NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 13, 1995

KSC Release No. 1-95

Note to Editors/News Directors:
TCDT MEDIA OPPORTUNITIES WITH STS-63 CREW SET FOR NEXT WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-63 next week during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

The six-member crew is scheduled to arrive at KSC Tuesday, Jan. 17, at 9:30 a.m. Media interested in viewing the arrival should be at the KSC Press Site parking lot (near the base of the stairs that lead to the dome) by 8:30 a.m. for transport to the Shuttle Landing Facility.

On Wednesday, the STS-63 crew will be available for an informal question and answer session at Pad 39B. News media should be at the KSC Press Site parking lot by 12 noon for transport to the pad.

On Thursday, the crew will depart their quarters for the pad at 7:45 a.m. Photographers who desire to cover the crew walkout should be at the KSC press site parking lot at 6:45 a.m. for transport to the Operations and Checkout Building.

The crew will board the Shuttle Discovery at about 8:15 a.m. Thursday and remain there through the end of the test. The mock countdown culminates with a simulated main engine cutoff at about 11 a.m. Thursday

Media interested in covering these events should contact the KSC Press Site to obtain the proper badge.

Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Discovery is currently targeted for launch at 12:49 a.m. EST, Feb. 2, on an 8-day mission. NASA managers will set the official launch date for mission STS-63 during the Flight Readiness Review scheduled to be held at KSC on Jan. 18. The mission will feature the first rendezvous with Russia's Mir space station. Also, astronaut Eileen Collins will be the first female to pilot the orbiter.

Crew members for mission STS-63 are: Commander Jim Wetherbee; Pilot Eileen Collins; Mission Specialists Michael Foale, Janice Voss, Bernard Harris; and Russian Air Force Colonel Vladimir Titov.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

January 25, 1995

KSC Release No. 3-95

Notice to Editors/News Directors:
EVENTS, NEWS CENTER HOURS OF OPERATION SET FOR MISSION STS-63

News conferences, events and operating hours for KSC's News Center have been set for the upcoming launch of the Space Shuttle Discovery on Mission STS-63.

At 4:30 p.m. EST Sunday, Jan. 29, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 12:48 a.m. EST on Thursday, Feb. 2. The launch window is five minutes.

The six crew members are scheduled to arrive at KSC on Sunday, Jan. 29, at midnight. News media representatives wishing to cover the event must be at the News Center by 11 p.m. Sunday for transportation to the Shuttle Landing Facility. Arrival of the STS-63 astronauts will be carried live on NASA TV. News media representatives needing credentials for crew arrival should call the News Center at 867-2468 on Sunday, Jan. 29, from noon to 5 p.m., or sooner, to make arrangements.

News media representatives will have an opportunity to discuss details of the launch countdown with NASA test directors during briefings at the KSC News Center next week (all will be carried live on NASA TV).

L- 4 Days - Sunday, Jan. 29
STS-63 fight crew arrival (live on NASA TV)----------midnight

L-3 Days - Monday, Jan. 30
Countdown Status Briefing----------9 a.m. EST
  John Guidi, NASA Test Director
  Roelof Schuiling, STS-63 Payload Manager
  Ed Priselac, Shuttle Launch Weather Officer

STS-63 fight crew arrival (tape replay)----------9:30 a.m. EST
(or immediately following the briefing)

L-2 Days - Tuesday, Jan. 31
Countdown Status Briefing----------9 a.m. EST
  Debbie Frostrom, NASA Test Director
  Roelof Schuiling, STS-63 Payload Manager
  Ed Priselac, Shuttle Launch Weather Officer

Replay of STS-63 crew and mission briefings ----------9:30 a.m. EST

Pre-launch News Conference----------3 p.m. EST
  Brewster Shaw, Director, Space Shuttle Operations, Johnson Space Center
  Wil Trafton, director of Space Station, NASA Headquarters
  Greg Reck, deputy associate administrator, Office of Space Access & Technology, NASA Headquarters
  Richard Hora, president & CEO of SPACEHAB, Inc.
  Bob Sieck, director of Shuttle Management and Operations, KSC
  Capt. David Biggar, Air Force Staff Meteorologist

L - 1 Day - Wednesday, Feb. 1
Countdown Status Briefing----------9 a.m. EST
  Bill Dowdell, NASA Test Director
  Roelof Schuiling, STS-63 Payload Manager

NASA Select live launch programming begins----------7:30 p.m. EST

Launch Day - Thursday, Feb. 2
Post-launch press conference----------L + 1 hour
  Loren Shriver, manager of Launch Integration for the Space Shuttle

Program
James Harrington, KSC Launch Director

KSC News Center office hours are as follows:

(Launch minus 4 days) Sunday, Jan. 29	noon - 5 p.m., 10 p.m. - 1 a.m.
(Launch minus 3 days) Monday, Jan. 30	7 a.m. - 4:30 p.m.
(Launch minus 2 days) Tuesday, Jan. 31	7 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Feb. 1	*7 a.m. - around-the-
(Launch day) Flight day 1, Thursday, Feb. 2	clock - 4:30 p.m.
Flight day 2, Friday, Feb. 3	7 a.m. - 4:30 p.m.
Flight day 3, Saturday, Feb. 4	CLOSED
Flight day 4, Sunday, Feb. 5	9 a.m. - 5 p.m.
Flight days 5-7, Feb. 6-8	7 a.m. - 4:30 p.m.
Flight day 8, Feb. 9	3 a.m. - 4:30 p.m.
Flight day 9, Landing Day, Feb. 10	3 a.m. - 4:30 p.m.

* The Audio/Visual section will be open at 6:30 a.m. for remote camera set-up.

News media representatives may obtain STS-63 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

* Monday, Jan. 30 -- 8 a.m. to 4:30 p.m.
* Tuesday, Jan. 31 -- 8 a.m. to 4:30 p.m.
* Wednesday, Feb. 1 -- 8 a.m. to 11:30 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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

January 27, 1995

KSC Release No. 6-95

SPACE SHUTTLE MISSION STS-63 LAUNCH COUNTDOWN TO BEGIN SUNDAY

The countdown for launch of the Space Shuttle Discovery on mission STS-63 is scheduled to begin Sunday, Jan. 29 at 4:30 p.m. EST, at the T-43 hour mark.

The countdown includes 37 hours and 15 minutes of built-in hold time leading to the opening of the launch window at approximately 12:48 a.m. (EST) on Feb. 2. The launch window extends for 5 minutes. The exact time of launch will be determined about 90 minutes before liftoff based on the location of the Mir space station.

The launch of Discovery will mark the beginning of the first mission to Russia's space station Mir. A rendezvous with the space station is scheduled for day four of the flight. Though Discovery will only come within about 38 feet of the station, this flight will set the stage for seven planned docking missions between the orbiter and Mir, the first of which is currently scheduled for early this summer.

In order to accommodate the short five minute window necessary to rendezvous with Mir, several changes have been made to the launch countdown. Most significant is the addition of an extra 30 minutes built into the hold at T-9 minutes.

STS-63 is the first of eight missions now scheduled for 1995. This will be the 20th flight of the Shuttle Discovery and the 67th flight overall in NASA's Space Shuttle program.

The primary payloads of mission STS-63 is the SPARTAN-204 free-flyer and Spacehab-3. SPARTAN (Shuttle Pointed Autonomous Research Tool for Astronomy) will be deployed on flight day 5 and retrieved 48 hours later for return to Earth. SPARTAN consists of instruments for celestial observations.

Also located in the payload bay is the Orbital Debris Radar Calibration Sphere-2 (ODERACS-2) experiment, in which calibration targets ranging from two to six inches in diameter will be ejected from the payload bay and tracked by ground-based radar and telescopes.

Discovery was rolled out of Orbiter Processing Facility bay 2 on Jan. 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 Jan. 10. Discovery last flew in September 1994.

The STS-63 crew are: Commander James Wetherbee, Pilot Eileen Collins, Mission Specialists Bernard Harris, Michael Foale and Janice Voss; and Russian cosmonaut Vladimir Titov.

Collins will be the first female to pilot a Space Shuttle flight.

The crew is scheduled to arrive at KSC at about 12 midnight Sunday evening, Jan. 29. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

As the countdown begins, the KSC launch team in Firing Room 3 of the Launch Control Center will verify all systems to assure

the Shuttle is properly powered up and the data processing and backup flight control systems are operating trouble free.

Verifications conducted throughout the launch countdown ensure continuous reviews are made of the flight software stored in the orbiter's twin memory banks. Computer controlled display systems will be activated and the backup flight system general purpose computer will be loaded.

Operations will also begin to prepare the orbiter for on-board cryogenic loading. Later, orbiter navigation aids will be turned on and tested and the inertial measurement units activated. Ground crews will make the final storage of mid-deck and flight deck supplies, perform microbial samplings of the flight crew's drinking water and check water levels in the waste management system.

At T-27 hours, the countdown enters its first scheduled hold. This is a four-hour hold lasting from 8:30 a.m. to 12:30 p.m. Monday.

When the countdown resumes, the launch pad will be cleared of all personnel for loading cryogenic reactants into the power reactant storage and distribution system tanks located under the payload bay lining. The reactants are used by the orbiter's fuel cells to provide electricity to the orbiter and drinking water for the crew. Cryogenic flow operations are scheduled to start at about 12:30 p.m. Monday and continue for about 7 hours.

As servicing of the cryogenic tanks is completed, the clock will enter an eight-hour built-in hold at the T-19 hour mark. This hold will last from 8:30 p.m. Monday to 4:30 a.m. Tuesday.

Following cryogenic loading operations, the pad will be re-opened for scheduled pre-launch activities. The orbiter mid-body umbilical unit, used to load the super-cold reactants in the orbiter's fuel cell tanks, will be demated and retracted into the launch structure.

When the countdown resumes, technicians will complete final vehicle and facility close-outs and begin configuring Discovery's cockpit for flight. The orbiter's flight control system and navigation aids will be activated. The stowable crew seats will be installed in the flight and mid-decks.

The countdown will enter another built-in hold at the T-11 hour mark at 12:30 p.m. Tuesday. This 20-hour, 25-minute hold will last until 8:55 a.m. Wednesday. During this hold, time critical equipment will be installed in the orbiter's cockpit. The inertial measurement units and the orbiter's communications systems will be activated.

At about 8 a.m. Wednesday, the Rotating Service Structure is scheduled to be moved away from the vehicle and placed in launch position.

At T-9 hours (10:55 a.m. Wednesday) the onboard fuel cells will be activated. At T-8 hours, the launch team will evacuate the blast danger area and clear the pad for loading the external tank with the cryogenic propellants for the orbiter's main engines. At T-7 hours, 30 minutes, conditioned air that is flowing through the orbiter's payload bay and other areas on the orbiter will be switched to gaseous nitrogen in preparation for fueling the external tank. The inertial measurement units will transition from the warm-up stage to the operate/attitude determination mode at T-6 hours, 45 minutes.

The countdown will enter another planned built-in hold at the T-6 hour mark at 1:55 p.m. Wednesday. During this two-hour hold, final preparations for loading the external tank will be completed. Also, a pre-tanking weather briefing will be conducted for the benefit of the Mission Management Team prior to their giving approval to begin tanking operations.

Chilldown of the lines that carry the cryogenic propellants to the external tank begins when the clock starts counting again at 3:55 p.m. Wednesday. Filling and topping off the external tank should be complete about three hours later at the beginning of the next planned hold at T-3 hours, or 6:55 p.m. Wednesday.

During the two-hour hold at the T-3 hour mark, the Final

Inspection Team (formerly known as the Ice and Debris Inspection Team) will conduct a final survey of the pad and various Shuttle components ensuring their readiness for flight. Also, the close-out crew will be dispatched to the pad and begin configuring the crew module and white room for the flight crew's arrival. Liquid oxygen and liquid hydrogen will be in a stable replenish mode during this time to replace any propellant that "boils" off.

The six flight crew members will be awakened at about 7:30 p.m. Wednesday and seated for their final meal before launch at about 8 p.m. Following their meal, the crew will receive a briefing on weather conditions at KSC and at the TransAtlantic Abort Landing sites.

The flight crew will suit-up in their partial-pressure suits, then leave the Operations and Checkout Building at about 9 p.m. Wednesday. They will arrive at the Pad 39B white room at about 9:30 p.m. where they will be assisted into the crew cabin by white room personnel.

Just prior to the T-60 minute mark, the test team and the flight crew will get another weather update, including observations from astronaut Robert Cabana flying in a Shuttle Training Aircraft in the KSC area.

The next built-in hold occurs at the T-20 minute mark (11:35 p.m. Wednesday) and lasts for 10 minutes. The final build-in hold occurs at the T-9 minute mark (11:56 p.m.) This hold usually extends for 10 minutes, however, due to the short 5 minute launch window necessary to rendezvous with Mir, the planned hold has been extended to 40 minutes. Based on the Mir orbit, the exact launch time will be adjust and the hold will be extended or shortened as necessary. This adjustment will not be more than a few minutes. During the final hold at T-9 minutes, the flight crew and ground team receive the NASA launch director's and the mission management team's final "go" for launch.

Milestones after the T-9 minute mark include start of the ground launch sequencer; retraction of the orbiter access arm at T-7 minutes, 30 seconds; start of the orbiter's auxiliary power units at T-5 minutes; pressurization of the liquid oxygen tank inside the external tank at T-2 minutes, 55 seconds; pressurization of the liquid hydrogen tank at T-1 minute, 57 seconds; ground power disconnection from the orbiter at T-50 seconds; and the electronic "go" to Discovery's onboard computers to start their own terminal countdown sequence at T-31 seconds. The orbiter's three main engines will start at T-6.6 seconds.

(The countdown will target launch for 12:45 a.m., the earliest possible launch opportunity based on the Mir orbit. The exact launch time will be adjusted at the T-9 minute hold.)

COUNTDOWN MILESTONES

Launch - 4 Days (Sunday, Jan. 29)

Prepare for the start of the STS-63 launch countdown
Perform the call-to-stations at the T-43 hour mark
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 4:30 p.m. EST

Launch - 3 Days (Monday, Jan. 30)

Start preparations for servicing fuel cell storage tanks
Begin final vehicle and facility close-outs for launch

Enter first planned built-in hold at T-27 hours for duration of four hours (8:30 a.m.)

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
Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (12:30 p.m.)

Clear launch pad of all personnel
Begin the 7 hour operation to load cryogenic reactants into
  Discovery's fuel cell storage tanks

Enter eight-hour built-in hold at T-19 hours (8:30 p.m.)

After cryogenic loading operations, re-open the pad
Resume orbiter and ground support equipment close-outs

Launch - 2 Days (Tuesday, Jan. 31)

Demate orbiter mid-body umbilical unit and retract into
  fixed service structure

Resume countdown (4:30 a.m.)

Start final preparations of the Shuttle's main engines for
  main propellant tanking and flight
Activate 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 20 hours, 25 minutes (12:30 p.m.)

Perform orbiter ascent switch list in crew cabin
Install film in numerous cameras on the launch pad
Activate the orbiter's communications systems
Activate orbiter's inertial measurement units
Fill pad sound suppression system water tank
Power on Spacehab laboratory module and begin experiment stowage

Launch -1 Day (Wednesday, Feb. 1)

Safety personnel conduct debris walkdown
Move Rotating Service Structure (RSS) to the park position
  at about 8 a.m.
Following the RSS move, begin final stowage of mid-deck
  experiments and flight crew equipment

Resume countdown (8:55 a.m.)

Install 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 Discovery's purge air to gaseous nitrogen

Enter planned two-hour built-in hold at the T-6 hour mark (1:55 p.m.)

Launch team verifies no violations of launch commit criteria
  prior to cryogenic loading of the external tank
Clear pad of all personnel

Resume countdown (3:55 p.m.)

Begin loading the external tank with cryogenic propellants (3:55 p.m.)
Perform inertial measurement unit preflight calibration
Align Merritt Island Launch Area (MILA) tracking antennas
Complete filling the external tank with its flight load of
  liquid hydrogen and liquid oxygen propellants (6:55 p.m.)

Enter two-hour hold at T-3 hours (6:55 p.m.)

Perform open loop test with Eastern Range
Conduct gimbal profile checks of orbital maneuvering system engines
Close-out crew and Final Inspection Team proceeds to Launch Pad 39B

Resume countdown at T-3 hours (8:55 p.m.)

Crew departs Operations and Checkout Building for the pad at 9 p.m.
Complete close-out preparations in the white room
Check cockpit switch configurations
Flight crew enters orbiter
Astronauts perform air-to-ground voice checks with Launch
  Control and Mission Control

Close Discovery's crew hatch
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
Final launch time determined based on Mir location

Enter planned 10-minute hold at T-20 minutes (11:35 p.m.)

NASA Test Director conducts final launch team briefings

Resume countdown (11:45 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 hold at T-9 minutes. Hold will last for about 40 minutes.
(11:37 a.m.)

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

Launch Day (Thursday, Feb. 2)

Resume countdown at T-9 minutes (12:36 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 MPS 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)
LPS go for start of orbiter automatic sequence (T-0:31 seconds)
Ignition of Shuttle's three main engines (T-6.6 seconds)
SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-63

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	8:30 a.m.Mon.	12:30 p.m. Mon.
T-19 hours	8 hours	8:30 p.m.Mon.	4:30 a.m. Tues.
T-11 hours	20 hrs.,25 mins.	12:30 p.m.Tues.	8:55 a.m. Wed.
T-6 hours	2 hours	1:55 p.m.Wed.	3:55 p.m. Wed.
T-3 hours	2 hours	6:55 p.m.Wed.	8:55 p.m. Wed.
T-20 minutes	10 minutes	11:35 p.m.Wed.	11:45 p.m. Wed.
T-9 minutes	40 minutes	11:56 p.m.Wed.	12:36 a.m. Thurs.

CREW FOR MISSION STS-63

Commander (CDR): James Wetherbee
Pilot (PLT): Eileen Collins
Mission Specialist (MS1): Bernard Harris
Mission Specialist (MS2): Michael Foale
Mission Specialist (MS3): Janice Voss
Mission Specialist (MS4): Vladimir Titov

SUMMARY OF STS-63 LAUNCH DAY CREW ACTIVITIES

Wednesday, Feb. 1

7:20 p.m. Wake up
7:50 p.m. Breakfast and crew photo
8:20 p.m. Weather briefing (CDR, PLT, MS2)
8:20 p.m. Don flight equipment (MS1, MS3, MS4)
8:30 p.m. Don flight equipment (CDR, PLT, MS2)
9:00 p.m. Depart for launch pad 39B
9:30 p.m. Arrive at white room and begin ingress

10:45 p.m. Close crew hatch

Thursday, Feb. 2, 1995

12:48 a.m. Launch (time estimated)

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 10, 1995

KSC Release No. 8-95

DISCOVERY SCHEDULED TO LAND AT KSC

The orbiter Discovery is scheduled to land at Kennedy Space Center on Saturday, Feb. 11 at 6:51 a.m. EST, completing its STS-63 mission which was launched from KSC on Feb. 3.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 129 at mission elapsed time of 8 days, 6 hours, 29 minutes. Deorbit burn will occur on orbit 128 at about 5:47 a.m. Saturday.

There is only one KSC landing opportunity on Saturday. Two landing opportunities are available on Saturday at Edwards Air Force Base, Calif. at 6:43 a.m. and 8:19 a.m. EST.

The landing of Discovery will mark the 22nd landing at KSC in the history of Space Shuttle flight. It will be the first KSC landing this year.

The landing of Discovery will be the first to occur on the newly resurfaced runway. The surface was modified over the summer in an effort to reduce wear and tear on orbiter tires during landing and to increase crosswind tolerances.

About six hours following landing at KSC, members of the STS-63 crew will hold a press conference to discuss their mission. Crew members attending the briefing will be announced soon after touchdown.

PREVIOUS SHUTTLE LANDINGS AT KSC

1. 41-B - Challenger, Feb. 11, 1984
2. 41-G - Challenger, Oct. 13, 1984
3. 51-A - Discovery, Nov. 16, 1984
4. 51-C - Discovery, Jan. 27, 1985
5. 51-D - Discovery, April 19, 1985
6. STS-38 - Atlantis, Nov. 20, 1990
7. STS-39 - Discovery, May 6, 1991
8. STS-43 - Atlantis, Aug. 11, 1991
9. STS-45 - Atlantis, April 2, 1992
10. STS-50 - Columbia, July 9, 1992
11. STS-46 - Atlantis, Aug. 8, 1992
12. STS-47 - Endeavour, Sept. 18, 1992
13. STS-52 - Columbia, Nov. 1, 1992
14. STS-54 - Endeavour, Jan. 19, 1993
15. STS-56 - Discovery, April 17, 1993

16. STS-57 - Endeavour, July 1, 1993

17. STS-51 - Discovery, Sept. 22, 1993

18. STS-61 - Endeavour, Dec. 13, 1993

19. STS-60 - Discovery, Feb. 11, 1994

20. STS-62 - Columbia, March 18, 1994

21. STS-65 - Columbia, July 23, 1994

KSC End Of Mission Landing Weather Constraints

At decision time for the deorbit burn (about 90 minutes before landing), general weather restrictions for a KSC landing are specified in part as:

* Visibility must be five miles or greater

* Peak surface winds must not exceed 20 knots in any direction

* The peak crosswinds must not exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day or night

* The forecast and observed cloud ceiling must be 10,000 feet or higher. For scattered clouds below 10,000 feet, cloud cover must be observed to be not greater than 20 percent

* There can be no precipitation at the Shuttle Landing Facility or in the proximity of the orbiter's glide path

* Thunderstorms, rain or the potential for lightning cannot exist within 30 nautical miles of the landing site

* Vertical cloud clearance at the 30 nautical mile range must be greater than 2 nautical miles

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 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 egress the vehicle and doff 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. 3. 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.

About 2 hours, 40 minutes after landing, the orbiter will be

towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Preparations will then begin for Discovery's next flight, mission STS-70, during which the orbiter will deploy the TDRS-G communications satellite. Launch is currently targeted for June 1995.

Following departure from the SLF, the crew of mission STS-63 will be taken to their quarters in the O&C Building, meet with their families, undergo a physical examination and prepare to depart for the skid strip at Cape Canaveral Air Station for their flights back to JSC.

The crew is planning to depart for JSC roughly 6 to 7 hours after landing. The exact time of departure will be determined following touchdown.

If a landing at KSC is not feasible and 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.

NOTICE TO EDITORS: Media wishing to view Discovery's landing should plan on being at the press site between 4 and 6 a.m. Monday for transport to the SLF. Other specific information is available at the KSC news center regarding landing photo opportunities, the post landing press conference, crew departure photo opportunities and news center operational hours.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 10, 1995

KSC Release No. 9-95

Note to Editors/News Directors:
TCDT MEDIA OPPORTUNITY WITH STS-67 CREW SET FOR NEXT WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-67 next week during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

The seven-member crew is scheduled to arrive at KSC on Sunday, Feb. 12, at about 6 p.m.

The only opportunity for media to photograph and speak with the crew will be on Tuesday, Feb. 14 during an informal question and answer session at Pad 39A. News media should be at the KSC Press Site by 12:30 p.m. for transport to the pad.

Media interested in covering the pad event should contact the KSC Press Site to obtain the proper badge.

On Wednesday, the crew will board the Shuttle Endeavour at about 8:15 a.m. and remain there through the end of the test. The mock countdown culminates with a simulated main engine cutoff at about 11 a.m. Wednesday

Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Endeavour is currently targeted for launch at 1:37 a.m. EST, March 2, on a 15 and a half day-long mission. NASA managers will set the official launch date for mission STS-67 during the Flight Readiness Review scheduled to be held at KSC on Feb. 15.

Mission STS-67 will feature the second flight of a series of telescopes -- called Astro-2 -- designed to probe the invisible universe of ultraviolet astronomy. This mission is also scheduled to be longest Shuttle flight to date.

Crew members for mission STS-67 are: Commander Stephen Oswald; Pilot William Gregory; Mission Specialists Tamara Jernigan, John Grunsfeld, Wendy Lawrence and Payload Specialists Samuel Durrance and Ronald Parise.

NOTE: The STS-63 badges will be honored for the Terminal Countdown Demonstration Test next week.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 14, 1995

KSC Release No. 10-95

ROAD WORK TO CAUSE TEMPORARY DETOUR ON S.R. 402

The section of Beach Road (State Route 402) between the Merritt Island National Wildlife Refuge Visitors Center and the intersection of Kennedy Parkway North (State Route 3) at Wilson's Corner will be closed to traffic Feb. 20-24 due to road resurfacing work.

Drivers heading east on Beach Road to KSC, Playalinda Beach and the refuge will be detoured northeast on Black Point Road (State Road 406) to Kennedy Parkway North. A left turn at this intersection will allow traffic to continue on to Haulover Canal and the refuge recreational facilities. A right-hand turn is necessary for KSC workers and visitors to Playalinda Beach. Beachgoers must then turn left at the Beach Road/ Wilson's Corner intersection to reach their destination.

The west side of the Wilson's Corner intersection will be barricaded, prohibiting KSC employees from turning left onto Beach Road for drivers northbound on Kennedy Parkway North. This traffic will be required to continue north to Blackpoint Road in order to return to the Titusville area.

Beach Road on the west end will remain open to provide access to the refuge center.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 16, 1995

KSC Release No. 11-95

KSC CUTS BACK ON ENGINEERING SUPPORT CONTRACTS

John F. Kennedy Space Center Director Jay Honeycutt announced today that KSC has decided not to award a follow-on contract for engineering support to the Safety Reliability and Quality Assurance Directorate (SR&QA).

This contract would have provided for various analysis functions in support of the SR&QA Directorates oversight of KSC prime contractor activities.

The new contract would have included some of the tasks that previously were performed by Hernandez Engineering Inc. and Analex Space Systems, Inc.

Analex has provided database management, software programming and other support to reliability and quality assurance functions including trends analysis and special studies since March 1, 1989. Hernandez has provided data acquisition analysis and other support to safety engineering functions including hazards analysis and risk assessment and safety review board processes since Oct. 1, 1991.

KSC has determined that the work can be performed by existing civil service personnel in SR&QA and in other NASA engineering organizations with SR&QA oversight. "Hernandez and Analex have provided outstanding support to the Space Shuttle SR&QA activities during the performance of their contract responsibilities. NASA engineers are prepared to continue performing these functions effectively, with safety as a top priority," Honeycutt said.

Honeycutt added, "KSC is reviewing all current and future support service procurement actions in the continuing effort by NASA to cut costs and activities which are not absolutely essential to KSC's primary tasks or which can be consolidated with other activities in a more cost-effective way."

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

February 17, 1995

KSC Release No. 12-95

KSC TO BECOME SPACE TECHNOLOGY CLEARINGHOUSE FOR FLORIDA INDUSTRY

KSC will become a problem-solving space technology clearinghouse for the state's industry, thanks to a recent agreement with the Technological Research and Development Authority (TRDA) to establish the NASA-KSC/Florida Technology Outreach Program.

"This jointly-funded program is designed to dramatically expand and accelerate the process of transferring space technology to industry," said Bill Sheehan, chief of the Technology Programs and Commercialization Office. "Through it, we will be helping Florida companies solve their engineering, development and production problems by direct application of KSC-and-NASA-developed technology to their needs."

Here's how the program will work: The TRDA will contract with the 67 Florida local economic development agencies and provide funds to work with businesses in their regions to identify their technology needs. After the two have submitted a problem statement to the TRDA , the state agency will review it and forward it to KSC.

"We will look at each statement to determine what KSC or NASA technology might be applicable in solving the problem and hopefully provide a solution," Sheehan said. "When NASA does not have a solution, KSC will pass the problem to the network of other federal laboratories for consideration."

However, the program is also expected to uncover technical capabilities within the state that could match KSC planned development needs, he pointed out. In this case, the company and NASA could form a partnership that would result in a marketable product for the company and new hardware for the space program at a fraction of the cost to taxpayers.

"This is known as a dual-use partnership, where both parties benefit," Sheehan explained. "The agency has been mandated to promote and encourage such partnerships with businesses, and it will be a major part of the new way that NASA does business."

KSC has been a pioneer in the dual-use concept for the agency. In 1993, the NASA Space Act Agreement between the State of Florida and the space center was signed by Governor Lawton Chiles and then-KSC director Robert L. Crippen. This was the first state/federal partnership arrangement designed to foster the development of dual-use programs in the country. The Technology Outreach Program is the newest element of the joint KSC/State of Florida effort.

This spring, the TRDA, the Economic Development Council of East Central Florida and KSC will sponsor a two-day training workshop that will showcase KSC-developed technologies that can be the basis for immediate-dual use partnerships. The event is an effort to familiarize economic development council representatives from around the state both with the space center and the kind of resources that are available.

"We hope to stimulate a lot of interest and spread the word about how working with NASA can benefit everyone," Sheehan said. " By providing direct access to NASA technologies, we are helping to improve economic growth for the state, helping

industry solve technology problems, and greatly reducing the cost of developing new hardware and applications for NASA."

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

February 22, 1995

KSC Release No. 14-95

Note to Editors/News Directors:
KSC TO HOST ANNUAL COMMUNITY LEADERS BREAKFAST ON FEB. 24

KSC Director Jay Honeycutt will meet with community leaders and give an overview of the center's role in Brevard County including the space center's economic contributions, budget issues, educational outreach efforts and highlights of recent accomplishments in the Shuttle program at the annual community leaders breakfast on Feb. 24 at Spaceport USA.

Community leaders will gather at the Orbit Cafeteria at 8 a.m. for a continental breakfast and proceed to the IMAX 2 theater for Honeycutt's remarks at 9 a.m. Guests will get an inside look at KSC during a two-hour tour of the center. Additionally, the Center for Space Education will host an Open House from 9:45 a.m. to 1 p.m.

Almost 350 are expected to attend the half-day event.

Media representatives are invited to attend the events listed above and should contact the KSC News Center at 867-2468 to make arrangements.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

February 24, 1995

KSC Release No. 15-95

Notice to Editors/News Directors:
EVENTS, NEWS CENTER HOURS OF OPERATION SET FOR MISSION STS-67, NORM THAGARD LAUNCH FROM BAIKONUR AND MIR DOCKING

News conferences, events and operating hours for KSC's News Center have been set for the upcoming launch of the Space Shuttle Endeavour on Mission STS-67. In addition, the News Center will be open for the Mar. 14 launch of Norm Thagard and the Mir 18 crew aboard a Soyuz rocket from Baikonur, Russia and their subsequent docking with the Mir space station on Mar. 16. These events are scheduled to be carried live on NASA TV (please refer to the STS-67 mission TV schedule for exact times).

The seven crew members are scheduled to arrive at KSC on Sunday, Feb. 26, at 11:15 p.m. EST. 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. Arrival of the STS-67 astronauts will NOT be carried live on NASA TV. News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

At 2 a.m. EST Monday, Feb. 27, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 1:37 a.m. EST on Thursday, Mar. 2. The launch window is 2 1/2 hours long.

News media representatives will have an opportunity to discuss details of the launch countdown with NASA test directors during briefings at the KSC News Center next week (all briefings will be carried live on NASA TV). Please refer to the STS-67 briefing schedule for times, participants and other events.

STS-67 BRIEFING SCHEDULE
(all times are in EST)

L- 4 Days - Sunday, Feb. 26
STS-67 fight crew arrival ----------11:15 p.m.

L-3 Days - Monday, Feb. 27
STS-67 fight crew arrival (tape replay) ----------5 a.m.

Countdown Status Briefing----------9 a.m.
* Bill Dowdell, Shuttle Test Director
* Glenn Snyder, STS-67 Payload Manager
* John Weems, Shuttle Weather Officer

STS-67 fight crew arrival (tape replay)--------9:15 a.m.
(or immediately following the briefing)

L-2 Days - Tuesday, Feb. 28
Countdown Status Briefing----------9 a.m.
* Debbie Frostrom, NASA Test Director
* Glenn Snyder, STS-67 Payload Manager
* John Weems, Shuttle Weather Officer

CMIX briefing ---------- 9:15 a.m.

* Jennifer Eroskey, CMIX program manager, Office of Space Access, NASA Headquarters
* Dr. Marian Lewis, CMIX project manager, University of Alabama at Huntsville
* John Cassanto, president, Instrumentation Technology Associates and program manager for commercial portion of CMIX

Pre-launch News Conference----------3 p.m.
(Time is approximate - will follow management meeting)
* Brewster Shaw, Director, Space Shuttle Operations, Johnson Space Center
* Dr. Edward Weiler, chief, Ultraviolet and Visible Astrophysics Branch, Office of Space Science, NASA Headquarters
* Bob Sieck, director of Shuttle Management and Operations, KSC
* Capt. David Biggar, Air Force Staff Meteorologist

L - 1 Day - Wednesday, Mar. 1
Countdown Status Briefing----------9 a.m.
* Kelvin Manning, NASA Test Director
* Glenn Snyder, STS-67 Payload Manager

Replay of STS-67 crew and mission briefings -----9:15 a.m.

NASA Select live launch programming begins----------9 p.m.

Launch Day - Thursday, Mar. 2
Post-launch press conference----------L + 1 hour
* Loren Shriver, manager of Launch Integration for the Space Shuttle Program
* James Harrington, KSC Launch Director

KSC News Center office hours for STS-67
(hours may be adjusted for in-flight events)

(Launch minus 4 days) Sunday, Feb. 26	9 p.m. - midnight
(Launch minus 3 days) Monday, Feb. 27	7 a.m. - 4:30 p.m.
(Launch minus 2 days) Tuesday, Feb. 28	7 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Mar. 1	*7 a.m. - around-the-
(Launch day) Flight day 1, Thursday, Mar. 2	clock - 4:30 p.m.
Flight day 2, Friday, Mar. 3	7 a.m. - 4:30 p.m.
Flight days 3-4, Mar. 4-5	CLOSED
Flight days 5-9, Mar. 6-10	7 a.m. - 4:30 p.m.
Flight days 10-11, Mar. 11-12	CLOSED
Flight day 12, Mar. 13	7 a.m. - 4:30 p.m.
Flight day 13, Mar. 14	midnight - 4:30 p.m.
Flight day 14, Mar. 15	7 a.m. - 4:30 p.m.
Flight day 15, Mar. 16	midnight - 4:30 p.m.
Flight day 16, Landing Day, Mar. 17	7 a.m. - midnight

* The Audio/Visual section will be open at 6:30 a.m. for remote camera set-up.

News media representatives may obtain STS-67 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Monday, Feb. 27	--	8 a.m. to 4:30 p.m.
Tuesday, Feb. 28	--	8 a.m. to 4:30 p.m.
Wednesday, Mar. 1	--	8 a.m. to 11:30 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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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February 24, 1995

KSC Release No. 18-95

SPACE SHUTTLE MISSION STS-67 LAUNCH COUNTDOWN TO BEGIN MONDAY

The countdown for launch of the Space Shuttle Endeavour on mission STS-67 is scheduled to begin Monday, Feb. 27 at 2 a.m. EST, at the T-43 hour mark.

The countdown includes 28 hours and 37 minutes of built-in hold time leading to the opening of the launch window at 1:37 a.m. (EST) on March 2. The launch window extends for 2 1/2 hours, through 4:07 a.m.

STS-67 is the second of eight missions scheduled for 1995. This will be the 8th flight of the Shuttle Endeavour and the 68th flight overall in NASA's Space Shuttle program.

The primary purpose of mission STS-67 is to support the Astro-2 payload, a series of ultraviolet telescopes that will study the evolution and composition of stars and galaxies and the interstellar dust between galaxies. The Astro-2 telescopes will also look at the planet Jupiter in hopes of observing any changes in the planet's upper atmosphere resulting from the Shoemaker-Levy 9 comet impacts last summer.

The three telescopes flying on Astro-2 are: Hopkins Ultraviolet Telescope (HUT), Wisconsin Ultraviolet Photo-Polarimeter Experiment (WUPPE) and Ultraviolet Imaging Telescope (UIT).

Other payloads located on the middeck are two Protein Crystal Growth investigations, the Commercial Materials Dispersion Apparatus Instrumentation Technology Associates Experiments (CMIX), and the Shuttle Amateur Radio Experiment (SAREX-II).

Endeavour was rolled out of Orbiter Processing Facility bay 1 on Feb. 3 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39A on Feb. 8. Endeavour last flew in September/October 1994.

The STS-67 crew are: Commander Stephen Oswald, Pilot William Gregory, Payload Commander/Mission Specialist Tamara Jernigan, Mission Specialists John Grunsfeld and Wendy Lawrence, and Payload Specialists Samuel Durrance and Ronald Parise.

The crew is scheduled to arrive at KSC at about 11:15 p.m. Sunday, Feb. 26. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

As the countdown begins, the KSC launch team in Firing Room 3 of the Launch Control Center will verify all systems to assure the Shuttle is properly powered up and the data processing and backup flight control systems are operating trouble free.

Verifications conducted throughout the launch countdown ensure continuous reviews are made of the flight software stored in the orbiter's twin memory banks. Computer controlled display systems will be activated and the backup flight system general purpose computer will be loaded.

Operations will also begin to prepare the orbiter for on-board cryogenic loading. Later, orbiter navigation aids will be turned on and tested and the inertial measurement units activated. Ground crews will make the final storage of mid-deck and flight deck supplies, perform microbial samplings of the flight crew's drinking water and check water levels in the waste management system.

At T-27 hours, the countdown enters its first scheduled hold. This is a four-hour hold lasting from 6 p.m.-10 p.m. Monday, Feb. 27.

When the countdown resumes, the launch pad will be cleared of all personnel for loading cryogenic reactants. Reactants are loaded into the power reactant storage and distribution system tanks located under the payload bay lining and the extended duration orbiter pallet tanks in the aft end of the payload bay. The reactants are used by the orbiter's fuel cells to provide electricity to the orbiter and drinking water for the crew. Cryogenic flow operations are scheduled to start at about 10 p.m. Monday and continue for about 12 hours.

As servicing of the cryogenic tanks nears completion, the clock will enter an eight-hour built-in hold at the T-19 hour mark. This hold

will last from 6 a.m.-2 p.m. Tuesday.

Following cryogenic loading operations, the pad will be re-opened for scheduled pre-launch activities. The orbiter mid-body umbilical unit, used to load the super-cold reactants in the orbiter's fuel cell tanks, will be demated and retracted into the launch structure.

When the countdown resumes, technicians will complete final vehicle and facility close-outs and begin configuring Endeavour's cockpit for flight. The orbiter's flight control system and navigation aids will be activated. The stowable crew seats will be installed in the flight and mid-decks.

The countdown will enter another built-in hold at the T-11 hour mark at 10 p.m. Tuesday. This 13-hour, 17-minute hold will last until 11:17 a.m. Wednesday. During this hold, time critical equipment will be installed in the orbiter's cockpit. The inertial measurement units and the orbiter's communications systems will be activated.

At about 8:30 a.m. Wednesday, the Rotating Service Structure is scheduled to be moved away from the vehicle and placed in launch position.

At T-9 hours (1:17 p.m. Wednesday) the onboard fuel cells will be activated. At T-8 hours, the launch team will evacuate the blast danger area and clear the pad for loading the external tank with the cryogenic propellants for the orbiter's main engines. At T-7 hours, 30 minutes, conditioned air that is flowing through the orbiter's payload bay and other areas on the orbiter will be switched to gaseous nitrogen in preparation for fueling the external tank. The inertial measurement units will transition from the warm-up stage to the operate/attitude determination mode at T-6 hours, 45 minutes.

The countdown will enter another planned built-in hold at the T-6 hour mark at 4:17 p.m. Wednesday. During this one-hour hold, final preparations for loading the external tank will be completed. Also, a pre-tanking weather briefing will be conducted for the benefit of the Mission Management Team prior to their giving approval to begin tanking operations.

Chilldown of the lines that carry the cryogenic propellants to the external tank begins when the clock starts counting again at 5:17 p.m. Wednesday. Filling and topping off the external tank should be complete about three hours later at the beginning of the next planned hold at T-3 hours, or 8:17 p.m. Wednesday.

During the two-hour hold at the T-3 hour mark, the Final Inspection Team will conduct a final survey of the pad and various Shuttle components ensuring their readiness for flight. Also, the close-out crew will be dispatched to the pad and begin configuring the crew module and white room for the flight crew's arrival. Liquid oxygen and liquid hydrogen will be in a stable replenish mode during this time to replace any propellant that "boils" off.

The seven flight crew members will be awakened at about 8:42 p.m. Wednesday and seated for their final meal before launch at about 9:12 p.m. Following their meal, the crew will receive a briefing on weather conditions at KSC and at the TransOceanic Abort Landing sites.

The flight crew will suit-up in their partial-pressure suits, then leave the Operations and Checkout Building at about 10:22 p.m. Wednesday. They will arrive at the Pad 39A white room at about 10:52 p.m. and be assisted into the crew cabin by white room personnel.

Just prior to the T-60 minute mark, the test team and the flight crew will get another weather update, including observations from astronaut Bob Cabana flying in a Shuttle Training Aircraft in the KSC area.

The next built-in hold occurs at the T-20 minute mark (12:57 a.m. Thursday) and lasts for 10 minutes. The final built-in hold occurs at the T-9 minute mark (1:18 a.m.) and extends for 10 minutes. During the final hold, the flight crew and ground team receive the NASA launch director's and the mission management team's final "go" for launch.

Milestones after the T-9 minute mark include start of the ground launch sequencer; retraction of the orbiter access arm at T-7 minutes, 30 seconds; start of the orbiter's auxiliary power units at T-5 minutes; pressurization of the liquid oxygen tank inside the external tank at T-2 minutes, 55 seconds; pressurization of the liquid hydrogen tank at T-1 minute, 57 seconds; ground power disconnection from the orbiter at T-50 seconds; and the electronic "go" to Endeavour's onboard computers to

start their own terminal countdown sequence at T-31 seconds. The orbiter's three main engines will start at T-6.6 seconds.

COUNTDOWN MILESTONES

Launch - 3 Days (Monday, Feb. 27)

* Prepare for the start of the STS-67 launch countdown
* Perform the call-to-stations at the T-43 hour mark
* 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 2 a.m. EST
* Start preparations for servicing fuel cell storage tanks
* Begin final vehicle and facility close-outs for launch

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

* Check out back-up flight systems
* Review flight software stored in mass memory units and display systems
* Load backup flight system software into Endeavour's general purpose computers
* Begin stowage of flight crew equipment
* Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
* Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (10 p.m.)

* Clear launch pad of all personnel
* Begin the 12 hour operation to load cryogenic reactants into Endeavour's fuel cell storage tanks and the extended duration orbiter pallet

Launch - 2 Days (Tuesday, Feb. 28)

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

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

Resume countdown (2 p.m.)

* Start final preparations of the Shuttle's main engines for main propellant tanking and flight
* Activate 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, 17 minutes (10 p.m.)

* Perform orbiter ascent switch list in crew cabin
* Install film in numerous cameras on the launch pad
* Activate the orbiter's communications systems
* Activate orbiter's inertial measurement units
* Fill pad sound suppression system water tank

Launch -1 Day (Wednesday, March 1)

* Safety personnel conduct debris walkdown
* Move Rotating Service Structure (RSS) to the park position at about 8:30 a.m.
* Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Resume countdown (11:17 a.m.)

* Install 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 Endeavour's purge air to gaseous nitrogen

Enter planned one-hour built-in hold at the T-6 hour mark (4:17 p.m.)

* Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
* Clear pad of all personnel

Resume countdown (5:17 p.m.)

* Begin loading the external tank with cryogenic propellants (5:17 p.m.)
* Perform inertial measurement unit preflight calibration
* Align Merritt Island Launch Area (MILA) tracking antennas
* Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (8:12 p.m.)

Enter two-hour hold at T-3 hours (8:17 p.m.)

* Perform open loop test with Eastern Range
* Conduct gimbal profile checks of orbital maneuvering system engines
* Close-out crew and Final Inspection Team proceeds to Launch Pad 39A

Resume countdown at T-3 hours (10:17 p.m.)

* Crew departs Operations and Checkout Building for the pad at 10:22 p.m.
* Complete close-out preparations in the white room
* Check cockpit switch configurations
* Flight crew enters orbiter

Launch Day (Thursday, March. 2)

* Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
* Close Endeavour's crew hatch
* 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 (12:57 a.m.)

* NASA Test Director conducts final launch team briefings

Resume countdown (1:07 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 final 10-minute hold at T-9 minutes (1:18 a.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 (1:28 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 MPS 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)
* LPS go for start of orbiter automatic sequence (T-0:31 seconds)
* Ignition of Shuttle's three main engines (T-6.6 seconds)
* SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-67

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	6:00 p.m. Mon.	10:00 p.m. Mon.
T-19 hours	8 hours	6:00 a.m. Tues.	2:00 p.m. Tues.
T-11 hours	13 hrs.,17 mins.	10:00 p.m. Tues.	11:17 a.m. Wed.
T-6 hours	1 hours	4:17 p.m. Wed.	5:17 p.m. Wed.

T-3 hours ---------2 hours ----------8:17 p.m. Wed.------10:17 p.m. Wed.
T-20 minutes ------10 minutes -------12:57 a.m. Thurs.-----1:07 a.m. Thurs.
T-9 minutes ------10 minutes --------1:18 a.m. Thurs.-----1:28 a.m. Thurs.

CREW FOR MISSION STS-67

Commander (CDR): Stephen Oswald (Red Team)
Pilot (PLT): William Gregory (Red Team)
Payload Commander/Mission Specialist (MS3): Tamara Jernigan (Blue Team)
Mission Specialist (MS1): John Grunsfeld (Red Team)
Mission Specialist (MS2): Wendy Lawrence (Blue Team)
Payload Specialist (PS1): Samuel Durrance (Blue Team)
Payload Specialist (PS2): Ronald Parise (Red Team)

SUMMARY OF STS-67 LAUNCH DAY CREW ACTIVITIES

Wednesday, March 1

8:42 p.m.	Wake up
9:12 p.m.	Dinner/Breakfast and crew photo
9:42 p.m.	Weather briefing (CDR, PLT, MS2)
9:42 p.m.	Don flight equipment (MS1, MS3, PS1, PS2)
9:52 p.m.	Don flight equipment (CDR, PLT, MS2)
10:22 p.m.	Depart for launch pad 39A
10:52 p.m.	Arrive at white room and begin ingress

Thursday, March 2, 1995

12:07 a.m.	Close crew hatch
1:37 a.m.	Launch

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March 7, 1995

KSC Release No. 21-95

ORANGE PARK, FLA. FIRM TO CONSTRUCT SHUTTLE COMPONENT REFURBISHMENT FACILITY

Military Construction Co., Orange Park, Fla. has been awarded a $7,851,155 contract to construct the 36,950-square-foot (3,434-square-meter) Component Refurbishment Facility at Kennedy Space Center. This facility is designed to improve the cleaning and refurbishment of Space Shuttle flight and ground support hardware and to reduce the impact of this operation on the environment..

The small business firm will have approximately 300 days to complete the first phase of the Component Refurbishment Facility construction project on Contractor Road in the Launch Complex 39 Area. The building will house the Wiltech Co. operations now located in the Propellants Storage and Service Area on Saturn Causeway approximately one mile east of the Vehicle Assembly Building. Deterioration of operations support facilities in this location, constructed in the mid-1960's, is a major reason for the move.

Components requiring the highest degree of cleanliness will be processed in a 4,900-square-foot (455-square-meter) clean room facility that will reduce the potential for contamination of Shuttle hardware. Some of the components to be precision cleaned in this area include Shuttle flight hardware and valves, filters and flex hoses for ground support equipment gas and fuel lines. Water and chemical cleaning of fixed launch support systems and component parts will be conducted in a Rough Clean area. Disassembly, inspection and testing of fluids system components will take place in another room that will feature a machine shop. The building will also contain a hydraulics laboratory, a storage area and offices.

The building is designed to support a new aqueous cleaning technique for components that will allow the use of water instead of chloroflurocarbon cleaning agents.

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March 7, 1995

KSC Release No. 22-95

COLORADO SPRINGS FIRM AWARDED KSC TELEPHONE SYSTEM CONTRACT

Space Mark, Inc., Colorado Springs, Colo. has been awarded a $8,446,624 fixed-price contract for the operations and maintenance of the Kennedy Space Center Administrative Telephone System.

This contract is for a five-year period consisting of one basic year with four one-year options. The small, disadvantaged business firm began work March 1, 1995.

The telephone system is critical to Space Shuttle and payload processing operations, providing a communications link between hundreds of facilities at the 140,000-acre center. There are over 20,000 telephones on this network, and connections are made through four large telephone exchanges. The network also supports three voice-mail systems.

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March 6, 1995

KSC Release No. 23-95

NOTE TO EDITORS/NEWS DIRECTORS:

OFFICIAL DEBUT OF UNIQUE MOBILE LAUNCH CONTROL CENTER SET FOR MARCH 9 AT UNIVERSITY HIGH SCHOOL IN ORLANDO

Local high school students will conduct the first official launch from a one-of-a-kind Launch Control Center on wheels this Thursday, March 9, at University High School in Orlando.

More than 140 dedicated and energetic students in Principles of Engineering Technology classes taught by instructor Rob Catto spent more than 15,000 hours meticulously transforming the interior of a full-size, 26-foot (eight-meter) long school bus into a mobile mini-firing room. Twelve engineers from Kennedy Space Center volunteered technical expertise for the project, and equipment was donated by NASA, the Orange County School Board, and several corporations.

The bus is outfitted with nine operator consoles, four equipment racks, a workbench and VIP seating. It features such standard launch control center systems as a countdown clock display, RF and hard-line communication systems, launch sequencer computer, and a launch control system which provides both monitoring and command of all pad and launch vehicle equipment. Ten students, each performing a key countdown function such as telemetry systems officer, will staff the mobile center.

Slated for launch for on its third official flight is the Space Shuttle Explorer, a 1/40 scale replica of the U.S. Shuttle which also was built by students in Catto's engineering technology classes. This will be the second year in a row the students launch Explorer in honor of National Engineers Week and engineering outreach activities conducted year-round by NASA, contractor and other engineers nationwide.

The students hope that eventually the mobile Launch Control Center can be used as part of an educational outreach effort throughout the state of Florida and possibly the southeastern United States. Future plans include construction of small sounding rockets and a mobile launch tower on a trailer to accompany the Launch Control Center on its travels. Students from other schools can then design small payloads which can be launched on one of the sounding rockets to an altitude in excess of 1 mile (1.6 kilometers).

The March 9 launch of Explorer will take place at 10:15 a.m. from Launch Pad 39C at University High School. KSC officials scheduled to be present for the event include Center Director Jay Honeycutt; Shuttle Management and Operations Director Robert Sieck; Launch Director James Harrington; Payload Management and Operations Director John Conway; Engineering Development Director Walter Murphy; Installation and Management Operations Director Marvin Jones; Acting Director, Safety and Reliability, Joel Reynolds; and Public Affairs Director Hugh Harris.

University High School is located at 11501 Eastwood Drive, Orlando. News media wishing to cover the event may drive to the launch pad area, located on the northeast side of the school, near a greenhouse.

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March 9, 1995

KSC Release No. 24-95

ORBITER DOCKING SYSTEM AND SPACELAB READY FOR INSTALLATION IN ATLANTIS

Two major hardware elements scheduled to fly on the first docking flight between the U.S. Space Shuttle and Russian Space Station Mir are ready for installation in the orbiter Atlantis.

On March 13, the Orbiter Docking System will be installed in the forward area of the payload bay of Atlantis, undergoing preflight processing in Orbiter Processing Facility Bay 3. Several days later, on March 17, a Spacelab module is scheduled for installation in the aft area of the cargo bay. The two elements will be connected via a Spacelab tunnel.

"Next week is going to be a big week for us," said Atlantis Flow Director Conrad Nagel. "It's our most significant week so far in preparing the orbiter midbody for flight."

The Orbiter Docking System, or ODS, includes an airlock, a supporting truss structure, a docking base, and a Russian-built docking mechanism, the Androgynous Peripheral Docking System (APDS). Once installed, the ODS will be connected to the internal airlock on Atlantis via a Spacelab tunnel adapter. During the first docking flight, STS-71, the APDS will be mated to a matching interface located on a docking port of the Kristall module, attached to the Mir space station. Crew members aboard Atlantis and Mir will be able to pass back and forth between the two mated spacecraft during joint operations.

The Spacelab module, identified as Spacelab-Mir for STS-71, will serve a dual purpose during the historic flight. "The Spacelab-Mir will act as a workroom for conducting research as well as a storehouse, so to speak, where materials can be stowed," said Payload Mission Operations Engineer Scott Higginbotham.

Spacelab-Mir will carry a complement of experiments focusing on the life sciences. Medical data will be gathered on the three crew members returning from Mir -- including U.S. astronaut Norm Thagard -- as well as on two cosmonauts who will transfer from the Shuttle to the space station.

The Spacelab also will carry a diverse array of logistics hardware, experiment samples and other items slated for transfer to the Mir.

The installation of the ODS and Spacelab-Mir in Atlantis' payload bay will pave the way for other noteworthy processing milestones at KSC. STS-71 crew members will be in the Orbiter Processing Facility on March 21 for an alignment check of one of the cameras which will be used during the docking sequence, giving them their first close-up look at the complete ODS-Spacelab complement.

Tentatively scheduled for March 29 is an end-to-end test, again including the flight crew. During this test, the crew will be stationed inside the orbiter cockpit to rehearse the actual docking sequence. Simulating the Kristall docking port will be a Russian-built passive docking system attached to an Orbiter Processing Facility crane. The end-to-end test will provide an excellent opportunity to further prepare the crew for STS-71.

Rollover of Atlantis from the Orbiter Processing Facility to the Vehicle Assembly Building is currently targeted for April 19, followed by rollout to Launch Pad 39A on April 26. The launch of STS-71 is expected in the late May/early June time frame.

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March 21, 1995

KSC Release No. 26-95

NASA BENEFIT ASSESSMENT SHOWS TECHNOLOGY TRANSFER ALLIANCE HELPS CREATE JOBS

NASA technology transfer efforts in the Southeast continue to show success in creating and preserving jobs as well as helping boost the nation's economy, according to a recent report from a newly established organization that includes KSC and two other space agency field centers.

The report, a survey of benefits stemming from NASA technology transfer, was issued by the Southeastern regional technology transfer alliance between Marshall Space Flight Center, Huntsville, Ala., Stennis Space Center in Mississippi and KSC. Together, they have helped to create an additional 2,093 direct and indirect new jobs between July and December 1994.

When added to the 5,300 jobs reportedly created or saved through Marshall's technology transfer effort through January 1993 to June 1994, NASA's estimated effects on the nation's economy -- particularly in the Southeast -- represents 7,393 jobs in 37 states. The alliance members estimate their technology transfer recipients will realize $185 million in economic benefits nationwide.

"While Marshall has had an active technology transfer program for many years, combining our efforts with those of the Kennedy Space Center and Stennis Space Center creates a synergistic effect," said Harry Craft, manager of the Marshall Technology Transfer Office. "By this I mean we can do more to transfer NASA and NASA contractor-derived technologies together than we can by working individually. Each center has unique resources. By pooling our talents we can better effect the flow of technology into the hands of Americans. This will create jobs, conserve resources and enhance our competitive edge in the global marketplace."

William Sheehan, chief of KSC's Technology Programs and Commercialization Office, cited a number of recent technology developments at the center which have been commercialized or have commercial potential. These items include electrically conducting polymer coatings for corrosion protection (particularly important since corrosion costs U.S. industries an estimated $80 billion annually), a universal signal conditioning amplifier that replaces about 1,000 analog amplifiers which require many man-hours of maintenance and the initiation of joint NASA-KSC/ State of Florida space commercialization agreements. These agreements include a supersonic gas-liquid cleaning system and an adaptation of NASA-developed instrumentation systems.

One success story among several cited by Craft is the creation of new jobs at Memphis Drum Co.

"We've adapted a weld-seam tracking device developed for the Space Shuttle external tank assembly to help this company recycle 55-gallon drums," Craft said. "The firm has been able to expand operations across the Mississippi River into Arkansas, creating 40 new jobs as a result."

The Frymaster Corp. in Louisiana, America's largest manufacturer of commercial deep-fat fryers, has also adapted the weld-seam tracking technology to its manufacturing needs, Craft added. Other success stories include assisting the North American Marine Jet Co. in Arkansas in developing a better method of manufacturing parts for jet engines used on boats. A joint Marshall and Stennis effort provided a private oil company in Louisiana with a means to use satellite imagery techniques to enhance images of obstructions down the holes of their oil wells. This technology has the potential of reducing U.S. dependency on foreign oil and consequently reducing the country's trade deficit, Craft said.

While the technology transfer efforts at all three centers have been able to resolve about 90 percent of the problems presented, about 95 percent of those industries asking for help say they would seek NASA assistance if problems arose in the future.

"Together, the three field centers offer an expanded menu of talents and research facilities which can be brought to bear on problems facing American businesses and private individuals," Sheehan said.

More information on NASA technology transfer programs can be obtained by contacting the KSC office at (407) 867-2544.

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March 17, 1995

KSC RELEASE NO. 27-95

ENDEAVOUR SCHEDULED TO LAND AT KSC

The orbiter Endeavour is scheduled to land at Kennedy Space Center on Friday, March 17 at 2:54 p.m. EST, completing its STS-67 mission which was launched from KSC on March 2.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 254 at mission elapsed time of 15 days, 13 hours, 16 minutes. Deorbit burn will occur at about 1:49 a.m. Friday.

There are two later KSC landing opportunities on Friday at 4:30 p.m. and 6:07 p.m. EST. In the event a landing is not possible at KSC on Friday due to weather concerns, no landing attempt will be made at Edwards Air Force Base, Calif. On Saturday, three landing opportunities are available at KSC and three are also available at Edwards.

Saturday landing times at KSC are: 3:19 p.m., 4:56 p.m. and 6:32 p.m. EST.

Saturday landing times at EAFB are: 4:47 p.m., 6:24 p.m. and 8 p.m. EST.

The landing of Endeavour will mark the 23rd landing at KSC in the history of Space Shuttle flight. It will be the second KSC landing this year.

The landing of Endeavour will be on the newly resurfaced runway. The surface was modified last summer in an effort to reduce wear and tear on orbiter tires during landing and to increase crosswind tolerances.

PREVIOUS SHUTTLE LANDINGS AT KSC

1. 41-B - Challenger, Feb. 11, 1984
2. 41-G - Challenger, Oct. 13, 1984
3. 51-A - Discovery, Nov. 16, 1984
4. 51-C - Discovery, Jan. 27, 1985
5. 51-D - Discovery, April 19, 1985
6. STS-38 - Atlantis, Nov. 20, 1990
7. STS-39 - Discovery, May 6, 1991
8. STS-43 - Atlantis, Aug. 11, 1991
9. STS-45 - Atlantis, April 2, 1992
10. STS-50 - Columbia, July 9, 1992
11. STS-46 - Atlantis, Aug. 8, 1992
12. STS-47 - Endeavour, Sept. 18, 1992
13. STS-52 - Columbia, Nov. 1, 1992
14. STS-54 - Endeavour, Jan. 19, 1993
15. STS-56 - Discovery, April 17, 1993
16. STS-57 - Endeavour, July 1, 1993
17. STS-51 - Discovery, Sept. 22, 1993
18. STS-61 - Endeavour, Dec. 13, 1993
19. STS-60 - Discovery, Feb. 11, 1994
20. STS-62 - Columbia, March 18, 1994
21. STS-65 - Columbia, July 23, 1994

KSC End Of Mission Landing Weather Constraints

At decision time for the deorbit burn (about 90 minutes before landing), general weather restrictions for a KSC landing are specified in part as:

· Visibility must be five miles or greater

· Peak surface winds must not exceed 20 knots in any direction

· The peak crosswinds must not exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day or night

· The forecast and observed cloud ceiling must be 10,000 feet or higher. For scattered clouds below 10,000 feet, cloud cover must be observed to be not greater than 20 percent

· There can be no precipitation at the Shuttle Landing Facility or in the proximity of the orbiter's glide path

· Thunderstorms, rain or the potential for lightning cannot exist within 30 nautical miles of the landing site

· Vertical cloud clearance at the 30 nautical mile range must be greater than 2 nautical miles

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 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 egress the vehicle and doff 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 Endeavour March 2. 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.

About 2 hours, 40 minutes after landing, the orbiter will be towed to Orbiter Processing Facility bay 1 for post-flight deservicing. Preparations will then begin for Endeavour’s next flight, mission STS-69. Launch is currently targeted for July 1995.

Following departure from the SLF, the crew of mission STS-67 will be taken to their quarters in the O&C Building, meet with their families, undergo a physical examination and prepare to depart for the skid strip at Cape Canaveral Air Station for their flights back

to JSC. Departure is scheduled for early Saturday morning.

If a landing at KSC is not feasible and Endeavour 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.

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April 5, 1995

KSC Release No. 30-95

NOTE TO EDITORS/NEWS DIRECTORS:

SPACE STATION MANAGER TO SPEAK INFORMALLY WITH NEWS MEDIA ON FRIDAY

Wilbur Trafton, International Space Station Program Director, NASA Headquarters, will be available for an informal question and answer session on Friday, April 7 from 2-3 p.m. at the KSC News Center auditorium.

Trafton is in Florida at the invitation of the National Space Club Florida Committee as the keynote speaker for the Debus Award dinner Friday evening.

Since this is an informal discussion about the status of International Space Station activities it will not be carried on NASA Television or the V system audio circuits.

For additional information or accreditation to participate in this activity call the NASA KSC News Center at 867-2468.

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April 19, 1995

KSC Release No. 31-95

MANAGERIAL CHANGES ANNOUNCED AT KSC

Three NASA managers at Kennedy Space Center have taken on new assignments, effective April 3.

Roy Tharpe, manager, Launch and Landing Projects Office in the Shuttle Management Operations Directorate, has been named associate director of Shuttle Management and Operations. In this capacity Tharpe will directly support directorate head Robert Sieck.

Larry Ellis, deputy manager, Launch and Landing Projects Office, switches to the Shuttle Operations directorate. As chief, Shuttle Processing Office, Ellis will assume the responsibilities formerly held by acting Shuttle Operations Director Norm Carlson, who retired on March 31.

Brian Harris, chief, Program Integration and Mission Planning Office in the Shuttle Management and Operations Directorate, will move into the slot vacated by Tharpe.

The deputy position being vacated by Ellis is being made into a six-month rotational assignment. Jan Heuser, deputy to the chief, Technology Programs and Commercialization Office, is the first person to take on the job.

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Revised June 1995

KSC Release No. 32-95

STS-70
DISCOVERY/TDRS-G

Assuring the continued full capability of NASA's orbiting communications network is the primary purpose of Space Shuttle Mission STS-70. The Tracking and Data Relay Satellite-G (TDRS-G) to be deployed during the mission will become an on-orbit spare in the advanced TDRS System (TDRSS).

In addition to TDRS-G, the Shuttle Discovery also will carry a crew of five and a number of smaller payloads on its 21st spaceflight. Liftoff will occur from Launch Pad 39B, at a 28.45-degree inclination to the equator into a 184-statute mile (296-kilometer) orbit. Mission duration currently is set for eight days, but may change to five due to scheduling requirements. If Discovery lifts off when planned, it will become the 100th U.S. human spaceflight.

Terence "Tom" Henricks (Col., USAF) is the mission commander. He served as pilot on his first two Shuttle flights, STS-44 in 1991 and STS-55 in 1993. Kevin R. Kregel, the pilot, will be taking his first trip into space. He is a former Air Force pilot.

Three mission specialists are assigned to STS-70. Nancy Jane Currie (formerly Sherlock) (Maj., USA) has flown in space once before, on STS-57 in 1993. Also embarking on a second space voyage is Donald A. Thomas, who holds a Ph.D. in materials science. His first flight was STS-65 in 1994. Space rookie Mary Ellen Weber earned her Ph.D. in physical chemistry before joining the astronaut corps.

STS-70 will mark the maiden flight of the new Block I orbiter main engine. Engine number 2036 features the new high-pressure liquid oxygen turbopump, a two-duct powerhead, baffleless main injector, single-coil heat exchanger and start sequence modifications. The modifications are designed to improve both engine performance and safety. The Block I engine will fly in the number one position on Discovery. The other two engines are of the existing Phase II design.

TDRS-G

TDRS spacecraft are among the largest, most advanced communications satellites yet built. Each TDRS is a three-axis stabilized satellite weighing about 5,000 pounds (2,268 kilograms) and measuring 57 feet (17.4 meters) across the fully deployed solar panels. At its highest transmission rate, a TDRS can transfer in a single second the entire contents of a 20-volume encyclopedia.

The TDRS network orbits geosynchronously at 22,300 statute miles (35,888 kilometers) and looks down on an orbiting Shuttle or spacecraft. This means that for most of their orbits around the Earth, these spacecraft will remain in sight of one or more TDRS satellites. The full TDRS constellation enables user spacecraft to communicate with Earth for about 85 to 100 percent of the orbit, depending on their altitude; prior to the deployment of the TDRSS, spacecraft could communicate with Earth only when they were in view of a ground tracking station, typically less than 15 percent of each orbit.

The TDRS satellites serve as relays, passing data between spacecraft and a ground terminal facility at White Sands, N.M. Because the satellites must be located within view of White Sands, there are brief periods at lower altitudes when user spacecraft over the Indian Ocean are out of sight of the TDRS relay, typically about six to 12 minutes during each 90-minute orbit . This area, stretching slightly less than 200 miles (322 kilometers) over the Earth's surface, is called the Zone of Exclusion.

The TDRSS is currently being rearranged and will, in the near term, include two fully operational spacecraft occupying the TDRS East and West slots, one on-orbit spare that is fully functional, a nearly depleted TDRS which has exceeded its planned lifetime, and a partially operational TDRS devoted to supporting the Compton Gamma Ray Observatory (GRO) by covering

the Zone of Exclusion via a station in Australia.

In addition to the Space Shuttle and GRO, users of the TDRS system include the Hubble Space Telescope, UARS (Upper Atmosphere Research Satellite), TOPEX (Topographical tracking stations has reduced NASA telecommunications Ocean Explorer) and the Extreme Ultraviolet Explorer spacecraft. Relying on the TDRSS rather than on ground costs by an estimated 60 percent.

The TDRS spacecraft with its attached upper stage, a 32,500-pound (14,742-kilogram) Inertial Upper Stage (IUS) rocket booster, is deployed from the orbiter payload bay about six hours into the mission. The IUS will ignite to propel the TDRS-G to geostationary orbit. After checkout at an intermediate location, TDRS-G will be moved to a permanent location to serve as an on-orbit spare. It will be redesignated as TDRS-7 once on-orbit.

The current effort of rearranging the on-orbit constellation involves moving TDRS-3 into the 275-degrees west longitude slot to replace TDRS-1. NASA is pulling -- for the time being -- the oldest TDRS from active service.TDRS-1 has operated well beyond a nominal life expectancy of 10 years; its future is still being evaluated. TDRS-3 will continue to provide the same support as has been provided by TDRS-1 to GRO via a ground tracking station in Tidbinbilla, Australia. Data relayed to the Tidbinbilla station is uplinked to a domestic communications satellite and then relayed to the White Sands ground tracking facility.

Its location above the Indian Ocean also will allow TDRS-3 to perform an additional service during the upcoming Shuttle-Mir docking missions: assuring continuous unbroken communications with the Shuttle by eliminating the Zone of Exclusion for these flights.

TDRS-G is the last in the current generation of TDRS satellites which includes TDRS-1 through 7. All are built by TRW, Redondo Beach, Calif.

Middeck Payloads

A number of smaller payloads will be flying in the middeck of Discovery. The Physiological and Anatomical Rodent Experiment/National Institutes of Health-Rodents (PARE/NIH-R) is a series of experiments designed to determine whether exposure to microgravity results in physiological or anatomical changes in rodents. The Bioreactor Demonstration System (BDS) is a continuing examination of the effects of microgravity on cell growth. The Commercial Protein Crystal Growth-III (CPCG-III) seeks to grow and retrieve highly structured protein crystals of sufficient size to allow analysis of the molecular structures of various proteins and to obtain information on the dynamics of protein crystallization. The Space Tissue Loss/National Institutes of Health-B (STL-B) is designed to validate models of muscle, bone and biochemical and functional loss induced by the stress of microgravity.

The Biological Research in Canisters-III (BRIC-III) experiment will investigate the effects of spaceflight on plant specimens. The Visual Function Tester-4 (VFT-4) is designed to measure near and far points of clear vision, as well as the ability to change focus within the range of clear vision. VFT-4 will provide data to evaluate on-orbit changes in vision over a period of several days.

The Handheld, Earth-Oriented, Real-Time, Cooperative, User-Friendly, Location Targeting and Environmental System (HERCULES) is designed to provide the capability to locate ground sites within one mile. The objective of Microcapsules in Space-B (MIS-B) is to demonstrate the feasibility of producing pharmaceutical microcapsules in a microgravity environment. The Window Experiment (WINDEX) will obtain spectrally isolated images of Shuttle surface glow, thruster plumes, aurora and airflow. The Radiation Monitoring Experiment (RME-III) investigation will record both rate and total dosage of ionizing radiation. The Military Applications of Ship Tracks (MAST) investigation is studying the characteristics of the tracks left by ships in the ocean.

In the Shuttle Amateur Radio Experiment-II (SAREX-II), crew members communicate with ground-based amateur radio operators and students around the world. Two investigations, the Air Force Maui Optical Site Calibration Test (AMOS) and Midcourse Space

Experiment (MSX), require no onboard hardware. In AMOS, the orbiter flies over the Maui facility and helps to support calibration of its infrared and optical sensors. In MSX, orbiter thruster firings are used as a calibration and evaluation target for sensors on the MSX military satellite.

KSC Processing

TDRS-G arrived at KSC on April 7 to begin final preparations for flight. After being mated to the IUS on April 12, the TDRS-G/IUS assembly was taken to the launch pad to await installation in Discovery's payload bay. Discovery flew once earlier this year, becoming the first orbiter in the fleet to notch 20 spaceflights.

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April 18, 1995

KSC Release No. 35-95

GOES-J PHOTO OPPORTUNITY SET FOR FRIDAY, APRIL 21

The GOES-J weather satellite, to be lofted into orbit by an Atlas 1 rocket from Complex 36 next month, will be the subject of a news media opportunity on Friday, April 21. The event will be held at the Astrotech Space Operations facility starting at 10 a.m.

GOES-J will join GOES 8 launched last year, the first of the new advanced geostationary weather satellites. GOES-J will become GOES-9 once in orbit.

As part of the opportunity, there will be a satellite orientation by NASA and Space Systems/LORAL spacecraft personnel. Available for interviews and to answer questions will be Steve Kirkner, GOES program manager for NOAA.

Procedures for optically sensitive spacecraft must be followed. Guidelines for controlled access to the cleanroom have been developed by Space Systems/LORAL and will be monitored by quality control personnel prior to entering the cleanroom. Cleanroom attire will be furnished. Long pants and closed toe shoes must be worn. No shorts or skirts.

On Friday, media may proceed directly to Astrotech located in the Spaceport Florida Industrial Park, 1515 Chaffee Drive, Titusville.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

April 20, 1995
KSC Contact: Jim Ball
KSC Release No. 36-95

SPACEPORT USA AGREEMENT SIGNALS MAJOR OVERHAUL OF VISITOR PROGRAM

NASA and Delaware North Park Services, of Buffalo, N.Y., announced today the signing of a 10-year agreement for the operation and management of Spaceport USA, NASA's largest and best attended visitor facility. The firm will assume responsibility on May 1.

The agreement provides for a Delaware North investment of nearly $40 million to fund a major renovation and upgrade of KSC's Public Visitor Program. Delaware North Park Services was selected from a field of three offerors which included incumbent concessioner TW Recreational Services and Bionetics.

"We believe the Delaware North Park Services' proposal matches our desire to take another leap forward in providing visitors with a better understanding of NASA's mission," said Kennedy Space Center Director Jay Honeycutt. "By bringing together some of the world's leading experts in the various areas, we are confident Delaware North will be able to make this vision a reality while providing visitors of all ages with an exciting and interesting experience."

As a key feature of their proposal to NASA, Delaware North assembled a prestigious team of subcontractors which will each contribute a unique expertise to the redevelopment and enhancement of the Public Visitor Program, including the first major revamping of KSC's public tours in their 28-year history. The firm's subcontractors include Edwin Schlossberg Incorporated, Johnson Controls World Services, Coleman Research Corporation, and Robinson Lake Sawyer Miller.

The transformation of Spaceport USA into a high-tech, interactive experience in which visitors participate as "citizen explorers" or "citizen specialists" will take place over the next three years with an up front investment of $35 million by Delaware North. Another $4.2 million will be invested by the company in a major renovation of existing food service and retail facilities.

Decisions over the exact content of the principal attractions and visitor experiences which will be funded by the investment will be made jointly by NASA and Delaware North in the coming weeks as a detailed development plan is initiated to revitalize the telling of the NASA story at Spaceport USA and on the public bus tours of Kennedy Space Center and the Cape Canaveral Air Force Station.

Preliminary concepts suggest attractions such as a full-sized replica of Space Station

Alpha, to be located in a facility on the tour, and the possible enclosing of the rocket garden and new "early space program" attractions in a domed structure. Proposed concepts for Space Shuttle-related activities will provide visitors opportunities to assume the roles of ground processing personnel or astronauts in training. In addition to exploring a new array of exhibit and show presentations, visitors will be invited to select and perform a "mission" from one of NASA's five major program areas.

"We still have to work out the details of exactly what we're going to do such that our visitor program remains compatible with KSC's primary operational mission, but Spaceport USA is without question going to become a more exciting, higher impact experience which will communicate better than ever before an understanding of NASA and what it does," said Jim Ball, Chief of the KSC Visitor Center Branch.

Examples of the proposed new activities include a 360-degree theater fly-through of the solar system, a simulated Space Shuttle landing at Kennedy Space Center, exploring environmental issues using data acquired during NASA and international space missions, and attending a mission briefing for astronauts about to embark a trip to Mars.

"A key objective will be making sure that people who visit Kennedy Space Center leave with a better understanding of what the workforce here does for a living, and how it impacts the everyday lives of both our U.S. and international guests," said Ball.

In addition to the major improvements to be funded by Delaware North, the company will manage the construction and opening of the new $35 million Apollo-Saturn V Center attraction which is scheduled to begin construction in May.

A major revamping of the public tours will be put into effect when the new facilities are available. Operational concepts include a broader range of tour options, and unlimited time for visitors to stay at facilities like the Apollo Saturn V Center.

The 10-year agreement is valued at an estimated $600 million based on Delaware North projections. NASA has an option to extend the agreement for an additional five years.

April 24, 1995

KSC Release No. 37-95

NASA EMPLOYEES CAN BRING DAUGHTERS TO WORK ON APRIL 27

NASA employees at Kennedy Space Center will have an opportunity April 27 to share their working world with their daughters.

The second annual "Take Our Daughters to Work" day is part of a public education program nationwide to break down gender and racial barriers and show young women career options available to them. The first event at KSC in 1994 was a great success, with more than 400 daughters of civil service employees participating. Many KSC contractors sponsor similar programs as well.

The day will begin at Spaceport USA, where each daughter will receive a badge, similar to the typical KSC employee. Morning activities include a welcome from Deputy Center Director Gene Thomas, videos, presentations by female engineers, an educational session on spaceflight and a group photo in the Rocket Garden. After lunch, daughters and their escorts will disperse to work sites on-center.

Some controlled areas on center will not be accessible for this event because of the hazardous nature of the work performed inside.

Sons of NASA employees will get their chance to visit the workplace during a "Take Our Sons to Work" day in June.

NOTE TO EDITORS:

News media representatives wishing to cover the event should contact the News Center to coordinate photo opportunity times.

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May 3, 1995

KSC Release No. 39-95

COCOA, FLA. FIRM AWARDED CONTRACT FOR CONSTRUCTION OF APOLLO/SATURN V CENTER

W&J Construction Corp., Cocoa, Fla., KSC's 1994 Small Business Contractor of the Year, has been awarded a $17 million sub-contract to build the 99,000 square-foot Apollo/Saturn V Center at Kennedy Space Center. This will be a major new facility on the KSC public tour and is designed to preserve an original Saturn V vehicle, a Lunar Lander, and other major artifacts from the Apollo/Saturn era. Exhibits and shows will include a realistic re-creation of an Apollo firing room, a lunar landing and Apollo's return home.

The contract for construction was awarded by former concessioner TW Recreational Services, Inc. and has been transitioned to the new Spaceport USA concessioner, Delaware North Park Services of Spaceport, Inc. Construction management will be handled by Morris Architects throughout the construction phase.

No appropriated funds will be used in connection with the Apollo/Saturn V Center. Funding for this project will be provided by Spaceport USA bus tour ticket surcharges and from state arranged funding under an interagency agreement between KSC and the Spaceport Florida Authority (SFA) and South Trust Bank of Alabama. Under the arrangement, SFA will provide the financing and own the building under a NASA-granted Use Permit until such time as the outstanding project debt is fully paid.

The Apollo/Saturn V Center will be located at the northern end of the existing Banana Creek launch viewing site in the Launch Complex 39 area. Visitors to the Center will enjoy a historical perspective of the significance of the manned lunar program. It is anticipated that construction will be complete and the facility open to the general public in late 1996.

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May 5, 1995

KSC Release No. 40-95

GOES-J/ATLAS CENTAUR 77 REACH MILESTONES TOWARD LAUNCH

The GOES-J weather satellite to be launched later this month aboard an Atlas I rocket will reach a milestone overnight tonight when it will be moved from the Astrotech payload processing facility in Titusville, Fla. to Pad B at Launch Complex 36. Tomorrow morning at 8:30 a.m. the satellite is scheduled to be hoisted into the Pad 36-B gantry and mated to the AC-77 rocket.

The Atlas I launch vehicle itself passed a milestone on May 3 when a Wet Dress Rehearsal (WDR) was successfully run. The WDR verifies the launch readiness of the vehicle, the launch support equipment at the pad and in the blockhouse, the countdown procedure, and the launch countdown operations of the Eastern Range. During this countdown test liquid hydrogen, liquid oxygen and RP-1 propellants are aboard the vehicle, verifying the structural integrity of the Atlas first stage and Centaur upper stage tanks.

The last major prelaunch milestone before actual countdown activities begin is the Combined Electrical Readiness Test, an integrated test between the GOES-J satellite and the AC-77 vehicle currently scheduled for May 9.

GOES-J is the second spacecraft to be launched in the new advanced series of geostationary weather satellites for the National Oceanic and Atmospheric Administration (NOAA). The spacecraft has the dual capability of providing pictures while performing atmospheric sounding at the same time.

The launch is scheduled for Friday, May 19 at the opening of a launch window which extends from 1:42 a.m. to 2:55 a.m. EDT.

The GOES-J satellite is built by Space Systems/LORAL of Palo Alto, Calif. NASA's Goddard Space Flight Center in Greenbelt, Md., is responsible for the GOES project management. The Kennedy Space Center is responsible for government oversight of the launch vehicle processing activities, integration of the GOES-J 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 Astronautics of Denver, Co., is under contract to Lewis Research Center to provide the Atlas I vehicle and associated launch services.

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May 11, 1995

KSC Release No. 41-95

LAUNCH OF GOES-J WEATHER SATELLITE SCHEDULED FOR MAY 19

The launch of the GOES-J weather satellite for NASA and NOAA aboard the AC-77 Atlas I rocket is scheduled for May 19 at the opening of a launch window which extends from 1:42 a.m. to 2:55 a.m. EDT. The liftoff will be from Pad B at Launch Complex 36 on Cape Canaveral Air Station.

NASA/NOAA MEDIA BRIEFINGS

A pair of briefings will be held in the NASA News Center auditorium on Thursday, May 18 beginning with the prelaunch news conference at 10:30 a.m. Participating in this event will be:

Floyd Curington, NASA Launch Manager, Kennedy Space Center
Pat Symons, NASA Launch Vehicle Manager, Lewis Research Center
Martin Davis, NASA Mission Director, Goddard Space Flight Center
Steven Kirkner, NOAA GOES Systems Acquisitions Manager
Joel Tumbiolo, Launch Weather Officer, USAF 45th Space Wing

Following immediately will be a NOAA briefing on GOES-J satellite applications and Doppler weather radar benefits for the nation. NOAA participants in this event will be:

Frederick Ostby, Director, National Severe Storms Forecast Center
Gary Davis, Director, Satellite Operations
James Purdom, Chief Regional and Mesoscale Meteorology
Steven Kirkner, GOES System Acquisition Manager

A post-launch news conference will be held on Cape Canaveral Air Station in the E&O building, Room 116 one hour after launch.

REMOTE TELEVISION INTERVIEW OPPORTUNITY

On L-1 day from 1:30 - 3:30 p.m., pre-scheduled remote television interviews will be conducted. Available for interviews are:

Frederick Ostby, Director, National Severe Storms Forecast Center
Jamison Hawkins, GOES Products Manager

The interviews will be carried on Spacenet 2, transponder 3, channel 5. The satellite is located at 69 degrees West. (This transponder is not NASA Television.) For information about scheduling a remote interview contact Stephanie Kenitzer of the National Weather Service Public Affairs Office at 301/713-0622.

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.

After spacecraft separation of GOES-J from the Centaur stage, media will convoy from Press Site 1 to the E&O Building for the post-launch news conference. Those not desiring to cover the post-launch briefing will be escorted back to Gate 1.

Media are not allowed to be unescorted on Cape Canaveral Air Station at any time.

ACCREDITATION

Those who wish to cover the launch of GOES-J and the associated prelaunch activities at the NASA News Center should send a letter of request on news organization letterhead which should 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-J Launch Accreditation
NASA PA-MSB
Kennedy Space Center, FL 32899

AC-77/GOES-J mission badges may be picked up at Gate 2 on State Road 3 on Merritt Island on May 18 between 8 and 10 a.m., or at Gate 1 on Cape Canaveral Air Station starting at 12:15 a.m. on May 19. Badges will not be issued from the KSC News Center.

An AC-77/GOES-J badge is required for all media covering the launch from Press Site 1 on launch day.

All foreign press should immediately request accreditation through the International Affairs Office at NASA Headquarters in Washington, D.C. Contact Debra Rahn at 202/358-1639.

REMOTE CAMERAS

On Thursday, May 18 at 2 p.m., a bus will depart the KSC 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.

KSC NEWS CENTER OVERNIGHT HOURS FOR LAUNCH

The NASA News Center at KSC will be open on May 19 starting at 12 midnight and remain open until one-half hour after launch.

NASA TV COVERAGE OF GOES-J

NASA Television will carry live the NASA AC-77/GOES-J prelaunch news conference on Thursday, May 18 starting at 10:30 a.m. The NOAA mission briefing will follow at 11 a.m.

On launch day, May 19, video programming will begin at 12 midnight. Launch commentary will begin at 12:15 a.m. and continue through spacecraft separation which occurs at 29 minutes after liftoff. The post-launch news conference will not be carried on NASA Television but audio of all AC-77/GOES-J media events will be on the NASA "V" circuits which may be accessed by dialing 407/867-1220...1240...1260.

NASA Television is available on Spacenet 2, transponder 5, channel 9 located at 69 degrees West.

STATUS REPORTS

Recorded daily status reports on the AC-77/GOES-J launch will be available on the KSC news media codaphone starting on May 15. The telephone number is 407/867-2525.

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May 9, 1995

KSC Release No. 42-95

BOARD APPOINTED TO INVESTIGATE HYPERGOLIC FIRE ON ENDEAVOUR

An investigation board has been named by Bob Sieck, Director of Shuttle Operations at KSC, to look into the circumstances surrounding the May 4, 1995 incident which caused a brief fire to occur on Endeavour's right hand orbital maneuvering system pod. The vehicle, located in Orbiter Processing Facility bay 1 and undergoing operations to prepare it for mission STS-69, is scheduled for launch in July 1995.

Chairman of the investigation board is Frank Buzzard, Space Shuttle Chief Engineer at Johnson Space Center. Board members include John Griffin, Chief, Propulsion Systems Branch, JSC; Frank Caldeiro, Mission Assurance Office, KSC; Grant Cates, NASA Vehicle Manager, KSC; Ralph Roe, Hypergolics and Hydraulics Branch Chief, KSC; and Bob Kowalski, Propulsion Test Office, White Sands Test Facility, N.M.

Ex-officio board members from KSC are Tracy Lee Crittenden, legal advisor; Brian Harris, administrative support; and Bruce Buckingham, public affairs advisor. William Higgins and Ronald Phelps have also been assigned to advise and assist with the board's investigation.

On May 4 at about 8 p.m., while technicians were working on disconnecting a thruster on Endeavour's right hand orbital maneuvering system (OMS) pod in Orbiter Processing Facility bay 1, a small hypergolic fire resulted which was rapidly extinguished. Technicians had disconnected the oxidizer (nitrogen tetroxide) line to OMS thruster R1A and were in the process of disconnecting the fuel (monomethylhydrazine) line when the fire erupted. The fire was extinguished by technicians who were in SCAPE suits and no injuries were reported. Only minor damage to the vehicle was evident. The pod will be removed and replaced prior to flight for extensive analysis.

Board functions include: investigating the facts surrounding the incident, determination of its probable cause, assessments of the possibility of a recurrence, and recommendations of corrective actions. A final report is expected by the end of May.

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May 15, 1995

KSC Release No. 44-95

NOTE TO EDITORS/NEWS DIRECTORS:

TCDT MEDIA OPPORTUNITY WITH STS-70 CREW SET FOR THIS WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-70 this week during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

The five-member crew is scheduled to arrive at KSC's Shuttle Landing Facility on Wednesday, May 17, at about 9:30 a.m. Media interested in viewing crew arrival should be at the Press Site by 8:30 a.m. Wednesday.

Another opportunity for media to photograph and speak with the crew will be on Thursday, May 18 during an informal question and answer session at Pad 39-B. News media should be at the KSC Press Site by 12 noon for transport to the pad. This event will be carried live on NASA TV.

Media interested in covering these events should contact the KSC Press Site to obtain the proper badge. Annual badges will be activated for these events.

On Friday, the crew will board the Shuttle Discovery at about 8:15 a.m. and remain there through the end of the test. The mock countdown culminates with a simulated main engine cutoff at about 11 a.m. Friday.

Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Discovery is currently targeted for launch on June 8, on an eight-day mission to deploy the TDRS communications satellite. NASA managers will set the official launch date for mission STS-70 during the Flight Readiness Review scheduled to be held at KSC on May 26.

Mission STS-70 also represents the 100th manned space flight of U.S. vehicles launched from Kennedy Space Center and Cape Canaveral.

Crew members for mission STS-70 are: CommanderTom Henricks; Pilot Kevin Kregel; and Mission Specialists Nancy Currie, Donald Thomas and Mary Ellen Weber.

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May 17, 1995

KSC Release No. 45-95

NOTE TO EDITORS/NEWS DIRECTORS:

HYPERGOLIC FIRE INVESTIGATION BOARD TO MAKE INTERIM REPORT

An investigation board, named to look into circumstances surrounding the May 4, 1995 incident which caused a brief fire on Endeavour's right-hand orbital maneuvering system pod, will make an interim report of their findings to the media.

The informal news conference will be held in the KSC Press Site auditorium at 10:30 a.m. on May 19.

The board, chaired by Frank Buzzard, Space Shuttle chief engineer at Johnson Space Center, has been meeting at Kennedy Space Center since being appointed by Bob Sieck, director of Shuttle Operations at KSC, soon after the incident.

The board was charged with the following directives: investigate the facts surrounding the incident, determine its probable cause, assess the possibility of a recurrence, and make recommendations for corrective actions.

A final report is expected to be issued by the end of the month.

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May 19, 1995

KSC Release No. 46-95

NOTE TO EDITORS/NEWS DIRECTORS:

TCDT MEDIA OPPORTUNITY WITH STS-71 CREW SET FOR NEXT WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-71 next week during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

The seven-member crew is scheduled to arrive at KSC's Shuttle Landing Facility on Monday, May 22, at about 5:30 p.m. Media interested in viewing crew arrival should be at the KSC Press Site by 4:30 p.m. Monday.

Another opportunity for media to photograph and speak with the crew will be on Wednesday, May 24, during an informal question and answer session at Pad 39-A. News media should be at the KSC Press Site by 2:45 p.m. for transport to the pad. This event will be carried live on NASA TV.

On Thursday, the crew will depart their quarters at about 7:45 a.m. Media who wish to view the crew walk-out should be at the Press Site by 6:45 a.m. The crew will then board the Shuttle Atlantis at about 8:15 a.m. and remain there through the end of the test. The mock countdown culminates with a simulated main engine cut-off at about 11 a.m. Thursday

Media interested in covering these events should contact the KSC Press Site to obtain the proper badge. Annual badges will be activated for these events.

Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Atlantis is currently targeted for launch no earlier than June 22 on an 11-day mission to dock with Russia's Mir space station. NASA managers will set the official launch date for mission STS-71 during the Flight Readiness Review scheduled to be held at KSC on June 2.

Crew members for mission STS-71 are: Commander Bob "Hoot" Gibson; Pilot Charles Precourt; Mission Specialists Ellen Baker, Greg Harbaugh and Bonnie Dunbar; and Cosmonauts Anatoly Solovyev and Nikolai Budarin.

Solovyev and Budarin will remain on Mir following the Atlantis docking. Returning from Mir back to Kennedy Space Center on Atlantis will be the Mir 18 crew, currently in Earth orbit. The Mir 18 crew members are: Astronaut Norm Thagard and Cosmonauts Vladimir Dezhurov and Gennady Strekalov.

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May 31, 1995

KSC Release No. 47-95

XTE SATELLITE ARRIVES AT KSC TO BEGIN LAUNCH PREPARATIONS

NASA's X-ray Timing Explorer (XTE) to be launched aboard a Delta II rocket late this summer arrived today at the Skid Strip on Cape Canaveral Air Station aboard a C-5 military transport jet. The spacecraft was shipped from NASA's Goddard Space Flight Center in Greenbelt, Md.

The purpose of the XTE satellite is to gather data with its three instruments about X-ray emitting objects within our Milky Way Galaxy and beyond. The spacecraft will provide information on the nature, energy source and evolution of X-ray sources such as white dwarfs, neutron stars and black holes.

The 6,700-pound XTE is being transported today to NASA Spacecraft Checkout Hangar AO on Cape Canaveral Air Station to begin approximately two months of activities. This will include completion of payload element integration, functional tests, spacecraft cleaning, installation of pyrotechnics and activation of the spacecraft batteries. In mid-August XTE will be transported to Pad A at Complex 17 for mating to the Delta II rocket.

Delta/XTE is currently scheduled for launch on Aug. 31, however, due to launch vehicle availability this date is under review.

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KSC Release No. 48-95

STS-71
Atlantis/First Shuttle-Mir Docking Mission

The first of seven scheduled docking missions between the U.S. Space Shuttle and the Russian Mir space station will take place during the 11-day STS-71 mission. The Space Shuttle Atlantis, fitted with the U.S.-and-Russian-built Orbiter Docking System (ODS) and the Spacelab module, will lift off from Launch Pad 39A and then rendezvous with Mir at an altitude of 213 nautical miles and an inclination of 51.6 degrees. Docking is expected to take place on Flight Day 3.

Within hours after docking, the two Russian cosmonauts who flew into orbit as STS-71 crew members, Anatoly Solovyev and Nikolai Budarin, will transfer into the Mir to assume command as the Mir 19 crew while the Mir 18 crew will move aboard Atlantis. During the four-day docking operations, hardware and supplies will be transferred to the space station, while medical samples taken during the Mir 18 mission will be stored in refrigerator-freezer units aboard Atlantis. The Mir 18 crew onboard the orbiter will be the subjects of medical investigations that are a part of the Shuttle-Mir Medical Project designed to collect data on the human body's adaptation to long- duration space flight.

The two spacecraft will undock on Flight Day 8. Atlantis will then perform a Mir flyaround and maneuver away into a different orbit. The medical experiments will continue through Flight Day 10.

Dr. Norman E. Thagard (M.D.), who has been aboard the Mir since March. 16, 1995, will have been in space longer than any other U. S. astronaut as of June 6, breaking the Skylab 4 crew record of 84 days set in 1973. He and the two Russian members of the Mir 18 crew, Vladimir Dezhurov and Gennady Strekalov, will be the first Mir crew to return to Earth via the Space Shuttle. The three, along with five STS-71 crew members, will make up the largest contingent of spacefarers ever to land via the Shuttle. The two Mir crews, along with the five U.S. astronauts, will set the record at ten as the most people who have flown in an orbiter during a mission.

The STS-71/Mir 19 Crew

Commander of the STS-71 flight crew is Robert L. (Hoot) Gibson (Captain, USN, who will be on his fifth space flight, having flown on STS 41-B in 1984, STS 61-C in 1986, STS-27 in 1988 and STS-47 in 1992. Charles J. Precourt (Lt. Col., USAF) is the STS-71 pilot. He has flown once before, as a mission specialist on STS-55 in 1993. Mission specialist Ellen S. Baker (M.D.) has flown on STS-34 in 1989 and STS-50 in 1992. Gregory J. Harbaugh is also on his third flight as a mission specialist, having flown on STS-39 in 1991 and STS-54 in 1993. Mission specialist Bonnie J. Dunbar (Ph.D.) is a veteran of three space flights, STS 61-A in 1985, STS-32 in 1990 and STS-50 in 1992. She also trained in Russia as Thagard's backup.

Mir 19 commander Anatoly Solovyev and flight engineer Nikolai Budarin make up the first Mir flight crew to be delivered to the Russian space station via the Space Shuttle. This will be Solovyev's fourth Mir mission. He has been in space for a total of 377 days. This will be Budarin's first space flight.

Orbiter Docking System

The ODS in Atlantis' payload bay will not only allow the orbiter and the Mir to dock, but is connected to the orbiter airlock by a short tunnel to provide a means for both U.S. and Russian crews to move in a shirt-sleeve environment from one spacecraft to another. The 3,500-pound (1,640 kilogram) ODS consists of an airlock, a supporting truss structure, a docking base and the Russian-built Androgynous Peripheral Docking System (APDS) atop the 131/2 -(4.2-meter)foot-high structure.

The APDS features a capture ring containing three

petals that are each equipped with two capture latches. These latch assemblies are designed to grapple body mounts on the Mir APDS attached to the docking port of the space station's Krystall module. The latches will engage once the capture rings on both APDS units are properly aligned. The Shuttle APDS is mounted on shock absorbers to reduce the relative motion of the two spacecraft and to prevent a collision. Once the capture is complete, motors on this APDS will move its capture ring to its fully extended position.

Mission Control and Docking Operations

The Shuttle-Mir docking missions are the first elements of a three-phase plan for human space cooperation between the U.S. and Russia that will culminate in the completion of an international space station. Flight control during docking operations will be provided by both NASA's Mission Control Center at Johnson Space Center, Houston, Texas, and the Russian Space Agency's Mission Control Center in Kaliningrad, Moscow. The two centers will share all communications links throughout this phase of the STS-71 mission.

As Atlantis begins its docking approach, the STS-71 crew will communicate directly with the Mir 18 crew with a new VHF radio that has an antenna located in the orbiter's payload bay. Another docking aid will be a television camera mounted on the ODS that will be directed at the docking target on the Krystall docking port. This camera will provide an image to a monitor on the flight deck that will be used by Gibson and Precourt as they make the final approach. The two will also be using a laser-ranging device mounted in the payload bay that will tell them the orbiter's exact distance to the Mir docking port and its precise rate of approach.

Unlike the velocity bar, or "V-bar", final approach from the side which was conducted by the STS-63 crew in February 1995, Atlantis will come up from below in a course that follows an imaginary line from the Earth's center to the Mir known as a radial bar, or "R-bar". When the orbiter is 30 feet away, Gibson will halt the approach and stationkeep for five minutes until a final "go" is given by the joint mission control. Then he will direct Atlantis upward at a rate of less than one foot per second until the orbiter APDS completes a capture of the Mir APDS and docking is complete.

Spacelab-Mir

The Spacelab-Mir module in Atlantis' payload bay is connected with the ODS by a Spacelab long transfer tunnel. It will serve as both a storage area for Mir 19 crew hardware and supplies that will be transferred to the space station and as an on-orbit life sciences laboratory for the Shuttle-Mir Medical Project investigations conducted by the Mir 18 and STS-71 flight crews. The module will also house two refrigerator/freezers that will preserve medical samples from these experiments and those taken by Dr. Thagard during the Mir 18 mission. Some of the equipment mounted in the module for the experiments include a bicycle ergometer, a treadmill and an echocardiograph/Baroreflex unit.

Shuttle-Mir Experiments

Many of the 28 Shuttle-Mir experiments will study metabolic physiology with emphasis in the areas of cardiopulmonary systems, human behavior and performance, environmental health and neurosensory functions. One biology experiment will use quail eggs to help understand how organisms develop in space. The Greenhouse experiment calls for Mir 18 crew members to harvest plants they grew during the Mir mission and transfer them to Atlantis so that these samples can be studied on Earth for the effects of long exposure to microgravity. Two microgravity experiments will study the growth of semiconductor materials and protein crystals in space.

Other Payloads

An IMAX 70-millimeter motion picture camera will be housed in the crew cabin middeck locker area for use during docking operations, on board the Mir, and in the Spacelab-Mir module. The Shuttle Amateur Radio Experiment-II (SAREX-II) will also be stowed in this area for use by the crew throughout the mission.

KSC Processing

Atlantis returned to KSC on Nov. 22, 1994 after completing the STS-66 mission with a landing in California. It was then moved to Orbiter Processing Facility 3 for preparation for the STS-71 mission. The ODS arrived at the center on Nov. 25. Installation of the ODS and Spacelab into Atlantis' payload bay was completed March 22, 1995. The Shuttle was rolled out to Pad 39A April 26 in preparation for liftoff in late June.

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May 26, 1995

KSC Release No. 49-95

NASA SETS JUNE 8 AS LAUNCH DATE FOR 100TH HUMAN SPACE MISSION

NASA managers today set June 8, 1995 as the official launch date for Space Shuttle Discovery on the STS-70 mission. The STS-70 mission achieves a unique milestone in the history of the American space program as it will mark the 100th human space mission flown by the United States since Alan B. Shepherd's historic 15 minute suborbital flight into space in 1961. The primary objective of the STS-70 mission is the deployment of the Tracking and Data Relay Satellite-G, the last in a series of a space-based satellite network that provides communication, tracking, telemetry, data acquisition and command services essential to Shuttle and low-Earth orbital spacecraft missions.

Discovery and the STS-70 crew are scheduled to be launched into a 160-mile circular orbit during a two hour 30 minute window which opens at 9:26 a.m. EDT on June 8. The mission is scheduled for seven days, 22 hours and 10 minutes but Shuttle officials may shorten the flight to five days depending on when the mission actually begins so that the next Shuttle mission - a historic link up with the Russian space station Mir - can be launched on or about June 22. An on-time STS-70 launch and full eight day mission would result in a June 16 landing at the Kennedy Space Center at 7:36 a.m. EDT.

Aboard Discovery will be a five-person crew commanded by two-time Shuttle pilot Terence "Tom" Henricks, pilot Kevin Kregel and mission specialists Donald Thomas (second flight), Nancy Curie (second flight) and Mary Ellen Weber. This will be Kregel and Weber's maiden space voyage.

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June 6, 1995

KSC Release No. 51-95

RUSSIAN DOCKING MODULE TO ARRIVE WEDNESDAY AT KSC ABOARD AEROFLOT AIR CARGO PLANE

The primary payload for Space Shuttle mission STS-74, the Russian Docking Module, is scheduled to arrive at the Kennedy Space Center on Wednesday, June 7 at 11 a.m. The Russian Docking Module will be attached to the MIR Space Station as an orbiter interface for the remaining six Space Shuttle rendezvous flights after STS-71. This will be the first payload to be prepared for launch in Kennedy Space Center's new Space Station Processing Facility (SSPF).

The Russian Docking Module and a pair of solar arrays for the MIR space station will arrive at the KSC Shuttle Landing Facility aboard an Aeroflot Antonov-124 aircraft, a Russian air cargo plane. It is approximately equivalent in size to an Air Force C-5. News media wishing to observe the arrival of the AN-124 aircraft at the SLF should be at the KSC News Center at 10 a.m. on Wednesday.

Approximately 50 Russian personnel will be at KSC over the next several months for the final assembly and testing of the Russian Docking Module. In late August the module will be turned over to the STS-74 payload test team at Kennedy Space Center and transferred to the Operations and Checkout Building. There it will undergo a series of tests verifying its readiness and compatibility with the Space Shuttle Atlantis. The Russian Docking Module will be installed into the payload bay of Atlantis at the orbiter processing facility the first week of September and integrated orbiter/payload testing will follow.

Launch of STS-74 with Atlantis and the Russian Docking Module is currently scheduled for late October.

News media representatives covering the arrival of the Russian Docking Module aboard the AN-124 aircraft may wish to call the KSC News Center early Wednesday morning to assure that the arrival time has not changed.

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June 15, 1995

KSC Release No. 53-95

KSC'S DR. IRENE LONG HONORED BY SOCIETY OF NASA FLIGHT SURGEONS

Dr. Irene Duhart Long has been awarded the president's special award by the Society of NASA Flight Surgeons.

The award recognizes Long's "superior contributions to aerospace medicine as a physician, a NASA flight surgeon, a certified specialist in aerospace medicine, as director of the Biomedical Operations and Research Office at the Kennedy Space Center and as an outstanding role model for those who will follow her," said Dr. Fred Kelly, president of the society.

In making the presentation May 10 at the organization's annual meeting in Anaheim, Calif., Kelly said he had no trouble deciding who the special honor would be awarded to.

"I've watched Dr. Long's progress through the years, and I'm extremely proud of her accomplishments over some rather severe obstacles," he said.

Long said the award holds special significance for her because of the caliber of previous recipients.

"I am very honored to be added to the list of previous winners," she said.

This list includes Sally Ride, Guion Bluford, Dr. Ashton Graybiel and Dr. Bill Thorton. Among the previous KSC recipients are Dr. David Tipton, chief of the Medical and Environmental Health Office, and Dr. Stanley White and Dr. Daniel Woodard of the Bionetics Corporation.

Long was named director of the Biomedical Office last July after serving as acting director since January. Previously she served as chief of the Medical and Environmental Health Office.

She is a graduate of Northwestern University in Evanston, Ill., and studied medicine at the St. Louis University School of Medicine, earning her medical degree in 1977. She completed two years of a general surgery residency at the Cleveland Clinic and the Mount Sinai Hospital of Cleveland.

Long went on to complete another residency and also earned a degree in aerospace medicine from Wright State University School of Medicine, Dayton, Ohio. Long lives in Merritt Island, Fl.

The Society of NASA Flight Surgeons was established as an affiliate of the Aerospace Medical Association in May, 1978 and is dedicated to the advancement of the science and practice of medicine in the space environment in order that all people may extend their useful role in the exploration of space.

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June 26, 1995

KSC Release No. 54-95

KSC SMALL BUSINESS COUNCIL TO HOST OPEN HOUSE

An open house for local area businesses will be part of a celebration for the first anniversary of the Central Industry Assistance Office (CIAO) at Kennedy Space Center. The event is being sponsored by the KSC Small Business Council and will be held on Thursday, June 29.

"The CIAO provides a unique service to private industry," said Ann Watson, KSC's Small Business Specialist.

Companies looking for business opportunities at KSC can meet with representatives from NASA and their major contractors under one roof, at one time. Since the CIAO opened in March 1994, the staff has counseled over 250 firms. Of those, 79 are now doing business with KSC.

Local firms are encouraged to attend the open house from 10 a.m. - 3:30 p.m. KSC representatives will counsel interested firms on how the industry assistance process can help focus a firm's marketing efforts at KSC. The NASA Technology Transfer Office will also be present to discuss technological partnerships between NASA and private industry. Refreshments will be available throughout the afternoon.

The KSC Central Industry Assistance Office is located at Gate 2 on North State Road 3, Merritt Island. Local business firms or news media who wish more information should call (407) 867-7353.

For news media representatives, the opening ceremony will be held at 8:30 a.m. on Thursday and the press is invited to attend. For information on interview opportunities with the participants, contact Joel Wells at 407/867-7353.

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June 19, 1995

KSC Release No. 55-95

SPACE SHUTTLE MISSION STS-71 LAUNCH COUNTDOWN TO BEGIN JUNE 20

NASA will begin the countdown for the 100th U.S. human space launch on Tuesday, June 20 at 9:30 a.m. The countdown for the launch of Space Shuttle Atlantis on mission STS-71 is scheduled to begin that day 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 36 hours and 39 minutes of built-in hold time leading to the opening of the launch window at about 5:08.37 p.m. (EDT) on June 23. The launch window extends for only seven 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 seven minute window necessary to rendezvous and dock with Mir, several changes have been made to the standard launch countdown. Most significant is the addition of an extra 30 minutes added to the normal 10 minute built-in hold at T-9 minutes. Also, tanking is scheduled to begin about 30 minutes earlier than usually.

The launch of Atlantis will mark the beginning of the first mission to dock with Russia's space station Mir. A rendezvous with the space station occurred earlier this year on mission STS-63.

STS-71 is the third mission scheduled for 1995. This will be the 15th flight of the Shuttle Atlantis and the 69th flight overall in NASA's Space Shuttle program.

Launch of Atlantis in June will mark a historic milestone in U.S. spaceflight endeavors as the 100th U.S. human space launch, dating back to Alan B. Shepard's first historic 15-minute sub-orbital flight 34 years ago.

Atlantis was rolled out of Orbiter Processing Facility bay 2 on April 20 and 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 26. Atlantis last flew in November 1994.

Atlantis will carry into orbit a seven member crew consisting of five U.S. astronauts and two Russian Cosmonauts, which are designated the Mir 19 crew. The two Mir crewmen will remain on the Russian Space Station changing places with the Mir 18 crew who will return to Earth aboard Atlantis. The Mir 18 crew, which includes astronaut Norm Thagard, have been aboard Mir since March 16.

The STS-71 crew are: Commander Robert (Hoot) Gibson, Pilot Charles Precourt, and Mission Specialists Ellen Baker, Greg Harbaugh and Bonnie Dunbar and Mir 19 crew cosmonauts Anatoly Solovyev and Nikolai Budarin. Members of the Mir 18 crew are: astronaut Norm Thagard and cosmonauts Vladimir Dezhurov and Gennady Strekalov.

The STS-71 crew are scheduled to arrive at KSC at about 4:30 p.m. Tuesday, June 20. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(The countdown will target launch for 5:09 p.m. The exact launch time will be adjusted at the T-9 minute hold.)

COUNTDOWN MILESTONES

*all times are Eastern

Launch - 3 Days (Tuesday, June 20)

Prepare for the start of the STS-71 launch countdown
Perform the call-to-stations at the T-43 hour mark (9 a.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 9:30 a.m.
Start preparations for servicing fuel cell storage tanks
Begin final vehicle and facility close-outs for launch

Launch - 2 Days (Wednesday, June 21)

Enter first planned built-in hold at T-27 hours for duration of four hours (1:30 a.m.)
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
Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (5:30 a.m.)

Clear launch pad of all personnel
Begin the 5 hour operation to load cryogenic reactants into Atlantis' fuel cell storage tanks

Enter eight-hour built-in hold at T-19 hours (1:30 p.m.)

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

Resume countdown (9:30 p.m.)

Start final preparations of the Shuttle's three main engines for main propellant tanking and flight

Launch - 1 Day (Thursday, June 22)

Activate 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 19 hours, 49 minutes (5:30 a.m.)

Perform orbiter ascent switch list in crew cabin
Install film in numerous cameras on the launch pad
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 at about 8:30 p.m.
Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Launch Day (Friday, June 23)

Resume countdown (1:19 a.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 (6:19 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 7:45 a.m.)

Resume countdown (8:19 a.m.)

Perform inertial measurement unit preflight calibration
Align Merritt Island Launch Area (MILA) tracking antennas
Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 10:45 a.m.)
Perform open loop test with Eastern Range
Conduct gimbal profile checks of orbital maneuvering system engines

Enter two-hour hold at T-3 hours (11:19 a.m.)

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

Resume countdown at T-3 hours (1:19 p.m.)

Crew departs Operations and Checkout Building for the pad (about 1:24 p.m.)
Complete close-out preparations in the white room
Check cockpit switch configurations
Flight crew begins entry into the orbiter (about 1:54 p.m.)
Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
Close Atlantis' crew hatch
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 (3:59 p.m.)

NASA Test Director conducts final launch team briefings

Resume countdown (4:09 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 40-minute hold at T-9 minutes (4:20 p.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.)

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

Resume countdown at T-9 minutes (5 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 MPS 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-71

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	1:30 a.m. Wed.	5:30 a.m. Wed.
T-19 hours	8 hours	1:30 p.m. Wed.	9:30 p.m. Wed.
T-11 hours	19 hours,49 minutes	5:30 a.m. Thurs.	1:19 a.m. Fri.

T-6 hours	2 hours	6:19 a.m. Fri.	8:19 a.m. Fri.
T-3 hours	2 hours	11:19 a.m. Fri.	1:19 p.m. Fri.
T-20	10 minutes	3:59 p.m. Fri.	4:09 p.m. Fri.
T-9 minutes	40 minutes	4:20 p.m. Fri.	5:00 p.m. Fri.

CREW FOR MISSION STS-71

Commander (CDR): Robert "Hoot" Gibson
Pilot (PLT): Charles Precourt
Mission Specialist (MS3): Ellen Baker
Mission Specialist (MS1): Greg Harbaugh
Mission Specialist (MS2): Bonnie Dunbar
Mir 19 Commander: Anatoly Solovyev (MS4 - Ascent only)
Mir 19 Flight engineer: Nikolai Budarin (MS5 - Ascent only)
Mir 18 Commander: Vladimir Dezhurov (Entry only)
Mir 18 Flight engineer: Gennady Strekalov (Entry only)
Mir 18 Cosmonaut-Researcher: Norm Thagard (Entry only)

SUMMARY OF STS-71 LAUNCH DAY CREW ACTIVITIES

Friday, June 23

5:09 a.m.	Wake up
5:45 a.m.	Breakfast
11:30 a.m.	Dinner and crew photo
12:14 p.m.	Weather briefing (CDR, PLT, MS2)
12:14 p.m.	Don flight equipment (MS1, MS3, MS4, MS5)
12:24 p.m.	Don flight equipment (CDR, PLT, MS2)
12:54 p.m.	Depart for launch pad 39A
1:24 p.m.	Arrive at white room and begin ingress
3:09 p.m.	Close crew hatch
5:09 p.m.	Launch

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GO TO THE JUNE 23 MEDIA ADVISORY

GO TO THE JUNE 26 NOTE TO EDITORS

GO TO THE JULY 6 NOTICE TO EDITORS

June 19, 1995

KSC Release No. 56-95

NOTICE TO EDITORS/ NEWS DIRECTORS:

EVENTS, KSC NEWS CENTER HOURS OF OPERATION SET FOR SPACE SHUTTLE MISSION STS-71

News conferences and operating hours for KSC's News Center have been set for the upcoming launch of the Space Shuttle Atlantis on Mission STS-71. All events, except where noted, are scheduled to be carried live on NASA TV (please refer to the STS-71 mission TV schedule for exact times).

On Tuesday, June 20, at 9:30 a.m. EDT, the launch countdown will begin at the T-43-hour mark. Launch is set for about 5:09 p.m. EDT on Friday, June 23. The launch window is seven minutes long.

The seven crew members who will be launched aboard Atlantis are scheduled to arrive at KSC on Tuesday, June 20, at about 4:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 3:30 p.m. Tuesday (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 KSC News Center at 867-2468 to make arrangements.

On June 20 and 21, news media representatives can discuss details of the launch countdown with NASA test directors and payload managers during status briefings at the KSC News Center. These briefings are set for 9 a.m. each day. Please refer to the STS-71 briefing schedule for participants names and other events.

-- End of general release --

STS-71 BRIEFING SCHEDULE
(all times are in EDT)
(all briefings are live on NASA TV except where noted)

L-3 Days - Tuesday, June 20

Countdown Status Briefing----------9:00 a.m.
· Bill Dowdell, Shuttle Test Director
· Scott Higginbotham, STS-71 Payload Manager

STS-71 fight crew arrival----------4:30 p.m.

L-2 Days - Wednesday, June 21

Countdown Status Briefing----------9:00 a.m.
· John Guidi, NASA Test Director
· Scott Higginbotham, STS-71 Payload Manager
· Ed Priselac, Shuttle Weather Officer

L-1 Day - Thursday, June 22

Pre-launch News Conference----------10:00 a.m.
· Tommy W. Holloway, Director, Phase One Program, NASA JSC
· Valeriy Ryumin, Vice-President, Phase One, RSC Energia
· Arnauld E. Nicogossian, M.D., Deputy Assoc. Admin., Office of Life and Microgravity Sciences and Applications, NASA HQ

· Brewster Shaw, Space Shuttle Program Director, JSC
· Bob Sieck, Director, Shuttle Operations, KSC
· Capt. David Biggar, KSC Staff Weather Liaison

Replay of STS-71 crew and mission briefings----------11:00 a.m.

Launch Day - Friday, June 23

NASA TV live launch programming and commentary begins------11:30 a.m.

Post-launch press conference----------Launch + 1 hour
· Loren Shriver, manager of Launch Integration for the Space Shuttle Program, KSC
· James Harrington, KSC Launch Director

(End of STS-71 briefing schedule)

KSC News Center office hours for STS-71
(hours subject to change pending in-flight events)

Launch minus 3 days	Tuesday, June 20	8 a.m. - 4:30 p.m.
Launch minus 2 days	Wednesday, June 21	7 a.m. - 4:30 p.m.
Launch minus 1 day	Thursday, June 22	7 a.m. - 12 midnight
LAUNCH DAY, Flight day 1	Friday, June 23	7 a.m. - 12 midnight
Flight days 2-3	Sat.-Sun., June 24-25	CLOSED
Flight days 4-8	Mon.-Fri., June 26-30	8 a.m. - 4:30 p.m.
Flight day 9	Sat. July 1	TBD (Undocking)
Flight day 10	Sun. July 2	CLOSED
Flight day 11	Monday, July 3	8 a.m. - 4:30 p.m.
Landing day, Flight day 12	Tuesday, July 4	8 a.m. - 7 p.m.

Appropriately accredited news media representatives may obtain STS-71 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

L-3 days	Tuesday, June 20	8 a.m. - 4:30 p.m.
L-2 days	Wednesday, June 21	8 a.m. - 4:30 p.m.
L-1 day	Thursday, June 22	8 a.m. - 8 p.m.
Launch day	Friday, June 23	8 a.m. - 4 p.m.

NOTE: 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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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June 19, 1995

KSC Release No. 57-95

PLAYALINDA BEACH CLOSED; WILL REOPEN THE DAY AFTER SPACE SHUTTLE LAUNCH

Playalinda Beach will closed to the public on Tuesday, June 20, due to the planned launch of the Space Shuttle Atlantis on Mission STS-71. Given a successful launch on Friday, June 23, the beach will reopen to the public at 6 a.m. the following day.

Launch of Atlantis is set for 5:09 p.m. EDT on Friday. The countdown leading to the 69th Space Shuttle flight begins at 9:30 a.m. Tuesday, June 20. Safety and security concerns require that Playalinda Beach be closed to the public throughout the majority of a Space Shuttle launch countdown.

Beachgoers wishing additional information on Playalinda Beach or the Canaveral National Seashore may call the National Park Service at 407/867-2805.

Other Canaveral National Seashore beaches, such as Apollo Beach, will not be affected by the referenced closing and will remain open during Atlantis' launch. Access to these beaches is through New Smyrna Beach.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

June 20, 1995
KSC Contact: Bruce Buckingham
KSC Release No. 58-95

AIRSPACE, BRIDGES AND WATERWAY RESTRICTIONS IN EFFECT FOR ALL SPACE SHUTTLE LAUNCHES

A number of restrictions are placed in effect around the Kennedy Space Center (KSC) during the hours immediately preceding and following the launch of a Space Shuttle.

Listed and described below are restrictions that apply to pilots, motor vehicle operators and boaters utilizing airspace, bridges and waterways that lead to KSC.

KSC AREA AVIATION RESTRICTIONS

The airspace immediately above and around KSC will be limited to official aircraft only and will be off-limits to general aviation pilots prior to and during the launch of a Space Shuttle.

NOTAMS must be checked by pilots prior to flights near the KSC area. Pilots are warned that violations of KSC's restricted airspace may likely result in serious penalties, including the suspension or revocation of pilot privileges.

Official aircraft supporting the launch will be in the air. Private pilots must be aware that wandering into a restricted area is not only forbidden, but that it also creates a safety hazard to support aircraft and the errant pilot.

Anyone wishing to view the launch from the air below 11,000 feet should stay west of the Indian River. Above 11,000 feet, pilots should stay west of the St. Johns River. Pilots are advised that the airspace in the KSC vicinity is expected to be congested with both controlled and uncontrolled aircraft.

Pilots should also be aware of the Solid Rocket Booster (SRB) exhaust cloud that occurs after launch. They should stay at least five miles away from the cloud, even if it drifts out of the restricted area. Research aircraft will be flying into and around the cloud, and visibility will be limited.

Generally, the airspace restrictions cover a variety of air ranges. In addition to the usual KSC and Cape Canaveral Air Station airspace restrictions, the upcoming launch requires that all private aircraft stay out of an area roughly bounded by the west side of the Indian River to the west, the Trident Basin (Port Canaveral) to the south, Haulover Canal to the north and 30 miles seaward to the east. These restrictions are "surface to unlimited." Launch-specific restrictions begin three hours prior to the planned launch time.

Pilots should consult the most recent editions of the Jacksonville Sectional Aeronautical Chart and the Airman's Information Manual. In addition, they should contact the St. Petersburg Flight Service Station at 1-800-992-7433. (1-800-WX-BRIEF). Advisories will be available from the Patrick Approach Control (VHF 134.95 megahertz), Space Center Executive Airport Tower (VHF 118.9 megahertz) or the NASA Tower (128.55 megahertz).

Pilots should also refer to the current Patrick Air Force Base news release concerning restricted airspace.

BRIDGES CONTROLLED FOR LAUNCH

The opening and closing of bridges over waterways surrounding KSC will be strictly controlled during the hours immediately before and after the launch period for each Space Shuttle mission.

Bridges affected by the launch include:

- Canaveral Harbor Barge Canal (SR 401, south of Cape Canaveral Air Station's Gate 1);
- Indian River Causeway West or NASA Causeway (Intracoastal Waterway at Addison Point);
- Merritt Island Barge Canal (Merritt Island State Road 3);
- Haulover Canal Bridge (State Road 3, north of KSC).

Restraints on bridge openings for boat traffic begin three hours before launch. The bridges may be opened for five minutes at the following points in the launch countdown: T-180 minutes, T-150 minutes, T-120 minutes, T-90 minutes, and T-65 minutes. Adding 20 minutes to these times and subtracting that amount from the launch time will result in an approximate time of openings.

Bridges will remain closed to boat traffic until 90 minutes after lift-off (T+90). They may then open for five minutes at T+90, T+120 minutes and T+150 minutes. Bridge operations will return to normal three hours (T+180 minutes) after launch.

Should the Shuttle be required to perform a Return-to-Launch-Site (RTLS) landing at KSC, all bridges would remain closed to boat traffic from 45 minutes before landing until at least one hour after landing.

KSC AREA BOATING RESTRICTIONS

Waterways and boating near the Kennedy Space Center will be strictly controlled prior to and during the launch of the Space Shuttle.

Safety and security requirements, including U.S. Air Force range safety impact limit lines, will go into effect as early as three days before launch. Other requirements will be phased into effect through sunset the night before launch. A general description of the area follows:

BANANA RIVER: Security limits begin at the Banana River Barge Canal south of KSC at the State Road 528 crossing and extend north. This restriction is effective roughly 12 hours prior to launch.

ATLANTIC OCEAN: Beginning the day before launch, a general exclusion zone will be in effect three miles offshore from the Haulover Canal, near the north end of KSC, and southward to Port Canaveral. Four hours prior to launch, all ocean-going traffic will be restricted from entering an area measured from five miles north and south of the launch pad and extending 30 miles east into the ocean. Pad 39A is located at latitude 28 degrees, 36 minutes, 29.7014 seconds north; longitude 80 degrees, 36 minutes, 15.4166 seconds west. Pad 39B is located at latitude 28 degrees, 37 minutes, 26 seconds north; longitude 80 degrees, 37 minutes, 15.09 seconds west. An additional three-mile-wide exclusion zone will be extended eastward along the projected flight path of the Space Shuttle.

MOSQUITO LAGOON: This area south of the Haulover Canal is off limits to all boats beginning the day before launch.

INDIAN RIVER: Restrictions apply from the NASA Causeway north to the Haulover Canal and east of the Indian River's main channel. Restrictions begin the day before launch.

All boating restrictions will be lifted approximately one hour after launch.

The U.S. Coast Guard, the U.S. Fish and Wildlife Service, and KSC security forces share responsibility for enforcing the boating guidelines.

June 21, 1995

KSC Release No. 59-95

KENNEDY SPACE CENTER NEWSROOM ACCESSIBLE VIA INTERNET

The Kennedy Space Center newsroom is expanding its boundaries into the electronic realm of the Internet. A wealth of information on the Space Shuttle and other NASA programs is now easily accessible online at URL:

http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

Sponsored by the Media Services Branch of NASA Public Affairs at KSC, the Newsroom Home Page links users to such pertinent topics as:

A Space Shuttle launch schedule that has the most current information available on upcoming flights, including launch dates and times;

Daily status reports on upcoming Space Shuttle missions and their payloads;

A Space Shuttle Mission Chronology providing specifics about all Shuttle flights, beginning with STS-1 and continuing through the most recently completed flight;

On-line versions of NASA Fact Sheets on a wide range of topics, from the Shuttle Solid Rocket Booster retrieval ships to orbiter end-of-mission landings;

NASA services available to educators and schools;

Ordering information for car passes to view Space Shuttle launches from KSC; and

An archive of KSC-issued Press Releases that will eventually date back to the early 1960s.

The Newsroom Home Page can be regarded as an electronic repository where these and other materials distributed by KSC's Public Affairs Office are permanently available for online study. News materials such as the Shuttle Daily Status Report, which are currently distributed on a regular basis to news media organizations via electronic-mail (E-Mail) and facsimile (Fax), will continue to be sent this way and then stored on the Home Page.

New material will be added regularly to the Newsroom data base so that it will continue to serve as the most comprehensive and up-to-the-minute official KSC Public Affairs information source for existing and future customers.

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June 21, 1995

KSC Release No. 60-95

NOTE TO EDITORS/NEWS DIRECTORS:

DEMONSTRATION OF NEW KSC NEWSROOM AND NASA SHUTTLE MISSION HOME PAGES SCHEDULED FOR L-1 AT KSC NEWS CENTER

A demonstration of the Kennedy Space Center Newsroom Home Page and the NASA Space Shuttle Mission Home Page making their Internet debut during Space Shuttle Mission STS-71 is planned at the KSC Press Site on Thursday, June 22.

The demonstration will be conducted in Trailer 19, the facility temporarily housing the KSC Public Affairs News Center, at around 11:15 a.m. or immediately following the L-1 Press Conference.

The KSC Newsroom Home Page becomes the latest NASA information source available on the World Wide Web. It will become a permanent repository for a variety of KSC-issued materials such as Press Releases, Fact Sheets and Daily Status Reports. The Newsroom Home Page is located at URL:

http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

The Space Shuttle Mission Home Page expands on the highly successful STS-67/Astro-2 Mission Home Page created earlier this year. For STS-71 and subsequent missions, the NASA Space Shuttle Home Page will provide current information on a Shuttle flight beginning the moment the countdown clock starts ticking and continuing through landing. It is located at URL:

http://shuttle.nasa.gov

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June 22, 1995

KSC Release No. 61-95

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-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-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather parameters 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 will not continue if the temperature exceeds 99 degrees for more than 30 consecutive minutes.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun, wind 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 (kts)	Relative Humidity 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, when the wind direction at the launch pad is between 300 degrees and 060 degrees, the highest wind allowable is 34 knots. When the wind direction is between 150 degrees and 200 degrees, the highest wind allowable is 20 knots. The peak allowable wind speeds are on a descending scale between the directions of 060 degrees and 150 degrees, and an ascending scale between 200 degrees and 300 degrees.

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.

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

Lightning (and electric fields with triggering potential):

- Tanking will not begin if lightning is observed within five nautical miles of the launch pad or is forecast to occur during the first hour of tanking.

- 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 occuring near the field mill which has been previously determined and documented to be benign is clearly causing the elevated readings.

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

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.

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 LANDING CRITERIA

Weather conditions for a landing also affect the launch criteria since the possibility exists for a Return To Launch Site abort (RTLS) at the Kennedy Space Center or for emergency landings at other off-site locations.

The landing criteria for the Trans-Oceanic Abort Sites (TAL), and the Abort Once Around (AOA) sites of Edwards Air Force Base, and White Sands Space Harbor are:

- Cloud coverage 5 tenths or less below 8,000 feet with a clear line of sight to the end of the runway.

- No detached opaque thunderstorm anvil cloud within 10 nautical miles of the runway or within 5 nautical miles of the final approach path extending to 30 nautical miles distance.

- For RTLS and the 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.

- For RTLS, a ceiling of 5,000 feet and a visibility of 4 nautical miles or greater is required.

- Visibility for the TAL sites and AOA, 5 statute miles or greater where microwave landing system (MLS) instrument landing capability is available; otherwise 7 statute miles.

- Crosswind component for Return to Launch Site (RTLS) not to exceed 15 knots. For Abort Once Around (AOA) and Trans-Oceanic (TAL) contingency landing sites the night-time crosswind limit is 12 knots.

- Headwind not to exceed 25 knots

- Tailwind not to exceed 10 knots average, 15 knots peak

- Sun angle on final approach not within 10 degrees in azimuth and 0 to 20 degrees in elevation

KSC END OF MISSION LANDING WEATHER CRITERIA

At decision time for the deorbit burn 90 minutes before landing:

- The visibility must be observed and forecast to be 5 nautical miles or greater.

- The peak wind speed, regardless of direction, may not be observed or forecast to exceed 20 knots.

- The peak cross wind shall not be observed or forecast to exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day or night.

- An observed or forecast cloud ceiling must be 10,000 feet or higher.

- Observed scattered cloud layers below 10,000 feet must not exceed 2/10 sky coverage.

- At a range of 30 nautical miles, vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles.

- Landing in or near precipitation is not acceptable.

- The deorbit burn shall not occur if thunderstorm, lightning, or precipitation activity is observed within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be observed or forecast to 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.

WEATHER INSTRUMENTATION

The equipment used by the forecaster to develop the downrange and launch clearance forecast are:

-Radar: The color weather radar display is located at the Cape Canaveral Forecast Facility. The antenna is located on Patrick Air Force Base in Cocoa Beach. Echo returns and information about rain intensity and cloud tops may be observed up to a distance of 200 nautical miles. Also available to the Shuttle Weather Officer is a display of the National Weather Service doppler weather radar located in Melbourne.

-Field Mill Network: Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide a contour map of electric fields and lightning activity. This tool assists the forecaster in determining that the lightning avoidance criteria are met.

-Lightning Detection System: Plots cloud to ground lightning strikes within 125 miles of the Range Weather Facility.

-Lightning Detection And Ranging (LDAR): A new system developed by NASA undergoing evaluation, LDAR is a three dimensional system that plots intracloud, cloud to cloud and cloud to ground lightning with high demonstrated accuracy within 25 nautical miles but recording lightning events up to 100 nautical miles distant from Cape Canaveral.

-Rawinsonde: A balloon with a tethered instrument package which radios to the ground its altitude with weather data on temperature, dewpoint and humidity, wind speed and direction, and pressure. A rawinsonde may reach an altitude as high as 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.

-Rocketsonde: On L-1 day, a 12-foot-tall instrumented rocket is launched. It returns data on temperature, wind speed and direction, wind shear, pressure, and air density at the altitude region 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 in the Range Weather Facility by the GOES weather satellites, and also high resolution pictures from polar low earth orbiting spacecraft including both the NOAA polar orbiters and the Defense Meteorological Support Program (DMSP) satellites.

-Meteorological Interactive Data Display System (MIDDS): Integrates

for the forecaster on a single visual display the satellite images, computer generated graphics of surface and upper air map features, and current weather observations. The system will also display or plot and contour various meteorological parameters, and can display any selected current National Weather Service radar picture.

-Wind towers: A total of 33 wind 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 sensors. The 60-foot wind towers at the launch pads and the 10-meter wind 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 and are used as a tool in short-term forecasting.

-Instrumented Weather Buoys: Anchored East-Northeast of Cape Canaveral, two meteorological buoys are stationed at distances of 25 nautical miles and 110 nautical miles. Offshore weather conditions may be influencing onshore weather. These ocean weather buoys relay hourly reports by satellite and are received at the Range Weather Facility. Measurements include air temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and the wave height with period.

-Solid Rocket Booster Retrieval Ships: These vessels radio observed weather conditions and sea state from the booster impact area located approximately 160 miles downrange.

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

NOTE: The launch weather forecast is prepared by the U.S. Air Force Range Weather Operations Facility at Cape Canaveral. The landing and RTLS forecast is prepared by the NOAA Space Flight Meteorology Group at the Johnson Space Center in Houston.

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June 26, 1995

KSC Release No. 62-95

SPACE ACT AGREEMENT SIGNED FOR DEVELOPMENT OF NEW KSC HYDROGEN FLAME DETECTOR

A KSC-designed hydrogen flame detector that will help eliminate costly false alarms that are common with detectors now on the market will begin its final design and development phase through a NASA Space Act technology transfer agreement signed last week between Kennedy Space Center and Scientific Instruments, Inc., West Palm Beach, Florida.

Under this agreement, Scientific Instruments will join KSC engineers in a two-year development and testing program to produce an electro-optical sensor system that will analyze both the ultraviolet (UV) and infrared (IR) wavelength emissions from hydrogen fires. A digital signal processor (DSP) in the unit will use an algorithm to distinguish between an invisible hydrogen flame and a flash of lightning or a bright reflection from a Space Shuttle launch pad hydrogen gas burnoff stack.

This agreement, part of KSC's dual-use program, is the fourth of its type pioneered by the KSC Technology Programs and Commercialization Office. It was developed with the State of Florida's Technological Research and Development Authority (TRDA). The KSC office strives to identify developing technologies that both fulfill a need at the space center and have commercial applications. Once a technology has been identified, a commercial firm with expertise in an applicable industry and interest in pursuing final development of the product is selected as an industry partner.

The multi-spectrum, hydrogen-specific detector represents the next step in flame detection systems. The false alarm problem led KSC engineers to initiate a research and design program that included development of a prototype that will be tested during the joint effort with Scientific Instruments. The new detector is the first of its type to use a DSP in its design. The algorithm, which contains a characterization of a hydrogen flame, was also developed at the space center.

Liquid hydrogen is used as the fuel for the Shuttle orbiter's three main engines and is loaded into the vehicle's external tank through an extensive storage and transfer system just hours before liftoff. Excess hydrogen is burned off through a stack during this operation. A leak and subsequent fire could threaten the safety of the Shuttle at the pad.

"The sensors we currently have at the launch pads can only detect the ultraviolet emissions from a flame and consequently are prone to causing false alarms during thunderstorms and after a Shuttle liftoff ," said KSC lead project engineer Gregory Hall. "When they work properly, they alert pad crews to invisible hydrogen fires that could damage the Space Shuttle. When they don't, they can cause delays in Shuttle processing time, since crews cannot enter the pad area when a warning for a hydrogen fire has been given."

"We see a real commercial market for the UV-IR detector unit in the aerospace, petrochemical , medical and eventually the transportation fields, since hydrogen will be the fuel of the future for commercial operations," Scientific Instruments Inc. president Jack Hoey said. "Because NASA has completed the initial design and development of the new detector, we will be able to save hundreds of thousands of dollars over what it would cost to produce this product on our own," he pointed out.

Once the UV-IR flame detector is on the market, KSC will be able to purchase off-the-shelf hardware at considerably less cost than if center engineers would have had to custom-build the detector units themselves, Hall said.

The TRDA, which submitted the original proposal to KSC, has been designated by NASA to manage the UV-IR development project. The agency will also be involved in the prototype testing phase of the effort.

June 26, 1995

KSC Release No. 63-95

NOTE TO EDITORS/NEWS DIRECTORS:

INTERIOR SECRETARY BABBITT TO OBSERVE MANATEES AT KSC ON WEDNESDAY

Interior Secretary Bruce Babbitt is scheduled to visit the Kennedy Space Center on Wednesday, June 28 as part of a three-day tour of Florida to focus attention on the environment and the upcoming re-authorization of the Endangered Species Act.

Babbitt will observe three manatees in the KSC holding pen located on the NASA Causeway. Representatives from Sea World and the U.S. Fish and Wildlife Service will be conducting routine health checks on each of the manatees. Babbitt is expected to have hands-on contact with the manatees. The endangered mammals have been in the pens for about three weeks and will remain there for several more weeks until they are ready for release.

This event is open to news media representatives (even if the launch of STS-71 is postponed on June 27 and rescheduled for the day of Babbitt's visit).

Media representatives should call the KSC Newsroom at (407) 867-2468 to make arrangements for credentials to enter the Center. Transportation for the media will depart the Press Site at 1:30 p.m. for the NASA Causeway. A van will also depart from the Pass and Identification Gate 3 at U.S. 1 at 1:30 p.m. STS-71 credentials will be valid for this event.

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July 6, 1995

KSC RELEASE NO. 65-95

ATLANTIS SCHEDULED TO LAND AT KSC

The orbiter Atlantis is scheduled to land at Kennedy Space Center on Friday, July 7 at 10:55 a.m. EDT, completing its STS-71 mission which was launched from KSC on June 27.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 154 at mission elapsed time of 9 days, 19 hours, 23 minutes. The deorbit burn will occur at about 9:45 a.m. Friday.

There is one later KSC landing opportunity on Friday at 12:30 p.m. In the event a landing is not possible at KSC on Friday due to weather concerns, no landing attempt is expected to be made at Edwards Air Force Base, Calif. (though two opportunities exist at 2:02 p.m. and 3:38 p.m. EDT). On Saturday, two landing opportunities are available at KSC and three are available at Edwards.

KSC Saturday landing times are: 11:35 a.m. and 1:12 p.m. EDT.

EAFB Saturday landing times are: 1:07 p.m., 2:43 p.m. and 4:20 p.m. EDT.

The landing of Atlantis will mark the 23rd landing at KSC in the history of Space Shuttle flight. It will be the second KSC landing this year.

About 7 hours after landing, select members of the flight crew will be present for a post-mission press conference. The Mir 18 crew will not be available. The conference will be held at the KSC TV auditorium and be 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 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 egress the vehicle and doff 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 June 27. 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.

About 2 hours, 40 minutes after landing, the orbiter will be towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Preparations will then begin for Atlantis' next flight, mission STS-74, the second mission to dock with Russia's Mir Space Station. Launch is currently targeted for late October 1995.

Following departure from the SLF, the crew of mission STS-71 will be taken to their quarters in the O&C Building, meet with their families, undergo a physical examination and prepare to depart for the skid strip at Cape Canaveral Air Station for their flights back to JSC.

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.

# # # #

NOTICE TO EDITORS: Media wishing to view Atlantis' landing should be at the KSC press site between 7 - 10 a.m. Friday for transport to the SLF. Other specific information is available at the KSC News Center regarding landing photo opportunities, the post landing press conference, crew departure photo opportunities and news center operational hours.

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July 7, 1995

KSC RELEASE NO. 66-95

SPACE SHUTTLE MISSION STS-70 LAUNCH COUNTDOWN TO BEGIN MONDAY

The countdown for launch of the Space Shuttle Discovery on mission STS-70 is scheduled to begin Monday, July 10 at 10 a.m. EDT, 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 41 minutes of built-in hold time leading to the opening of the launch window at 9:41 a.m. (EDT) on July 13. The launch window extends for 2 1/2 hours.

STS-70 is the fourth mission scheduled for 1995. This will be the 21st flight of the Shuttle Discovery and the 70th flight overall in NASA's Space Shuttle program.

The primary purpose of mission STS-70 is to deploy the Tracking and Data Relay Satellite (TDRS-G), the last in a series of a space-based satellite network that provides communications, tracking, telemetry, data acquisition and command services essential to Shuttle and low-Earth orbital spacecraft missions.

Also, STS-70 marks the first flight of the new Block 1 Space Shuttle Main Engine, located in the No. 1 position on Discovery.

Discovery was rolled out of Orbiter Processing Facility bay 2 on May 3 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39-B on May 11. Discovery had to be returned to the VAB on June 8 to allow access to the external tank for repairs of nearly 200 holes in the foam insulation caused by nesting woodpeckers. The holes were patched and Discovery was returned to Pad 39-B on June 15. Discovery last flew in February of this year.

The STS-70 crew are: Commander Tom Henricks, Pilot Kevin Kregel, and Mission Specialists Nancy Currie, Donald Thomas and Mary Ellen Weber.

The crew is scheduled to arrive at KSC at about 4:20 p.m. Monday, July 10. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

COUNTDOWN MILESTONES

Launch - 3 Days (Monday, July 10)

* Prepare for the start of the STS-70 launch countdown
* Perform the call-to-stations. All Firing Room console operators report on station.
* 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 10 a.m. EDT at the T-43 hour mark
* Start preparations for servicing fuel cell storage tanks
* Begin final vehicle and facility close-outs for launch
* Begin stowage of flight crew equipment
* Load backup flight system software into Discovery's general purpose computers
* Close payload bay doors for flight (10 p.m.)
* Check out back-up flight systems

Launch - 2 Days (Tuesday, July 11)

Enter first planned built-in hold at T-27 hours for duration of four hours (2 a.m.)

* Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
* Review flight software stored in mass memory units and display systems
* Clear launch pad of all personnel
* Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (6 a.m.)

* Begin the 8 hour operation to load cryogenic reactants into Discovery's fuel cell storage tanks

Enter eight-hour built-in hold at T-19 hours (2 p.m.)

* After cryogenic loading operations, re-open the pad
* Resume orbiter and ground support equipment close-outs

Resume countdown (10 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

Launch - 1 Day (Wednesday, July 12)

* Activate 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, 21 minutes (6 a.m.)

* Perform orbiter ascent switch list in crew cabin
* Install film in numerous cameras on the launch pad
* 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 at about 5:30 p.m.
* Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Resume countdown (7:21 p.m.)

* Install 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 in Houston for launch
* Clear the blast danger area of all non-essential personnel
* Switch Discovery's purge air to gaseous nitrogen

Launch Day (Thursday, July 13)

Enter planned one-hour built-in hold at the T-6 hour mark (12:21 a.m.)

* Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
* Clear pad of all personnel

Resume countdown (1:21 a.m.)

* Begin loading the external tank with cryogenic propellants (1:21 a.m.)
* Perform inertial measurement unit preflight calibration
* Align Merritt Island Launch Area (MILA) tracking antennas
* Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (4:21 a.m.)

Enter two-hour hold at T-3 hours (4:21 p.m.)

* Perform open loop test with Eastern Range
* Conduct gimbal profile checks of orbital maneuvering system engines
* Close-out crew and Final Inspection Team proceeds to Launch Pad 39-B

Resume countdown at T-3 hours (6:21 a.m.)

* Crew departs Operations and Checkout Building for the pad 39-B (6:26 a.m.)
* Complete close-out preparations in the white room
* Check cockpit switch configurations
* Flight crew enters orbiter
* Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
* Close Discovery's crew hatch
* 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 (9:01 a.m.)

* NASA Test Director conducts final launch team briefings

Resume countdown (9:11 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 final 10-minute hold at T-9 minutes (9:22 a.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 (9:32 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 MPS 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)
* Ignition of three Space Shuttle main engines (T-6.6 seconds)
* SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-70

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	2:00 a.m. Tuesday	6:00 a.m. Tuesday
T-19 hours	8 hours	2:00 p.m. Tuesday	10:00 p.m. Tuesday
T-11 hours	13 hours, 21 minutes	6:00 a.m. Wednesday	7:21 p.m. Wednesday
T-6 hours	1 hour	12:21 a.m. Thursday	1:21 a.m. Thursday
T-3 hours	2 hours	4:21 a.m. Thursday	6:21 a.m. Thursday
T-20 minutes	10 minutes	9:01 a.m. Thursday	9:11 a.m. Thursday
T-9 minutes	10 minutes	9:22 a.m. Thursday	9:32 a.m. Thursday

CREW FOR MISSION STS-70

Tom Henricks	Commander (CDR)
Kevin Kregel	Pilot (PLT)
Donald Thomas	Mission Specialist (MS1)
Nancy Currie	Mission Specialist (MS2)
Mary Ellen Weber	Mission Specialist (MS3)

SUMMARY OF STS-70 LAUNCH DAY CREW ACTIVITIES

Thursday, July 13

	4:46 a.m.	Wake up
*	5:16 a.m.	Breakfast and crew photo
	5:46 a.m.	Weather briefing (CDR, PLT, MS2)
	5:46 a.m.	Don flight equipment (MS1, MS3)
	5:56 a.m.	Don flight equipment (CDR, PLT, MS2)
*	6:10 a.m.	Crew suiting photo
*	6:26 a.m.	Depart for launch pad 39B
*	6:56 a.m.	Arrive at white room and begin ingress
*	8:11 a.m.	Close crew hatch
*	9:41 a.m.	Launch

* Televised events -- times may vary

July 7, 1995

KSC Release No. 67-95

NOTICE TO EDITORS/ NEWS DIRECTORS:

EVENTS, NEWS CENTER HOURS OF OPERATION SET FOR MISSION STS-70

News conferences, events and operating hours for KSC's News Center have been set for the July 13 launch of the Space Shuttle Discovery on Mission STS-70. These events are scheduled to be carried live on NASA TV (please refer to the STS-70 mission TV schedule for exact times).

At 10 a.m. EDT Monday, July 10, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 9:41 a.m. EDT on Thursday, July 13. The launch window is 2 1/2 hours long.

The five crew members are scheduled to arrive at KSC on Monday, July 10, at 4:20 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 3:30 p.m. Monday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility. Arrival of the STS-70 astronauts will NOT be carried live on NASA TV, but will be replayed at 5 p.m. Monday. News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

News media representatives will have an opportunity to discuss details of the launch countdown with NASA test directors during briefings at the KSC News Center next week (all briefings will be carried live on NASA TV). Please refer to the STS-70 briefing schedule for times, participants and other events.

Pre-flight briefings for Mission STS-69 will be held at the Johnson Space Center, Houston, next week. Please refer to the news release for times and participants.

# # # #

STS-70 BRIEFING SCHEDULE

(all times are in EDT and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Monday, July 10
Countdown Status
Briefing----------8 a.m.
John Guidi, Shuttle Test Director
Roelof Schuiling, STS-70 Payload Manager
Ed Priselac, Shuttle Weather Officer

STS-70 fight crew arrival (tape replay)----------5 p.m.

L-2 Days - Tuesday, July 11
Countdown Status
Briefing----------9 a.m.
Steve Altemus, NASA Test Director
Roelof Schuiling, STS-70 Payload Manager
Ed Priselac, Shuttle Weather Officer

Block I Space Shuttle Main Engine class---------- 12 p.m.- 4 p.m.
(local KSC event in the Press Site auditorium)

L - 1 Day - Wednesday, July 12

Pre-launch News Conference----------9 a.m.

Brewster Shaw, Director, Space Shuttle Operations, Johnson Space Center
Charles Force, Associate Administrator for the Office of Space Communications
Bob Sieck, Director of Shuttle Operations, KSC
Capt. David Biggar, KSC Staff Weather Liaison

Replay of STS-70 crew and mission briefings----------1 p.m.

Launch Day - Thursday, July 13

NASA Television live launch programming begins----------5 a.m.

Post-launch press conference----------L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program
James Harrington, KSC Launch Director

KSC News Center office hours for STS-70
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Monday, July 10	7:00 a.m. - 6:00 p.m.
(Launch minus 2 days) Tuesday, July 11	7:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, July 12	7:00 a.m. - around-the-
(Launch day) Flight day 1, Thursday, July 13	clock - 4:30 p.m.
Flight day 2, Friday, July 14	8:00 a.m. - 4:30 p.m.
Flight days 3-4, July 15-16	CLOSED
Flight days 5-8, July 17-20	8:00 a.m. - 4:30 p.m.
Flight day 9, Landing Day, July 21	4:30 a.m. - 4:30 p.m.

News media representatives may obtain STS-70 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Monday, July 10	--	7:00 a.m. to 4:30 p.m.
Tuesday, July 11	--	7:00 a.m. to 4:30 p.m.
Wednesday, July 12	--	7:00 a.m. to 6:00 p.m.
Thursday, July 13	--	4:30 a.m. to 8:30 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.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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STS-69

Endeavour: Wake Shield Facility-2/Spartan-201-3
KSC Release No. 68-95
July 1995

The orbiter Endeavour and its crew of five astronauts on STS-69 will deploy and later retrieve two free-flying payloads -- a "first" in the 14-year-old Space Shuttle flight program.

Primary objectives of the mission are the deployment, retrieval and operation of the *Wake Shield Facility (WSF) satellite* on its second flight and the *Spartan-201 spacecraft* which is making its third flight. The crew also will conduct and oversee a wide variety of secondary experiments, including solar and stellar observations, commercial materials processing and biotechnology investigations.

Two members also will carry out a nearly 6 1/2- hour extravehicular activity (EVA) or spacewalk to test assembly techniques and tools for the international space station and to evaluate thermal design modifications to space suits worn during spacewalks.

Endeavour will ascend at a 28.45-degree inclination to the equator for direct insertion to a 200- nautical-mile (370-kilometer/230-statute-mile) orbit. The orbiter's altitude will be raised to 215 nautical miles (398 kilometers/247 statute miles) on Flight Day 4 for WSF-2 operations, and then lowered to 185 nautical miles (343 kilometers/213 statute miles) on Flight Day 8 for the Shuttle Glow Experiment (GLO-3).

The 71st Space Shuttle mission, and the ninth flight of Endeavour (OV-105), will begin with liftoff from Pad A, Launch Complex 39. The 11-day flight is scheduled to end at KSC's Shuttle Landing Facility.

Four experienced space flyers and one rookie comprise the STS-69 crew.

The mission commander is David M. Walker (Capt., USN), who will be making his fourth flight. He was pilot of STS 51-A in 1984, and commander of STS-30 in 1989 and STS-53 in 1992.

He will be assisted at the flight controls by Pilot Kenneth D. Cockrell, who previously flew as a mission specialist on STS-56 in 1993.

James S. Voss (Lt. Col., USA), a mission specialist, will oversee the many planned experiment activities as payload commander. He flew twice before as a mission specialist -- on STS-44 in 1991 and with Walker on STS-53 in 1992.

The other mission specialists are James H. Newman and Michael L. Gernhardt, who hold doctoral degrees, in physics and bioengineering, respectively. Newman flew once before, as a mission specialist on STS-51 in 1993. Gernhardt is a first-time space flyer.

Wake Shield Facility (WSF-2)
From inside the orbiter, Mission Specialist Newman will operate the controls of Endeavour's Remote Manipulator System (RMS) robotic arm which will grapple the WSF from its berth in the payload bay on Flight Day 4. The following day, the arm will release the free-flying 12- foot-in-diameter (3.8-meter) stainless steel disc after checkout and oxygen scrubbing of the scientific instrument side, or wake side, of WSF to prevent contamination from the orbiter. WSF will fire its cold gas thruster to position itself approximately 35 nautical miles (65 kilometers/40 statute miles) behind Endeavour. It will mark the first time a payload has performed its own burn to separate itself from the orbiter. The spacecraft will fly free of the orbiter about 56 hours, creating a base vacuum in the wake estimated to be 10,000 to 100,000 times better under operating conditions than can be achieved on Earth. Retrieval with the RMS arm is planned on Flight Day 7. When WSF is in close proximity to Endeavour, a plume impingement experiment using the orbiter's thrusters will be performed. After retrieval, the Charge Hazards and Wake Studies (CHAWS) will be conducted.

The "proof-of-concept" WSF payload is designed to generate an "ultra vacuum" in space in which to grow and process up to seven high-purity epitaxial thin films of advanced semiconductor material for electronic circuits, photonic devices, and digital, analog, microwave and optical devices. High-performance computers, cellular phones, radar and high-definition television are among the potential applications of the semiconductor growth technology.

During its first flight on STS-60 in 1994, the WSF was not deployed because of an attitude sensor malfunction. But five of the seven planned thin films were grown on the platform held by the RMS arm. The WSF still achieved about 80 percent of its mission objectives on that first flight.

Scientists hope that the free-flying disc on this flight will produce thin film growths of the highest possible purity, without contamination from the orbiter.

The Wake Shield Facility was developed and built by the Space Vacuum Epitaxy Center at the University of Houston, one of 11 NASA Centers for the Commercial Development of Space.

Two more WSF flights are planned, in 1996 and 1998, with eventual integration of the facility in the international space station program.

Spartan-201
On Flight Day 2, Mission Specialist Gernhardt will operate the RMS controls to deploy the Spartan-201 platform. During up to 47 hours of free-flying operations, Spartan-201 will investigate the physical conditions of the solar corona, particularly that part of the sun's atmosphere where the solar wind is generated. Electronically charged particles stream from the sun as the solar wind, traveling as fast as 1,000 kilometers (621 statute miles) per second. The observations are timed to coincide with the passes of NASA's Ulysses spacecraft over the north polar region of the sun. The satellite will be grappled by the RMS arm on Flight Day 4.

The platform will contain the same two instruments -- the White Light Coronograph and the Ultraviolet Coronal Spectrometer -- used on the first two Spartan-201 missions, STS-56 in 1993 and STS-64 in 1994.

All data gathered by Spartan-201 will be stored on an onboard tape recorder for analysis after landing.

One more flight of Spartan-201 is scheduled, in 1997.

Spacewalk
Mission Specialists Voss and Gernhardt will perform the EVA or spacewalk on Flight Day 10. This is the second in a series of six EVA development flight tests to prepare for assembly and maintenance of the international space station beginning in 1997.

The objectives of the EVA are to evaluate space station tasks and tools, thermal design modifications to the Extravehicular Mobility Unit (EMU) space suit, and the electronic cuff checklist device worn on the wrist.

Among the EMU modifications which will be tested are gloves with heat added for the first time, and improved adjustable thermal mittens. Astronauts who conducted a spacewalk on STS-63 earlier this year experienced cold fingertips. As a result of their comments, additional thermal protection will be provided for the hands as well as other parts of the body on this flight.

Other Payloads
STS-69 will be the first mission to include two separate payloads in the Hitchhiker Program managed by the Shuttle Small Payloads Project at Goddard Space Flight Center (GSFC) in Greenbelt, Md. Hitchhiker is designed for customers who wish to fly quick-reaction and relatively low-cost experiments on the Shuttle. Payloads receive power and data handling through Hitchhiker avionics, and experimenters can communicate with their experiments through the Payload Operations Control Center at GFSC. Both Hitchhiker payloads are in Endeavour's cargo bay.

The International Extreme Ultraviolet Hitchhiker (IEH)-1 includes four experiments mounted on a bridge assembly in

the payload bay. They are: Solar Extreme Ultraviolet Hitchhiker (SEH); Ultraviolet Spectrograph Telescope for Astronomical Research (UVSTAR); Shuttle Glow Experiment (GLO-3); and Consortium for Materials Development of Space Complex Autonomous Payload (CONCAP IV-03) non-linear optics experiments.

The Capillary Pumped Loop-2/Gas Bridge Assembly (CAPL-2/GBA) includes a prototype of the thermal control system planned for use on the Earth Observing System (EOS) platform. The Gas Bridge Assembly holds four Get Away Special (GAS) canisters of self-contained experiments, and the Thermal Energy Storage investigation to enhance performance of solar- dynamic power system heat receivers.

Middeck experiments include:
Space Tissue Loss/National Institutes of Health-Cells (STL/NIH-C) to evaluate, among other things, muscle and bone loss in microgravity.

Commercial Materials Dispersion Apparatus Instruments Technology Associates Experiment (CMIX) will collect data on scientific methods and the commercial potential of biomedical and fluid science applications.

Commercial Generic Bioprocessing Apparatus (CGBA) processes biological fluid samples in microgravity.

Electrolysis Performance Improvement Concept Study (EPICS) investigates the electrolysis of water in the microgravity environment.

Biological Research in Canister (BRIC) studies the effects of spaceflight on arthropod animals and plants.

Midcourse Space Experiment (MSX), a payload of opportunity, will use orbiter thruster firings as a sensor calibration and evaluation target for the orbiting MSX satellite.

INTERNET ADDRESS -- KSC MISSION HOME PAGE: http://www.ksc.nasa.gov/shuttle/countdown

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July 17, 1995

KSC RELEASE NO. 69-95

NOTE TO EDITORS/NEWS DIRECTORS:

TCDT MEDIA OPPORTUNITY WITH STS-69 CREW SET FOR THIS WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-69 on Wednesday, July 19, during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

Media interested in speaking with the crew during this question and answer session at Pad 39-A, should be at the KSC Press Site by 12 noon Wednesday for transport to the pad.

Media interested in covering the event Wednesday should contact the KSC Press Site to obtain the proper badge. Annual badges and STS-70 badges will be activated for this event.

The five-member crew is scheduled to arrive at KSC's Shuttle Landing Facility late this afternoon. No photo opportunity is available for crew arrival.

On Thursday, the crew will depart their quarters at about 7:45 a.m. and begin to board the Shuttle Endeavour at about 8:15 a.m. where they will remain through the end of the test. The mock countdown culminates with a simulated main engine cut-off at 11 a.m. Thursday.

Following TCDT Thursday, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Endeavour is now targeted for launch no earlier than August 3 on an 11-day mission to deploy and retrieve the Wake Shield Facility and the Spartan 201 free-flyer payloads.

Crew members for mission STS-69 are: Commander David Walker; Pilot Ken Cockrell; and Mission Specialists James Voss, James Newman and Michael Gernhardt.

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July 21, 1995

KSC Release No. 70-95

FIVE KSC WORKERS HONORED BY NASA ASTRONAUTS

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

Astronaut Steve Smith presented awards at KSC in June to Rebecca J. Kleinschmidt of Merritt Island, and Jeanne S. O'Bryan and Patsy H. Fuller, both of Titusville. Astronaut Marsha Ivins gave out awards, also in June, to Paul E. Paulick and David W. Burris, both of Titusville.

Kleinschmidt, personal assistant to the NASA director of Safety, Reliability and Quality Assurance, was commended for her ability to handle a heavy workload and adapt to constantly changing schedules. "You exemplify world-class quality in all you do and provide a visible, inspirational focus on the importance of establishing and meeting the highest quality standards," Smith told her.

The other four recipients are in the Payload Operations Directorate. A systems engineer, O'Bryan was applauded for her part in overseeing the operation and maintenance of various aspects of the Payload Operation Network, which provides computer network communications in support of payload processing. "Your efforts have benefited the processing of Shuttle payloads and will continue to provide new benefits as the electronic linking of the day-to-day exchange continues," astronaut Smith said.

Fuller, lead secretary and personal assistant to the director of Payload Operations, was congratulated for performing her duties in an outstanding manner, and going above and beyond expectations. "You show excellent judgment in carrying out your responsibilities and have gained the respect of both internal and external customers for your ability to get the job done," Smith told her.

Paulick, lead engineer for the Partial Payload Checkout Unit (PPCU) sustaining engineering activities, was recognized for heading a joint NASA/contractor team that was responsible for three computer software releases during the last year. "The exceptional manner in which you have carried out your responsibilities exceeds normal requirements and demonstrates pride in your work," astronaut Ivins told him.

Burris was commended for his efforts in reducing acquisition cost and operation and maintenance costs for space station processing at KSC. "These initiatives (you introduced) have resulted in a total cost avoidance to the program of $1 million," Ivins said.

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

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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July 20, 1995

KSC RELEASE NO. 71-95

DISCOVERY SCHEDULED TO LAND AT KSC

The orbiter Discovery is scheduled to land at Kennedy Space Center on Friday, July 21 at 7:54 a.m. EDT, completing its STS-70 mission which was launched from KSC on July 13.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 127 at mission elapsed time of 7 days, 22 hours, 12 minutes. The deorbit burn will occur at about 6:54 a.m. Friday.

There is one later KSC landing opportunity on Friday at 9:30 a.m. In the event a landing is not possible at KSC on Friday due to weather concerns, no landing attempt is expected to be made at Edwards Air Force Base, Calif. (though one opportunity exists at 9:21 a.m. EDT). On Saturday, two landing opportunities are available at KSC and one at Edwards.

KSC Saturday landing times are: 6:26 a.m. and 8:01 a.m. EDT.

EAFB Saturday landing time is: 9:28 a.m. EDT.

The landing of Discovery will mark the 24th landing at KSC in the history of Space Shuttle flight. It will be the third KSC landing this year.

About 5 hours after landing, 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 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 egress the vehicle and doff 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 July 13. 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, undergo a physical examination and prepare to depart for the skid strip at Cape Canaveral Air Station for their trip back to JSC.

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 hours, 30 minutes after Discovery lands at KSC, it will be towed to Orbiter Processing Facility bay 1 for post-flight deservicing. Preparations will then begin for Discovery to be ferried to Palmdale, Calif., where it will spend about 9 months undergoing standard refurbishment and modifications to support future flights to the international Space Station. Discovery is scheduled to be delivered to Palmdale about Oct. 1 and return to Kennedy Space Center on about July 1, 1996. Discovery's next flight is not scheduled to occur until early 1997, the second mission to re-visit the Hubble Space Telescope.

# # # #

NOTICE TO EDITORS: Media wishing to view Discovery's landing should be at the KSC press site between 4:30 - 6:30 a.m. Friday for transport to the SLF. Other specific information is available at the KSC News Center regarding landing photo opportunities, the post landing press conference, crew departure photo opportunities and news center operational hours.

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July 21, 1995

KSC RELEASE NO. 72-95

NOTE TO EDITORS/NEWS DIRECTORS:

KSC NEWS CENTER HOURS OF OPERATION FOR LANDING ON JULY 22

The orbiter Discovery is scheduled to land at Kennedy Space Center on Saturday, July 22. This is following Friday's landing attempt wave-off due to low clouds and fog at KSC. The two KSC landing opportunities on Saturday are at 6:26 a.m. and 8:02 a.m. EDT. There is one opportunity to land at Edwards Air Force Base, Calif., tomorrow at 9:29 a.m. EDT.

To support tomorrow's landing attempt, the KSC News Center will open at 4 a.m. and close following the astronaut post-landing press conference, which is scheduled to occur about 5 hours after touchdown.

Media wishing to view Discovery's landing should be at the KSC press site between 4 - 5:30 a.m. Saturday for transport to the Shuttle Landing Facility.

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July 28, 1995

KSC Release No. 73-95

PRELIMINARY FINDING OF KSC'S BIRD INVESTIGATION REVIEW AND DETERRENT TEAM COMPLETED

KSC's Bird Investigation Review and Deterrent (BIRD) Team recently completed its initial review of the problem that caused the delay of mission STS-70 earlier this year. The flight of Discovery was postponed because of flicker woodpeckers attempting to nest in the foam insulation of the vehicle's external tank over the Memorial Day weekend while Discovery was being prepared for launch at pad 39B.

The report includes background and historical data and characterizes some of the behavioral aspects of the flicker woodpeckers. The BIRD team drew significant conclusions from the data collected and made recommendation for a long term habitat management and monitoring program.

In addition, the BIRD team evaluated a wide variety of products and services, the results of which are detailed in the report.

After consultations with leading ornithologists and wildlife experts, the BIRD team concluded that the migratory Northern Flicker Woodpeckers were attempting to excavate a cavity in the external tank because they may have lost a nest or roost cavity to starlings. If a nest is overtaken before the female can lay her eggs, the pair becomes desperate for a nest, the report explains. This may explain the unusually aggressive behavior of the flicker pair that damaged the tank.

In an effort to keep this problem from recurring and to reduce NASA's exposure to risk of flight hardware damage, the BIRD team has recommended a three-phased long-term plan.

Phase 1 involves establishing an aggressive habitat management program to make the pads more unattractive to flickers and to disperse the resident population of flickers. Phase 2 includes implementation of scare and deterrent tactics at the pads. Phase 3 is the formal implementation of bird sighting response procedures.

Though significant inroads were made in dealing with the woodpecker problem that ultimately caused Discovery to be rolled back to the Vehicle Assembly Building for repairs to the external tank, the team will continue efforts to develop a long-term system of effective deterrents at the pads.

The full report is available to interested members of the media. Please call the KSC News Center at 407-867-2468 for a copy.

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August 1, 1995

KSC Release No.: 75-95

SOHO ARRIVES AT KSC TO BE PREPARED FOR ATLAS LAUNCH

The Solar and Heliospheric Observatory (SOHO) of the European Space Agency (ESA) arrived at the Shuttle Landing Facility today from Toulouse, France aboard an Air France 747 cargo plane.

The SOHO spacecraft will carry a complement of eleven instruments from ESA and NASA and is part of a larger effort known as the International Solar-Terrestrial Physics (ISTP) science initiative.

SOHO will have a superlative view of the sun from a circular orbit around a point know as the "L-1 Lagrangian point." This is located approximately 930,000 miles from Earth and is where the gravitational forces of the Earth and sun balance one another. SOHO will then study the origin of the energy within the sun which reaches the sun's surface. Part of this energy is then transported to Earth as solar wind.

SOHO will receive final testing and preparation for launch in the Spacecraft Assembly and Encapsulation Facility (SAEF-2) located in the KSC Industrial Area. Several processing activities will take place on the payload module to prepare the science instruments for launch. Also, the solar arrays will be attached with the service module which holds the spacecraft subsystems. All of the instruments will be checked out as part of an overall spacecraft functional test and a compatibility check with NASA's Goddard Space Flight Center in Greenbelt, Md. The high gain communications antenna will also have a test release and the spacecraft communications and data systems will be checked. The thermal blanket insulation will be attached and the spacecraft control propellant loaded aboard.

SOHO is approximately 12.5 feet in height by 12.1 feet in diameter and weighs approximately 4,080 pounds. It was manufactured in France by Matra Marconi under a contract with the European Space Agency.

In mid-October the spacecraft is scheduled to be transported to Pad B at Launch Complex 36 for mating with the Atlas IIAS, an Atlas Centaur launch vehicle featuring two solid rocket boosters. Lockheed Martin manufactures the launch vehicle and is under contract with the NASA Lewis Research Center to provide the launch services. The Kennedy Space Center is responsible for the government technical oversight of launch vehicle preparations and the launch day countdown activities. The liftoff is targeted to occur between Oct. 31 and Nov. 7, 1995.

ESA has the overall mission responsibility while NASA is responsible for the collection and dissemination of the SOHO science data through the Goddard Space Flight Center and the Deep Space Network at the Jet Propulsion Laboratory, Pasadena, Calif. NASA's participation in the SOHO program is managed by the Space Physics Division of NASA Headquarters.

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August 8, 1995

KSC Release No. 76-95

EXHIBITOR REGISTRATION UNDER WAY FOR KSC'S NOVEMBER BUSINESS EXPO

Organizers of the sixth annual Kennedy Space Center Business Expo are accepting applications from companies who wish to display their products and services to the expected hundreds of attendees. The Expo, sponsored by KSC's Small Business Council, has become a successful event uniting large, small and disadvantaged businesses with NASA and space center contractors.

"If a vendor has to choose one trade fair to attend in 1995, the KSC Expo should be the one," said Ann Watson, NASA KSC's small business specialist. "The low cost and the number of networking opportunities available under one roof provide a real bang for your marketing buck." This matchmaker event provides attendees a chance to talk with representatives from KSC's procurement and technical communities.

More than 200 exhibitors participated last year and organizers expect at least that many this year. Display space is limited and includes one eight-foot table at a cost of $75 per company. Interested firms should fax company name, address, point of contact and phone number to (407) 867-9187. For an application or additional information, call the NASA Central Industry Assistance Office at (407) 867-7353.

Port Canaveral Cruise Terminal 5 will be the location for the event scheduled for Tuesday, Nov. 14, 1995, from 9 a.m. - 3 p.m.

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August 11, 1995

KSC Release No. 78-95

SEVEN KSC WORKERS HONORED BY NASA ASTRONAUTS

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

Astronaut Marsha Ivins presented the awards at KSC in July to Robert P. Mueller and Kristen J. Riley, both of Merritt Island; Rosaly J. Santos-Ebaugh of Titusville; and Kyle J. Cartier of Rockledge. Astronaut Andy Thomas gave the awards in July to Ann M. Nelson and Linda B. Burns, both of Titusville; and Alex J. Bengoa of Cape Canaveral.

Mueller, Riley, Santos-Ebaugh and Cartier are all engineers in the Engineering Development Directorate. Mueller, lead system engineer for testing in the Launch Equipment Test Facility (LETF), was commended for his role in the tests for development of the external tank (ET) composite nose cone. "As a result of your leadership in the acceptance testing, the ET composite nose cone will provide an increased structural factor of safety and a recurring cost savings for each external tank," Ivins told him.

Riley was applauded for her achievements in metrology development, specifically a very low pressure standard for measurement of differential pressure hardware such as orbiter windshields, and a technique for accurate measurement of internal threads of hardware. "You are to be commended for planning, managing and coordinating technology activities across the NASA centers, and for leading efforts to improve safety and metrology-related technology issues for the entire agency," Ivins told her.

An environmental engineer, Santos-Ebaugh was congratulated for her contributions to the success of KSC's Clean Air Program. "Your dedication and skills are key to the Clean Air Program's meeting regulatory agreement that resulted in KSC's compliance with environmental regulations," Ivins told her.

Cartier is the lead design engineer on the Launch Control Center (LCC) air-handling unit and LCC and Vehicle Assembly Building low bay reheat coil replacement. He also was recognized for his work on the Apollo/Saturn V facility now being built at KSC. "In particular, your commitment to quality and your ability to make decisions have shown in your projects," Ivins told him.

Nelson, a secretary in the Facility Operations Office under the Installation Operations Directorate, was commended for her initiative and willingness to help others, and her volunteer duties such as Public Affairs support, property custodian, records control officer and leadership in the Stay-in-School Program. Ivins told Nelson that she serves "as an example for others in today's budgetary environment to do more with less."

Burns is a quality assurance specialist supervisor in the Safety, Reliability and Quality Assurance Directorate. She was commended for the role she played in coordination and preparation of experiments for the STS-58 Space Life Sciences-2 mission and the STS-65 International Microgravity Laboratory flight. "Your contributions to mission success, your knowledge of off-line processing procedures, and dedication to achieving excellence cannot be overstated," Thomas told her.

Bengoa, an experiment fluids engineer with the Payload Operations Directorate, was recognized for his efforts in developing programs to integrate the Labview Data Acquisition System into payload operations. "Your application of Labview on the International Microgravity Laboratory-2 payload for the Spacelab rack air flow balance operations reduced activity time in half," Thomas told him.

Snoopy, of the comic strip "Peanuts," has been the

unofficial mascot of NASA's astronaut corps since the earliest days of manned spaceflight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of manned spaceflight.

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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August 11, 1995

KSC Release No. 79-95

MIR-2 DOCKING MODULE TRANSFER TO NASA CEREMONY PLANNED AT KSC AUG. 14

The Russian-built MIR-2 Docking Module, the primary payload of the STS-74 mission, will be received by NASA in a ceremony to mark a transition to prepare it for integration with the Space Shuttle Atlantis. The event will be held on Monday, August 14 and will begin at 11:30 a.m. in the high bay of the Space Station Processing Facility in front of the docking module.

The primary objective of the STS-74 mission planned for late October is to dock the MIR-2 Docking Module to the Krystal Module on the MIR space station. The docking module will remain attached to the Krystal module to support all other orbiter dockings as well as potential Soyuz dockings. Two sets of solar arrays, mounted externally on top of the docking module, will later be attached to MIR by Russian cosmonauts. The Shuttle/MIR docking missions have the purpose of conducting microgravity and life science research, as well as engineering refurbishment and resupply of the MIR complex.

Speaking at the MIR-2 Docking Module Transfer to NASA Ceremony will be:

J.A. Thomas, Deputy Director, John F. Kennedy Space Center, NASA
John Conway, Director of Payload Operations, NASA-KSC
Valeri Grigoriev, Department Manager, Manned Flight Programs Directorate, Russian Space Agency
Viatcheslav Gavrilov, Manager of Ground Operations and Docking Module Processing, RSC Energia
Frank Culbertson, Phase I Program Deputy Director, NASA-JSC

At the conclusion of remarks, the official transfer document will be signed.

After the ceremony, media will have an opportunity to interview the participants and photograph the Russian MIR-2 Docking Module.

Media wishing to cover the event should be at the KSC News Center at 10:30 a.m. for transportation to the Space Station Processing Facility. Prior to entering the high bay photography equipment will require a wipe down with supplies which will be provided. Tripods must have rubber tips or otherwise will be confined to a riser. No clean room attire will be necessary, however, long pants and closed-toed shoes are required.

This event will be carried live on NASA Television starting at 11:30 a.m. NASA TV is on Spacenet 2, Transponder 5, Channel 9 located at 69 degrees West. Audio will also be available on the V circuits which may be dialed at 867-1220...1240...1260.

Media needing accreditation should contact the KSC News Center no later than 8:30 a.m. on Monday, Aug. 14.

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August 11, 1995

KSC Release No. 80-95

RADARSAT SPACECRAFT ARRIVES AT VANDENBERG AIR FORCE BASE, CA, FOR PLANNED SEPTEMBER LAUNCH

The Canadian Space Agency's RADARSAT spacecraft, to be launched by a Delta rocket in September, arrived at Vandenberg Air Force Base, CA, this week to begin final preparations for launch.

Carrying a powerful radar that can "see through" clouds and darkness, RADARSAT will produce high resolution images of the Earth's lands and oceans. Data from satellite images will be used for research and applications in oceanography, agriculture, forestry, hydrology and geology. Information on sea ice and terrestrial ice sheets will be used for climate studies and as a real-time aid for navigation of Arctic and Antarctic ocean waters, including iceberg surveillance.

RADARSAT is a cooperative program between the Canadian Space Agency, NASA and NOAA. The Canadian Space Agency built and will operate the satellite; NASA will furnish the launch. In exchange, U.S. government agencies will have access to all archived RADARSAT data and have approximately 15% of the satellite's observing time.

The National Oceanic and Atmospheric Administration will facilitate distribution of data to other U.S. government agencies and will make use of the data for its own environmental monitoring programs. Radarsat International, Inc. will be the commercial distributor of RADARSAT data worldwide. Lockheed Martin has distribution rights in the United States.

The Kennedy Space Center Vandenberg Resident Office is supporting the Canadian Space Agency with the facility and other ground support to prepare RADARSAT for launch. Among the activities included in prelaunch preparation are a spacecraft functional check, battery charging, leak check, fueling, and thermal blanket closeouts. It is scheduled to be taken to NASA's Space Launch Complex 2 on Sept. 12 for mating with the McDonnell Douglas Delta II rocket which is now on the launch pad. Liftoff is currently planned for Sept. 20.

The 7,000-pound RADARSAT spacecraft will be launched by the Delta II rocket into a 500-mile high polar orbit and is designed to collect data for three years. Processed and interpreted information will be available only a few hours after RADARSAT passes over an area.

The Kennedy Space Center is responsible for government oversight of the Delta II processing activities at Vandenberg Air Force Base, CA, integration of the RADARSAT spacecraft with the launch vehicle and launch countdown activities. The Goddard Space Flight Center is responsible for the launch services contract with McDonnell Douglas. The Jet Propulsion Laboratory and NOAA will provide early on-orbit tracking support of the RADARSAT spacecraft.

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August 17, 1995

KSC Release No. 81-95

Note to Editors:
KSC DIRECTOR OF SHUTTLE OPERATIONS TO MEET WITH LOCAL MEDIA

Robert B. Sieck, KSC Director of Shuttle Operations, will meet informally with the local media on Friday, Aug. 18 at 3:30 p.m. He will briefly discuss the repair work on Endeavour's solid rocket boosters which begins tomorrow at Pad 39-A. This event will be held in the KSC News Center auditorium and is primarily intended to answer questions by those reporters in attendance. This is not a briefing and will not be carried on NASA Television or associated audio circuits.

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August 22, 1995

KSC Release No. 83-95

Note to Editors/News Directors:
SPACE SHUTTLE MAIN ENGINE MANAGER TO INSPECT NEW ENGINE PUMP

Otto Goetz, deputy project manager for the Space Shuttle Main Engine, plans to conduct the first inspection of the new high pressure liquid oxidizer turbopump tomorrow at the Kennedy Space Center in Florida. The pump, built by Pratt and Whitney and incorporated into the Rocketdyne-built main engine, saw its first flight on July 13 on Space Shuttle mission STS-70.

Goetz will be available to answer questions from the media at the Main Engine Shop tomorrow following the pump inspection at 3 p.m.

The pump is incorporated into a new configuration main engine known as the Block I engine. Along with the new pump, the Block I engine has a new two-duct powerhead and single-coil heat exchanger.

The Block I improvements increase the safety margins and reliability of the Shuttle main engines which provide the second stage of propulsion in Space Shuttle flights.

Properly badged news media representatives must be at the Public Affairs trailer by 2:45 p.m. for transport to the Main Engine Shop.

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August 25, 1995

KSC Release No. 84-95

SPACE SHUTTLE MISSION STS-69 LAUNCH COUNTDOWN TO BEGIN MONDAY

The countdown for launch of the Space Shuttle Endeavour on mission STS-69 is scheduled to begin Monday, Aug. 28 at 3 p.m. EDT, 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 25 hours and 4 minutes of built-in hold time leading to the opening of the launch window at 11:04 a.m. (EDT) on Aug. 31. The launch window extends for 2 1/2 hours.

STS-69 is the fifth Space Shuttle mission for 1995. It will be the 9th flight of the Shuttle Endeavour and the 71st flight overall in NASA's Space Shuttle program.

The primary purpose of mission STS-69 is to deploy and retrieve the Wake Shield Facility-2 and the Spartan-201-03 free-flying payloads and to perform a spacewalk to practice for space station activities.

Endeavour was rolled out of Orbiter Processing Facility bay 1 on June 28 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39-A on July 5. Endeavour was returned to the VAB on August 1 as Hurricane Erin approached the east coast of Florida. Endeavour was rolled back out to Pad 39-A a week later on Aug. 8. Endeavour last flew in March of this year on mission STS-67.

Also, launch was delayed for about four weeks as engineers performed repair work on the solid rocket booster nozzles at the pad. Insulation material around the joints in the nozzles had to be removed and reinstalled using a different technique that prevents air voids from forming in the material. These voids were responsible for hot gas paths to the joints' O-ring seals in two previous Shuttle launches.

The STS-69 crew are: Commander David Walker, Pilot Ken Cockrell, and Mission Specialists James Voss, James Newman and Michael Gernhardt.

The crew is scheduled to arrive at KSC at about 12:30 p.m. Monday, Aug. 28. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

COUNTDOWN MILESTONES

Launch - 3 Days (Monday, Aug. 28)

* Prepare for the start of the STS-69 launch countdown
* Perform the call-to-stations. All Firing Room console operators report on station.
* 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 3 p.m. EDT at the T-43 hour mark
* Start preparations for servicing fuel cell storage tanks
* Begin final vehicle and facility close-outs for launch
* Begin stowage of flight crew equipment

Launch - 2 Days (Tuesday, Aug. 29)

* Load backup flight system software into Endeavour's general purpose computers
* Check out back-up flight systems
* Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
* Review flight software stored in mass memory units and display systems

Enter first planned built-in hold at T-27 hours for duration of four hours (7 a.m.)

* Clear launch pad of all personnel
* Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (11 a.m.)

* Begin the 8-hour operation to load cryogenic reactants into Endeavour's fuel cell storage tanks

Enter four-hour built-in hold at T-19 hours (7 p.m.)

* After cryogenic loading operations, re-open the pad
* Resume orbiter and ground support equipment close-outs
* Begin installation of mission specialists' seats in crew cabin

Resume countdown (11 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

Launch - 1 Day (Wednesday, Aug. 30)

* Activate flight controls and navigation systems
* Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 44 minutes (7 a.m.)

* Perform orbiter ascent switch list in crew cabin
* Install film in numerous cameras on the launch pad
* 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 at about 2:30 p.m.
* Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Resume countdown (8:44 p.m.)

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

Launch Day (Thursday, Aug. 31)

Enter planned one-hour built-in hold at the T-6 hour mark (1:44 a.m.)

* Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
* Clear pad of all personnel

Resume countdown (2:44 a.m.)

* Begin loading the external tank with cryogenic propellants (2:44 a.m.)
* Perform inertial measurement unit preflight calibration
* Align Merritt Island Launch Area (MILA) tracking antennas
* Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (5:44 a.m.)

Enter two-hour hold at T-3 hours (5:44 a.m.)

* Perform open loop test with Eastern Range
* Conduct gimbal profile checks of orbital maneuvering system engines
* Close-out crew and Final Inspection Team proceeds to Launch Pad 39-A

Resume countdown at T-3 hours (7:44 a.m.)

* Crew departs Operations and Checkout Building for pad 39-A (7:49 a.m.)
* Complete close-out preparations in the white room
* Check cockpit switch configurations
* Flight crew enters orbiter
* Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
* Close Endeavour's crew hatch
* 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 (10:24 a.m.)

* NASA Test Director conducts final launch team briefings

Resume countdown (10:34 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 final 10-minute hold at T-9 minutes (10:45 a.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 (10:55 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 MPS 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)
* Ignition of three Space Shuttle main engines (T-6.6 seconds)
* SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-69

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	7:00 a.m. Tuesday	11:00 a.m. Tuesday
T-19 hours	4 hours	7:00 p.m. Tuesday	11:00 p.m. Tuesday
T-11 hours	13 hours, 44 minutes	7:00 a.m. Wednesday	8:44 p.m. Wednesday
T-6 hours	1 hour	1:44 a.m. Thursday	2:44 a.m. Thursday
T-3 hours	2 hours	5:44 a.m. Thursday	7:44 a.m. Thursday
T-20 minutes	10 minutes	10:24 a.m. Thursday	10:34 a.m. Thursday
T-9 minutes	10 minutes	10:45 a.m. Thursday	10:55 a.m. Thursday

CREW FOR MISSION STS-69

David Walker	Commander (CDR)
Ken Cockrell	Pilot (PLT)
James Voss	Mission Specialist (MS1)
James Newman	Mission Specialist (MS2)
Michael Gernhardt	Mission Specialist (MS3)

SUMMARY OF STS-69 LAUNCH DAY CREW ACTIVITIES

Thursday, Aug. 31

	3:00 a.m.	Wake up
	3:30 a.m.	Breakfast
	4:00 a.m.	Free Time
*	6:39 a.m.	Crew Photo and Snack
	7:09 a.m.	Weather briefing (CDR, PLT, MS2)
	7:09 a.m.	Don flight equipment (MS1, MS3)
	7:19 a.m.	Don flight equipment (CDR, PLT, MS2)
*	7:30 a.m.	Crew suiting photo
*	7:49 a.m.	Depart for launch pad 39A
*	8:19 a.m.	Arrive at white room and begin ingress
*	9:34 a.m.	Close crew hatch
*	11:04 a.m.	Launch

* Televised events -- times may vary

August 25, 1995

KSC Release No. 85-95

Notice to Editors/News Directors:
EVENTS, NEWS CENTER HOURS OF OPERATION SET FOR MISSION STS-69

News conferences, events and operating hours for KSC's News Center have been set for the Aug. 31 launch of the Space Shuttle Endeavour on Mission STS-69. These events are scheduled to be carried live on NASA TV (please refer to the STS-69 mission TV schedule for exact times).

The five STS-69 crew members are scheduled to arrive at KSC on Monday, Aug. 28, at 12:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 11:30 a.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.

At 3 p.m. EDT Monday, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 11:04 a.m. EDT on Thursday, Aug. 31. The launch window is 2 1/2 hours long.

STS-69 BRIEFING SCHEDULE
(all times are in EDT and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Monday, Aug. 28
Countdown Status
Briefing----------9:00 a.m.
Bill Dowdell, Shuttle Test Director
Lesa Roe, STS-69 Payload Manager
Ed Priselac, Shuttle Weather Officer

STS-69 fight crew arrival (live on NASA TV)----------12:30 p.m.

Launch countdown begins---------- 3:00 p.m.

L-2 Days - Tuesday, Aug. 29
Countdown Status Briefing----------9:00 a.m.
Steve Altemus, NASA Test Director
Lesa Roe, STS-69 Payload Manager
Ed Priselac, Shuttle Weather Officer

L - 1 Day - Wednesday, Aug. 30

Pre-launch News Conference----------10:00 a.m.
(or immediately following the management team's meeting)

Tommy Holloway, NASA Shuttle Program Manager, Johnson Space Center
Gregory Reck, Deputy Associate Administrator for the Office of Space Access and Technology, NASA Headquarters
Dr. George Withbroe, Director Space Physics Division, Office of Space Science, NASA Headquarters
Bob Sieck, Director of Shuttle Operations, KSC
Capt. David Biggar, KSC Staff Weather Liaison

Replay of STS-69 crew and mission briefings----------1:00 p.m.

Launch Day - Thursday, Aug. 31

NASA Television live launch programming begins----------6:00 a.m.

Post-launch press conference----------L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program
James Harrington, KSC Launch Director

KSC News Center office hours for STS-69
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Monday, Aug. 28	8:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Tuesday, Aug. 29	7:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Aug. 30	7:00 a.m. - around-the-
(Launch day) Flight day 1, Thursday, Aug. 31	clock - 7:00 p.m.

Flight day 2, Friday, Sept. 1	8:00 a.m. - 4:30 p.m.
Flight day 3, Sept. 2	CLOSED
Flight day 4, Sept. 3 (Spartan Retrieval)	9:30 a.m. - 1:30 p.m.
Flight day 5, Labor Day, Sept. 4 (WSF Deploy)	5:00 a.m. - 1:30 p.m.
Flight days 6-9, Sept. 5-8	8:00 a.m. - 4:30 p.m.
Flight day 10, Sept. 9 (EVA)	3:30 a.m. - 12:30 p.m.
Flight day 11, Sept. 10	8:00 a.m. - 4:30 p.m.
Flight day 12, Landing Day, Sept. 11	4:30 a.m. - 4:30 p.m.

News media representatives may obtain STS-69 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Tuesday, Aug. 29	--	7:00 a.m. to 4:30 p.m.
Wednesday, Aug. 30	--	7:00 a.m. to 6:00 p.m.
Thursday, Aug. 31	--	7:00 a.m. to 10:00 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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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August 29, 1995

KSC Release No. 86-95

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-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-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather parameters 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 will not continue if the temperature exceeds 99 degrees for more than 30 consecutive minutes.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun, wind 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 (kts)	Relative Humidity 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, when the wind direction at the launch pad is between 300 degrees and 060 degrees, the highest wind allowable is 34 knots. When the wind direction is between 150 degrees and 200 degrees, the highest wind allowable is 20 knots. The peak allowable wind speeds are on a descending scale between the directions of 060 degrees and 150 degrees, and an ascending scale between 200 degrees and 300 degrees.

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.

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

Lightning (and electric fields with triggering potential):

- Tanking will not begin if lightning is observed within five nautical miles of the launch pad or is forecast to occur during the first hour of tanking.

- 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 occuring near the field mill which has been previously determined and documented to be benign is clearly causing the elevated readings.

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

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.

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 LANDING CRITERIA

Weather conditions for a landing also affect the launch criteria since the possibility exists for a Return To Launch Site abort (RTLS) at the Kennedy Space Center or for emergency landings at other off-site locations.

The landing criteria for the Trans-Oceanic Abort Sites (TAL), and the Abort Once Around (AOA) sites of Edwards Air Force Base, and White Sands Space Harbor are:

- Cloud coverage 5 tenths or less below 8,000 feet with a clear line of sight to the end of the runway.

- For AOA, 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.

- For RTLS and the 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.

- 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 RTLS, a ceiling of 5,000 feet and a visibility of 4 nautical miles or greater is required.

- Visibility for the TAL sites and AOA, 5 statute miles or greater where microwave landing system (MLS) instrument landing capability is available; otherwise 7 statute miles.

- Crosswind component for Return to Launch Site (RTLS) not to exceed 15 knots. For Abort Once Around (AOA) and Trans-Oceanic (TAL) contingency landing sites the night-time crosswind limit is 12 knots.

- Headwind not to exceed 25 knots

- Tailwind not to exceed 10 knots average, 15 knots peak

- Sun angle on final approach not within 10 degrees in azimuth and 0 to 20 degrees in elevation

KSC END OF MISSION LANDING WEATHER CRITERIA

At decision time for the deorbit burn 90 minutes before landing:

- The visibility must be observed and forecast to be 5 nautical miles or greater.

- Headwind not to exceed 25 knots

- Tailwind not to exceed 10 knots average, 15 knots peak

- The peak cross wind shall not be observed or forecast to exceed 15 knots, 12 knots at night. If the mission duration is greater than 12 days the limit is 12 knots, day or night.

- An observed or forecast cloud ceiling must be 10,000 feet or higher.

- Observed scattered cloud layers below 10,000 feet must not exceed 2/10 sky coverage.

- At a range of 30 nautical miles, vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles.

- The deorbit burn shall not occur if thunderstorm, lightning, or precipitation activity is observed or forecast within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be observed or forecast to 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.

WEATHER INSTRUMENTATION

The equipment used by the forecaster to develop the downrange and launch clearance forecast are:

-Radar: The color weather radar display is located at the Cape Canaveral Forecast Facility. The antenna is located on Patrick Air Force Base in Cocoa Beach. Echo returns and information about rain intensity and cloud tops may be observed up to a distance of 200 nautical miles. Also available to the Shuttle Weather Officer is a display of the National Weather Service doppler weather radar located in Melbourne.

-Field Mill Network: Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide a contour map of electric fields and lightning activity. This tool assists the forecaster in determining that the lightning avoidance criteria are met.

-Lightning Detection System: Plots cloud to ground lightning strikes within 125 miles of the Range Weather Facility.

-Lightning Detection And Ranging (LDAR): A new system developed by NASA undergoing evaluation, LDAR is a three dimensional system that plots intracloud, cloud to cloud and cloud to ground lightning with high demonstrated accuracy within 25 nautical miles but recording lightning events up to 100 nautical miles distant from Cape Canaveral.

-Rawinsonde: A balloon with a tethered instrument package which radios to the ground its altitude with weather data on temperature, dewpoint and humidity, wind speed and direction, and pressure. A rawinsonde may reach an altitude as high as 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.

-Rocketsonde: On L-1 day, a 12-foot-tall instrumented rocket is launched. It returns data on temperature, wind speed and direction, wind shear, pressure, and air density at the altitude region
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 in the Range Weather Facility by the GOES weather satellites, and also high resolution pictures from polar low earth orbiting spacecraft including both the NOAA polar orbiters and the Defense Meteorological Support Program (DMSP) satellites.

-Meteorological Interactive Data Display System (MIDDS): Integrates for the forecaster on a single visual display the satellite images, computer generated graphics of surface and upper air map features, and current weather observations. The system will also display or plot and contour various meteorological parameters, and can display any selected current National Weather Service radar picture.

-Wind towers: A total of 33 wind 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 sensors. The 60-foot wind towers at the launch pads and the 10-meter wind 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 and are used as a tool in short-term forecasting.

-Instrumented Weather Buoys: Anchored East-Northeast of Cape Canaveral, two meteorological buoys are stationed at distances of 25 nautical miles and 110 nautical miles. Offshore weather conditions may be influencing onshore weather. These ocean weather buoys relay hourly reports by satellite and are received at the Range Weather Facility. Measurements include air temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and the wave height with period.

-Solid Rocket Booster Retrieval Ships: These vessels radio observed weather conditions and sea state from the booster impact area located approximately 160 miles downrange.

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

NOTE: The launch weather forecast is prepared by the U.S. Air Force Range Weather Operations Facility at Cape Canaveral. The landing and RTLS forecast is prepared by the NOAA Space Flight Meteorology Group at the Johnson Space Center in Houston.

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September 1, 1995

KSC Release No. 87-95

Nptice to Editors/News Directors:
STS-69 EVENTS, NEWS CENTER HOURS OF OPERATION RESCHEDULED

News conferences, events and operating hours for KSC's News Center have been re-scheduled for the Sept. 7 launch of the Space Shuttle Endeavour on Mission STS-69. These events are scheduled to be carried live on NASA TV (please refer to the STS-69 mission TV schedule for exact times).

At 4 p.m. EDT Monday, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 11:09 a.m. EDT on Thursday, Sept. 7. The launch window is 2 1/2 hours long.

The five STS-69 crew members are scheduled to arrive at KSC on Tuesday, Sept. 5, at 4:30 p.m. EDT. News media representatives wishing to cover the event must be at the News Center by 3:30 p.m. Tuesday (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.

# # # #

NASA Television is carried on Spacenet 2, transponder 5, Channel 9, C-Band, located at 69 degrees West longitude, with horizontal polarization. Frequency is 3880 MHz with audio on 6.8 MHz.

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 at the KSC PAO Home Page at http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm.

STS-69 BRIEFING SCHEDULE
(all times are in EDT and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Monday, Sept. 4
(office closed in observance of Labor Day)

Launch countdown begins---------- 4:00 p.m.
(KSC codaphone, 867-2468, will be updated to reflect the start of the count)

L-2 Days - Tuesday, Sept. 5

Countdown Status Briefing---------- 9:00 a.m.
Bill Dowdell, Shuttle Test Director
Jeff Beyer, STS-69 Mission Operations Engineer
Ed Priselac, Shuttle Weather Officer

STS-69 fight crew arrival (will not be live on NASA TV)----------4:30 p.m.

L - 1 Day - Wednesday, Sept. 6

Countdown Status Briefing---------- 9:00 a.m.
John Stealey, NASA Test Director
Jeff Beyer, STS-69 Mission Operations Engineer
Ed Priselac, Shuttle Weather Officer

Launch Day - Thursday, Sept. 7

NASA Television live launch programming begins---------- 6:00 a.m.

Post-launch press conference---------- L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program
James Harrington, KSC Launch Director

KSC News Center office hours for STS-69
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Monday, Sept. 4	CLOSED
(Launch minus 2 days) Tuesday, Sept. 5	7:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Sept. 6	7:00 a.m. - around-the-

(Launch day) Flight day 1, Thursday, Sept. 7	clock - 7:00 p.m.
Flight day 2, Friday, Sept. 8	8:00 a.m. - 4:30 p.m.
Flight day 3, Sept. 9	CLOSED
Flight day 4, Sept. 10 (Spartan Retrieval)	9:30 a.m. - 1:30 p.m.
Flight day 5, Sept. 11 (WSF Deploy)	5:00 a.m. - 4:30 p.m.
Flight days 6-9, Sept. 12-15	8:00 a.m. - 4:30 p.m.
Flight day 10, Sept. 16 (EVA)	3:30 a.m. - 12:30 p.m.
Flight day 11, Sept. 17	8:00 a.m. - 4:30 p.m.
Flight day 12, Landing Day, Sept. 18	4:30 a.m. - 4:30 p.m.

News media representatives may obtain STS-69 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, Thursday, Sept. 7, from 7 a.m. to 10 a.m. If credentials are necessary prior to this time, news media representatives should call 867-2468 to make arrangements.

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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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September 12, 1995

KSC Release No. 88-95

Notice to Editors/News Directors:

KSC TO SUPPORT TEST OF WORLD'S LARGEST HELIUM BALLOON

A leak check test of the world's largest helium balloon will be performed on a cost-reimbursable basis in the Vehicle Assembly Building at Kennedy Space Center on Sept. 16-17. The balloon's pilot, Capt. Henk Brink of The Netherlands, hopes to complete the first non-stop flight around the world in the balloon, and requested NASA's help in preparing for his history-making trip. The VAB is the only building believed to be large enough to accommodate an indoor leak check on a balloon that is 200 feet (61 meters) tall when fully inflated.

Capt. Brink and his wife Evelien, who is the only woman to have crossed the Atlantic in a balloon, will be available for interviews with the news media during a photo/video opportunity inside the VAB at 12:30 p.m. on Saturday, Sept. 16. Testing of the helium balloon will be under way at this time. NASA Test Director Pete Nickolenko and Joe Porta, lead for Handling and Umbilicals in the Mechanical Ground Support Equipment Division of the Mechanical Engineering Directorate, will be available also to answer questions about NASA's support for the project.

The balloon is to arrive at the space center on Sept. 12, after being flown into Miami from The Netherlands and offloaded onto a truck for transport. Henk and a support team will be on hand to conduct the inflation and leak check of the balloon, scheduled to begin Sept. 15 and conclude Sept.17. For the purposes of the leak check test, the balloon will only be partially inflated to assure the proper clearances between the balloon and the VAB transfer aisle.

Properly badged news media interested in attending this event need to be at the News Center, Trailer 19, by 12:00 p.m., Sept. 16, for escort to the VAB. For more information, please contact Lisa Malone at the KSC News Center, 407 867-2468.

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September 8, 1995

KSC Release No. 89-95

Note to Editors/News Directors:

TCDT MEDIA OPPORTUNITY WITH STS-73 CREW SET FOR NEXT WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-73 on Monday, Sept. 11, during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

Media interested in speaking with the crew during this question and answer session at Pad 39-B, should be at the KSC Press Site by 7:30 a.m. Monday for transport to the pad.

Media interested in covering the event should contact the KSC Press Site to obtain the proper badge. Annual badges and STS-69 badges will be activated for this event.

The seven-member crew is scheduled to arrive at KSC's Shuttle Landing Facility on Sunday. No photo opportunity is available for crew arrival.

On Tuesday, the crew will depart their quarters at about 7:45 a.m. and begin to board the Shuttle Columbia at about 8:15 a.m. where they will remain through the end of the test. The mock countdown culminates with a simulated main engine cut-off at 11 a.m. Tuesday.

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 Sept. 28 on an extended duration flight lasting 16 days. The mission will feature activities involving the second flight of the U.S. Microgravity Laboratory.

Crew members for mission STS-73 are: Commander Ken Bowersox; Pilot Kent Rominger; Payload Commander Kathryn Thornton, Mission Specialists Catherine Coleman and Michael Lopez-Alegria, and Payload Specialists Fred Leslie and Albert Sacco.

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STS-73/Columbia
United States Microgravity Laboratory-2 (USML-2)

KSC Release No. 92-95
September 1995

Aqui esta la version para la Mision STS-73 Fact Sheet en Espanol.

Hier finden Sie den "STS-73 Fact Sheet" auf deutsch.

STS-73 LAUNCH DELAYS SUMMARY

During one of the longest scheduled Space Shuttle missions to date, the seven-member STS-73 flight crew will conduct scientific investigations with experiment facilities that make up the United States Microgravity Laboratory-2 (USML-2) primary payload. The 15-day, 22-hour mission will begin with the liftoff of the Space Shuttle Columbia from Launch Pad 39B at Kennedy Space Center into an orbit of 172 statute miles at an inclination of 39 degrees to the Earth's equator.

Once in orbit, Payload Commander Kathryn C. Thornton will activate the USML-2 Spacelab habitation long module and the onboard experiments. From then on, the crew will work around the clock, with the four-member Red Team taking the first 12-hour shift while the three-member Blue team begins their sleep period. The two teams will rotate work periods throughout the mission.

The STS-73 mission is scheduled to end when Columbia touches down at KSC's Shuttle Landing Facility.

The Crew
The STS-73 crew is made up of two space veterans and five first-timers. Mission Commander Kenneth D. Bowersox (Cdr., USN) is on his third space flight, having served as pilot on both STS-50 in 1992 and STS-61. Pilot Kent V. Rominger (Lt. Cdr., USN) has over 3,000 hours of flight time in 35 types of aircraft. Payload Commander Kathryn C. Thornton (Ph..D.) has served as mission specialist on three space flights; STS-33, STS-49 and STS-61. Mission Specialist Michael E. Lopez-Alegria (Lt. Cdr., USN) has been both an instructor and engineering test pilot. Mission Specialist Catherine G. "Cady" Coleman (Ph.D., Captain, USAF) has worked as a research chemist for the Air Force. Payload Specialist Albert Sacco Jr. (Ph.D.) is a principal investigator for the crystal growth experiments. Payload Specialist Fred W. Leslie (Ph.D.) is a co-investigator on the USML-2 Geophysical Fluid Flow Cell experiment.

The Mission
Throughout the flight, the crew will continue the microgravity research in fluid physics, combustion science, materials science and biotechnology that was conducted during the STS-50/USML-1 mission that lifted off from KSC in June 1992. Analyses of the data from that space flight has lead to new insights into the behavior of fluids, significant findings for research into spacecraft safety, new fundamental information on the role of gravity in the formation of material and protein crystals, and the demonstration of an important operational concept for materials science experiments on the international space station. The extended duration USML-2 mission will provide and opportunity to

validate this information and tohelp understand the effects of microgravity over a longer period of time.

The USML-2 experiments are designed to help lead to new discoveries in the fields of fluid physics, combustion science, materials science and biotechnology, as well as providing technology demonstrations to help develop the hardware necessary for future microgravity research. The experiments are housed in Spacelab racks and in the crew cabin middeck locker area.

Throughout the mission, telemetry data will be relayed from the instruments to NASA research personnel, as well as those from industry and academia, located at Marshall Space Flight Center's Spacelab Mission Operations Center in Huntsville, Ala. A new Hi-Pac video downlink system that is designed to increase the amount and quality of downlink video available to these scientists will make its first flight on this mission.

USML-2 Experiments
Spacelab USML-2 Payloads
The Surface Tension Driven Convection Experiment apparatus will be used to study basic fluid mechanics and the heat transfer of thermocapillary flows in the microgravity environment. These flows play an important role in many industrial and materials processing methods. In space, they also affect spacecraft fuel management and life support systems.

The Drop Physics Module (DPM) will be used for two experiments. The Drop Dynamics Experiment will gather data on the dynamics of liquid drops to provide information that could lead to containerless processing of materials and polymer encapsulation of living cells. The second experiment will examine the influence of surfactants on the behavior of drops.

The Geophysical Fluid Flow Cell Experiment will study how fluids move in microgravity to help researchers understand the large-scale fluid dynamics of planetary and stellar atmospheres. The four experiments to be conducted in the Crystal Growth Furnace (CGF) will involve the high- temperature growth of cadmium zinc telluride, mercury cadmium telluride, and gallium arsenide crystal semiconductor materials, as well as mercury zinc telluride alloy crystals.

The European Space Agency's Glovebox Facility is an enclosed transparent container that permits the crew to handle and manipulate materials through glove ports and allows the safe handling of hazardous materials. Seven Glovebox investigations, from a fluid flow to a particle dispersion experiment, will be conducted on this flight.

The Advanced Protein Crystallization Facility (ACPF) will use three methods of protein crystal growth and will house 15 investigations that will study crystal development. Several experiments will measure and record orbiter accelerations and vibrations in the microgravity environment, including the Space Acceleration Measurement System (SAMS), the Three Dimensional Microgravity Accelerometer (3DMA) and the Orbital Acceleration Research Experiment (OARE).

Middeck USML-2 Payloads
The Zeolite Crystal Growth (ZCG) furnace will process 38 zeolite sample containers during the mission to examine techniques to create large near-perfect crystals. Zeolite is used for the purification of fluids in life support systems, the petroleum refining process and in the waste management and biomedical fields.

The Single Locker Protein Crystal Growth experiment will process more than 800 protein samples stored in two types of crystal growth containers. The new container, the Diffusion-controlled Crystallization Appa-ratus for Microgravity (DCAM), uses a methodology that could lead to long- duration controlled crystal growth aboard the international space station.

The Commercial Protein Crystal Growth (CPCG) experiment will be housed in three middeck lockers. It is designed to grow large quantities of crystals of various proteins using the batch process method.

The Commercial Generic Bioprocessing Apparatus (CGBA) will house a variety of investigations in the areas of biomedical testing and drug development, ecological test systems and biomaterials products and processes. Many of the experiments could lead to advances in human medicine.

The Astroculture Facility will be used to conduct research on plant growth in microgravity. One goal will be to verify the effectiveness of the unit as an on-orbit plant growth system, while another will be to investigate the nature of starch accumulation in microgravity.

KSC Payload Processing
Payload integration of the USML-2 module began in January 1995 in the Operations and Checkout (O&C) Building. Final testing for the integrated module was completed on June 13. The payload was then transported to Orbiter Processing Facility (OPF) 3 to be installed in Columbia's payload bay July 10.

Because of the perishable nature of some of the USML-2 experiment materials, KSC payload engineers and technicians will be installing the samples into the module beginning at L-40 hours before liftoff. All middeck experiment materials will be installed starting at 22 hours before launch. This operation will be completed at L-19 hours.

Columbia's last mission was the STS-65/International Microgravity Laboratory-2 (IML-2), which lifted off July 8, 1994 and ended with a KSC landing on July 23. The orbiter was rolled out to Pad 39B on Aug. 28, 1995.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

September 22, 1995
KSC Contact: Bruce Buckingham
KSC Release No. 94-95

DISCOVERY SCHEDULED TO DEPART KSC FOR ORBITER MODIFICATIONS IN PALMDALE, CALIF.

The orbiter Discovery, NASA's most prolific spacefaring vehicle and a veteran of 21 Space Shuttle missions, will leave KSC on Sept. 26 for a scheduled period of orbiter modifications (OMDP).

Discovery will spend about nine months at Rockwell's Palmdale, Calif. Orbiter Modification Center, where about 100 modifications will be performed on the vehicle. The most extensive of these will be the installation of an external airlock (replacing the current airlock) to support international Space Station operations. Also, Discovery will be modified to accept a 5th set of onboard cryogenic tanks. This will enable the orbiter to remain in space several days beyond its current capability.

Other work includes thermal protection system repairs and replacements, installation of upgraded hardware for improved payload bay flood lighting, star-tracker shutter replacements and structural corrosion inspections.

This is Discovery's second OMDP. Its first was performed at KSC in 1992.

Discovery is scheduled to be rolled out of KSC's Orbiter Processing Facility bay 1 at about 5 a.m. Monday, Sept. 25 and towed to the Shuttle Landing Facility where it will be mated atop the 747 Shuttle Carrier Aircraft. Departure of the Orbiter/SCA is scheduled for about 7 a.m. Tuesday, Sept. 26.

Discovery's route to Palmdale will include a refueling stop at Ft. Worth Naval Air Station in Texas and an overnight stay at Salt Lake City International Airport in Utah. Discovery will then continue its ferry flight to California, arriving in Palmdale early Wednesday afternoon, Sept. 27. All ferry flight plans are subject to weather restrictions and alternate landing sites may be selected en route if necessary.

News media interested in viewing Discovery's departure from KSC should be at the KSC press site by 6 a.m. Tuesday for transport to the Shuttle Landing Facility.

Following this modification period, Discovery is scheduled to return to KSC in June 1996. Discovery's next flight, the second mission to service the Hubble Space Telescope, is targeted for launch in early 1997.

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September 22, 1995

KSC Release No. 95-95

Notice to Editors/News Directors:

EVENTS, NEWS CENTER HOURS OF OPERATION SET FOR MISSION STS-73

News conferences, events and operating hours for KSC's News Center have been set for the Sept. 28 launch of the Space Shuttle Columbia on Mission STS-73. These events are scheduled to be carried live on NASA TV (please refer to the STS-73 mission TV schedule for exact times).

At 4 a.m. EDT Monday, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 9:35 a.m. EDT on Thursday, Sept. 28. The launch window is 2 1/2 hours long.

The seven STS-73 crew members are scheduled to arrive at KSC on Monday, Sept. 25, at 8 a.m. EDT. News media representatives wishing to cover the event must be at the News Center by 7 a.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.

NASA Television is carried on Spacenet 2, transponder 5, Channel 9, C-Band, located at 69 degrees West longitude, with horizontal polarization. Frequency is 3880 MHz with audio on 6.8 MHz.

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 at the KSC PAO Home Page at http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm.

STS-73 BRIEFING SCHEDULE
(all times are in EDT and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Monday, Sept. 25
Launch countdown begins----------4:00 a.m.

STS-73 fight crew arrival (live on NASA TV)----------8:00 a.m.

Countdown Status Briefing----------9:00 a.m.
John Guidi, Shuttle Test Director
Glenn Snyder, STS-73 Payload Manager
John Weems, Shuttle Weather Officer

L-2 Days - Tuesday, Sept. 26
Countdown Status Briefing----------9:00 a.m.
John Stealey, NASA Test Director
Glenn Snyder, STS-73 Payload Manager
John Weems, Shuttle Weather Officer

L-1 Day - Wednesday, Sept. 27
Pre-launch News Conference----------10:00 a.m.
(or immediately following the management team's meeting)
Tommy Holloway, NASA Shuttle Program Manager, Johnson Space Center
Robert Rhome, Director, Microgravity Science and Applications Division, NASA Headquarters
Ed Gabris, Director, Space Processing Division, Office of Space Access and Technology, NASA Headquarters
Bob Sieck, Director of Shuttle Operations, KSC
Capt. David Biggar, KSC Staff Weather Liaison

Replay of STS-73 crew and science briefings----------1:00 p.m.

Launch Day - Thursday, Sept. 28
NASA Television live launch programming begins----------5:00 a.m.

Post-launch press conference----------L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program
James Harrington, KSC Launch Director

KSC News Center office hours for STS-73
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Monday, Sept. 25	6:30 a.m. - 4:30 p.m.
(Launch minus 2 days) Tuesday, Sept. 26	6:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Sept. 27	7:00 a.m. - around-the-
(Launch day) Flight day 1, Thursday, Sept. 28	clock - 7:00 p.m.
Flight day 2, Friday, Sept. 29	8:00 a.m. - 4:30 p.m.
Flight days 3-4, Sept. 30-Oct. 1	CLOSED
Flight days 5-9, Oct. 2-6	8:00 a.m. - 4:30 p.m.
Flight days 10-11, Oct. 7-8	CLOSED
Flight day 12, Oct. 9 (Columbus Day)	CLOSED
Flight days 13-16, Oct. 10-13	8:00 a.m. - 4:30 p.m.
Flight day 17, Landing Day, Oct. 14	4:00 a.m. - 4:30 p.m.

News media representatives may obtain STS-73 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Tuesday, Sept. 26	--	8:00 a.m. to 4:30 p.m.
Wednesday, Sept. 27	--	8:00 a.m. to 6:00 p.m.
Thursday, Sept. 28	--	4:30 a.m. to 8:30 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.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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September 22, 1995

KSC Release No. 96-95

SPACE SHUTTLE MISSION STS-73 LAUNCH COUNTDOWN TO BEGIN MONDAY

The countdown for launch of the Space Shuttle Columbia on mission STS-73 is scheduled to begin Monday, Sept. 25 at 4 a.m. EDT, 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 35 minutes of built-in hold time leading to the opening of the launch window at 9:35 a.m. (EDT) on Sept. 28. The launch window extends for 2 1/2 hours.

STS-73 is the sixth Space Shuttle mission for 1995. It will be the 18th flight of the Shuttle Columbia and the 72nd flight overall in NASA's Space Shuttle program.

The primary objective of mission STS-73 is to successfully perform the planned operations of the second U.S. Microgravity Laboratory. USML-2 experiments cover a variety of scientific disciplines including fluid physics, materials science, biotechnology and combustion science.

Columbia was rolled out of Orbiter Processing Facility bay 3 on Aug. 21 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39-B on Aug. 28.

This mission will be Columbia's first in over a year. Columbia was sent to Palmdale, Calif., for about six months where it underwent various structural inspections and modifications. It was returned to KSC on April 14. Columbia last flew in July 1994.

The STS-73 crew are: Commander Ken Bowersox, Pilot Kent Rominger, Mission Specialists Kathryn Thornton, Catherine Coleman and Michael Lopez-Alegria, and Payload Specialists Fred Leslie and Albert Sacco.

The crew is scheduled to arrive at KSC at about 8 a.m. Monday, Sept. 25. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

COUNTDOWN MILESTONES
All times Eastern
Launch - 3 Days (Monday, Sept. 25)

* Prepare for the start of the STS-73 launch countdown
* Perform the call-to-stations. All Firing Room console operators report on station.
* 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 4 a.m. EDT at the T-43 hour mark
* Start preparations for servicing fuel cell storage tanks
* Begin final vehicle and facility close-outs for launch
* Begin stowage of flight crew equipment
* Load backup flight system software into Columbia's general purpose computers
* Check out back-up flight systems
* Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
* Review flight software stored in mass memory units and display systems

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

* Clear launch pad of all personnel
* Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (12 midnight)

Launch - 2 Days (Tuesday, Sept. 26)

* Begin the 12-hour operation to load cryogenic reactants into Columbia's fuel cell storage tanks and Extended Duration Orbiter storage tanks.

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

* After cryogenic loading operations, re-open the pad
* Resume orbiter and ground support equipment close-outs
* Begin installation of mission specialists' seats in crew cabin

Resume countdown (4 p.m.)

* Activate spacelab and begin late stowage of spacelab equipment and experiments
* 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 flight controls and navigation systems
* Close-out the tail service masts on the mobile launcher platform
* Perform orbiter ascent switch list in crew cabin
* Install film in numerous cameras on the launch pad
* Activate the orbiter's communications systems
* Activate orbiter's inertial measurement units

Launch - 1 Day (Wednesday, Sept. 27)

Enter planned hold at T-11 hours for 19 hours, 15 minutes (12 midnight)

* Fill pad sound suppression system water tank
* Safety personnel conduct debris walkdown
* Move Rotating Service Structure (RSS) to the park position at about 2 p.m.
* Following the RSS move, continue final stowage of mid-deck experiments and flight crew equipment

Resume countdown (7:15 p.m.)

* Start fuel cell flow-through purge
* Install time critical flight crew equipment
* Perform pre-ingress switch list
* Activate the orbiter's fuel cells
* Configure communications at Mission Control in Houston for launch
* Activate the solid rocket booster’s joint heaters
* Clear the blast danger area of all non-essential personnel
* Switch Columbia's purge air to gaseous nitrogen
* Activate auxiliary power unit heaters

Launch Day (Thursday, Sept. 28)

Enter planned one-hour built-in hold at the T-6 hour mark (12:15 a.m.)

* Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
* Verify pad is clear of all personnel

Resume countdown (1:15 a.m.)

* Begin loading the external tank with cryogenic propellants (1:15 a.m.)
* Perform inertial measurement unit preflight calibration
* Align Merritt Island Launch Area (MILA) tracking antennas
* Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (4:15 a.m.)

Enter two-hour hold at T-3 hours (4:15 a.m.)

* Perform open loop test with Eastern Range
* Conduct gimbal profile checks of orbital maneuvering system engines
* Close-out crew and Final Inspection Team proceeds to Launch Pad 39-B

Resume countdown at T-3 hours (6:15 a.m.)

* Crew departs Operations and Checkout Building for Launch Pad 39-B (6:20 a.m.)
* Complete close-out preparations in the white room
* Check cockpit switch configurations
* Flight crew enters orbiter
* Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
* Close Columbia's crew hatch
* 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 (8:55 a.m.)

* NASA Test Director conducts final launch team briefings

Resume countdown (9:05 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 final 10-minute hold at T-9 minutes (9:16 a.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 (9:26 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 MPS 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)
* Ignition of three Space Shuttle main engines (T-6.6 seconds)
* SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-73

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	8:00 p.m. Monday	12 midnight Monday
T-19 hours	8 hours	8:00 a.m. Tuesday	4:00 p.m. Tuesday
T-11 hours	19 hours, 15 minutes	12:00 a.m. Wednesday	7:15 p.m. Wednesday
T-6 hours	1 hour	12:15 a.m. Thursday	1:15 a.m. Thursday
T-3 hours	2 hours	4:15 a.m. Thursday	6:15 a.m. Thursday
T-20 minutes	10 minutes	8:55 a.m. Thursday	9:05 a.m. Thursday
T-9 minutes	10 minutes	9:16 a.m. Thursday	9:26 a.m. Thursday

CREW FOR MISSION STS-73

Ken Bowersox	Commander (CDR)	Red Team
Kent Rominger	Pilot (PLT)	Red Team
Catherine Coleman	Mission Specialist (MS1)	Blue Team
Michael Lopez-Alegria	Mission Specialist (MS2)	Blue Team
Kathryn Thornton	Mission Specialist (MS3)	Red Team
Fred Leslie	Payload Specialist (PS1)	Blue Team
Albert Sacco	Payload Specialist (PS2)	Red Team

SUMMARY OF STS-73 LAUNCH DAY CREW ACTIVITIES

Wednesday, Sept. 27

7:00 p.m.	Wake up (Blue Team)
7:30 p.m.	Breakfast (Blue Team)

Thursday, Sept. 28

	12:30 a.m.	Lunch (Blue Team)
	4:00 a.m.	Wake up (Red Team)
*	5:10 a.m.	Breakfast/Dinner and Crew Photo
	5:40 a.m.	Weather briefing (CDR, PLT, MS2)
	5:40 a.m.	Don launch and entry suits (MS1, MS3, PS1, PS2)
	5:50 a.m.	Don launch and entry suits (CDR, PLT, MS2)
*	6:00 a.m.	Crew suiting photo
*	6:20 a.m.	Depart for Launch Pad 39B
*	6:50 a.m.	Arrive at white room and begin orbiter ingress
*	8:05 a.m.	Close crew hatch
*	9:35 a.m.	Launch

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

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September 26, 1995

KSC Release No. 97-95

Note to Editors/News Directors:

INTERIOR SECRETARY BABBITT TO LAUNCH EAGLE AT KSC SEPT. 27

Interior Secretary Bruce Babbitt is scheduled to visit the Kennedy Space Center on Wednesday, Sept. 27 to release an eagle as part of his continuing interest in the environment and the upcoming re-authorization of the Endangered Species Act.

Babbitt will be available by appointment for press interviews at the Merritt Island National Wildlife Refuge Visitor Center from 8:45 a.m. to 9:30 a.m. on Wednesday. At 9:30 a.m. those interested will be escorted to a 12-foot observation tower along the Black Point Wildlife Trail where Babbitt will release an immature eagle. Nicknamed "Merritt," the eagle was found in an emaciated condition by refuge officials in July. Since that time, the bird has been successfully treated by the Florida Audubon Society's Center for Birds of Prey. Babbitt will be available for press interviews after the eagle is released.

KSC Center Director Jay Honeycutt, KSC's Associate Director Al Parrish, a group of fifth graders from Oak Park Elementary School, Titusville, and members of the Florida Audubon Society will also be present for the eagle release.

News media representatives will be escorted to the refuge visitor center at 8:30 a.m. and at 9:30 a.m. from both the KSC Press Site and from KSC's outer gate on State Road 406 in Titusville.

Media representatives should call the KSC Newsroom at (407) 867-2468 for logistical information. STS-73 credentials will be valid for this event. Video tapes of this event will be available for the television media who are unable to attend.

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September 29, 1995

KSC Release No. 98-95

Notice to Editors/News Directors:

STS-73 EVENTS, NEWS CENTER HOURS OF OPERATION RESCHEDULED

News conferences, events and operating hours for KSC's News Center have been re-scheduled for the Oct. 5 launch of the Space Shuttle Columbia on Mission STS-73. These events are scheduled to be carried live on NASA TV unless otherwise noted (please refer to the STS-73 mission TV schedule for exact times).

With the successful completion of changing out the main fuel valve on Columbia's No. 1 main engine, the STS-73 launch countdown will begin at 4 a.m. EDT Monday at the T-43 hour mark. Launch is planned for 9:40 a.m. EDT on Thursday, Oct. 5. The launch window is 2 1/2 hours long.

The seven STS-73 crew members are scheduled to arrive at KSC on Monday, Oct. 2 at two different times. The red team consisting of Commander Ken Bowersox, Pilot Kent Rominger, Payload Commander Kathryn Thornton and Payload Specialist Albert Sacco are scheduled to arrive at 4 p.m. EDT at the Shuttle Landing Facility. Blue team members Mission Specialists Catherine Coleman and Michael Lopez-Alegria and Payload Specialist Fred Leslie are scheduled to arrive at 10:30 p.m. on Oct. 2.

There will be a photo opportunity of the red team's arrival, however, due to their late arrival time, there will be no photo opportunity of the blue team. News media representatives wishing to cover the red team must be at the News Center by 3 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.

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 at the KSC PAO Home Page at http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm.

STS-73 BRIEFING SCHEDULE
(all times are in EDT and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Monday, Oct. 2

Launch countdown begins----------4:00 a.m.
(KSC codaphone, 867-2525, will be updated to reflect the start of the count)

Countdown Status Briefing----------9:00 a.m.
John Guidi, Shuttle Test Director
Glenn Snyder, STS-73 Payload Manager
John Weems, Shuttle Weather Officer

STS-73 crew arrival (will not be carried live on NASA Television)--4:00 p.m. and 10:30 p.m.

L-2 Days - Tuesday, Oct. 3

Countdown Status Briefing----------9:00 a.m.
NASA Test Director
Glenn Snyder, STS-73 Payload Manager
John Weems, Shuttle Weather Officer

L - 1 Day - Wednesday, Oct. 4

Countdown Status Briefing----------9:00 a.m.
NASA Test Director
Glenn Snyder, STS-73 Payload Manager
John Weems, Shuttle Weather Officer

Launch Day - Thursday, Oct. 5

NASA Television live launch programming begins----------5:00 a.m.

Post-launch press conference----------L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program

James Harrington, KSC Launch Director

NASA Television is carried on Spacenet 2, transponder 5, Channel 9, C-Band, located at 69 degrees West longitude, with horizontal polarization. Frequency is 3880 MHz with audio on 6.8 MHz.

KSC News Center office hours for STS-73
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Monday, Oct. 2	8:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Tuesday, Oct. 3	8:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Wednesday, Oct. 4	7:00 a.m. - around-the-
(Launch day) Flight day 1, Thursday, Oct. 5	clock - 7:00 p.m.
Flight day 2, Friday, Oct. 6	8:00 a.m. - 4:30 p.m.
Flight days 3-4, Oct. 7 -8	CLOSED
Flight day 5, Oct. 9 (STS-74 pad rollout)	7:00 a.m. - 2:00 p.m.
Flight days 6-9, Oct. 10-13	8:00 a.m. - 4:30 p.m.
Flight day 10, Oct. 14 (Open House)	TBD
Flight day 11, Oct. 15	CLOSED
Flight days 12-16, Oct. 16-20	8:00 a.m. - 4:30 p.m.
Flight day 17, Landing Day, Oct. 21	4:30 a.m. - 4:30 p.m.

News media representatives may obtain STS-73 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Wednesday, Oct. 4 -- 12:30 p.m. - 4:30 p.m.
Thursday, Oct. 5 -- 4:30 a.m. - 8:30 a.m.

If credentials are necessary prior to this time, news media representatives should call 867-2468 to make arrangements

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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 2, 1995

KSC Release No. 99-95

SPACE SHUTTLE MISSION STS-73 LAUNCH COUNTDOWN AGAIN UNDERWAY

The countdown for launch of the Space Shuttle Columbia on mission STS-73 began today at 4 a.m. EDT, at the T-43 hour mark. This is the second launch attempt of Columbia on mission STS-73. It follows last week's launch scrub during tanking operations due to a leaking main fuel valve on main engine no. 1. The valve was successfully replaced at the pad, tested and checked for leaks over the weekend.

The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center. The countdown includes 34 hours and 40 minutes of built-in hold time leading to the opening of the launch window at 9:40 a.m. (EDT) on Oct. 5. The launch window extends for 2 1/2 hours.

STS-73 is the sixth Space Shuttle mission for 1995. It will be the 18th flight of the Shuttle Columbia and the 72nd flight overall in NASA's Space Shuttle program.

The primary objective of mission STS-73 is to successfully perform the planned operations of the second U.S. Microgravity Laboratory. USML-2 experiments cover a variety of scientific disciplines including fluid physics, materials science, biotechnology and combustion science.

Columbia was rolled out of Orbiter Processing Facility bay 3 on Aug. 21 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39-B on Aug. 28.

This mission will be Columbia's first in over a year. Columbia was sent to Palmdale, Calif., for about six months where it underwent various structural inspections and modifications. It was returned to KSC on April 14. Columbia last flew in July 1994.

The STS-73 crew are: Commander Ken Bowersox, Pilot Kent Rominger, Mission Specialists Kathryn Thornton, Catherine Coleman and Michael Lopez-Alegria, and Payload Specialists Fred Leslie and Albert Sacco.

The crew will arrive at KSC later this afternoon and tonight in two waves. The Red Team (Bowersox, Rominger, Thornton and Sacco) is scheduled to arrive at 4 p.m. The Blue Team (Coleman, Lopez-Alegria and Leslie) is scheduled to arrive at about 10:30 p.m. Their activities at KSC prior to launch will include equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

COUNTDOWN MILESTONES

All times Eastern
Launch - 3 Days (Monday, Oct. 2)

* Prepare for the start of the STS-73 launch countdown
* Perform the call-to-stations. All Firing Room console operators report on station.
* 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 4 a.m. EDT at the T-43 hour mark

* Start preparations for servicing fuel cell storage tanks
* Begin final vehicle and facility close-outs for launch
* Begin stowage of flight crew equipment
* Load backup flight system software into Columbia's general purpose computers
* Check out back-up flight systems
* Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
* Review flight software stored in mass memory units and display systems

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

* Clear launch pad of all personnel
* Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (12 midnight)

Launch - 2 Days (Tuesday, Oct. 3)

* Begin the 12-hour operation to load cryogenic reactants into Columbia's fuel cell storage tanks and Extended Duration Orbiter storage tanks.

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

* After cryogenic loading operations, re-open the pad
* Resume orbiter and ground support equipment close-outs
* Begin installation of mission specialists' seats in crew cabin

Resume countdown (4 p.m.)

* Activate spacelab and begin late stowage of spacelab equipment and experiments
* 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 flight controls and navigation systems
* Close-out the tail service masts on the mobile launcher platform
* Perform orbiter ascent switch list in crew cabin
* Install film in numerous cameras on the launch pad
* Activate the orbiter's communications systems
* Activate orbiter's inertial measurement units

Launch - 1 Day (Wednesday, Oct. 4)

Enter planned hold at T-11 hours for 19 hours, 20 minutes (12 midnight)

* Fill pad sound suppression system water tank
* Safety personnel conduct debris walkdown
* Move Rotating Service Structure (RSS) to the park position at about 2 p.m.
* Following the RSS move, continue final stowage of mid-deck experiments and flight crew equipment

Resume countdown (7:20 p.m.)

* Start fuel cell flow-through purge
* Install time critical flight crew equipment
* Perform pre-ingress switch list
* Activate the orbiter's fuel cells
* Configure communications at Mission Control in Houston for launch
* Activate the solid rocket booster’s joint heaters
* Clear the blast danger area of all non-essential personnel
* Switch Columbia's purge air to gaseous nitrogen
* Activate auxiliary power unit heaters

Launch Day (Thursday, Oct. 5)

Enter planned one-hour built-in hold at the T-6 hour mark (12:20 a.m.)

* Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
* Verify pad is clear of all personnel

Resume countdown (1:20 a.m.)

* Begin loading the external tank with cryogenic propellants (1:20 a.m.)
* Perform inertial measurement unit preflight calibration
* Align Merritt Island Launch Area (MILA) tracking antennas
* Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (4:20 a.m.)

Enter two-hour hold at T-3 hours (4:20 a.m.)

* Perform open loop test with Eastern Range
* Conduct gimbal profile checks of orbital maneuvering system engines
* Close-out crew and Final Inspection Team proceeds to Launch Pad 39-B

Resume countdown at T-3 hours (6:20 a.m.)

* Crew departs Operations and Checkout Building for Launch Pad 39-B (6:25 a.m.)
* Complete close-out preparations in the white room
* Check cockpit switch configurations
* Flight crew enters orbiter
* Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
* Close Columbia's crew hatch
* 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 (9:00 a.m.)

* NASA Test Director conducts final launch team briefings

Resume countdown (9:10 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 final 10-minute hold at T-9 minutes (9:21 a.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 (9:31 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 MPS 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)
* Ignition of three Space Shuttle main engines (T-6.6 seconds)
* SRB ignition and liftoff (T-0)

CREW FOR MISSION STS-73

Ken Bowersox	Commander (CDR)	Red Team
Kent Rominger	Pilot (PLT)	Red Team
Catherine Coleman	Mission Specialist (MS1)	Blue Team
Michael Lopez-Alegria	Mission Specialist (MS2)	Blue Team
Kathryn Thornton	Mission Specialist (MS3)	Red Team
Fred Leslie	Payload Specialist (PS1)	Blue Team
Albert Sacco	Payload Specialist (PS2)	Red Team

SUMMARY OF STS-73 LAUNCH DAY CREW ACTIVITIES

Wednesday, Oct. 4

7:00 p.m.	Wake up (Blue Team)
7:30 p.m.	Breakfast (Blue Team)

Thursday, Oct. 5

12:30 a.m.	Lunch (Blue Team)
4:00 a.m.	Wake up (Red Team)

*	5:15 a.m.	Breakfast/Dinner and Crew Photo
	5:45 a.m.	Weather briefing (CDR, PLT, MS2)
	5:45 a.m.	Don launch and entry suits (MS1, MS3, PS1, PS2)
	5:55 a.m.	Don launch and entry suits (CDR, PLT, MS2)
*	6:10 a.m.	Crew suiting photo
*	6:25 a.m.	Depart for Launch Pad 39B
*	6:55 a.m.	Arrive at white room and begin orbiter ingress
*	8:10 a.m.	Close crew hatch
*	9:40 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

October 4, 1995

KSC Release No. 100-95

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-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-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather parameters 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 will not continue if the temperature exceeds 99 degrees for more than 30 consecutive minutes.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun, wind 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 (kts)	Relative Humidity 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, when the wind direction at the launch pad is between 300 degrees and 060

degrees, the highest wind allowable is 34 knots. When the wind direction is between 150 degrees and 200 degrees, the highest wind allowable is 20 knots. The peak allowable wind speeds are on a descending scale between the directions of 060 degrees and 150 degrees, and an ascending scale between 200 degrees and 300 degrees.

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 lightning is observed within five nautical miles of the launch pad or is forecast to occur during the first hour of tanking.

- 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.

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

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.

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 LANDING CRITERIA

Weather conditions for a landing also affect the launch criteria since the possibility exists
for a Return To Launch Site abort (RTLS) at the Kennedy Space Center or for emergency landings at other off-site locations.

The landing criteria for the Trans-Oceanic Abort Sites (TAL), and the Abort Once Around (AOA) sites of Edwards Air Force Base, and White Sands Space Harbor are:

- Cloud coverage 5 tenths or less below 8,000 feet with a clear line of sight to the end of the runway.

- For AOA, 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.

- For RTLS and the 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.

- 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 RTLS, a ceiling of 5,000 feet and a visibility of 4 nautical miles or greater is required.

- Visibility for the TAL sites and AOA, 5 statute miles or greater where microwave landing system (MLS) instrument landing capability is available; otherwise 7 statute miles.

- Crosswind component for Return to Launch Site (RTLS) not to exceed 15 knots. For Abort Once Around (AOA) and Trans-Oceanic (TAL) contingency landing sites the night-time crosswind limit is 12 knots.

- Headwind not to exceed 25 knots

- Tailwind not to exceed 10 knots average, 15 knots peak

- Sun angle on final approach not within 10 degrees in azimuth and 0 to 20 degrees in elevation

KSC END OF MISSION LANDING WEATHER CRITERIA

At decision time for the deorbit burn 90 minutes before landing:

- The visibility must be observed and forecast to be 5 nautical miles or greater.

- Headwind not to exceed 25 knots

- Tailwind not to exceed 10 knots average, 15 knots peak

- The peak cross wind shall not be observed or forecast to exceed 15 knots, 12 knots at night. If
the mission duration is greater than 12 days the limit is 12 knots, day or night.

- An observed or forecast cloud ceiling must be 10,000 feet or higher.

- Observed scattered cloud layers below 10,000 feet must not exceed 2/10 sky coverage.

- At a range of 30 nautical miles, vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles.

- The deorbit burn shall not occur if thunderstorm, lightning, or precipitation activity is observed
or forecast within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be observed or forecast to 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.

WEATHER INSTRUMENTATION

The equipment used by the forecaster to develop the downrange and launch clearance forecast are:

-Radar: The color weather radar display is located at the Cape Canaveral Forecast Facility. The antenna is located on Patrick Air Force Base in Cocoa Beach. Echo returns and information about rain intensity and cloud tops may be observed up to a distance of 200 nautical miles. Also available to the Shuttle Weather Officer is a display of the National Weather Service doppler weather radar located in Melbourne.

-Field Mill Network: Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide a contour map of electric fields and lightning activity. This tool assists the forecaster in determining that the lightning avoidance criteria are met.

-Lightning Detection System: Plots cloud to ground lightning strikes within 125 miles of the Range Weather Facility.

-Lightning Detection And Ranging (LDAR): A new system developed by NASA undergoing evaluation, LDAR is a three dimensional system that plots intracloud, cloud to cloud and cloud to ground lightning with high demonstrated accuracy within 25 nautical miles but recording lightning events up to 100 nautical miles distant from Cape Canaveral.

-Rawinsonde: A balloon with a tethered instrument package which radios to the ground its altitude with weather data on temperature, dewpoint and humidity, wind speed and direction, and pressure. A rawinsonde may reach an altitude as high as 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.

-Rocketsonde: On L-1 day, a 12-foot-tall instrumented rocket is launched. It returns data on temperature, wind speed and direction, wind shear, pressure, and air density at the altitude region
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 in the Range Weather Facility by the GOES weather satellites, and also high resolution pictures from polar low earth orbiting spacecraft including both the NOAA polar orbiters and the Defense Meteorological Support Program (DMSP) satellites.

-Meteorological Interactive Data Display System (MIDDS): Integrates for the forecaster on a single visual display the satellite images, computer generated graphics of surface and upper air map features, and current weather observations. The system will also display or plot and contour various meteorological parameters, and can display any selected current National Weather Service radar picture.

-Wind towers: A total of 33 wind 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 sensors. The 60-foot wind towers at the launch pads and the 10-meter wind 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 and are used as a tool in short-term forecasting.

-Instrumented Weather Buoys: Anchored East-Northeast of Cape Canaveral, two meteorological buoys are stationed at distances of 25 nautical miles and 110 nautical miles. Offshore weather conditions may be influencing onshore weather. These ocean weather buoys relay hourly reports by satellite and are received at the Range Weather Facility. Measurements include air temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and the wave height with period.

-Solid Rocket Booster Retrieval Ships: These vessels radio observed weather conditions and sea state from the booster impact area located approximately 160 miles downrange.

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

NOTE: The launch weather forecast is prepared by the U.S. Air Force Range Weather Operations Facility at Cape Canaveral. The landing and RTLS forecast is prepared by the NOAA Space Flight Meteorology Group at the Johnson Space Center in Houston.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 5, 1995

KSC Release No. 101-95

Note to Editors/News Directors:
XTE MISSION SCIENCE BRIEFING/PHOTO OPPORTUNITY AT KSC OCT. 6

The launch of NASA's X-Ray Timing Explorer (XTE) will be the subject of a mission science briefing and a spacecraft photo opportunity at Kennedy Space Center starting at 1:30 p.m. Friday, Oct. 6. Briefing participants are:

Dr. Alan Bunner, chief, High Energy Astrophysics Office, NASA Headquarters
Dr. Rick Rothschild, principal investigator, University of California at San Diego
Dr. Richard Mushotzky, x-ray scientist, NASA Goddard Space Flight Center
Dr. Fred Lamb, astronomer, University of Illinois
Dale Schulz, XTE project manager, NASA Goddard Space Flight Center

The briefing will be carried on NASA Television which is on Spacenet 2, transponder 5, channel 9 located at 69 degrees West.

After the briefing, media who wish to see or photograph the satellite will be taken to NASA Spacecraft Hangar AO. Members of the spacecraft science and development team will be available for interviews.

Those media attending are requested to wear long pants and closed-toe shoes. Matches, lighters, tobacco products, food or pocket knives may not be taken into the cleanroom.

Launch of XTE will be aboard a McDonnell Douglas-built Delta II rocket from Pad A at Complex 17. Liftoff is currently targeted for mid-November.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 10, 1995

KSC Release No. 102-95

Notice to Editors/News Directors:
STS-73 EVENTS, NEWS CENTER HOURS OF OPERATION RESCHEDULED

News conferences, events and operating hours for KSC's News Center have been re-scheduled for the Oct. 14 launch of the Space Shuttle Columbia on Mission STS-73. These events are scheduled to be carried live on NASA TV unless otherwise noted (please refer to the STS-73 mission TV schedule for exact times).

With the successful completion of changing out and retesting the master events controller in Columbia's aft compartment, the STS-73 launch countdown will begin at 4 a.m. EDT Wednesday at the T-43 hour mark. Launch is planned for 9:46 a.m. EDT on Saturday, Oct. 14. The launch window is 2 1/2 hours long.

The seven STS-73 crew members are scheduled to arrive at KSC on Wednesday, Oct. 11 at two different times. The red team consisting of Commander Ken Bowersox, Pilot Kent Rominger, Payload Commander Kathryn Thornton and Payload Specialist Albert Sacco is scheduled to arrive at 4 p.m. EDT at the Shuttle Landing Facility. Blue team members Mission Specialists Catherine Coleman and Michael Lopez-Alegria and Payload Specialist Fred Leslie are scheduled to arrive at 10:30 p.m. that same day.

There will be a photo opportunity of the red team's arrival; however, due to their late arrival time, there will be no photo opportunity of the blue team. News media representatives wishing to cover the red team must be at the News Center by 3 p.m. Wednesday (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.

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 at the KSC PAO Home Page at http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm.

STS-73 BRIEFING SCHEDULE
(all times are in EDT and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Wednesday, Oct. 11

Launch countdown begins---------- 4:00 a.m.
(KSC codaphone, 867-2525, will be updated to reflect the start of the count)

Countdown Status Briefing---------- 9:00 a.m.
John Guidi, Shuttle Test Director
Joel Tumbolio, Shuttle Weather Officer

STS-73 crew arrival (will not be carried live on NASA Television)--4:00 p.m.
and 10:30 p.m.

L-2 Days - Thursday, Oct. 12

Countdown Status Briefing----------9:00 a.m.
Bill Dowdell, Shuttle Test Director
John Weems, Shuttle Weather Officer

L - 1 Day - Friday, Oct. 13

Countdown Status Briefing----------9:00 a.m.
Jeff Spaulding, NASA Test Director
John Weems, Shuttle Weather Officer

Launch Day - Saturday, Oct. 14

NASA Television live launch programming begins----------5:00 a.m.

Post-launch press conference----------L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program
James Harrington, KSC Launch Director

NASA Television is carried on Spacenet 2, transponder 5, Channel 9, C-Band, located at 69 degrees West longitude, with horizontal polarization. Frequency is 3880 MHz with audio on 6.8 MHz.

KSC News Center office hours for STS-73
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Wednesday, Oct. 11	8:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Thursday, Oct. 12	8:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Friday, Oct. 13	7 a.m. - around-the-
(Launch day) Flight day 1, Saturday, Oct. 14	clock - 7:00 p.m.

News media representatives may obtain STS-73 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, on Saturday, Oct. 14 from 4:30 a.m. to 8:45 a.m. If credentials are necessary prior to this time, news media representatives should call 867-2468 to make arrangements.

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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 12, 1995

KSC Release No. 104-95

Note to Editors/News Directors:
TCDT MEDIA OPPORTUNITY WITH STS-74 CREW SET FOR NEXT WEEK

News media representatives will have an opportunity to speak informally with and photograph the crew of Space Shuttle mission STS-74 on Tuesday, Oct. 17, during the Terminal Countdown Demonstration Test (TCDT) at Kennedy Space Center.

Media interested in speaking with the crew during this question and answer session at Pad 39A, should be at the KSC Press Site by 1:45 p.m. Tuesday for transport to the pad.

Media covering the event should contact the KSC Press Site to obtain the proper badge. Annual badges and STS-73 badges will be activated for this event.

The five-member crew is scheduled to arrive at KSC's Shuttle Landing Facility on Sunday. No photo opportunity is available for crew arrival.

On Wednesday, the crew will depart their quarters at about 7:45 a.m. and begin to board the Shuttle Atlantis at about 8:15 a.m. where they will remain through the end of the test. The mock countdown culminates with a simulated main engine cut-off at 11 a.m. Wednesday.

Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Atlantis is now targeted for launch as early as Nov. 1. If Columbia, on mission STS-73, launches as scheduled, Atlantis and mission STS-74 will be delayed about a week. Mission STS-74 will feature the second docking with Russia's Mir Space Station.

Crew members for mission STS-74 are: Commander Ken Cameron; Pilot James Halsell; and Mission Specialists Jerry Ross, William McArthur and Chris Hadfield.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 17, 1995

KSC Release No. 105-95

Notice to Editors/News Directors:
STS-73 EVENTS, NEWS CENTER HOURS OF OPERATION RESCHEDULED

An STS-73 launch countdown status briefing will be held on launch-minus-one-day, or Thursday, Oct. 19, at 9 a.m. EDT at the KSC Press Site auditorium. Participants include a Shuttle Test Director and a Shuttle Weather Officer. This will be live on NASA Television.

Launch is planned for 9:50 a.m. EDT on Friday, Oct. 20. The launch window is 2 1/2 hours long and extends until 12:20 p.m. EDT. NASA Television will carry live progamming of Mission STS-73 beginning at 5 a.m. EDT on the day of launch.

News Center office hours this week

(Launch minus 3 days) Tuesday, Oct. 17	8 a.m. - 4:30 p.m.
(Launch minus 2 days) Wednesday, Oct. 18	8 a.m. - 4:30 p.m.
(Launch minus 1 day) Thursday, Oct. 19	7 a.m. - around-the-clock - 7 p.m.
(Launch day) Flight day 1, Friday, Oct. 20	
Flight days 2-3, Oct. 21-22	CLOSED

News media badges

News media representatives with proper identification may obtain STS-73 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, on Friday, Oct. 20 from 5 a.m. to 9 a.m. If credentials are necessary prior to this time, news media representatives should call 867-2468 to make arrangements.

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 at the KSC PAO Home Page at http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm.

NASA Television is carried on Spacenet 2, transponder 5, Channel 9, C-Band, located at 69 degrees West longitude, with horizontal polarization. Frequency is 3880 MHz with audio on 6.8 MHz.

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STS-74/ATLANTIS
SHUTTLE/MIR MISSION-2:
DOCKING MODULE, SOLAR ARRAYS

KSC Release No. 106-95
October 1995

The U.S. Space Shuttle Atlantis will carry a new docking attachment and two solar arrays to the Russian Space Station Mir during Mission STS-74, the second of seven planned linkups between the two spacecraft.

Atlantis (OV-104) is set to lift off from Launch Pad 39A into a 196-245 statute mile orbit (315-394 kilometers) at a 51.6-degree inclination to the equator. The launch window is seven minutes long.

Atlantis' 15th flight is scheduled to conclude with a landing at the Kennedy Space Center. The planned mission duration is approximately eight days.

The Shuttle flights to Mir are part of the first phase of the international space station program. This multinational effort brings together the United States, Russia, member nations of the European Space Agency, Canada and Japan in a quest to establish a permanently inhabited orbiting laboratory. In addition to the Shuttle-Mir linkups, Phase I includes scientific research aboard Mir by the United States, an astronaut-cosmonaut exchange program between the two nations, re-supply to the nearly 10-year-old Mir to maintain its on-orbit capabilities, and joint planning and operations between the U.S. and Russian space programs that will help pave the way toward the multinational space station.

STS-74 crew
Heading up the five-member flight crew is Commander Kenneth D. Cameron (Col., USMC), who will be embarking on his third trip into space. Cameron flew his first mission as pilot on STS-37 in 1991, and served as commander on his second flight, STS-56, in 1993. He has participated in Phase I activities since early on, having been named the first director of operations-Russia in February 1994. Cameron spent time at the Russian cosmonaut training facility in Star City, and Mission Control in Kaliningrad, both outside Moscow. He oversaw U.S. astronaut training at Star City and worked with the Russian Space Agency on joint Shuttle/Mir flight operations and planning.

James D. Halsell Jr. (Lt. Col., USAF) is the STS-74 pilot. Selected as an astronaut in January 1990, he has flown in space once before, on STS-65 in 1994.

Three mission specialists are assigned to STS-74. William S. "Bill" McArthur Jr. (Lt. Col., USA) first flew on Mission STS-58 in 1993. He will serve as mission specialist 3. Spaceflight veteran Jerry L. Ross (Col., USAF) is making his fifth spaceflight, having previously flown on Missions STS 61-B, -27, -37 and -55. As mission specialist 2 on STS-74, he also is the flight engineer. Chris A. Hadfield (Maj., CAF), mission specialist 1, becomes the fourth Canadian to fly on the U.S. Shuttle, joining Marc Garneau (STS 41-G), Roberta Bondar (STS-42) and Steven MacLean (STS-52).

The mission
The primary payload of Mission STS-74 is the Russian-built Mir-2 Docking Module (DM), the first payload flight hardware to be received in the Space Station Processing Facility at KSC. The DM will be installed on Mir's Kristall module docking port -- the node to which the orbiter attaches -- to become a permanent extension to the station complex.

If the DM were not available, the Kristall module would have to be moved from its radial axis to the longitudinal axis every time the Shuttle docked in order to provide adequate clearance between the orbiter and Mir's existing solar panels. Locating the Kristall on the longitudinal axis is undesirable because this is a re-supply/crew module docking port, and because there are inherent risks in having to continually move the Kristall module back and forth.

The DM is a pressurized module about 7.2 feet wide (2.2 meters) and 15.4 feet (4.7 meters) long. RSC Energia built the DM under contract to the Russian Space Agency in agreement with NASA, and Rockwell Aerospace provided technical oversight.

The DM is launched in the aft section of Atlantis' payload bay. Installed in the forward area is the U.S./Russian-built Orbiter Docking System (ODS). The ODS served as the connection point between the orbiter and the Kristall module docking port during the STS-71 mission in June-July earlier this year. Rockwell Aerospace oversaw development of the ODS, with RSC Energia serving as a subcontractor. During the mission, the DM will first be attached to the ODS, then mated to the Kristall docking port.

Mounted on top of the ODS, either end of the DM and the Kristall docking node is the standard interface for Mir linkups, the Russian-designed Androgynous Peripheral Assembly (or Docking) System (APAS or APDS). The APDS also was built by RSC Energia; an earlier version supported the Apollo-Soyuz Test Project in 1975, and a similar mechanism will be used on the international space station.

Piggybacking a ride to Mir on the DM are two solar arrays which will eventually supply power to the station. One array was built as a cooperative project between the United States and Russia, combining proven Russian structures and mechanisms with advanced U.S. solar array modules. The second array is made of all Russian components. The arrays are stowed on either side of the DM, and will be removed and installed on Mir during a spacewalk to be completed sometime after STS-74. In addition to extending Mir's lifetime, the arrays also will support U.S. science and technology research on the station.

On Flight Day 3, the DM will be unberthed and installed on the ODS using the orbiter's Remote Manipulator Arm. A centerline camera will be installed to serve as the primary rendezvous/docking aid.

Atlantis will dock to Mir on Flight Day 4. During docked operations, supplies will be transferred from the orbiter to Mir, including drinking water, and experiment samples transferred from Mir to Atlantis for return to Earth. A ceremonial gift exchange between the Atlantis crew and Mir 20 Commander Yuri Gidzenko, Flight Engineer Sergei Avdeyev and cosmonaut Thomas Reiter of Germany also will take place.

Undocking will occur on Flight Day 7. The Shuttle crew will disconnect the ODS from the DM, leaving it permanently attached to the Kristall docking port. All future hookups between the Shuttle and Mir will be via the DM.

Additional payloads
Also flying in Atlantis' cargo bay is the IMAX Cargo Bay Camera (ICBC), a 65- mm color motion picture camera. The camera will be used to film the DM installation on the ODS, the Mir rendezvous, docking and separation burn.

Another payload located in the cargo bay is the Glow Experiment (GLO- 4)/Photogrammetric Appendage Structural Dynamics Experiment (PASDE) Payload (GPP). The GPP payload consists of a Hitchhiker carrier designed for side-mounting in the payload bay. The GLO-4 will make measurements of Shuttle glow phenomena, while the PASDE will record structural data from various Mir appendages during docking operations.

The crew will take advantage of the Shuttle Amateur Radio Experiment-II (SAREX-II) to talk to ham radio operators, including students, around the world.

KSC processing
Atlantis flew for the first time on Oct. 3, 1985, on STS 51-J. Atlantis completed its most recent trip, Mission STS-71, with a landing at KSC's Shuttle Landing Facility on July 7. Rollover to the Vehicle Assembly Building for mating with the external tank/twin solid rocket booster assembly took place on Oct. 3, and was followed by rollout to Pad 39A on Oct. 12.

The ODS was removed from Atlantis after STS-71 and taken to the offline Extended Duration Orbiter (EDO) Facility inside the Vehicle Assembly Building to be prepared for STS-74. Its protective thermal blankets were removed and most of its external electrical cabling taken off and replaced with new cables and a connector switchbox that will allow control of the APDS interfaces on the ODS as well as the DM.

In parallel with this work, the APDS from STS-71 was removed from the ODS. A new APDS was installed on the ODS outfitted with four umbilicals to provide power, control and telemetry to the DM and its APDS interfaces once the module is installed atop the ODS.

The DM arrived at KSC on June 7. Russian Space Agency and RSC Energia technicians completed offline preflight preparations in the Space Station Processing Facility before turning the module over to KSC on Aug. 14. After transport to the Operations and Checkout Building, the DM underwent Cargo Integration Test Equipment (CITE) stand testing to insure compatibility with orbiter interfaces. It was transferred to the Orbiter Processing Facility on Sept. 11 for installation in the payload bay of Atlantis. An electrical check called the Interface Verification Test (IVT) using ground support equipment cables was conducted in the OPF to insure a smooth interface between the ODS, DM and orbiter.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

October 27, 1995
KSC Release No. 107-95

RADARSAT LAUNCH ABOARD DELTA II ROCKET SET NOV. 3

The Canadian Space Agency's RADARSAT spacecraft is scheduled to be launched at 6:22 a.m. PST on Nov. 3 from NASA's Space Launch Complex 2 at Vandenberg Air Force Base, Calif. aboard a McDonnell Douglas Delta II rocket.

Carrying a powerful radar that can "see through" clouds and darkness, RADARSAT will produce high resolution images of the Earth's lands and oceans. Data from satellite images will be used for research and applications in oceanography, agriculture, forestry, hydrology and geology. Information on sea ice and terrestrial ice sheets will be used for climate studies and as a real-time aid for navigation of Arctic Ocean waters, including iceberg surveillance.

RADARSAT is a cooperative program between the Canadian Space Agency, NASA and the National Oceanic and Atmospheric Administration (NOAA). The Canadian Space Agency developed and will operate the satellite; NASA will furnish the Delta II launch. In exchange, U.S. government agencies will have access to all 6-month-old archived RADARSAT data and direct approximately 15 percent of the satellite's observing time. An important use of the data in the U.S. will be by the National Ice Center, operated collectively by NOAA, the Navy, and the U.S. Coast Guard to produce forecasts of sea ice and ice conditions on the Great Lakes and Chesapeake Bay.

RADARSAT will provide the first routine surveillance of the entire Arctic region by way of daily ice charts. The images can differentiate new ice from old ice and will make it easier to plot ship routes and enhance the safety of ships, operations at offshore oil exploration platforms and ocean research activities in the Arctic. In the Antarctic , RADARSAT will provide new data to create better maps of ice fields. The spacecraft can also detect changes in coastal erosion, detect shipping operations near shores, and pinpoint potentially productive fishing areas.

Urban planners will be able to chart the expansion or decline of urban areas and farmland. Data on the moisture content of soil can be used to determine developing drought patterns, forecast crop production, and determine the extent of flood damage or the impact of water diversion projects. Many of the world's rain forest areas, mountainous and coastal regions will be accurately mapped for the first time. By mapping the Earth's surface using radar, geological features can be used in the search for new mineral, oil and gas deposits.

RADARSAT data can assist oil spill clean-up operations by mapping the extent of marine oil spills and even be used to identify appropriate sites for hazardous waste disposal. Also the deterioration of forests caused by acid rain and other factors can be monitored. Maps of forests can be created to monitor the extent of clear-cutting over periods of time, and also the success of replanting operations.

RADARSAT, built by Spar Aerospace of Canada, weighs approximately 6,300 pounds, and with antenna and solar arrays fully deployed, spans 60 feet. The launch azimuth for the Delta rocket will be 196 degrees. After spacecraft separation, the spacecraft's orbital altitude will be 490 statute miles. The solar arrays are scheduled for deployment about 90 minutes after launch. Three days later the radar antenna will be deployed.

The RADARSAT spacecraft will operate in a near-polar sun synchronous orbit at an inclination of 98.6 degrees at an altitude of about 500 statute miles (approximately an 800 km circular orbit). This orbit has been chosen so that the

satellite crosses the equator at its local time of 6 a.m. and 6 p.m., which keeps it almost perpetually in the sun, thus enabling it to draw power continuously from its solar arrays. RADARSAT's orbit allows it to cover the Arctic daily, all of Canada every three days and the entire globe every four to five days.

Data will be downlinked to one of three tracking and data stations located at Gatineau, Quebec; Prince Albert, Saskatchewan; and Fairbanks, Alaska. There will be other stations around the world which will be licensed to receive RADARSAT data. NOAA will facilitate distribution of data to other U.S. government agencies and will make use of the data for its own environmental monitoring programs. Radarsat International, Inc. (RSI) will be the commercial distributor of RADARSAT data worldwide. Lockheed Martin, a partner in RSI, has distribution rights in the United States.

Also attached to the Delta II second stage is SURFSAT (Summer Undergraduate Research Fellowship Satellite). SURFSAT will be used as a test vehicle for NASA, supporting deep space communications research and training of tracking station personnel at the Jet Propulsion Laboratory's Deep Space Network.

RADARSAT and SURFSAT are being launched aboard Delta 229, a McDonnell Douglas Delta II launch vehicle model 7920-10 rocket. This is a two- stage expendable vehicle with nine strap-on solid rocket motors and a ten-foot payload fairing. The rocket is 125 feet tall and eight feet in diameter. The Delta first stage burns liquid oxygen and RP-1, a highly refined kerosene. The total thrust at liftoff is 789,420 pounds which is created by the first stage and six of the nine solid rocket motors. Three of the nine solid rocket motors will ignite at altitude during the first-stage burn. After first stage separation, the second stage ignites burning Aerozine-50 fuel and using nitrogen tetroxide as an oxidizer. Two separate burns by the Delta second stage will place RADARSAT in its proper orbit.

This launch marks the first use of the fully renovated and modified Space Launch Complex 2-West. The last launch from SLC-2W was the Cosmic Observation Background Explorer (COBE) which occurred almost six years ago on Nov. 18, 1989. First used by NASA for Delta launches starting in 1969, the launch pad mobile service structure and fixed umbilical tower have been raised approximately 12 feet to accommodate the longer length of the Delta II vehicle.

The Kennedy Space Center is responsible for government oversight of the Delta II processing activities at Vandenberg Air Force Base, integration of the RADARSAT spacecraft with the launch vehicle and launch countdown activities. The Kennedy Space Center is responsible for the launch and countdown activities. The Goddard Space Flight Center is responsible for the launch services contract with McDonnell Douglas. NOAA and the Jet Propulsion Laboratory will provide early on-orbit tracking support of the RADARSAT spacecraft.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 26, 1995
KSC Release No. 110-95

KSC AWARDS CONTRACT TO CLOSE SCHWARTZ ROAD LANDFILL

EA Engineering, Science and Technology Inc., with headquarters in Hunt Valley, Md., has been awarded a nearly $3.3 million fixed-price contract to close the Schwartz Road landfill at Kennedy Space Center.

The firm will have 240 days to complete the work, which includes the construction of stormwater management facilities, grading and landfill capping at the 64-acre site. The landfill is filled to capacity. Ten bids were submitted.

A new 59-acre landfill site has been prepared just east of the existing landfill. A management plan was developed for the new site, which is awaiting final permits before activation.

EA Engineering, Science and Technology Inc., provides engineering, scientific, analytical and remediation services. The company has offices in 16 states and in Mexico.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 26, 1995
KSC Release No. 111-95

KSC ENGINEERS RUNNER-UP FOR NASA SOFTWARE OF THE YEAR AWARD

James M. Dumoulin and Samuel M. Rushing were presented with cash awards for their role in the development of a software program that won runner-up for NASA's most prestigious software award. Dumoulin, chief engineer of the Payload Operations Information Systems Laboratory and Rushing, a former KSC software engineer, were both major contributors to the development of the WinVN program. The development of this software saved KSC between $500,000 and $1 million.

Other KSC employees recognized for their role as contributors to WinVN, were Don Gardner and Mike Downs who also received cash awards.

WinVN allows the exchange of technical information among a large group of users. KSC software engineers developed the program to expand the utility of the KSC Payload Operations Management System (PDMS), which supports Space Shuttle payload processing. WinVN is used to facilitate discussions about various technical and procedural issues between NASA centers and international partners.

An electronic discussion method was needed because persons dealing with these issues often worked different shifts or in different time zones. Instead of developing a KSC-unique solution, NASA software developers looked to a public domain computer program written by Mark Riordan, of Michigan State University.

Working with Riordan, and others around the world, Dumoulin and Rushing coordinated an open internet development effort to extend WinVN's features and release enhanced versions back into the public domain.

This public domain software, originally enhanced to meet the needs of KSC, is finding usefulness throughout the world in a variety of situations. Commercial interest has developed and the software program is now available in bookstores and on CD-ROM with more than 3 million copies currently in use. The WinVN program is used in personal computers worldwide, in hundreds of universities, the White House, the Pentagon and many other institutions. WinVN is available free by downloading from the internet.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 26, 1995
KSC Release No. 113-95

KSC HOSTS BUSINESS OPPORTUNITIES EXPO ON NOV. 14

Kennedy Space Center's Small Business Council invites all Florida firms to attend the sixth annual Business Opportunities Expo on Nov. 14 at Port Canaveral Cruise Terminal 5. The free event will be held from 9 a.m. to 3 p.m.

Approximately 200 exhibitors from across the Southeast will display their products and services, representing diverse capabilities ranging from computer technology to cryogenic equipment. Additionally, attendees will be able to talk with buyers and users from KSC's procurement and technical communities. A NASA contracting representative will be available to answer questions about the consolidation of Shuttle contracts.

This year's expo will feature a panel presentation for the first time. The question- and-answer forum, entitled "Florida Business and Its Future," will begin at 11 a.m. Panelists will include representatives from Enterprise Florida, Florida's Office of Planning and Budgeting, the Florida Chamber of Commerce, the East Central Florida Economic Development Council and the Florida Institute of Technology.

"Attending the Expo will be time well-spent," said Ann Watson, NASA/KSC small business specialist. "It's a chance for Florida firms to find teaming opportunities with about 200 exhibiting vendors, and to ask a panel of business experts about issues that will help Florida companies plan their future."

For more information, 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 27, 1995
KSC Release No. 114-95

Note to Editors/News Directors
RADARSAT/DELTA II ROCKET READY FOR LAUNCH NOV. 3

The launch of the Canadian Space Agency's Radarsat spacecraft aboard a McDonnell Douglas-built Delta II rocket is scheduled to occur from NASA's Space Launch Complex 2 at Vandenberg Air Force Base, Calif., on Friday, Nov. 3 at the opening of a one minute launch window which extends from 6:22 - 6:23 a.m. PST. The spacecraft was mated atop the Delta II rocket yesterday, Oct. 25.

RADARSAT is a cooperative program between the Canadian Space Agency, NASA and the National Oceanic and Atmospheric Administration (NOAA). Carrying a powerful radar that can "see through" clouds and darkness, RADARSAT will produce high resolution images of the Earth's lands and oceans. Data from satellite images will be used for research and applications in oceanography, agriculture, forestry, hydrology and geology. Information on sea ice and terrestrial ice sheets will be used for climate studies and as an aid for navigation of Arctic and Antarctic Ocean waters, including iceberg surveillance.

The Canadian Space Agency developed and will operate the satellite; NASA will furnish launch services. In exchange, the United States will have access to archived data and direct approximately 15 per cent of the satellite's observing time. NOAA will use the data for environmental monitoring programs and also facilitate data distribution to other U.S. government agencies. RADARSAT International, Inc. (RSI) will be the commercial distributor of the data worldwide. Lockheed Martin, as a partner in RSI, has distribution rights in the United States.

Canadian media desiring to cover the launch at Vandenberg Air Force Base and related Delta/RADARSAT media activities, who have not already submitted a request for accreditation, should immediately do so by contacting the Canadian Space Agency. Requests should be made to:

Canadian Space Agency
Attention: Lynn Blenkhorn
Telephone: 514/926-4349
Fax: 514/926-4352

U.S. media desiring accreditation information should contact the Air Force at:

Public Affairs Office
Vandenberg Air Force Base
Telephone: 805/734-8232, Ext. 63595
FAX: 805/734-8232, Ext. 68303
E-mail: pubaffairs@plans.vafb.af.mil

Delta/RADARSAT access badges will be issued upon entry to Vandenberg Air Force Base and will be valid for the prelaunch news conference and activities on L-1 day and also on launch day.

The prelaunch news conference will be held on Thursday, Nov. 2 at 11 a.m. PST in the main conference room of the NASA Vandenberg Resident Office, Building 840, Vandenberg Air Force Base, Calif. Participants will be:

Floyd Currington, NASA Launch Manager, Kennedy Space Center
Don Miller, NASA Launch Vehicle Manager, Goddard Space Flight Center
Robert Warren, RADARSAT Spacecraft Manager, Canadian Space Agency
Capt. John Shattuck, USAF Launch Weather Officer, Vandenberg AFB

The news conference will be carried on NASA Television.

Media desiring to cover the prelaunch news conference should meet at the south gate of Vandenberg Air Force Base on California State Road 246 at 10:30 a.m. and will be escorted to the NASA Vandenberg Resident Office located on south Vandenberg Air Force Base.

After the briefing, those wishing to do so will be taken to Space Launch Complex 2 for a tour of the facility. NASA and McDonnell Douglas spokespeople will be on hand to discuss the renovation of Space Launch Complex 2 to support future government and commercial launches of the Delta II rocket. Also, those photographers desiring to set up remote cameras near the pad will be able to do so at this opportunity.

On launch day, media covering the Delta/RADARSAT launch should be at the south gate at 5 a.m. to be escorted to the press site located on north Vandenberg Air Force Base.

Television coverage of the Delta/RADARSAT launch on NASA Television will begin at 5 a.m. PST and continue through spacecraft separation.

A post-launch news conference will be held at 9:00 a.m. PST in the main conference room of the NASA Vandenberg Resident Office and will be carried on NASA Television. Those wishing to attend will be escorted from the press site to the news conference location. Those wishing to leave will be escorted to the gate.

NASA Television is carried on Spacenet 2, transponder 5, channel 9 located at 69 degrees West. Audio only will be available on the V-3 circuit which may be reached by dialing 407/867-1260.

The Delta/RADARSAT News Center will be staffed starting Wednesday, Nov. 1 and may be reached at 700/785-3051. A recorded status report will also be available by dialing 700/785-3456.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

October 26, 1995
KSC Release No. 115-95

KENNY AGUILAR RECEIVES KENNEDY SPACE CENTER DIRECTOR'S AWARD

Kenny E. Aguilar, assistant personnel officer and chief, policy and special programs branch in the Kennedy Space Center Administration Office was recently named as the 1995 recipient of the Director's Award, the highest and most prestigious award available at the Center.

The award is granted at the discretion of the center director to a KSC civil service employee who has accomplished a job-related task of such magnitude and merit as to deserve recognition. Only one award is presented each year.

Aguilar's was recognized for his accomplishments in a number of areas, including KSC union/management relations, promotion of a positive and motivating work environment, and increasing the quality and diversity of the KSC workforce.

Prior to Aguilar accepting a transfer to KSC in 1993, he held a number of other positions for NASA at Lewis Research Center. Among those positions were the deputy personnel director and Equal Opportunity Officer. Aguilar has been a NASA employee since 1979 and assumed his present duties in April 1994.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 1, 1995
KSC Release No. 116-95

Note to Editors/News Directors:
DELTA/RADARSAT RESCHEDULED FOR SATURDAY, NOV. 4 AT 6:22 A.M. PST

The launch of Delta/RADARSAT for the Canadian Space Agency has been rescheduled by 24 hours. Additional time is necessary to complete the installation of the redesigned umbilical fairings located between the Delta first stage and the nine solid rocket boosters.

All media and NASA Television activities are being rescheduled accordingly. The pre-launch news conference will begin at 12 noon on Friday, Nov. 3. Media covering the event should meet at the South Gate of Vandenberg AFB at 11:30 a.m. Following the pre-launch news conference media will be taken to Space Launch Complex 2 as planned.

On launch day, coverage will begin on NASA Television at 5 a.m. PST, Saturday, Nov. 4. The post-launch news conference will begin 11 a.m. PST.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 3, 1995
KSC Release No. 117-95

COLUMBIA SCHEDULED TO LAND AT KSC

The orbiter Columbia is scheduled to land at Kennedy Space Center on Sunday, Nov. 5 at 6:45 a.m. EST, completing its STS-73 mission which was launched from KSC on Oct. 20.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 255 at the mission elapsed time of 15 days, 21 hours, 52 minutes. The deorbit burn will occur at about 5:46 a.m. Sunday.

There is one later KSC landing opportunity on Sunday at 8:19 a.m. In the event a landing is not possible at KSC on Sunday due to weather concerns, no landing attempt is expected to be made at Edwards Air Force Base, Calif. On Monday, two landing opportunities are available at KSC and one at Edwards.

KSC Monday landing times are: 6:50 a.m. and 8:24 a.m. EST.

EAFB Monday landing time is: 9:50 a.m. EST.

The landing of Columbia will mark the 26th landing at KSC in the history of Space Shuttle flight. It will be the fifth KSC landing this year.

About six to seven hours after landing, 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 egress the vehicle and doff 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 Oct. 20. 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, undergo a physical examination and prepare to depart for the skid strip at Cape Canaveral Air Station for their trip back to JSC.

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 4 hours, 30 minutes after Columbia lands at KSC, time critical experiments in the spacelab will be destowed while Columbia remains on the runway. Then about 6 hours, 30 minutes after touchdown, the orbiter will be towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Preparations will then begin for Columbia’s next mission, STS- 75, currently scheduled for launch in February 1996.

NOTICE TO EDITORS: Media wishing to view Columbia's landing should be at the KSC press site between 4 - 5:30 a.m. Sunday 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

November 3, 1995
KSC Release No. 118-95
Note to Editors/News Directors:

KSC NEWS CENTER HOURS OF OPERATION FOR LANDING OPERATIONS

The orbiter Columbia is scheduled to land at Kennedy Space Center on Sunday, Nov. 5. The two KSC landing opportunities on Sunday are at 6:45 a.m. and 8:19 a.m. EST.

To support Sunday's landing attempt, the KSC News Center will open at 4 a.m. Sunday and close following the astronaut post-landing press conference, which is scheduled to occur about six to seven hours after touchdown.

Also, the office will be open on Saturday, Nov. 4, from 9 a.m. to 3 p.m.

Media wishing to view Columbia's landing should be at the KSC press site between 4-5:30 a.m. Sunday for transport to the Shuttle Landing Facility.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 7, 1995
KSC Release No. 119-95
Notice to Editors/News Directors:

MISSION STS-74 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Nov. 11 launch of the Space Shuttle Atlantis on Mission STS-74, the last launch of the calendar year. These events are scheduled to be carried live on NASA TV (please refer to the STS-74 TV schedule for exact times).

At 7 a.m. EST Wednesday, the launch countdown will begin at the T-43-hour mark. Launch is currently set for 7:56 a.m. EST on Saturday, Nov. 11. The launch window is approximately 7 minutes long.

The five STS-74 crew members who will be launched aboard Atlantis are scheduled to arrive at KSC on Wednesday, Nov. 8, at 11 a.m. EST. News media representatives wishing to cover the event must be at the News Center by 10 a.m. Wednesday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility. This event will be carried live on NASA Television. News media representatives needing credentials for crew arrival should call the News Center at 867-2468 to make arrangements.

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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 at the KSC PAO Home Page at http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm

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STS-74 BRIEFING SCHEDULE
(all times are in EST and conferences are held inside the KSC Press Site auditorium)

L-3 Days - Wednesday,  Nov. 8
Launch countdown begins------------------------------------------ 7:00 a.m.

Countdown Status Briefing----------------------------------------- 9:00 a.m.
Bill Dowdell, Shuttle Test Director
Lesa Roe, STS-74 Payload Manager
Ed Priselac, Shuttle Weather Officer

STS-74 fight crew arrival (live on NASA TV)----------------------- 11:00 a.m.

L-2 Days - Thursday, Nov. 9
Countdown Status Briefing----------------------------------------- 9:00 a.m.
John Stealey, NASA Test Director
Lesa Roe, STS-74 Payload Manager
Ed Priselac, Shuttle Weather Officer

L - 1 Day - Friday, Nov. 10

Space Station News Conference------------------------------------- 9:00 a.m.
Wil Trafton, Director International Space Station, NASA Headquarters
Doug Stone, Vice President of International Space Station, Boeing Defense & Space Group

Pre-launch News Conference---------------------------------------- 10:00 a.m.
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(or immediately following the management team's meeting)

Tommy Holloway, NASA Shuttle Program Manager, Johnson Space Center
Frank Culbertson, Acting Director, Phase One Program, Johnson Space Center
Yuriy Sememov, President, RSC Energia
Valeriy Ryumin, Vice-President Phase One Program, RSC Energia
Dr. Harry Holloway, Associate Administrator, Life and Microgravity Sciences, NASA Hq.
Dr. Steve MacLean, Director General of the Astronaut Program, Canadian Space Agency
Bob Sieck, Director of Shuttle Operations, KSC
Capt. Scot Heckman, KSC Staff Weather Liaison (Note: the spelling Scot is correct)

Replay of STS-74 crew, mission briefings ------------------------------ TBD

Launch Day - Saturday, Nov. 11

NASA Television live launch programming begins------------------- 2:30 a.m.

Post-launch press conference------------------------------------ L + 1 hour
Loren Shriver, manager of Launch Integration for the Space Shuttle Program
James Harrington, KSC Launch Director

NASA Television is carried on Spacenet 2, transponder 5, channel 9, C-band, located at 69 degrees West longitude, with horizontal polarization. Frequency is 3880 MHz with audio on 6.8 MHz.

KSC News Center office hours for STS-74
(hours may be adjusted for in-flight events)

(Launch minus 3 days) Wednesday, Nov. 8	7:00 a.m. - 4:30 p.m.
(Launch minus 2 days) Thursday, Nov. 9	8:00 a.m. - 4:30 p.m.
(Launch minus 1 day) Friday, Nov. 10	7:00 a.m. - around-the-
(Launch day) Flight day 1, Saturday, Nov. 11	clock - 4:30 p.m.
Flight Day 2, Sunday, Nov. 12	CLOSED
Flight day 3, Monday, Nov. 13 (module installation)	12:00 a.m. - 4:30 p.m.
Flight day 4, Tuesday, Nov. 14 (Atlantis docks to Mir)	12:00 a.m. - 4:30 p.m.
Flight day 5, Wednesday, Nov. 15 (Gift exchange)	6:00 a.m. - 4:30 p.m.
Flight day 6, Thursday, Nov. 16	8:00 a.m. - 4:30 p.m.
Flight day 7, Friday, Nov. 17 (Undocking)	12:00 a.m. - 4:30 p.m.
Flight day 8, Saturday, Nov. 18	9:00 a.m. - 2:00 p.m.
Flight day 9, Sunday, Nov. 19 (Landing)	10:00 a.m. - 9:00 p.m.

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

News media representatives may obtain STS-74 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Thursday, Nov. 9 -- 8:00 a.m. to 4:30 p.m.
Friday, Nov. 10 -- 8:00 a.m. to 4:30 p.m.
Saturday, Nov. 11 -- 4:00 a.m. to 7:00 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. IN ADDITION, NEWS MEDIA ARE ALLOWED ON CENTER ONLY WHEN THE NEWS CENTER IS OPEN.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 7, 1995
KSC Release No. 121-95

SPACE SHUTTLE MISSION STS-74 LAUNCH COUNTDOWN TO BEGIN NOV. 8

NASA will begin the countdown for launch of Space Shuttle Atlantis on the second mission to dock with Russia's space station Mir on Wednesday, Nov. 8 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 29 hours and 56 minutes of built-in hold time leading to the opening of the launch window at about 7:56 a.m. (EST) on Nov. 11. The launch window extends for about seven 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 seven minute 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 added to the normal 10 minute built-in hold at T-9 minutes. Also, tanking is scheduled to begin about 30 minutes earlier than usual.

STS-74 is the seventh and final mission scheduled for 1995. This will be the 15th flight of the Shuttle Atlantis and the 73rd flight overall in NASA's Space Shuttle program.

Atlantis was rolled out of Orbiter Processing Facility bay 2 on Oct. 3 and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was then transported to Pad 39A on Oct. 12. Atlantis last flew on the first Shuttle/Mir docking flight in June/July 1995.

Atlantis will carry into orbit a five member crew. No Russian cosmonauts will be flown on this mission nor will any crew members be changed out as was the case on the first docking mission.

The crew of Atlantis will carry additional supplies for the Mir crew and two new solar arrays for installation on the Russian space station. Also, located in the orbiter's payload bay is the Mir Docking Module. This module will be permanently attached to Mir during this flight and used for future docking missions.

The STS-74 crew are: Commander Ken Cameron; Pilot James Halsell; and Mission Specialists Jerry Ross, William McArthur and Chris Hadfield.

The STS-74 crew are scheduled to arrive at KSC at about 11 a.m. Wednesday, Nov. 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 7:56 a.m. The exact launch time will be adjusted at the T-9 minute hold.)

COUNTDOWN MILESTONES
*all times are Eastern

Launch - 3 Days (Wednesday, Nov. 8)

¨ Prepare for the start of the STS-74 launch countdown
¨ Perform the call-to-stations (6:30 a.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 (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 (Thursday, Nov. 9)

¨ 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 the eight-hour operation to load cryogenic reactants into Atlantis' fuel cell storage tanks (3-11 a.m.)

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

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

Resume countdown (7 p.m.)

¨ Start final preparations of the Shuttle's three main engines for main propellant tanking and flight

Launch -1 Day (Friday, Nov. 10)

¨ Activate 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, 6 minutes (3 a.m.)

¨ Perform orbiter ascent switch list in crew cabin
¨ Install film in numerous cameras on the launch pad
¨ 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 (1:30 p.m.)
¨ Following the RSS move, begin final stowage of mid-deck experiments and flight crew equipment

Resume countdown (4:06 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 (9:06 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 10:36 p.m.)

Resume countdown (11:06 p.m.)

Launch Day (Saturday, Nov. 11)

¨ Perform inertial measurement unit preflight calibration
¨ Align Merritt Island Launch Area (MILA) tracking antennas
¨ Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 1:30 a.m.)
¨ Perform open loop test with Eastern Range
¨ Conduct gimbal profile checks of orbital maneuvering system engines

Enter two-hour hold at T-3 hours (2:06 a.m.)

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

Resume countdown at T-3 hours (4:06 a.m.)

¨ Crew departs Operations and Checkout Building for the pad (about 4 a.m.)
¨ Complete close-out preparations in the white room
¨ Check cockpit switch configurations
¨ Flight crew begins entry into the orbiter (about 4:40 a.m.)
¨ Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
¨ Close Atlantis' crew hatch
¨ 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 (6:46 a.m.)

¨ NASA Test Director conducts final launch team briefings

Resume countdown (6:56 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 (7:07 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 will likely vary.)

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

Resume countdown at T-9 minutes (7:47 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 MPS 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-74

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	11:00 p.m. Wed.	3:00 a.m. Thurs.
T-19 hours	8 hours	11:00 a.m. Thurs.	7:00 p.m. Thurs.
T-11 hours	13 hours, 6 minutes	3:00 a.m. Fri.	4:06 p.m. Fri.
T-6 hours	2 hours	9:06 p.m. Fri.	11:06 p.m. Fri.
T-3 hours	2 hours	2:06 a.m. Sat.	4:06 a.m. Sat.
T-20 minutes	10 minutes	6:46 a.m. Sat.	6:56 a.m. Sat.
T-9 minutes	40 minutes	7:07 a.m. Sat.	7:47 a.m. Sat.

CREW FOR MISSION STS-74

Commander (CDR): Ken Cameron
Pilot (PLT): James Halsell
Mission Specialist (MS1): Chris Hadfield
Mission Specialist (MS2): Jerry Ross
Mission Specialist (MS3): William McArthur

SUMMARY OF STS-74 LAUNCH DAY CREW ACTIVITIES

Friday, Nov. 10

10:00 p.m.	Wake up
10:30 p.m.	Breakfast

Saturday, Nov. 11

* 2:51 a.m.	Lunch and crew photo
3:21 a.m.	Weather briefing (CDR, PLT, MS2)
3:21 a.m.	Don launch and entry suits (MS1, MS3)
3:31 a.m.	Don launch and entry suits (CDR, PLT, MS2)
* 3:41 a.m.	Crew suiting photo
* 4:01 a.m.	Depart for launch pad 39A
* 4:41 a.m.	Arrive at white room and begin ingress
* 5:56 a.m.	Close crew hatch
* 7:56 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

November 10, 1995
KSC Release No. 122-95

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-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-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints
The basic weather parameters 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 will not continue if the temperature exceeds 99 degrees for more than 30 consecutive minutes.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun, wind 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 (kts)	Relative Humidity 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, when the wind direction at the launch pad is between 300 degrees and 060 degrees, the highest wind allowable is 34 knots. When the wind direction is between 150 degrees and 200 degrees, the highest wind allowable is 20 knots. The peak allowable wind speeds are on a descending scale between the directions of 060 degrees and 150 degrees, and an ascending scale between 200 degrees and 300 degrees.

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 concurance 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.

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

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.

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 LANDING WEATHER CRITERIA

Weather conditions for a landing also affect the 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 first day PLS which is forecast weather only.

- For RTLS, cloud coverage 5/10 or less below 5,000 feet and a visibility of 4 nautical miles or greater is required.

- For AOA, TAL and PLS sites, cloud coverage 5 tenths or less below 8,000 feet and a visibility of five nautical miles.

- With redundant Microwave Landing System capability or weather reconnaissance aircraft, the ceiling and visibility must be 10,000 feet and 7 nautical miles for all sites.

- For RTLS and the 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.

- 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.

- Crosswind component not to exceed 15 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 CRITERIA

All criteria refer to observed and forecast weather conditions. All criteria refer to observed and forecast weather conditions except for the 2/10 cloud rule which is required to be observed only. At decision time for the deorbit burn 90 minutes before landing the required conditions must be:

- Cloud coverage of 5/10 or less below 10,000 feet and a visibility of 5 miles or greater is required.

- The peak cross wind cannot be 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.

- The deorbit burn shall not occur if thunderstorm, lightning, or precipitation activity is forecast within 30 nautical miles of the Shuttle Landing Facility.

- At a range of 30 nautical miles, vertical clearance from the tops of rain showers or thunderstorms must be greater than 2 nautical miles.

- 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.

- Scattered cloud layers below 10,000 feet must not exceed 2/10 sky coverage.

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

WEATHER INSTRUMENTATION The equipment used by the forecasters to develop the downrange and launch clearance and landing forecasts are:

-Radar: Launch and landing forecasters 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 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 miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurance.

-Lightning Detection And Ranging (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 was developed by NASA-KSC and is currently being transitioned to operational status.

- 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 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.

-Satellites: Images and data from GOES weather satellites are provided directly to the satellite terminal at USAF Range Weather Opeations and NOAA National Weather Service Spaceflight Meteorology Group in Houston. Also available are the high resolution pictures from polar low earth orbiting spacecraft including both the NOAA polar orbiters and the Defense Meteorological Support Program (DMSP) satellites.

-Meteorological Interactive Data Display System (MIDDS): Integrates for the forecaster diverse weather data on a single visual display 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.

- Meteorological towers: 33 wind 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 wind towers at the launch pads and the 33-foot wind 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 important as a tool in short-term forecasting and wind prediction. It also used as an aid in determining the direction and distance a toxic plume would move as a result of a launch mishap.

-Weather Buoys: Instrumented meteorological buoys are anchored 20, 110 and 175 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 temperture, and wave height and period. Buoy data is used in forecasting for launch and landing, the solid rocket booster recovery area for the retrieval ships, and in preparing daily operational forecasts.

-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.

NOTE: The launch weather forecast is prepared by the U.S. Air Force Range Weather Operations Facility at Cape Canaveral. The landing and RTLS forecast is prepared by the NOAA National Weather Servcice Spaceflight Meteorology Group at the Johnson Space Center in Houston.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 14, 1995
KSC Release No. 123-95

KSC CONTRACTORS OF YEAR HONORED

Eight Kennedy Space Center (KSC) contractors received honors at the fiscal year 1995 Contractor Awards Ceremony, hosted by the KSC Small and Disadvantaged Business Council on November 13 at Spaceport USA.

EG&G Florida, Inc., was recognized as the large business contractor of the year for their exemplary support of small, small disadvantaged, and women-owned small businesses. EG&G has provided outstanding support of socioeconomic programs over the years. This year was no exception as over 85 percent of their subcontracting dollars went to small businesses.

The following Small Business contractors were recognized for outstanding contract performance:

Small business contractor -- ENSCO, Inc., Springfield, Virginia, for its work in technology evaluation and transition;

Small disadvantaged business contractor -- I-NET, Inc., Bethesda, Maryland, the engineering support contractor at KSC;

Woman-owned small business contractor -- Priority One Construction of Brevard, Inc., Titusville, contracted to construct the astronaut crew quarters modifications;

Small business subcontractor -- Hydraulic House, Inc., Orlando, provider of hydraulic components, equipment repair and services to Lockheed Martin Space Operations;

Small business subcontractor -- Specialty Maintenance & Construction, Inc., Lakeland, supplier of fabrication and machining services for McDonnell Douglas Aerospace, Space Defense Systems;

Small disadvantaged business subcontractor -- RSDI Environmental, Inc., Jacksonville, for its environmental consulting, geosciences and technical services to Lockheed Martin Space Operations;

Woman-owned small business subcontractor -- Troutman Technical Services, Inc., Indialantic, for technical support services to Lockheed Martin Space Operations.

KSC Director Jay Honeycutt presented each honoree with an engraved plaque.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

November 20, 1995
KSC Release No. 124-95

Note to Editors/News Directors:
SOHO SCHEDULED FOR LAUNCH ABOARD ATLAS IIAS ROCKET NOV. 23

The launch of the Solar Heliospheric Observatory (SOHO) aboard a Lockheed Martin Atlas IIAS rocket is scheduled for Thursday, Nov. 23 at the opening of a 90-minute launch window which extends from 1:54 a.m. - 3:24 a.m. EST. Liftoff will occur from Launch Complex 36-Pad B located on Cape Canaveral Air Station. SOHO is a project of international cooperation between the European Space Agency (ESA) and NASA.

PRELAUNCH NEWS CONFERENCE
The prelaunch news conference is scheduled for Wednesday, Nov. 22 at 10:30 a.m. in the KSC News Center auditorium and will be carried live on NASA Television. Participating in the briefing will be:

Floyd Curington, NASA Launch Manager, Kennedy Space Center
Pat Symons, Launch Vehicle Manager, Lewis Research Center
Fabrizio Felici, SOHO Mission Director, European Space Agency
Ken Sizemore, ISTP Project Manager, Goddard Space Flight Center
Joel Tumbiolo, Launch Weather Officer, Department of the Air Force

Immediately after the news conference there will be a replay of the SOHO mission science briefing on NASA Television.

ACCREDITATION
Those media without permanent accreditation who wish to cover the launch of SOHO including the prelaunch news conference on L-1 day 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:

SOHO Launch Accreditation
NASA PA-MSB
Kennedy Space Center, FL 32899

SOHO mission badges may be picked up at Gate 2 on State Road 3 on Merritt Island on Nov. 22 between 8 a.m. and 10 a.m. or at the KSC News Center from 8 a.m. to 4:30 p.m. Media covering the launch only may obtain badging at Gate 1 on Cape Canaveral Air Station starting at 12:30 a.m. on Nov. 23. An AC-121/SOHO badge is required for all media covering the launch from Press Site 1 on launch day.

REMOTE CAMERAS
On Wednesday, Nov. 22 at 11:30 a.m. a bus will depart the KSC News Center for Launch Complex 36 for media photographers who wish to establish remote cameras at the pad. There will be no access or transportation from Gate 1 on Cape Canaveral Air Station.

LAUNCH DAY COVERAGE
On launch day, media covering the event should assemble at Gate 1 on Cape Canaveral Air Station located on State Road 401 at 12:30 a.m. to convoy to Press Site 1. After launch, following the initial burn of the Centaur stage and

during the extended coast phase of the vehicle, media wishing to cover spacecraft separation and the post launch news conference will convoy from Press Site 1 to the E&O Building on Cape Canaveral Air Station to cover these activities. Those not desiring to cover these events will be escorted back to Gate 1 at this time. Media are not allowed to be unescorted at any time while on Cape Canaveral Air Station.

The post launch news conference will begin at 4:30 a.m. in the E&O Building, Room 116. This will not be carried on NASA Television or the the "V" circuits. After this event media will be escorted back to Gate 1.

The NASA News Center at KSC will not be open for the SOHO launch.

NASA TELEVISION AND V CIRCUIT COVERAGE OF SOHO
NASA Television will carry the prelaunch news conference starting at 10:30 a.m. on Wednesday, Nov. 22. On launch day, countdown coverage will begin at 12:30 a.m. and continue through spacecraft separation which occurs approximately two hours after launch. NASA Television is available on Spacenet 2, transponder 5, channel 9 located at 69 degrees West.

Audio only of all SOHO activities except the post launch news conference will also be available on the "V" circuits which may be dialed directly at 407/867-1220, 1240 or 1260.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 6, 1995
KSC Release No. 126-95

NEAR SPACECRAFT ARRIVES TO BEGIN LAUNCH PREPARATIONS

The Near Earth Asteroid Rendezvous (NEAR) spacecraft arrived at Cape Canaveral today aboard a C-5 military aircraft. It is scheduled for launch early next year aboard a McDonnell Douglas Delta II rocket from Launch Complex 17. The 1,800-pound spacecraft was designed and built at the Johns Hopkins University Applied Physics Laboratory. NEAR is part of NASA's Discovery program for lower cost space exploration missions.

NEAR will rendezvous in 1999 with the near-earth asteroid Eros. Twenty-five miles long, Eros was the first near-Earth asteroid discovered in 1898. NEAR will orbit the asteroid for a year-long mission and will conduct the first long-term, close-up look at an asteroid's surface composition and physical properties.

After its arrival this morning, NEAR was taken to NASA Spacecraft Hangar AE on Cape Canaveral Air Station to begin final testing and checkout activities including compatibility testing with the Deep Space Network of the Jet Propulsion Laboratory. Spacecraft checks will continue until Jan. 19, 1996 when it will be transported to NASA's Spacecraft and Assembly and Encapsulation Facility-2 (SAEF-2) at the Kennedy Space Center. There the spacecraft will be fueled, the batteries installed, and the solar arrays attached. On Feb. 1, it will be mated to the Delta third stage, also at SAEF-2 for spin balance testing.

The NEAR/Delta II third stage combination will be transported from SAEF-2 to Pad B at Launch Complex 17 on Feb. 12 where it will be mated to the second stage of the rocket. Finally, after integrated testing, the Delta nose fairing will be installed around the spacecraft on Feb. 12.

The launch of Delta/NEAR is targeted to occur at the beginning of a 16-day launch opportunity which starts on Friday, Feb. 16, at 3:53 p.m. There is a daily launch window of 20 seconds.

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NASA News Release
ON LINE
JOHN F. KENNEDY SPACE CENTER

December 4, 1995
KSC Release No. 127-95

Note to Editors/News Directors:
XTE SCHEDULED FOR LAUNCH ABOARD DELTA ROCKET DEC. 10

The launch of NASA's X-RAY TIMING EXPLORER (XTE) aboard a McDonnell Douglas Delta II rocket is scheduled for Sunday, Dec. 10 at the opening of a 90-minute minute launch window which extends from 9:38 a.m. to 11:03 a.m. EST. Liftoff will occur from Launch Complex 17-Pad A on Cape Canaveral Air Station.

PRELAUNCH NEWS CONFERENCE

The prelaunch news conference is scheduled for Friday, Dec. 8 at 11 a.m. in the KSC News Center auditorium and will be carried live on NASA Television. Participating in the briefing will be:

Floyd Curington, NASA Launch Manager, Kennedy Space Center
David Mitchell, Launch Vehicle Manager, Goddard Space Flight Center
Dale Schulz, Mission Director/XTE Project Manager
Dr. Hale Bradt, XTE Principal Investigator, Mass. Institute of Technology
Joel Tumbiolo, Launch Weather Officer, Department of the Air Force

Immediately after the news conference there will be a replay of the XTE mission science briefing on NASA Television.

ACCREDITATION

Those media without permanent accreditation who wish to cover the launch of Delta/XTE including the prelaunch news conference on L-1 day 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:

XTE Launch Accreditation
NASA PA-MSB
Kennedy Space Center, FL 32899

XTE mission badges may be picked up at Gate 2 on State Road 3 on Merritt Island on Dec. 8 between 8:30 a.m. and 10:30 a.m. or at the KSC News Center from 8 a.m. to 4:30 p.m. Media covering the launch only may obtain badging at Gate 1 on Cape Canaveral Air Station starting at 8 a.m. on Sunday, Dec. 10. A Delta-/XTE mission badge is required for all media covering the launch from Press Site 1 on launch day.

REMOTE CAMERAS

On Saturday, Dec. 7 at 9:30 a.m. a NASA van will depart Gate 1 on Cape Canaveral Air Station for Launch Complex 17 for media photographers who wish to establish remote cameras at the pad. There will be no access or transportation from the NASA-KSC News Center.

LAUNCH DAY COVERAGE

On launch day, media covering the event should assemble at Gate 1 on Cape Canaveral Air Station located on State Road 401 at 8 a.m. to convoy to Press Site 1. After launch, following the initial burn of the second stage, media wishing to cover the coast phase and spacecraft separation from the E&O Building will convoy from Press Site 1 to cover this activity. Others will be escorted back to Gate 1 if they wish to leave. A post launch news conference will be held one hour minutes after spacecraft separation in the E&O Building if there is sufficient media interest. This briefing will not be carried on NASA Television or the "V" circuits. After this event, media will be escorted back to Gate 1.

The NASA News Center at KSC will not be open for the XTE launch.

NASA TELEVISION AND V CIRCUIT COVERAGE OF XTE

NASA Television will carry the prelaunch news conference starting at 11 a.m. on Friday, Dec. 8. On launch day, countdown coverage will begin at 8 a.m. and continue through spacecraft separation. NASA Television is available on Spacenet 2, transponder 5, channel 9 located at 69 degrees West longitude.

Audio only of all XTE activities except the post launch news conference will also be available on the "V" circuits which may be dialed directly at 407/867-1220, 1240 or 1260.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 7, 1995
KSC Release No. 128-95

KSC PROVIDES $1.31 BILLION BOOST TO FLORIDA'S ECONOMY

Space related employment and contracts at NASA Kennedy Space Center yielded a $1.31 billion boost to Florida's economy during the 1995 fiscal year which ended Sept. 30. This figure represents $1.18 billion in Florida contracts and purchases along with $126.5 million in civil service personnel compensations.

Approximately ninety-five percent of the Florida dollars or $1.12 billion was expended within Brevard County. Of KSC's total expenditures, $1.11 billion went to contractors operating on-site at the space center.

An additional $12.6 million went to off-site businesses in Brevard County, while $57.1 million was awarded to Florida businesses outside the county. Out-of-state purchases totaled about $64 million.

Furthermore, KSC exceeded its socioeconomic goals, established by the Small Business Administration, by awarding over $73 million in contracts to small, disadvantaged and woman-owned businesses.

Permanent federal employees at KSC totaled 2,272 during fiscal year 95. While 1,999 people were employed through construction and tenant jobs at KSC, the majority of the workers were employed by the on-site contractors and numbered almost 10,551. Overall, approximately 14,822 workers were employed at KSC through the close of the fiscal year on Sept. 30.

Major contractors at KSC include 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.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 8, 1995
KSC Release No. 130-95

Note to Editors/News Directors:
TCDT MEDIA OPPORTUNITIES WITH STS-72 CREW SET FOR NEXT WEEK

News media representatives will have an opportunity to view and photograph the arrival of the six-member STS-72 Space Shuttle crew on Sunday, Dec. 9, when they arrive at KSC for the Terminal Countdown Demonstration Test (TCDT). Media interested in covering this photo opportunity should be at the newly opened News Center by 10 a.m. for transport to the Shuttle Landing Facility.

Then on Monday, media can speak informally with and photograph the STS-72 crew at pad 39B during their training activities. Media interested in speaking with the crew during this question and answer session, should be at the KSC Press Site by 11:30 a.m. Monday for transport to the pad.

Media covering these events should contact the KSC Press Site to obtain the proper badge.

On Tuesday, the crew will depart their quarters at about 7:45 a.m. and begin to board the Shuttle Endeavour at about 8:15 a.m. where they will remain through the end of the test. The mock countdown culminates with a simulated main engine cut-off at 11 a.m.

Following TCDT, the crew will return to Houston for final flight preparations.

Endeavour is now targeted for launch on Jan. 11. Mission STS-72 will feature the retrieval of the Japanese Space Flyer Unit which was launched March 18, 1995, aboard a Japanese H-2 rocket.

Crew members for mission STS-72 are: Commander Brian Duffy; Pilot Brent Jett; and Mission Specialists Leroy Chiao, Daniel Barry, Winston Scott and Koichi Wakata, a Japanese astronaut representing NASDA.

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NASA News Release ON LINE

JOHN F. KENNEDY SPACE CENTER

December 12, 1995
KSC Release No. 131-95

Note to Editors/News Directors:
RIBBON CUTTING SET FOR DEC. 14 TO COMMEMORATE NEW KSC NEWS CENTER

A ribbon cutting ceremony is planned Dec. 14 at 9:15 a.m. to celebrate the opening of KSC's new News Facility, located in Launch Complex 39. The event will take place at the entrance of the News Facility.

Laurie Boeder, Associate Administrator of NASA Public Affairs; Jay Honeycutt, Kennedy Space Center Director; Hugh Harris, Public Affairs Director; and Frank Durso, Facilities Engineering and Project Management Director are expected to participate.

The new facility is a permanent building replacing the geodesic dome. The facility houses NASA Public Affairs and contractor employees and provides working space for the news media. In addition, this facility features libraries from which official NASA video tapes, audio tapes, still photos and printed materials are released to the news media.

News media are invited to attend the ceremony and those with proper credentials may drive directly to the News Facility. The 1995 annual news media badges will be valid Dec. 14. Those members of the news media needing credentials should call 867-2468 to make arrangements.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 10, 1995
Media Advisory

LAUNCH ADVISORY: DELTA/XTE LAUNCH POSTPONED

The launch of NASA's X-ray Timing Explorer aboard a McDonnell Douglas Delta II rocket has been postponed for 24 hours due to unfavorable wind conditions on the surface and aloft. The next launch attempt will be on Monday, Dec. 11 at the opening of an 84-minute launch window which remains unchanged from today's attempt, 9:38 a.m. to 11:02 a.m.

The weather forecast on Monday calls for clearing skies but remaining somewhat windy and cold.

NOTE TO EDITORS: Media covering the launch on Monday should be at Gate 1 of Cape Canaveral Air Station at 8 a.m. to convoy to Press Site 1. Launch coverage on NASA Television will begin at 8 a.m. and continue through spacecraft separation.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 11, 1995
Media Advisory

LAUNCH ADVISORY: DELTA/XTE LAUNCH POSTPONED UNTIL DEC. 12

The launch of NASA's X-ray Timing Explorer aboard a McDonnell Douglas Delta II rocket has been postponed for 24 hours due to unfavorable upper level wind conditions. The next launch attempt is tentatively scheduled for Tuesday, Dec. 12 at the opening of an 84-minute launch window which opens at 9:39 a.m. to 11:03 a.m.

The weather forecast on Tuesday calls for favorable surface weather conditions. Upper level wind conditions may begin to moderate on Tuesday.

NOTE TO EDITORS: NASA Television coverage will begin at 8 a.m. and continue through spacecraft separation. Media covering the launch should be at Gate 1 on Cape Canaveral Air Station at 8 a.m. to convoy to Press Site 1.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 12, 1995
Media Advisory

LAUNCH ADVISORY: DELTA/XTE RETARGETED FOR NEXT WEEKEND

The launch of NASA's X-ray Timing Explorer aboard a McDonnell Douglas Delta II rocket from Complex 17 has been rescheduled once again due to out of limit upper level wind conditions. The next launch attempt will occur on Saturday or Sunday, with the earliest opportunity dependent on the launch of an Atlas rocket scheduled from Complex 36 on Thursday evening, Dec. 14.

The launch window for Delta/XTE on either Saturday, Dec. 16 or Sunday, Dec. 17 is 9:41 a.m. - 11:04 a.m., a duration of 83 minutes.

The KSC codaphone will be updated on Friday with launch schedule status and may be reached at 867-2525.

NOTE TO EDITORS: This weekend, NASA Television coverage of Delta/XTE will begin at 8:15 a.m. and continue through spacecraft separation. Media covering the launch should be at Gate 1 on Cape Canaveral Air Station at 8:30 a.m. to convoy to Press Site 1.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 14, 1995
Media Advisory

LAUNCH ADVISORY: DELTA/XTE SCHEDULED FOR SUNDAY, DEC. 17

The launch of NASA's X-ray Timing Explorer aboard a McDonnell Douglas Delta II rocket from Complex 17 is now scheduled for Sunday, Dec. 17. The launch window extends from 9:41 a.m. - 11:04 a.m., a duration of 83 minutes.

NOTE TO EDITORS: Photographers establishing remote cameras at Complex 17 should be at Gate 1 of Cape Canaveral Air Station on Saturday morning at 9:30 a.m. On Sunday, media covering the launch should be at Gate 1 of Cape Canaveral Air Station at 8:15 a.m. to convoy to Press Site 1. NASA Televison coverage on Sunday will begin at 8:15 a.m. and continue through spacecraft separation.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 17, 1995
Media Advisory

LAUNCH ADVISORY: DELTA/XTE SCHEDULED FOR MONDAY, DEC. 18

The launch attempt of NASA's X-ray Timing Explorer (XTE) aboard a McDonnell Douglas Delta II rocket from Complex 17 was postponed again today due to unfavorable wind conditions aloft. The launch has been rescheduled for Monday, Dec. 18 at the opening of a launch window which extends from 9:42 a.m. to 11:05 a.m., a duration of 83 minutes.

NOTE TO EDITORS: On Monday, media covering the launch should be at Gate 1 of Cape Canaveral Air Station at 8:15 a.m. to convoy to Press Site 1. NASA Televison coverage on Monday will begin at 8:15 a.m. and continue through spacecraft separation.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 18, 1995
Media Advisory

LAUNCH ADVISORY: DELTA/XTE LAUNCH POSTPONED DUE TO LAUNCH VEHICLE ANOMALY

The launch countdown of NASA's X-ray Timing Explorer (XTE) spacecraft aboard a McDonnell Douglas Delta II launch vehicle shutdown today when a main engine liquid oxygen valve failed to open as programmed. The cutoff occurred approximately 2.5 seconds prior to the anticipated 10:01 a.m. EST liftoff.

The vernier engines, two auxiliary engines used to control the vehicle, did ignite; however, the main engine did not ignite because of the valve's failure to open. Further analysis is underway to determine the cause. The corrective action required to ready the vehicle for countdown is not known at this time.

The XTE spacecraft atop the Delta II rocket will not require any significant maintenance activities prior to the next countdown.

The next launch attempt will be made no earlier than Dec. 27 depending on the work and corrective action required. The furlough of government employees will not impact activities to prepare the Delta for launch once again.

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NASA Media Advisory ON LINE

JOHN F. KENNEDY SPACE CENTER

December 28, 1995
LAUNCH ADVISORY:

DELTA/XTE LAUNCH ATTEMPT SCHEDULED FOR FRIDAY, DEC. 29

NASA and McDonnell Douglas managers confirmed today after a final review meeting that the next launch attempt of NASA's X-Ray Timing Explorer will be on Friday, Dec. 29. The liftoff aboard a Delta II rocket from Pad A at Launch Complex 17 is scheduled to occur at the opening of a window which extends from 8:47 a.m. to 12:11 p.m. EST.

The previous launch attempt on Dec. 18 was terminated after the Delta first stage liquid oxygen valve failed to open during the main engine start sequence. The failure was determined to be caused by the freezing of condensed moisture that accumulated on the downstream side of the valve precluding it from opening. The moisture was formed as the result of the Delta/XTE multiple launch attempts. Other potential causes were eliminated after extensive testing, inspections and analysis. For future Delta/XTE countdowns, after two consecutive launch attempts, an inspection of the valve will be made and will be followed by a dry gaseous nitrogen purge.

The McDonnell Douglas Delta II rocket and NASA's XTE spacecraft are ready for launch at this time. The only concern for tomorrow's launch attempt is the wind forecast at the surface and aloft.

NOTE TO EDITORS: Media covering the launch on Friday will depart for Press Site 1 from Gate 1 at Cape Canaveral Air Station at 7:30 a.m. Because of the furlough of government employees there will be no NASA Television launch coverage and no post-launch news conference. Also, no prerecorded video tapes of the launch will be available. Television stations must plan on covering the launch if video is needed. Audio of the countdown activities and the launch commentary will be available on the "V" circuits beginning at 7:30 a.m. and may be dialed at 407/867-1220, 1240 or 1260.

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