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NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release
January 2, 1990
2 pm CST

Jeffrey Carr
RELEASE NO. 90-001

ASTRONAUT CREW NAMED TO INTERNATIONAL MICROGRAVITY MISSION

USAF Col. Ronald J. Grabe has been named to command STS-42, a nine-day mission aboard the Space Shuttle Columbia in December, 1990. Stephen S. Oswald will be the pilot, and William F. Readdy will fly as a mission specialist. Mary L. Cleave, Ph.D., and Norman E. Thagard, Ph.D., were assigned to the flight as mission specialists in June, 1989.

Columbia's cargo bay will carry the International Microgravity Laboratory (IML-1) in which five NASA astronauts and two payload specialists will conduct a variety of studies and experiments in the fields of materials processing and life sciences.

The two payload specialists will be named in the near future.

Grabe, commanding his first Shuttle mission, will make his third flight in space. He flew previously as pilot on STS-51J in October, 1985, and on STS-30 in May, 1989. He was born June 13, 1945 in New York, NY.

Oswald will make his first space flight. He was born June 30, 1951, in Seattle, WA, but considers Bellingham, WA, to be his hometown.

Readdy, also making his first flight, was born January 24, 1952, in Quonset Point, RI, but considers McLean, VA, to be his hometown.

Cleave will make her third space flight, having flown as mission specialist on STS 61-B in November, 1985, and on STS-30 in May, 1989. She was born February 5, 1947, in Southampton, NY.

Thagard will make his fourth space flight. He flew as mission specialist on STS-7 in June, 1983, on STS 51-B in April, 1985, and on STS-30 in May, 1989. Thagard was born July 3, 1943, in Marianna, FL, but considers Jacksonville, FL, to be his hometown.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

January 3, 1990

Jeffrey Carr
RELEASE NO. 90-002

NOTE TO EDITORS: STS-32 INFLIGHT CREW PRESS CONFERENCE

A press conference with the STS-32 astronauts aboard the Space Shuttle Columbia will be conducted during the upcoming mission.

Accredited news media who wish to participate must be located at the Johnson Space Center in Houston. The exact date for the event has yet to be determined, but is expected to occur after the primary mission objectives have been met.

The news conference will be broadcast live on NASA Select television and available for live use and rebroadcast. NASA Select programming is carried on RCA SATCOM F2R, transponder 13, located at 72 degrees West Longitude. Media may also monitor the event live from various NASA field centers.

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NASA News

National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Jeffrey Carr
RELEASE NO. 90-003

January 11, 1990

NOTE TO EDITORS: STS-32 INFLIGHT CREW PRESS CONFERENCE

A press conference with the STS-32 astronauts aboard the Space Shuttle Columbia will be conducted at 9:12 a.m. CST Saturday, January 13. Duration will be approximately 17 minutes.

Accredited news media who wish to participate must be located in room 135, building 2 at the Johnson Space Center in Houston. Participants should be in place by 9 a.m. CST.

The news conference will be broadcast live on NASA Select television and available for live use and rebroadcast. NASA Select programming is carried on RCA SATCOM F2R, transponder 13, located at 72 degrees West Longitude. Media may also monitor the event live from various NASA field centers.

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NASA News

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483 5111

James Hartsfield
RELEASE NO:90-004

January 4, 1990

DISTRIBUTED EARTH MODEL ORBITER SIMULATION USED DURING STS-32

A new graphic display first used in Mission Control during the space shuttle Atlantis' October 1989 flight will again provide three-dimensional views of the Shuttle and Earth during shuttle mission STS-32, Columbia's flight scheduled for launch this month.

The Distributed Earth Model Orbiter Simulation (DEMOS) is a joint project between the Mission Operations Directorate and the Mission Support Directorate. The display is based on live position and attitude data from the shuttle and provides a color view of the way the shuttle looks as it orbits the Earth. The view is presented as if seen from a variety of imaginary points, ranging from a look at the whole planet with an exaggerated shuttle orbiter circling it to a rear-position view of the orbiter as it reenters the atmosphere, banking as it slows for approach and landing.

Although it is based on live data, the display is driven by predicted simulations of the Orbiter's position during times when such data is not available. In addition to showing the Earth and the shuttle, the display will include the Sun, the Moon, 100 of the brightest navigational stars, and payloads, including the Long Duration Exposure Facility (LDEF) scheduled to be brought back to Earth on STS-32. The groundtrack of the shuttle also will be displayed as part of the new graphic.

The new display will be projected on one of the four large screens that flank the 10-foot by 20-foot global tracking map at the front of the Flight Control Room. DEMOS is not a replacement graphic for the global tracking map, nor a graphic that has been certified for use in making operational mission decisions. For STS-32, DEMOS will be used only during periods of high activity and interest, including the rendezvous with LDEF and landing.

DEMOS has been developed by a small team in the Mission Operations Systems Lab at JSC. Its development is part of a continuing effort to upgrade the graphics and information displayed for flight controllers to aid them in visualizing the Orbiter's positions.

NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

R E V I S E D

Jeffrey Carr
January 12, 1990
RELEASE NO. 90-005

NOTE TO EDITORS: STS-32 INFLIGHT CREW PRESS CONFERENCE

A press conference with the STS-32 astronauts aboard the Space Shuttle Columbia will be conducted at 8:02 a.m. CST Saturday, January 13. Duration will be approximately 20 minutes.

Accredited news media who wish to participate must be located in room 135, building 2 at the Johnson Space Center in Houston. Participants should be in place by 7:50 a.m. CST.

The news conference will be broadcast live on NASA Select television and available for live use and rebroadcast. NASA Select programming is carried on RCA SATCOM F2R, transponder 13, located at 72 degrees West Longitude. Media may also monitor the event live from various NASA field centers.

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NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Jeffrey Carr
RELEASE NO. 90-006

January 17, 1990
3:00 p.m.EST

1990 ASTRONAUT CANDIDATES SELECTED

In the first of what will become standard biennial selections, 23 new astronaut candidates have been named for the Space Shuttle program.

The candidates were chosen from among 1,945 qualified applicants, 106 of whom received interviews and medical examinations between September and November, 1989. They will report to the Johnson Space Center in July to begin a year of training and evaluation, after which they will receive technical assignments leading to selection for Shuttle flight crews.

The 1990 group consists of 7 pilot candidates and 16 mission specialist candidates, including 11 civilians and 12 military officers. Among the 5 women selected are 3 military officers, including the first woman to be named as a pilot candidate, and the first Hispanic woman to be chosen. A listing of the candidates and biographical data follows.

# # #

1990 ASTRONAUT CANDIDATES

Lcdr. Daniel W. Bursch	U.S. Navy	Mission Specialist
Dr. Leroy Chiao	Civilian	Mission Specialist
Maj. Michael R. U. Clifford	U.S. Army	Mission Specialist
Kenneth D. Cockrell	Civilian	Pilot
Maj. Eileen M. Collins	U.S. Air Force	Pilot
Capt. William G. Gregory	U.S. Air Force	Pilot
Maj. James D. Halsell, Jr.	U.S. Air Force	Pilot
Dr. Bernard A. Harris, Jr.	Civilian	Mission Specialist
Capt. Susan J. Helms	U.S. Air Force	Mission Specialist
Dr. Thomas D. Jones	Civilian	Mission Specialist
Maj. William S. McArthur, Jr.	U.S. Army	Mission Specialist
Dr. James H. Newman	Civilian	Mission Specialist
Dr. Ellen Ochoa	Civilian	Mission Specialist
Maj. Charles J. Precourt	U.S. Air Force	Pilot
Capt. Richard A. Searfoss	U.S. Air Force	Pilot
Dr. Ronald M. Sega	Civilian	Mission Specialist
Capt. Nancy J. Sherlock	U.S. Army	Mission Specialist
Dr. Donald A. Thomas	Civilian	Mission Specialist
Dr. Janice E. Voss	Civilian	Mission Specialist
Capt. Carl E. Walz	U.S. Air Force	Mission Specialist
Maj. Terrence W. Wilcutt	U.S. Marine Corps	Pilot
Dr. Peter J. K. Wisoff	Civilian	Mission Specialist
Dr. David A. Wolf	Civilian	Mission Specialist

BIOGRAPHICAL DATA

NAME: Daniel W. Bursch, Lt. Cmdr., USN, Mission Specialist

BIRTHPLACE/DATE: July 25, 1957 - Bristol, Pennsylvania

RESIDENCE: Pacific Grove, California

EDUCATION: Vestal Senior High School, Vestal, New York
BS, Physics, US Naval Academy, 1979

CURRENT POSITION: Student, US Naval Postgraduate School

PARENTS: Mr. & Mrs. Donald D. Bursch, Charlotte, North Carolina

MARITAL STATUS: Single. One child.

NAME: Leroy Chiao, Ph.D., Mission Specialist

BIRTHPLACE/DATE: August 28, 1960 - Milwaukee, Wisconsin

RESIDENCE: Danville, California

EDUCATION: Monte Vista High School, Danville, California
BS, Chemical Engineering, Univ. of California, Berkeley, 1983
MS, Chemical Engineering, Univ. of California, Santa Barbara, 1985
Ph.D., Chemical Engineering, Univ. of California, Santa Barbara, 1987

CURRENT POSITION: Research Engineer, Lawrence Livermore National Laboratory, Livermore, California

PARENTS: Mr. and Mrs. Tsu Tao Chiao, Fairfield, California

MARITAL STATUS: Single

NAME: Michael R. U. Clifford, Major, USA, Mission Specialist

BIRTHPLACE/DATE: October 13, 1952 - Norton AFB, California

RESIDENCE: Seabrook, Texas

EDUCATION: Ben Lomond High School, Ogden, Utah
BS, Basic Science, US Military Academy, 1974
MS, Aerospace Engineering, Georgia Tech., 1982

CURRENT POSITION: Vehicle Integration Test Engineer
Johnson Space Center
Houston, Texas

PARENTS: John M. Uram, Deceased
Lenore C. Clifford, Ogden, Utah

MARITAL STATUS: Married to the former Nancy Elizabeth Brunson.

NAME: Kenneth D. Cockrell, Pilot

BIRTHPLACE/DATE: April, 9, 1950 - Austin, Texas

RESIDENCE: Houston, Texas

EDUCATION: Rockdale High School, Rockdale, Texas
BS, Mechanical Engineering, Univ. of Texas, 1972
MS, Aero Systems, Univ. of Florida, 1974
U.S. Naval Test Pilot School, Patuxent River, Maryland

CURRENT POSITION: Aerospace Engineer & Research Pilot
NASA/Johnson Space Center
Houston, Texas

PARENTS: Mr. & Mrs. Buford D. Cockrell, Westminister, South Carolina

MARITAL STATUS: Married to the former Joan Denise Raines.

NAME: Eileen M. Collins, Major, USAF, Pilot

BIRTHPLACE/DATE: November 19, 1956 - Elmira, New York

RESIDENCE: Edwards, California

EDUCATION: Elmira Free Academy, Elmira, New York
BA, Math, Syracuse Univ., 1978
MS, Operations Research, Stanford Univ., 1986
MA, Space Systems Management, Webster Univ., 1989

CURRENT POSITION: Student
USAF Test Pilot School
Edwards AFB, California

PARENTS: James E. Collins, Elmira, New York
Rose Marie Collins, Elmira, New York

MARITAL STATUS: Married to James P. Youngs

NAME: William G. Gregory, Captain, USAF, Pilot

BIRTHPLACE/DATE: May 14, 1957 - Lockport, New York

RESIDENCE: Edwards, California

EDUCATION: Lockport Senior High School, Lockport, New York
BS, Engineering Science, USAF Academy, 1979
MS, Engineering Mechanics, Columbia Univ., 1980
MS, Management, Troy State, 1984

CURRENT POSITION: Test Pilot
Edwards AFB, California

PARENTS: Mr. & Mrs. William Gregory, Gilbert, Arizona

MARITAL STATUS: Married to the former Mary Elizabeth Harney.

NAME: James D. Halsell, Jr., Major, USAF, Pilot

BIRTHPLACE/DATE: September 29, 1956 - Monroe, Louisiana

RESIDENCE: Edwards AFB, California

EDUCATION: West Monroe High School, West Monroe, Louisiana
BS, Engineering, USAF Academy, 1978
MS, Management, Troy State, 1983
MS, Space Operations, AF Institute of Technology, 1985

CURRENT POSITION: F-16 & SR-71 Test Pilot
Edwards AFB, California

PARENTS: Mr. & Mrs. James D. Halsell, West Monroe, Louisiana

MARITAL STATUS: Single

NAME: Bernard A. Harris, Jr., M.D., Mission Specialist

BIRTHPLACE/DATE: June 26, 1956 - Temple, Texas

RESIDENCE: Houston, Texas

EDUCATION: San Antonio High School, San Antonio, Texas
BS, Biology, Univ. of Houston, 1978
MD, Texas Tech Univ., 1982

CURRENT POSITION: Medical Officer
NASA/Johnson Space Center
Houston, Texas

PARENTS: Bernard A. Harris, Sr., Philadelphia, Pennsylvania
Gussie H. Burgess, San Antonio, Texas

MARITAL STATUS: Married to the former Sandra Faye Lewis.

NAME: Susan J. Helms, Captain, USAF, Mission Specialist

BIRTHPLACE/DATE: February 26, 1958, Charlotte, North Carolina

RESIDENCE: Alberta, Canada

EDUCATION: Parkrose Senior High School, Portland, Oregon
BS, Aerospace Engineering, USAF Academy, 1980
MS, Aeronautics/Astronautics, Stanford Univ., 1985

CURRENT POSITION: Flight Test Engineer
Aerospace Engineering Test Establishment
Alberta, Canada

PARENTS: Mr. & Mrs. Patrick G. Helms, Albuquerque, New Mexico

MARITAL STATUS: Single

NAME: Thomas D. Jones, Ph.D., Mission Specialist

BIRTHPLACE/DATE: January 22, 1955 - Baltimore, Maryland

RESIDENCE: Fairfax, Virginia

EDUCATION: Kenwood Senior High School, Baltimore, Maryland
BS, Basic Sciences, USAF Academy, 1977
Ph.D.., Planetary Science, Univ. of Arizona, 1988

CURRENT POSITION: Scientist
CIA, Office of Research & Development
Washington, DC

PARENTS: Mr. & Mrs. David Jones, Essex, Maryland

MARITAL STATUS: Married to the former Elizabeth Lynn Fulton.

NAME: Ellen Ochoa, Ph.D., Mission Specialist

BIRTHPLACE/DATE: May 10, 1958 - Los Angeles, California

RESIDENCE: Los Altos, California

EDUCATION: Grossmont High School, La Mesa, California
BS, Physics, San Diego State, 1980
MS, Electrical Engineering, Stanford Univ., 1981
Ph.D.., Electrical Engineering, Stanford Univ., 1985

CURRENT POSITION: Optical Physicist
NASA/Ames Research Center
Moffett Field, California

PARENTS: Joseph L. Ochoa and
Rosanne Ochoa, La Mesa, California

MARITAL STATUS: Single

NAME: Charles J. Precourt, Major, USAF, Pilot

BIRTHPLACE/DATE: June 29, 1955 - Waltham, Massachusetts

RESIDENCE: Middletown, Rhode Island

EDUCATION: Hudson High School, Hudson, Massachusetts
BS, Aeronautical Engineering, USAF Academy, 1977
MS, Management, Golden Gate U., 1988

CURRENT POSITION: Student
Naval War College of Command and Staff
Newport, Rhode Island

PARENTS: Mr. & Mrs. Charles A. Precourt, Hudson, Massachusetts

MARITAL STATUS: Married to the former Lynne Denise Mungle

NAME: William S. McArthur, Jr., Major, USA, Mission Specialist

BIRTHPLACE/DATE: July 26, 1951 - Laurinburg, North Carolina

RESIDENCE: Houston, Texas

EDUCATION: Red Springs High School, Red Springs, North Carolina
BS, Applied Sci. & Engr., US Military Academy, 1973
MS, Aerospace Engineering, Georgia Tech, 1983

CURRENT POSITION: Vehicle Integration Test Engineer
Johnson Space Center
Houston, Texas

PARENTS: William S. McArthur, Deceased
Edith P. Avant, Wakulla, North Carolina

MARITAL STATUS: Married to the former Cynthia Kathryn Lovin.

NAME: James H. Newman, Ph.D., Mission Specialist

BIRTHPLACE/DATE: October 16, 1956 - Trust Territory of the Pacific Islands

RESIDENCE: Houston, Texas

EDUCATION: La Jolla High School, La Jolla, California
BA, Physics, Dartmouth College, 1978
MA, Physics, Rice Univ., 1982
Ph.D., Physics, Rice Univ., 1984

CURRENT POSITION: Simulation Supervisor
NASA/Johnson Space Center
Houston, Texas

PARENTS: William A. Newman, La Jolla, California
Ruth A. Newman, La Jolla, California

MARITAL STATUS: Single

NAME: Richard A. Searfoss, Major, USAF, Pilot

BIRTHPLACE/DATE: June 6, 1956 - Mount Clemens, Michigan

RESIDENCE: Lancaster, California

EDUCATION: Portsmouth Senior High School, Portsmouth, New Hampshire
BS, Aerospace Engineering, USAF Academy, 1978
MS, Aerospace Engineering, Caltech, 1979

CURRENT POSITION: Instructor/Deputy Chief-Flying Qualities
USAF Test Pilot School
Edwards AFB, California

PARENTS: Stanley G. Searfoss, Lakeland, Florida
Mary K. Searfoss, Deceased

MARITAL STATUS: Married to the former Julie McGuire

NAME: Ronald M. Sega, Ph.D., Mission Specialist

BIRTHPLACE/DATE: December 4, 1952 - Cleveland, Ohio

RESIDENCE: Seabrook, Texas

EDUCATION: Nordonia High School, Macedonia, Ohio
BS, Physics/Math, USAF Academy, 1974
MS, Physics, Ohio State, 1975
Ph.D.., Electrical Engineering, Univ. of Colorado, 1982

CURRENT POSITION: Asst. Director for Flight Programs/Professor
Univ. of Houston-Space Vacuum Epitaxy Center
Houston, Texas

PARENTS: Mr. & Mrs. John R. Sega, Arvada, Colorado

MARITAL STATUS: Married to Bonnie J. Dunbar

NAME: Nancy J. Sherlock, Captain, USA, Mission Specialist

BIRTHPLACE/DATE: December 29, 1958 - Wilmington, Delaware

RESIDENCE: Houston, Texas

EDUCATION: Troy High School, Troy, Ohio
BA, Biological Science, Ohio State, 1980
MS, Safety Engineering, Univ of Southern CA., 1985

CURRENT POSITION: Flight Simulation Engineer
Johnson Space Center
Houston, Texas

PARENTS: Mr. & Mrs. Warren F. Decker, Troy, Ohio

MARITAL STATUS: Married to Richard J. Sherlock

NAME: Donald A. Thomas, Ph.D., Mission Specialist

BIRTHPLACE/DATE: May 6, 1955 - Cleveland, Ohio

RESIDENCE: Seabrook, Texas

EDUCATION: Cleveland Heights High School, Cleveland, Ohio
BS, Physics, Case Western Univ., 1977
MS, Materials Science, Cornell Univ., 1980
Ph.D., Materials Science, Cornell Univ., 1982

CURRENT POSITION: Materials Engineer
NASA/Johnson Space Center
Houston, Texas

PARENTS: William G. Thomas, Sr., Englewood, Florida
Irene M. Thomas, American Embassy, Burma

MARITAL STATUS: Married to the former Kristine R. Castagnola

NAME: Janice E. Voss, Ph.D., Mission Specialist

BIRTHPLACE/DATE: October 8, 1956 - South Bend, Indiana

RESIDENCE: Houston, Texas

EDUCATION: Minnechang Regional High School, Wilbraham, Mass.
BS, Engineering Science, Purdue Univ., 1975
MS, Electrical Engineering, MIT, 1977
Ph.D., Aero/Astronautics, MIT, 1987

CURRENT POSITION: Manager, Integrations & Operations
Orbital Sciences Corp.
Houston, Texas

PARENTS: Mr. & Mrs. James R. Voss, Wilbraham, Massachusetts

MARITAL STATUS: Single

NAME: Carl E. Walz, Captain, USAF, Mission Specialist

BIRTHPLACE/DATE: September 6, 1955 - Cleveland, Ohio

RESIDENCE: Henderson, Nevada

EDUCATION: Charles T. Brush High School, Lyndhurst, Ohio
BS, Physics, Kent State, 1977
MS, Physics, John Carroll Univ., 1979

CURRENT POSITION: Flight Test Program Manager
Air Force Flight Test Center
Pittman Station, Nevada

PARENTS: Mr. & Mrs. Carl J. Walz, South Euclid, Ohio

MARITAL STATUS: Married to the former Pamela J. Glady

NAME: Terrence W. Wilcutt, Major, USMC, Pilot

BIRTHPLACE/DATE: October 31, 1949 - Russellville, Kentucky

RESIDENCE: NAS Patuxent River, Maryland

EDUCATION: Southern High School, Louisville, Kentucky
BA, Math, Western Kentucky Univ., 1974

CURRENT POSITION: Test Pilot/Project Officer
NAS Patuxent River, Maryland

PARENTS: Mr. & Mrs. George B. Wilcutt, Russellville, Kentucky

MARITAL STATUS: Married to the former Robin Jo Moyers

NAME: Peter J. K. Wisoff, Ph.D., Mission Specialist

BIRTHPLACE/DATE: August 16, 1958 - Norfolk, Virginia

RESIDENCE: Houston, Texas

EDUCATION: Norfolk Academy, Norfolk, Virginia
BS, Physics, Univ. of Virginia, 1980
MS, Physics, Stanford Univ., 1982
Ph.D., Applied Physics, Stanford Univ., 1986

CURRENT POSITION: Asst. Professor
Rice University
Dept. of Electrical & Computer Engineering
Houston, Texas

PARENTS: Mr. & Mrs. Carl P. Wisoff, Norfolk, Virginia

MARITAL STATUS: Single

NAME: David A. Wolf, M.D., Mission Specialist

BIRTHPLACE/DATE: August 23, 1956 - Indianapolis, Indiana

RESIDENCE: Houston, Texas

EDUCATION: BS, Electrical Engineer, Purdue Univ., 1978
M.D., Indiana Univ., 1982

CURRENT POSITION: Aerospace Medical Officer
NASA/Johnson Space Center
Houston, Texas

PARENTS: Harry Wolf, Indianapolis, Indiana
Dorothy Wolf, Indianapolis, Indiana

MARITAL STATUS: Single

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Jeffrey Carr
January 24, 1990
RELEASE NO. 90-007

NOTE TO EDITORS: STS-32 POST FLIGHT CREW PRESS CONFERENCE

The astronaut crew of Shuttle mission STS-32 will meet with news media next week to discuss their recent flight which featured the deployment of a SYNCOM-IV satellite and the retrieval of the Long Duration Exposure Facility (LDEF).

The news conference will be held at 1 pm central time on Tuesday, January 30, at the Johnson Space Center and will be broadcast live on NASA Select television. Accredited media who wish to participate may do so in the building 2 briefing room at JSC, or via support audio from other NASA field centers.

NASA Select programming is carried on RCA SATCOM F2R, transponder 13, located at 72 degrees West Longitude.

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NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
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For Release
January 24, 1990

Kari Fluegel
RELEASE NO. 90-008

PROPOSALS SOUGHT FOR SATELLITE SERVICER FLIGHT DEMONSTRATION

NASA's Johnson Space Center, Houston, has issued a call for proposals for requirement definition studies and preliminary design for a Satellite Servicer System flight demonstration.

The Satellite Servicer System flight demonstration will show the ability to maintain satellites in locations not readily accessible to humans (e.g., polar and high inclination orbits), to permit hazardous servicing, to reduce Space Transportation System extravehicular activity dependency and to improve cost efficiencies.

The system will be used in a three-phase, on-orbit flight demonstration launched from the Space Shuttle orbiter. The demonstration will exercise autonomous rendezvous and docking, orbital replacement unit exchange and fluid transfer capabilities, and will use existing technologies, including the Orbital Manuevering Vehicle and elements of the Flight Telerobotic Servicer, to minimize costs and reduce technical risks.

The flight demonstration Phase B studies, estimated at $1.3 million each, will include the design and definition of the servicer system, a target vehicle, and ground and on-orbit control stations. Two firm, fixed-price, Phase B contracts, with a 12-month period of performance, are expected to be awarded this summer. Responses to the request for proposals, released Jan. 19, are due March 5.

Phase B project managment resides at JSC's New Initiatives Office, Satellite Servicing Project Office.

NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

January 25, 1990

Jeffrey Carr
RELEASE: 90-009

SCIENCE PAYLOAD COMMANDERS NAMED; CARTER REPLACES CLEAVE ON IML-1

In a move to provide long range leadership in the development and planning of payload crew science activities, four Space Shuttle mission specialists currently assigned to STS missions have been designated as payload commanders.

The payload commanders will have overall crew responsibility for the planning, integration and on-orbit coordination of payload/Space Shuttle activities on their mission. The crew commander will retain overall responsibility for mission success and safety of flight.

Named as payload commander for STS-42, the first flight of the International Microgravity Laboratory (IML-01) set for late 1990, is mission specialist Norman E. Thagard, M.D. In addition, Navy Capt. Manley L. "Sonny" Carter, M.D., has been named as a mission specialist on the IML crew, replacing Mary L. Cleave, Ph.D., who has resigned her flight assignment for personal reasons.

Kathryn D. Sullivan, Ph.D., will serve as payload commander for STS-45, the first flight of the Atmospheric Laboratory for Applications and Science (ATLAS-01), slated for launch in 1991.

Payload commander for STS-46 is Jeffrey A. Hoffman, Ph.D. The STS-46 mission, set for 1991, will feature the first flights of the European Retrievable Carrier (EURECA), developed by the European Space Agency, and the Tethered Satellite System, a joint project between NASA and the Italian space agency, Agenzia Spaziale Italiana.

Air Force Lt. Col. Mark Lee will be the payload commander on mission STS-47 for Spacelab-J, a joint science venture between NASA and the Japanese National Space Development Agency, NASDA, also in 1991.

-more-

Future assignments of payload commanders normally will be made in advance of the remainder of the flight crew in order to help identify and resolve training issues and operational constraints prior to crew training.

The role of the payload commander also is expected to serve as a foundation for the development of a space station mission commander concept.

-end-

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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AC 713 483-5111

For Release

January 26, 1990

Linda Matthews Copley
RELEASE NO: 90-010

FLUOR-DANIEL SERVICES, INC., AWARDED CONSTRUCTION CONTRACT

NASA's Johnson Space Center (JSC), Houston, has selected Flour-Daniel Services, Inc., Greenville, S.C., for negotiations leading to award of a cost-plus-award-fee contract for construction support services. The first contract year will begin on or about Feb. 1, 1990.

The contract covers a planned 5-year performance period which includes a 1-year basic period plus four 1-year options. Proposed cost and fee for the 5-year program, including yearly options, is approximately $27.5 million.

Services to be provided by Flour-Daniel include management, planning and execution of a broad variety of construction tasks at JSC, including the alteration of an existing physical plant.

- end -

NASA News

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For Release

January 26, 1990

Linda Matthews Copley
RELEASE NO: 90-011

HERNANDEZ ENGINEERING AWARDED INFORMATION SUPPORT CONTRACT

NASA's Johnson Space Center (JSC), Houston, has awarded a contract to Hernandez Engineering, Inc., Houston, for technical information and public affairs support. The basic period of performance began Jan. 1, 1990.

The cost-plus-fixed-fee contract is for a basic year effort plus four 1-year options. Estimated cost and fee for the basic year is valued at $7.7 million. If the options are exercised, the contract value will increase by $8.1 million for the first option, $8.5 million for the second option, $9.1 million for the third option and $9.7 million for the last option.

The effort involves approximately 205 employees, both at JSC and in other designated locations. The contract includes providing public affairs support services, correspondence and communications management, security support services, information resource management, documentation management, technical information support services and duplication, reproduction, microforms and distribution management.

The new contract was awarded under the 8(a) Small Business Administration program. The previous contractor, Omniplan, Inc., had provided these services to JSC since 1981 and is no longer under the 8(a) program.

- end -

NASA News

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For Release

James Hartsfield
Feb. 1, 1990
RELEASE: 90-012

EPA, NASA WHITE SANDS TEST FACILITY ENTER CONSENT AGREEMENT

NASA has entered into a formal consent agreement with the U.S. Environmental Protection Agency (EPA) regarding assessment of groundwater contamination at the White Sands Test Facility (WSTF). The agreement recognizes contamination assessment work accomplished by NASA at WSTF since 1986, and it identifies the additional steps needed at WSTF to complete the assessment and determine whether remedial action is necessary.

NASA has confirmed that the groundwater beneath WSTF has been contaminated with low levels of hazardous constituents, principally trichloroethylene and Freon. The major source of the contamination appears to have resulted from the original construction of WSTF in the mid-1960s when organic solvents were used to precision clean piping. In addition, the on-site cleaning facility has used various solvents and degreasing agents to meet operational and testing requirements.

WSTF has established operating procedures for the management of hazardous wastes that comply with both the EPA and New Mexico environmental regulations. These safeguards are preventing the introduction of additional contaminants into the groundwater.

While test results have indicated that contamination has migrated beyond the facility boundaries, no hazardous chemicals have been detected in drinking water supplies, including the NASA/WSTF water supplies located 3.5 and 4 miles from the facility boundary.

The agreement language reflects a cooperative working relationship between NASA and the EPA which permits an efficient and effective approach to assuring protection of human health and the environment. NASA is continuing its assessment efforts under the agreement and will keep the public fully informed of the results.

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WSTF operates as an organizational element of the Johnson Space Center. Facilities at WSTF include spacecraft propulsion system test facilities and materials test laboratories. Established in 1963, the facility actively supported the Apollo, Skylab, Viking and other NASA programs. WSTF presently performs development, evaluation and qualification testing of Space Shuttle propulsion systems, materials and components. Materials testing in support of the Space Station Freedom Program was initiated in 1989, and propulsion testing will begin in 1991.

-end-

NASA News

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For Release
February 1, 1990

Jeffrey Carr
RELEASE NO. 90-013

SHUTTLE ASTRONAUTS TO ATTEND SOVIET SPACE LAUNCH

The National Aeronautics and Space Administration has accepted an invitation for Shuttle astronauts to attend a Soviet manned space launch and to tour space facilities in the Soviet Union this month. The invitation was extended to NASA astronauts earlier this year by General Alexei Leonov, Deputy Head of the Y. A. Gagarin Cosmonaut Training Center.

Members of the astronaut delegation traveling to the Soviet Union are JSC Deputy Director Paul J. Weitz, Chief Astronaut Daniel C. Brandenstein, Ronald J. Grabe, and Jerry L. Ross.

The group is scheduled to arrive in Moscow on February 9, and will travel to Baikonour the following day to tour launch facilities there and to view a manned launch. The group will also travel to Star City, near Moscow, to visit the Gagarin Cosmonaut Training Center and to the Manned Spaceflight Control Center in Kaliningrad, before returning on February 14.

# # #

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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For Release

Brian Welch
Release No. 90-014

February 8, 1990

MISSION OPERATIONS NAMES TWO NEW FLIGHT DIRECTORS

Two new flight directors have been named within the Mission Operations Directorate at Johnson Space Center.

The two, both veteran flight controllers, are Jeffrey W. Bantle and Philip L. Engelauf.

During Space Shuttle missions, flight directors lead the large cadre of operators within the Mission Control Center who are responsible for monitoring spacecraft systems and operations. Flight `irectors have overall responsibility for the conduct of the mission ıd for real-time decision making as flight events unfold.

Bantle, Head of the Guidance and Control Systems Section in the Systems Division, has served as Guidance, Navigation and Control Officer (GNC) in Mission Control for several Shuttle missions.

He was born in Marinette, WI, in September 1958 and graduated from Marinette High School in 1976 before going on to earn a B.A. in math and physics from Ripon College in Ripon, WI, in 1980. He later earned a master's in aeronautical engineering from George Washington University, Washington, D.C., while working in supersonic aircraft studies at NASA's Langley Research Center, Hampton, VA before coming to Houston in September 1982.

Bantle worked for Ford Aerospace in the Guidance and Control Systems Section for two years, then became a NASA employee in 1984. Bantle was named Section Head in 1988. His console experience in the Mission Control Center began with the sixth Space Shuttle flight in 1983.

Engelauf, born in Riverside, CA, in October 1956, is a 1974 graduate of Rubidoux High School and a 1978 graduate of the California Institute of Technology, where he earned a B.S. in engineering and applied sciences.

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He earned a master's in aeronautical and astronautical engineering from Stanford University in 1981 while working at NASA's Ames Research Center, Mountain View, CA. Engelauf began with NASA Ames in 1978 as a wind tunnel facility engineer.

He transferred to JSC in 1982 and has supported several Space Shuttle missions, beginning with STS-4, as a Flight Activities Officer.

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NASA News

National Aeronautics and
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For Release

February 8, 1990

Linda Matthews Copley
Johnson Space Center
(713) 483-5111

RELEASE NO: 90-015

JOHNSON SPACE CENTER CONTRIBUTES $973 MILLION TO HOUSTON AREA ECONOMY IN FY89

NASA's Johnson Space Center contributed approximately $973 million to the Houston area economy in Fiscal Year (FY) 1989 ending Sept. 30. This is an increase of $400 million over the previous year. JSC received $1.9 billion, or about 17 percent of the $11 billion appropriated for the agency's FY89 total.

The center's expenditures locally included $157 million in federal salaries, $3 million in air travel, and $812 million in goods and services from over 1100 local businesses, averaging $3.7 million for each working day.

The major portion of JSC's budget, $1.6 billion, went for Research and Development (R&D) and Space Flight Control and Data Communications. Research and Program Management (R&PM), covering everything from salaries, gas and electric utility bills, and mowing the grass, took $301 million. Facility construction accounted for the remaining $14 million.

Utility costs for the center for FY89 were $1.6 million for gas, $7.4 million for electricity, $6.8 million for (phone and electronic) communications, and $300,000 for the purchase of surface water and sewage treatment.

Since moving to Houston in 1962, total JSC funding from NASA equals $37.3 billion in actual dollars through Sept. 30, 1989. That total includes $3.9 billion for R&PM, $33 billion for R&D, and $351 million for construction of facilities overall in the past 28 years.

JSC spent $1.10 billion in FY89 with both Texas firms and out-of-state companies that pay salaries to employees in their Texas operations. That places Texas third behind California ($2.7 billion) and Florida ($1.2 billion) in states receiving NASA funds for contracts or grants. Maryland ranks fourth ($753 million) and Alabama fifth ($699 million). JSC has paid out $2.6 billion in civil service salaries since 1962.

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The center employed 3,773 civil servants in FY89 compared to 3,552 the year before. Peak space industry employment in the JSC area occurred in 1989, with 11,120 aerospace industry and support contractor personnel working on or near the center. The peak year for numbers of federal employees at JSC was 1967, with 5,261 positions.

By the end of FY 89, the average federal salary was $43,450. The average age of JSC employees was 42, with 1,927 of those having earned bachelors degrees, 648 with masters degrees, and 191 have doctorates, law, or medical degrees.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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Kari Fluegel
Release No. 90-016

For Release
Feb. 9, 1990
Immediate Release

LOCKHEED, ROCKWELL TEAMS SELECTED FOR ACRV DEFINITION CONTRACTS

Two teams of aerospace companies will begin negotiations with NASA for contracts for the definition and preliminary design of the Assured Crew Return Vehicle, a rescue system for Space Station Freedom.

The two teams headed by Lockheed Missiles and Space Company Inc. and Rockwell International Space Transportation Systems Division will enter into negotiations with the National Aeronautics and Space Administration with contracts becoming effective April 1, 1990.

Lockheed is teamed with Boeing Aerospace and Electronics Co. and IBM Systems Integration Division, while Rockwell is teamed with McDonnell-Douglas Space Systems Division, TRW and Honeywell. The two teams were the only compliant responses received after release of the request for proposals in November.

Each team will conduct a six-month Phase A Prime study, valued at approximately $1.5 million, to establish a common set of requirements for the ACRV and answer specific questions regarding configuration and external interfaces. The 12-month Phase B option, valued at $4.5 million, would result in the detailed definition of a preliminary design.

The ACRV, formerly known as the Crew Emergency Return Vehicle (CERV), will provide on-orbit emergency capability for the Space Station Freedom crew to return to Earth independent of the space shuttle in the event of medical emergency, space station contingency or Space Transportation System launch schedule interuption.

A third response to the request for proposals was received from Vanguard Research Inc. of Fairfax, Virgina, but was found to be non-compliant.

The program is managed by the ACRV Project Office in the New Initiatives Office at the Johnson Space Center, Houston, Texas.

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NASA News

National Aeronautics and
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For Release

Linda Matthews Copley
February 15, 1990
RELEASE NO: 90-017

JOHNSON SPACE CENTER CONTRIBUTES $973 MILLION TO HOUSTON AREA ECONOMY IN FY89

NASA's Johnson Space Center contributed approximately $973 million to the Houston area economy in Fiscal Year (FY) 1989 ending Sept. 30. This is an increase of $400 million over the previous year. JSC received $1.9 billion, or about 17 percent of the $11 billion appropriated for the agency's FY89 total.

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JSC spent $1.10 billion in FY89 with both Texas firms and out-of-state companies that pay salaries to employees in their Texas operations. That places Texas third behind California ($2.7 billion) and Florida ($1.2 billion) in states receiving NASA funds for contracts or grants. Maryland ranks fourth ($753 million) and Alabama fifth ($699 million). JSC has paid out $2.6 billion in civil service salaries since 1962.

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For Release

Kari Fluegel
Release No. 90-018

Feb. 16, 1990
Immediate

JSC ESTABLISHES LUNAR AND MARS EXPLORATION PROGRAM OFFICE

A Lunar and Mars Exploration Program Office has been established by Johnson Space Center Director Aaron Cohen to begin preliminary technical definition and integration for the agency's exploration initiative.

The office will be headed by Mark K. Craig, manager of the exploration office formerly housed within the New Initiatives Office. Craig will report to Arnold Aldrich, associate administrator for the Office of Aeronautics and Space Technology.

"The program office is responsible for defining how an outpost on the Moon and manned missions to Mars will be undertaken, both technically and programmatically," Craig said.

"Our job will be to create workable programs which meet the objectives established by NASA Headquarters and the National Space Council. We'll work closely with NASA centers around the country, integrating the various study results into a comprehensive program," Craig said.

The office will be composed of an existing 22 JSC civil service positions plus about 50 contractors and civil servants from other NASA centers and NASA Headquarters.

Deputy manager of the program office is Douglas R. Cooke, currently deputy manager of the exploration office in the New Initiatives Office.

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For Release

Jeff Carr
Release No. 90-019

February 20, 1990
Immediate

MULLANE TO RETIRE FROM NASA, AIR FORCE

Effective July 1, 1990, Colonel Richard M. Mullane will retire from NASA and the Air Force.

Mullane was selected as a mission specialist astronaut in 1978 and has flown two Space Shuttle missions. His third flight is scheduled for launch Thursday aboard Atlantis.

He flew on Discovery's maiden flight, STS 41-D in August 1984 and on the third flight of Atlantis, STS-27, in December 1988.

After leaving NASA and the Air Force, Mullane will return to his hometown of Albuquerque, NM.

# # #

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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For Release

Jeffrey E. Carr
RELEASE NO. 90-020

February 26, 1990
2 p.m. CST

VETERAN SHUTTLE ASTRONAUT WILLIAMS TO RETIRE FROM NASA, NAVY

Navy Capt. Donald E. Williams, veteran of two Shuttle flights, will retire from NASA and the Navy, effective March 1, to pursue a career in private industry.

"I reached my goal as a pilot, which was to command a mission," said Williams. "Now it's time to go on to other challenges. JSC and NASA have been a wonderful place to work and I'm proud to have been a part of the team."

Williams was selected by NASA as an astronaut in 1978, and made his first space flight in April 1985 as pilot of Discovery on mission STS-51D, which included the first unscheduled rendezvous and spacewalk. He flew again as crew commander of Atlantis in October 1989 on mission STS-34, highlighted by the deployment of the Jupiter probe, Galileo.

Prior to STS-34, Williams served as chief of the Astronaut Office Mission Support Branch. He also served as Deputy Manager of Operations Integration in the NSTS Program Office, and as Deputy Chief, Aircraft Operations Division during his years with NASA.

Williams will be joining Science Applications International Corporation in Houston as Senior Systems Engineer.

# # #

NASA News

National Aeronautics and
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AC 713 483-5111

For Release

Pam Alloway
RELEASE NO.: 90-021

March 5, 1990

NOTE TO SCIENCE EDITORS: NASA JOHNSON SPACE CENTER HOSTS 21ST LUNAR AND PLANETARY SCIENCE CONFERENCE MARCH 12-16, 1990.

Scientists from around the world will converge on Houston's Johnson Space Center March 12-16 to discuss the latest research on lunar and planetary science, including preliminary findings from the Long Duration Exposure Facility (LDEF) retrieved on STS-32 in January.

About 750 scientists are expected to attend the 21st Lunar and Planetary Science Conference which will feature sessions on Mars, the Voyager 2 mission, LDEF, and various lunar topics.

There will be two public sessions: a discussion March 12 of President Bush's Moon/Mars exploration initiative featuring JSC Director Aaron Cohen; and a special Voyager 2 session March 14 featuring the California Institute of Technology's Andrew Ingersoll. The Voyager 2 spacecraft in August 1989 sent back data and images of Neptune. Both programs will begin at 8 p.m. in Teague auditorium in Bldg. 2 and are free of charge.

Concurrent sessions are scheduled each day at 8:30 a.m. and 1:30 p.m. On the conference's final day - March 16 - sessions are scheduled for 8:30 a.m. and 10:15 a.m. The sessions will take place in the Gilruth Center at JSC.

Scientists and scholars will present about 375 papers during the conference. Technical sessions will cover such subjects as: a Venus overview prior to Magellan; lunar meteorites, geology and resource utilization; cosmic rays; comets and orbital dust collection; the outer solar system; Martian geophysical and tectonic evolution, volcanic evolution, climate histories and craters; solar nebula and planetary origins; heavy metal meteorites; Triton and Phobos; and planetary geological processes.

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An 8:30 a.m. March 14 technical session will feature discussions on interplanetary dust and LDEF findings. The STS-32 shuttle crew retrieved LDEF, a bus-sized satellite stranded in space for nearly six years, from space Jan. 12.

Media interested in covering the conference should register in the Gilruth Center's Room 216 from 8 a.m. to 5 p.m. March 12-15 or in the morning of March 16. Conference abstract volumes containing condensed versions of several scientists' papers will be available at the Gilruth Center or on request from JSC's newsroom.

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For Release

NASA'S FIRST SPACEWALK IN OVER FIVE YEARS IS SET FOR NOVEMBER

James Hartsfield
RELEASE NO. 90-022

March 7, 1990

In November, astronauts will step out the door 243 nautical miles above Earth for the first NASA spacewalk in five years, or as it might be better described, a space ride.

Shuttle mission STS-37 crew members Jerry Ross and Jay Apt will conduct the Crew and Equipment Translation Aid (CETA) flight experiment in the payload bay of Atlantis. Ross and Apt will try three different methods of propelling a small cart along rails in the bay in an effort to identify the best way to move on the exterior of Space Station Freedom. Necessity, good timing and enthusiasm have pushed CETA a long way in a short time.

"EVA's are something it's easy to get people excited about," said Ed Whitsett, CETA project manager at the Johnson Space Center. "People have been willing to make a lot of sacrifices to pull this all together."

CETA didn't exist until June 1989, after the final payload review for STS-37 had already taken place, Whitsett said. But the experiment, through long hours put in by those supporting it, came together and was ready for the previously scheduled launch of STS-37 this June. The flight crew played a large part in getting the experiment on track for the prospective launch date.

Although mechanical tests and procedure checks of CETA are the primary reason behind the spacewalk, an important contributing factor is the simple need for NASA to take a walk on the high side again.

"We're excited about it," explained Ross, who will make his third spacewalk. "We're anxious to build up the EVA team again, to build up the experience base. We see a large quantum jump ahead in the amount of time spent EVA as space station gets closer."

The five-year lapse has taken a toll on experienced EVA personnel available among astronauts, flight controllers, engineers and other team members.

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"The crew needs to get operational experience for EVAs and we need to get EVA inputs for space station design -- it's a perfect match," Whitsett said.

By coincidence, Ross was the last American to shut the door on space, after conducting two spacewalks on STS-61B in late November 1985.

"When I got back inside after my second EVA on 61B, I thought that was the finale ... I'd never have that opportunity again," Ross said. "But through a strange twist, I'm going to do this one. You know, I smile a lot thinking about it. It is really a fantastic experience you just can never fully explain to anyone."

A method for crew members to move up and down the 400-foot long space station truss structure has always been planned, but the original concept was akin to a large space golf cart.

"We thought it was overkill," Whitsett said. "It was like taking a bus when all you need to do is go out to the back field on your motorcycle."

Although the simplest method of movement would be a hand-over-hand pull down the truss, with no special equipment except a tether, such a method could cause excessive wear and tear on the truss and suit. Also, it would be difficult to carry cargo.

CETA may be the answer. It is a small cart that runs along a track which can be built into the Space Station Freedom truss. Astronauts would ride prone on CETA, and could pull equipment along behind them. But how to propel the cart, how much stress the various methods of movement would put on the truss and the astronaut, and how fast it can be comfortably and safely moved are questions to be studied on STS-37.

The cart will be mounted on a track in the payload bay, skirted by two handrails for half of the bay and by one rail, to be extended following deployment of the Gamma Ray Observatory (GRO), for the entire distance _ 46 feet. Apt and Ross will move the cart in three different fashions: lying prone, one crewman will pull himself along the track hand over hand; with the astronaut angled upward slightly, the cart will be changed to accomodate a lever that can be pumped to move it up and down the track, much like an old railroad handcar; and, also with the crewman at about a 45-degree angle, the cart will be propelled by hand-pushed pedals similiar to a bicycle _ the pedals will generate electricity to drive the cart.

The first two versions of CETA are called the manual and mechanical cart designs. The third is the electrical design. All of the versions include brakes and provisions for moving in reverse, which, for the electrical version consists of turning the pedals backward, creating a reverse current that in turn drives the electric motor backward.

Ross and Apt will evaluate the amount of energy required to move each version; comfort; how secure they feel moving in them; control; and visibility. Sensors on the track and cart will provide information on the amount of stress each version places on the track and handrails. Although CETA is a one-person cart, Ross and Apt also will propel themselves "piggyback" on each version to test the cart's cargo-carrying ability.

The astronauts also will test a one-person "tether shuttle," a very simple, small cart designed to attach a tether to so it can slide along as an astronaut pulls hand-over-hand along the railway. The "tether shuttle" is intended as a way for one crew member, carrying no extra cargo, to move around if the main cart were in use or broken.

CETA will take up most of the single, six-hour spacewalk planned, but Apt and Ross will do some additional tasks. Using the shuttle's robot arm, they will evaluate how much flexibility can be allowed in the Astronaut Positioning System (APS) and how quickly an astronaut can be moved comfortably at the end of an arm. The APS is a manipulator arm planned for use when astronauts begin assembling the truss structure for Space Station Freedom. It will move an astronaut, standing in foot restraints at its end, from place to place to assemble the various joints.

Using the Crew Loads Instrumented Pallet (CLIP), an EVA workstation mounted on the side of the shuttle's bay, the astronauts will gather more information on stresses imparted to structures during space work. The pallet part of CLIP has flown twice aboard the shuttle.

The results of CETA and the other EVA experiments scheduled on STS-37 could make some designs for Space Station Freedom spacewalk aids less complex, Whitsett said.

"It has been kind of a crash program, but there's been a real fine team," Whitsett said. "It's fallen into place quickly and smoothly."

The launch of STS-37 originally was scheduled for June, but it has been reset for November. The delay is disappointing for those who've worked on CETA, but the extra time won't be wasted.

"The time will allow for some things we were a little pressed on to be double-checked," Whitsett said.

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NASA News

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AC 713 483-5111

For Release

Kari Fluegel
Release No. 90-023

March 6, 1990
3 p.m. CST

NASA AWARDS OPERATIONS SUPPORT CONTRACT TO ROCKWELL TEAM

NASA today announced the selection of Rockwell Space Operation Company, Houston, Texas, for negotiations of a 10-year cost-plus-award-fee Operations Support Contract totaling $814 million.

The contract for the Mission Operations Directorate provides support for operations concepts development, and for mission, flight crew, and facility operations for the Space Station Freedom Program and other space flight programs supported by the Johnson Space Center. Support for the Space Shuttle Program and related projects is not included in the OSC.

Major tasks under the OSC are management functions and systems, mission operations, training, ground facility support, flight crew operations directorate support, and other support to include multiple program operations with responsibility distributed throughout NASA.

The 10-year performance contract, which includes an eight-year basic period and a two-year option, is set to begin on or around April 1.

Subcontractors for Rockwell are Barrios Technology Inc., Bendix Field Engineering Corp., Omniplan Corp., Science Applications International Corp., Systems Management American Corp. and UniSys-Air Defense and Space Systems Division.

Other companies and subcontractors submitting proposals were:

• Ford Aerospace Corporation of Houston Texas with Booz, Allen and Hamilton Inc., GEO Control Systems Inc., GE Government Services, Hernandez Engineering Inc., and TRW Defense Systems Group;

-more-

• Lockheed Engineering and Services Corp. of Houston, Texas, with Electronic Data Systems Federal Corp; and

• McDonnell Douglas Space Systems Co. of Houston, Texas, with Boeing Aerospace Operations Inc., Computer Sciences Corp., International Business Machines Corp. Systems and Integration Division, McDonnell Douglas-Douglas Aircraft Company, and Write Right Technical Publication Inc.

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NASA News

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For Release

Jeffrey E. Carr
March 16, 1990
RELEASE NO. 90-024

NOTE TO EDITORS: STS-31 BRIEFINGS CHANGED TO MARCH 22

Due to a change in the Terminal Countdown Demonstration Test, the STS-31 briefings and crew press conference have been postponed to Thursday, March 22.

T-0 for the TCDT, orginally set for Thursday, was moved to Tuesday because of a revision in launch pad activities at the Kennedy Space Center. TCDT is the crew's traditional dress rehearsal for launch day.

The briefings, originating at the Johnson Space Center, will begin at 8:30 a.m. CST, Thursday, with a briefing by Flight Director Bill Reeves. A briefing regarding the secondary payloads and the student experiment is set for 9:30 a.m., followed by the crew press conference at 10:30 a.m.

All briefings will be carried on NASA Select.

NASA News

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For Release

Pam Alloway
RELEASE NO. 90-025

March 16, 1990

SHUTTLE TRASH COMPACTOR TO SERVE AS EXTENDED DURATION FLIGHT TREASURE

When Fred Abolfathi and J.B. Thomas work on one of their many projects at Johnson Space Center, a detailed test objective scheduled to fly on STS-35 in May, they don't have any problem finding material to test it out - they just reach for the nearest trash can.

Abolfathi, a Lockheed Engineering and Science Corp. project engineer, and Thomas, a subsystems manager in JSC's Man-Systems Division, have spent the past year working on a trash compactor for the Space Shuttle. They've crushed hundreds of pop cans, squished thousands of memos, mutilated pounds of flight food containers, and even thrown in a couple of cans full of cat food, just to test odor containment. "So far we haven't had any trouble generating trash," Abolfathi said.

The experimental shuttle trash compactor is scheduled to fly on STS-35 for the first time as detailed test objective (DTO) 0634. The compactor will become an important part of shuttle hardware as NASA begins flying extended duration orbiter flights (EDO), said project managers. EDO missions mean more trash in a vehicle where stowage space already is extremely limited. The first 13 day EDO mission currently is scheduled in 1992. Plans call for the first 16 day EDO mission to occur in 1994.

"The goal of the EDO Trash Compactor is to reduce the trash to a manageable volume for EDO missions," said Thomas. "Each crew member generates about one-half cubic foot of trash per day."

Current projections indicate about 56 cubic feet of trash will be generated on the first 16 day EDO flight and those working on this project would like to reduce that number to 14 cubic feet, said Abolfathi.

The 48-pound compactor fits in place of a middeck locker and is operated manually. Trash is placed inside a polypropylene bag which, when full, is placed inside the chamber of the compactor.

One bag holds a volume equivalent to one-half cubic foot. A metal compactor door is closed securing the bag inside the chamber. A crew member then uses handles on either side of the compactor in a garden shear-type movement to engage gears which push a piston

-more-

from the back of the chamber to the front, compressing the trash to a volume four times smaller. The piston compresses the trash using a force of about 60 pounds per square inch.

After the piston is moved as far forward as it was designed to go, the crew member retracts the piston, opens the compactor door, and pulls a strap to remove the bag from the chamber. The bag has a lid which houses a charcoal filter to contain odors, fluids and bacteria. A one way air valve in the lid allows air out of the bag, relieving pressure built up during compaction. Next, the entire package is placed inside the orbiter trash stowage compartment. The bags fit through an eight inch diameter hole in the middeck floor. This compartment, known as Volume F, normally is used for wet trash stowage.

Operating the EDO Trash Compactor could provide a type of exercise for the crew, Thomas said.

About 10 years ago Johnson Engineering Corp. in Boulder, Colo. began working on a concept for an orbiter trash compactor that could be developed commercially for recreational vehicles. Using that experience, the company bid on a contract in July 1989 to design a shuttle trash compactor.

The design has been tested and certified using a variety of items, including: food, water, flight trash, plastic and metal food containers, and teleprinter pages.

The current shuttle rehydratable food package, which does not crush well in the compactor, is being redesigned for EDO missions, Abolfathi said.

"The DTO is flying as a proof of concept for the compactor," said Abolfathi. "We'll prove the concept will work and results will be used to build two flight units."

During STS-35, crew members will experiment with various types of lids and bags, Abolfathi said. Thirty bags and lids will accompany the compactor into space.

The hardware is scheduled to be shipped to KSC March 19 to support the Crew Equipment Interface Test), said Hamid Tabibian, Man-System's Systems Development Section manager.

"We've always been interested in designing a trash compactor for the shuttle but we just couldn't justify flying it until extended duration flights began coming along," Tabibian said. "EDO missions will last up to 16 days and can have as many as seven people. The trash compactor will become essential for those types of missions."

Photos available through JSC's Still Photo Library, (713) 483-4231. Photo numbers: S90-31435, S90-31434, S90-31433.

NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
Area Code 713

For Release

Kari Fluegel
Release No. 90-026

March 30, 1990
Immediate

NASA CALLS FOR MIDDECK LOCKER MODULE PROPOSALS

The National Aeronautics and Space Administration Thursday put out a call for proposals to lease space and related services on a pressurized manned module to expand the orbiters' middeck locker experiment capability.

Called the Commercial Middeck Augmentation Module, the commercially-developed and owned module will ride in the payload bay when carried, be accessible through the air lock and add the volume equivalent of about 50 middeck lockers to the orbiters' capacity.

The Request for Proposals seeks responses from companies that can provide the module for lease by the government; physical and operational integration of the module and the experiment requirements; operator training; and data collection, processing and distribution.

Need for the additional capability emanates from NASA's Commercial Development of Space Program. In support of private sector research initiatives, NASA is offering shuttle-based flight research opportunities through its grant program for Centers for the Commercial Development of Space. The experiments will involve breakthrough technologies in areas such as materials processing, protein crystal growth, biotechnolgy and fluid dynamics. The government's minimum requirements are for the lease of 175 middeck locker volume equivalents and related services which are to be provided over five flights beginning in 1993 and ending in 1995. An option, if proposed and exercised, will involve 25 additional middeck locker equivalents and related services be provided on a September 1992 flight.

Deadline for the proposals is April 30. In FY91, Approximately $14 million is available for the CMAM project. The entire project is budgeted for $180 million through 1995.

The CMAM will be managed by the CMAM Project Office in the New Initiatives Office at the Johnson Space Center in Houston.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Linda Matthews Copley
Johnson Space Center, Houston
(Phone: 713/483-5111)

April 2, 1990

RELEASE NO:90-027

JSC AWARDS ENGINEERING SUPPORT CONTRACT EXTENSION TO LOCKHEED

NASA's Johnson Space Center (JSC) has exercised its options to extend the period of performance and increase the required efforts for the Engineering Support Contract (ESC) with Lockheed Engineering & Sciences Company in Houston.

The value of options exercised is $444,556,000, which increases the total value of the cost-plus-award-fee contract to $884,831,870. The period of performance has been extended to May 9, 1995.

The objective of the ESC is providing research and development (R&D) support services to all elements of the Engineering Directorate, the New Initiatives Office, to specified elements of the Space and Life Sciences Directorate, and to other JSC elements for related functions.

The major emphasis of the contract is continued support to the Space Shuttle, Space Station Freedom, and Advanced Space Programs. Lockheed will continue to provide functions ranging from hands-on maintenance and operation tasks to the engineering associated with major systems design and development projects.

The work will be performed by Lockheed at JSC and at the contractor's facilities at 2400 Nasa Road 1, located adjacent to the center.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Brian Welch
April 6, 1990
Release No. 90-028

FLIGHT CONTROL OF STS-31

Flight control for STS-31, the thirty-fifth voyage of the Space Shuttle, will follow the same procedures and traditions common to all U.S. manned space flights since the Mission Control Center was first used in 1965.

Responsibility for conduct of the mission will revert to the Mission Control Center (MCC) in Houston once Discovery's two solid rocket boosters ignite. Mission support will begin in the MCC about five hours prior to launch and will continue around-the-clock through the landing and post-landing activities.

The mission will be conducted from Flight Control Room One (FCR-1) on the second floor of the MCC located in Bldg. 30 at Johnson Space Center.

Three teams of flight controllers will alternate shifts in the control center and in nearby analysis and support facilities. The handover between each team takes about an hour and allows each flight controller to brief his or her oncoming colleague on the course of events over the previous two shifts. Change-of-shift press conferences with offgoing flight directors generally take place 30 minutes to an hour after the shift handovers have been completed.

The three flight control teams are referred to as the Ascent/Entry/Orbit 1, Orbit 2 and Planning teams. Generally, the STS-31 crew's working day is split between the Orbit 1 and Orbit 2 shifts.

The ascent phase will be conducted by Flight Director Ronald D. (Ron) Dittemore. Once Discovery is in orbit, this shift is known as Orbit 1 and will be headed by STS-31 Lead Flight Director William D. (Bill) Reeves. Some of the flight control positions will be staffed by the same personnel for both Ascent/Entry and Orbit 1 operations. Other positions will alternate between specialists in launch/landing activities and orbital operations. On the final day of the mission, Flight Director N. W. (Wayne) Hale will head the Entry team for Discovery's landing phase. As is the traditional practice, Hale

also will lead the Orbit 1/Entry team the day before landing to oversee entry preparations.

The Orbit 2 team will be led by Flight Director James M. (Milt) Heflin. The Orbit 2 team will be prime for EVA operations should a spacewalk by crew members Dr. Kathryn Sullivan and Bruce McCandless become necessary. The Orbit 1 team will be prime for Hubble Space Telescope deploy operations.

The Planning Team, which for the most part operates during the crew's sleep shift, will be led by Flight Director Alan L. (Lee) Briscoe.

MCC POSITIONS AND CALL SIGNS FOR STS-31

STS-31 will mark the first mission since the early days of the Shuttle program in which the responsibility for electrical and environmental systems will be divided into two console positions, called EECOM and EGIL. The position known as EECOM--for Environmental Engineer and Consumables Manager--will continue to have responsibility for the life support systems aboard Discovery, as well as cabin pressure, active and passive thermal control systems (such as the Flash Evaporator System), and the management of the supply and waste water tanks.

The EGIL position--for Electrical Generation and Illumination--has responsibility for operation of the three fuel cells, the DC buses and AC power inverters, and the overall electrical system aboard the Orbiter. EGIL also will be responsible for the Master Caution and Warning System.

The flight control positions in the Mission Control Center, their call signs and their functions are:

Flight Director (FLIGHT)

Has overall responsibility for the conduct of the mission.

Spacecraft Communicator (CAPCOM)

By tradition an astronaut; responsible for all voice contact with the flight crew.

Flight Activities Officer (FAO)

Responsible for procedures and crew timelines; provides expertise on flight documentation and checklists; prepares messages and maintains all teleprinter and/or Text and Graphics System traffic to the vehicle.

Phase Specialist (PROCEDURES)

This is a speciality position which sometimes operates at

the FAO console. The Phase Specialist offers expertise for the Flight Director in specific procedures required during complex operations.

Integrated Communications Officer (INCO)

Responsible for all Orbiter data, voice and video communications systems; monitors the telemetry link between the vehicle and the ground; oversees the uplink command and control processes.

Flight Dynamics Officer (FDO)

Responsible for monitoring vehicle performance during the powered flight phase and assessing abort modes; calculating orbital maneuvers and resulting trajectories; and monitoring vehicle flight profile and energy levels during reentry.

Guidance Procedures Officer (GPO)

Responsible for the onboard navigational software and for maintenance of the Orbiter's navigational state, known as the state vector.

Trajectory Officer (TRAJECTORY)

Also known as "TRAJ," this operator aids the FDO during dynamic flight phases and is responsible for maintaining the trajectory processors in the MCC and for trajectory inputs made to the Mission Operations Computer.

Environmental Engineer & Consumables Manager (EECOM)

Responsible for all life support systems, cabin pressure, thermal control and supply and waste water management; manages consumables such as oxygen and hydrogen.

Electrical Generation and Illumination Officer (EGIL)

Responsible for power management, fuel cell operation, vehicle lighting and the master caution and warning system.

Payloads Officer (PAYLOADS)

Coordinates all payload activities; serves as principal interface with remote payload operations facilities.

Data Processing Systems Engineer (DPS)

Responsible for all onboard mass memory and data processing hardware; monitors primary and backup flight software systems; manages operating routines and multi-computer configurations.

Propulsion Engineer (PROP)

Manages the reaction control and orbital maneuvering thrusters during all phases of flight; monitors fuel usage and storage tank status; calculates optimal sequences for thruster firings.

Booster Systems Engineer (BOOSTER)

Monitors main engine and solid rocket booster performance during ascent phase.

Guidance, Navigation & Control Systems Engineer (GNC)

Responsible for all inertial navigational systems hardware such as star trackers, radar altimeters and the inertial measurement units; monitors radio navigation and digital autopilot hardware systems.

Ground Controller (GC)

Coordinates operation of ground stations and other elements of worldwide space tracking and data network; responsible for MCC computer support and displays.

Maintenance, Mechanical, Arm & Crew Systems (MMACS)

Formerly known as RMU; responsible for remote manipulator system; monitors auxilliary power units and hydraulic systems; manages payload bay and vent door operations.

Rendezvous Guidance and Procedures Officer (RENDEZVOUS)

Monitors onboard navigation of the Orbiter during rendezvous operations and advises the control team on the rendezvous profile. Should a contingency revisit to HST become necessary on this flight, the Rendezvous position would be activated.

Flight Surgeon (SURGEON)

Monitors health of flight crew; provides procedures and guidance on all health-related matters.

Public Affairs Officer (PAO)

Provides real-time explanation of mission events during all phases of flight.

STS-31 FLIGHT CONTROL TEAM STAFFING

Position	Ascent/Entry	Orbit 1	Orbit 2	Planning
FLIGHT	Ron Dittemore (A) Wayne Hale (E)	Bill Reeves	Milt Heflin	Lee Briscoe
CAPCOM	Steve Oswald (A) Mike Baker (E)	Story Musgrave (P) Don McMonagle (B)	James Voss (P) Ken Bowersox (B)	Kathy Thornton
FAO	Nancy Jackson	Nancy Jackson	Neil Woodbury	Tony Griffith
PROCEDURES	/////	Eric Joern	/////	Mike Hurt
INCO	Edgar Walters	Edgar Walters	Jay Conner	Joe Gibbs
FDO	Brian Perry (A) Bruce Hilty (E)	Philip Burley	Keith Fletcher	Richard Theis
TRAJ	Matt Abbott (A) William Tracy (E)	William Tracy	Debbie Langan	Dan Adamo
GPO	Jeff Bertsch (A) John Turner (E)	John Malarkey	Andy Dougherty	/////
EECOM	Dave Herbek	Dave Herbek	Leonard Riche	Peter Cerna
EGIL	Ray Miessler	Ray Miessler	Robert Floyd	Charles Dingell
PAYLOADS	Nellie Carr	Nellie Carr	Jeffrey Hanley	Cheryl Molnar-Boyd
DPS	Terry Keeler	Terry Keeler	David Tee	Gloria Araiza
PROP	Anthony Ceccacci	Anthony Ceccacci	Matthew Barry	Jeff Detroye

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STS-31 FLIGHT CONTROL TEAM STAFFING
(Continued)

Position	Ascent/Entry	Orbit 1	Orbit 2	Planning
BOOSTER	Thomas Kwiatkowski	/////	/////	Ken Dwyer (PL)
GNC	David Miller	David Miller	Edward Trlica	Chuck Alford
GC	Norm Talbott Larry Foy	John Wells Joe Acquino	Chuck Capps Per Barsten	Victor Lucas Bob Reynolds
MMACS	Paul Dye	Paul Dye	Robert Doremus	Ledessa Hicks
SURGEON	Jeff Davis	Jeff Davis	Philip Stepaniak	/////
PAO	Billie Deason	Jeff Carr	Kyle Herring	James Hartsfield

(A) = Ascent; (E) = Entry
(P) = Prime ; (B) = Backup
(PL)= Pre-Launch

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Jeffrey E. Carr
April 16, 1990
RELEASE NO. 90-029

NOTE TO EDITORS: STS-35 (ASTRO-1) ASTRONAUT PRESS CONFERENCE

The astronaut crew for Shuttle mission STS-35 (ASTRO-1) will meet with news media on Friday, April 20, to discuss their roles in the flight, set for mid-May. The press conference will be held at the Johnson Space Center beginning at 9:30 a.m. cdt.

News media are invited to participate on location at JSC in Building 2, room 135, or via two-way audio from NASA Headquarters in Washington, D.C., the Marshall Space Flight Center in Huntsville, AL, the Goddard Space Flight Center in Greenbelt, MD, and the Kennedy Space Center in FL.

Live NASA Select television coverage will be carried on Satcom F2R, transponder 13.

Round robin interviews with the crew will be conducted immediately following the press conference. Media who wish to participate should notify the JSC news center, 713/483-5111, as soon as possible.

# # #

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Brian Welch
June 20, 1990
Release No. 90-030

MISSION CONTROL TURNS 25 AS JSC PREPARES FOR THE 21ST CENTURY

June 1990 will mark the 25th anniversary of Gemini IV, the first manned space flight guided from what was then NASA's newest field center, and the flight which made famous the phrase, "This is Mission Control, Houston."

The year was 1965, a time of rapid expansion in the American manned space flight program as NASA sought to meet the challenge proposed for the civilian space program by President John F. Kennedy, to land men on the Moon and return them safely to the Earth before the end of the decade. Just four months after Kennedy's May, 1961 speech proposing that bold step, NASA chose a 1,620-acre site south of Houston for construction of what was then known as the Manned Spacecraft Center.

Houston became the new home of the Space Task Group, the cadre of scientists, engineers and managers responsible for selecting and training the astronauts, designing and building the spacecraft they would fly in, and conducting flight operations for all manned missions.

The Space Task Group originally was formed in October 1958 to carry out Project Mercury, just one week after NASA itself was created by an act of Congress to function as an independent Executive Branch agency, responsible to the President for all civilian space exploration activities. The new agency was built upon the 43-year-old foundation provided by the National Advisory Committee for Aeronautics (NACA), whose 8,000 employees, three laboratories and budget were absorbed by the new space agency.

By the end of Project Mercury, the Space Task Group's size and responsibilities had grown to the point that a new home for manned spaceflight was necessary. Construction began on the sprawling field center in Houston in 1962 and was largely complete two years later. Since that time, the facility, renamed in honor of President Lyndon B. Johnson in 1973, has operated 60 manned space flights from the Mission Control Center, including nine missions to the Moon and 36 flights of the Space Shuttle.

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The history of those programs included many examples of international cooperation in space exploration. During the Apollo program, scientists from Europe and other countries aided their American colleagues in formulating goals and plans for lunar surface exploration. The Shuttle program, with strong ties to Canada and the member nations of the European Space Agency, has made possible the flights of the first West German astronaut, Ulf Merbold in 1983; the first Canadian in space, Marc Garneau in 1984; and the first French astronaut, Patrick Baudry in 1985.

Today the Johnson Space Center is playing an important role in the country's even more ambitious plans for the future. In addition to the Shuttle program, JSC's government and aerospace industry team, consisting of more than 12,000 civil service and contractor personnel, are working on the design and development of Space Station Freedom, a manned research laboratory scheduled to begin operations in low Earth orbit in the late 1990s. The orbital complex will include laboratory and logistics modules developed by the European Space Agency and Japan's National Space Development Agency, and will rely heavily on a robotic manipulator system--similar to the Shuttle's robot arm--developed by Canada.

In addition, JSC will play a central role in the space exploration initiative announced in 1989 by President George Bush, which committed the United States to renewed exploration of the Moon and construction of a lunar base early in the 21st Century, and eventual manned expeditions to Mars.

One result of this heightened activity in the civilian space program is an increasingly favorable economic impact on the Houston metroplex. In 1987 alone, JSC is estimated to have had an impact of almost three-quarters of a billion dollars , resulting in 25,000 jobs in the local economy. By 1993, planned Space Station Freedom expenditures are projected to increase current levels of economic activity by more than 66 percent and create as many as 7,000 to 8,000 new jobs which will require additional goods and services, homes, schools, offices, hotels and tourist attractions. In the three years immediately following President Ronald Reagan's approval of the Space Station program, 26 new aerospace office buildings with a total of more than 2 million square feet were constructed in the Clear Lake area, with a total investment of $140 million.

JSC's new $60 million visitor center, Space Center Houston, now being developed in partnership with Walt Disney Imagineering, is scheduled to open next year and will also have a dramatic economic impact. The facility is expected to attract from 2 to 3 million visitors each year, whose stay in the area could generate an additional $60 to $90 million into the local economy.

# # #

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Barbara Schwartz
May 2, 1990
RELEASE NO. 90-031

NOTE TO EDITORS: STS-31 POSTFLIGHT CREW PRESS CONFERENCE

The STS-31 astronaut crew will meet with news media at the Johnson Space Center on Wednesday, May 9, to discuss the recent mission to deploy the Hubble Space Telescope. The event will begin at 11 a.m. CDT and consist of a slide and video presentation by the astronauts, followed by media questions.

News media may participate in building 2, room 135, or via two-way audio from NASA Headquarters in Washington, D.C., the Goddard Space Flight Center in Greenbelt, Maryland, the Kennedy Space Center in Florida, or the Marshall Space Flight Center in Huntsville, Alabama.

Live NASA Select television coverage will be carried on Satcom F2R, transponder 13.

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NASA News

National Aeronautics and
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For Release

Jeffrey E. Carr
RELEASE NO. 90-32

May 3, 1990

SAMUEL T. DURRANCE MEDICALLY QUALIFIED FOR ASTRO-1 FLIGHT

Space flight medical authorities at the Johnson Space Center have determined that ASTRO-1 payload specialist Samuel T. Durrance is medically qualified to participate in Shuttle mission STS-35.

Durrance's medical condition has been evaluated and resolved to the satisfaction of the NASA Aerospace Medicine Board, clearing the way for his participation.

# # #

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Jeffrey Carr
Release No. 90-033

For Release:
May 24, 1990
11 a.m. CDT

SHUTTLE CREWS NAMED FOR 1991 MISSIONS (STS-43, STS-44, STS-45)

Astronaut crew assignments have been made for three Space Shuttle missions scheduled for early to mid 1991, bringing the total number of Shuttle crews currently in training to twelve.

Navy Capt. David M. Walker will command a crew aboard the Space Shuttle Atlantis on STS-44, a Department of Defense dedicated flight currently targeted for March, 1991. Air Force Lt. Col. Terence T. "Tom" Henricks will serve as pilot. Mission specialists for the flight will be F. Story Musgrave, M.D., Navy Lt. Cmdr. Mario Runco, Jr., and Army Lt. Col. James S. Voss.

Marine Col. Charles F. Bolden, Jr., will command Shuttle flight STS-45 (ATLAS-01), a mission dedicated to studying atmospheric phenomena from a laboratory aboard the Space Shuttle Columbia. Air Force Maj. Brian Duffy will serve as pilot. Mission specialists are payload commander Kathryn D. Sullivan, Ph.D., C. Michael Foale, Ph.D., and Navy Capt. David C. Leestma. Payload specialists for the mission, currently projected for April, 1991, are Michael L. Lampton, Ph.D., and Byron K. Lichtenburg, Ph.D. Sullivan, Foale, Lampton, and Lichtenburg had been previously named to the flight.

Air Force Col. John E. Blaha will command STS-43, a five day mission to deploy the Tracking and Data Relay Satellite, TDRS-E, planned for May, 1991. Serving as pilot aboard Discovery will be Navy Lt. Cmdr. Michael A. Baker. Mission specialists will be Shannon W. Lucid, Ph.D., G. David Low, and Army Lt. Col. James C. Adamson.

# # #

STS-44

Walker will make his third Shuttle flight, his second as commander. He flew previously on STS-51A as pilot, and as commander for STS-30. Walker was born May 20, 1944, in Columbus, GA, but consider Eustis, FL, to be his hometown.

Henricks, making his first space flight, was born July 5, 1952, in Bryan, OH, but considers Woodville, OH, to be his hometown.

Musgrave has flown three times previously on STS-6, STS-51F, and STS-33. He was born August 19, 1935, in Boston, MA, but considers Lexington, KY, to be his hometown.

Runco will also make his first space flight. He was born January 26, 1952, in Bronx, NY, but considers Yonkers, NY, to be his hometown.

Voss, also making his first flight into space, was born March 3, 1949, in Cordova, AL, but considers Opelika, AL, to be his hometown.

STS-45

Bolden receives his first command after two previous assignments as pilot for missions STS-61C and STS-31. He was born August 19, 1946, in Columbia, SC.

Duffy will be making his first trip to space. He was born June 20, 1953, in Boston, MA.

Sullivan, making her third flight, served as mission specialist for STS-41G and STS-31. She was born October 3, 1951, in Paterson, NJ, but considers Woodland Hills, CA, to be her hometown.

Leestma will make his third Shuttle flight, having flown as mission specialist on STS-41G and on STS-28. He was born May 6, 1949, in Muskegon, MI.

Foale will also make his first space flight. He was born an American citizen on January 6, 1957, in Louth, England, and considers Cambridge, England, to be his hometown.

Lampton will make his first trip to orbit. He was born March 1, 1941, in Williamsport, PA.

Lichtenburg will make his second space flight. He served as payload specialist on STS-9 (SL-1). Lichtenburg was born February 19, 1948, in Stroudsburg, PA.

STS-43

Blaha has flown twice previously as pilot on STS-29 and STS-33. He was born August 26, 1942, in San Antonio, TX.

Baker will make his first space flight. He was born October 27, 1953, in Memphis, TN, but considers Lemoore, CA, to be his hometown.

Low, making his second Shuttle flight, served as mission specialist on STS-32. He was born February 19, 1956, in Cleveland, OH.

Adamson has flown previously as mission specialist on STS-28. He was born March 3, 1946, in Warsaw, NY, but considers Monarch, MT, to be his hometown.

Lucid will make her third flight, having flown as mission specialist on STS-51G and STS-34. She was born an American citizen in Shanghai, China, on January 14, 1943, and considers Bethany, OK, to be her hometown.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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AC 713 483-5111

For Release

Brian Welch
May 24, 1990
Release No. 90-034

FLIGHT CONTROL OF STS-35

Flight control for STS-35, the thirty-sixth voyage of the Space Shuttle, will follow the same procedures and traditions common to all U.S. manned space flights since the Mission Control Center was first used in 1965.

Responsibility for conduct of the mission will revert to the Mission Control Center (MCC) in Houston once Columbia's two solid rocket boosters ignite. Mission support will begin in the MCC about five hours prior to launch and will continue around-the-clock through the landing and post-landing activities.

Responsibility for conduct of the science activities will revert to the Payload Operations Control Center (POCC) at the Marshall Space Flight Center in Huntsville, Alabama, once Columbia has been cleared for orbital operations and the payload instruments have been activated.

Because these operations will take place simultaneously around the clock, transmissions to and from the Columbia will be broadcast on two separate channels--one devoted to science operations, the other devoted to Orbiter flight operations. Science operations with the ASTRO-1 and Broad Band X-Ray Telescope payloads will be the subject of communications on the air-to-ground one (A/G-1) channel, with the Crew Interface Coordinator (CIC) at the POCC using the call sign "Huntsville," and the crew using the call sign "ASTRO." Orbiter operations will be the subject of communications on the air-to-ground two (A/G-2) channel, with the Spacecraft Communicator (CAPCOM) in the MCC using the call sign "Houston," and the orbiter hailed as "Columbia."

In Houston, the mission will be conducted from Flight Control Room One (FCR-1) on the second floor of the MCC located in Bldg. 30 at Johnson Space Center. The teams of flight controllers will alternate shifts in the control center and in nearby analysis and support facilities. The handover between each team takes about an hour and allows each flight controller to brief his or her oncoming colleague on the course of events over

-more-

the previous two shifts. Change-of-shift press conferences with offgoing flight directors generally take place 30 minutes to an hour after the shift handovers have been completed.

The four flight control teams for this mission will be referred to as the Ascent/Entry, Orbit 1, Orbit 2 and Orbit 3 teams. The ascent and entry phases will be conducted by Flight Director N. W. (Wayne) Hale. The Orbit 1 team will be headed by STS-35 Lead Flight Director Gary Coen. The Orbit 2 team, responsible for activation and deactivation of the Spacelab payload, will be led by G. A. (Al) Pennington. The Orbit 3 team will be directed by R.E. (Bob) Castle.

MCC POSITIONS AND CALL SIGNS FOR STS-35

The flight control positions in the MCC, and their responsibilities, are:

Flight Director (FLIGHT)

Has overall responsibility for the conduct of the mission.

Spacecraft Communicator (CAPCOM)

By tradition an astronaut; responsible for all voice contact with the flight crew.

Flight Activities Officer (FAO)

Responsible for procedures and crew timelines; provides expertise on flight documentation and checklists; prepares messages and maintains all teleprinter and/or Text and Graphics System traffic to the vehicle.

Integrated Communications Officer (INCO)

Responsible for all Orbiter data, voice and video communications systems; monitors the telemetry link between the vehicle and the ground; oversees the uplink command and control processes.

Flight Dynamics Officer (FDO)

Responsible for monitoring vehicle performance during the powered flight phase and assessing abort modes; calculating orbital maneuvers and resulting trajectories; and monitoring vehicle flight profile and energy levels during reentry.

Guidance Procedures Officer (GPO)

Responsible for the onboard navigational software and for maintenance of the Orbiter's navigational state, known as the state vector.

Trajectory Officer (TRAJECTORY)

Also known as "TRAJ," this operator aids the FDO during dynamic flight phases and is responsible for maintaining the trajectory processors in the MCC and for trajectory inputs made to the Mission Operations Computer.

Environmental Engineer & Consumables Manager (EECOM)

Responsible for all life support systems, cabin pressure, thermal control and supply and waste water management; manages consumables such as oxygen and hydrogen.

Electrical Generation and Illumination Officer (EGIL)

Responsible for power management, fuel cell operation, vehicle lighting and the master caution and warning system.

Payloads Officer (PAYLOADS)

Coordinates all payload activities; serves as principal interface with remote payload operations facilities.

Data Processing Systems Engineer (DPS)

Responsible for all onboard mass memory and data processing hardware; monitors primary and backup flight software systems; manages operating routines and multi-computer configurations.

Propulsion Engineer (PROP)

Manages the reaction control and orbital maneuvering thrusters during all phases of flight; monitors fuel usage and storage tank status; calculates optimal sequences for thruster firings.

Booster Systems Engineer (BOOSTER)

Monitors main engine and solid rocket booster performance during ascent phase.

Guidance, Navigation & Control Systems Engineer (GNC)

Responsible for all inertial navigational systems hardware such as star trackers, radar altimeters and the inertial

measurement units; monitors radio navigation and digital autopilot hardware systems.

Ground Controller (GC)

Coordinates operation of ground stations and other elements of worldwide space tracking and data network; responsible for MCC computer support and displays.

Maintenance, Mechanical, Arm & Crew Systems (MMACS)

Formerly known as RMU; responsible for remote manipulator system; monitors auxilliary power units and hydraulic systems; manages payload bay and vent door operations.

Flight Surgeon (SURGEON)

Monitors health of flight crew; provides procedures and guidance on all health-related matters.

Public Affairs Officer (PAO)

Provides real-time explanation of mission events during all phases of flight.

STS-35 FLIGHT CONTROL TEAM STAFFING

Position	Ascent/Entry	Orbit 1	Orbit 2	Orbit 3
FLIGHT	Wayne Hale	Gary Coen	Al Pennington	Bob Castle
CAPCOM	Mike Baker (A) Ken Bowersox(E)	Kathy Thornton	Story Musgrave	James Voss
FAO	Steve Gibson	Steve Gibson	Jeff Davis	Lee Wedgeworth
INCO	Harry Black	Harry Black	Roberto Moolchan	Joe Gibbs
FDO	Timothy Brown (A) Matt Abbott (E)	Ed Gonzalez	Philip Burley	William Tracy
TRAJ	Steve Stich (A) Debbie Langan (E)	Brian Perry	Dan Adamo	Mark Haynes
GPO	John Turner (A) Dennis Bentley (E)	/////	/////	/////
EECOM	Dave Herbek	Dave Herbek	Leonard Riche	Peter Cerna
EGIL	Charles Dingell	Charles Dingell	Robert Armstrong	Robert Floyd
PAYLOADS	Mark Kirasich	Mark Kirasich	Debra Bulgher	Roger Galpin
DPS	Mark Erminger	Mark Erminger	Paul Tice	Gloria Araiza
PROP	Keith Chappell	Keith Chappell	Lonnie Schmitt	William Powers

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STS-35 FLIGHT CONTROL TEAM STAFFING
(Continued)

Position	Ascent/Entry	Orbit 1	Orbit 2	Orbit 3
BOOSTER	Mark Jenkins (A) Kenneth Dwyer (E)	/////	/////	Tom Kwiatkowski
GNC	Stephen Elsner	Edward Trlica	Kenneth Bain	Linda Patterson
GC	John Snyder Per Barsten	Mike Marsh Henry Allen	Chuck Capps Lynn Vernon	John Wells Frank Stolarski
MMACS	Kevin McCluney	Keven McCluney	Brian Anderson	Paul Dye
SURGEON	Jeff Davis (A) Brad Beck (E)	Denise Baisden*	Larry Pepper*	/////
PAO	Billie Deason (A) Jeff Carr (E)	Jeff Carr Brian Welch	James Hartsfield	Kyle Herring

(A) = Ascent; (E) = Entry

*Note: For STS-35, flight surgeon shifts will overlap the crew handover times between the Red and Blue teams.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release
June 28, 1990

James Hartsfield
Public Affairs Specialist
NASA Johnson Space Center
(713) 483-5111

Kathie Krause
News Bureau Manager
Rice University
(713) 527-4807

Release No. 90-035

NASA, UNIVERSITIES CONSORTIUM TO STUDY SPACE STATION ROBOTICS

A laboratory as big as Texas employing the state's brightest students will soon be put to work with NASA to aid in developing robotics for Space Station Freedom.

The NASA/JSC Universities Space Automation and Robotics Consortium will link robotics laboratories at Rice University, the University of Texas, the University of Texas at Arlington and Texas A&M University with JSC labs to study the robotics tasks planned for Space Station Freedom. The labs will be interconnected by a computer network to allow the universities to remotely control each other's robots as well as those at JSC. Experiments can then be carried out in what will essentially be a statewide lab. The project, proposed to NASA by the four schools, will be funded by a $240,000 grant to begin before October.

The consortium was formed by the schools in 1989, all of which, excluding UTA, have been participants in past NASA robotics research.

"With the interconnected labs and the consortium, we'll be able to take advantage of all the different areas of expertise exhibited by the schools," Carl Adams, NASA project engineer, said. The schools' areas of expertise include the machine vision and mobile robotics at Rice; manual controllers and modular robot architectures at UT; system architectures and artificial intelligence at A&M; and human performance and workloads at UTA.

-more-

"People today use computer networks to exchange data, but we'll be using this network to control robots at the four universities and the JSC labs from remote facilities," said Prof. Rui de Figueiredo, Rice researcher and consortium chairman. "The universities got together and approached NASA with the idea to better coordinate our efforts and areas of specialty. It's a logical arrangement." The four universities jointly presented the proposed consortium to NASA, where Charles R. Price, chief of the Robotic Systems Development Branch at JSC, suggested a computer link among the labs to study simultaneous control of multiple robots.

The universities' areas of expertise are complementary, and, in addition to space station maintenance studies, an evaluation of future robotics applications in space will be conducted by the consortium. The connected labs will allow NASA a flexibility to use research conducted by the schools in a way that has not been possible before.

"We can be of great benefit to the Space Station Freedom Program," de Figueiredo said. "And the importance of the work, along with its posture on the cutting edge of robotics, will provide a strong motivation and a sense of real accomplishment for our students."

"We're trying to create one large lab," Adams added. "It's good for the schools, the students get to work on something that has a direct application, and it's good for us -- NASA gets the benefits of their work."

De Figueiredo chairs the consortium and is the project's principal investigator at Rice; Prof. Delbert Tesar is UT's prinicipal investigator; Prof. George Kondraske is UTA's principal investigator; and Prof. Richard Volz is A&M's principal investigator.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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For Release

Jeffrey Carr
July 3, 1990
RELEASE NO. 90-036

ASTRONAUT CLASS OF 1990 REPORTS FOR DUTY
Media Reception Planned

Members of the astronaut candidate class of 1990 will report to the Johnson Space Center Monday, July 16, to begin a year of candidate training and evaluation. The 23 candidates were selected earlier this year from nearly 2000 qualified applicants.

Their first week on the job will consist primarily of orientation briefings and tours, in addition to physiological training which is prerequisite to T-38 flight training. The following several months will consist of intensive instruction in the fundamentals of aerodynamics, electronics, and computers, as well as in Shuttle systems and operations.

Candidates will also receive training in water and wilderness survival techniques, SCUBA, and will attend lectures on a variety of subjects ranging from space flight history to Shuttle applied sciences.

The group includes 7 pilot candidates and 16 mission specialist candidates. Of the 23 candidates, 11 are civilians and 12 are military officers. Among the 5 women selected, 3 are military officers, including the first woman to be named as a pilot candidate, and the first Hispanic woman to be selected.

A brief reception is planned for 1:00 p.m. CDT on the 16th to introduce the candidates to accredited news media. Photo opportunities and brief interviews will be accommodated as time permits. Media who are interested in attending should contact the JSC News Center at 713/483-5111.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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For Release:

Jeffrey Carr
RELEASE NO. 90-037

July 9, 1990
3 p.m. CDT

SHUTTLE CREW COMMANDERS REASSIGNED

Two veteran Shuttle crew commanders have been removed from flight assignments for violations of Johnson Space Center flight crew operations guidelines. They are Navy Cmdr. Robert L. "Hoot" Gibson and Navy Capt. David M. Walker.

Gibson, crew commander for Shuttle mission STS-46, has been removed from the flight and from T-38 jet trainer flight status for one year for violation of a policy which restricts high risk recreational activities for astronauts named to flight crews.

Director of Flight Crew Operations Donald R. Puddy has announced the action in response to Gibson's participation in an airplane race at a civilian airshow in central Texas, on Saturday.

"Our high risk activity policy defines plain and simple guidelines for astronauts assigned to flight crews. They are intended to preserve our crews as assigned and apply regardless of the time prior to launch," said Puddy.

The policy defines high risk recreational activities as those which involve exposure to major or fatal injury. "The race was a clear violation of the policy," he said.

Gibson has flown aboard the Shuttle as pilot on mission STS-41B in February, 1984, and as crew commander on STS-61C in January, 1986, and on STS-27 in December, 1988. A new crew commander will be named in the near future.

Air Force Col. Frederick D. Gregory will replace Walker as crew commander on Shuttle flight STS-44, a dedicated Department of Defense mission set for March, 1991. Walker has been replaced on the flight and suspended from T-38 flight status for 60 days for infractions of JSC aircraft operating guidelines.

(more)

Walker flew as pilot on STS-51A in 1984, and as commander of STS-30, last year. Gregory has flown twice previously, as pilot for Shuttle mission STS-51B in April, 1985, and as crew commander for STS-33, also a dedicated Department of Defense flight, in November, 1989.

Both Walker and Gibson can become eligible again for Shuttle crew assignment following reinstatement to T-38 flight status.

"Dave and Hoot have each made substantial contributions to the Shuttle and Space Station programs, and have performed in an outstanding manner on their respective Shuttle flights," said chief astronaut Daniel C. Brandenstein. "These actions are unfortunate, but they're in the best interests of us all. These policies are vitally important and are to be taken seriously."

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Billie Deason
Release No. 90-038

For Release:
July 17, 1990

APOLLO-SOYUZ TEST PROJECT REUNION TO BE HELD AT JSC

American and Soviet crewmembers of the Apollo-Soyuz Test Project (ASTP) will return to the Johnson Space Center on July 24 for a reunion observing the 15-year anniversary of their historic mission.

Astronauts Tom Stafford and Deke Slayton, both now retired, and Cosmonauts Alexei Leonov and Valery Kubasov will join in a tour of three NASA Centers to celebrate history's first international joint space mission. Astronaut Vance Brand, commander of upcoming Shuttle mission STS-35 and a member of the ASTP crew, will participate in the JSC events if schedules permit. Spouses and family members of the crew will take part in the reunion activities. The party will arrive the morning of July 24 at Ellington Field where Center Director Aaron Cohen will welcome them.

A press conference will be held at 10:45 a.m. in the JSC press briefing room, building 2, room 135. Following the press conference, the ASTP crews and their families will be guests of Stafford and Cohen for a luncheon at the Gilruth Center.

In the afternoon, the group will tour the Weightless Environment Training Facility, Mission Control, the Shuttle trainer and the Space Station Freedom full-scale mockups.

At 3:45 p.m., the party will return to the press briefing room for the signing of a letter of agreement between the Soviet Soyuz All-Union Aerospace Youth Society, acting on behalf of Gosteleradio (USSR television) and the producers of Houston Public Television's new PBS children's space science series, "The Spacewatch Club." The agreement finalizes arrangements for two television projects to be jointly produced by the Soyuz Society, Gosteleradio, PBS and Spacewatch.

Kubasov will sign for the Soyuz Society and James S. Miller, executive producer of "The Spacewatch Club" series, will sign for Houston Public Televsion.

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An evening reception sponsored by the Space Foundation will be held at the Lunar and Planetary Institute adjacent to Johnson Space Center. The group will depart Ellington Field the morning of July 25 for a reunion celebration at the Marshall Space Flight Center in Huntsville, Alabama.

The Apollo-Soyuz Test Project mission resulted from a 1972 agreement between the United States and the Soviet Union to work toward a common docking system for future spacecraft. The special docking module, compatible with both the Apollo and Soyuz spacecraft, was developed by the United States for use by both countries.

Both the Soyuz and Apollo spacecraft were launched on July 15, 1975. Apollo lifted off about 7½ hours after Soyuz. On its 17th orbit, Soyuz maneuvered to the planned docking orbit about 138 miles above Earth. The successful rendezvous and docking was completed on July 17, 1975, when the Apollo spacecraft gradually piloted toward the orbiting Soyuz.

During the following two days, the crews accomplished four transfer operations between the two spacecraft and completed five scheduled experiments. While the two spacecraft were docked, the crews provided television views of their activities, the interior of the two spacecraft and demonstrated various aspects of space operations.

The Soyuz landed on July 21, and Apollo landed July 24.

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NOTE TO EDITORS:

Still photography and video products documenting the ASTP mission are available through the JSC Media Services Branch. For still photography, call 713-483-4231; for video products, call 713-486-9606.

NASA News

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For Release:

James Hartsfield
Release No.: 90-039

July 31, 1990

SPACE STATION NEUTRAL BUOYANCY LAB CONSTRUCTION SET FOR DECEMBER

It will weigh more than 1 billion pounds, have walls of 12-foot thick concrete, an eight-foot thick bottom, and it will make its inhabitants feel lighter than a feather.

Workers will begin digging a 400,000 cubic-foot hole on the grounds of the Johnson Space Center in December as they start construction of the new Neutral Buoyancy Laboratory (NBL), a facility that may be as crucial to the success of Space Station Freedom as the launch pad.

"The only way that we can see that you can prove you can assemble Space Station Freedom in orbit," said Vern Hammersley, chief of the Man-Systems Division's Facilities Operations Branch, "is to do it in the water first."

Simulating weightlessness on Earth in enough quantity to practice assembling Freedom, or even a few parts of Freedom, means thinking big. And the NBL is a lesson in large, said Bill Roeh, the facility's project manager from the Facility Development Division.

The pool will be 60 feet deep, 135 feet wide and 235 feet long. The building that will surround it could hold a football field sans one end zone, and its ceiling will reach almost as high as nine-story Bldg. 1, with a 10-ton crane that can traverse its length.

"The size has been the challenge," Roeh said. "Our design team has really enjoyed working on all the unusual aspects of it. It's been a set of new frontiers and has expanded their engineering skills."

The NBL is the first building at JSC designed specifically as a neutral buoyancy facility. All past such pools, including the current Weightless Environment Training Facility (WETF), have been housed in hand-me-down buildings modified to accept them.

more

First, there was the Water Immersion Facility (WIF) installed in Bldg. 5 in 1966. Next, the WIF was moved to Bldg. 260, occupying a tank previously used to practice splashdowns and recoveries at sea. Then, in 1980, the WETF was born in Bldg. 29, a building that had previously held a centrifuge.

The NBL will be completed in June 1993. And it will be a first-of-a-kind.

Due to its 60-foot depth, astronauts will have to decompress following a training session. They will enter the pool from the surface to begin training, but they will leave through an underwater door in the side of the pool, 30 feet down. The door will lead to a more than three stories tall, 26-foot diameter, solid stainless steel exit chamber, half-filled with water and half-filled with a compressed atmosphere. Astronauts will exit the water there, doff their suits and then move through a common air lock to either of two decompression chambers, both capable of being used as medical facilities or as decompression and debriefing areas.

The decompression chambers are designed to take subjects to a pressure equal to 160 feet underwater, a requirement for treatment of decompression sickness, commonly called "the bends."

"The exit chamber permits us to decompress suited crewmen in their shirt sleeves," Hammersley said. "Without it, they would have to make long decompression stops at certain depths on the way up."

Scuba divers won't have to decompress; they will be rotated once an hour. And they'll breathe nitrox, a compressed air mixture consisting of about 40 percent oxygen, 60 percent nitrogen, instead of the standard 20 percent oxygen, 80 percent nitrogen compressed air in scuba tanks. The oxygen-rich nitrox will provide an additional safeguard against decompression sickness that can be caused by frequent deep dives.

The pool will be heated to 84 degrees, the optimum temperature for diving safety. Each of the 14 million gallons of water it holds will be filtered once every 24 hours, at a rate of 10,000 gallons per minute through filters that remove particles smaller than human red blood cells. A slower, 1,000 gallon-per-minute bank of filters will continually "polish" the water, removing particles as small as those that make up smoke.

To build the NBL, thirty-three 85-foot deep wells will be drilled around the perimeter of the building site, draining the water table to a depth of 40 feet at the location. The pool will be built 30 feet below ground, 30 feet above ground.

Due to the weight of water as the pool is filled, its sides and bottom are designed to flex as the structure settles. The pool may settle as much as two inches. The sides may bow outward as much as a half a foot each.

The pool is designed to flex, but the building surrounding it is not. So special connections and expansion joints have been designed in attachments between the two to allow for the pool's movement. Also, two viewing windows will be in the side of the pool, 15 feet down.

An aircraft carrier-type cutaway in the deck of the pool will allow mockups to be hoisted from a storage area below the floor to the deck. Four small cranes will be located along the edges of the pool to lower astronauts or objects into the water.

The NBL is designed to allow multiple training activities to be done at once. For example, a shuttle crew and a Freedom crew can train underwater at different spots in the pool simultaneously.

A 32,000 square-foot wing on the building will house offices, mechanical equipment, changing areas and technical support areas. A future wing on the opposite side of the building is designed to accommodate a balcony viewing area 15 feet above the pool's deck.

The NBL will be built at the corner of Avenue B and 2nd Street, and is projected to cost from $30 million to $40 million. An invitation for bids on the project is scheduled for September, Roeh said. A contract will be awarded in December, with groundbreaking following soon after. After the NBL is finished and operational, the WETF will remain in a standby mode for one year. After that, its future is uncertain.

"The most exciting time for me will be when they're pouring the concrete for the pool bottom and walls," Roeh said. "And it will also be the most critical."

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NASA photos available to illustrate this release include S90-38712; S89-20030; S90-44689; and S90-44690. They may be obtained by contacting the JSC Still Photo Library at (713) 483-4231.

NASA News

National Aeronautics and
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Houston, Texas 77058
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For Release:

Kelly Humphries
(Phone: 713-483-4111)

July 19, 1990

YOUNG RECEIVES SILVER KNIGHT OF MANAGEMENT AWARD

Dr. R. Wayne Young, Deputy Director of Administration at Johnson Space Center, has been honored for his management and leadership skills by the JSC chapter of the National Management Association (NMA).

The Silver Knight of Management Award presented to Young is the highest honor NMA chapters can bestow on an executive. The recipient must be a civic, business or industrial executive who is well-known to the members of an organization and whose example has stimulated and inspired them; who has demonstrated the highest qualities of leadership in business, community and industrial relationships; and who is well-known for his/her efforts in the preservation of the competitive enterprise system.

Young joined JSC in 1962 as the Apollo Guidance and Navigation Subsystems Manager and during the following two years became Project Manager over that area. He later became branch chief in the Lunar Module Project Office and Assistant Chief of the Apollo Program Control Division.

In 1967 and 1968, he attended the Stanford University School of Business Management as a Sloan Fellow. Upon completion of his studies, he returned to JSC as Manager of the Program Control and Contracts Office in the Advanced Missions Program Office. He has assumed positions of increasing responsibility, including Manager of Space Shuttle Program Support, Assistant Director of Procurement, Manager of Space Shuttle Resources and Schedules Integration and Assistant Director of Administration before receiving his current assignment.

Young's parents, Mr and Mrs. Robert L. Young are residents of Waco, Texas.

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NASA News

National Aeronautics and
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For Release:
August 6, 1990

Steve Nesbitt
RELEASE NO. 90-040

EDUCATORS ATTEND NASA HONORS TEACHER WORKSHOP

Corsandra Stallworth, a teacher at Taylor Elementary School in Colorado Springs, Colorado, recently completed a two-week space science education workshop at the NASA Johnson Space Center in Houston, Texas.

Selected from throughout the United States, 25 teachers received an overview of the latest space technology developments from engineers, scientists, astronauts and researchers at JSC during the July 22-Aug. 3 workshop. Each participant maintained a journal of activities and observations for use in developing classroom teaching materials.

JSC's space science education specialists also provided teachers with printed materials, computer programs and audiovisual aids for use in classrooms.

Workshop participants were chosen for their interest in space sciences and in professional growth.

-end-

NASA News

National Aeronautics and
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Kari Fluegel
Release No. 90-041

For Release
August 23, 1990

SPACE TECHNOLOGY SPINS INTO DAILY LIFE

Since before Neil Armstrong made his leap for mankind, NASA technology has been spinning back to the American people, returning to the private sector its investment in space.

More than 32,000 products using space technology have found their way into American homes, hospitals, factories and schools. A popular brand of sunglasses uses technology from space helmet visor advances and fabric building materials like that covering the Pontiac Silverdome has spunoff of space suit advances. Even a brand of jogging shoes evolved from knowledge gleaned while designing the moon boots Armstrong used for his famous leap.

NASA's commitment to technology transfer dates back to 1958 when Congress mandated through the Space Act that the country's space agency have "the widest practical and appropriate dissemination of information on new technology."

That dissemination of information is continuing as NASA starts a new decade of exploration. Electrocardiograph sensor technology now is being used in exercise systems. Microminiaturized fluid control systems have been adapted for an implantable insulin delivery system freeing diabetics from daily injections. And intelligent training systems used to prepare NASA flight controllers are being adapted to teach high school students physics and prison inmates how to read. Each year 900 new technology spinoffs from all areas of life are reported to NASA's Technology Utilization Office.

"This technology already exists," said Dean Glenn, Technology Utilization Officer at the Johnson Space Center. "The taxpayers have paid for the development of these technologies. These types of transfers not only help a variety of people, they allow the United States to be competitive in the international marketplace."

- end -

A video regarding technology utilization (CMP 117617) is available from the Johnson Space Center Public Affairs Office at (713) 483-5111.

NASA News

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For Release:

Barbara Schwartz
Release No. 90-042

August 29, 1990
12 noon CDT

ASTRONAUT MCCULLEY TO RETIRE FROM THE NAVY AND LEAVE NASA

Astronaut Michael J. McCulley (Captain, USN) is retiring from the Navy and leaving NASA in early October after the STS-41 Ulysses launch.

McCulley has accepted the position of Vice President and Deputy Director, KSC - Launch Site, with Lockheed Space Operations Company. "I am not changing teams with this move, only my position on the team," McCulley said. McCulley will be heavily involved in the day-to-day processing of Space Shuttle vehicles in his new position.

McCulley was the pilot on mission STS-34 during which the crew successfully deployed the Galileo spacecraft for its journey to explore Jupiter. Selected by NASA in May 1984, McCulley has served as the Astronaut Office weather coordinator, the flight crew representative to the Shuttle Program Requirements Control Board, Technical Assistant to the Director of Flight Crew Operations, and currently, as lead of the Astronaut Support Team at the Kennedy Space Center.

Regarding McCulley's decision to retire, Director of Flight Crew Operations Donald R. Puddy said, "Mike has always been a top-notch performer in every way. Both as a pilot and as a technical expert, he has made significant contributions to the Shuttle Program and to my office. We will miss him here at JSC, but his experience and expertise will be extremely valuable in his new position."

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For Release

Steve Nesbitt
NASA Johnson Space Center
(713) 483-5111

Sept. 10, 1990

RELEASE NO. 90-043

A series of preflight briefings for Space Shuttle mission STS-41, the deployment of the Ulysses spacecraft, will be held Wednesday and Thursday at the Johnson Space Center in Houston and NASA Headquarters in Washington, D.C.

Lead Flight Director Milt Heflin will present an overview of the mission beginning at 9 a.m. Wednesday.

The astronaut crew of STS-41 will hold a press conference beginning at 10 a.m., followed in the afternoon by round robin interviews. Media representatives wishing to participate in the interviews should notify the JSC Newsroom by Tuesday afternoon.

Thursday's briefings begin at noon with the Ulysses spacecraft and science objectives, followed by briefings on other payloads and mission objectives. All events originate in Houston except the Ulysses briefing which originates at HASA Headquarters. All times are Central Daylight Time.

All briefings will be carried on NASA Select Television. Two-way audio for Q&A will be available at other NASA manned flight centers including Kennedy Space Center in Florida and Marshall Space Flight Center in Alabama.

NASA Select programming is carried on RCA Satcom F2R, transponder 13, located at 72 degrees west longitude.

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NASA News

National Aeronautics and
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For Release

Barbara Schwartz
Release No. 90-044

September 10, 1990
For Immediate Release

MCCANDLESS RETIRES FROM NASA, NAVY

Captain Bruce McCandless, II, a NASA astronaut since April 1966 and mission specialist on two Space Shuttle flights, retired from NASA and the Navy August 31.

During his first space flight, STS 41-B in February 1984, McCandless made the first, untethered, free flight of the Manned Maneuvering Unit (MMU) which he developed with Charles E. "Ed" Whitsett of the Automation and Robotics Division. Paraphrasing Neil Armstrong's historical comment on Apollo 11, McCandless said, "That may have been one small step for Neil, but it's a heck of a big leap for me," just before leaving the orbiter's payload bay for his MMU flight.

His second flight, STS-31 in April 1990, deployed the Hubble Space Telescope.

McCandless was Capcom on Apollo 10 and 11 and a member of the astronaut support crew for the Apollo 14 mission. He was backup pilot for the first manned Skylab mission and was co-investigator with Whitsett on the M-509 astronaut maneuvering unit experiment which was flown in the Skylab Program. He has been responsible for crew inputs to the development of hardware and procedures for the Inertial Upper Stage (IUS), Space Telescope, the Solar Maximum Repair Mission, and the Space Station Program.

McCandless remained an active-duty Naval officer through his NASA career. He retired with more than 32 years of Naval service.

McCandless did not announce his plans for the future.

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NASA News

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Houston, Texas 77058
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For Release

Barbara Schwartz
Release No. 90-045

September 13, 1990

DUNBAR NAMED PAYLOAD COMMANDER FOR USML-1

Bonnie J. Dunbar, Ph.D., has been named payload commander for the STS-50 U.S. Microgravity Laboratory (USML-1) mission currently scheduled for March 1992.

USML-1 consists of a complement of experiments focusing on microgravity materials processing technology and other science and research requiring a microgravity environment. Orbiter Columbia will be modified with an Extended Duration Orbiter (EDO) kit which will provide additional expendable supplies, allowing a 13-day mission which will extend the scientific research time in space.

As payload commander, Dunbar is responsible for coordinating all payload requirements for the mission.

Dunbar was a mission specialist on STS 61-A, the West German D-1 Spacelab mission launched Oct. 30, 1985, and STS-32 in Jan. 1990 on which the crew successfully deployed the Syncom IV-F5 satellite, retrieved the Long Duration Exposure Facility, and performed a variety of middeck scientific experiments.

Four candidates for two payload specialist positions on STS-50 were named in August with a final selection to be made in March 1991. The candidates are Lawrence J. DeLucas, O.D., Ph.D., of University of Alabama; Joseph Prahl, Ph.D., of Case Western Reserve University; Albert Sacco,Jr., Ph.D., of Worcester Polytechnic Institute; and Eugene H. Trinh, Ph.D., of Jet Propulsion Laboratory.

The remainder of the seven-member crew will be announced later.

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NASA News

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For Release:

Kelly Humphries
Release No. 90-046

September 26, 1990

JSC HOSTS SYMPOSIUM ON WOMEN IN SCIENCE, ENGINEERING, TECHNOLOGY

Johnson Space Center and the Center for the Advancement of Science, Engineering and Technology (CASET) will sponsor the first annual Women's Symposium on Women in Science, Engineering and Technology, Oct. 15-17, at JSC's Gilruth Recreation Center.

The symposium will look at the underrepresentation of women in fields such as science, engineering and technology. Participants will discuss ways of preparing women of all ages and ethnic backgrounds for scientific and technical carrers, and innovative methods for bringing them into the technological work force.

Dr. Harriett Jenkins, Assistant Administrator for Equal Opportunity Programs at NASA Headquarters, will speak at the 9:30 a.m., Oct. 15, opening session. Betty Vetter, Executive Director, Commission of Professionals in Science and technology, will be the keynote speaker at 10:45 a.m.

Dr. Mae Jemison, NASA Astronaut, will speak at 12:30 p.m. during the opening day luncheon. Tickets for the luncheon may be obtained from CASET's Linda Talley, (713) 280-4875, or Freda Marks, JSC's Federal Women's Program Manager, (713) 483-0606. Luncheon tickets must be purchased by Oct. 5.

CASET is currently studying factors related to the underrepresentaiton of minorities and women in science and technology career fields, as well as recruitment and retention strategies. CASET is funded by the Department of Defense, and receives support from NASA and the Department of Labor.

-end-

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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For Release:

Jeffrey Carr
Release No. 90-047

September 25, 1990

FLIGHT CONTROL OF STS-41

Flight control for STS-41, the thirty-sixth voyage of the Space Shuttle, the eleventh flight of Discovery, will follow the same procedures and traditions common to all U.S. manned space flights since the Mission Control Center was first used in 1965.

Following ignition of Discovery's solid rocket boosters, responsibility for conduct of the mission will revert to the Mission Control Center (MCC) in Houston. Active mission support will begin in the MCC about five hours prior to launch and will continue around-the-clock through the landing and post-landing activities.

Once an operational orbit has been achieved and the flight director declares the team "go for orbit ops", efforts to deploy the Ulysses solar probe will be coordinated between three control centers. Under the guidance of the MCC team, the Ulysses Payload Operations Control Center (UPOCC) at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, will support payload health and status verifications. The Consolidated Space Test Center (CSTC) at Onizuka Air Force Station in Sunnyvale, California, will be responsible for inertial upper stage (IUS) verifications prior to deployment.

In Houston, the mission will be conducted from Flight Control Room One (FCR-1) on the second floor of the MCC, located in Bldg. 30 at Johnson Space Center. Four flight control teams, referred to as the Ascent/Entry, Orbit 1, Orbit 2, and Planning teams, will alternate shifts in the control room and in nearby analysis and support facilities. Handovers between teams take about an hour and allow each flight controller to brief his or her oncoming colleague on the course of events over the previous two shifts.

Change-of-shift press conferences with offgoing flight directors are generally scheduled 30 minutes to an hour after the shift handovers have been completed.

The ascent and entry phases will be conducted by Flight Director Ronald D. Dittemore. He will also lead the Orbit 1 team, which replaces the Ascent/Entry team during orbit operations. Some flight control positions will be staffed by the same personnel for both Ascent/Entry and Orbit 1 operations. Other positions will alternate between launch/landing specialists and on-orbit operators.

STS-41 Lead Flight Director J. M. (Milt) Heflin will head the Orbit 2 team, responsible for preparation and deployment of the Ulysses solar probe from the payload bay.

The Planning team, responsible for overnight vehicle monitoring and realtime mission planning, will be directed by Gary E. Coen.

MCC POSITIONS AND CALL SIGNS FOR STS-41

The flight control positions in the MCC, and their responsibilities, are:

Flight Director (FLIGHT)

Has overall responsibility for the conduct of the mission.

Spacecraft Communicator (CAPCOM)

By tradition an astronaut; responsible for all voice contact with the flight crew.

Flight Activities Officer (FAO)

Responsible for procedures and crew timelines; provides expertise on flight documentation and checklists; prepares messages and maintains all teleprinter and/or Text and Graphics System traffic to the vehicle.

Integrated Communications Officer (INCO)

Responsible for all Orbiter data, voice and video communications systems; monitors the telemetry link between the vehicle and the ground; oversees the uplink command and control processes.

Flight Dynamics Officer (FDO)

Responsible for monitoring vehicle performance during the powered flight phase and assessing abort modes; calculating orbital maneuvers and resulting trajectories; and monitoring vehicle flight profile and energy levels during reentry.

Guidance Procedures Officer (GPO)

Responsible for the onboard navigational software and for maintenance of the Orbiter's navigational state, known as the state vector.

Trajectory Officer (TRAJECTORY)

Also known as "TRAJ," this operator aids the FDO during dynamic flight phases and is responsible for maintaining the trajectory processors in the MCC and for trajectory inputs made to the Mission Operations Computer.

Environmental Engineer & Consumables Manager (EECOM)

Responsible for all life support systems, cabin pressure, thermal control and supply and waste water management; manages consumables such as oxygen and hydrogen.

Electrical Generation and Illumination Officer (EGIL)

Responsible for power management, fuel cell operation, vehicle lighting and the master caution and warning system.

Payloads Officer (PAYLOADS)

Coordinates all payload activities; serves as principal interface with remote payload operations facilities.

Data Processing Systems Engineer (DPS)

Responsible for all onboard mass memory and data processing hardware; monitors primary and backup flight software systems; manages operating routines and multi-computer configurations.

Propulsion Engineer (PROP)

Manages the reaction control and orbital maneuvering thrusters during all phases of flight; monitors fuel usage and storage tank status; calculates optimal sequences for thruster firings.

Booster Systems Engineer (BOOSTER)

Monitors main engine and solid rocket booster performance during ascent phase.

Guidance, Navigation & Control Systems Engineer (GNC)

Responsible for all inertial navigational systems hardware such as star trackers, radar altimeters and the inertial measurement units; monitors radio navigation and digital autopilot hardware systems.

Ground Controller (GC)

Coordinates operation of ground stations and other elements of worldwide space tracking and data network; responsible for MCC computer support and displays.

Maintenance, Mechanical, Arm & Crew Systems (MMACS)

Formerly known as RMU; responsible for remote manipulator system; monitors auxilliary power units and hydraulic systems; manages payload bay and vent door operations.

Payload Data & Retrieval System (PDRS)

A specialist responsible for monitoring the general operation of the remote manipulator system.

Flight Surgeon (SURGEON)

Monitors health of flight crew; provides procedures and guidance on all health-related matters.

Public Affairs Officer (PAO)

Provides real-time explanation of mission events during all phases of flight.

# # #

STS-41 FLIGHT CONTROL TEAM STAFFING

Position	Ascent/Entry	Orbit 1	Orbit 2	Planning
FLIGHT	Ron Dittemore	Ron Dittemore	Milt Heflin (Lead)	Gary Coen
CAPCOM	Ken Bowersox (A) Brian Duffy (E)	Marsha Ivins	Kathy Thornton	Story Musgrave
FAO	Tony Griffith	Tony Griffith	Gayle Schneider	Debbie Jackson
INCO	Joe Gibbs	Joe Gibbs	Jay Connor	Chris Counts
FDO	Bruce Hilty (A) Doug Rask (E)	Phil Burley	Tim Brown	Keith Fletcher
TRAJ	Matt Abbott(A) Ed Gonzalez (E)	Dan Adamo	Carson Sparks	Lisa Shore
GPO	Matthew Glenn (A) Dennis Bentley (E)	///////	///////	///////
EECOM	Dave Herbek	Dave Herbeck	Quinn Carelock	Peter Cerna
EGIL	Charles Dingell	Charles Dingell	Robert Floyd	Ray Miessler
PAYLOADS	David Schurr	David Schurr	Gene Cook	Mark Childress
DPS	David Tee	David Tee	James Hill	Terry Keeler
PROP	Tony Ceccacci	Tony Ceccacci	Matt Barry	Karen Jackson

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STS-41 FLIGHT CONTROL TEAM STAFFING
(Continued)

Position	Ascent/Entry	Orbit 1	Orbit 2	Orbit 3
BOOSTER	Mark Jenkins (A) Kenneth Dwyer (E)	//////	//////	Terri Stowe
GNC	James Webb	James Webb	Heather Mitchell	David Miller
GC	John Snyder (A/E) Ed Klein (A/E)	Larry Foy Terry Quick	Chuck Capps Henry Allen	Joe Aquino Mike Marsh
MMACS	Paul Dye	Paul Dye	James Medford	Alan Bachik
PDRS	David Moyer	David Moyer	Don Pallesen	Gary Pollock
SURGEON	Denise Baisden	John Schultz	Phil Stepaniak	///////
PAO	Billie Deason (A) Jeff Carr (E)	Jeff Carr	Brian Welch	Kari Fluegel

# # #

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:

Barbara Schwartz
October 11, 1990
Release No. 90-050

NOTE TO EDITORS: STS-41 POSTFLIGHT CREW PRESS CONFERENCE

The STS-41 postflight crew press conference will be held Thursday, October 18, at 1:00 p.m. central time at the Johnson Space Center in Bldg. 2, Room 135. News media are invited to participate on location at JSC or by two-way audio from other NASA centers.

The crew members will describe their recent flight which included the successful deployment of the Ulysses, an interplanetary spacecraft designed to study the Sun. They will show and narrate film highlights of the mission activities.

The press conference will be broadcast live on NASA Select television which is carried on RCA SATCOM F2R, transponder 13, located at 72 degrees west longitude.

# # #

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:
October 15, 1990

Kelly Humphries
Release No. 90-051

FOUR COMPANIES WIN JSC TEAM EXCELLENCE AWARDS

Johnson Space Center Director Aaron Cohen has chosen the four recipients of JSC's Team Excellence Awards for 1990.

Barrios Technology Inc., Houston; Honeywell Inc., Space and Strategic Systems Operation, Clearwater, Fla., Rockwell International Corp., Space Systems Division, Downey, Calif., and UNISYS Houston Operations will receive the awards at their facilities during this, National Quality Month.

"These four companies have demonstrated exemplary technological performance by consistently providing our JSC team with high-quality products and services vital to the success of this nation's space program," Cohen said. "The Johnson Space Center applauds the contributions of these companies, and their employees for their leadership and commitment to continuous quality and productivity improvement."

The winners also will be among nine finalists vying for the 1989-90 NASA Excellence Award. NASA Administrator Richard H. Truly will present that award during the seventh annual NASA/Contractors Conference on Quality and Productivity Oct. 24-25 in Grenelefe, Fla., near Kennedy Space Center.

Barrios, winning the award for the second time, furnishes engineering and administrative services for the space shuttle, space station and mission operations; conducts metrology and calibration services; and provides administrative support to the Assured Crew Return Vehicle project.

Rockwell's Space Systems Division, which has won all three years the award has been presented, builds the space shuttle, supports missions, integrates shuttle elements and provides engineering services to the shuttle program.

Honeywell's Space and Strategic Systems Operation, a subcontractor to Rockwell, supports the guidance, navigation and control systems for the orbiter.

UNISYS provides software analyses, systems engineering and systems software engineering support for JSC's shuttle ground facilities.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

Pam Alloway
November 8, 1990
Release No. 90-052

ORBITER PRODUCTION CONTRACT MODIFIED

NASA has modified its main orbiter production contract with Rockwell International Corp. to include the production of replacement tiles for the Space Shuttle Orbiter Thermal Protection System (TPS).

The negotiated amount of the TPS contract modification is $26.2 million. The current negotiated value of the Rockwell contract, also known as contract NAS 9-14000 (Schedule B), is $5.5 billion and is a cost-plus-fixed-fee/award-fee contract. The TPS modification does not include any award-fee features.

Rockwell International Corp.'s Space Systems Division is based in Downey, California. Work on the production of the tiles will be performed at Rockwell's Downey and Palmdale facilities, and various vendors' facilities. The TPS contract modification covers performance on the project from October 1988 through September 1991. Rockwell will produce tiles from raw materials as replacements for tiles lost during orbiter flights. Rockwell will produce a minimum of 3,288 tiles.

This TPS contract modification was noncompetitive.

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:

Steve Nesbitt
Release No. 90-053

November 13, 1990

NOTE TO EDITORS: JSC NEWSROOM HOURS FOR STS-38

The Johnson Space Center newsroom in Bldg. 2 will not operate on a 24-hour basis during the upcoming space shuttle mission, STS-38.

The newsroom will remain open on launch day until approximately one hour after the astronaut crew has been cleared to remain on orbit. On subsequent days of the flight, the newsroom hours will be 7 a.m. to 7 p.m. CST.

Launch of the Space Shuttle Atlantis on the Department of Defense-dedicated mission is scheduled to take place within a launch period of between 5:30 p.m. and 9:30 p.m. CST Thursday, Nov. 15. A landing day and period is expected to be announced approximately 24 hours after launch.

Because of the classified nature of the mission, there will be no NASA Select Television or public affairs commentary except during launch and landing operations.

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NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:

Barbara Schwartz
November 16, 1990
Release No. 90-054

NTE: SHUTTLE CARRIER AIRCRAFT DELIVERY CEREMONY AT ELLINGTON

NASA Johnson Space Center will take delivery of the second Shuttle Carrier Aircraft (SCA), at Boeing Military Airplanes facilities in Wichita, Kansas, on November 20.

Following delivery ceremonies in Wichita, the SCA will be flown to Ellington Field in Houston, Hangar 990, for a 3:30 p.m. central time ceremony. News media are invited to attend the ceremony and to tour the aircraft escorted by members of the flight crew.

Boeing Military Airplanes will provide video tapes of the refurbishing process.

Attached is background information on the SCA.

SHUTTLE CARRIER AIRCRAFT (SCA)

NASA 911 - BOEING 747-100SR

Aircraft Type: The SCA is a highly modified Boeing 747-100SR aircraft which is capable of ferrying the Shuttle Orbiters.

Description: The Boeing 747 SCA is a heavy wide-bodied swept wing turbo jet which is powered by four Pratt & Whitney JT9D-7J engines. Some features which distinguish this aircraft from a standard Boeing 747 are:

1. Three struts with associated interior structural beef-up protruding from the top of the fuselage (2 aft, 1 forward) for mating the orbiter.
2. Two additional vertical stabilizers, one on each end of the standard horizontal stabilizer to enhance directional stability.
3. Removal of all interior furnishings and equipment aft of the forward number one doors.

Dimensions:	Wingspan - 195 feet 8 inches Length - 231 feet 10 inches Height to top of vertical stabilizer - 63 feet 5 inches Height to top of cockpit area - 32 feet 1 inch
Weight:	Maximum taxi weight - 713,000 pounds Maximum brake release weight - 710,000 pounds Maximum landing weight - 600,000 pounds Maximum zero-fuel weight - variable depending on orbiter weight
Airspeed Limits:	250 KIAS or 0.6 Mach number
Altitude:	Maximum mated 15°F (-9°C) or 8 psi ambient pressure Typical cruise mated - 13,000-15,000 ft MSL Typical cruise unmated - 24,000-26,000 ft MSL
Range:	Typical mated - 1000 N.M. (with reserves) Maximum unmated - 5500 N.M.
Fuel:	47,210 gallons or 316,307 pounds of jet fuel
Crew:	Minimum for flight - two pilots and one flight engineer Minimum mated - two pilots and two flight engineers
Ground Support Equipment:	None required

NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:

Barbara Schwartz
November 16, 1990
Release No. 90-055

NASA ANNOUNCES DELIVERY OF SECOND SHUTTLE CARRIER AIRCRAFT

NASA Johnson Space Center will take delivery of the second Shuttle Carrier Aircraft (SCA), NASA 911, at Boeing Military Airplanes Facilities in Wichita, Kansas, on Tuesday, November 20.

The SCA, a Boeing 747, was a passenger carrier for Japan Air Lines (JAL). The aircraft, having logged about 32,000 hours of flight time, was acquired for NASA by Boeing in 1988 after inspectors determined that it was in excellent structural condition.

The $55 million contract with Boeing called for purchase of the aircraft, modifications and delivery within two years. The work was completed on schedule for less than the estimated cost.

All interior furnishings and equipment aft of the forward doors was removed. Structural bulkheads were installed and fuselage skin reinforced for added support of the shuttle attachment struts. The attachment struts were located atop the aircraft to match orbiter and external tank fittings. Two vertical stabilizers were added, one on each end of the existing horizontal stabilizers, to enhance directional stability.

After the structural work was completed, the aircraft was delivered to Chrysler Technologies in Waco, Texas, for its blue-on-white paint job. The freshly painted SCA was returned to Wichita November 13.

Following delivery ceremonies in Wichita, SCA 2 will be piloted by its NASA crew to Ellington Field in Houston before continuing on to El Paso the following morning. The SCA will be maintained there by JSC's aircraft maintenance contractor, Northrup Worldwide Aircraft Services, Inc.

The Shuttle Program's first SCA, NASA 905, has been in service since the Shuttle Approach and Landing Test Program in 1977. With the prospect of an increased Shuttle flight rate and continued landings at Edwards Air Force Base, a second SCA will provide reliable ferry capability. The benefits of a second SCA

were stated in 1986 by the Rogers Commission recommendations which said, "increased landings at Edwards may necessitate a dual ferry capability."

According to JSC Flight Crew Operations director Donald R. Puddy, "The addition of a second carrier will greatly enhance the reliability of our ferry operations and eliminates a single point failure from the program."

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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For Release:
November 26, 1990

Jeffrey Carr
Release No. 90-056

FLIGHT CONTROL OF STS-35

Flight control for STS-35, the thirty-eighth voyage of the Space Shuttle, the tenth flight of Columbia, will follow the procedures and traditions common to U.S. manned space flights since the Mission Control Center was first used in 1965.

Responsibility for conduct of the mission will revert to the Mission Control Center (MCC) in Houston once Columbia's two solid rocket boosters ignite. Mission support will begin in the MCC about five hours prior to launch and will continue around the clock through the landing and post-landing activities.

Responsibility for conduct of the science activities will revert to the Payload Operations Control Center (POCC) at the Marshall Space Flight Center in Huntsville, Alabama, once Columbia has been cleared for orbital operations and the payload and pointing instruments have been activated.

These simultaneous operations will be conducted around the clock. Throughout the orbital phase, voice communications between Columbia and the ground will be carried on two separate channels--one devoted to science operations, the other devoted to Orbiter operations. Science operations with the ASTRO-1 and Broad Band X-Ray Telescope payloads will be the subject of communications on the air-to-ground one (A/G-1) channel, with the Crew Interface Coordinator (CIC) at the POCC using the call sign "Huntsville," and the crew using the call sign "ASTRO." Orbiter flight operations will be the subject of communications on the air-to-ground two (A/G-2) channel, with the spacecraft communicator (CAPCOM) in the MCC using the call sign "Houston," and the orbiter hailed as "Columbia."

In Houston, the mission will be conducted from Flight Control Room One (FCR-1) on the second floor of the MCC located in Bldg. 30 at Johnson Space Center. The teams of flight controllers will alternate shifts in the control center and in nearby analysis and support facilities. The handover between each team takes about an hour and allows each flight controller to brief his or her oncoming colleague on the course of events over

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the previous two shifts. Change-of-shift press conferences with offgoing flight directors generally take place 30 minutes to an hour after the shift handovers have been completed.

The four flight control teams for this mission will be referred to as the Ascent/Entry, Orbit 1, Orbit 2, and Orbit 3 teams. The ascent and entry phases will be conducted by Flight Director N. W. (Wayne) Hale. The Orbit 1 team will be headed by STS-35 Lead Flight Director Gary Coen. The Orbit 2 team, responsible for activation and deactivation of the Spacelab payload, will be led by G. A. (Al) Pennington. The Orbit 3 team will be directed by R.E. (Bob) Castle.

MCC POSITIONS AND CALL SIGNS FOR STS-35

The flight control positions in the MCC, and their responsibilities, are:

Flight Director (FLIGHT)

Has overall responsibility for the conduct of the mission.

Spacecraft Communicator (CAPCOM)

By tradition an astronaut; responsible for all voice contact with the flight crew.

Flight Activities Officer (FAO)

Responsible for procedures and crew timelines; provides expertise on flight documentation and checklists; prepares messages and maintains all teleprinter and/or Text and Graphics System traffic to the vehicle.

Integrated Communications Officer (INCO)

Responsible for all Orbiter data, voice and video communications systems; monitors the telemetry link between the vehicle and the ground; oversees the uplink command and control processes.

Flight Dynamics Officer (FDO)

Responsible for monitoring vehicle performance during the powered flight phase and assessing abort modes; calculating orbital maneuvers and resulting trajectories; and monitoring vehicle flight profile and energy levels during reentry.

Guidance Procedures Officer (GPO)

Responsible for the onboard navigational software and for maintenance of the Orbiter's navigational state, known as the state vector.

Trajectory Officer (TRAJECTORY)

Also known as "TRAJ," this operator aids the FDO during dynamic flight phases and is responsible for maintaining the trajectory processors in the MCC and for trajectory inputs made to the Mission Operations Computer.

Environmental Engineer & Consumables Manager (EECOM)

Responsible for all life support systems, cabin pressure, thermal control and supply and waste water management; manages consumables such as oxygen and hydrogen.

Electrical Generation and Illumination Officer (EGIL)

Responsible for power management, fuel cell operation, vehicle lighting and the master caution and warning system.

Payloads Officer (PAYLOADS)

Coordinates all payload activities; serves as principal interface with remote payload operations facilities.

Data Processing Systems Engineer (DPS)

Responsible for all onboard mass memory and data processing hardware; monitors primary and backup flight software systems; manages operating routines and multi-computer configurations.

Propulsion Engineer (PROP)

Manages the reaction control and orbital maneuvering thrusters during all phases of flight; monitors fuel usage and storage tank status; calculates optimal sequences for thruster firings.

Booster Systems Engineer (BOOSTER)

Monitors main engine and solid rocket booster performance during ascent phase.

Guidance, Navigation & Control Systems Engineer (GNC)

Responsible for all inertial navigational systems hardware such as star trackers, radar altimeters and the inertial

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measurement units; monitors radio navigation and digital autopilot hardware systems.

Ground Controller (GC)

Coordinates operation of ground stations and other elements of worldwide space tracking and data network; responsible for MCC computer support and displays.

Maintenance, Mechanical, Arm & Crew Systems (MMACS)

Formerly known as RMU; responsible for remote manipulator system; monitors auxilliary power units and hydraulic systems; manages payload bay and vent door operations.

Flight Surgeon (SURGEON)

Monitors health of flight crew; provides procedures and guidance on all health-related matters.

Public Affairs Officer (PAO)

Provides real-time explanation of mission events during all phases of flight.

STS-35 FLIGHT CONTROL TEAM STAFFING

Position	Ascent/Entry	Orbit 1	Orbit 2	Orbit 3
FLIGHT	Wayne Hale	Gary Coen	Al Pennington	Bob Castle
CAPCOM	Mike Baker	Marsha Ivins	Story Musgrave	James Voss
FAO	Steve Gibson	Steve Gibson	Jeff Davis Ann Bowersox	Lee Wedgeworth Fisher Reynolds
INCO	Harry Black	Harry Black	Roberto Moolchan	Joe Gibbs
FDO	Ed Gonzalez (A) Matt Abbott (E)	Timothy Brown	Philip Burley	William Tracy
TRAJ	Brian Perry (A) Debbie Langan (E)	Steve Stich	Dan Adamo	Carson Sparks
GPO	Dennis Bentley (A) John Turner (E)	/////	/////	/////
EECOM	Dave Herbek	Dave Herbek	Leonard Riche	Peter Cerna
EGIL	Charles Dingell	Charles Dingell	Robert Armstrong	Robert Floyd
PAYLOADS	Mark Kirasich	Mark Kirasich	Debra Bulgher	Roger Galpin
DPS	Mark Erminger	Mark Erminger	Gloria Araiza	David Tee
PROP	Keith Chappell	Keith Chappell	Lonnie Schmitt	William Powers

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STS-35 FLIGHT CONTROL TEAM STAFFING
(Continued)

Position	Ascent/Entry	Orbit 1	Orbit 2	Orbit 3
BOOSTER	Mark Jenkins (A) Kenneth Dwyer (E) or, Frank Markle (E)	/////	/////	Tom Kwiatkowski
GNC	Stephen Elsner	Edward Trlica	Kenneth Bain	Linda Patterson
GC	John Snyder Per Barsten	Mike Marsh Henry Allen	Lynn Vernon Terry Quick	John Wells Frank Stolarski
MMACS	Kevin McCluney	Keven McCluney	William Anderson	Paul Dye
SURGEON	Jeff Davis (A) Brad Beck (E)	Denise Baisden	Larry Pepper	/////
PAO	Brian Welch (A) Jeff Carr (E)	Jeff Carr	James Hartsfield	Kyle Herring

(A) = Ascent; (E) = Entry

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:

Kari Fluegel
November 29, 1990
Release No. 90-057

NEW TREATMENT EASES EFFECTS OF SPACE MOTION SICKNESS

Physicians at NASA's Johnson Space Center (JSC), Houston, have instituted a new treatment for space motion sickness that has markedly decreased the severity of the illness in crewmembers.

Promethezine, an intramuscular treatment administered after the onset of symptoms, has helped decrease the symptoms of space motion sickness on 14 occasions since NASA's return to flight in September 1988, according to Dr. Sam Pool, Chief of the Medical Sciences Division at JSC.

Medical researchers believe changes in the body's vestibular system contribute significantly to space motion sickness. The vestibular system regulates the body's sense of balance and, when the tiny stones in the inner ear called otoliths no longer have weight in a microgravity environment, the brain may misinterpret the sensations an individual may feel while moving around in microgravity. The unusual visual cues experienced during floating in the Shuttle orbiter cabin may further confuse the brain's perceptions and produce symptoms.

Since the early days of space flight, many space travelers have experienced this space motion sickness. Symptoms resemble those of Earth-based motion sickness and may include headache, malaise, lethargy, stomach awareness, loss of appetite, nausea and/or episodic vomiting. Symptoms tend to worsen during body movement, especially movements of the head.

In the first 24 missions of the Space Shuttle program, about 67 percent of the 85 crew members making their first flight reported symptoms of space motion sickness. About 30 percent reported mild symptoms; 24 percent, moderate symptoms; and 13 percent severe symptoms. Most recovered by the end of the third day in space. In one extreme case in the Soviet Salyut 6 mission, however, one crewmember was ill for 14 days. The incidence of space motion sickness among those making a second flight dropped to 46 percent.

During the first 24 Shuttle missions, scopolamine and a combination of scopolamine and dextroamphetamine, given orally, were used to treat space motion sickness. Recent studies at the JSC Biomedical Operations and Research Branch by Drs. Nitza Cintron and Lakshmi Putcha, however, have shown that the oral absorption of scopolamine and other medications in weightlessness is unpredictable.

Since the initiation of intramuscular promethazine therapy, Shuttle crewmembers have not experienced severe cases of space motion sickness and almost all have been essentially symptom free by the end of the second flight day. Crewmembers now receive training in administering the medication should space motion sickness develop during Shuttle flights. Research for space motion sickness is sponsored by NASA's Office of Space Science and Applications.

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NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:
December 3, 1990

Billie Deason
Release No. 90-058

NASA AWARDS COMMERCIAL MIDDECK AUGMENTATION MODULE CONTRACT

NASA has awarded a contract to SPACEHAB, Inc., Washington, D.C., to provide the services of a commercial middeck augmentation module (CMAN).

The firm-fixed-price contract covers a 5-year period, November 1990 through December 1995. The total amount of the negotiated contract is $184,236,000. At the time of contract award, NASA will fund $7,959,000.

The first SPACEHAB module is slated for flight aboard the Space Shuttle in December 1992. The leased module will ride in the payload bay when carried, be accessible through the air lock and add the volume equivalent of about 50 middeck lockers to the orbiters' capacity.

Under the contract, SPACEHAB will provide for the physical and operational integration of the module and the experiments, power, cooling, data management and crew training spread over six flights which will occur at intervals of about 6 months.

In support of private sector research initiatives, NASA is leasing two-thirds of the available module volume, over a six-flight profile. This volume will be used for flight research opportunities for NASA's Centers for the Commercial Development of Space and for Joint Endeavor Agreements. SPACEHAB will market to commercial users the remaining one-third of the module space.

The SPACEHAB lease will be managed by the CMAM Project Office in the New Initiatives Office at Johnson Space Center, Houston, on behalf of the NASA Headquarters Office of Commercial Programs. SPACEHAB submitted the only proposal received in response to NASA's request for proposals.

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NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release:
December 5, 1990
IMMEDIATE

Steve Nesbitt
~~Johnson Space Center~~
~~(713) 483-5111~~
Release no: 90-059

NASA OFFICIALS DENY REPORTS OF PHONE MISUSE

NASA Johnson Space Center officials today categorically denied recent news reports of large-scale unauthorized use of long distance phone service at the center.

The Houston Chronicle incorrectly reported Wednesday that hackers accessing federal long distance phone lines had stolen up to $12 million dollars worth of service over a two-year period.

Space Center officials issued a statement Wednesday that, given that the entire long distance bill for nearly 10,000 federal employees and contractors runs under $3 million each year, the Chronicle's assertion could not possibly be correct.

Acting on an inquiry from the Chronicle on November 16, the center shut down an off-site access link to federal long distance service. It was also discovered that an access number to that link had been published on a "hackers' bulletin board."

There has been no appreciable change in Federal Telecommunications Service (FTS) call statistics from the space center nor indication of significant abuse over the last several years. Any abuse at a level even much smaller than that asserted in the Chronicle article would have been impossible to miss and would have been investigated.

"While unauthorized use of the telephone undoubtedly occurs, as is likely on any large commercial or government system, we are confident it is a small percentage of total telephone costs," said John Garman, Deputy Director of Information Systems at JSC.

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December 5, 1990

NASA News

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

For Release

December 12, 1990

Barbara Schwartz
Release No. 90-060

SPRINGER RETIRES FROM NASA, MARINE CORPS

Col. Robert C. Springer, selected as an astronaut in 1980 and a mission specialist on two shuttle flights has retired from NASA and the U.S. Marine Corps.

Springer announced he will work for Boeing Aerospace and Electronics Division in Huntsville, Ala. as the manager of the Space Station Freedom's element integration.

During his first space flight, STS-29 in March 1989, Springer and his crewmates deployed a Tracking and Data Relay Satellite, and performed numerous secondary experiments, including a Space Station "heat pipe" radiator experiment, two student experiments, a protein crystal growth experiment, and a chromosome and plant cell division experiment. Additionally, the crew took more than 4,000 photographs of the earth using several types of cameras, including the IMAX 70 mm movie camera.

Springer also flew on STS-38, a Department of Defense flight, which launched Nov. 15, 1990.

Springer's technical assignments have included serving as a member of the support crew for STS-3, concept development studies for the Space Operations Center, and the coordination of various aspects of the final development of the Remote Manipulator System for operational use. He also worked in the Mission Control Center as spacecraft communicator (CAPCOM) for seven flights in 1984 and 1985.

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
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For Release
December 12, 1990

Barbara Schwartz
Release No. 90-061

NOTE TO EDITORS: STS-35 POSTFLIGHT CREW PRESS CONFERENCE

The STS-35 Postflight Crew Press Conference will be held at Johnson Space Center, Building 2, Room 135, on Thursday, December 20, at 1 p.m. central time. Crew members will narrate slides and film from their recent Astro-1 mission, followed by a question and answer session.

News media are invited to participate on location at JSC or by two-way audio from NASA Headquarters in Washington, DC; Kennedy Space Center in Florida; or Marshall Space Flight Center, in Huntsville, Alabama.

The briefing will be carried live on NASA Select television, Satcom F2R, Transponder 13, C-band, at 72° West Longitude, Frequency 3960.0 MHz, Audio 6.8 MHz.

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MACHINING AND SHEETMETAL FABRICATION SUPPORT CONTRACTOR SELECTED

NASA has selected ESCO Inc. of Houston as the contractor that will provide finished machined and sheetmetal items to the Johnson Space Center's Technical Service Division.

The proposed cost-plus-award-fee contract consists of a basic period of one year with priced options for four additional one-year periods. ESCO and NASA representatives will negotiate the terms of the contract and it is anticipated that NASA will award the contract in its agreed-upon form in February. ESCO's proposed cost and fee for the five-year period is about $18.6 million.

There are no major subcontracts under this contract.

The contract provides for the contractor to provide all management, labor, materials, facilities, equipment, and incidental engineering to deliver finished machined and sheetmetal items based on JSC drawings and specifications. The work is to be performed at the contractor's facility and will include machining of irregular shapes and three-dimensional contoured surfaces, designing of special tools, layout and fitting of multimotional intricate assemblies, and related processes.

One other proposal was received from Merritt Tool Co. of Kilgore, Tx.

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NASA ANNOUNCES CREW MEMBERS FOR FUTURE SHUTTLE FLIGHTS

The National Aeronautics and Space Administration today announced crew members for future Space Shuttle flights STS-48 Upper Atmosphere Research Satellite (UARS), STS-46 Tethered Satellite Systems, STS-49 Intelsat, and STS-50 United States Microgravity Laboratory (USML-1).

STS-48 UARS, scheduled for Nov. 1991, is a mission to study the Earth's upper atmosphere on a global scale. Nine UARS sensors will provide comprehensive data on energy inputs, winds, and chemical composition of the stratosphere. Crew members are:

Commander: John O. Creighton, Capt. USN
Pilot: Kenneth S. Reightler, Jr., Cdr. USN
Mission Specialists: James F. Buchli, Col. USMC
Mark N. Brown, Col. USAF
Charles D. "Sam" Gemar, Maj. USA

Creighton, 47, was born in Orange, Texas, and received his bachelor of science from the U.S. Naval Academy and master of science in administration of science and technology from George Washington University. He was pilot on STS 51-G and commander on STS-36.

Reightler, 39, was born at Patuxent River Naval Air Station, Maryland, and received his bachelor of science in aerospace engineering from the U.S. Naval Academy; master of science in aeronautical engineering from the U.S. Naval Postgraduate School and master of science in systems management from the University of Southern California. He was selected as a pilot astronaut in 1987, and this is his first Shuttle mission.

Buchli, 45, was born in New Rockford, North Dakota, and received his bachelor of science in aeronautical engineering from the U.S. Naval Academy and master of science in aeronautical engineering systems from the University of West Florida. He has flown on STS 51-C, STS 61-A, and STS-29.

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Brown, 39, was born in Valparaiso, Indiana, and received his bachelor of science in aeronautical and astronautical engineering from Purdue University and master of science in astronautical engineering from the U.S. Air Force Institute of Technology. He flew on STS-28.

Gemar, 35, was born in Yankton, South Dakota, and received his bachelor of science in engineering from the U.S. Military Academy. He flew on STS-38.

STS-46 TSS, scheduled for March 1992, is a tethered satellite which will be deployed from the orbiter payload bay on an approximately 12-mile (20 km) tether where it will collect electrodynamic data in the upper reaches of the Earth's atmosphere. Also, the European Retrievable Carrier (EURECA), a free-flying reusable platform dedicated to material science and life science experiments, will be deployed. Crew members are:

Commander: Loren J. Shriver, Col. USAF
Pilot: James D. Wetherbee, Cdr. USN
Mission Specialists: Andrew M. Allen, Maj. USMC
Other Mission Specialists previously named to this flight are: Franklin R. Chang-Diaz, Ph.D.
Jeffrey A. Hoffman, Ph.D.
Claude Nicollier, ESA Astronaut
Payload Specialist: A prime and backup payload specialist will be selected from the two announced candidates:
Umberto Guidoni - Italy
Franco Malerba - Italy

Shriver, 46, was born in Jefferson, Iowa, and received his bachelor of science in aeronautical engineering from the U.S. Air Force Academy and master of science in astronautical engineering from Purdue University. He was pilot on STS 51-C and commander on STS-31.

Wetherbee, 38, was born in Flushing, New York, and received his bachelor of science in aerospace engineering from the University of Notre Dame. He was pilot on STS-32.

Allen, 35, was born in Philadelphia, Pennsylvania, and received his bachelor of science in mechanical engineering from Villanova University. He was selected as a pilot astronaut in 1987, and this is his first Shuttle mission.

STS-49 Intelsat, scheduled for May 1992, is a flight on which crew members will attach a new booster and redeploy the Intelsat satellite. Additionally, three Extra-Vehicular Activities (EVAs--spacewalks) will be performed in an extensive test of EVA techniques to be employed during assembly of Space Station Freedom. This will be the first flight for the new orbiter Endeavour. Crew members are:

Commander: Daniel C. Brandenstein, Capt. USN
Pilot: Kevin P. Chilton, Maj. USAF
Mission Specialists: Pierre J. Thuot, Cdr. USN
Kathryn C. Thornton, Ph.D.
Richard J. Hieb
Thomas D. Akers, Maj. USAF
Bruce E. Melnick, Cdr. USCG

Brandenstein, 47, was born in Watertown, Wisconsin, and received his bachelor of science in mathematics and physics from the University of Wisconsin at River Falls. He was pilot on STS-8 and commander on STS 51-G and STS-32.

Chilton, 36, was born in Los Angeles, California, and received his bachelor of science in engineering sciences from the U.S. Air Force Academy and master of science in mechanical engineering from Columbia University. He was selected as a pilot astronaut in 1987, and this is his first Shuttle mission.

Thuot, 35, was born in Groton , Connecticut, and received his bachelor of science in physics from the U.S. Naval Academy and master of science in systems management from the University of Southern California. He flew on STS-36.

Thornton, 38, was born in Montgomery, Alabama, and received her bachelor of science from Auburn University, master of science and doctorate of philosophy in physics from the University of Virginia. She flew on STS-33.

Hieb, 35, was born in Jamestown, North Dakota, and received his bachelor of arts in mathematics and physics from Northwest Nazarene College and master of science in aerospace engineering from the University of Colorado. He is scheduled to fly on STS-39 in March 1991.

Akers, 39, was born in St. Louis, Missouri, and received his bachelor and master of science in applied mathematics from University of Missouri-Rolla. He flew on STS-41.

Melnick, 41, was born in New York, New York, and received his bachelor of science in engineering from the U.S. Coast Guard Academy and master of science in aeronautical systems from the University of West Florida. He flew on STS-41.

STS-50 USML-1, scheduled for June 1992, is a complement of microgravity materials processing technology experiments to be flown on the first Extended Duration Orbiter mission aboard Columbia. This mission is planned for a 13-day duration, the longest Shuttle mission to date. Crew members are:

Commander:	Richard N. Richards, Capt. USN
Pilot:	John H. Casper, Col. USAF
Mission Specialists:	Kenneth D. Bowersox, Lt.Cdr. USN
	Bonnie J. Dunbar, Ph.D. Payload Commander (previously named)
	Carl J. Meade, Lt. Col. USAF
Payload Specialists:	Two prime and two backup payload specialists will be selected from the announced candidates:
	Lawrence J. DeLucas, Ph.D.
	Joseph M. Prahl, Ph.D.
	Albert Sacco, Jr., Ph.D.
	Eugene H. Trinh, Ph.D.

Richards, 44, was born in Key West, Florida, and received his bachelor of science in chemical engineering from the University of Missouri and master of science in aeronautical systems from the University of West Florida. He was pilot on STS-28 and commander on STS-41.

Casper, 47, was born in Greenville, South Carolina, and received his bachelor of science in engineering science from the U.S. Air Force Academy and master of science in astronautics from Purdue University. He was a pilot on STS-36.

Bowersox, 34, was born in Portsmouth, Virginia, and received his bachelor of Science in aerospace engineering from the U.S. Naval Academy and master of science in mechanical engineering from Columbia University. He was selected as a pilot astronaut in 1987, and this is his first Shuttle mission.

Meade, 40, was born at Chanute AFB, Illinois, and received his bachelor of science in electrical engineering from the University of Texas where he participated in plasma dynamics research and master of science in electronics engineering from the California Institute of Technology as a Hughes Fellow doing research involving the application of information theory to neurophysiology. He flew on STS-38.

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NASA AWARDS EQUIPMENT PROCESSING CONTRACT EXTENSION

NASA has extended its Flight Equipment Processing Contract (FEPC) with Boeing Aerospace Operations through Nov. 30, 1993. The value of the three year extension is $103.4 million, increasing the current contract value to $210.3 million.

Boeing was first awarded the contract in December 1985. The cost-plus-award-fee contract also includes options which would extend the performance period to Nov. 30, 2000. The potential total value of the contract is $492.1 million.

The contract provides for the processing and preparation of astronaut flight equipment for Space Shuttle missions and astronaut crew training. The contract includes the management, operation, testing and modification of specific equipment. Most of the work on the contract is performed at Boeing's Houston facility at 1045 Gemini Ave.

Examples of items included in the contract are the extravehicular mobility unit, tools, food, clothing, personal items, communication, photographic and video equipment.

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