Air Station.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 15, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 140-97

Attention: Business editors
OCT. 29 SET FOR 8th ANNUAL KSC SMALL BUSINESS EXPO

KSC's Small Business Council along with the 45th Space Wing and the Canaveral Port Authority are enlisting large and small businesses alike to take part in the 8th Annual Kennedy Space Center and 45th Space Wing Business Opportunities Expo on Oct. 29. This is a once a year opportunity for businesses of all sizes to present their capabilities to buyers and engineers from KSC, Patrick Air Force Base, and other government organizations.

Approximately 200 exhibitors and 1000 attendees are expected to fill Port Canaveral's Cruise Terminal 10 on Oct. 29 at the Expo. Exhibitors also will be able to network with major players from the Space Coast's business community. NASA, the Small Business Administration, the Air Force and prime contractors are a few of the groups that will provide one-on-one counseling to expo participants and visitors.

"While this is our 8th Expo, it is the first one that includes the 45th Space Wing as a co-sponsor," said David A. Wansley, KSC's Small Business Specialist. "This is truly a unique opportunity for the area's businesses to meet on this scale with the major government agencies in Brevard County and their prime contractors."

The KSC Small Business Council is accepting exhibitor applications until Aug. 27. A registration fee of $100 includes an eight-foot tabletop display, a continental breakfast and a box lunch. To receive an exhibitor application, company representatives should fax their company name, address, point of contact and phone number to (407) 867-7999.

For additional information call the NASA Central Industry Assistance Office at (407) 867-7353.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 15, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 141-97

DISCOVERY SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-85

The orbiter Discovery is scheduled to land at Kennedy Space Center on Monday, Aug. 18 at 7:14 a.m. EDT completing its 11-day STS-85 mission which was launched from KSC on Aug. 7.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 174 at a mission elapsed time of 10 days, 20 hours, 33 minutes. Deorbit burn will occur at about 6:17 a.m. Monday.

If a landing is not possible at KSC on Monday due to weather, managers will likely keep Discovery in orbit an additional day rather than land at Edwards Air Force Base, CA. No landing support is being called up for Edwards until Tuesday at the earliest.

The single KSC landing opportunity on Tuesday is at 7:08 a.m. EDT. The single Edwards Air Force Base, CA, landing opportunity on Tuesday is at 10:09 a.m.

This landing of Discovery will mark the 39th landing at KSC in the history of Space Shuttle flight. It will be the sixth landing of the Shuttle at KSC this year.

Four to six hours after landing at KSC, select members of the flight crew will be present for a post-mission press conference. The conference will be held at the KSC Press Site TV auditorium and carried live on NASA TV.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Discovery Aug. 7. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC later in the afternoon following landing.

If Discovery lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 3 1/2 hours after Discovery lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 3 for post-flight deservicing. Operations in OPF bay 3 will be made to prepare Discovery for its next mission, STS-91, scheduled for launch in May, 1998.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 18, 1997
KSC Contact: George H. Diller
KSC Release No. 142-97

Note to Editors/News Directors:
CASSINI/HUYGENS MEDIA EVENT TO BE HELD AT KSC AUG. 22 DIGITAL VERSATILE DISK WITH PUBLIC SIGNATURES TO BE ATTACHED

NASA's Cassini spacecraft, due for launch toward the planet Saturn in early October, is the subject of a news media event on Friday, Aug. 22 at 9:30 a.m. Cassini will deploy the European Space Agency's instrumented probe called "Huygens" to the Saturnian moon Titan, itself the size of a small planet.

Media representatives will be taken to the Payload Hazardous Servicing Facility (PHSF) located in the KSC Industrial Area. While media are in the facility high bay, a Digital Versatile Disk (DVD) will be ceremoniously attached to the spacecraft. A high-tech equivalent of a message in a bottle, Cassini's DVD digitally contains a collection of 616,000 signatures of citizens from the United States and 80 foreign nations.

Before entering the PHSF, media must submit to a routine security search of camera and utility bags. Due to extensive clean room requirements, media planning to attend are requested to wear long pants and closed-toe shoes, and dress in clean room attire (bunny suits) which will be provided. No suede, leather or vinyl attire or accessories are permitted. Ladies are asked not to wear makeup.

Quality control personnel will request cleaning of photographic equipment with alcohol wipes which will be provided. Special plastic bags will be provided for photographic accessories. No food, chewing gum, tobacco, lighters, matches, or pocket knives will be permitted inside the clean room. Also, no cellular telephones or transceiver type radio equipment can be allowed.

Electronic flash photography is permitted. The lighting in the facility is high pressure sodium (orange).

Spokespeople from the Jet Propulsion Laboratory and the European Space Agency will be available for questions and interviews about the Cassini mission, the spacecraft and the attached Huygens probe. They will include:

- Richard J. Spehalski, Cassini Program Manager, Jet Propulsion Laboratory
- Charles E. Kohlhase, Cassini Science and Mission Design Manager, Jet Propulsion Laboratory
- Dr. Hamid Hassan, Huygens Project Manager, European Space Agency

A Huygens probe principal investigator will also be in attendance.

Media needing accreditation should contact the NASA-KSC News Center at 407/867-2468 by the close of business Thursday, Aug. 21. Departure from the KSC News Center for the PHSF will be at 9:30 a.m. on Friday, Aug. 22. This is the only opportunity for the media to photograph the Cassini spacecraft in its launch configuration.

The Cassini spacecraft is scheduled for launch aboard an Air Force Titan IV rocket from Cape Canaveral Air Station, Complex 40 on Oct. 6 at 5:38 a.m. EDT. This will begin Cassini's 6.7 year journey to the outer solar system. Arrival at Saturn is projected to occur on July 1, 2004. During the four-year mission it will complete 74 orbits of Saturn touring

the planet and its moons.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 19, 1997
KSC Contact: George Diller
KSC Release No. 143-97

ADVANCED COMPOSITION EXPLORER TO BE LAUNCHED AUG. 24

Advanced Composition Explorer (ACE) images

The launch of NASA's Advanced Composition Explorer (ACE) aboard a Boeing Delta II rocket is scheduled for Aug. 24. Liftoff is targeted to occur at the opening of a launch window which extends from 10:41 - 11:06 a.m. EDT, a duration of 25 minutes. Launch will occur from Pad A at Complex 17 on Cape Canaveral Air Station.

ACE, built for NASA by the Johns Hopkins University Applied Physics Laboratory, is a spin-stabilized spacecraft having a combination of nine sensors and instruments. Spinning at five revolutions per minute, it will sample the steady stream of accelerated particles originating from the Sun and from other galactic and interstellar sources that constantly bombard the Earth in an effort to learn more about the origin of matter. The spacecraft will orbit the Libration Point, a location 900,000 miles from Earth where the gravitational effects of the Sun and Earth are balanced. ACE will give scientists information about the formation of solar corona, solar flares, the acceleration of the solar wind and the Sun's effect on the near-Earth environment.

There are also two secondary investigations on the satellite itself. The Real Time Solar Wind Monitor for the National Oceanic and Atmospheric Administration (NOAA) will provide continuous "space weather" information that can give limited advance warning of geomagnetic storms. The Spacecraft Loads and Acoustics Monitor for the Goddard Space Flight Center is a research and development payload which will monitor the sound characteristics a spacecraft experiences within the rocket's nose fairing environment during launch.

ACE Prelaunch News Conference

The prelaunch news conference will be held at the NASA News Center at KSC on Saturday, Aug. 23 at 11 a.m. EDT. Participating in the briefing will be:

- Ray Lugo, Assistant NASA Launch Manager, Kennedy Space Center
- Bruce Clark, Launch Vehicle Manager, NASA Goddard Space Flight Center
- Rich Murphy, Flight Director, The Boeing Company
- Donald Margolies, ACE Mission Director, Goddard Space Flight Center
- Dr. Ed Stone, ACE Principal Investigator, Jet Propulsion Laboratory
- Joel Tumbiolo, Launch Weather Officer, 45th Weather Squadron, USAF

A post-launch news conference is not planned, however NASA Television coverage will continue until spacecraft separation from the Delta rocket has been confirmed and the health of the spacecraft has been determined.

Launch Day Press Coverage

On launch day, media covering the event should assemble at the Gate 1 Pass and Identification Building on Cape Canaveral Air Station located on State Road 401. **The convoy to Press Site 1 will depart at 9:15 a.m.**

Those who wish to cover the prelaunch news conference and the launch of ACE should send a letter of request on news organization letterhead. Include the names and Social Security numbers of those desiring accreditation. Letters should be faxed to 407/867-2692 or may be addressed to:

ACE Launch Accreditation
NASA AB-A
Kennedy Space Center, FL 32899

ACE mission badges may be picked up at the KSC News Center beginning on Thursday, Aug. 21. Badges may also be obtained on launch day at the Gate 1 Pass and Identification Building starting at 9 a.m. To obtain a badge, proper media identification must be presented, or a letter requesting accreditation should be sent in advance to the KSC News Center.

On launch day, an ACE mission badge is required for all media covering the launch from Press Site 1. No other badges can be honored.

Remote Camera Placement

On Saturday, Aug. 23 at 11:30 a.m. or immediately following the prelaunch news conference, a bus will depart from the NASA-KSC News Center for Complex 17 for media photographers who wish to establish remote cameras at the pad. There will be no access or transportation for remotes from Gate 1.

News Center Hours for Launch

On L-1 day, the NASA News Center at KSC will open for the prelaunch news conference at 10 a.m. and will close at 1 p.m. On launch day, the News Center will open at 8 a.m. and will remain open through conclusion of coverage on NASA Television.

NASA Television Coverage

NASA Television will carry live the Delta/ACE Prelaunch News Conference on Saturday, Aug. 23 starting at 11 a.m. On launch day, August 24, launch commentary will begin at 9 a.m. EDT and continue until a successful mission can be confirmed which will be approximately 90 minutes after launch. NASA Television is available on the GE-2 satellite, Transponder 9C, located at 85 degrees West.

Audio only of the prelaunch press conference and the launch coverage will be carried on the NASA "V" circuits which may be accessed by dialing 407/867-1220...1240...1260.

Status Reports

Recorded status reports on the launch of ACE will be available on the KSC news media codaphone starting on Friday, Aug. 22. The telephone number is 407/867-2525.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 19, 1997
KSC Contact: Joel Wells
KSC Release No. 144-97

Attention Business And Technology Editors/News Directors:
NASA/INDUSTRY TEAM SCORES BIG WITH DUAL-USE TECHNOLOGY

A partnership between Kennedy Space Center, the State of Florida and manufacturer L-3 Communications Telemetry & Instrumentation will deliver a new system that enhances Shuttle launch preparations and promises commercial applications as well. On Aug. 22 at the KSC Visitor Complex, L-3 Communications will present the finished product to KSC Director Roy Bridges and other managers.

The new Automated Data Acquisition System (ADAS) will save up to 20,000 man-hours per year while monitoring temperature, pressure and vibration measurements at KSC's Shuttle launch pads. Before ADAS, when test engineers needed to reset Shuttle sensors they also had to manually re-adjust hundreds of transducers. The new system reduces that effort from hours to seconds.

"Sharing NASA expertise while improving Shuttle safety is directly inline with KSC's goal to build productive partnerships with industry," said Dr. Gale Allen, chief of KSC's Technology Programs and Commercialization Office.

Jointly funded by NASA and the State of Florida's Technological Research and Development Authority (TRDA), a development team comprised of NASA, I-NET and L-3 engineers pooled their expertise to achieve this technological breakthrough. I-NET, KSC's Engineering Support Contractor, produced the system's key component - - the Universal Signal Conditioning Amplifier (USCA). USCA has a continuous calibration feature which allows it to recognize and automatically match itself to any type of transducer.

Two Melbourne, FL companies and a St. Augustine firm hold L-3 contracts to fabricate ADAS hardware and L-3 is currently marketing the system to potential aerospace, industrial and automotive customers. "Our number one goal is creating and preserving jobs for Floridians," said Frank Kinney, TRDA executive director. "We want to prove that you can transfer cutting-edge technology to other industries and grow more jobs in the process."

An ADAS delivery ceremony will be held on Friday, Aug. 22 at 11:15 a.m. in the Spaceport Theater at the KSC Visitor Complex. Media interested in attending the ceremony should contact the KSC Press Site by 4:30 p.m. on Thursday, Aug. 21. Key members of the NASA, TRDA and L-3 Communications team will be on-hand for interviews and photos.

For automatic e-mail subscriptions to this daily Shuttle status report or KSC-originated press releases, send an Internet electronic mail message to domo@news.ksc.nasa.gov. In the body of the message (not the subject line) type the words "subscribe shuttle-status", or "subscribe ksc-press-release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 24, 1997
KSC Contact: George Diller
KSC Release No. 146-97

NASA Launch Advisory:
ACE POSTPONED 24-HOURS - RESCHEDULED FOR 10:39 A.M. AUG. 25

The launch of a Boeing Delta II rocket with NASA's Advanced Composition Explorer (ACE) has been rescheduled for Monday, Aug. 25 at 10:39 a.m. EDT at the opening of a 25 minute window.

Launch was scrubbed today by Air Force range safety personnel due to two commercial fishing vessels located about 23 nautical miles offshore from launch Pad 17A. The boats were within the Delta's launch danger area, a location where the solid rocket motors would drop into the sea after being jettisoned from the Delta's first stage.

Air Force weather forecasters indicate a 20 percent chance of weather violating launch weather criteria tomorrow due to a chance of clouds and showers in the launch area.

NASA's ACE spacecraft will travel about 900,000 miles from Earth to a point in space where the gravitational pulls of the Earth and the Sun balance out. From there, the spacecraft will spend the next 2-5 years measuring solar particles and other solar phenomena and provide early warnings of solar storms.

ACE launch coverage on NASA TV will begin at 9 a.m. Media will depart Gate 1 for Press Site One at 9:15 a.m.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 26, 1997
KSC Contact: Joel Wells
KSC Release No. 147-97

Note to Editors:
KSC TESTS ROBOTIC SUBMERSIBLE IN BOOSTER RECOVERY OPERATIONS

Space Shuttle solid rocket booster (SRB) recovery operations are among the most hazardous and physically demanding at Kennedy Space Center. To assist in making this operation safer, KSC's Advanced Systems Development (ASD) laboratory is testing an unmanned robotic submersible to evaluate its ability to assist divers in the task of recovering spent SRBs in the Atlantic Ocean. On Wednesday, Aug. 27 at 10 a.m., NASA and contractor Deep Sea Systems of Falmouth, Mass., will demonstrate the Max Rover system at Port Canaveral's Trident pier.

The fact finding tests are part of NASA's effort to make SRB recovery operations safer and less strenuous. The twin solid rocket boosters as jettisoned from the Space Shuttle about two minutes after launch and fall into the ocean where they are recovered for reuse.

Currently, scuba divers manually insert the Diver Operated Plug (DOP) into the aft nozzle 60-70 feet below the surface of the ocean. This operation is performed while the SRBs are bobbing in a vertical orientation. After the plug is installed, water is pumped out of the boosters allowing them to float horizontally. They are then towed back to Hangar AF at Cape Canaveral Air Station.

KSC's SRB retrieval team and the ASD laboratory hope that new robotic technology will improve the process of inserting the plug. Wednesday, technicians will attach a DOP to the robot submersible known as Max Rover and practice inserting the plug into a simulated SRB nozzle. Official observers will evaluate the mobility and maneuverability of the submersible for application in future booster recovery activities.

Media interested in covering this demonstration will meet at 9:30 a.m. Wednesday at the Gate 1 Pass and Identification Building on Cape Canaveral Air Station located on Road 401 for escort to the Trident docks. NASA and Deep Sea Systems representatives will be on hand for interviews.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 27, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 148-97

SRB RETRIEVAL SHIPS TO BEGIN TOWING SPACE SHUTTLE EXTERNAL TANK

The two ships which have been retrieving spent Solid Rocket Boosters (SRBs) for the Space Shuttle program since its inception in 1981 now have an additional job: Delivering the Shuttle external tanks that are manufactured in Michoud, LA, to Kennedy Space Center.

While the first tow operation is still some time off - around the April/May 1998 time frame - the hardware needed to do the job is already on deck at NASA's Hangar AF on Cape Canaveral Air Station, home port for the two ships.

The initiative fits in well with the streamlining measures Shuttle prime contractor United Space Alliance (USA) is tasked with implementing. In the past, the task of towing the external tank by barge to KSC was carried out under a subcontract overseen by Marshall Space Flight Center, Huntsville, AL. USA is now managing that subcontract, which will be phased out once the booster retrieval ships take over.

The ships' primary task will continue to be the retrieval of the spent SRBs following a Shuttle launch, said Anker Rasmussen, USA chief technical manager for postflight operations.

Permanent structural changes already have been made by Dentyen's Shipyard, Charleston, SC. These include strengthening of the stern at critical points, new bulwark fairings, and the installation of a new H-bitt through which cabling will be threaded to keep it centered during towing operations.

Still to be installed is a new double winch, referred to as a double-drum waterfall winch, said Joe Chaput, captain of the Liberty Star retrieval ship. One drum will support booster retrievals while the other will be devoted to ET towing. It will be within the line of sight of the aft bridge of the ship, from where booster retrieval operations are controlled, thus offering better control capability than the current system. Other equipment will be taken on and off the ships depending on which job they are performing, including the "Texas bar" that provides maneuvering capability.

Chaput and Freedom Star Capt. Dave Fraine are accompanying the current ET towing contractor on trips from the Michoud plant located on the Mississippi River Gulf Outlet, a 65-mile-long channel, becoming familiar with the route and the towing operation. "We have to complete at least four round trips to meet the pilot license requirements to tow the barge," said Chaput.

The changes and new hardware should pay for themselves after about 14 to 15 tank deliveries.

The ships have a top cruising speed of about 17 miles (15 knots) per hour, and a range of 6,900 miles. They were built at Atlantic Marine Shipyard near Jacksonville in 1980-81. The same firm which designed them, Rodney E. Lay & Associates, assisted with the design work for the modifications to allow external tank towing.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 28, 1997
KSC Contact: George H. Diller
KSC Release No. 149-97

CASSINI SPACECRAFT MATED TO TITAN ROCKET AT LAUNCH PAD

The international Cassini spacecraft passed a milestone today toward launch when it was moved to Launch Complex 40 on Cape Canaveral Air Station and hoisted atop the Air Force Titan IV/Centaur rocket. The spacecraft left the Payload Hazardous Servicing Facility (PHSF) at KSC at 12:15 a.m. today and arrived at the pad at 1 a.m. It was on the Titan's Centaur upper stage at 9 a.m. Until now, Cassini and the European Space Agency's Huygens probe it carries have been undergoing integration and testing at the PHSF.

On Sept. 2, interface verification tests will begin. This test will verify that all of the electrical and mechanical connections between the spacecraft, the vehicle and the launch pad are complete. Also, a spacecraft functional test will be performed as a state of health check required to verify Cassini's successful transition from the spacecraft checkout hangar to the top of the Titan IV rocket.

Cassini close-out activities will begin on Sept. 8 leading to the encapsulation into the Titan IV nose fairing beginning Sept. 12. On Sept. 20 the Huygens probe close-outs will be performed.

A final integrated systems test for launch is currently scheduled for Sept. 23. This is primarily an electrical test of the Titan IV, the spacecraft and the mission critical ground support assets. This test includes the prelaunch "minus count" to T-0 and a "plus count" of the in-flight events for the Titan IV.

The last access by workers to Cassini and the Huygens probe will be Oct. 3 during the close-outs of the Titan IV fairing.

Cassini is scheduled for launch on Oct. 6 at 5:39 a.m. EDT. The window extends for one hour, 40 minutes. Cassini will spend the next 6.7 years en route to the planet Saturn with a projected arrival date of July 1, 2004.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

August 28, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 150-97

KSC RECEIVES $195,000 REBATE FOR ENERGY-EFFICIENT EFFORTS

Florida Power & Light (FPL) Company officials recognized KSC's commitment to reducing overall energy consumption and costs with a rebate check for $195,000, presented to Center Director Roy Bridges at KSC yesterday. KSC has received FPL rebates for its energy-saving efforts since 1993. Yesterday's check, presented by Larry Laseter, vice president of Sales and Marketing for FPL, is the largest single-project rebate to date.

The energy savings realized by KSC comes as a direct result of installing new chilled water systems hardware, also known as 'chillers' (used to produce air conditioning inside facilities), in the KSC Industrial Area Chiller Plant. Previously, individual chillers were located in various buildings in the industrial area. The new hardware reduced the number of smaller chillers in KSC's Industrial Area from 18 to six, thereby reducing the cost of operations and maintenance. Additionally, the new chillers use more environmentally friendly refrigerants, reducing potentially hazardous effects to the Earth's ozone layer.

Expansion of the chiller plant also allows KSC to produce an additional 7,500 tons of air conditioning capacity.

The FPL rebate came as a result of the commitment KSC has demonstrated to energy-saving modifications now and in the future. Federal regulations state that 50 percent of KSC's rebate will be deposited in the U.S. Treasury. The other half will be retained by KSC for use in future energy-saving initiatives.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 4, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 151-97

Note to Editors:
MEDIA OPPORTUNITIES WITH STS-86 CREW SET FOR NEXT WEEK'S TCDT

The crew of Space Shuttle mission STS-86 will be at Kennedy Space Center next week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cut-off. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The seven-member crew of mission STS-86 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 7:30 p.m. Sunday, Sept. 7. No photo opportunity is scheduled for this event.

On Tuesday, Sept. 9, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39A. Media interested in participating in this question and answer session should be at the KSC Press Site by 8:45 a.m. Tuesday for transport to the pad. This event will be carried live on NASA TV.

On Wednesday, the crew will take part in simulated launch day events. A media photo opportunity is available for the crew's departure to the pad from their quarters in the Operations and Checkout Building. Media should be at the KSC Press Site by 6:45 a.m. Wednesday for transport to the O&C Building.

Once at the pad, the crew will enter the orbiter Atlantis fully suited for the simulated Shuttle main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations. A media photo opportunity is available of the crew departure from the SLF. Media should again be at the KSC Press site by 1 p.m. Wednesday for transport to the Shuttle Landing Facility

Atlantis is now targeted for launch on Sept. 25 at about 10:34 p.m. EDT. Mission STS-86 will be the 7th mission to dock with Russia's space station Mir and will feature a joint U.S./Russian space walk. The mission is scheduled to last 10 days.

Crew members for mission STS-86 are: Commander James Wetherbee, Pilot Mike Bloomfield, and Mission Specialists Vladimir Titov, Scott Parazynski, Jean-Loup Chretien, Wendy Lawrence and Dave Wolf. Wolf will remain on Mir and Mission Specialist Michael Foale will return with the rest of the Atlantis crew.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 4, 1997
KSC Contact: George H. Diller
KSC Release No. 152-97

CASSINI PROGRAM ASSESSES NEW LAUNCH TIMEFRAME

NASA managers today reached a consensus that mid-October is an achievable timeframe for the Cassini spacecraft to be ready for its launch to Saturn.

"We're not going to ask the Air Force for an actual launch date to target until after the Huygens probe has been disassembled and we have been able to fully evaluate the work that needs to be done," said Richard Spehalski, Cassini Program Manager from the Jet Propulsion Laboratory. "At least a full week of work will be necessary once Huygens has been demated from Cassini."

A decision was made on Sept. 3 to remove the spacecraft from the Air Force Titan IV rocket and return it to the Payload Hazardous Servicing Facility at KSC. Damage to thermal insulation was discovered inside the Huygens probe from a higher than appropriate flow rate of conditioned air. Further internal inspections, insulation repair and a cleaning of the probe are now required.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 11, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 153-97

NASA/AF TESTS AT CAPE CANAVERAL AIR STATION WILL DEVELOP METHOD FOR CONVERTING HAZARDOUS WASTE INTO FERTILIZER

A joint venture between NASA and the U.S. Air Force to develop a system to recover and convert unused rocket propellant oxidizer into a useable fertilizer product will be tested during the next few weeks.

In the past, the toxic nitrogen dioxide vapor which results from transferring the oxidizer (nitrogen tetroxide) from storage tanks into rockets or vice versa was captured in what are called scrubbers to prevent it from venting into the air. The resulting chemical reaction of the nitrogen dioxide and the sodium hydroxide produced a liquid which had be disposed of as a hazardous material. The new method being tested during the next few weeks will chemically convert the nitrogen dioxide into fertilizer which can be used at Cape Canaveral Air Station (CCAS) and Kennedy Space Center resulting in an estimated savings of $83,000 a year.

This new project is in compliance with Executive Orders on pollution and waste prevention. The effort could lead to reducing the waste by-products and eliminate the second largest hazardous waste stream at KSC and CCAS. It would also lower operational costs.

Because the tests are intended to find the optimum efficiency of the new scrubber, it is possible that an inadvertent release of nitrogen dioxide may occur. If this should happen, it would appear as a reddish cloud over the Cape Canaveral Air Station's fuel storage facility and may be noticeable. Strict weather criteria are being followed to insure any clouds that may form will quickly dissipate to a safe and harmless concentration and not drift near any populated areas around CCAS. The tests will proceed only if wind speed and direction are acceptable to 45th Space Wing safety officials.

Teams of personnel will monitor the air quality from boats stationed on a 4,000 foot safety perimeter on the Banana River during the tests to ensure the concentration of nitrogen dioxide does not exceed government established safety limits. All other boating traffic will be kept out of this safety perimeter during testing. The Florida Department of Environmental Protection (FDEP) has been informed of this test procedure and have presented no objections.

A successful test will allow a much more beneficial process to be inaugurated which will produce fertilizer instead of hazardous waste resulting in a significant savings of taxpayer money.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 8, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 154-97

VIRTUAL CLASSROOM PROGRAM KICKOFF TO BE HELD SEPT. 8 LIVE ON THE INTERNET

Kennedy Space Center engineers and scientists will become virtual guest instructors at 20 southwestern Florida middle schools through an interactive science education program that will begin at 6 p.m. on Sept. 8 with a live broadcast through the Internet.

The kickoff video-conference for the Virtual Science Mentor (VSM) program will originate from KSC and be broadcast live to Hill-Gustat Middle School in Sebring, Fla., where an open house will be held for the event. The program will feature KSC Deputy Director James L. Jennings, who - from KSC -- will address students, teachers, mentors and Florida Education Commissioner Frank T. Brogan on the importance of science education and the space center's commitment to support the state's educational system.

The broadcast will be viewed on classroom computers that are equipped with digital video cameras and microphones. After Jennings' 'virtual' presentation, open house participants in Sebring will be able to ask him questions and hear his response in near-real time.

"The opening program will provide a good demonstration of the interactive capabilities of the video-conferencing hardware and software that we will use for the VSM program," said Gregg Buckingham of the KSC University Affairs Education Office. "With this system, KSC mentors will be able to actually take part in classroom activities and provide curriculum materials. They will also discuss NASA mission activities, judge class science projects and act as role models for the class."

The Virtual Science Mentor program uses the latest in desktop video technology to bring the mentors and science class students together. The program is the result of a partnership between NASA/KSC, the State of Florida's Technological Research and Development Authority (TRDA), Florida Gulf Coast University (FGCU), and middle schools in six southwestern Florida counties.

The TRDA has funded the program through a $250,000 grant, with additional funding of $160,000 provided by NASA. The goal of the program is to enhance learning and stimulate interest in science classes through the use of KSC engineers and scientists and cutting-edge educational technology. FGCU has been designated as the distance-learning demonstration center for the state university system.

Under the program, 40 KSC mentors and a similar number of middle school teachers have been paired up to determine how the mentors will play a part in science class activities. Topics to be covered include physics, astronomy, technology transfer, engineering principles, weather and other subjects.

The KSC mentors will communicate with their teachers and students on a regular basis, providing them with information that will be available through the Internet. This includes large amount of space and science related materials already on-line and accessible through the NASA home pages.

"This program is great because we are going to be able to reach a much broader area with our educational outreach

efforts," said NASA payload integration engineer and VSM mentor Mike Generale. "We also be able to help teachers by providing our expertise in areas where the educators may not have a strong knowledge or background."

Generale is paired with Susan Harris, a Sebring middle school teacher, and will provide lectures on physics. As with other mentor/teacher pairs, the two have worked together to put together coordinated lesson plans for the fall semester. The mentors also have program lesson plans to help reduce their amount of class planning.

This program will provide a major benefit for Florida schools and students while making better use of our resources here at KSC, Buckingham said. "Once this program has proven to be successful, we hope to involve industry and higher education in the effort."

Go to the *KSC Press Releases* Home Page

STS-86
Atlantis
Seventh Shuttle-Mir Docking

KSC Release No. 155-97
September 1997

STS-86 images

The seventh of nine scheduled dockings of the Space Shuttle with the Russian Space Station Mir will take place on Mission STS-86 aboard Atlantis. Another primary objective of the planned 10-day flight will be the scheduled exchange of U.S. astronauts for an extended stay on the Russian orbiting outpost.

STS-86 Mission Specialist David A. Wolf is scheduled to become the sixth American astronaut to live and work on the Mir since the joint U.S.-Russian space project began in 1994. Wolf is scheduled to join the Mir 24 crew of Commander Anatoly Yankovlevich Solovyev and Flight Engineer Pavel Vinogradov, replacing C. Michael Foale, who has been on the Russian station since the docking of Atlantis with the Mir on STS-84 in May.

Wolf was a late addition to the STS-86 crew. Mission Specialist Wendy B. Lawrence originally was scheduled for the next long-duration flight on Mir. In late July, NASA announced that Lawrence would remain a member of the STS-86 crew and her backup, Wolf, would be added to replace Foale and participate in Mir spacewalks to repair damage from the June collision of a Russian Progress vehicle with Mir's Spektr module. Unlike Lawrence, Wolf has undergone spacewalk training and fits in the Orlan spacesuit used by Russians on extravehicular activities (EVAs). Wolf will remain on the Mir until his replacement, as yet unannounced, arrives on the STS-89 mission slated for launch in January 1998.

A critical element needed to perform the repair spacewalks will be among the three-and-a-half tons of science/logistical equipment and supplies which will be exchanged between the two orbiting spacecraft during the mission. For the first time, Atlantis will carry three air pressurization units with breathing air to repressurize airlocks after spacewalks. Most of the items carried to and from the Mir will be stored in a pressurized SPACEHAB Double Module in Atlantis' payload bay.

STS-86 also will feature a joint U.S.-Russian spacewalk to retrieve four suitcase-sized environmental experiments on Mir's docking module. The spacewalk is scheduled to take place on the fourth of six days Atlantis will be docked to the Russian station.

STS-86 is part of Phase 1 of the International Space Station program. Under Phase 1, Americans and Russians work together on the Mir as a prelude to assembly (Phase 2), scheduled to get under way in 1998, and long-term operation (Phase 3) of the International Space Station.

The 87th Space Shuttle launch and 20th flight of Atlantis (OV-104) will begin with liftoff from Pad A, Launch Complex 39. Atlantis will ascend at a 51.6-degree inclination to the equator for direct insertion to a 184-statute-mile (160-nautical-mile/296-kilometer) orbit. Atlantis is expected to rendezvous and dock with Mir at an altitude of 213 nautical miles on Flight Day 3.

Landing is planned at Kennedy Space Center's Shuttle Landing Facility.

The Crew

The space agencies of Russia and France will be represented on the seven-member crew flying to the Mir.

As mission commander, James D. Wetherbee (Capt., USN) will lead the crew of five other experienced space flyers and one rookie on the flight to the Russian space station. This will be his fourth space flight, and his third as commander, including STS-63 in 1995, the first flight of the new joint Russian-American space program and the first rendezvous of the Shuttle orbiter with the Mir. He also flew as the pilot of STS-32 in 1990 and as the commander of STS-52 in 1992. The naval aviator became an astronaut in 1985. He also served as deputy director of Johnson Space Center in 1996.

Assisting him at the controls will be Pilot Michael J. Bloomfield (Maj., USAF), who is making his first space flight. The Air Force instructor pilot, fighter pilot and test pilot was assigned to NASA as an astronaut candidate in 1995.

David A. Wolf (M.D.) will make his second space flight on STS-86. He is a USAF senior flight surgeon in the Air National Guard. He joined the Medical Sciences Division of Johnson Space Center in 1983; among his inventions was the Space Bioreactor for cell tissue growth. He also served as chief engineer for design of the space station medical facility. Wolf was selected as an astronaut in 1990, and flew as a mission specialist on STS-58 in 1993. He previously was scheduled to fly to Mir in January and be the last U.S. astronaut to live and work on the station.

While she will not have a long-duration stay on the Mir, Mission Specialist Wendy B. Lawrence (Cmdr., USN) will remain a member of the STS-86 crew. The Navy helicopter pilot was selected as an astronaut candidate in 1992 and flew once, as the flight engineer and a mission specialist on STS-67 in 1995. Before training for this mission, she was director of operations for NASA at the Gagarin Cosmonaut Training Center in Star City, Russia.

Mission Specialist Scott E. Parazynski (M.D.) will make his second space flight, serving as the flight engineer and one of two spacewalkers on the mission. He joined NASA in 1992 and was assigned as a backup for the third American long-duration stay aboard the Russian space station, but was withdrawn from Mir training when he was deemed to be too tall at 6 feet, 3 inches to fit safely in the Russian Soyuz spacecraft in the event of an emergency situation requiring evacuation from Mir. He was involved in the design of several exercise devices for long-duration space flight, and has particular expertise in human adaptation to stressful environments. He was a mission specialist on STS-66 in 1994.

The other spacewalker will be Mission Specialist Vladimir Georgievich Titov, a colonel in the Russian Air Force who was selected to join the cosmonaut team in 1976. He previously flew four times in space, most recently as a mission specialist on STS-63, and three times on Russian spacecraft as mission commander. Titov and fellow cosmonaut Musa Manarov set a then-world record of nearly 366 consecutive days in space in 1987-88 during which Titov logged almost 14 hours of EVA time on the Mir. He will be the first non-American space flyer to perform a Shuttle-based EVA.

Also serving as a mission specialist will be French astronaut Jean-Loup J.M. Chretien, a brigadier general in the French Air Force and chief of the Astronaut Office of the French Space Agency, CNES. The first Frenchman to fly in

space, he was selected as a cosmonaut in 1980 and served twice as a research-cosmonaut on Russian missions to the Mir and the Salyut 7 space stations.

C. Michael Foale, who has a doctorate in laboratory physics, will join the other STS-86 crew members on their return to Earth. He was a fellow crew member with Wetherbee and Titov on STS-63, and also flew as a mission specialist on STS-45 in 1992, on STS-56 in 1993 and on STS-84 this year when he transferred to Mir. He was selected by NASA in 1987.

Extravehicular Activity

During their planned approximate five-hour spacewalk, Parazynski and Titov will retrieve four Mir Environmental Effects Payload (MEEP) experiment packages from the Mir docking module. The MEEP experiments, which characterize the environment surrounding the Mir, were installed by spacewalking astronauts on STS-76 last year.

The spacewalkers also are scheduled to evaluate hand controller deployment and the automatic hold feature of the Simplified Aid for EVA Rescue (SAFER), a jet backpack which spacewalking astronauts can use to maneuver. SAFER was flight tested on STS-64 in 1994, but this will be the first flight of the production model.

The two-person EVA crew will evaluate other hardware and tools being developed for use on the International Space Station, including the universal foot restraint and the multiuse tether. They will install outside the docking module a solar array cap, a late cargo addition which may be used in the future if the damaged Spektr solar array is removed and discarded. The spacewalkers also may help out with inspection and repair activities on the Spektr module.

Payloads and Experiments

The recent Progess-Spektr collision, last-minute Russian cargo requirements, and the late addition of Wolf to the crew have resulted in a dynamic payload situation on STS-86. More changes may be made until shortly before launch.

For the fourth consecutive docking mission, the SPACEHAB Double Module will serve as the primary cargo container. Science experiments and hardware will be transferred to the Mir for Wolf to use during his four-month stay, and data and samples from Foale's research will be returned to Earth.

Among the major logistics items to be transferred to Mir are food, water produced from the orbiter's fuel cells, a gyrodyne used to stabilize the space station's attitude in space, batteries for storing energy from Mir's solar arrays, the solar array cap and air pressurization units, hygiene supplies, clothing, film and Wolf's seat liner for the Soyuz vehicle.

Experiments slated to be conducted during the mission include the Commercial Protein Crystal Growth investigation; Risk Mitigation Experiments to monitor the Mir for crew health and safety and to evaluate technology applications for the International Space Station; the Cell Culture Module experiment; Seeds in Space-II, a NASA educational outreach program for study of space-grown tomato seeds; two radiation-monitoring studies, the Cosmic Radiation Effects and Activation Monitor and the Radiation Monitoring Experiment-III; and two experiments with no hardware, the Shuttle Ionespheric Modification with Pulsed Local Exhaust and the Midcourse Space Experiment .

The KidSat program allows students to make Earth observations with images taken from KidSat cameras onboard the orbiter and downlinked for use in classroom studies. This will be the third flight for KidSat, which on STS-86 will involve students from 52 middle schools in three nations. In Brevard County, Ronald McNair Magnet School and Space Coast Middle School will participate in KidSat during STS-86.

GO TO THE *KSC FACT SHEETS* HOME PAGE

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 12, 1997
KSC Contact: Patti Phelps
KSC Release No. 156-97

NASA HONORS KENNEDY SPACE CENTER EMPLOYEES

Kennedy Space Center (KSC) will honor 48 of its civil service and contractor employees at a special Honoree Event to be held Sept. 23-25 at the space center.

The KSC employees are among some 250 NASA and industry employees from around the country who will be honored by top NASA and industry leaders for their significant contributions to the nation's space program.

The KSC employees will attend a special reception in their honor, and will be joined by astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. They will be given a VIP tour of Kennedy Space Center and will participate in various briefings. They also will watch the STS-86 launch of the Space Shuttle Atlantis, which is scheduled Sept. 25, from a special VIP viewing site. STS-86 will be the seventh docking of the Space Shuttle with the Russian Space Station Mir.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. Recipients are selected for their professional dedication and outstanding achievement in support of the human spaceflight program.

Nine civil service employees will be honored. They are Peter J. Chitko, Calleen R. Coiner, Valarie J. Franklin, Roberta P. Gnan, William E. Larson, Penny L. Myers, Timothy L. O'Brien, Rayelle E. Thomas and Robyn W. Wesley.

Contractor employees to be honored include Lisa L. Leger and Kelly L. Norwood, The Bionetics Corp.; Timothy C. Lorenz, Boeing Space Systems, Rocketdyne; Albert A. Fazio and Robert G. Van Sickle, Boeing Space Systems; and Patricia H. Bennett, Jon F. Gleman, Harris Graeber II, Kilby B. Holt and Connie L. McFadden, Boeing KSC.

Also, Caroline B. Zaffery, I-NET Inc.; Anthony M. Corak, Joel E. Dyson and Joel R. Thilburg, United Technologies, USBI Co.; Anne F. Ball, Advanced Aerospace Materials Corp.; Robert J. Palka, Furon Co.; and Donald L. Ackerman Jr., Maxine Daniels, James A. Johnson, David E. Kolb, James H. Lesky, William B. Nichols, Dawn S. Patton and Diane S. Smith, EG&G Florida Inc.

United Space Alliance employees who will be honored are Ashleigh L. Beatrice, Jimmie H. Creagle, Daniel T. Dowling, Audrey E. Grayson, James F. Hardman, Jeannette H. Harrell, Stephen A. Hunter, Paul A. Krause, Laura L. Ledford, Richard

A. Morgan, Donald R. Pataky, Norman D. Peters, Jonathan C. Phillips, Keith A. Ray and David J. Zwick.

For automatic e-mail subscriptions to this daily Shuttle status report or KSC-originated press releases, send an Internet electronic mail message to domo@news.ksc.nasa.gov. In the body of the message (not the subject line) type the words "subscribe shuttle-status", or "subscribe ksc-press-release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 15, 1997
KSC Contact: Patti Phelps
KSC Release No. 157-97

FOUR KSC WORKERS HONORED BY NASA ASTRONAUTS

Four NASA/KSC employees recently were presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

John E. Stealey of Merritt Island and Thomas G. Draus of New Smyrna Beach, both of the Shuttle Processing Directorate, were presented awards at KSC on Sept. 5 by astronauts Michael L. Gernhardt and Susan Leigh Still. Loraine Schafer of Cocoa Beach and Anthony R. Killiri Jr. of Oviedo, both of the Logistics Operations Directorate, were given their awards on Sept. 3 by astronaut James M. Kelly.

Stealey is a lead NASA test director. He was commended for "the exceptional job done on a particularly challenging flow on (Space Shuttle Mission) STS-79 that involved numerous major schedule changes such as rolling back from the launch pad due to Hurricane Bertha; demating to check a potential SRB (solid rocket booster) joint seal problem; and returning to the pad only to roll back again due to the Hurricane Fran threat," astronaut Gernhardt said.

Draus, a senior lead for the Shuttle's orbital maneuvering and reaction control system, was applauded for his contributions to the STS-82 Space Shuttle mission through his recognition of a problem with the oxidizer tank hypergolic system. "Your technical competence and attention to detail were key to the accuracy of the hypergolic servicing and clear contributors to the success of the mission," Gernhart told him.

Schafer, a logistics operations engineer, was recognized for her role as logistics lead to the Checkout Control and Launch System 60-day Study Team. "You were instrumental in ensuring that logistics interests were maintained and properly input to the overall project proposal, thereby promoting project life cycle cost effectiveness," astronaut Kelly said. "Your leadership, ingenuity and initiative are to be commended."

Killiri, an engineer, was acknowledged for his efforts in providing computer capability to ground operations logistics. "Your knowledge in the computer area satisfies a critical need and has made you an asset to KSC and the Shuttle program," Kelly told him.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human spaceflight. The Silver Snoopy

Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 15, 1997
KSC Contact: Patti Phelps
KSC Release No. 158-97

LORAINE MARINELLI SCHAFER HONORED BY NASA ASTRONAUTS

Loraine Marinelli Schafer, a native of Youngstown, OH, and daughter of Michael and Marcella Marinelli of Boardman, OH, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Schafer graduated in 1983 from Boardman (OH) High School. She earned a bachelor's degree in industrial engineering from the University of Central Florida in Orlando in 1990.

She lives in Cocoa Beach, FL.

Astronaut James M. Kelly presented the award to Schafer on Sept. 3 at KSC. Schafer is a NASA logistics operations engineer. Schafer joined the space center in 1991.

She was commended for her role as logistics lead to the Checkout Control and Launch System (CLCS) 60-day Study Team. The CLCS will replace the Launch Processing System for the checkout, processing and launch of the Space Shuttle at KSC.

"You were instrumental in ensuring that logistics interests were maintained and properly input to the overall project proposal, thereby promoting project life cycle cost effectiveness," astronaut Kelly told her. "Your leadership, ingenuity and initiative are to be commended."

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release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 19, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 159-97

Notice to Editors/News Directors:
MISSION STS-86 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Sept. 25 launch of the Space Shuttle Atlantis on Mission STS-86, the 87th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-86 NASA TV schedule for exact times.

The seven STS-86 crew members are scheduled to arrive at KSC on Monday, Sept. 22, at about 3:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 2:30 p.m. Monday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-86 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

KSC press releases and other information are available on the KSC PAO Home Page at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

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STS-86 BRIEFING & EVENTS SCHEDULE
(all times are EDT)
(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Monday, Sept. 22

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Todd Corey, STS-86 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- (Launch countdown begins at **2 p.m.**)

- STS-86 Flight Crew Arrival (Live on NASA TV) ----- **3:30 p.m.**

L-2 Days - Tuesday, Sept. 23

- Countdown Status Briefing ----- **9:00 a.m.**
  * Jeff Spaulding, Shuttle Test Director
  * Todd Corey, STS-86 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

L-1 Day - Wednesday, Sept. 24

- Pre-launch News Conference ----- **10:30 a.m.**
  * Tommy Holloway, NASA Shuttle Program Manager, JSC
  * Frank Culbertson, Phase 1 Shuttle-Mir Program Director
  * Valery Ryumin, Russian Mir-Shuttle Program Director
  * General Yuri Glazkov, Deputy Director Gagarin Cosmonaut Training Center
  * Gerard Blondeau, Deputy Director, International Affairs, French Space Agency
  * Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
  * Capt. Dave Biggar, Launch Weather Officer, USAF 45th Weather Squadron

- (News media KSC orientation tour begins at **1:00 p.m.**)

- (No photo opportunities are available for Rotating Service Structure move or sunset)

Launch Day - Thursday, Sept. 25

- (Tanking begins at about **1:10 p.m.**)

- NASA Television live launch programming begins ----- **5:00 p.m.**

- Launch of Atlantis ----- **10:34 p.m.**

- Post-launch Press Conference ----- **L + 1 hour**
  * Donald R. McMonagle, manager of Launch Integration for the Space Shuttle Program
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-86
(hours may be adjusted for in-flight events)

- Monday, Sept. 22 --- *(Launch minus 3 days)* --- **8:00 a.m. - 4:30 p.m.**
- Tuesday, Sept. 23 --- *(Launch minus 2 days)* --- **8:00 a.m. - 4:30 p.m.**
- Wednesday, Sept. 24 --- *(Launch minus 1 day)* --- **8:00 a.m. - 4:30 p.m.**
- Thursday, Sept. 25 --- *(Launch) Flight day 1* --- **8:00 a.m. - 2:00 a.m. (Fri.)**
- Friday, Sept. 26 --- *Flight day 2* --- **8:00 a.m. - 9:00 p.m.**
- Saturday, Sept. 27 --- *Flight day 3* --- **4:00 p.m. - 10:00 p.m.**
- Sunday, Sept. 28 --- *Flight day 4* --- **TBD**
- Mon.-Tues., Sept. 29-30 --- *Flight days 5-6* --- **8:00 a.m. - 4:30 p.m.**
- Wednesday, Oct. 1 --- *Flight day 7* --- **8:00 a.m. - 10:00 p.m.**
- Thurs.- Fri., Oct. 2-3 --- *Flight days 8-9* --- **8:00 a.m. - 4:30 p.m.**
- Saturday, Oct. 4 --- *Flight day 10* --- **10:00 a.m. - 7:00 p.m.**
- Sunday, Oct. 5 --- *(Landing) Flight day 11* --- **3:00 p.m. - 12 midnight**

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-86 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Monday, Sept. 22 ----- **8:00 a.m. - 1:30 p.m.**
Tuesday, Sept. 23 ----- **8:00 a.m. - 12 noon**
Wednesday, Sept. 24 ----- **8:00 a.m. - 4:30 p.m.**
Thursday, Sept. 25 ----- **8:00 a.m. - 9:30 p.m.**

News media with annual Shuttle credentials are reminded to sign the log book at the query counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 23, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 159-97, Rev. A

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L-1 Day - Wednesday, Sept. 24

- Countdown Status Briefing ----- **10:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Todd Corey, STS-86 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- (News media KSC orientation tour begins at **1:00 p.m.**)

- (No photo opportunities are available for Rotating Service Structure move or sunset)

Launch Day - Thursday, Sept. 25

- Pre-launch News Conference ----- **11:00 a.m.**
  * Will Trafton, NASA Headquarters
  * Tommy Holloway, NASA Shuttle Program Manager, JSC
  * Frank Culbertson, Phase 1 Shuttle-Mir Program Director
  * Valery Ryumin, Russian Mir-Shuttle Program Director
  * General Yuri Glazkov, Deputy Director Gagarin Cosmonaut Training Center
  * Gerard Blondeau, Deputy Director, International Affairs, French Space Agency
  * Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
  * Capt. Dave Biggar, Launch Weather Officer, USAF 45th Weather Squadron

- (Tanking begins at about **1:10 p.m.**)

- NASA Television live launch programming begins ----- **5:00 p.m.**

- Launch of Atlantis ----- **10:34 p.m.**

- Post-launch Press Conference ----- **L + 1 hour**
  * Donald R. McMonagle, manager of Launch Integration for the Space Shuttle Program
  * Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-86
(hours may be adjusted for in-flight events)

- Monday, Sept. 22 --- *(Launch minus 3 days)* --- **8:00 a.m. - 4:30 p.m.**
- Tuesday, Sept. 23 --- *(Launch minus 2 days)* --- **8:00 a.m. - 4:30 p.m.**
- Wednesday, Sept. 24 --- *(Launch minus 1 day)* --- **8:00 a.m. - 4:30 p.m.**
- Thursday, Sept. 25 --- *(Launch) Flight day 1* --- **8:00 a.m. - 2:00 a.m. (Fri.)**
- Friday, Sept. 26 --- *Flight day 2* --- **8:00 a.m. - 9:00 p.m.**
- Saturday, Sept. 27 --- *Flight day 3* --- **4:00 p.m. - 10:00 p.m.**
- Sunday, Sept. 28 --- *Flight day 4* --- **TBD**
- Mon.-Tues., Sept. 29-30 --- *Flight days 5-6* --- **8:00 a.m. - 4:30 p.m.**
- Wednesday, Oct. 1 --- *Flight day 7* --- **8:00 a.m. - 10:00 p.m.**
- Thurs.- Fri., Oct. 2-3 --- *Flight days 8-9* --- **8:00 a.m. - 4:30 p.m.**
- Saturday, Oct. 4 --- *Flight day 10* --- **10:00 a.m. - 7:00 p.m.**

- Sunday, Oct. 5 --- *(Landing) Flight day 11* --- **3:00 p.m. - 12 midnight**

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-86 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

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NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 24, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 159-97, Rev. B

Notice to Editors/News Directors:
MISSION STS-86 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Sept. 25 launch of the Space Shuttle Atlantis on Mission STS-86, the 87th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-86 NASA TV schedule for exact times.

The seven STS-86 crew members are scheduled to arrive at KSC on Monday, Sept. 22, at about 3:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 2:30 p.m. Monday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-86 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: http://www.ksc.nasa.gov/shuttle/countdown/ and at http://shuttle.nasa.gov/

KSC press releases and other information are available on the KSC PAO Home Page at: http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

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STS-86 BRIEFING & EVENTS SCHEDULE
(all times are EDT)
(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Monday, Sept. 22

- Countdown Status Briefing ----- **9:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Todd Corey, STS-86 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- (Launch countdown begins at **2 p.m.**)

- STS-86 Flight Crew Arrival (Live on NASA TV) ----- **3:30 p.m.**

L-2 Days - Tuesday, Sept. 23

- Countdown Status Briefing ----- **9:00 a.m.**
  * Jeff Spaulding, Shuttle Test Director
  * Todd Corey, STS-86 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

L-1 Day - Wednesday, Sept. 24

- Countdown Status Briefing ----- **10:00 a.m.**
  * John Guidi, Shuttle Test Director
  * Todd Corey, STS-86 Payload Manager
  * Ed Priselac, Shuttle Weather Officer

- (News media KSC orientation tour begins at **1:00 p.m.**)

- (No photo opportunities are available for Rotating Service Structure move or sunset)

Launch Day - Thursday, Sept. 25

- Daniel Goldin briefing on STS-86 status ----- **10:00 a.m.**

- Pre-launch News Conference ----- **11:00 a.m.**
  * Will Trafton, Associate Administrator for Space Flight, NASA HQ
  * Tommy Holloway, NASA Shuttle Program Manager, JSC
  * Frank Culbertson, Phase 1 Shuttle-Mir Program Director
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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 23, 1997
KSC Contact: Joel Wells
KSC Release No. 161-97

KSC AWARDS CONTRACT FOR ENGINEERING DEVELOPMENT SUPPORT

NASA's Kennedy Space Center (KSC) awarded a contract valued at over $160 million to Dynacs Engineering Company, Inc. of Clearwater, FL, yesterday to provide engineering support to KSC's Engineering Development organization.

The contractor will provide high technology and research services as well as engineering design and technician support. A variety of KSC laboratories will be operated and maintained by Dynacs technicians and their engineers will manage complex research and technology projects. Dynacs will also assist in the transfer of NASA technology to the private sector as part of KSC's Technology Transfer and Commercialization Program.

"This year NASA named Dynacs Small Disadvantaged Business contractor of the year and we look forward to a very positive relationship here at Kennedy Space Center," said KSC Director Roy Bridges.

The cost plus award fee contract begins Oct. 1, 1997 and, including the four one-year options to extend, potentially continues through Sept. 30, 2002.

Dynacs is classified by the Small Business Administration as a small disadvantaged business.

The incumbent engineering support contractor is I-NET, Inc., of Bethesda, MD. I-NET was awarded the contract in 1992. I-NET is now classified as a large business and was ineligible for the competition. A total of 13 companies competed for the contract.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 23, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 162-97

NASA MANAGERS AWAITING SHUTTLE-MIR INDEPENDENT SAFETY REVIEWS RESCHEDULE PRE-LAUNCH PRESS CONFERENCE

NASA managers today held their launch minus two day mission management meeting at the Kennedy Space Center, FL where they reviewed the readiness of the launch of Atlantis on mission STS-86. At this time, no technical issues are being worked and the launch team is proceeding towards a launch on Thursday evening, Sept. 25 at 10:34 p.m. EDT.

Final approval for Atlantis' launch is awaiting the results of two external Mir safety reviews. Lt. General Thomas Stafford, USAF (Ret.) conducts an independent review before each Space Shuttle mission to Mir at the request of NASA Administrator Daniel S. Goldin. In addition, NASA also has asked Mr. A. Thomas Young to conduct an external assessment. Stafford and Young will separately brief the Administrator on their findings on Wednesday afternoon.

Since the independent review results will not be available until late Wednesday afternoon, the pre-launch press briefing by NASA senior managers has been rescheduled to Thursday, Sept. 25 at 11 a.m. EDT.

A countdown status briefing is scheduled for 10 a.m. EDT on Wednesday, Sept. 24.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 163-97

PETER CHITKO HONORED FOR ROLE IN SPACE PROGRAM

Peter Chitko, son of Madeline Chitko of Jacksonville Beach, FL, and a graduate of Georgia Tech, Atlanta, GA, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Camp Lejeune, NC, Chitko graduated in 1978 from Bishop Kenney High School in Jacksonville, FL. He received two mechanical engineering degrees from Georgia Tech, a bachelor's in 1982 and a master's in 1983. He also earned a master's in engineering management from the University of Central Florida.

At KSC, Chitko is employed by NASA as the lead orbiter/external tank launch accessories engineer. He joined the space center in 1983.

Chitko and his wife, the former Elizabeth Benedetto, live in Merritt Island, FL. They have two children.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. The Honorees also were taken to a special VIP viewing area to watch the STS-86 launch of the Space Shuttle Atlantis on Sept. 25.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-86 was the seventh docking of the Space Shuttle with the Russian Space Station Mir. Crew members on the trip to Mir were Commander James D. Wetherbee, Pilot Michael J. Bloomfield, and Mission Specialists David A. Wolf, Wendy B. Lawrence, Scott E. Parazynski, Vladimir Georgievich Titov of the Russian Space Agency, and Jean-Loup J.M. Chretien of the French Space Agency, CNES. Wolf replaced astronaut and Mir 24 crew member C. Michael Foale, who will return to Earth aboard Atlantis after an approximate four-month stay on the Russian space station.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 164-97

CALLEEN R. COINER HONORED FOR ROLE IN SPACE PROGRAM

Calleen R. Coiner, a native of Salina, UT, and daughter of Calvin and June Rasmussen of Salt Lake City, UT, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Coiner graduated in 1966 from North Sevier High School in Salina, UT. She has worked for the federal government for 27 years, including 14 with the Utah Army National Guard.

At KSC, she is employed by NASA as a secretary in the Occupational Health Program Office. She joined the space center in 1987.

Coiner and her husband, Warren, live in Titusville, FL. They have three grown children and one grandchild.

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JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 165-97

VALARIE JEAN FRANKLIN HONORED FOR ROLE IN SPACE PROGRAM

Valarie Jean Franklin, a resident of Merritt Island, FL, and daughter of Eugene Rogers of Cocoa, FL, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in St. Augustine, FL, Franklin graduated in 1971 from Monroe High School, Cocoa, FL. She has attended the Melbourne, FL, campus of Orlando College, and the Merritt Island, FL, campus of Barry University.

At KSC, she is employed by NASA as a laboratory management assistant in the Materials Science Laboratory in the Logistics Operations Directorate. She joined the space center in 1987 and has received several awards, including a Certificate of Commendation.

Franklin and her husband, Robert Charles Franklin, have four children. She has long been active in community affairs, and currently is secretary of the Black Employee Strategy Team (BEST) and a member of the AMVET Wives Club in Cocoa.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 166-97

ROBERTA "BOBBI" PERRY GNAN HONORED FOR ROLE IN SPACE PROGRAM

Roberta "Bobbi" Perry Gnan, daughter of Jim and Marty Perry of Cocoa Beach, FL, and a 1985 graduate of Auburn (AL) University, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Rockledge, FL, Gnan graduated in 1979 from Cocoa Beach (FL) High School. She earned a bachelor's degree in industrial engineering from Auburn University, and a master's in management from the Florida Institute of Technology, Melbourne, FL, in 1993.

At KSC, she is employed by NASA as a Spacelab project manager. She joined the space center in 1979.

Gnan and her husband, John William Gnan, live in Orlando, FL. They have two children.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 167-97

WILLIAM E. LARSON HONORED FOR ROLE IN SPACE PROGRAM

William E. Larson, son-in-law of Mr. And Mrs. George Carroll of Kill Devil Hills, NC, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Newport News, VA, Larson graduated in 1973 from Ferguson High School in Newport News. He received a bachelor's degree in computer science from Old Dominion University in Norfolk, VA, in 1982. He also did graduate study at George Washington University. He is the son of Theodore E. "Jeep" Larson and Lucille L. Larson of Ft. Pierce, FL.

At KSC, William Larson is employed by NASA as an electronics engineer. He is being recognized for his contribution to the replacement of a Space Shuttle launch pad data system. The new Ground Measurements System will significantly reduce the cost of measurements made during Shuttle launches. He joined the space center in 1989, and has published numerous papers and received several awards, including the Space Act Award, a Certificate of Commendation and a Certificate of Appreciation.

Larson and his wife, the former Terri Leigh Carroll, live in Merritt Island, FL. They have three children.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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KSC Contact: Patti Phelps
KSC Release No. 169-97

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October 1, 1997
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WILLIAM E. LARSON HONORED FOR ROLE IN SPACE PROGRAM

William E. Larson, formerly of Langley Research Center's Instrument Research Division, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Newport News, VA, Larson graduated in 1973 from Ferguson High School in Newport News. He received a bachelor's degree in computer science from Old Dominion University in Norfolk, VA, in 1982. He also did graduate study at George Washington University. His parents, Theodore E. "Jeep" and Lucille L. Larson, live in Ft. Pierce, FL.

At KSC, William Larson is employed by NASA as an electronics engineer. He is being recognized for his contribution to the replacement of a Space Shuttle launch pad data system. The new Ground Measurements System will significantly reduce the cost of measurements made during Shuttle launches. He joined the space center in 1989, and has published numerous papers and received several awards, including the Space Act Award, a Certificate of Commendation and a Certificate of Appreciation.

Larson and his wife, the former Terri Leigh Carroll, live in Merritt Island, FL. They have three children.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. The Honorees also were taken to a special VIP viewing area to watch the STS-86 launch of the Space Shuttle Atlantis on Sept. 25.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-86 was the seventh docking of the Space Shuttle with the Russian Space Station Mir. Crew members on the trip to Mir were Commander James D. Wetherbee, Pilot Michael J. Bloomfield, and Mission Specialists David A. Wolf, Wendy B. Lawrence, Scott E. Parazynski, Vladimir Georgievich Titov of the

Russian Space Agency, and Jean-Loup J.M. Chretien of the French Space Agency, CNES. Wolf replaced astronaut and Mir 24 crew member C. Michael Foale, who will return to Earth aboard Atlantis after an approximate four-month stay on the Russian space station.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 171-97

TIMOTHY L. O'BRIEN HONORED FOR ROLE IN SPACE PROGRAM

Timothy L. O'Brien, son of Marion M. O'Brien of Charleston, SC, and the late Gilbert M. O'Brien, and a 1974 graduate of Bishop England High School, Charleston, SC, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Ft. Belvoir, VA, O'Brien received a bachelor's degree in industrial/systems engineering from the University of Florida, Gainesville, FL, in 1979, and a master's in engineering from the University of Central Florida in 1991. He served in the Navy from 1979-85, attaining the rank of lieutenant in the Supply Corps. He also has served in the Naval Reserve since 1986, and has the rank of lieutenant commander, Supply Corps. He has earned several military awards, including the National Defense Service Medal.

At KSC, O'Brien is employed by NASA as an industrial engineer with Shuttle Processing Integration. He joined the space center in 1988.

O'Brien and his wife, Donna Bernardi O'Brien, live in Rockledge, FL. They have two children. O'Brien is active in community affairs, and serves as president of the St. Mary's School Board.

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CNES. Wolf replaced astronaut and Mir 24 crew member C. Michael Foale, who will return to Earth aboard Atlantis after an approximate four-month stay on the Russian space station.

For automatic e-mail subscriptions to this daily Shuttle status report or KSC-originated press releases, send an Internet electronic mail message to domo@news.ksc.nasa.gov. In the body of the message (not the subject line) type the words "subscribe shuttle-status", or "subscribe ksc-press-release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 172-97

ROBYN W. WESLEY HONORED FOR ROLE IN SPACE PROGRAM

Robyn W. Wesley, daughter of E. Ray and Reba Witter of Lansing, MI, and a 1981 graduate of J.W. Sexton High School, Lansing, MI, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Red Bank, NJ, Wesley earned a bachelor's degree in industrial engineering from Auburn (AL) University in 1986, and a master's in engineering management from the University of Central Florida in 1994.

At KSC, she is employed by NASA as the technical assistant to the NASA/KSC director of Quality Assurance. She joined the space center in 1991.

Wesley and her husband, Richard Wesley, live in Rockledge, FL.

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the subject line) type the words "subscribe shuttle-status", or "subscribe ksc-press-release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 173-97

LISA L. LEGER HONORED FOR ROLE IN SPACE PROGRAM

Lisa L. Leger, a resident of Titusville, FL, and daughter of Steve and Gail Leger of Cocoa, FL, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Rockledge, FL, Leger graduated in 1988 from Cocoa (FL) High School. She is attending Brevard Community College.

At KSC, she is employed by The Bionetics Corp., as a secretary in the Project Office. She joined the space center in 1990.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 174-97

KELLY NORWOOD HONORED FOR ROLE IN SPACE PROGRAM

Kelly Norwood, a former resident of Jacksonville, FL, and a 1995 graduate of the University of Florida, Gainesville, FL, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Norwood is the daughter of Richard and Susan Norwood of Rockwall, TX. She attended Stanton College Preparatory School in Jacksonville, FL, and Madison High School in Vienna, VA. She received a bachelor's degree in biomedical engineering from the University of Florida.

At KSC, she is employed by The Bionetics Corp., as a biomedical engineer. She joined the space center in 1995. She lives in Merritt Island, FL.

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quotation marks). The system will reply with a confirmation via e-mail of each subscription.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 1, 1997
KSC Contact: Patti Phelps
KSC Release No. 175-97

TIMOTHY C. LORENZ HONORED FOR ROLE IN SPACE PROGRAM

Timothy C. Lorenz, a resident of Merritt Island, FL, was among 48 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Born in Cleveland, OH, Lorenz graduated in 1966 from James Ford Rhodes High School in Cleveland. He received a bachelor's degree in psychology from Kent (OH) State University in 1973. He also served in the Navy from 1968-69.

At KSC, Lorenz is employed by Boeing Space Systems, Rocketdyne, as an operations manager. He joined the space center in 1989.

Lorenz and his wife, the former Vicki Lynn Van Ormer, have three grown children.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 48 employees selected were part of a contingent of some 250 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

October 3, 1997
KSC Contact: George H. Diller
KSC Release No. 176-97

Note to Editors/News Directors:
CASSINI/HUYGENS SCHEDULED FOR LAUNCH TO SATURN OCT. 13

The launch of NASA's Cassini spacecraft and the European Space Agency's Huygens probe is scheduled for Monday, Oct. 13, at 4:55 a.m. EDT. Liftoff will occur aboard an Air Force Titan IV-B/Centaur rocket from Space Launch Complex 40 on Cape Canaveral Air Station, FL. The launch window extends for 140 minutes until 7:15 a.m. EDT. The primary launch opportunity extends through Nov. 15.

With an Oct. 13 launch, arrival at Saturn is projected to occur July 1, 2004. During the 4-year mission at the planet, Cassini will complete 60 orbits touring Saturn and its moons. Saturn is best known for its complex ring system, banded atmosphere and 18 known moons. The Cassini spacecraft will deploy the instrumented Huygens probe to the Saturnian moon Titan, itself the size of a small planet. Huygens will parachute through Titan's dense atmosphere, which may have important similarities to the early atmosphere of Earth. Studies of Saturn's atmosphere along with its rings and moons, will help produce a better understanding of planetary evolution.

PRELAUNCH NEWS CONFERENCE

A prelaunch news conference is scheduled for Saturday, October 11, at 2:30 p.m. EDT in the NASA-KSC News Center auditorium and will be carried live on NASA Television. Participating in the briefing will be:

- Dr. Wesley Huntress, Associate Administrator for Space Science
  NASA Headquarters
- Dr. Roger Bonnet, Director of Scientific Programs
  European Space Agency
- Prof. Giancarlo Setti, Chairman, ASI Scientific Committee
  Italian Space Agency
- Col. Everett Thomas, Titan IV Launch Director
  USAF 5th Space Launch Squadron, Cape Canaveral Air Station
- Heinz Wimmer, Launch Vehicle Project Manager
  NASA Lewis Research Center
- Richard Spehalski, Mission Director/ Cassini Program Manager
  Jet Propulsion Laboratory
- Beverly Cook, Director, Space Nuclear Programs
  Department of Energy

- John Weems, Launch Weather Officer
  Department of the Air Force

A post-launch news conference will be held at the NASA-KSC News Center approximately two hours after launch to discuss the countdown, launch and current state of health of the Cassini spacecraft.

ACCREDITATION

Media who wish to cover the launch of Cassini including the prelaunch news conference on L-2 days should send a letter of request to the NASA-KSC News Center on news organization letterhead. It should include name and Social Security number or passport number. Letters should be faxed to 407/867-2692 or addressed to:

Cassini/Huygens Launch Accreditation
NASA AB-A
Kennedy Space Center, FL 32899

Cassini mission badges may be obtained at the NASA-KSC News Center on Friday, Oct. 10 between 8 a.m. and 4:30 p.m. On Saturday, Oct. 11, badges may be picked up at the News Media Pass & Identification Building at Gate 2 on SR3, Merritt Island, between 10 a.m. and 2 p.m. On launch day, Monday, Oct. 13, Cassini mission badges will be available between 1 and 4 a.m.

On launch day, a Cassini mission badge is required for all media covering the launch. Annual badges or other Space Shuttle launch credentials will not be honored. For further information on Cassini launch accreditation contact Selina Scorah at the NASA-KSC News Center at 407/867-2468.

REMOTE CAMERAS

Media wishing to establish remote cameras at the launch pad should meet at the NASA-KSC News Center at 12:30 p.m. on Sunday, Oct. 12, to be escorted to Launch Complex 40.

PRESS COVERAGE

The NASA-KSC News Center operating hours will be:

L-3 days, Oct. 10, Friday, 8 a.m. - 4:30 p.m.
L-2 days, Oct. 11, Saturday, 10 a.m. - 4:30 p.m.
L-1 day, Oct. 12, Sunday, 12 p.m. (noon) through launch + 4 hrs.

For optimum viewing, media will be able to cover the launch from a remote press site established at the NASA Causeway on the banks of the Banana River. Bus transportation will be provided to this location from the NASA-KSC News Center beginning at 1:30 a.m. The last bus will leave the News Center at 3:30 a.m. For launch safety reasons, no private vehicles can be used for transportation to the remote press site. Media representatives may also cover launch from the Complex 39 Press Site if desired.

Coverage at the NASA Causeway location is predicated on acceptable wind conditions the morning of launch. As with all Titan IV launches, no one will be permitted to be downwind of any potential chemically toxic plume formed by propellants as a result of a launch mishap. Should wind conditions be unfavorable on launch day, media coverage will be from the north side of the barge turn basin adjacent to the NASA-KSC News Center. Should wind conditions turn unfavorable or be forecast to become unfavorable prior to launch, media could be asked on short notice to relocate to the barge turn basin area.

Video and audio feeds from NASA Television will be supplied at the remote press site for the media, however, no electrical power will be available.

NASA TELEVISION COVERAGE, V CIRCUITS AND LAUNCH STATUS

NASA Television will carry the prelaunch news conference at 2:30 p.m. EDT on Saturday, Oct. 11. On launch day, Monday, Oct. 13, countdown coverage will begin at 3 a.m. Coverage will conclude after Cassini's signal is acquired through the Deep Space Network's Canberra, Australia tracking station. Acquisition occurs approximately one hour after launch. The post-launch news conference will follow approximately 2 hours after launch.

NASA Television is available on satellite GE 2, transponder 9C, located at 85 degrees West longitude.

Audio only of NASA Television coverage of the prelaunch news conference, launch commentary and post-launch news conference will be available on the "V" circuits which may be dialed directly at 407/867-1220, 867-1240 or 867-1260.

The NASA-KSC News Center codaphone will carry Titan/Cassini prelaunch status reports beginning at L-3 days, on Friday, Oct. 10, and may be dialed at 407/867-2525.

Go to the *KSC Press Releases* Home Page

NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

October 3, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 177-97

ATLANTIS SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-86

The orbiter Atlantis is scheduled to land at Kennedy Space Center on **Sunday, Oct. 5 at 6:58 p.m. EDT** completing its 10-day STS-86 mission which was launched from KSC on Sept. 25.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 155 at mission elapsed time 9 days, 20 hours, 24 minutes. Deorbit burn will occur at about 5:55 p.m. Sunday.

The two **KSC landing opportunities on Sunday are: 6:58 p.m. and 8:35 p.m. EDT.** If a landing is not possible at KSC, two opportunities are also available at Edwards Air Force Base (EAFB), CA, at 8:30 p.m. and 10:06 p.m. EDT.

If managers must keep Atlantis in orbit an additional day, two landing opportunities are available at KSC and two at EAFB on Monday.

KSC Monday landing times are: 5:56 p.m. and 7:32 p.m. EDT.

EAFB Monday landing times are: 8:02 p.m. and 10:38 p.m. EDT.

This landing of Atlantis will mark the 40th landing at KSC in the history of Space Shuttle flight. It will be the seventh landing of the Shuttle at KSC this year. Atlantis is currently on the 87th mission in the history of the Space Shuttle program

Select members of the flight crew will be present for a post-mission press conference at about 1:30 p.m. the day after landing. The conference will be held at the KSC Press Site TV auditorium and carried live on NASA TV.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Atlantis Sept. 25. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of

coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC late Monday afternoon.

If Atlantis lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 8 1/2 hours after Atlantis lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 3 for post-flight deservicing. Operations in OPF bay 3 will be made to prepare Atlantis for a planned modification down period in California. Atlantis' next mission, STS-92, scheduled for launch in January, 1999.

-- end --

NOTICE TO EDITORS: The KSC press site will be open Saturday from 10 a.m. - about 7 p.m. The office will be open on Sunday from 2 p.m. through about midnight. Media wishing to view Atlantis' landing should be at the KSC press site between 4 - 6 p.m. Sunday, for transport to the SLF. Accreditation must be arranged in advance. Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 178-97

TAMMY A. SHIFLETT PARTICIPATES IN NASA TEACHER PROGRAM

Tammy A. Shiflett, a teacher at W.C. Abney Elementary School in Dallas, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Shiflett was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

STEP introduces educators to science and technology research being conducted in academic settings and in government laboratories. The teachers learn about the university's programs and the type of jobs available in industry. Through demonstrations, lectures and hands-on activities, the educators also learn about NASA strategic enterprises, research conducted in those areas, and ways to incorporate the activities into classroom curricula.

KSC program highlights included watching a Delta rocket launch and a landing of a Space Shuttle orbiter, collection and observation of a variety of plants and animals found in marshy lagoon areas, meeting astronauts, viewing Space Shuttle processing activities, and interacting with scientists and other employees at the space center. STEP participants made and launched model rockets at Southern Polytechnic State University.

All the educators received participation awards and other materials at the conclusion of the monthlong program. The teachers reported that they found the program a rewarding experience that would enrich their teaching.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 179-97

ULYSSES HENLEY JR. PARTICIPATES IN NASA TEACHER PROGRAM

Ulysses Henley Jr., a teacher at Etowah High School in Woodstock, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Henley was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 180-97

CHARLES K. BRADLEY PARTICIPATES IN NASA TEACHER PROGRAM

Charles K. Bradley, a teacher at Mt. Zion (GA) Elementary School, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Bradley was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 181-97

RAYMOND M. BOOTH PARTICIPATES IN NASA TEACHER PROGRAM

Raymond M. Booth, a teacher at Bagley Middle School in Chatsworth, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Booth was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 182-97

JAMES R. LYNN PARTICIPATES IN NASA TEACHER PROGRAM

James R. Lynn, a teacher at Turner Middle School in Lithia Springs, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Lynn was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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All the educators received participation awards and other materials at the conclusion of the monthlong program. The teachers reported that they found the program a rewarding experience that would enrich their teaching.

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BILLY E. WILLIAMS PARTICIPATES IN NASA TEACHER PROGRAM

Billy E. Williams, a teacher at Cousins Middle School in Covington, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Williams was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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DANELLE AUTRY PARTICIPATES IN NASA TEACHER PROGRAM

Danelle Autry, a teacher at West Newton Elementary School in Covington, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Autry was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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CYNTHIA PELTON PARTICIPATES IN NASA TEACHER PROGRAM

Cynthia Pelton, a teacher at Ficquett Elementary School, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Pelton was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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FRANKIE SHAW PARTICIPATES IN NASA TEACHER PROGRAM

Frankie Shaw, a teacher at Dobbins Middle School in Powder Springs, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Shaw was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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LINDA C. ALLEMANI PARTICIPATES IN NASA TEACHER PROGRAM

Linda C. Allemani, a teacher at Indian Creek Middle School in Covington, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Allemani was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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BECKY LUNSFORD PARTICIPATES IN NASA TEACHER PROGRAM

Becky Lunsford, a teacher at Indian Creek Middle School in Covington, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Lunsford was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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GWENN G. SARAVIA PARTICIPATES IN NASA TEACHER PROGRAM

Gwenn G. Saravia, a teacher at Carroll County Schools in Carrollton, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Saravia was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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TAMBRA E. CROWE PARTICIPATES IN NASA TEACHER PROGRAM

Tambra E. Crowe, a teacher at Central High School of Carroll County in Carrollton, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Crowe was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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HELEN M. CAMP PARTICIPATES IN NASA TEACHER PROGRAM

Helen M. Camp, a teacher at Evans Middle School in Newnan, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Camp was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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GEORGETTE S. COOPER PARTICIPATES IN NASA TEACHER PROGRAM

Georgette S. Cooper, a teacher at Evans Middle School in Newnan, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Cooper was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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MARY V. ROGERS PARTICIPATES IN NASA TEACHER PROGRAM

Mary V. Rogers, a teacher at East Coweta Middle School in Senoia, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Rogers was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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ALICE J. KEEL PARTICIPATES IN NASA TEACHER PROGRAM

Alice J. Keel, a teacher at Atkinson Elementary School in Newnan, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Keel was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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AMANDA G. YORK PARTICIPATES IN NASA TEACHER PROGRAM

Amanda G. York, a teacher at Dobbins Middle School in Powder Springs, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

York was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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CHARLOTTE MURPHY PARTICIPATES IN NASA TEACHER PROGRAM

Charlotte Murphy, a teacher at Dobbins Middle School in Powder Springs, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Murphy was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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KARLA PAYNE PARTICIPATES IN NASA TEACHER PROGRAM

Karla Payne, a teacher at P.B. Ritch Elementary School in Hiram, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Payne was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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ANNANDEE SEBALY PARTICIPATES IN NASA TEACHER PROGRAM

Annandee Sebaly, a teacher at P.B. Ritch Elementary School in Hiram, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Sebaly was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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CHERRYL CRISCENTI PARTICIPATES IN NASA TEACHER PROGRAM

Cherryl Criscenti, a teacher at Eastside Elementary School in Senoia, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Criscenti was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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KELLY R. AGUZZI PARTICIPATES IN NASA TEACHER PROGRAM

Kelly R. Aguzzi, a teacher at Eastside Elementary School in Senoia, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Aguzzi was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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NANCY B. WILLIAMSON PARTICIPATES IN NASA TEACHER PROGRAM

Nancy B. Williamson, a teacher at Evans Middle School in Newnan, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Williamson was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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GABRIELLE JUDKINS PARTICIPATES IN NASA TEACHER PROGRAM

Gabrielle Judkins, a teacher at Elm Street School in Newnan, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Judkins was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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All the educators received participation awards and other materials at the conclusion of the monthlong program. The teachers reported that they found the program a rewarding experience that would enrich their teaching.

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 203-97

SUZANNE DOBSON PARTICIPATES IN NASA TEACHER PROGRAM

Suzanne Dobson, a teacher at Adairsville (GA) Middle-High School, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Dobson was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 6, 1997
KSC Contact: Steve Dutczak
KSC Release No. 204-97

TRICIA CAUFFIEL PARTICIPATES IN NASA TEACHER PROGRAM

Tricia Cauffiel, a teacher at Indian Creek Middle School in Covington, GA, participated in the Summer Teacher Enrichment Program (STEP) at NASA's John F. Kennedy Space Center (KSC) in Florida.

Cauffiel was one of 27 teachers from rural Georgia counties who participated in the four-week program, from July 7 through Aug. 1, which included two weeks at KSC and two weeks at Southern Polytechnic State University in Marietta, GA. STEP is open to teachers from kindergarten through Grade 12 in rural counties within a 120-mile radius of the university.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 17, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 205-97

BUSINESSES INVITED TO 8TH ANNUAL KSC SMALL BUSINESS EXPO

KSC's Small Business Council, the 45th Space Wing and the Canaveral Port Authority extend an invitation to all firms to attend the 8th Annual Business Opportunities Expo on Wednesday, Oct. 29, at Port Canaveral's Cruise Terminal 10.

Over 200 exhibitors from across the Southeast U.S. will assemble under the same roof to display a wide variety of products and services to buyers and engineers from Kennedy Space Center and Patrick Air Force Base. Showcased will be an assortment of expertise ranging from computer technology to cryogenic equipment.

Business owners are invited to network with the potential prime contractors that will be competing on the Joint Base Operations & Support Contract - a consolidation of NASA's Base Operation Contract (BOC) and the 45th Space Wing's Base Support Contract. The potential contractors will be located on the second floor of the terminal.

The Expo will be conducted from 9 a.m. - 3 p.m. at Port Canaveral's Cruise Terminal 10. Admission is free. For additional information please call the NASA Central Industry Assistance Office at (407)867-7353.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 28, 1997
KSC Contact: George H. Diller
KSC Release No. 206-97

KENNEDY ASSUMES LEAD FOR ACQUISITION AND MANAGEMENT OF EXPENDABLE LAUNCH VEHICLE LAUNCH SERVICES

NASA has assigned the Kennedy Space Center lead center responsibility for the agency's acquisition and management of expendable launch vehicle launch services.

This assignment will eliminate redundancy in the procurement, management, fiscal and administrative functions of expendable launch vehicles. It also will enable concentration of launch operations expertise at Kennedy which is NASA's operational launch center.

Kennedy will be fully functional in this new role by FY 1999. The Kennedy Expendable Vehicles Directorate expects to draw expertise, on a voluntary basis, from the Goddard Space Flight Center in Greenbelt, MD and the Lewis Research Center in Cleveland, OH.

To facilitate a smooth transition, Goddard and Lewis will maintain present responsibilities for manifested near-term missions. Atlas management will transition to Kennedy from Lewis after the next Atlas mission which is currently planned to occur in June, 1998 from Vandenberg Air Force Base. Delta and Pegasus management will transition from Goddard to Kennedy by FY 1999. Certain mission integration responsibilities for Goddard-managed spacecraft are expected to remain at Goddard.

Kennedy will also issue and award the launch services contract(s) for the follow-on small expendable launch vehicle contract with support from Goddard and the Marshall Space Flight Center, Huntsville, AL. The Kennedy assignment complements and does not alter NASA's assignment to Marshall for the lead in vehicle engineering and insight for development vehicles which lack a flight history.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 29, 1997
KSC Contact: Joel Wells
KSC Release No. 207-97

COLUMBIA ROLLS OUT TO REFURBISHED PAD 39B; FUEL CELL MODS COMPLETE

The Space Shuttle Columbia arrived at Pad 39B at 2:45 p.m. today after departing the Vehicle Assembly Building at 7 a.m. for the 4.2-mile trip atop the crawler transporter.

The launch of mission STS-87 from Pad 39B will be the first since significant modifications were made following the STS-81 launch on Jan. 12. In the 10 months that followed, workers replaced the long-run cables that extend through the entire Fixed Service Structure allowing electronic control and connectivity between the firing rooms, pad and Shuttle. Modernization of the 1960's era elevator system required replacement of technology left over from the Apollo program with state-of-the-art, electronically controlled elevators. Also, the air conditioning "chillers" that provide cool, dry air to the Shuttle prior to launch were replaced during this refurbishment period.

At the pad today, workers have begun pad validations and are preparing to hot fire auxiliary power unit No. 2 late tonight. The Rotating Service Structure will be placed around the vehicle tomorrow afternoon in preparation for vertical payload installation into the Shuttle's cargo bay on Nov. 1.

On this 24th flight of Columbia, an upgrade to the orbiter's fuel cell monitoring system is in place following an expedited design and KSC implementation process. Prior to the shortened STS-83 flight, NASA was studying ways to improve vehicle health monitoring with a focus on fuel cells. The desire for more refined fuel cell data before and after launch lead to the installation of off-the-shelf hardware and configuration changes in the crew module and midbody.

Columbia is scheduled to launch on mission STS-87 Nov. 19 on a 16-day flight of the U.S. Microgravity Payload (USMP) - 4 mission. This mission also features the deployment and retrieval of the Spartan-201 satellite and a spacewalk to demonstrate assembly and maintenance operations for future use on the International Space Station.

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STS-87
Columbia
United States Microgravity Payload-04 (USMP-04) and Spartan-201

KSC Release No. 208-97
November 1997

STS-87 images

The STS-87 mission aboard Columbia will feature the fourth flight for the U.S. Microgravity Payload (USMP-04) as well as deployment and retrieval of the Spartan-201 satellite to investigate the mechanisms causing the heating of the solar corona and the acceleration of the solar wind which originates in the corona. Also, an extravehicular activity (EVA) spacewalk demonstrating International Space Station assembly and maintenance operations will round out the 16-day mission. Another objective of the flight is to perform the Collaborative Ukraine Experiment (CUE), a middeck payload designed to study the effects of microgravity on plant growth. Other payloads on STS-87 include Getaway Specials (GAS), a special NASA program that offers individuals or groups opportunities to fly small experiments aboard the Space Shuttle.

The 87th Shuttle launch and 24th flight of Columbia (OV-102) is scheduled to begin with an afternoon liftoff from Launch Pad 39B at the opening of a 2-hour, 30-minute launch window. The orbiter will circle the Earth at an altitude of 172 statute miles at an inclination of 28.45 degrees to the equator. Once in orbit, the six-member crew will oversee 11 experiments in Columbia's payload bay and conduct four in-cabin scientific investigations. The mission is scheduled to conclude with an early morning touchdown at Kennedy Space Center's Shuttle Landing Facility.

The Crew

As mission commander, two-time space flier Kevin R. Kregel will lead the crew of one other veteran space flyer and four rookies on mission STS-87 aboard the Shuttle Columbia. Kregel, who became an astronaut in 1992, previously flew on STS-70 and -78 and has logged more than 618 hours in space.

Pilot Steven W. Lindsey (Major, USAF) became an astronaut in May 1996. This is his first flight on the Space Shuttle, but he previously has logged more than 2,700 hours of flying time in 49 different types of aircraft.

Mission specialists for STS-87 include Winston Scott, Kalpana Chawla, Ph.D., and Takao Doi, Ph.D. Scott, a captain in the Navy, served as a mission specialist on STS-72, during which he conducted two spacewalks to demonstrate and evaluate techniques to be used in the assembly of the International Space Station. Scott will again perform spacewalks on STS-87, along with Dr. Doi, who joined the National Space Development Agency (NASDA) of Japan in 1985 and

has been working in the Japanese manned space program since then. Doi served as a back-up payload specialist for the Spacelab Japan mission (STS-47) and also worked as a project scientist on the International Microgravity Laboratory-2 mission (STS-65). During the STS-87 mission, Dr. Doi will become the first Japanese astronaut to conduct a spacewalk from a Space Shuttle.

First-time Shuttle flier Dr. Chawla reported for training as an astronaut at Johnson Space Center in 1995. She has a doctorate in aerospace engineering from the University of Colorado.

USMP-04

The fourth United States Microgravity Payload (USMP-4) is one of a series of missions designed to conduct scientific research aboard the Shuttle in the unique microgravity environment for extended periods of time. In the past, USMP missions have provided invaluable experience in the design of instruments needed for the International Space Station (ISS) and microgravity programs to follow in the 21st century. USMP research also has provided the foundation for advanced scientific joint investigations in laboratories on the Russian Space Station Mir and the ISS. The USMP-4 mission consists of six major experiments mounted on two support structures bridging Columbia's payload bay. The USMP-4 scientific experiments are concentrated in the two major areas of materials science and fundamental physics.

Materials Science

MEPHISTO, a French acronym for "Materials for the Study of Phenomena Concerning Solidification on Earth and in Orbit," is a cooperative American and French investigation on the fundamentals of crystal growth. **AADSF,** or Advanced Automated Directional Solidification Furnace, will help determine how gravity-driven convection (flows and movement within a material) affects the composition and properties of alloys, while the Isothermal Dendritic Growth Experiment, or **IDGE,** will be used to study the solidification of molten materials. **SAMS,** or Space Acceleration Measurement System, will assess vibration levels on board the Shuttle that might affect sensitive microgravity experiments, while **OARE,** the Orbital Acceleration Research Experiment, will measure low-level aerodynamic acceleration along the orbiter's principal axes to help in the design of experiments for future missions.

Fundamental Physics

The Confined Helium Experiment, or **CHeX,** will use microgravity to study one of the basic influences on the behavior and properties of materials by using liquid helium confined between silicon disks.

Other Payload Bay Experiments

Another highlight of the STS-87 mission is the deployment and retrieval of **Spartan-201,** a small satellite involved in research to study the interaction between the Sun and its wind of charged particles. Observations made from Spartan-201 may have important practical implications for studies of how the variations in radiation and particle outputs of the Sun affect terrestrial magnetism, climate and weather.

Other payload bay experiments include the Shuttle Ozone Limb Sounding Experiment **(SOLSE)** to determine the altitude distribution of ozone in an attempt to better understand its behavior. The Loop Heat Pipe **(LHP)** test will advance thermal energy management technology and validating technology readiness for upcoming commercial spacecraft applications, and the Sodium Sulfur Battery Experiment **(NaSBE)** will characterize the performance of four 40-amp-hour sodium-sulfur battery cells.

STS-87 also will provide a platform for **Getaway Special (GAS)** 744 from Sierra College in Rocklin, Calif. The object of this experiment is to take ozone measurements of the Earth's upper atmosphere. The Turbulent Gas Jet Diffusion Flames **(TGDF)** payload is another payload using the GAS carrier. Its purpose is to gain an understanding of the characteristics of transitional and turbulent gas jet diffusion flames.

In-Cabin Experiments

The Collaborative Ukraine Experiment **(CUE),** a middeck payload, will study the effects of microgravity on plant growth.

Cosmonaut Leonid Kadenyuk will perform the CUE experiments, a collection of 10 plant space biology experiments that will fly in Columbia's middeck. CUE also features an educational component that involves evaluating the effects of microgravity on the pollinating Brassica rapa seedlings. Ukrainian and American students will participate in the same experiment on the ground and have several live opportunities to discuss the experiment with Kadenyuk in Space.

The Microgravity Glove Box **(MGBX)** facility was designed for conducting experiments requiring crew participation and which may contain substances that are could be hazardous or involve operations impractical in the cabin environment. The MGBX was developed to be used in the Shuttle Middeck, the Mir Space Station, and International Space Station. It has flown during STS-75 (USMP-3) and several Shuttle/Mir docking missions.

The three experiments in the MGBX are the Particle Engulfment and Pushing by a Solid Liquid Interface **(PEP)** which will seek to understand how to process superior composite materials, the Wetting Characteristics of Immiscibles **(WCI),** or materials incapable of mixing, that seeks to learn more about controlling immiscibles to produce more desirable structures, and the Enclosed Laminar Flames experiment, or **(ELF)** which will study combustion to learn more about important hidden processes during ignition, flame spreading and flame extinction.

Extravehicular Activity (EVA)

One scheduled extravehicular activity (EVA) spacewalk will be performed during STS-87 to demonstrate International Space Station assembly and maintenance operations. The spacewalk also will expand the EVA experience base for ground and flight crews. Mission Specialists Scott and Doi are scheduled to perform the EVA on Flight Day 6.

KSC Shuttle and Payloads Processing

Columbia's last spaceflight was STS-94, the reflight of the Microgravity Science Laboratory-1. Launch took place July 1, beginning the 16-day MSL-1 mission, which ended on July 17 with a landing at KSC. The orbiter was then moved to Orbiter Processing Facility Bay 2. After final checkout, Columbia rolled out to Launch Pad 39B on Oct. 29. The United States Microgravity Payload-4 was processed in KSC's Space Station Processing Facility, while the Spartan-201 deployable satellite was prepared at KSC's Vertical Processing Facility. The Microgravity Glovebox was processed at the Marshall Space Flight Center; and CUE was processed at the Life Sciences Support Facility at Hangar L at Cape Canaveral Air Station.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 30, 1997
KSC Contact: Joel Wells
KSC Release No. 209-97

KSC EXTENDS CURRENT BASE OPERATIONS CONTRACT

NASA procurement officials plan to exercise an option to extend the performance period of the KSC Base Operations Contract (BOC). The action is effective Nov. 1, 1997 through Sept. 30, 1998 with an estimated value of $147 million.

The option's original performance period was for two years through October 31, 1999, but, in order to accommodate the anticipated award of the Joint Base Operations Support Contract (JBOSC) slated for award by October 1, 1998 it will be shortened to eleven months.

The JBOSC is a joint procurement effort between NASA and the Air Force 45th Space Wing to provide unified base support services for KSC, Cape Canaveral Air Station, and Patrick Air Force Base.

EG&G Florida, Inc. of Cape Canaveral, FL, has been KSC's base operations contractor since 1983, providing management, operation, maintenance and engineering for KSC utilities, facilities, health, fire, security services and some technical operations. Their current contract was effective Nov. 1, 1993 and has a base period of performance through Oct. 31, 1997. The exercising of this option is within the provisions of the existing contract.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 31, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 210-97

Note to Editors:
MEDIA OPPORTUNITIES WITH STS-87 CREW SET FOR NEXT WEEK'S TCDT

The crew of Space Shuttle mission STS-87 will be at Kennedy Space Center next week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cut-off. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The six-member crew of mission STS-87 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 9:30 a.m. Monday, Nov. 3. Media wanting to view crew arrival should be at the KSC Press Site at 8:30 a.m. for transport to the SLF. Also, a photo opportunity of the crew driving the M-113 armored personnel vehicle will be available. Press should again meet at the KSC Press Site at 2:15 p.m. for transport to the M-113 location.

On Tuesday, Nov. 4, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39B. Media interested in participating in this question and answer session should be at the KSC Press Site by 7:30 a.m. Tuesday for transport to the pad.

On Wednesday, the crew will take part in simulated launch day events. A media photo opportunity is available for the crew's departure to the pad from their quarters in the Operations and Checkout Building. Media should be at the KSC Press Site by 6:45 a.m. Wednesday for transport to the O&C Building.

Once at the pad, the crew will enter the orbiter Columbia fully suited for the simulated Shuttle main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Columbia is now targeted for launch on Nov. 19 at 2:46 p.m. EST. Mission STS-87 will carry into space the U.S. Microgravity Payload-4 and will feature the deployment and retrieval of the Spartan 201-04 free-flying laboratory. The mission is scheduled to last 16 days.

Crew members for mission STS-87 are Commander Kevin Kregel; Pilot Steven Lindsey; Mission Specialists Winston Scott, Kalpana Chawla and Takao Doi; and Payload Specialist Leonid Kadenyuk.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 3, 1997
KSC Contact: Joel Wells
KSC Release No. 211-97

COLUMBIA'S STS-87 MISSION SET TO LAUNCH NOV. 19 FROM KSC

Space Shuttle Program managers today selected Nov. 19 as the launch date for the eighth and final mission of 1997 to deploy and retrieve a sun-studying science satellite, conduct microgravity experiments and test International Space Station assembly and maintenance techniques and tools.

The Flight Readiness Review was held today at the Kennedy Space Center, FL, to evaluate the readiness of the flight crew, vehicle and launch and mission control teams to support the flight.

The launch window opens at 2:46 p.m. EST and closes two and a half hours later at about 5:30 p.m. Following a nominal flight duration of 15 days, 16 hours, 34 minutes, Columbia is scheduled to land at KSC at about 7:20 a.m. EST, Dec. 5.

Columbia's crew is comprised of Commander Kevin Kregel, Pilot Steven Lindsey, Mission Specialists Takao Doi, Winston Scott and Kalpana Chawla, and Ukrainian Payload Specialist Leonid Kadenyuk.

One of the highlights of the flight is a spacewalk by Scott and Doi who will test tools, techniques and hardware that will help in the assembly and maintenance of the International Space Station, both during its construction and subsequent operations. The spacewalk also will test a unique, basketball shaped satellite which is remotely operated from inside the Shuttle to demonstrate the feasibility of remote photography near the Shuttle or station.

"The processing and training teams have done an excellent job getting Columbia and its crew ready for this mission," said George Abbey, Director of the Johnson Space Center, who chaired the Flight Readiness Review.

STS-87 will be Columbia's 24th flight and the 88th Shuttle flight in the program's history.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 10, 1997
KSC Contact: Joel Wells
KSC Release No. 212-97

ATLANTIS SCHEDULED TO DEPART KSC FOR MAJOR MODIFICATIONS IN PALMDALE, CA.

The orbiter Atlantis, veteran of 20 Space Shuttle flights and seven Mir docking missions, will depart Kennedy Space Center, FL, on Tuesday, Nov. 11, for Palmdale, CA, for extensive inspections and modifications as part of the scheduled orbiter maintenance down period (OMDP).

This is Atlantis' second OMDP, an action that periodically removes all four of NASA's orbiters from flight operations. The orbiter's first OMDP extended from October 1992 through May 1994 with major work required to support missions to Mir.

Atlantis will spend more than nine months at the Orbiter Assembly Facility in Palmdale where about 120 modifications will be performed on the vehicle. Among the major modifications, an enhanced Global Positioning Satellite system will be installed to more accurately pinpoint the orbiter's location in flight. This improvement provides state of the art technology to both flight crew and mission controllers. Final preparations for future International Space Station (ISS) missions are also planned during Atlantis' down time. For example, the orbiter's docking system will be configured for ISS docking operations instead of the current Mir configuration.

Atlantis rolled out of KSC's Orbiter Processing Facility bay 3 today, bound for the Shuttle Landing Facility's Mate-Demate Device. Later tonight, Atlantis will be mated, in "piggy-back" fashion, to the Boeing 747 Shuttle Carrier Aircraft (SCA). Ferry flight departure may occur as early as 6:30 a.m. Tuesday, Nov. 11.

The coupled orbiter and SCA are expected to make a one-day cross-country flight to California, with a planned refueling stop in Texas. All ferry flight plans are subject to weather restrictions and alternate landing sites may be selected en route if necessary.

Ferry flight rules state the orbiter/SCA cannot fly through precipitation, thick clouds or high turbulence. There are also wind and temperature restrictions. Following this modification period, Atlantis is expected to return to KSC in late August of 1998. The orbiter's next flight, targeted for Jan. 14, 1999, will be the third ISS assembly flight.

News media interested in viewing the orbiter/SCA departure from KSC must be at the KSC press site by 6 a.m. Tuesday for transport to the Shuttle Landing Facility. Media should call the KSC Press Site before close of business today to confirm the departure time.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 13, 1997
KSC Contact: Joel Wells
KSC Release No. 213-97

SPACE SHUTTLE MISSION STS-87 LAUNCH COUNTDOWN TO BEGIN NOV. 16

NASA will begin the countdown for launch of Space Shuttle Columbia on mission STS-87 on Nov. 16 at 3 p.m. EST at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center.

The countdown includes 28 hours and 46 minutes of built-in hold time leading to a launch time of 2:46 p.m. (EST) on Nov. 19. The launch window extends for 2 hours and 30 minutes.

STS-87 is the eighth and final Space Shuttle mission of 1997. This will be the 24th flight of the orbiter Columbia and the 88th flight overall in NASA's Space Shuttle program. STS-87 is scheduled to last 15 days, 16 hours, 34 minutes and end with a planned KSC landing at about 7:20 a.m. on Dec. 5.

Columbia was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 3 on Oct. 24 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was transported to Pad 39B on Oct. 29.

On mission STS-87, Columbia will carry into orbit a six member crew. Once on orbit the United States Microgravity Payload experiments will be activated and the Spartan-201 satellite will be deployed on the second day of the mission. Spartan retrieval is slated for flight day 4 and two days later Mission Specialists Winston Scott and Takao Doi will conduct a six-hour space walk to demonstrate techniques to be used in the assembly of the International Space Station. Throughout the mission, Ukrainian Payload Specialist Leonid Kadenyuk will conduct plant growth experiments as part of the Collaborative Ukrainian Experiment.

The STS-87 crew consist of: Commander Kevin Kregel, Pilot Steven Lindsey, Mission Specialists Winston Scott, Kalpana Chawla, and Takao Doi, and Payload Specialist Leonid Kadenyuk.

The crew is scheduled to arrive at KSC at about 3:30 p.m., Sunday, Nov. 16. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES
***all times are Eastern**
Launch - 3 Days (Sunday, November 16)

- Prepare for the start of the STS-87 launch countdown
- Perform the call-to-stations (2:30 p.m.)
- All members of the launch team report to their respective consoles in Firing Room 3 in the Launch Control Center for the start of the countdown

Countdown begins at the T-43 hour mark (3 p.m.)
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Columbia's general purpose computers
- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
- Complete cryogenic servicing of payloads

Launch - 2 Days (Monday, November 17)

- Activate and test navigational systems
- Complete preparations for loading of power reactant storage and distribution system
- Complete payload bay close-outs

Enter first planned built-in hold at T-27 hours for duration of six hours (7 a.m.)

- Close payload bay doors
- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (1 p.m.)

- Begin operations to load cryogenic reactants into Columbia's fuel cell storage tanks and extended duration orbiter (EDO) tanks located in the orbiter's payload bay (1 p.m. - 1 a.m.)

Enter six-hour built-in hold at T-19 hours (9 p.m.)

Launch -1 Day (Tuesday, November 18)

- After cryogenic loading operations, re-open the pad
- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Resume countdown (3 a.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Install mission specialists' seats in crew cabin
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 26 minutes (11 a.m.)

- Activate the orbiter's flight controls and navigation systems
- Begin startracker functional checks
- Activate orbiter's inertial measurement units
- Install film in numerous cameras on the launch pad
- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down
- Move Rotating Service Structure (RSS) to the park position (9 p.m.)
- Flight crew equipment late stow
- Perform ascent switch list

Launch Day (Wednesday, November 19)

Resume countdown (12:26 a.m.)

- Start fuel cell flow-through purge
- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Columbia's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (5:26 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 6 a.m.)

Resume countdown (6:26 a.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 9:26 a.m.)

Enter planned two-hour built-in hold at T-3 hours (9:26 a.m.)

- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines
- Close-out crew and Final Inspection Team proceed to Launch Pad 39B

Resume countdown at T-3 hours (11:26 a.m.)

- Crew departs Operations and Checkout Building for the pad (about 11:31 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 12:01 p.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Columbia's crew hatch (about 1:16 p.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (2:06 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (2:16 p.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (2:27 p.m.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (2:37 p.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-6:15)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-87

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	6 hours	7:00 a.m. Mon.	1:00 p.m. Mon.
T-19 hours	6 hours	9:00 p.m. Mon.	3:00 a.m. Tues.
T-11 hours	13 hours, 26 minutes	11:00 a.m. Tues.	12:26 a.m. Wed.
T-6 hours	1 hour	5:26 a.m. Wed.	6:26 a.m. Wed.
T-3 hours	2 hours	9:26 a.m. Wed.	11:26 a.m. Wed.
T-20 minutes	10 minutes	2:06 p.m. Wed.	2:16 p.m. Wed.
T-9 minutes	10 minutes	2:27 p.m. Wed.	2:37 p.m. Wed.

CREW FOR MISSION STS-87

Commander (CDR):	Kevin Kregel
Pilot (PLT):	Steven Lindsey
Mission Specialist (MS1):	Kalpana Chawla
Mission Specialist (MS2):	Winston Scott
Mission Specialist (MS3):	Takao Doi
Payload Specialist (PS):	Leonid Kadenyuk

SUMMARY OF STS-87 LAUNCH DAY CREW ACTIVITIES

Wednesday, November 19

9:51 a.m.	Wake up
***10:21 a.m.**	**Breakfast and Crew photo**
10:51 a.m.	Weather briefing (CDR, PLT, MS2)
10:51 a.m.	Don launch and entry suits (MS1, MS3, PS)
11:01 a.m.	Don launch and entry suits (CDR, PLT, MS2)
11:15 a.m.	Suit up photo
***11:31 a.m.**	**Depart for launch pad 39B**
***12:01 p.m.**	**Arrive at white room and begin ingress**
*** 1:16 p.m.**	**Close crew hatch**
*** 2:46 p.m.**	**Launch**

* Televised events (times may vary slightly)

All times Eastern

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 13, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 214-97

Notice to Editors/News Directors:
MISSION STS-87 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Nov. 19 launch of the Space Shuttle Columbia on Mission STS-87, the 88th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-87 NASA TV schedule for exact times.

The six STS-87 crew members are scheduled to arrive at KSC on Sunday, Nov. 16, at about 3:30 p.m. EST. News media representatives wishing to cover the event must be at the News Center by 2:30 p.m. Sunday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-87 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: **http://www.ksc.nasa.gov/shuttle/countdown/** and at **http://shuttle.nasa.gov/**

KSC press releases and other information are available on the KSC PAO Home Page at: **http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm**

STS-87 BRIEFING & EVENTS SCHEDULE *(all times are EDT)*
(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Sunday, Nov. 16
No Countdown Status Briefing is scheduled

(Launch countdown begins at 3 p.m.)

STS-87 Flight Crew Arrival (Live on NASA TV) ----- 3:30 p.m.

L-2 Days - Monday, Nov. 17
Countdown Status Briefing ----- 9 a.m.

- Doug Lyons, Shuttle Test Director
- Richard Kuhns, STS-87 Payload Manager
- Ed Priselac, Shuttle Weather Officer

L-1 Day - Tuesday, Nov. 18
Pre-launch News Conference ----- 10 a.m.

- Tommy Holloway, NASA Shuttle Program Manager, JSC
- Joel Kearns, Manager, Microgravity Program, MSFC
- Dr. George Withbroe, Director, Sun-Earth Connection Program, Office of Space Science, HQ
- Dr. Edward I. Kuznetsov, Deputy Director General, National Space Agency of Ukraine
- TBD NASDA representative
- Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
- Capt. Dave Biggar, Launch Weather Officer, USAF 45th Weather Squadron

(News media KSC orientation tour begins at 1 p.m.)

Launch Day - Wednesday, Nov. 19
(Tanking begins at about 6 a.m.)

NASA Television live launch programming begins ----- 9 a.m.

Launch of Columbia ----- 2:46 p.m.

Post-launch Press Conference ----- Launch + 1 hour

- Donald R. McMonagle, Manager, Launch Integration for the Space Shuttle Program
- Jim Harrington, KSC Launch Director

KSC News Center office hours for STS-87
(hours may be adjusted for in-flight events)

Sunday, Nov. 16--------- (Launch minus 3 days)---	12 noon - 6 p.m.
Monday, Nov. 17--------- (Launch minus 2 days)---	8 a.m. - 4:30 p.m.
Tuesday, Nov. 18-------- (Launch minus 1 day)----	8 a.m. - 12 midnight
Wednesday, Nov. 19------ (Launch) Flight day 1---	5:30 a.m. - 12 midnight
Thursday, Nov. 20------- Flight day 2 ----------	8 a.m. - 6:30 p.m.
Friday, Nov. 21--------- Flight day 3 ----------	8 a.m. - 6:30 p.m.
Sat.-Sun., Nov. 22/23--- Flight day 4-5----------	CLOSED
Mon.-Wed., Nov. 24-26--- Flight days 6-8 --------	8 a.m. - 4:30 p.m.
Thursday, Nov. 27------- Flight day 9 ----------	CLOSED
Fri., Nov. 28----------- Flight days 10 ---------	8 a.m. - 4:30 p.m.
Sat.-Sun., Nov. 29-30--- Flight days 11-12 ------	CLOSED
Mon.-Thurs., Dec. 1-4--- Flight days 13-16 ------	8 a.m. - 4:30 p.m.
Friday, Dec. 5---------- (Landing) Flight day 17-	4 a.m. - 4:30 p.m.

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-87 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Sunday, Nov. 16 ---------- 12 noon - 2:30 p.m.
Monday, Nov. 17 ---------- 8 a.m. - 4:30 p.m.
Tuesday, Nov. 18 ---------- 8 a.m. - 4:30 p.m.
Wednesday, Nov. 19 ---------- 8 a.m. - 1:30 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the query counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

Go to the *KSC Press Releases* Home Page

NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 21, 1997
KSC Contact: Joel Wells
KSC Release No. 215-97

NASA SPACE ANALOG STATION COMMISSIONED AT KSC VISITOR COMPLEX

NASA's Scott Carpenter Space Analog Station -- a functional human-tended simulator to demonstrate concepts of space life support systems to students from kindergarten through grade 12 - is being commissioned at Kennedy Space Center's (KSC's) Visitor Complex Rocket Garden at 11 a.m. today. Mercury astronaut Scott Carpenter will be the keynote speaker at the ceremony, which will include Center Director Roy Bridges Jr., U.S. Representative Dave Weldon, and about 500 students from across Florida.

The analog (analogous) station, designed for use underwater, simulates a space station environment to demonstrate life support systems necessary for space stations and moon and Mars bases. Communicating the concepts of oxygen generation, carbon dioxide scrubbing, cabin atmosphere and pressures, waste removal, and other closed life support system processes helps students learn about space life science as well as stimulating interest in science in general.

The sumbergible test bed was built with $70 thousand of education outreach money from NASA Headquarters' Office of Life Sciences. Designed by KSC engineers Dennis Chamberland and Jim Bishop, the station was outfitted with necessary instrumentation by KSC technicians.

As part of KSC's Mission to America's Remarkable Students (MARS) outreach effort, the Carpenter Station operated continuously for 31 days on the sea floor near Key Largo, Florida, during the STS-86 mission. As part of the nearly 11-day mission, the orbiter Atlantis carried 31/2 million tomato seeds that were exposed to the vacuum of space in a Get Away Special (GAS) canister. The station carried an identical cargo in its sea floor location at a pressure of 1.7 atmospheres.

Station crews conducted 21 classroom telephone and live Internet links with MARS schools during the mission to answer students' questions about space life sciences and the experiment, which sought to demonstrate how plants cultivated in the space environment will serve as a source of bioregenerative life support for future space travelers.

The Carpenter Station will be on display at Sea World of Florida tomorrow, Nov. 22, and will make its first classroom stop at Suntree Elementary School in Melbourne on Monday, Nov. 24.

NOTE TO EDITORS: Space and education reporters are encouraged to attend.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 4, 1997
KSC Contact: George H. Diller
KSC Release No. 216-97

LUNAR PROSPECTOR SPACECRAFT ARRIVES IN FLORIDA FOR FINAL LAUNCH PREPARATIONS

The Lunar Prospector spacecraft, to be launched for NASA in early January on an Athena 2 rocket by Lockheed Martin, arrived in Florida today to begin final prelaunch preparations. The work is being performed in Titusville, Fl, at Astrotech, a commercial payload processing facility. The small robotic spacecraft is designed to provide the first global maps of the Moon's surface compositional elements and its gravitational and magnetic fields.

While at Astrotech, Lunar Prospector will be fueled with its attitude control propellant and then mated to a Trans-Lunar Injection Stage which is a solid propellant upper stage motor. The combination will next be spin tested to verify proper balance, then encapsulated into the Athena nose fairing. Early on Dec. 23, Lunar Prospector will be transported from Astrotech to Cape Canaveral Air Station and mated to the Athena rocket. The Athena, which is also currently undergoing final prelaunch preparations, is awaiting the spacecraft's arrival at Spaceport Florida's new Launch Complex 46, the organization's first from that pad.

Stacking of the three-stage Athena booster at the pad began this summer and will culminate with a 34-hour countdown dress rehearsal on Dec. 10-11.

The launch of Lunar Prospector is scheduled for Jan. 5, 1998 at 8:31 p.m.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

December 4, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 217-97

COLUMBIA SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-87

The orbiter Columbia is scheduled to land at Kennedy Space Center on Friday, Dec. 5 at 7:20 a.m. EST completing its 16-day, 6.5 million mile, STS-87 mission which was launched from KSC on Nov. 19.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 252 at mission elapsed time 15 days, 16 hours, 34 minutes. Deorbit burn will occur at about 6:19 a.m. Friday.

The two KSC landing opportunities on Friday are: 7:20 a.m. and 8:55 a.m. EST. Managers have decided not to call up the back-up landing location at Edwards Air Force Base (EAFB), CA, for a landing attempt on Friday.

If managers must keep Columbia in orbit an additional day, two landing opportunities are available at KSC and one at EAFB on Saturday.

KSC Saturday landing times are: 7:22 a.m. and 8:57 a.m. EST.

EAFB Saturday landing time is at 10:24 a.m. EST.

This landing of Columbia will mark the 41st landing at KSC in the history of Space Shuttle flight. It will be the eighth and final landing of the Shuttle at KSC this year. Columbia is currently on the 88th Space Shuttle mission in the history of the program

Select members of the flight crew will be present for a post-mission press conference at about 1 p.m. on Friday. The conference will be held at the KSC Press Site TV auditorium and carried live on NASA TV. The exact time of the news conference will be announced by the KSC Press Site as soon as it is known.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Columbia Nov. 19. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE

suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC Friday afternoon.

If Columbia lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 31/2 hours after Columbia lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 3 for post-flight deservicing. Operations in OPF bay 3 will be made to prepare Columbia for is next Space Shuttle mission, STS-90, to be launched in early April 1998.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 8, 1997
KSC Contact: Bruce Buckingham
KSC Release No. 218-97

Notice to Editors:
MARS PATHFINDER STAMP TO BE ISSUED AT KSC

NASA's Mars Pathfinder mission to the red planet will be commemorated on a postage stamp to be issued this week.

The $3 stamp will be issued first on Wednesday, Dec. 10 at the Jet Propulsion Laboratory, Pasadena, CA. The second day of issue will be Thursday, Dec. 11 at Kennedy Space Center. A ceremony featuring Titusville Postmaster Ed Link and Floyd Curington, director, Expendable Launch Vehicles, will be held at 11 a.m. at Spaceport Theater, KSC Visitor's Complex.

The stamp depicts the Sojourner rover at rest on the Pathfinder spacecraft with a panoramic Martian view that is based on one of the first mission images sent back to Earth. Commemorative stamp cancellations will be available after the ceremony.

Media interested in attending the KSC ceremony may proceed directly to the Spaceport Theater.

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STS-89
Endeavour
Eighth Shuttle-Mir Docking

KSC Release No. 220-97
December 1997

STS-89 images

During STS-89, the Space Shuttle Orbiter Endeavour will conduct the eighth of nine dockings of a U.S. spacecraft with the Russian Mir space station. This is Endeavour's first docking mission. After docking is completed, Andrew S. W. Thomas, the seventh and last U.S. astronaut to live and work aboard the Russian space platform, will transfer from Endeavour to become a member of the Mir 24 crew for approximately four months. Thomas will replace Dr. David A. Wolf, who boarded Mir during the STS-86 mission in September. Wolf will return to Earth aboard Endeavour.

The nine-day mission will begin when Endeavour lifts off from Launch Pad 39A on its 12th space flight during a 5- to 10-minute launch window and enters an orbit of 160 nautical miles and an inclination of 51.6 degrees to the Earth's equator. The orbiter will then rendezvous with Mir at an altitude of 213 nautical miles and dock on Flight Day 3.

In addition to the crew transfer during docking operations, the seven-member crew will move tons of science and logistical materials as well as supplies between the two spacecraft, including water from the orbiter's fuel cells for use on Mir. Science investigations that are concerned with crew health and safety aboard Mir and technical applications for the International Space Station will be also conducted during this time.

When docking operations are complete, Endeavour will undock on Flight Day 8 and prepare for its return to Earth. Weather permitting, the orbiter will touch down at KSC's Shuttle Landing Facility to conclude the 89th Space Shuttle mission.

The Crew

One Russian cosmonaut and six American astronauts will make up the STS-89 crew. Three crew members have previously flown in space.

Mission Commander Terrence W. Wilcutt (Lt. Col., USMC) has flown twice before as pilot, on STS-68 and the fourth Shuttle-Mir docking mission, STS-79. The Marine Corps test pilot/project officer became an astronaut in 1991.

The STS-89 pilot is Joe Frank Edwards Jr. (Cmdr., USN), who is on his first space flight. The Navy fighter pilot and project flight test officer was selected as an astronaut candidate in 1994.

Five mission specialists round out the crew. Andrew S. W. Thomas (Ph.D.) flew before as payload commander on STS-77. Before the Australian-born scientist was selected as an astronaut candidate in 1992, he was a NASA Jet Propulsion Laboratory (JPL) employee who became leader of that center's program for microgravity materials processing in space.

Bonnie J. Dunbar (Ph.D.) has trained in Star City, Russia, as a backup Mir crew member. She is on her fifth Shuttle flight. Dunbar became an astronaut in 1981 after working at Johnson Space Center as a project officer/payload officer. She holds a doctorate in mechanical/biomedical engineering.

James F. Reilly II (Ph.D.) is a first-time space flyer who was selected for the astronaut program in 1994. He was an oil and gas exploration geologist before his selection and holds a doctorate in geosciences.

Michael P. Anderson (Maj., USAF) is another space rookie who was selected by NASA in 1994. He has been an Air Force aircraft commander, instructor pilot and tactics officer.

Salizhan Shakirovich Sharipov of Kirghizia was selected as a cosmonaut-candidate in 1990 by the Gagarin Cosmonaut Training Center. He will be on his first space flight. He was a Russian Air Force pilot-instructor before his selection.

David A. Wolf (M.D.) is a medical doctor and a flight surgeon in the Air National Guard. He transferred to the Mir on his second Shuttle flight, STS-86. Wolf was selected as an astronaut in 1990.

Shuttle-Mir to International Space Station

The Shuttle-Mir docking missions represent Phase I of the International Space Station (ISS) flight program prior to the Phase 2 construction scheduled to begin in the summer of 1998. The international cooperation and on-going scientific research conducted aboard the Shuttle orbiter and by the U.S. and Russian crew members aboard the Mir are considered by NASA to be laying the foundation for the construction and operation of the ISS. One of the goals of the Shuttle-Mir missions is to understand more fully how to operate an international space station, providing researchers from all over the world access to laboratory facilities in space.

When Andrew Thomas leaves the Russian orbital platform during the last docking mission, the STS-91 space flight now targeted for May 1998, he will be ending a joint program that has led to significant gains in advanced technology, earth sciences, fundamental biology, human life sciences, microgravity and ISS Risk Mitigation research that began when U.S. astronaut Norman Thagard boarded Mir in March 1995.

Docking missions help sustain Mir

The SPACEHAB Double Modules (DMs) located in Shuttle orbiter payload bays have played a critical role in Shuttle-Mir docking missions by serving as the means to transport Russian supplies, logistics items and experiments to Mir. Some of the 4,435 pounds of equipment that will be transferred from the DM in Endeavour's payload bay during STS-89 docking operations include a gyrodyne, storage batteries, clothing, personal hygiene, and sleeping articles and food and water containers. More than 1,400 pounds of water will also be supplied from Endeavour's fuel cells. Other equipment includes the hardware for International Space Station Risk Mitigation Experiments (RME) that will be conducted aboard Mir, as well as advanced technology, microgravity and NASA Human Life Sciences investigations.

ISS Risk Mitigation Experiments (RME)

The goal of ISS RME experiments conducted aboard the Mir and the Shuttle orbiter is to gather information to help improve the design of the ISS in the areas of crew health and safety. During STS-89, the Mir Electric Field Characterization (MEFC) experiment will monitor internal and external radio interference and then be returned to the SPACEHAB module. The Cosmic Radiation Effects and Activation Monitor (CREAM) is an RME experiment aboard Endeavour. Five other RME experiments will measure ionizing and cosmic radiation, expose materials to the Mir external orbital environment and test the Mir potable water processor and a water treatment process designed for use on the ISS.

Other Mir Experiments

Other experiments that will be carried out aboard the Russian space station by the STS-89 and Mir 24 crews include two Advanced Technology investigations, the Astroculture and Advanced X-Ray Detector (XDT) experiments. Microgravity experiments will include the Diffusion-Controlled Crystallization Apparatus for Microgravity (DCAM) hardware to manufacture protein crystals, the Mechanics of Granular Materials (MGM) experiment, and the Space Acceleration Monitoring System (SAMS). Sample items from the Biochemistry of 3-Dimensional Tissue Engineering experiment (BIO3D) already aboard Mir will be returned aboard Endeavour.

The hardware for six NASA/JSC Human Life Sciences experiments that will be carried out when Thomas is onboard Mir will be transferred inside the Russian orbital outpost during STS-89. These investigations will help determine the effects of long-duration spaceflight on crew members' back muscles and spine, immune systems, interpersonal performance, renal systems and cardio- vascular neural control mechanisms.

Other Shuttle payloads

Several experiments in addition to RME experiments will also be conducted in the orbiter crew cabin middeck area. The Closed Equilibrated Biological Aquatic System (CEBAS) Minimodule is a habitat for aquatic organisms that is under development by the German Space Agency and Kennedy Space Center. It will allow the orbiter crew to conduct gravity-related experiments in the areas of zoology, botany and developmental biology. The hardware for the Microgravity Plant Nutrient Experiment (MPNE) will fly for the first time to validate its performance in space. It is a part of NASA's Advanced Life Support System (ALS) Test Facility. Another middeck experiment is the Human Performance experiment that will be used to investigate the ability of the STS-89 crew to perform cognitive and psychomotor tasks in microgravity.

A Get Away Special (GAS) payload carried in Endeavour's payload bay that is sponsored by the Chinese Academy of Sciences that contains five experiments. Two experiments will conduct metallurgical research and three will be used to perform crystal-growth-related investigations.

KSC Shuttle and Payloads Processing

Endeavour was outfitted for Mir and ISS docking operations during its first Orbiter Maintenance Down Period (OMDP) at Palmdale, Calif., and returned to KSC March 26. Endeavour was mated to its external tank and solid rocket boosters in the Vehicle Assembly Building (VAB) Dec. 13 and transported out to Launch Pad 39A Dec. 19. The SPACEHAB-DM payload was moved to the pad and installed in Endeavour's payload bay on Dec. 20. The Terminal Countdown Demonstration Test (TCDT) was rescheduled for Jan. 9-10, 1998.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 16, 1997
KSC Contact: George H. Diller
KSC Release No. 221-97

LUNAR PROSPECTOR MEDIA OPPORTUNITY SET FOR FRIDAY, DEC. 19

The Lunar Prospector spacecraft, to be lofted toward the moon by a Lockheed Martin Athena II rocket, will be the subject of a news media opportunity on Friday, Dec. 19. The event will be held at the Astrotech Space Operations facility starting at 9:15 a.m.

Lunar Prospector, also built by Lockheed Martin, is a small robotic spacecraft designed to provide NASA the first global maps of the Moon's surface compositional elements and its gravitational magnetic fields. Liftoff will occur from Spaceport Florida's new Launch Complex 46 on Cape Canaveral Air Station, the organization's first launch from that pad.

Procedures for optically sensitive spacecraft must be followed for individuals entering the cleanroom where the spacecraft is being processed. Guidelines for controlled access to the cleanroom have been developed by quality control personnel and will be monitored prior to entering the facility. Cleanroom attire will be furnished. A request may be made to clean cameras or accessories using alcohol wipes which will be provided.

Long pants and closed toe shoes must be worn -- no shorts or skirts. Non-essential equipment such as camera bags or other carrying cases should be left outside the cleanroom. Flash photography cannot be permitted. There is adequate metal halide lighting in the facility for photography (white with slight green cast). No pencils or felt-tipped pens can be permitted, only ball point pens may be used.

On Friday, media may proceed directly to Astrotech located in the Spaceport Florida Industrial Park, 1515 Chaffee Drive, Titusville. Spokespeople will be available for interviews and to answer questions about the spacecraft, its mission, Launch Complex 46 and the Athena II rocket.

The three-stage Athena II successfully completed a 34-hour countdown dress rehearsal last week and is currently undergoing final preparations on the pad. Launch is scheduled for Monday, Jan. 5, 1998 at 8:31 p.m. EST.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 23, 1997
KSC Contact: George Diller
KSC Release No. 222-97

LUNAR PROSPECTOR TO BE LAUNCHED ABOARD ATHENA II JAN. 5

The launch of Lunar Prospector aboard a Lockheed Martin Athena II rocket is scheduled for Monday, Jan. 5, at 8:31 p.m. EST. The launch window is four seconds in duration. Launch will occur from Complex 46 on Cape Canaveral Air Station, Spaceport Florida's new commercial launch pad.

Lunar Prospector, built for the NASA Ames Research Center by Lockheed Martin, is a spin-stabilized spacecraft designed to provide NASA the first global maps of the Moon's surface and its gravitational magnetic fields. It will orbit the Moon at an altitude of approximately 63 miles during a one-year mission. Its five science instruments will provide detailed data on the composition and structure of the entire lunar landscape, of which more than 75 percent remains virtually unexplored. A key mission objective is to provide direct evidence of the presence or absence of ice in the shaded regions of the lunar poles.

Lunar Prospector Prelaunch News Conference

The prelaunch news conference will be held at the NASA News Center at KSC on Sunday, Jan. 4, at 12 noon EST. Participating in the briefing will be:

- Dr. Wesley Huntress, Associate Administrator for Space Science
  NASA Headquarters
- Edward A. O'Connor, Executive Director
  Spaceport Florida Authority
- Victor Whitehead, Vice President, Space Launch Systems
  Lockheed Martin Astronautics
- Scott Hubbard, Lunar Prospector Mission Manager
  NASA Ames Research Center
- Joseph Boyce, Lunar Prospector Program Scientist
  NASA Headquarters
- James Sardonia, Launch Weather Officer
  45th Weather Squadron, USAF

A post-launch news conference will also be held at the NASA-KSC News Center on Monday, Jan. 5, beginning at 10:30 p.m. EST.

Remote Camera Placement

On Sunday, Jan. 4, at 7:30 a.m., a bus will depart from the NASA-KSC News Center for Complex 46 for media photographers who wish to establish remote cameras at the pad. There will be no access or transportation for remotes from Gate 1. An opportunity will be provided on launch day to make any adjustments necessary for camera timers.

Launch Day Press Coverage

On launch day, there will be a photo opportunity of the Lunar Prospector/Athena II launch vehicle at Complex 46 after tower rollback is complete. Spokespeople will be available during this opportunity to provide a status of the launch countdown. Those photographers needing to make adjustments to remote camera placements may do so at this time. Those wishing to participate will depart by bus from the NASA-KSC News Center for Complex 46 at noon. Media will be returned to the News Center by 2 p.m.

For launch, media covering the event should assemble at the Gate 1 Pass and Identification Building on Cape Canaveral Air Station located on State Road 401. A special press site has been established for the launch of Lunar Prospector which is located on south Cape Canaveral Air Station adjacent to the Trident turn basin. Because this site is located on a bluff that is relatively remote and space available for parking is limited, media will be taken by bus to this location. Television stations using remote trucks for launch coverage will be the only media vehicles permitted at the press site. The bus will depart from Gate 1 at 7:15 p.m. Remote trucks will also be escorted to the special press site location at this time.

Video and audio plug-in capability for NASA Television will be available. There will not be telephones available, so media should plan on bringing their own cellular phones.

Accreditation

Those who wish to cover the prelaunch news conference and the launch of Lunar Prospector should send a letter of request on news organization letterhead. Include the names and Social Security numbers of those desiring accreditation. Letters should be faxed to 407/867-2692 or may be addressed to:

Lunar Prospector Launch Accreditation
NASA AB-F1
Kennedy Space Center, FL 32899

Lunar Prospector mission badges may be picked up at the NASA-KSC News Center on Friday, Jan. 2, and Sunday, Jan. 4, by contacting the accreditation secretary at 407/867-2468. Badges may also be obtained on launch day at the Gate 1 Pass and Identification Building starting at 7 p.m. To obtain a badge, proper media identification must be presented or a letter requesting accreditation should be sent in advance to the KSC News Center.

On launch day, a Lunar Prospector mission badge is required for all media covering the launch from Cape Canaveral Air Station. No other badges can be honored.

News Center Hours for Launch

On L-1 day, Jan. 4, the NASA News Center at KSC will open at 7 a.m. for remote camera placements and the Prelaunch News Conference, closing at 3 p.m. On launch day, Jan. 5, the News Center will open at 8 a.m. and will remain open through the conclusion of the post-launch news conference.

NASA Television Coverage

NASA Television will carry live the Lunar Prospector/Athena II Prelaunch News Conference on Sunday, Jan. 4, starting at 12 noon, EST. On launch day, Monday, Jan. 5, launch commentary will begin at 7:30 p.m. EST and continue until a successful mission can be confirmed which will be approximately one hour after launch. The post-launch news conference will also be carried which starts at 10:30 p.m. NASA Television is available on the GE-2 satellite, Transponder 9C, located at 85 degrees West.

Audio only of the prelaunch press conference and the launch coverage will be carried on the NASA "V" circuits which may be accessed by dialing 407/867-1220...1240...1260.

Status Reports

Recorded status reports on the launch of Lunar Prospector will be available on the KSC news media codaphone starting on Sunday, Jan. 4. The telephone number is 407/867-2525.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 17, 1997
KSC Contact: Joel Wells
KSC Release No. 223-97

KSC LAUNCH DIRECTOR HARRINGTON TO RETIRE; SUCCESSORS NAMED

Shuttle Launch Director James F. Harrington has announced his retirement effective Jan. 2, 1998. He will be succeeded in the launch director's position by Shuttle Processing Deputy Director David A. King and Process Engineering Director Ralph R. Roe.

As the senior member of the Shuttle launch team during the three-day countdown, the launch director makes the final determination to launch. He also oversees prelaunch preparations at the space center, as well as KSC landing operations.

Since being named launch director effective Jan. 22, 1995, Harrington has overseen 22 successful Space Shuttle launches. "The skill and ease with which Jim has managed the countdown process has left a record of which we can all be proud," said Shuttle Processing Director Robert B. Sieck, himself a former launch director.

Harrington has overseen every Shuttle mission to date to rendezvous and dock with the Russian Space Station Mir. In 1997, he and the KSC launch team loaded the orbiter's external tanks eight times and sent eight Shuttle missions into orbit. He was also involved with the first reflight of an entire vehicle, payload, and crew on Mission STS-94. In 1995, Harrington was involved with the quickest turnaround between the landing of one mission, STS-71, and the launch of another, STS-70, just six days later.

"Being able to work with the KSC launch team and seeing them perform as well as they do is the best thing about this job," Harrington commented.

Harrington began his space program career in 1957 as a senior flight test engineer for General Dynamics Astronautics at Cape Canaveral on the Mercury-Atlas launch team. He started with NASA in 1966 as a senior test conductor. Taking on assignments of increasing responsibility, he has held such positions as senior test conductor, vehicle manager and flow director. He was appointed deputy director, Shuttle Operations, in 1986, and director in 1988. He was then named director, Safety and Reliability, for KSC in February 1994 and held that position until assuming the position of launch director in 1995. The naming of two people to succeed Harrington will provide needed depth to the launch director function. "To put it in football terms, we want to have more depth on the bench," Sieck said, noting that both he and Harrington served as launch director for extended tenures.

King will have the assignment for a period of about six months to a year - enough to encompass at least three or four Shuttle launches - after which Roe will serve in the position for a similar length of time. The first launch that King will oversee will be STS-89, the eighth Shuttle-Mir docking flight, set to launch in January next year.

Assessments will then begin to determine if a third person should also be trained in the position or whether two will be enough. Imposing a time frame on the assignment does not mean King or Roe is serving in an acting capacity. "This is a full-time job," Sieck said.

King began his career with NASA in 1983 as a main propulsion engineer. He later served as flow director for the

orbiter Discovery and as the acting deputy director of the Installation Operations Directorate. As deputy director of Shuttle Processing, he assists the director in management and oversight of all activities involving Shuttle processing and launch operations at KSC. He has a bachelor's of science degree in mechanical engineering from the University of South Carolina and a master's degree in business administration from the Florida Institute of Technology.

"I am privileged to have the opportunity to be a launch director for this great NASA/contractor team at KSC," King said. "We have the significant challenges this coming year of completing the Phase 1 program with Mir and launching the first element of the International Space Station, and I am sure this team is up to the task."

Roe also began his career at KSC in 1983, serving initially as a propulsion systems test engineer. He also has been chief, Fluid Systems Division, and acting director, Process Engineering. He was named Process Engineering director in October 1996, with responsibility for the engineering management and technical expertise of personnel involved in prelaunch, landing, recovery and turnaround operations for the Shuttle fleet. Like King, Roe has a bachelor's of science degree in mechanical engineering from the University of South Carolina. He also has a master's degree in industrial engineering from the University of Central Florida.

"To be selected as a launch director represents both a great honor and challenge," said Roe. "I look forward to working with the KSC launch team as we prepare for the International Space Station missions next year and continue a robust Shuttle program into the next century."

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 19, 1997
KSC Contact: David Dickinson or Joel Wells
KSC Release No. 224-97

KENNEDY SPACE CENTER LOOKED TO PAST, PRESENT AND FUTURE IN 1997

In 1997, Kennedy Space Center paid allegiance to the past, retained a firm grip on the present, and positioned itself for a challenging future.

KSC's seventh center director, Roy Bridges Jr., came on board March 2, and wasted no time in putting together a top management team which developed a strategic plan and road map for KSC's future through 2025. Joining him in leading all aspects of center operations are Loren Shriver, deputy director for Launch and Payload Processing; James Jennings, deputy director for Business Operations; and JoAnn Morgan, associate director for Advanced Development and Shuttle Upgrades.

By year's end, eight Space Shuttles had lifted off, carrying 53 crew members into space, logging more than 34 million miles and taking several major payloads into orbit. In addition, KSC's Expendable Launch Vehicle team supported three missions carrying NASA payloads, including the Cassini spacecraft and attached Huygens probe to Saturn.

The diversity of tasks undertaken by the KSC work force reflected the center's commitment to keeping the Space Shuttle operational, while positioning itself to support future missions and launch vehicles. As one team of KSC employees began the meticulous process of developing a new launch processing and countdown system to replace the '70s-era original, another was taking steps to improve the efficiency of the nearly two-decade-old Shuttle transportation system. Yet another group welcomed the first U.S. element of the International Space Station to the center and initiated preflight processing for its launch in 1998.

At the same time, the center continued to make safety its top priority, while streamlining operations and the work force to prepare for the future.

"Kennedy Space Center is in a unique position to carry the U.S. space program into the next century," said Bridges. "Our work force has no equal in the launch processing and countdown business, and our ability to look to the future and prepare for the natural evolution of missions and technology will stand us in good stead in the coming years. While we look forward to preparing for the on-orbit assembly and operation of the International Space Station (ISS) beginning next year, we also look forward to the challenge of what lies beyond, be it a return human mission to the moon or the first crewed expedition to Mars. We'll be ready."

Space Shuttle upgrades

Kennedy Space Center provides major contributions to NASA's four-phased plan to assure safe and continuous operation of the Shuttle fleet through the year 2012 and to incorporate major improvements through 2030.

Phase One prepared the program for the ISS and is well under way, with the only remaining projects being the new super lightweight tank and the Block II Shuttle main engines.

Upgrades under Phase Two are high-value projects which don't change the vehicle configuration significantly. At KSC

these include the development of the new Checkout and Launch Control System (CLCS), which will reduce launch processing time while lowering some operational costs by 50 percent.

Other KSC development projects invest in systems design, technologies and concepts such as the Integrated Vehicle Health Monitoring (IVHM) flight technology demonstration, use of fiber optics in flight systems to reduce vehicle cycle time, and less toxic Thermal Protection System waterproofing materials for a safer workplace.

Phase Three includes replacing Auxiliary Power Units, hydraulics, fuel cells and avionics; eliminating toxic propellants; and adding a new IVHM system. Phase Four would incorporate new flight elements such as a Liquid Flyback Booster. KSC engineers are contributing to all these efforts.

KSC also is leading an effort to develop methods for reduction of Shuttle payload bay reconfigurations between flights, allowing up to 15 flights a year. Most of these projects have application to potential new flight systems as well.

Shuttle mission highlights

Seven Shuttle missions were planned, but an eighth, STS-94, was added as a reflight of the STS-83 mission with the Microgravity Science Laboratory-1 payload. STS-83 was cut short by 12 days because of concerns about a fuel cell. The STS-94 mission three months later was the first reflight of the same payload and crew in Shuttle history.

The KSC launch team processed the orbiter Columbia for flight in 56 calendar days, a post-return-to-flight record. That quick turnaround was accomplished in part by reservicing the MSL-1 payload in Columbia, the first time a primary payload was reserviced in the orbiter.

The total flight time of the Space Shuttle program passed the two-year mark during STS-86, the seventh mission of the year.

Three missions with the SPACEHAB double module were among the nine planned dockings of the Space Shuttle with the Russian Space Station Mir. The second servicing of the Hubble Space Telescope took place in February during five spacewalks on the STS-82 mission.

Other major payloads flown included the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite (CRISTA-SPAS) on STS-85, and the United States Microgravity Payload-4 and Spartan-201 satellite on STS-87. Spacewalking astronauts retrieved the Spartan-201 when it failed to deploy properly.

All eight Shuttle missions landed at KSC in 1997. The orbiter Endeavour rejoined the fleet in March after returning from its first scheduled orbiter maintenance down period (OMDP) in California. Atlantis, veteran of 20 Space Shuttle flights, including all seven Mir dockings to date, departed in November for its second OMDP.

ELV program

KSC this year received lead center responsibility for NASA's acquisition and management of expendable launch vehicle launch services.

Besides supporting the Air Force launch of NASA's Cassini mission on a Titan IVB/Centaur in October, the KSC ELV team also launched in August NASA's Advanced Composition Explorer (ACE) on a Boeing Delta II rocket to study low-energy particles of solar origin and high-energy galactic particles.

The third in a series of sophisticated weather satellites called Geostationary Operational Environmental Satellites (GOES) lifted off in April on an Atlas-Centaur rocket.

International Space Station

The past year saw the continuation of Phase I of the International Space Station effort, with seven Shuttle flights to dock with the Russian Space Station Mir now completed. In 1998, the last docking missions will occur and on-orbit

assembly of the International Space Station will begin.

KSC already is preparing for the first U.S. assembly flight, STS-88, in July. The Shuttle Endeavour will carry into space the Node 1, with two pressurized mating adapters attached, to provide the interface between the U.S. and Russian-built elements of the station.

The node and adapters are already at KSC, undergoing preflight processing in the Space Station Processing Facility. More elements will follow as KSC becomes the final checkpoint for U.S.-launched ISS hardware in the coming months.

KSC signed a new customer agreement with JSC in December to support engineering development of the Space Station Crew Return Vehicle (CRV). The KSC tasks include instrumentation system design, secondary structural systems design and other developmental projects.

X-33/X-34 responsibilities

KSC has entered into a partnership with industry and other NASA centers in the development of the next-generation crewed launch vehicles. A team of KSC employees is working with the X-34 program, providing the capability to support X-34 operations at KSC, as well as the flight design.

KSC also designed and built hardware for the X-33 program, and is assessing futher involvement in supporting flight test operations.

Mars exploration

During 1997, KSC formed an Exploration Think Tank to participate in integrated planning for future robotic and human missions to Mars.

KSC personnel are helping to define what needs to occur to make a human Mars mission a reality, and working on the technologies to enable such future missions.

Potential technology development research areas for KSC include cryogenic, in-situ propellant production; autonomous processing; bioregenerative plant growth; advanced instrumentation; electro-static discharge; and vehicle health management.

Contracts and added responsibilities

Besides becoming the lead NASA center for expendable launch vehicles, KSC took on a major new task by assuming agencywide responsibility for NASA's occupational health program in 1997.

1997 also was the first full year under the Space Flight Operations Contract (SFOC) awarded to United Space Alliance (USA) for consolidation of ground processing and operations.

As part of its continuing efforts to promote efficiency and quality, KSC also renegotiated the Payload and Ground Operations Contract (PGOC) and the Base Operations Contract (BOC) to performance-based contracts.

More changes in the BOC are expected next fall when Kennedy and the Air Force 45th Space Wing award a contract for joint base operations and support (JBOSC). The JBOSC contract is projected to lower costs and increase responsiveness of services for space customers at KSC, Cape Canaveral Air Station and Patrick Air Force Base.

The contract will be managed by the new Joint Performance Management Office, a team of 40 KSC and 45th Space Wing personnel.

Along with other NASA centers, KSC this year launched a major effort to obtain certification in ISO 9001, an international standard for quality management systems.

Facilities

A major new tour attraction featuring a restored Saturn V rocket opened in January. Construction was completed on two other new tour sites for visitors - a 60-foot-high observation gantry located in the heart of Launch Complex 39 and an International Space Station exhibit facility.

Construction also started on the Space Shuttle Main Engine Processing Facility, while work was completed on the Component Refurbishment and Chemical Analysis Facility.

Other facility improvements begun or completed this year included extensive modifications to Launch Pad 39B; a major upgrade of the gaseous nitrogen pipeline which supplies KSC and Cape Canaveral Air Station; and installation of new runway centerline lights.

Community outreach

The space center and its employees expanded on a long tradition of reaching out to the community and youth, in particular, during 1997. New partnerships were formed with universities, K-12 schools and the state.

KSC engineers and scientists used desktop video technology to bring mentors and science students together in the kickoff of the Virtual Science Mentor Program.

The new NASA Minority Partnership Awards program is designed to provide students and faculty exposure to high-technology small businesses.

A KSC-led student team participated in the For Inspiration and Recognition of Science and Technology (FIRST) national engineering contest in which competing teams of high school students conceive, design and construct robotic devices. The team placed 14th nationally and was the top NASA team. Also, the engineering co-operative student program was reactivated at the space center.

To cap off the year, NASA employees reached out to the community at an unprecedented level through record donations to the Combined Federal Campaign.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 2, 1997
KSC Contact: Dennis Armstrong
Release No. I97-11

NASA LOOKS TOWARD VISIONARY INTERSTELLAR TRAVEL

Many people wonder when we will be able to travel to distant solar systems as easily as envisioned in science fiction. Discover NASA's perspective on the prospects that exist today for achieving such far-future visions via a new World Wide Web site called, "Warp Drive, When?" Explore the site at:

http://www.lerc.nasa.gov/WWW/PAO/warp.htm

This web site explains the challenges of interstellar travel, the prospects and limitations of existing propulsion ideas, and the prospects emerging from science that may one day provide the breakthroughs needed to enable practical interstellar voyages. Analogies to familiar science fiction are used to simplify concepts such as "warp drive."

For a look at what NASA is doing to achieve such breakthroughs, another web site is available about the new NASA Breakthrough Propulsion Physics program:

http://www.lerc.nasa.gov/WWW/bpp/

This modest program is taking a step-by-step approach toward discovering the ultimate breakthroughs needed to revolutionize space travel and enable human journeys to other star systems - credible progress toward incredible possibilities. This program represents the combined efforts of individuals from various NASA centers, other government labs, universities and industry.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 7, 1997
KSC Contact: Lisa Malone
Note to Editors No. N97-1

NASA MANAGERS SET JANUARY 12 AS LAUNCH DATE FOR FIRST SHUTTLE MISSION OF 1997

Following completion of a flight readiness review meeting, NASA managers set January 12 as the official launch date for the first Shuttle mission of 1997.

The mission, designated STS-81, is the fifth in a series of docking missions between the Space Shuttle and the Russian space station Mir and the second mission involving an exchange of U.S. astronauts. Astronaut John Blaha, who has been on Mir since Sept. 19, 1996, will be replaced by STS-81 crew member Jerry Linenger. Linenger will spend more than four months on Mir before returning to Earth on Space Shuttle Mission STS-84 in mid-May.

The current launch window on Jan. 12 opens at 4:27 a.m. EST and extends for about ten minutes. The actual launch window may vary by a few minutes based on calculations of Mir's precise location in space at the time of liftoff due to Shuttle rendezvous phasing requirements.

The STS-81 mission is scheduled to last just over ten days. An on-time launch on Jan. 12 and nominal mission duration will result in Atlantis landing back at Kennedy Space Center, FL, on Jan. 22 at approximately 8 a.m. EST.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 27, 1997
KSC Contact: William R. Johnson
NOTE TO EDITORS: N97-75

FOALE TO DISCUSS MIR MISSION

Astronaut Michael Foale, who recently returned from his 145-day stay in space, will discuss his journey during a news conference Wednesday, Oct. 29 at 10 a.m. EST.

The press conference will originate from the Johnson Space Center, Houston, and will be broadcast on NASA Television, providing multi-center question and answer capability for reporters at participating NASA centers. Due to Foale's post-flight schedule requirements, he may not be available for additional interview opportunities in the near future.

During his 134 days as a crew member aboard the Russian Mir space station, Foale traveled more than 58 million miles. Foale was launched in May as a crew member on STS-84, which delivered him to the Mir on May 17, and he returned on STS-86 on Oct. 6.

Foale's press conference can be seen on NASA Television, which is carried on GE-2, Transponder 9C, at 85 degrees West longitude, frequency 3880 Mhz, audio 6.8 Mhz.

Media planning to attend the briefing at the Johnson Space Center should contact the newsroom by 4 p.m. CST on Oct. 27 for accreditation.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 31, 1997
KSC Contact: William R. Johnson
Note to Editors: N97-76

NEXT SPACE SCIENCE UPDATE FEATURES SUN'S "MAGNETIC CARPET"

The next Space Science Update (SSU) is scheduled for 1 p.m. EST, Wednesday, Nov. 5, 1997, at NASA Headquarters, Washington, DC . The Update will feature new data from the joint European Space Agency-NASA Solar and Heliospheric Observatory (SOHO) mission. Scientists have found a rapidly changing magnetic carpet covering the solar surface which changes on a time scale of approximately 40 hours.

Panelists will be:

- Dr. Joseph B. Gurman, Deputy U.S. Project Scientist for SOHO mission, NASA Goddard Space Flight Center, Greenbelt, MD;
- Dr. Alan Title, Professor and Co-Director of the Stanford- Lockheed Institute for Space Research, Stanford University, Stanford, CA;
- Dr. Edward Spiegel, the Lewis Morris Rutherford Professor in Astronomy at Columbia University, New York;
- Mandy Hagenaar, astronomer, Utrecht University, the Netherlands, and Stanford-Lockheed Institute for Space Research; and
- Dr. George Withbroe, Science Director for the Sun-Earth Connection program, NASA Headquarters, Washington, DC, is panel moderator.

The SSU will originate from NASA Headquarters Auditorium, 300 E St., S.W., Washington, DC, and will be carried live on NASA TV with two-way question-and-answer capability for reporters covering the event from participating NASA centers.

NASA Television is broadcast on the GE2 satellite which is located on Transponder 9C, at 85 degrees West longitude, frequency 3880.0 Mhz, audio 6.8 MHz. Audio of the broadcast will be available on voice circuit at the Kennedy Space Center on 407/867-1220.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 31, 1997
KSC Contact: William R. Johnson
Note to Editors: N97-80

NASA'S EARLY NOVEMBER NEWS BRIEFINGS

Over the next several weeks, NASA has a busy schedule of news briefings on a number of subjects that are listed below, in chronological order.

Mars Pathfinder -- Tuesday, Nov. 4 at 12:30 p.m. EST from the Jet Propulsion Laboratory, Pasadena, CA. Scientists will discuss the results of attempts to contact Pathfinder and alternate plans of action if communication cannot be reestablished. The contact for further information is Doug Isbell, 202/358-1547. Additional information also can be found on the Web at URL:

ftp://ftp.hq.nasa.gov/pub/pao/note2edt/1997/n97-078.txt

Solar and Heliospheric Observatory (SOHO) -- Wednesday, Nov. 5 at 1 p.m. EST from NASA Headquarters, Washington, DC. Scientists will discuss the new discovery of a rapidly changing magnetic carpet covering the solar surface, which changes on a time scale of approximately 40 hours. The contact for further information is Donald Savage, 202/358-1547. Additional information can be found on the following URL:

ftp://ftp.hq.nasa.gov/pub/pao/note2edt/1997/n97-076.txt

Tropical Rainfall Measuring Mission (TRMM) -- Thursday, Nov. 6 at 1 p.m. EST from NASA Headquarters, Washington, DC. The first Earth science satellite dedicated to studying the properties of tropical and subtropical rainfall, TRMM carries microwave and visible/infrared sensors, and the first spaceborne rain radar. Launch is scheduled for Tuesday, Nov. 18. The contact is Doug Isbell, 202/2358-1547. Additional information can be found at the following URL:

ftp://ftp.hq.nasa.gov/pub/pao/note2edt/1997/n97-079.txt

Mars Global Surveyor (MGS) -- Monday, Nov. 10 at 1 p.m. EST from the Jet Propulsion Laboratory. NASA's MGS flight team will discuss the details of lowering the spacecraft's orbit around Mars set to begin on Nov. 7 and the future plans for the spacecraft. The contact for this event is Doug Isbell, 202/358-1547. Additional information can be found at the following URL:

ftp://ftp.hq.nasa.gov/pub/pao/note2edt/1997/n97-077

STS-87 Pre-flight briefings -- Wednesday, Nov. 12 from 9 a.m. - 6 p.m. EST from the Johnson Space Center, Houston, TX. Panelists will discuss a variety of flight experiments scheduled for this mission. The contact for the briefings is Debra Rahn, 202/358-1639, or Ed Campion, 281/483-5111. Additional information on the STS-87 briefings will be released at a later date.

The briefings will be carried live on NASA TV with two-way question and answer capability for reporters covering the events from participating NASA centers.

NASA Television is broadcast on the GE2 satellite which is located on Transponder 9C, at 85 degrees West longitude, frequency 3880.0 Mhz, audio 6.8 Mhz.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 3 , 1997
KSC Contact: William R. Johnson
Note to Editors: N97-81

BRIEFINGS SET FOR FINAL SHUTTLE MISSION OF 1997

A series of briefings on the upcoming flight of Space Shuttle Columbia on Mission STS-87 will be held on Wednesday, Nov. 12, 1997. The STS-87 mission, the eighth and final Shuttle flight of the year, will include observations of the Sun's outer atmospheric layers, experiments to study how the weightless environment of space affects various physical processes and a spacewalk to rehearse future International Space Station operations.

The briefings will begin on Nov. 12 at 9 a.m. EST (all times listed are EST) with a Mission Overview briefing conducted by STS- 87 Lead Flight Director Bill Reeves at the Johnson Space Center (JSC), Houston, TX. At 10 a.m., a United States Microgravity Payload briefing will originate from NASA's Marshall Space Flight Center (MSFC), Huntsville, AL. NASA's Goddard Space Flight Center (GSFC), Greenbelt, MD, will host a Spartan payload briefing at 11 a.m. followed by the daily NASA Video File at noon.

The briefings will then resume from the Kennedy Space Center (KSC), FL, at 12:30 p.m. with a presentation on the Collaborative Ukrainian Experiment (CUE). Activities and objectives associated with a planned spacewalk on the sixth day of the mission will be discussed at a briefing from JSC starting at 1:30 p.m. The briefings will return to GSFC at 3 p.m. for a presentation of the Hitchhiker and Get Away Special experiments that will fly in the cargo bay of Columbia. The briefings will wrap up with the STS-87 Crew News Conference at 5 p.m.

All of the STS-87 briefings will be carried on NASA Television which is available through the GE2 satellite system, located on Transponder 9C, at 85 degrees West longitude, frequency 3880.0 MHz, audio 6.8 MHz.

STS-87 PRE-FLIGHT BRIEFINGS (All Times EST)

9 a.m. - 10 a.m.: ***STS-87 MISSION OVERVIEW (JSC)***
Bill Reeves, STS-87 Lead Flight Director

10 a.m.-11 a.m.: ***USMP-4 (MSFC)***
Joel Kearns, Microgravity Research Program Manager
Sherwood Anderson, USMP-4 Mission Manager
Dr. Peter Curreri, USMP-4 Mission Scientist
Dr. Martin (Marty) Glicksman, Principal Investigator, Isothermal Dendritic Growth Experiment (IDGE), Rensselaer Polytechnic Institute, Troy, NY
Dr. Doru Stefanescu, Principal Investigator, Particle Engulfment and Pushing by a Solid/Liquid Interface PEP (MGBX), Univ. of Alabama, Tuscaloosa

11 a.m. - noon: ***SPARTAN (GSFC)***
Craig Tooley - Spartan 201-04 Mission Manager, GSFC
Dr. Richard Fisher - White Light Coronograph, GSFC
Dr. Leonard Strachan, Ultraviolet Coronal Spectrometer, Smithsonian Astrophysical Observatory, Cambridge, MA

Gene Beam - Project Manager, Auto Rendezvous & Docking Experiment, MSFC

12 noon: ***NASA Video File (HQ)***

12:30 p.m. - 1:30 p.m.: ***Collaborative Ukrainian Experiment (CUE) (KSC)***
Dr. Bill Knott, CUE Mission Scientist, KSC
Cindy Martin, CUE Mission Manager

1:30 p.m. - 3 p.m.: ***EVA / AERCam / SPRINT Briefing (JSC)***
Mike Hess, STS-87 EVA Officer
Cliff Hess, AERCam Project

3 p.m. - 3:45 p.m.: ***STS-87 GAS/HITCHIKER PAYLOADS (GSFC)***
Tammy Brown, SOLSE Payload Manager, GSFC
Lee Shiflett, Get Away Special Manager, GSFC
Dr. Ruthan Lewis, Hitchhiker Mission Manager, GSFC

5 p.m. - 6 p.m.: ***STS-87 Crew News Conference (JSC)***
Kevin Kregel, Commander
Steve Lindsey, Pilot
Kalpana Chawla, Mission Specialist 1
Winston Scott, Mission Specialist 2
Takao Doi, Mission Specialist 3
Leonid Kadenyuk, Payload Specialist 1

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 25, 1997
KSC Contact: George Diller
Note to Editors N97-85

Note to Editors:
LUNAR PROSPECTOR MISSION BRIEFING SCHEDULED FOR DEC. 4

A press briefing on the upcoming Lunar Prospector mission to the Moon and its scientific goals has been scheduled for Thursday, Dec. 4, 1997, at 1 p.m. EST in the NASA Headquarters auditorium, 300 E St., SW, Washington, DC. The briefing will last approximately one hour and will be broadcast live on NASA Television.

The third flight in NASA's Discovery Program of lower-cost, highly focused Solar System exploration missions, Lunar Prospector is scheduled for launch at 8:32 p.m. EST on Jan. 5, 1998, from Spaceport Florida's new Launch Complex 46 in Cape Canaveral, FL. The small robotic mission is designed to provide the first global maps of the Moon's elemental surface composition and its gravitational and magnetic fields.

Participants in the press briefing are scheduled to include:

- Dr. Carl B. Pilcher, acting solar system exploration director, Office of Space Science, NASA Headquarters, who will speak on the purpose and goals of the Discovery Program;
- Mr. G. Scott Hubbard, Lunar Prospector mission manager from NASA's Ames Research Center, Moffett Field, CA, who will describe the development of Lunar Prospector and its mission operations;
- Dr. Alan Binder, principal investigator for Lunar Prospector and head of the Lunar Research Institute, Gilroy, CA, who will discuss the mission's five science instruments and their related research goals, and
- Dr. Michael Drake, director of the Lunar and Planetary Laboratory, University of Arizona, Tucson, who will give an overview of current scientific understanding of the Earth-Moon system and provide insights into the value of Lunar Prospector data for the study of the origin and evolution of the Solar System.

The briefing will include a short demonstration of the new Lunar Prospector web site on the Internet, which will enable the public to view user-friendly visualizations of science data transmissions from the spacecraft at the same time they are first seen by mission scientists.

The Web site is located at the following URL:

http://lunar.arc.nasa.gov/

NASA Television is available on GE-2, transponder 9C at 85 degrees West longitude, with vertical polarization. Frequency is on 3880.0 megahertz, with audio on 6.8 megahertz. Reporters who wish to observe and participate in the live broadcast of the press conference remotely may do so at participating NASA field centers.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 9, 1997
KSC Contact: William R. Johnson
Note to Editors: N97-89

MIR 24 CREW NEWS CONFERENCE SET

The three Mir 24 crewmembers, including U.S. astronaut David Wolf, will hold a news conference from the Mir space station on Friday, Dec. 12, starting at approximately 10:05 a.m. EST. The news conference, to be broadcast on NASA Television, will include multicenter question-and-answer capability for reporters at participating NASA centers.

The news conference will be carried through the Russian Altair satellite during a 30-minute window for television capability from the Mir, to be transmitted to the U.S. by satellite from the Russian Mission Control Center. Interpretation will be provided for questions posed in English to the Russian crewmembers and their answers in English for members of the news media.

Mir 24 Commander Anatoly Solovyev and Flight Engineer Pavel Vinogradov have been aboard Mir since August and are scheduled to be replaced by another cosmonaut crew in late January. Wolf is nearing the end of his third month aboard the Mir. He is scheduled to be replaced in late January by astronaut Andy Thomas, who will be launched to the Mir as part of the STS-89 crew as the final U.S. astronaut to occupy the Russian outpost.

NASA Television is carried on GE-2, Transponder 9C at 85 degrees West longitude, vertical polarization, frequency 3880 Mhz, audio 6.8 Mhz.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 10, 1997
KSC Contact: William R. Johnson
Note to Editors: N97-90

NEXT SPACE SCIENCE UPDATE FEATURES STARS IN BLAZE OF GLORY

The next Space Science Update (SSU), called "Final Blaze of Glory," is scheduled for Wednesday, Dec. 17, at 1 p.m. EST. The Update will feature a dazzling collection of detailed views released by several teams of astronomers using NASA's Hubble Space Telescope. The images reveal surprisingly intricate glowing patterns spun into space by aging stars: pinwheels, lawn sprinkler style jets, elegant goblet shapes, and even some that look like a rocket engine's exhaust.

The astronomers say the incandescent sculptures are forcing a re-thinking of stellar evolution. In particular, the patterns may be woven by an aging star's interaction with unseen companions: planets, brown dwarfs, or smaller stars.

Panelists will be:

- Dr. Howard Bond, Space Telescope Science Institute (STScI), Baltimore MD
- Dr. Mario Livio, STScI
- Dr. Bruce Balick, University of Washington, Seattle
- Dr. Anne L. Kinney, Space Telescope Science Institute, Baltimore, MD
- Dr. David Leckrone, HST Project Scientist, Goddard Space Flight Center, Greenbelt, MD, panel moderator

The SSU will originate from NASA Headquarters Auditorium, 300 E St., SW, Washington, DC, and will be carried live on NASA TV with two-way question-and-answer capability for reporters covering the event from participating NASA centers.

NASA Television is broadcast on the GE2 satellite which is located on Transponder 9C, at 85 degrees West longitude, frequency 3880.0 Mhz, audio 6.8 MHz. Audio of the broadcast will be available on voice circuit at the Kennedy Space Center on 407/867-1220.

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JOHN F. KENNEDY SPACE CENTER

December 12, 1997
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NEWS BRIEFING WRAPS GALILEO'S SPECTACULAR PRIMARY MISSION; JOURNEY CONTINUES WITH CLOSE EUROPA FLYBY

Just six hours after NASA's Galileo spacecraft makes its closest-ever pass above Jupiter's icy moon Europa, scientists and engineers will present highlights of the spacecraft's primary mission and preview its two-year extended mission at a press briefing. The briefing, to be held on Tuesday, Dec. 16 at 1 p.m. EST, also will feature new images from Galileo's previous Europa flyby on Nov. 6, the final encounter of the primary mission. The briefing will originate from NASA's Jet Propulsion Laboratory, Pasadena, CA, and will be carried live on NASA Television, with two-way question-and-answer capability for reporters at participating NASA Centers.

Galileo concluded its historic primary mission on Dec. 7 after spending two years studying Jupiter, its magnetosphere and its four largest moons.

The spacecraft immediately embarked on a two-year extension, called the Galileo Europa Mission, with eight planned Europa flybys, four Callisto flybys and one or two Io encounters, depending on spacecraft health. Scientists hope to learn more about the tantalizing prospect that liquid oceans may lie underneath Europa's icy crust. The first flyby of the Galileo Europa Mission will take place on Dec. 16 at 7:03 a.m. EST, at an altitude of only 124 miles (200 kilometers) above Europa, with the signal reaching Earth at 7:49 a.m. EST. This will be the closest approach to any planetary body by the Galileo spacecraft.

During the primary mission, Galileo returned about one gigabyte of data and hundreds of high-resolution pictures. At the briefing, scientists will summarize key findings from the spacecraft's abundant harvest of scientific information, including:

- Ganymede's magnetic field
- Volcanic ice flows and melting or "rafting" on Europa's surface that support the premise of liquid oceans underneath
- Studies of water vapor, lightning and aurora on Jupiter
- The discovery of a hydrogen and carbon dioxide atmosphere on Callisto
- The presence of metallic cores in Europa, Io and Ganymede and the lack of evidence for such a core in Callisto
- High volcanic activity on Io, with dramatic changes since the Voyagers

The Galileo spacecraft entered orbit around Jupiter on Dec. 7, 1995, becoming the first mission to orbit one of the Solar System's outer planets. It also deployed a parachute-borne probe into Jupiter's outer atmosphere. JPL manages the Galileo mission for NASA's Office of Space Science, Washington, DC.

NASA Television is available through GE-2, transponder 9C at 85 degrees west longitude, vertical polarization, with a frequency of 3880 MHz, and audio at 6.8 MHz. The new images will be released on the Galileo Internet home page at the following URL:

http://www.jpl.nasa.gov/galileo/

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